

PM Reconsideration QA Revisions - 40 CFR Part 58, Appendix A, B and E

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PM Rule QA Changes - Background



Disclaimer:

This presentation is focused only on QA changes in the PM Reconsideration. We will not talk about all the changes.

PM Rule QA Changes - Background



The following sections of 40 CFR Part 58 were revised with respect to Quality Assurance:

Appendix A, Quality Assurance Requirements for Monitors used in Evaluations of National Ambient Air Quality Standards (NAAQS)

Appendix B, Quality Assurance Requirements for Prevention of Significant Deterioration (PSD) Air Monitoring

Appendix E, Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring

PM Rule QA Changes - Background



- **The intent for these revisions was not to create new requirements and create new burden on monitoring organizations.**
- **Where possible, improvements or efficiencies have been included where data or expertise dictate.**



PM Rule QA Changes – Getting Started



The revisions for Appendices A and B are very similar and will be discussed together



Then we'll jump over to Appendix E and talk about the changes there

PM Rule QA Changes – Summary



Appendices A and B

Calculations for Data Quality Assessments

- Updated Section 4.2.1, Equation 6 and Equation 7 for calculating the Collocated Quality Control Sampler Precision Estimate for PM₁₀, PM_{2.5} and Pb.
- Updated Section, 4.2.5, Equation 8 calculation for the Performance Evaluation Programs Bias Estimate for PM_{2.5}

Quality System Requirements

- Reconsidered the Section, 2.3.1.1 total bias goal using new statistics
- Revised Section, 2.6.1 pertaining to EPA Protocol Gas standards and PGVP

PM Rule QA Changes – Summary



Appendices A and B

Measurement Quality Check Requirements

- Remove section 3.1.2.2 allowing NO₂ compressed gas standards to be used to generate audit standards.
- Revise section 3.1.3.3 requiring annual verification of National Performance Audit Program (NPAP) tank gases to allow ORD verification frequencies.
- Adjust the minimum value required in section 3.2.4 to be considered valid sample pairs for the PM_{2.5} Performance Evaluation Program (PEP) from 3 µg/m³ to 2 µg/m³.

References

- Updated references and hyperlinks in Reference sections.
- Add footnote to Table A-1 to clarify the allowable time between checks.

PM Rule QA Changes – Summary



Appendix E

Through multiple rule revisions since 2006, some requirements were inadvertently omitted, and the clarity of this Appendix was reduced. In a few instances, this led to unintended and conflicting regulatory requirements.

- Reorganized and created separate sections for criteria monitoring and open path monitoring requirements.
- Lengthens overall App. E regulation text. but shortens and provides more clarity for the sections most used by SLTs.
- Reconciling conflicting requirements.
- Adding specificity and clarity for existing requirements.
- Retaining Waiver Provisions.

National Ambient Air Monitoring Conference, New Orleans, August 2024

PM Rule QA Changes – Getting Started



Let's get
into the
details



FEDERAL REGISTER

The Daily Journal of the United States Government



Ⓜ Rule

Design Updates: As part of our ongoing effort to make FederalRegister.gov more accessible and easier to use we've enlarged the space available to the document content and moved all document related data into the utility bar on the left of the document. [Read more in our feature announcement.](#)

Reconsideration of the National Ambient Air Quality Standards for Particulate Matter

A Rule by the Environmental Protection Agency on 03/06/2024

National Ambient Air Monitoring Conference, New Orleans, August 2024



Calculations for Data Quality Assessments - Precision

Section 4.2.1, EPA revised Equation 6 and Equation 7 for calculating the Collocated Quality Control Sampler Precision Estimate for PM₁₀, PM_{2.5} and Pb.

- The prior precision estimate used a Relative Percent Difference when comparing two collocated samplers.
- As the two numbers used in the comparison get smaller, the statistic generally produced an inflated precision statistic even though the numbers were relatively close to each other.

PM Rule QA Changes - Calculations for Data Quality Assessments for Precision

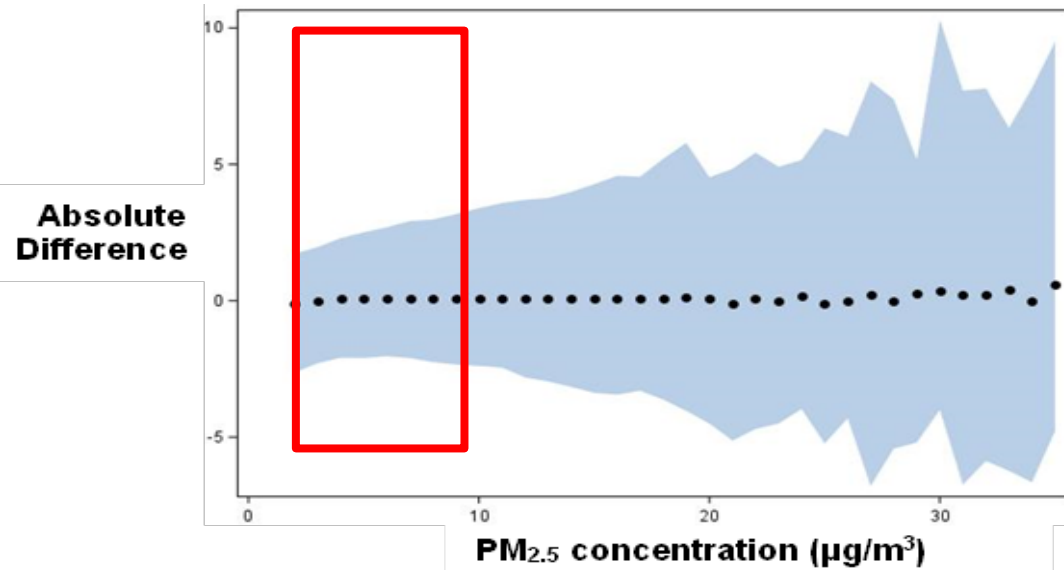


Figure 5. Average absolute difference in PM_{2.5} measurements between paired samples (dots), with 5th and 95th percentiles in differences (blue region), for 1 µg/m³ groups.

