

APPENDIX C

PM_{2.5} Continuous Monitor Comparability Assessment and Request for Waiver

Introduction

The South Coast AQMD monitoring program has historically operated PM_{2.5} 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 PM_{2.5} 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 PM_{2.5} 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 PM_{2.5} continuous FEMs can potentially lower the number of filters 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. The goal of this appendix is to demonstrate the evaluation performed in accordance with U.S. EPA requirements and to request exclusion of specific FEM datasets from comparison to the NAAQS, as permitted under 40 CFR § 58.11(e).

South Coast AQMD has been evaluating PM_{2.5} continuous monitors since they were designated equivalent methods. Although PM_{2.5} 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.

In some cases, data visualization and analysis using the U.S. EPA PM_{2.5} FRM/FEM Comparability Tool is not feasible due to historical differences in instrument method codes POC configurations. Specifically, certain monitors had previously been assigned method code 88502 because they had failed comparability testing in previous years. In addition, some monitors were operated as part of a continuous coarse PM monitor (PM₁₀-PM_{2.5}) and were assigned POC 9. In contrast, their replacements were assigned method code 88101 and POC 3. These differences in configuration prevent direct integration in the assessment tool and necessitate manual comparability evaluation.

Request for Exclusion of PM_{2.5} 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 comparability between PM_{2.5} FRM and FEM instruments is based on the criteria set forth in 40 CFR § 58.11(e) and Table C-4 to Subpart C of 40 CFR Part 53, which require a slope of 1.0 ± 0.10 and an intercept within $\pm 2.0 \mu\text{g}/\text{m}^3$. These thresholds are used to assess bias between paired instruments. As shown in Table 1C, several sites did not meet these requirements for one or more years. Specifically, Los

Angeles (Main St.) failed in 2022, 2023, and 2024; Compton in 2024; and Route 710 Near Road site in 2024.

The correlation of reference value should be ≥ 0.95 for the $R(y)$ vs FRM CCV (x) to meet the part 53 correlation criteria used in approving continuous $PM_{2.5}$ 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). While correlation is required to be reported in the assessment, failure to meet the correlation criteria alone does not constitute grounds for exclusion of FEM data. However, data with a correlation coefficient (r) of 0.90 or higher are considered to meet the criteria identified in guidance for AQI reporting.

Therefore, in accordance with the $PM_{2.5}$ NAAQS rule published on January 15, 2013 (78 FR 3086), and pursuant to 40 CFR § 58.10(b)(13) and § 58.11(e), South Coast AQMD formally requests that the following datasets be excluded from NAAQS comparison: Los Angeles (Main St.) (POC 3 and 9, 2020 – 2022), (POC 3 and 9, 2021–2023) and (POC 3, 2022 – 2024); Compton (POC 3, 2024); and Long Beach Route 710 (POC 3, 2024). These requests are based on comparability tests results as detailed in Table 1C and are consistent with U.S. EPA guidance.

To address the issue of $PM_{2.5}$ FEM instruments not passing the comparability assessment, South Coast AQMD has implemented a comprehensive and well-documented quality assurance and quality control program. This includes systematic data review, routine and traceable calibrations, annual zero tests, and preventive maintenance procedures designed to minimize downtime and ensure the accuracy of collected data. The agency also works closely with instrument manufacturers to identify and resolve performance issues, demonstrating its continued commitment to producing high quality air monitoring data.

South Coast AQMD is currently investigating specific comparability issues at the Los Angeles, Compton and the 710 Near Road sites. Although instruments at these locations have been replaced, not all replacements involved third generation models. At the Compton site, a new third generation federal equivalent method instrument has been installed and is showing improved performance. It is anticipated that this site will meet comparability requirements once sufficient data has been collected. At the Los Angeles and 710 Near Road sites, further investigation is underway to evaluate the impact of downtube lengths in areas with high ceilings and to review site operator procedures to ensure consistency and adherence to best practices.

In addition to equipment upgrades and procedural reviews, South Coast Air Quality Management District is also examining metadata for the instruments that are not passing comparability assessments. This effort aims to identify configuration differences or other operational factors that may be contributing to inconsistent performance. These investigations are part of a broader strategy to maintain the integrity of the monitoring network and ensure compliance with federal data quality requirements.

For FRM monitors, preventive maintenance and regular calibrations are conducted in accordance with U.S. EPA requirements and internal Standard Operating Procedures (SOPs), reinforcing the robustness of the overall network. South Coast AQMD is also replacing remaining second-generation FEM instruments with third-generation models provided under the American Rescue Plan (ARP), following the successful resolution of known issues in collaboration with the manufacturers.

