APPENDIX C

PM2.5 Continuous Monitor Comparability Assessment and Request for Waiver

Introduction

The South Coast AQMD monitoring program has historically operated PM2.5 continuous monitors primarily to support forecasting and reporting of the Air Quality Index (AQI). These monitors supply hourly data to provide AQI information to the general public through the South Coast AQMD smartphone application and website AQI map. The data also supports national websites such as AirNow (www.airnow.gov). South Coast AQMD has been using PM 2.5 continuous monitors since the early 2000s. The first PM2.5 continuous monitor was approved as a (Federal Equivalent Method) FEM in 2008. By utilizing an approved FEM, any subsequent data produced from the method may be eligible for comparison to U.S. EPA's health-based standard known as the NAAQS. The primary advantage of operating a PM2.5 continuous FEM is that it can support the AQI, while also supplying data that is eligible for comparison to the NAAQS. Thus, a network utilizing PM2.5 continuous FEMs can potentially lower the number of filter based Federal Reference Method (FRM) samplers operated in the network, which are primarily used for comparison to the NAAQS. These filter based FRMs are resource intensive in that they require field operations, pre-and post-sampling laboratory analysis, which results in data not being available for 2-4 weeks after sample collection.

South Coast AQMD has been evaluating PM2.5 continuous monitors since they were designated equivalent methods. Although PM2.5 continuous FEMs are automated methods, these methods still require careful attention in their set-up, operation, calibration, and validation of data. Once enough data was collected, South Coast AQMD began to evaluate the performance of these methods compared to collocated FRM data per 40 CFR §58.11(e). The evaluation is explained further below and includes our request regarding the use of the data from these methods.

Request for Exclusion of PM2.5 Continuous FEM Data from Comparison to the NAAQS

Evaluation requirements for requesting exclusion of data from comparison to the NAAQS are identified in 40 CFR §58.11 (e). These requirements refer to the performance criteria described in Table C-4 to subpart C of part 53. To accommodate the differences in how routine monitoring agencies, operate their networks, additional provisions are described in §58.11 (e). When a topic is not addressed in §58.11 (e), then the test specifications from Table C-4 applies.

Evaluation of FRM/FEM data per §53 Table C-4 requires a slope of regression to be 1 ± 0.10 and an intercept of regression $\pm$ 2.0 to meet bias requirements. Table 1C shows, the slopes of the regression between collocated FRM and FEM measurements which do not meet the 1 ± 0.10 specification indicated in §53 Table C-4 (i.e. slope = 1 ± 0.1) or the intercept of the regression relationship between FRM and FEM data of ±2.0 (also indicated in §53 Table C-4). The Compton, and Mira Loma (Van Buren) failed to meet these criteria. Compton is two quarters short of the full three years required, South Coast AQMD requests U.S. EPA consider the data after July 1, 2023, when the full three years has been obtained.

Additionally, the correlation of reference value should be $\geq$ 0.95 for the R(y) vs FRM CCV (x) to meet the part 53 correlation criteria used in approving continuous PM2.5 FEMs, as per "Technical Note – PM 2.5 Continuous Monitor Comparability Assessment." According to §58.11 (e)(6), The key statistical metric to include in an assessment is the bias of the PM 2.5 continuous FEM(s) compared to a collocated FRM(s). Correlation is required to be reported in the assessment, but failure to meet the correlation criteria, by itself, is not cause to exclude data from a continuous FEM monitor. Data at or above the dashed line (r =0.9) meet the correlation criteria identified in guidance for reporting the AQI.

Thus, in accordance with the PM NAAQS rule published on January 15, 2013 (78 FR 3086) and specific to the provisions detailed in §58.10 (b)(13) and §58.11 (e), South Coast AQMD is requesting that data from the Compton (POC 3), and Mira Loma (Van Buren) (POC 3) monitors be set aside for comparison to the NAAQS. While South Coast AQMD is working to optimize the monitoring instrumentation to meet all our monitoring objectives, the performance is not yet at a point where the comparability of the PM2.5 continuous FEM compared to collocated FRMs is acceptable and should be submitted as 88502 in AQS.

Detailed one-page assessments from which the information was obtained are summarized in Table 1C and included at the end of this section.

Table 1C – Request for Exclusion of PM2.5 Continuous FEM Data

Site Name	City	Site ID	Cont. POC	Cont. Method Description	PM2.5 Cont. Begin Date	PM2.5 Cont. End Date	Continuous / FRM Sampler Pairs Per Season	Slope (m)	Intercept (y)	Meets Bias Requirement	Correlation (r)
Sites with $PM_{2.5}$ continuous FEMs that are collocated with FRMs											
Compton	Compton	06-037-1302	3	Met-One BAM 1020 w/VSCC **as 88502*	07/01/2020	12/31/2022	Winter = 177 Spring = 176 Summer = 263 Fall = 264 Total = 880	0.89	2.52	No	0.98
Mira Loma (Van Buren)	Mira Loma	06-065-8005	3	Met-One BAM 1020 w/VSCC **as 88502*	01/01/2020	12/31/2022	Winter = 263 Spring = 259 Summer = 271 Fall = 259 Total = 1052	0.93	2.11	No	0.97