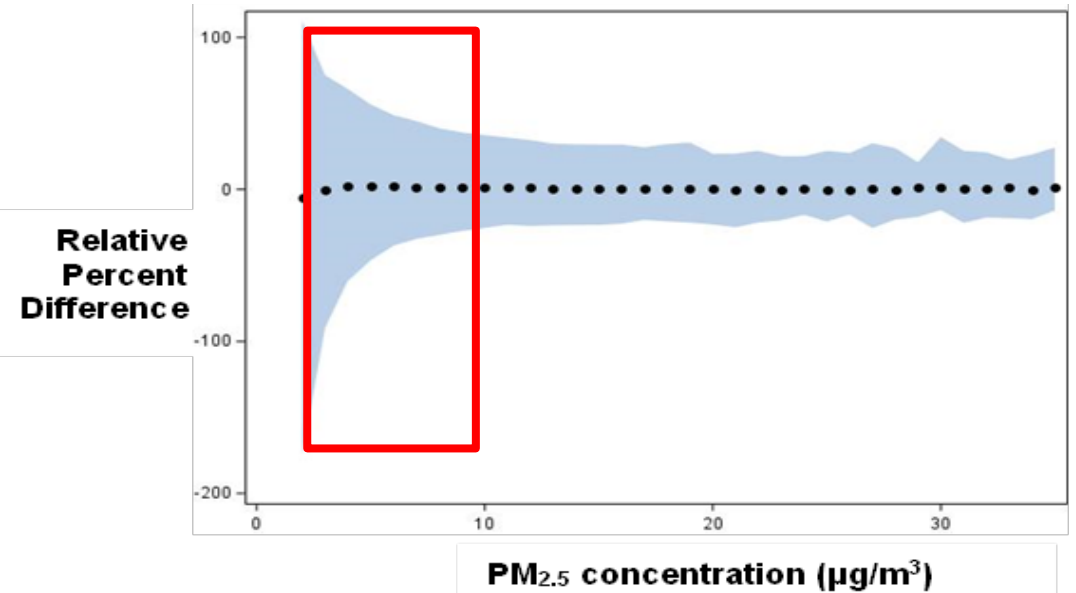


Figure 4. Average relative percent difference in PM_{2.5} measurements paired samples (dots), with 5th and 95th percentiles in the relative percent differences (blue region), for 1 µg/m³ groups.

Acknowledgement to Battelle for the statistical assessment

PM Rule QA Changes - Calculations for Data Quality Assessments for Precision



Equation 6

Prior:

$$d_i = \frac{X_i - Y_i}{(X_i + Y_i)/2} \times 100\%$$

New:

$$t_i = \frac{X_i - Y_i}{\sqrt{(X_i + Y_i)/2}}$$

PM Rule QA Changes - Calculations for Data Quality Assessments for Precision



Correction Notice:

Printing Error in CFR... Here's what was printed:

Equation 6 to Section 4.2.1 of Appendix B

$$t_i = \frac{X_i - Y_i}{\sqrt{(X_i - Y_i)/2}}$$

PM Rule QA Changes - Calculations for Data Quality Assessments for Precision



Equation 7

Prior:

$$\sqrt{\frac{n \sum_{i=1}^n d_i^2 - (\sum_{i=1}^n d_i)^2}{2n(n-1)}} \times \sqrt{\frac{n-1}{\chi_{0.1, n-1}^2}}$$

New:

$$\sqrt{\frac{n \sum_{i=1}^n t_i^2 - (\sum_{i=1}^n t_i)^2}{2n(n-1)}} \times \sqrt{\frac{n-1}{\text{NAAQS} \times \chi_{0.1, n-1}^2}} \times 100\%$$

Precision is expressed as CV90 at the annual NAAQS

PM Rule QA Changes - Calculations for Data Quality Assessments for Precision

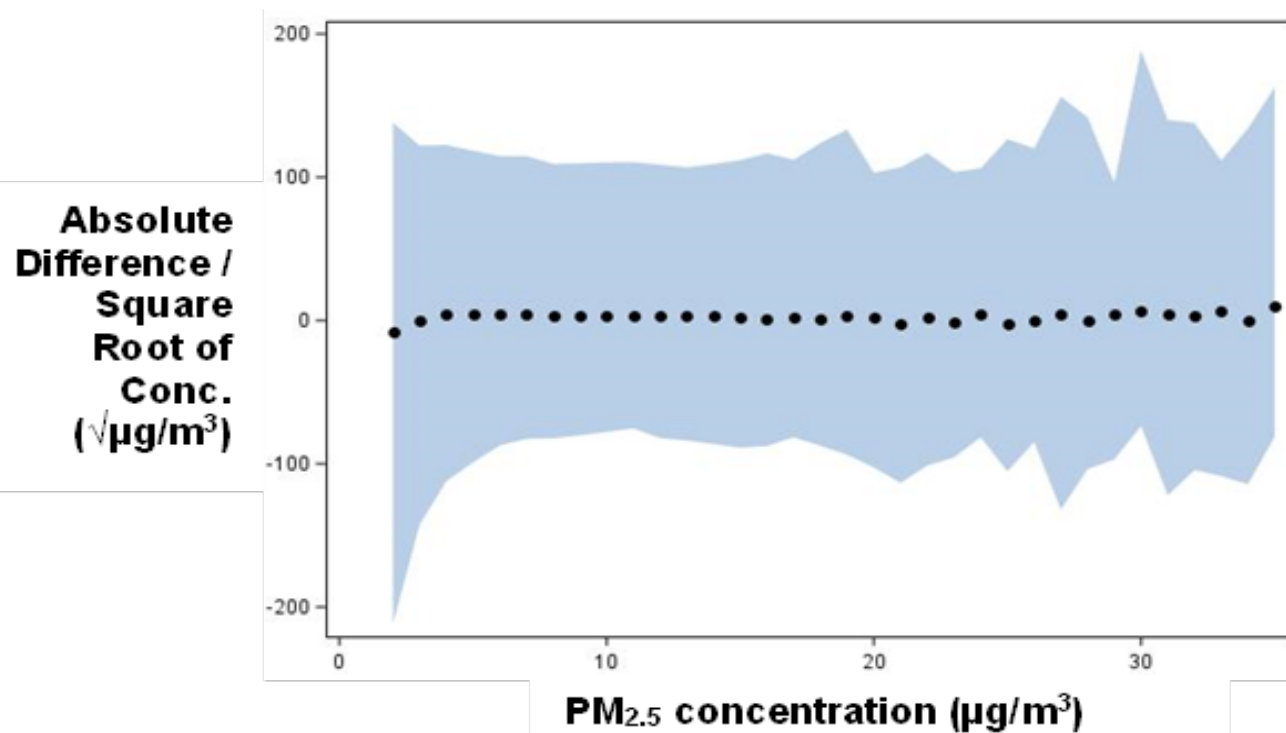


Figure 6. Average absolute difference in PM_{2.5} measurements divided by square root of concentration ($\sqrt{\mu\text{g}/\text{m}^3}$) between SLT and PEP samples (dots), with 5th and 95th percentiles in the percent differences (blue region), for 1 $\mu\text{g}/\text{m}^3$ groups and considering FRM samplers only.