The preceding efforts underscore South Coast AQMD’s commitment to meeting U.S. EPA monitoring requirements and upholding the highest standards in ambient air quality data collection.

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 PM_{2.5} Continuous FEM Data

Site Name	City	Site ID	Cont. POC	Cont. Method Description	PM _{2.5} Cont. Begin Date	PM _{2.5} Cont. End Date	Continuous/ FRM Sampler Pairs Per Season	Slope (m)	Intercept (y)	Meets Bias Requirement	Correlation (r)
<i>Sites with PM_{2.5} continuous FEMs that are collocated with FRMs</i>											
Los Angeles ¹ (Main St.)	Los Angeles	06-037-1103	Combined 3 & 9	Met-One BAM 1020 w/VSCC 88101\88502 ¹	1/1/2020	12/31/2022	Winter = 258 Spring = 257 Summer = 266 Fall = 267 Total = 1048	0.80	3.97	No	0.94
Los Angeles ¹ (Main St.)	Los Angeles	06-037-1103	Combined 3 & 9	Met-One BAM 1020 w/VSCC 88101\88502 ¹	1/1/2021	12/31/2023	Winter = 258 Spring = 260 Summer = 265 Fall = 264 Total = 1047	0.85	3.41	No	0.91
Los Angeles (Main St.)	Los Angeles	06-037-1103	3	Met-One BAM 1020 w/VSCC 88101	1/1/2022	12/31/2024	Winter = 265 Spring = 265 Summer = 272 Fall = 258 Total = 1060	0.90	2.51	No	0.95
Compton ²	Compton	06-037-1302	3	Met-One BAM 1020 w/VSCC 88101\88502 ²	01/01/2022	12/31/2024	Winter = 240 Spring = 252 Summer = 253 Fall = 258 Total = 1003	0.89	2.1	No	0.96
Route 710 NR	Long Beach	06-037-4008	3	Met-One BAM 1020 w/VSCC 88101	01/01/2022	12/31/2024	Winter = 175 Spring = 180 Summer = 203 Fall = 257 Total = 815	0.92	3.10	No	0.93

¹The PM_{2.5} FEM instrument operated under POC 9 with method code 88502, as it had previously failed the comparability assessment while operating as part of a PM coarse monitoring configuration. The PM₁₀ and PM_{2.5} instruments operated independently, but their data were combined separately, to calculate coarse particulate concentrations. As a result, they were assigned separate POC codes to reflect their role in the coarse monitoring setup. After the PM coarse monitoring was discontinued, the PM_{2.5} instrument was replaced with a separate FEM and reassigned to the standard POC 3 with method code 88101, consistent with its role as a stand-alone PM_{2.5} FEM instrument.

²The monitor was previously granted a data exclusion and had been assigned method code 88502. Following the replacement in 2024, it was assigned POC 3, method code 88101, as a result, some of the data cannot be combined using the U.S. EPA PM_{2.5} comparability assessment tool and must be evaluated manually.

Period of Exclusion of Data from the PM_{2.5} Continuous FEMs

The above Table 1C details the period of available data by monitor on which the request to exclude PM_{2.5} 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, 2025) 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.