Period of Exclusion of Data from the PM2.5 Continuous FEMs

The above Table 1C details the period of available data by monitor on which the request to exclude PM2.5 continuous FEM data is based. Per U.S. EPA Regional Office approval, this data will be entered into U.S. EPA's AQS database in a manner where the data is only used for the appropriate monitoring objective(s) (i.e., use data for just the AQI). Additionally, South Coast AQMD will continue to load any new data generated for the next 18 months (intended to represent the period until December 31, 2022) in the same manner or until such time we request and receive approval from the U.S. EPA Regional Office to change the status of these monitors.

PM2.5 Continuous FEM data for Reporting the AQI

Where the analysis supports the request for exclusion from comparison to the NAAQS, the data is of sufficient comparability to collocated FRMs that they be used for public AQI reporting. Therefore, with U.S. EPA Regional Office approval we will report this data on our website and to AirNow (www.airnow.gov). As such, data submitted to U.S. EPA's AQS database will be under "acceptable AQI" reporting (i.e., parameter code 88502) so that data users will know that this data is appropriate for use in AQI calculations, but not for NAAQS comparison.

Assessments

The following one-page assessments are of locations where South Coast AQMD has collocated PM2.5 FRM and continuous FEM monitors. Each of these assessments is represented in the "Table 1C – Request for Exclusion of PM2.5 Continuous FEM Data" and "Table 2C – Request for Inclusion of PM2.5 Continuous FEM Data" above.

Compton

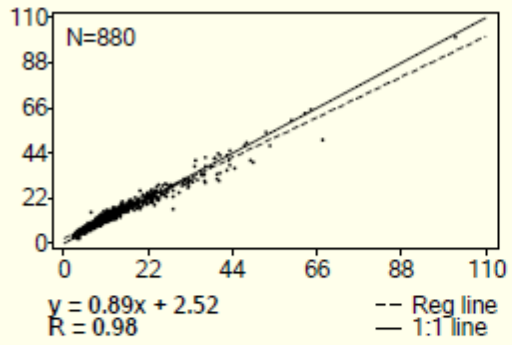
(FRM POC: 1 - FEM POC: 3) **as 88502*

$PM_{2.5}$ Continuous Monitor Comparability Assessment

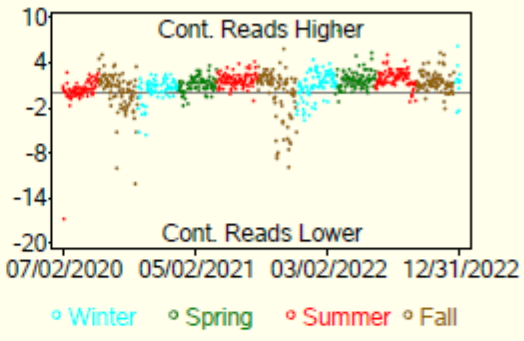
Site 06-037-1302: Compton, CA

FRM: R & P Model 2025 PM-2.5 Sequential Air Sampler w/VSCC - Gravimetric (120,145,155), PM2.5 - Local Conditions (88101), POC=1
Cont: Met-One BAM W/PM2.5 VSCC - Beta Attenuation (733), Acceptable PM2.5 AQI & Speciation Mass (88502), POC=3

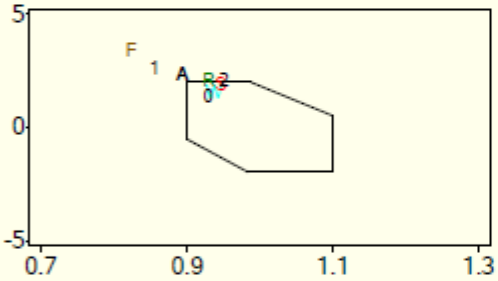
Cont. (y) vs. FRM (x) ($\mu g/m^3$)



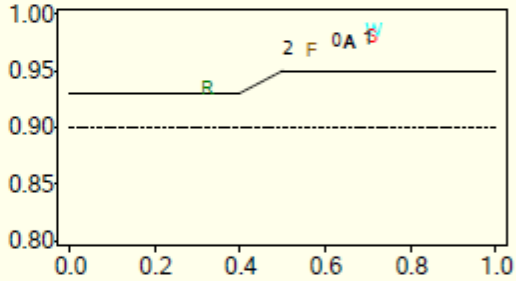
Cont. minus FRM ($\mu g/m^3$)



Additive (y) vs. Multiplicative (x) Bias



R (y) vs. FRM CCV (x)



Mean Concentration ($\mu g/m^3$)