Using this new approach, variability is more constant across all concentrations thereby reducing the inflated effect.

PM Rule QA Changes - Calculations for Data Quality Assessments for Bias



Similarly...

Section 4.2.5, EPA proposes to change the Equation 8 calculation for the Performance Evaluation Program's Bias Estimate for PM_{2.5}.

- The prior method of calculation is not appropriate for determining bias at lower ambient concentrations and using newer and more sensitive sampling methodologies.
- As the two numbers used in the comparison get smaller, the statistic generally produces a result that is inflated.
- A bias statistic calculated for low-concentration data may show poor agreement even if the nominal values are relatively close to each other.

PM Rule QA Changes - Calculations for Data Quality Assessments for Bias

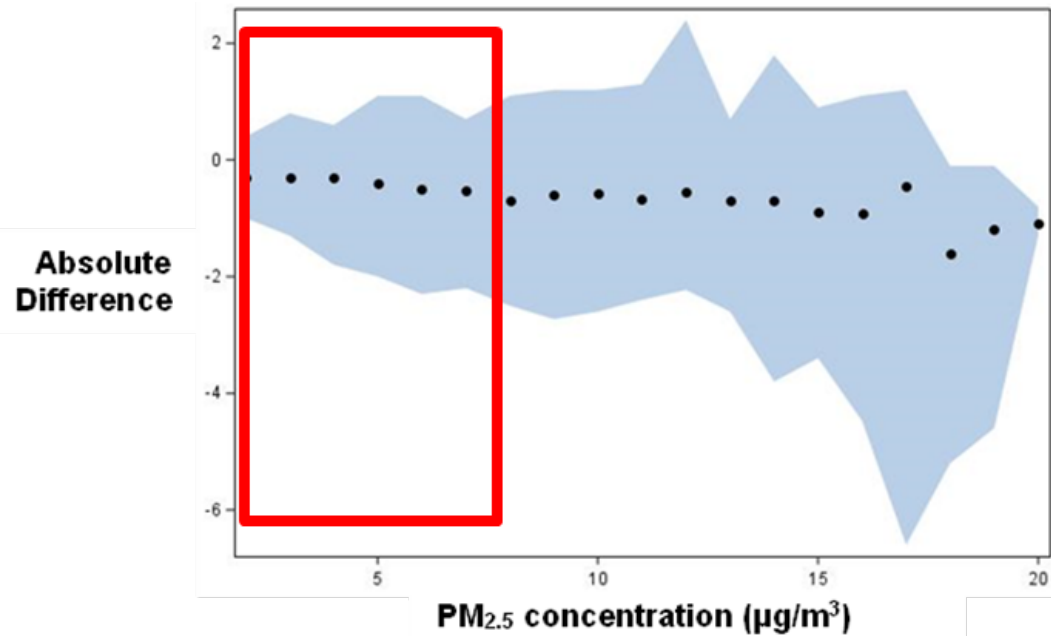


Figure 2. Average absolute difference in PM_{2.5} measurements between SLT and PEP samples (dots), with 5th and 95th percentiles in the differences (blue region), for 1 $\mu\text{g}/\text{m}^3$ groups and considering FRM samplers only.

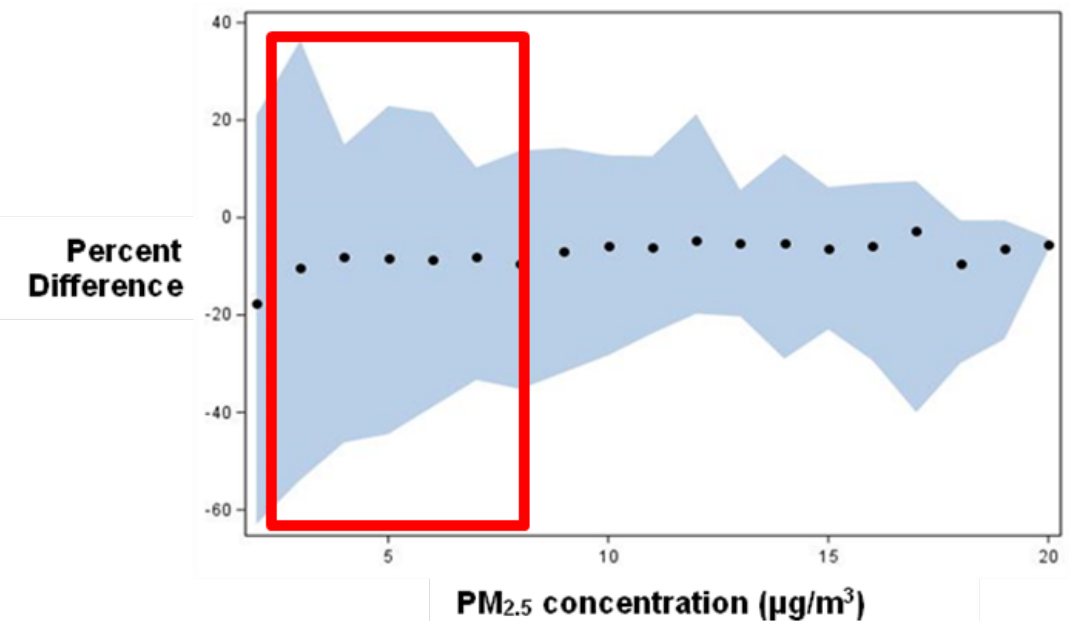


Figure 1. Average percent difference in PM_{2.5} measurements between SLT and PEP samples (dots), with 5th and 95th percentiles in the percent differences (blue region), for 1 $\mu\text{g}/\text{m}^3$ groups and considering FRM samplers only.

