UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NATIONAL EXPOSURE RESEARCH LABORATORY
Air Measurements Research Division
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Office of
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MEMORANDUM

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Subject: **Supplemental Interim Guidance for Quality Assessment of Continuous PM_{10} Analyzers**

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Complete quality assurance and data quality assessment (PARS) procedures for continuous PM_{10} analyzers (*i.e.* **beta gauges** and the **TEOM**® monitor) have not yet been developed. Interim procedures and guidance for these analyzers were issued by Memorandum, dated August 31, 1992. The interim procedure for precision assessment is now being changed to allow a simpler alternative technique that does not require an external flow rate standard. Accordingly, the following procedures and supplemental guidance supersede the previous (August 31, 1992) interim procedures. These new procedures should be used for SLAMS and NAMS monitoring networks, as a part of and in conjunction with other data quality assessment requirements specified in 40 CFR 58, Appendix A. These procedures may also be used in connection with PSD monitoring, along with other data quality assessment requirements specified in 40 CFR 58, Appendix B.

General quality assurance

Quality control procedures described in the Operation or Instruction manual associated with each method should be implemented as completely as feasible. The use of calibration foils (for beta gauges) or standard filters (for the TEOM®) that may be available from the instrument's manufacturer is encouraged to the extent possible. Special

care should be given to checking and recording the operational parameters of the instruments, since it may not be possible to verify these parameters in data output reports to printers or data processing systems. The use of control charts for recording the operational parameters is encouraged for ongoing control of the measurement system.

Precision **assessment**

Because of the high cost of providing a collocated PM_{10} analyzer, flow checks are used instead to assess precision. Carry out a one-point check of each PM_{10} analyzer's normal operating flow rate at least once every two weeks. If a precision check is made in conjunction with a zero or span adjustment, it must be made prior to such zero and span adjustment. Randomization of the precision check with respect to time of day, day of week, and routine service and adjustments is encouraged where possible.

Standard procedure: Use a flow rate transfer standard as described in section 2.3.3 of Part 58, Appendix A to check the analyzer's normal flow rate. Care should be used in selecting and using the flow rate measurement device such that it does not alter the normal operating flow rate of the analyzer. Report the actual analyzer flow rate measured by the transfer standard and the corresponding flow rate measured, indicated, or assumed by the analyzer.

Alternative procedure: It is permissible to obtain the precision check flow rate data from the analyzer's internal flow meter *without the use of an external flow rate transfer standard*, provided that (1) the flow meter is audited with an external flow rate transfer standard at least every 6 months, (2) records of at least the 3 most recent flow audits of the instrument's internal flow meter over at least several weeks[1] confirm that the flow meter is stable, reliable, and accurate to ±4%, and (3) the instrument and flow meter give no indication of improper operation. With suitable communication capability, the precision check may thus be carried out remotely. For this procedure, report the *set-point flow rate* as the "actual flow rate" along with the flow rate measured or indicated by the analyzer flow meter.

For either procedure, the percent differences between the actual and indicted flow rates are used to assess the precision of the monitoring data as described in section 5.1 of Appendix A (using flow rates in lieu of concentrations).

Accuracy **assessment**

[1]Initial flow meter audits could be carried out more frequently than every 6 months in order to meet this test more quickly.

Each calendar quarter, audit the flow rate of at least 25 percent of the SLAMS PM_{10} analyzers such that each analyzer is audited at least once per year. If there are fewer than four PM_{10} analyzers within a reporting organization, randomly re-audit one or more analyzers so that at least one analyzer is audited each calendar quarter. Where possible, EPA strongly encourages more frequent auditing, up to an audit frequency of once per quarter for each SLAMS analyzer.

The audit is made by measuring the analyzer's normal operating flow rate, using a flow rate transfer standard as described in section 2.3.3 of Part 58, Appendix A. The flow rate standard used for auditing must not be the same flow rate standard used to calibrate the analyzer. However, both the calibration standard and the audit standard may be referenced to the same primary flow rate or volume standard. Great care must be used in auditing the flow rate to be certain that the flow measurement device does not alter the normal operating flow rate of the analyzer. Report the audit flow rate and the corresponding flow rate indicated or assumed by the sampler. The percent differences between these flow rates are used to calculate accuracy as described in section 5.4.1 of Appendix A.

Additional Guidance

Portions of the guidance on flow rate standard devices and flow rate checks and audits for dichotomous PM_{10} samplers given in Section 2.10 of the Quality Assurance Handbook, Volume II (EPA-600/R-94/038b) are also applicable to flow rate checks of the continuous PM_{10} analyzers. Copies of Section 2.10 can be obtained from the ORD Publications Center (CERI) in Cincinnati (513-569-7562) or from the Quality Assurance Branch, or by downloading from EPA's OAQPS TTN AMTIC electronic bulletin board system. For the TEOM®, the *actual instrument flow rate* (nominally 3.0 liters/min) should be measured and reported for precision and accuracy. The total flow rate (nominally 16.7 liters/min) should be checked to verify that it is within the ±10% tolerance specified for the PM_{10} inlet, but total flow rates should *not* be reported for precision or accuracy.

Further, we strongly encourage the periodic checking of instrument response using calibration foils or other attenuation standards for beta gauges or accurately weighed "standard" filters for the TEOM®. Some PM_{10} analyzer manufacturers offer devices or kits for this purpose at nominal cost. The results from these response tests should be used to monitor instrument response and detect possible instrument malfunction. However, the results from these response checks using calibration foils or standard filters should *not* be reported as accuracy audits until definitive procedures for reporting these results are established.

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