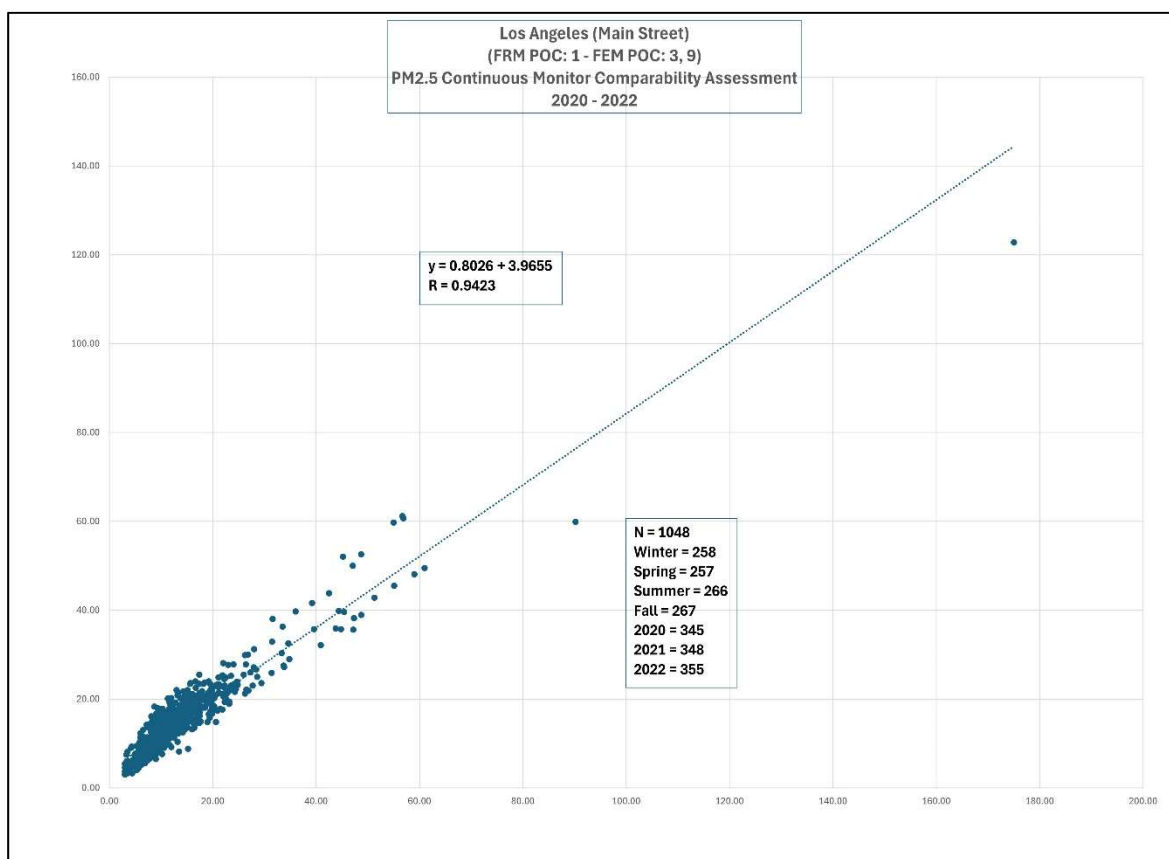
PM_{2.5} Continuous FEM data for Reporting the AQI

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.

