



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
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OFFICE OF AIR QUALITY PLANNING AND STANDARDS**

**DRAFT**  
**Technical Note –Pb Monitoring Implementation Strategy**  
**Sampler Issues**

**Background:** On November 12, 2008 EPA substantially strengthened the national ambient air quality standards (NAAQS) for lead (see 73 FR 66964). EPA revised the level of the primary (health-based) standard from 1.5 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) to  $0.15 \mu\text{g}/\text{m}^3$ , measured as total suspended particles (TSP) and revised the secondary (welfare-based) standard to be identical in all respects to the primary standard. In conjunction with strengthening the lead (Pb) NAAQS, EPA identified the need for states to improve existing lead monitoring networks by requiring monitors to be placed in areas with sources that emit one ton or more per year (tpy) of lead and in urban areas with more than 500,000 people. Depending on specific circumstances, States may have the option of using monitoring for either Pb-TSP or Pb-PM10 using approved FRM's or FEM's to demonstrate compliance.

**What sampler design(s) are approved for TSP sampling?**

**We have noticed the availability of “modern” adaptations of the classic TSP peaked-roof design, for example, with volumetric flow control. Are these newer designs approved by EPA as FRM's?**

Any TSP sampler design that meets the requirements of Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere (High-Volume Method) is acceptable as for use as a FRM sampler for Pb-TSP. Unlike other FRM samplers, EPA has not issued specific approvals for individual manufacturer versions of TSP samplers. Alternative types of flow control and measurement per sections 6.1 and 6.2 of Appendix B are acceptable. Any adaptations to the peaked roof design should be consistent with the requirements of section 7.3.1 of Appendix B.

**Where can I find the list of EPA-approved TSP samplers?**

As noted above, such a list does not exist. Samplers that meet the requirements of Appendix B to Part 50 are considered appropriate for TSP sampling. States should conduct their own assessment of TSP sampler designs and not rely solely on manufacturer claims that designs are “EPA-approved” samplers.

**Can States use existing TSP samplers that have been either used in the field for many years or have been retrieved from storage?**

Yes. States should, of course, conduct visual and operational checks on the samplers(s). Likely areas of maintenance for TSP samplers include motors, brushes, flow control devices, and deteriorated gaskets, tubing, and wiring.

**What checks must be performed on long-dormant TSP samplers to prepare them for active monitoring use?**

As noted above, performing an overall visual assessment and cleaning together with attention on key flow-control and flow-measurement components should be sufficient, given the relatively simplistic nature of the high-volume sampler. Samplers should, of course, be recalibrated with certified reference

standards, and should ideally undergo pre-sampling field test runs and be subjected to several standard quality control checks (i.e., flow rate verifications) to confirm acceptable performance prior to the start-up of required sampling.

**Can existing high-volume PM10 samplers be modified for use as Pb-TSP samplers?**

If the high-volume PM10 sampler can be adapted to remove the size-selective inlet and replace it with the peak-roof design, then the sampler should conform to Appendix B of Part 50 and be acceptable for use in TSP sampling. Note that the acceptable flow range for TSP sampling is much greater (39 – 60 ft<sup>3</sup>/min) than what has been typically been employed for high-volume PM10 sampling (~40 ft<sup>3</sup>/min) so some adjustments to the sampler's flow controller may be needed.

**Vendors have TSP inlets available for use with low-volume samplers. Can they be used to meet Pb-TSP monitoring requirements?**

No. Current low-volume TSP inlets do not meet the requirements of Appendix B to Part 50 and cannot be used for Pb-TSP monitoring in support of the NAAQS.

**What is the required sampler separation distance (from other samplers) for high-volume samplers?**

As noted in Appendix E to Part 58, high-volume samplers (and other types of samplers drawing more than 200 liters/min of air) should be spaced a minimum of 2 meters away from other samplers and inlet probes. The exhaust from TSP samplers should ideally be routed away from other samplers and inlets. Users should consider brush-less motors, particularly at NATTS, Chemical Speciation Network, and IMPROVE sites to preclude the chance of contamination of samples by brush exhaust from hi-vol motors.

**What low-volume PM10 samplers are approved for use in Pb-PM10 monitoring?**

The list of approved low-volume samplers is available at: <http://www.epa.gov/ttn/amtic/files/ambient/criteria/reference-equivalent-methods-list.pdf>. It is important to note that only low-volume PM10 samplers that meet the requirements for PM<sub>10C</sub> samplers (as described in Appendix O of Part 50) can be used for Pb-PM10 monitoring intended to meet NAAQS comparison objectives.

**I have high-volume PM10 samplers available, some deployed at our NATTS site for providing metals data. Why can't these samplers also be used for meeting the Pb NAAQS monitoring requirement?**

High-volume PM10 samplers do not have to meet the more demanding performance specifications required of low-volume samplers. Accordingly, the data from high-volume samplers would be expected to have a greater measurement uncertainty (based on precision and bias) than data from low-volume samplers, and would possibly not meet the revised data quality objectives established for Pb NAAQS monitoring. We note that it is acceptable to utilize low-volume PM10 samplers at NATTS stations and that EPA anticipates the future approval of Pb-PM10 FEM's (including ICP-MS) that would support both NATTS and NAAQS objectives.

**Who should I contact to obtain filters for Pb monitoring?**

Please discuss anticipated Pb-related filter needs with your Regional Office contacts. Monitoring agencies should determine the number of high-volume TSP and/or low-volume PM10 samplers planned for Pb monitoring and then calculate the needed 8" x 10" glass fiber filters and/or 46.2 mm Teflon filters

that would be required to support the 1-in 6 day sampling frequency plus accommodation for required collocation and filter blank requirements.

**For Further Information**

This document and other documents intended to assist monitoring agencies implement the Pb monitoring requirements can be found at - <http://www.epa.gov/ttn/amtic/pb-monitoring.html>

For additional information, please contact Kevin Cavender of the Air Quality Assessment Division, Ambient Air Monitoring Group, 919-541-2364, [cavender.kevin@epa.gov](mailto:cavender.kevin@epa.gov).