Acknowledgement to Battelle for the statistical assessment

National Ambient Air Monitoring Conference, New Orleans¹⁷, August 2024

PM Rule QA Changes - Calculations for Data Quality Assessments for Bias



Equation 8

Prior:

$$\frac{\sum_{i=1}^n d_i}{n} \quad \text{where} \quad d_i = \frac{\text{routine} - \text{PEP}}{\text{PEP}} \times 100\%$$

New:

$$\frac{\sum_{i=1}^n S_i}{n \times \sqrt{\text{NAAQS}}} \times 100\% \quad \text{where} \quad S_i = \frac{\text{routine} - \text{PEP}}{\sqrt{\text{PEP}}}$$

PM Rule QA Changes - Calculations for Data Quality Assessments for Bias

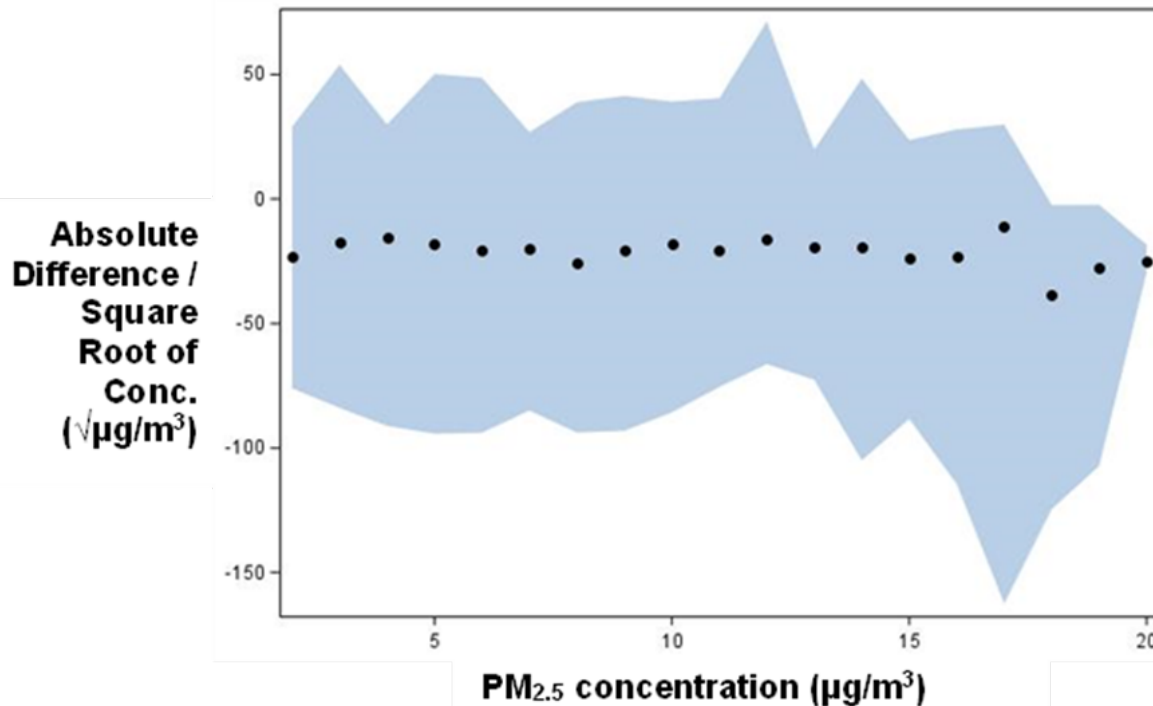


Figure 3. Average absolute difference in PM_{2.5} measurements divided by square root of concentration ($\sqrt{\mu\text{g}/\text{m}^3}$) between SLT and PEP samples (dots), with 5th and 95th percentiles in the differences (blue region), for 1 $\mu\text{g}/\text{m}^3$ groups and considering FRM samplers only.

Using this new approach, variability is more constant across all concentrations thereby reducing the inflated effect.

PM Rule QA Changes - Quality System Requirements



Section 2.3.1.1, EPA reconsidered the total bias goal of upper 90 percent confidence limit for the coefficient of variation (CV) of 10 percent and ± 10 percent for total bias using new proposed statistics

- The goal still appears to be appropriate when using the proposed statistic to estimate bias.
- No change to the regulation, only verified to new approach.
- EPA will continue to evaluate this metric with upcoming PM_{2.5} measurements

PM Rule QA Changes - Quality System Requirements



Section 2.6.1, EPA clarified ambient air monitoring requirements pertaining to EPA Protocol Gas standards used for ambient air monitoring and the Ambient Air Protocol Gas Verification Program.

- Gases must adhere to the requirements of 40 CFR section 75.21(g). This brings the PGVP in line with the CAMD program.
- Only regulatory ambient air monitoring programs may submit cylinders for assay verification to the EPA Ambient Air Protocol Gas Verification Program.
- Allows uncertainty of ± 2.0 percent for EPA Protocol Gas standards used in ambient air monitoring which is consistent with EPA's continuous emission monitoring program found in Part 75, Appendix A, Section 5.1.4(b).



PM Rule QA Changes - Measurement Quality Check Requirements



Section 3.1.2.2, EPA removed the allowance for NO₂ compressed gas standards to be used to generate audit standards.

- NO₂ compressed gas standards are not currently designated by EPA's Office of Research and Development as an EPA Protocol Gas Standard.
- Conflicts with paragraph 2.6.1 of Appendix A that requires that any standard used for generating test atmospheres be an EPA Protocol Gas Standard.
- If these NO₂ compressed gas standards can, in the future, be proven to be stable and approvable as EPA Protocol Gas Standards, the EPA will consider restoring this provision to Appendix A.



PM Rule QA Changes Measurement Quality Check Requirements



Section 3.1.3.3, EPA changed the requirement for the National Performance Audit Program (NPAP) gas verifications from annual to the ORD-recommended certification periods for standards identified in Table 2-3 of the EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (Appendix A, 6.0(4)).

- Decreases the cost and burden on the Protocol Gas Verification Program (PGVP).
- Provides auditors with longer periods with valid certifications to perform audits without annual interruptions.
- ORD-recommended periods are based on the periods for which similar gas mixtures over specific concentration ranges have been shown to be stable

PM Rule QA Changes - Measurement Quality Check Requirements



Section 3.2.4, EPA adjusted the minimum value to be considered valid sample pairs for the PM_{2.5} Performance Evaluation Program (PEP) from 3 $\mu\text{g}/\text{m}^3$ to 2 $\mu\text{g}/\text{m}^3$.