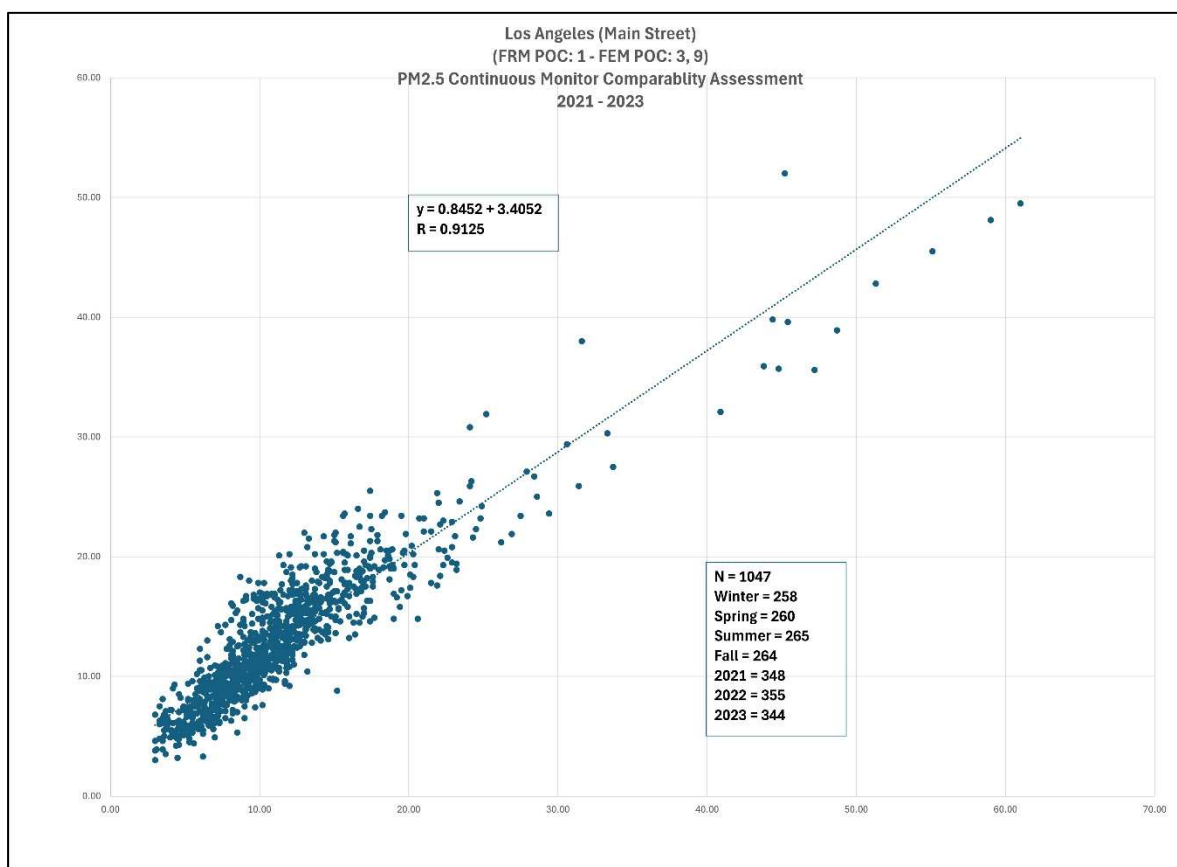
Assessments

The following one-page assessments are of locations where South Coast AQMD has collocated PM_{2.5} FRM and continuous FEM monitors. Each of these assessments is represented in the "Table 1C – Request for Exclusion of PM_{2.5} Continuous FEM Data" and "Table 2C – Request for Inclusion of PM_{2.5} Continuous FEM Data" above.

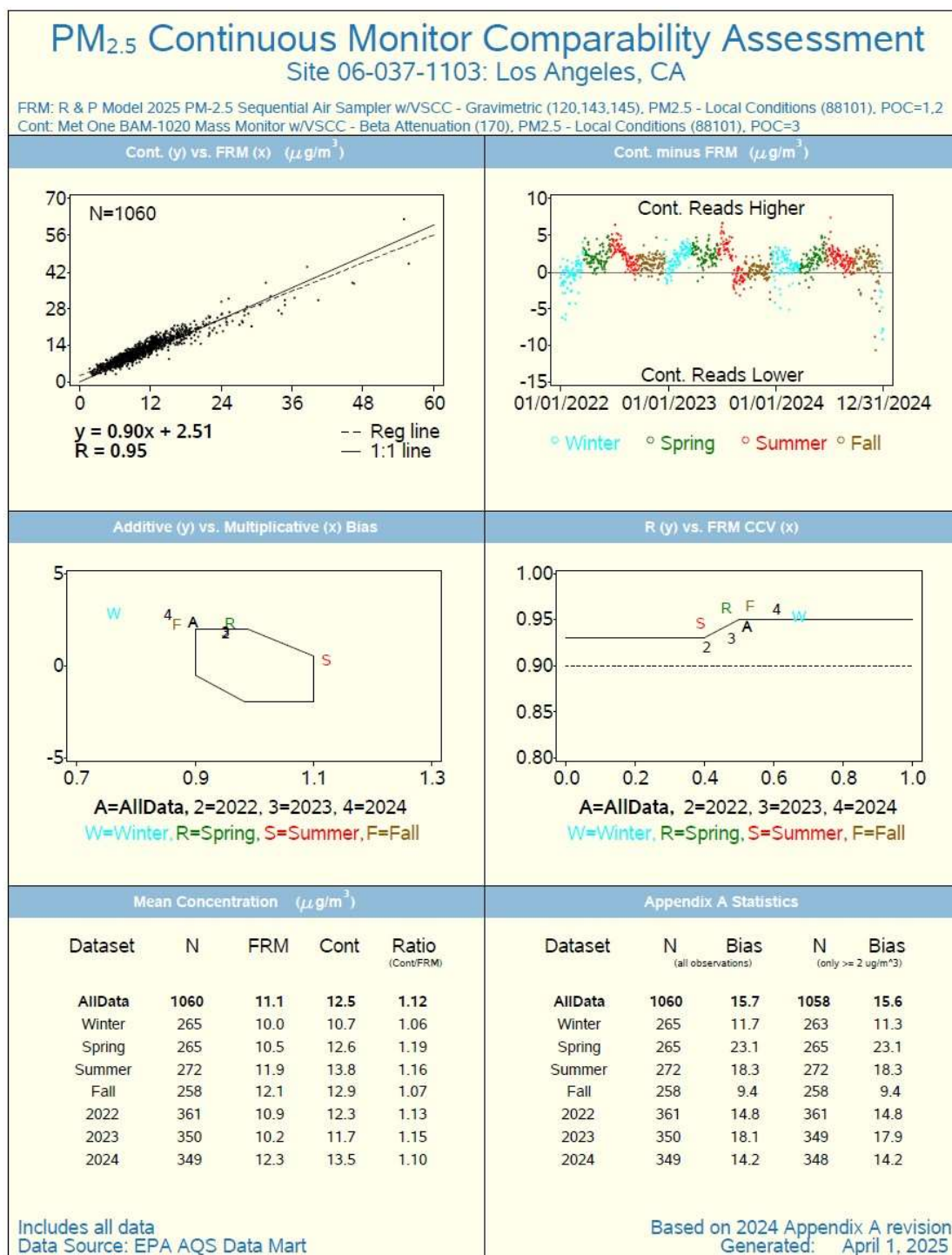
**Los Angeles (Main St.)
(FRM POC: 1 - FEM POC: 3, 9)**



