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OFFICE OF AIR QUALITY PLANNING AND STANDARDS

Technical Note –PSD Monitoring
Quality Assurance Issues

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Background: In May 1987, the EPA finalized a guidance document titled “*Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD)*,” EPA-450/4-87-007. Over the past 25 years significant advancements and changes have been made in the regulatory requirements for ambient air monitoring, not only for PSD but also for State and Local Air Monitoring Stations (SLAMS). Therefore, the 1987 PSD guidance document is outdated. In 2016 EPA had the opportunity to revise QA requirements and revised appendix B. This technical note provides guidance in the form of questions and answers (Q&As) related to quality assurance activities for PSD monitoring organizations. This document applies to non-governmental industrial monitoring organizations subject to the PSD air monitoring requirements of 40 CFR part 51. This document should be used as a resource for affected PSD monitoring organizations, their contractors, and State, Local, Tribal (S/L/T) and Federal agencies responsible for ensuring that the 40 CFR part 51 requirements are met. It is our intention to provide future updates to this technical note on an as needed basis.

Section 1 – General Information

Q1. What is the QA role of the EPA for PSD monitoring organizations running an air monitoring network? What is the QA role of the Reviewing Authority?

The EPA is responsible for establishing the PSD QA requirements that PSD monitoring organizations must follow. The reviewing authority is responsible for ensuring that the applicable QA requirements are being met by the PSD organizations. The EPA provides assistance in interpreting these requirements through guideline documents, technical notes, meetings and other private and public forums. In some cases, the EPA is the reviewing authority and would in such situations work directly with the PSD organization to assure compliance.

Q2. Are State PSD programs required to enforce all requirements of appendix B? If not, what circumstances would allow a State to not enforce these requirements?

The EPA expects that State agencies that have been delegated or have SIP approved PSD reviewing authority are implementing and enforcing the requirements of appendix B. The EPA can envision situations where a PSD monitoring organization might not be able to meet a specific requirement of appendix B for logistical or other unavoidable reasons. In these cases, the EPA would expect the reviewing authority to identify and document non-conformance to the requirements and to instruct the PSD monitoring organization to document a QA program (see 2.1 below) that meets the intent of the requirement, which would then be approved by the reviewing authority. Non-conformance with a requirement can jeopardize use of data for NAAQS decisions.

Q3. Formerly, the EPA relied on the document titled “*Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD)*,” EPA-450/4-87-007, May 1987. Is the document still applicable?

Yes; the 1987 PSD guideline document is still applicable. However, several changes in the monitoring and QA regulations that have occurred since 1987 would take precedence over the 1987 guideline document. Similarly, the guidance provided in this Q&A document as well takes precedence over the 1987 guideline document.

Section 1.2 - Primary Quality Assurance Organization

Q4. Can a single PSD monitoring organization form a primary quality assurance organization (PQAO)?

By definition, a single PSD monitoring organization is considered a single PQAO for fulfilling the quality assurance and quality control (QA/QC) requirements specified in appendix B.

Q5. Can multiple PSD monitoring organizations form a PQAO?

Yes; multiple PSD monitoring organizations are allowed to form a single PQAO. However a PSD PQAO must be associated with only one PSD reviewing authority. Forming a single PQAO could help reduce the collective workload for the PSD monitoring organizations and the reviewing authority. For example, if this aggregate PQAO used a common QAPP and a common set of SOPs this would reduce the number of documents needing development and approval. Please note that the reviewing authority has the obligation to approve PQAO consolidation requests and to ensure that the common factors specified in section 1.2.1 of appendix B have been met.

Section 2.1 - Quality Management Plans and Quality Assurance Project Plans

Q6. What quality documents are required for PSD monitoring organizations?

A Quality Assurance Project Plan (QAPP) is required for all PSD environmental data operations. Though a Quality Management Plan (QMP) is not a required document for PSD operations, the QAPP should include discussion of relevant QMP elements. As an example, the QAPP should discuss how the monitoring organization achieves organizational independence of its quality assurance functions as required by Section 2.2 of part 58 appendix B. The EPA recommends that PSD monitoring organizations follow the graded approach in developing their QAPPs. Discussion on the graded approach can be found in appendix C of the “*Quality Assurance Handbook for Air Pollution Measurement Systems Volume II – Ambient Air Monitoring Program*” EPA-454/B-08-003, December 2008¹.