- PEP collocation data along with the new statistic for determining PEP bias allows for a lower threshold.
- Ambient PM_{2.5} concentrations have decreased, and many samples being collected now are below the 3 $\mu\text{g}/\text{m}^3$ threshold and deemed invalid for purposes of a valid audit sample.
- Decreasing this threshold from 3 $\mu\text{g}/\text{m}^3$ to 2 $\mu\text{g}/\text{m}^3$ would increase the number of valid PEP sample pairs collected, which would reduce the number of re-audits that need to be performed to compensate for invalid sample pairs saving resources in time and money.

PM Rule QA Changes - Measurement Quality Check Requirements



Correction Notice:

Section 4. Calculations for Data Quality Assessments, (a)(5)

- The current limit for PM_{2.5} collocated data pairs for use in the precision and bias assessment is 3 µg/m³.
- For consistency and comparability, when we changed the limit for the collocated PM_{2.5} PEP pairs to 2 µg/m³, we intended to change the limit for the rest of the PM_{2.5} monitoring network as well. We missed the reference.
- The change to **2 µg/m³** will be reflected in CFR when the Correction notice is approved and published.

PM Rule QA Changes - References



References, EPA updated the references and hyperlinks for Appendices A and B

- Several of the reference documents have been updated and the web locations have changed.
- Monitoring organizations and stakeholders need the most current materials that provide clarification and guidance on the interpretation of the regulations.

6. References

- (1) American National Standard Institute—Quality Management Systems For Environmental Information And Technology Programs—Requirements With Guidance For Use. ASQ/ANSI E4-2014. February 2014. Available from ANSI Webstore <https://webstore.ansi.org/>.
- (2) EPA Requirements for Quality Management Plans. EPA QA/R-2. EPA/240/B-01/002. March 2001. Reissue May 2006. Office of Environmental Information, Washington DC 20460. <http://www.epa.gov/quality/agency-wide-quality-system-documents>.
- (3) EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations. EPA QA/R-5. EPA/240/B-01/003. March 2001, Reissue May 2006. Office of Environmental Information, Washington DC 20460. <http://www.epa.gov/quality/agency-wide-quality-system-documents>.
- (4) EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards. EPA-600/R-12/531. May, 2012. Available from U.S. Environmental Protection Agency, National Risk Management Research Laboratory, Research Triangle Park NC 27711. <https://www.epa.gov/nscep>.
- (5) Guidance for the Data Quality Objectives Process. EPA QA/G-4. EPA/240/B-06/001. February, 2006. Office of Environmental Information, Washington DC 20460. <http://www.epa.gov/quality/agency-wide-quality-system-documents>.
- (6) List of Designated Reference and Equivalent Methods. Available from U.S. Environmental Protection Agency, Center for Environmental Measurements and Modeling, Air Methods and Characterization Division, MD-D205-03, Research Triangle Park, NC 27711. <https://www.epa.gov/amtic/air-monitoring-methods-criteria-pollutants>.
- (7) Transfer Standards for the Calibration of Ambient Air Monitoring Analyzers for Ozone. EPA-454/B-13-004 U.S. Environmental Protection Agency, Research Triangle Park, NC 27711, October, 2013. <https://www.epa.gov/sites/default/files/2020-09/documents/ozonetransferstandardguidance.pdf>.
- (8) Paur, R.J. and F.F. McElroy. Technical Assistance Document for the Calibration of Ambient Ozone Monitors. EPA-600/4-79-057. U.S. Environmental Protection Agency, Research Triangle Park, NC 27711, September, 1979. <http://www.epa.gov/ttn/amtic/cpreldoc.html>.
- (9) Quality Assurance Handbook for Air Pollution Measurement Systems, Volume 1—A Field Guide to Environmental Quality Assurance. EPA-600/R-94/038a. April 1994. Available from U.S. Environmental Protection Agency, ORD Publications Office, Center for Environmental Research Information (CERI), 26 W. Martin Luther King Drive, Cincinnati, OH 45268. <https://www.epa.gov/amtic/ambient-air-monitoring-quality-assurance#documents>.
- (10) Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II: Ambient Air Quality Monitoring Program Quality System Development. EPA-454/B-13-003. <https://www.epa.gov/amtic/ambient-air-monitoring-quality-assurance#documents>.
- (11) National Performance Evaluation Program Standard Operating Procedures. <https://www.epa.gov/amtic/ambient-air-monitoring-quality-assurance#npep>.

PM Rule QA Changes - References



References, EPA added a footnote to Table A-1 of Appendix A and Table B-1 of Appendix B - Minimum Data Assessment Requirements for NAAQS Related Criteria Pollutant Monitors to clarify the allowable time between checks and encourage monitoring organizations to perform data assessments at regular intervals.

The current stipulation leaves it unclear on what day of the specified interval (e.g., month, quarter, 6 months) the required verifications should be performed.

Method	Assessment method	Coverage	Minimum frequency	Parameters reported	AQS assessment type
		samples for primary QA orgs with >5 sites			

¹ Effective concentration for open path analyzers.

² Corrected concentration, if applicable for open path analyzers.

³ Both primary and collocated sampler values are reported as raw data.

⁴ PM_{2.5} is the only particulate criteria pollutant requiring collocation of continuous and manual primary monitors.

⁵ EPA's recommended maximum number of days that should exist between checks to ensure that the checks are routinely conducted over time and to limit data impacts resulting from a failed check.

PM Rule QA Changes - References



References, EPA added a footnote to Table A-1 of Appendix A and Table B-1 of Appendix B – continued

- For example, under the current flow rate verification for PM₁₀ (low vol.) PM_{2.5}, and Pb-PM₁₀, a flow check could be performed on April 1 and not checked again until May 31, leaving approximately two months between checks.
- Following this practice would leave large intervals of time between verifications, and if a check fails using the described practice, an unacceptably large data loss could result.
- This is not the intended practice for quality control measures that are meant to ensure equipment is continually operating properly over an operational period.



Appendix E

Separated Open Path Monitoring Requirements from Criteria Requirements

Created a separate section for open path monitors. This allowed the EPA to more clearly articulate minimum technical siting requirements for each.

Open Path Monitoring measurements have not been loaded to AQS since 2009. (Further rational to separate these requirements in App. E)



PM Rule QA Changes - Probe and Siting Criteria



Summary Tables E-3 and E-6: Amended text to more clearly communicate the rounding precision for spacing offsets

Distance offsets have a precision of 2 significant figures unless otherwise stated.

Changed the “>” (greater than) symbols to “≥”.