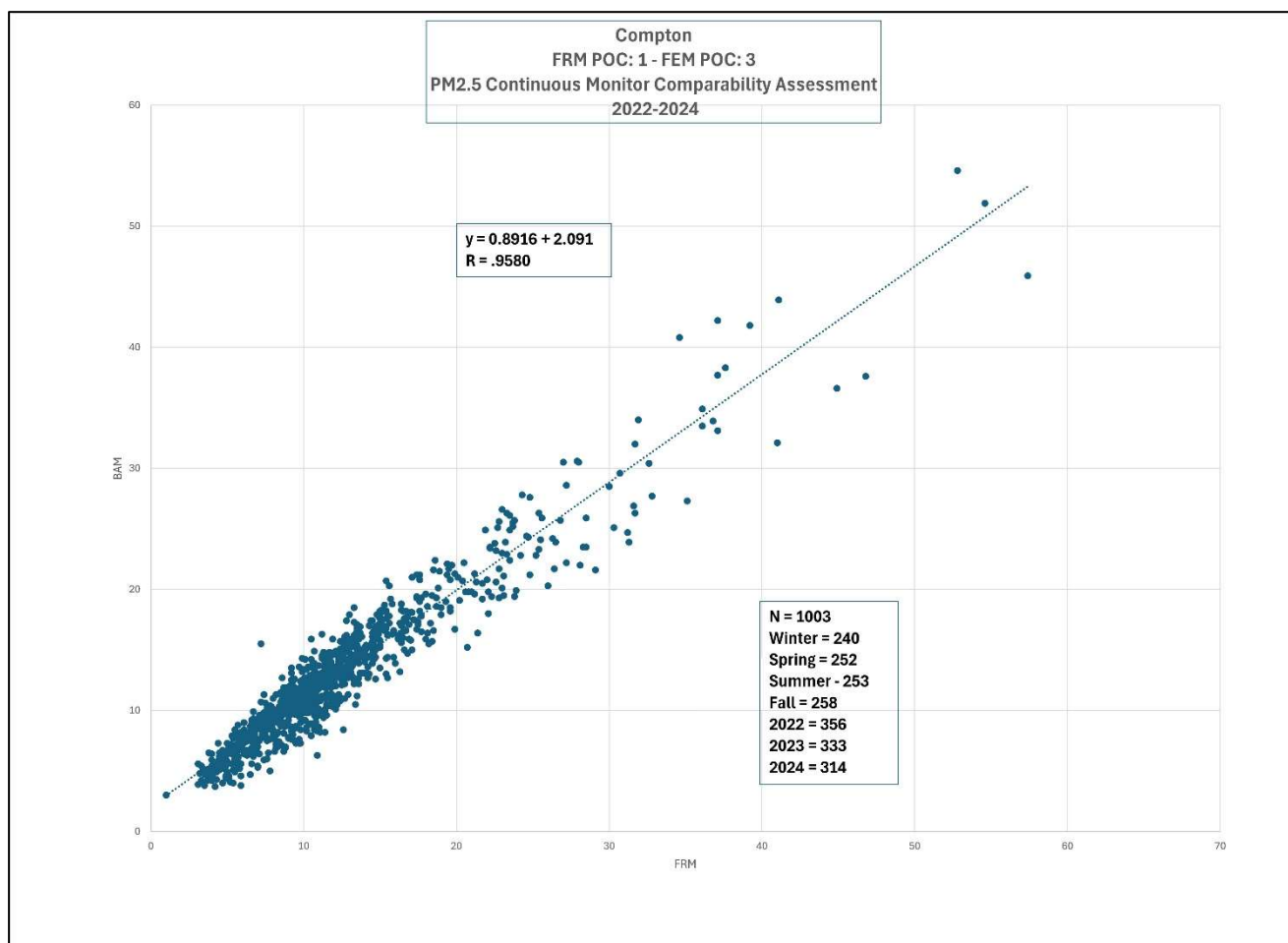
**Los Angeles (Main St.)
(FRM POC: 1 - FEM POC: 3, 9)**



Los Angeles (Main St.) (FRM POC: 1 - FEM POC: 3)



Compton (FRM POC: 1 - FEM POC: 3)



Route 710 NR (FRM POC: 1 - FEM POC: 3)