Dataset	N	FRM	Cont	Ratio (Cont/FRM)
AllData	**880**	**13.9**	**15.0**	**1.08**
Winter	177	15.1	15.9	1.05
Spring	176	10.5	12.0	1.14
Summer	263	12.1	13.5	1.12
Fall	264	17.1	17.7	1.03
2020	182	18.4	18.7	1.01
2021	340	13.4	14.2	1.06
2022	358	12.1	13.7	1.14

Appendix A Statistics

Dataset	N (all observations)	Bias	N (only >= 3 ug/m^3)	Bias
AllData	**880**	**12.4**	**875**	**12.4**
Winter	177	10.1	176	9.9
Spring	176	16.9	174	16.6
Summer	263	14.2	261	14.5
Fall	264	9.1	264	9.1
2020	182	3.6	181	3.9
2021	340	11.9	338	11.7
2022	358	17.3	356	17.3

Data Source: EPA AQS Data Mart

Generated: April 5, 2023

Mira Loma (Van Buren)

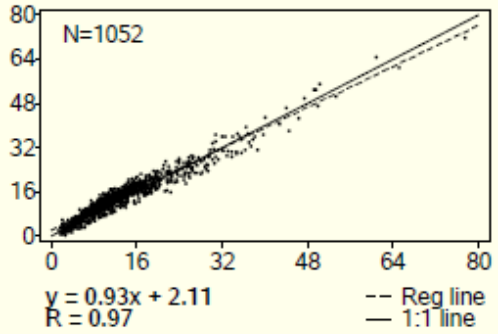
(FRM POC: 1, 2 - FEM POC: 3) ***as 88502***

$PM_{2.5}$ Continuous Monitor Comparability Assessment

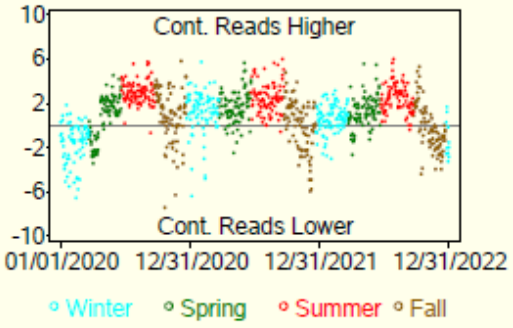
Site 06-065-8005: Mira Loma, CA

FRM: R & P Model 2025 PM-2.5 Sequential Air Sampler w/VSCC - Gravimetric (120,143,145), PM2.5 - Local Conditions (88101), POC=1,2
Cont: Met-one BAM-1020 W/PM2.5 SCC - Beta Attenuation (170), Acceptable PM2.5 AQI & Speciation Mass (88502), POC=3

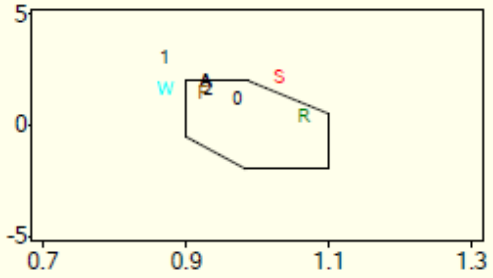
Cont. (y) vs. FRM (x) ($\mu g/m^3$)



Cont. minus FRM ($\mu g/m^3$)

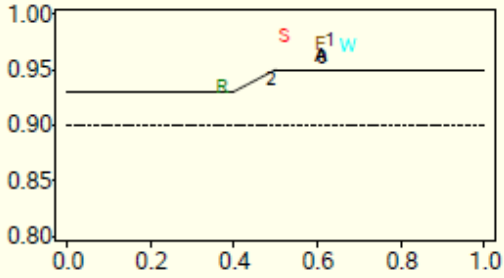


Additive (y) vs. Multiplicative (x) Bias



A=AllData, 0=2020, 1=2021, 2=2022
W=Winter, R=Spring, S=Summer, F=Fall

R (y) vs. FRM CCV (x)



A=AllData, 0=2020, 1=2021, 2=2022
W=Winter, R=Spring, S=Summer, F=Fall

Mean Concentration ($\mu g/m^3$)

Dataset	N	FRM	Cont	Ratio (Cont/FRM)
AllData	**1052**	**13.5**	**14.7**	**1.08**
Winter	263	13.0	13.1	1.01
Spring	259	11.2	12.4	1.11
Summer	271	12.6	15.3	1.21
Fall	259	17.4	17.7	1.02
2020	350	14.8	15.8	1.06
2021	347	14.4	15.7	1.09
2022	355	11.4	12.5	1.09

Appendix A Statistics

Dataset	N (all observations)	Bias	N (only >= 3 ug/m^3)	Bias
AllData	**1052**	**11.9**	**1019**	**12.2**
Winter	263	7.2	242	6.3
Spring	259	11.1	250	12.9
Summer	271	24.0	271	24.0
Fall	259	4.7	256	4.5
2020	350	7.8	333	9.7
2021	347	15.9	342	14.6
2022	355	12.0	344	12.1

Data Source: EPA AQS Data Mart

Generated: April 5, 2023