TABLE E-6 SECTION 3.8 OF APPENDIX E—SUMMARY OF MONITORING PATH SITING CRITERIA

Pollutant	Maximum monitoring path length ^{9 10}	Height from ground to 80% of monitoring path ^{1 8} (meters)	Horizontal or vertical distance from supporting structures ² to 90% of monitoring path ^{1 8} (meters)	Distance from trees to 90% of monitoring path ^{1 8} (meters)	Distance from roadways to monitoring path ^{1 8} (meters)
SO ₂ ^{3 4 5 6}	<= 300 m for Middle <= 1.0 km for Neighborhood, Urban, and Regional	2.0-15	≥1.0	≥10	N/A.
CO ^{4 5 7}	<= 300 m for Micro [downtown or street canyon sites]	2.5-3.5	≥1.0	≥10	2.0-10 for downtown areas or street canyon microscale.

PM Rule QA Changes - Probe and Siting Criteria



Section 3.2 Spacing from Minor Sources – Added Flexibility

The prior regulation required that probe inlets “*must*” not be near minor sources. However, the prior rule did not specify how far the probe must be spaced from such minor sources.

EPA replaced the ‘must’ with a “*should*” in this regulation as this is more appropriate since the required offset distance is not specified.

WARNING: Minor sources can have adverse impacts on the representativeness of the ambient pollutant concentrations sampled by the probe inlet. EPA recommends that sites with these minor sources be avoided whenever practicable and probe inlets spaced as far from these minor sources as possible when alternative monitoring stations are not suitable.

PM Rule QA Changes - Probe and Siting Criteria



Sections 2.3(b), 2.7 (Table E-3), 3.3(b), 3.8 (Table E-6)

- Reinstated the 270-degree minimum arc in reg. text. (This requirement was only found in a footnote in the prior regulation)
- Clarified that the 180-degree minimum arc is allowable for street canyon sites
- Clarified that probe inlets **must be 10 meters** from tree driplines and **should be greater than 20 meters** from tree driplines.

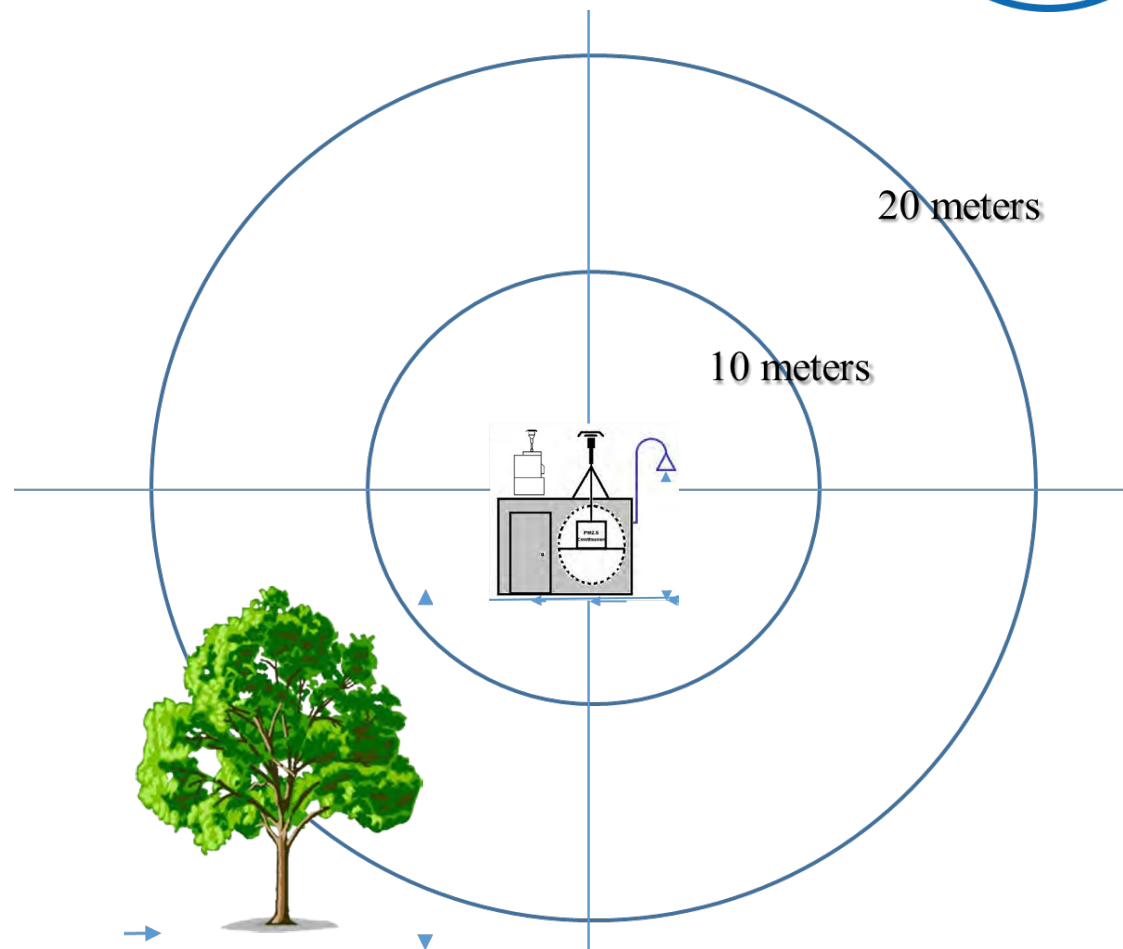


PM Rule QA Changes - Probe and Siting Criteria



Tree Dripline Criteria Example

- Tree dripline criteria does not consider Primary Wind Direction or that the tree is an obstruction
- Figure Example: (**Siting Adequate**)
 - Does **NOT** meet the '*should*' for the 20-meter offset
 - Does meet the '*must*' for the 10-meter offset