Q7. Who approves PSD quality system documentation?

Quality system documents such as a QAPP and the associated standard operating procedures (SOPs) are to be approved by both the PSD monitoring organization and the PSD reviewing authority.

Q8. Does the EPA have any authority in the approval process for non-federal PSD quality system documents?

The EPA does not have responsibility to review or approve non-federal PSD quality system documents. The reviewing authority is responsible for final approval of these documents which should occur prior to commencement of sampling. However, as the data from PSD monitoring operations can be used in litigation, the EPA expects the reviewing authority to thoroughly review quality system documentation for compliance to all applicable quality assurance requirements.

Section 2.2 - Independence of Quality Assurance

Q9. How is organizational independence achieved for PSD monitoring programs?

It is expected that the PSD monitoring program will have a quality assurance program that maintains an adequate level of independence from the monitoring program in order to provide a reasonable independent review of quality procedures. Appendix B refers to the development of the PSD Primary Quality Assurance Organization (PQAO) and is defined in Section 1.2 of appendix B. This quality program may be established internally or externally (by an outside contractor), but in all cases it is the responsibility of the PSD monitoring organization to ensure that the monitoring operations include an independent QA/QC component. Note that if an outside contractor is used to perform QA audits this may be perceived as a conflict of independence due to the contractual obligations between the PSD source and the contractor. In such situations it is imperative that the

¹ <https://www3.epa.gov/ttn/amtic/qalist.html>

reviewing authority take an active role in overseeing and verifying that the audits are performed correctly and as independently as possible.

Q10. Who is responsible for ensuring organizational adequacy and independence?

Organizational adequacy and independence should be verified by the reviewing authority during the quality system documentation review/approval process and documented in the QAPP. Detailed discussion on these topics from a QA assessment perspective can be found in Section 2.6.3 of the EPA document titled “*Guidance on Assessing Quality Systems*” EPA/240/R-3/002, March 2003².

Detailed information on the adequacy and independence criteria that the EPA follows when determining whether an S/L/T can be approved for implementing the National Performance Evaluation Program (NPEP) can be found in the latest annual Implementation Decision Memo from OAQPS³.

Q11. If the PSD monitoring organization cannot satisfy the independence criteria can the reviewing authority serve this independence function?

Yes. The EPA believes that the reviewing authority can serve the role of independent oversight authority to a PSD monitoring organization. The reviewing authority inherently performs many independent oversight tasks in its current role. These tasks include reviewing and approving monitoring equipment and siting locations, approving quality system documentation, analyzing raw data and reviewing data quality control reports. Additional tasks that should be added if the reviewing authority has accepted QA oversight authority include the performance of site visits, data trail audits, performance evaluations and contract lab audits.

Section 2.3 - Data Quality Performance Requirements

Q12. Are the data quality objective (DQO) requirements of appendix B applicable to PSD monitoring organizations? If so do PSD monitoring organizations have the option to either adopt the SLAMS DQOs or develop their own DQOs?

Yes; the DQO requirements are applicable to PSD monitoring organizations. Section 2.3.1 states that the PSD reviewing authority and the PSD monitoring organization will be jointly responsible for determining whether adherence to the NAAQS DQOs specified in appendix B of this part are appropriate or if DQOs from project specific systematic planing process are necessary. In this respect, it is the EPA’s intent that PSD monitoring organizations have the flexibility to develop and implement their own DQOs or to adopt the EPA-developed NAAQS DQOs. Note that any project-specific DQOs developed by a PSD monitoring organization must be appropriate for the monitoring objective and must be approved by the reviewing authority.

Section 2.4 - National Performance Evaluation Programs

Q13. Are all PSD monitoring organizations required to participate in the EPA NPEP or an NPEP-equivalent program?

Organizations operating PSD monitoring networks are required to implement the EPA’s national performance evaluation program (NPEP) if the data will be used for NAAQS decisions and at the discretion of the PSD reviewing authority if PSD data are not used for NAAQS decisions. If the PSD monitoring organization chooses to implement an NPEP-like audit program, the reviewing authority should ensure that this independent audit program is of similar rigor to the EPA NPEP and is described in 3.1.3 of 40 CFR Part 58 appendix B.