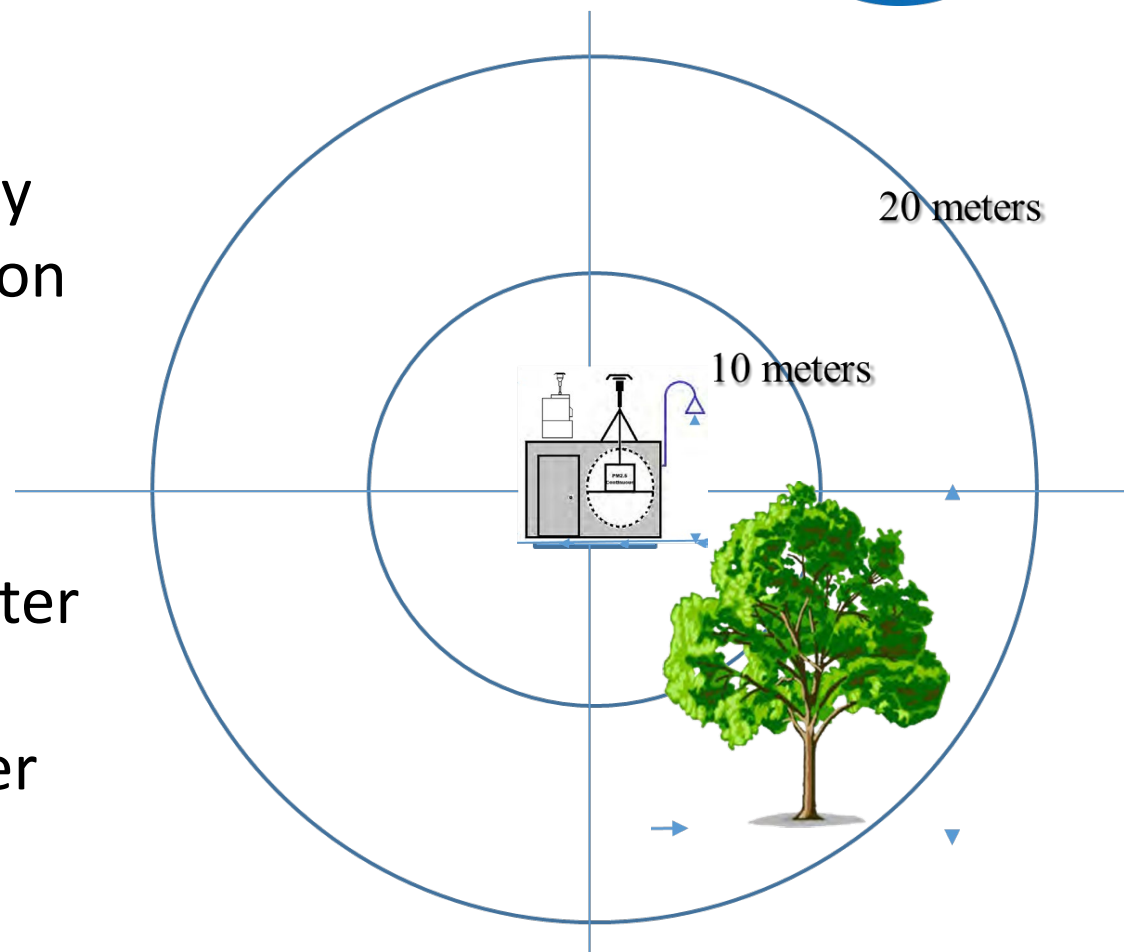


PM Rule QA Changes - Probe and Siting Criteria



Tree Dripline Criteria Example

- Tree dripline criteria does not consider Primary Wind Direction or that the tree is an obstruction
- Figure Example: (**Siting Inadequate**)
 - Does **NOT** meet the '*should*' for the 20-meter offset
 - Does **NOT** meet the '*must*' for the 10-meter offset



PM Rule QA Changes - Probe and Siting Criteria



Clarification:

EPA does not consider shrubs and other small vegetation that may be near the site to be subject to the tree dripline requirement unless the dripline of that vegetation is at or above the level of the probe inlet. As a reminder, trees and shrubs grow, so maintenance is essential.





Section 2.4 and 3.4 Spacing from Trees - Amended Spacing for Microscale Monitoring

- Changed from a goal to a requirement that microscale sites for any pollutant **shall have no trees** or shrubs blocking the line-of-sight fetch between the monitor's probe inlet and the source under investigation.
- Clarified that EPA does not consider small obstacles such as shrubs that are below this fetch to adversely impact the representativeness of the air quality measurements results for microscale monitoring.

PM Rule QA Changes - Probe and Siting Criteria



Figure E-1: Cleaned up and revised

- Received a comment on the proposed rule that Figure E-1 was not legible.
- Updated Figure per comment received.

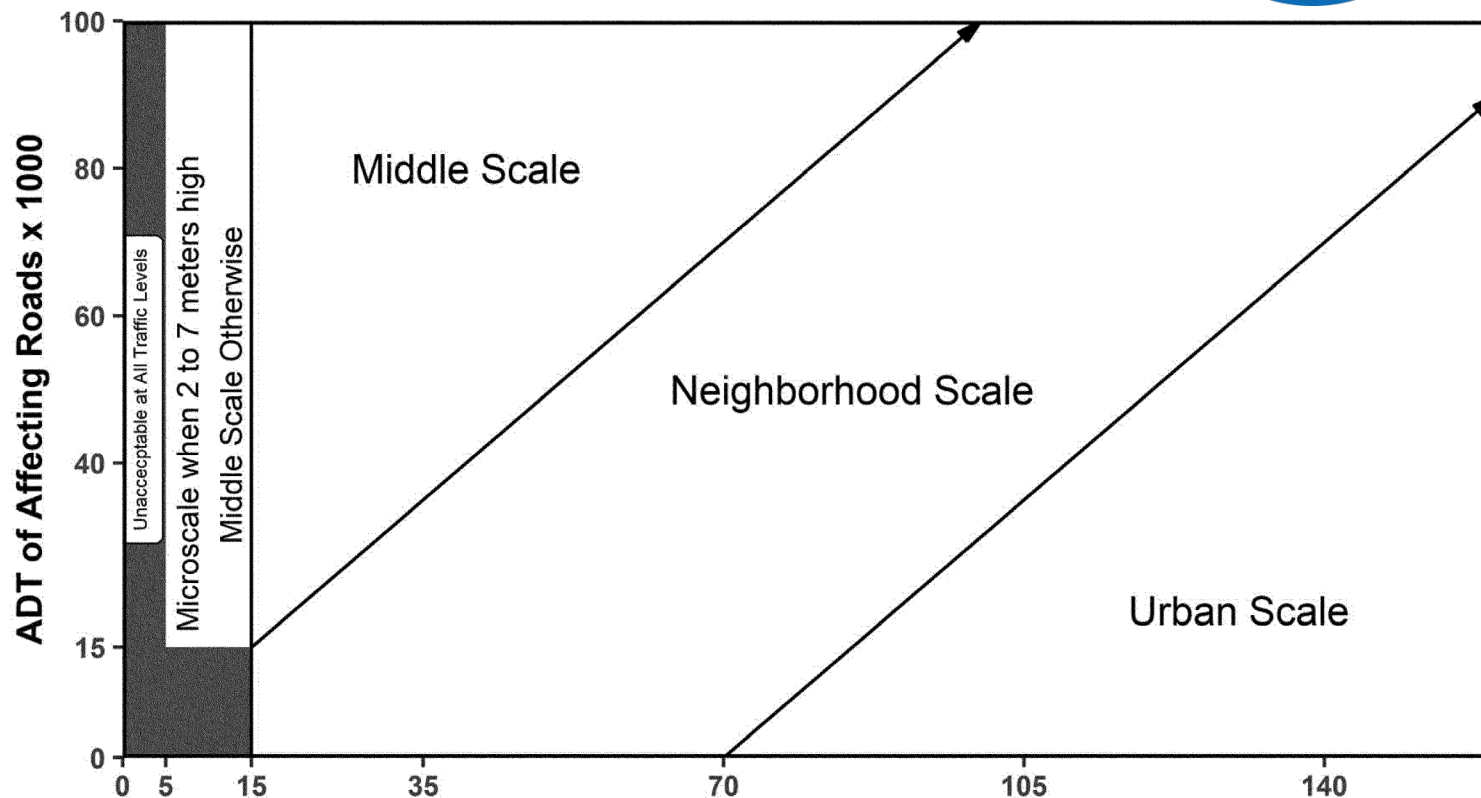


Figure E-1. Distance of PM Samplers to nearest traffic lane (meters)

Notes: Microscale street canyon sites must reside between 2 and 10 meters from the roadway.
Near-Road sites must be within 50 meters of the roadway.
The slopes of the lines between monitoring scales are one to one.

PM Rule QA Changes - Probe and Siting Criteria



Tables E-3 (below) and E-6 were misprinted. Merged Cells in Tables were unmerged by printing office resulting 'blank' cells and poor formatting. Revisions Pending, see next slide.

Pollutant	Scale ⁹	Height from ground to probe ⁸ (meters)	Horizontal or vertical distance from supporting structures ¹⁸ to probe inlet (meters)	Distance from drip line of trees to probe ⁸ (meters)	Distance from roadways to probe ⁸ (meters)
SO ₂ ^{2 3 4 5}	Middle, Neighborhood, Urban, and Regional	2.0-15	≥1.0	≥10	N/A.
CO ^{3 4 6}	Micro [downtown or street canyon sites]	2.5-3.5			2.0-10 for downtown areas or street canyon microscale.
	Micro [Near-Road sites]	2.0-7.0	≥1.0	≥10	≤50 for near-road microscale.
	Middle and Neighborhood	2.0-15			See Table E-2 of this appendix for middle and neighborhood scales.
O ₃ ^{2 3 4}	Middle, Neighborhood, Urban, and Regional	2.0-15	≥1.0	≥10	See Table E-1.
	Micro	2.0-7.0			≤50 for near-road micro-scale.
NO ₂ ^{2 3 4}	Middle, Neighborhood, Urban, and Regional	2.0-15	≥1.0	≥10	See Table E-1.
PAMS ^{2 3 4} Ozone precursors	Neighborhood and Urban	2.0-15	≥1.0	≥10	See Table E-1.
PM, Pb ^{2 3 4 7}	Micro	2.0-7.0			
	Middle, Neighborhood, Urban and Regional	2.0-15	≥2.0 (horizontal distance only)	≥10	See Figure E-1.

PM Rule QA Changes - Probe and Siting Criteria



Tables E-3 (below) and E-6 will be corrected by adding a value to each cell in the tables as below. Editorial Revisions Pending.

Pollutant	Scale ⁹	Height from ground to probe ⁸ (meters)	Horizontal or vertical distance from supporting structures ¹⁸ to probe inlet (meters)	Distance from drip line of trees to probe ⁸ (meters)	Distance from roadways to probe ⁸ (meters)
SO ₂ ²³⁴⁵	Middle, Neighborhood, Urban, and Regional	2.0-15	≥1.0	≥10	N/A.
CO ³⁴⁶	Micro [downtown or street canyon sites]	2.5-3.5	≥1.0	≥10	2.0-10 for downtown areas or street canyon microscale.
CO ³⁴⁶	Micro [Near-Road sites]	2.0-7.0	≥1.0	≥10	≤50 for near-road microscale.
CO ³⁴⁶	Middle and Neighborhood	2.0-15	≥1.0	≥10	See Table E-2 of this appendix for middle and neighborhood scales.
O ₃ ²³⁴	Middle, Neighborhood, Urban, and Regional	2.0-15	≥1.0	≥10	See Table E-1.
NO ₂ ²³⁴	Micro	2.0-7.0	≥1.0	≥10	≤50 for near-road micro-scale.
NO ₂ ²³⁴	Middle, Neighborhood, Urban, and Regional	2.0-15	≥1.0	≥10	See Table E-1.
PAMS ²³⁴ Ozone precursors	Neighborhood and Urban	2.0-15	≥1.0	≥10	See Table E-1.
PM, Pb ²³⁴⁷	Micro	2.0-7.0	≥1.0	≥10	See Figure E-1.
PM, Pb ²³⁴⁷	Middle, Neighborhood, Urban and Regional	2.0-15	≥2.0 (horizontal distance only)	≥10	See Figure E-1.

PM Rule QA Changes - Probe and Siting Criteria



Section 4.3 Waiver Provisions

- The revision specifies that approved waivers from the siting criteria **must be renewed minimally every 5 years.**
- The approval date of the waiver **must then be included in the annual monitoring network plan.**



PM Rule QA Changes - Probe and Siting Criteria



2.6 Probe Material and Pollutant Sampler Residence Time - Broadened Acceptable Probe Materials

The prior regulation limited acceptable probe materials for sampling reactive gases to borosilicate glass and FEP, (or their equivalent):

- Based on EPA ORD's research, EPA revised and broaden the regulation to include the following materials:

Material	Also known as
borosilicate glass	Pyrex [®]
FEP	FEP Teflon [®] <i>fluorinated ethylene propylene</i>
PVDF	Kynar[®] <i>polyvinylidene fluoride</i>
PTFE	PTFE Teflon[®] <i>polytetrafluoroethylene</i>
PFA	PFA Teflon[®] <i>perfluoroalkoxy</i>

QA 101 – Questions?



National Ambient Air Monitoring Conference, New Orleans, August 2024