Q14. How often do PSD monitoring organizations have to conduct NPEP audits (Section 2.4 of appendix B)?

This is dependent on the number of stations operated in a PSD network and the type of audit. Since PSD monitoring organizations usually operate only a few stations, this requirement would most often follow the minimum requirement for each type of NPEP audit (e.g., only five audits per year are required for PM_{2.5}

² <https://www.epa.gov/sites/production/files/2015-06/documents/g3-final.pdf>

³ <https://www3.epa.gov/ttn/amtic/npepqa.html>

networks with fewer than five stations). Nonetheless, PSD monitoring organizations should consult with the reviewing authority to verify the appropriate number of audits and schedule. For pre-construction monitoring, the number and frequency of audits should be agreed upon during the QAPP development process prior to commencement of monitoring operations.

Q15. How does NPEP differ for PSD monitoring organizations (as compared to the S/L/T program)?

The process for performing NPEP at PSD and S/L/T sites should be similar. How the NPEP is funded is different. The S/L/T NPEP program is implemented using State and Tribal Assistance Grant (STAG) funds which pay for NPEP contractors and for the purchase and maintenance of audit equipment. Since the EPA cannot accept outside resources, federal regulations do not allow PSD monitoring organizations to transfer funds to the EPA to implement these audits on the monitoring organizations' behalf. Accordingly, the majority of STAG funded NPEP audits are conducted on SLAMS and Tribal stations. However, S/L/T agencies may, at their discretion, request that the EPA withhold a portion of their STAG funds from their grant allocation and request that EPA conduct NPEP audits at PSD air monitoring stations within their jurisdiction. Note that the EPA does not actively solicit the use of EPA NPEP for PSD monitoring organizations and would only perform this STAG fund transfer in situations where the S/L/T agency requests that this be done.

Q16. Who can perform NPEP audits for PSD monitoring organizations?

The EPA or S/L/T staff, as well as independent contractors who have up-to-date certification by the EPA, can perform NPEP audits of PSD monitoring programs and sites. As implied in the answer to the previous question, U.S. government funds must cover all auditing costs whenever EPA staff or EPA contractors conduct audits. Similarly, federal acquisition requirements limit the use of government-furnished equipment by independent contractors; NPEP equipment can only be used if the rental requirements of the Federal Acquisition Regulation (FAR) section 52.245-9 are followed. However, the PSD monitoring organization always has the option to directly hire a certified contractor and have them use non-government issued audit equipment to perform the required NPEP audits.

Q17. What are the training/certification requirements for PSD auditors? How do we know who is certified to perform NPEP audits?

First time auditors who have not been certified by EPA need to complete the first-time full-length training course including webinars/teleconferences, hands-on training and testing. For NPAP, in addition to the initial and recertification training sessions, the first time auditor must also participate actively and successfully in at least 3 documented field audit trips (not just single site audit trips, but multiple site trips) following initial training. The trips must be with an experienced, EPA certified auditor, who can adequately supervise the completion of the audit procedures and related tasks by the first time auditor. Recertification training is required at two-year intervals and does not require field audits by an EPA certified auditor.

The EPA Regions will provide or arrange for initial and recertification auditor training and will confer with OAQPS on selecting and appropriate training contractor if that is the preferred instructional approach. The EPA Regions will provide the OAQPS NPEP (PEP and NPAP) leads with the documented results (see below) of the classroom and hands-on training performance checklists and written tests.

Each year, the EPA will place on a QA website an updated list of all persons and affiliation certified to perform NPEP and NPAP audits⁴. Registration is necessary.

Q18. What happens if the NPEP audit "fails"?

Audit failure contingency plans should be included in the PSD monitoring organizations QAPP as approved by the reviewing authority (e.g., planning additional audits). The EPA recommends that, when an audit result falls outside the acceptance criteria identified in a QAPP, the result of the audit should be verified and the reason for the difference be identified by the auditor and the operator of the station. The results of the audit and any corrective action should be well documented.

⁴ <https://www3.epa.gov/ttn/amtic/npaplist.html>

Q19. What happens if one or both of the concentrations measured during a performance evaluation are below the levels specified in section 4(b) of Appendix B? Are PSD monitoring organizations required to resample?

The PSD monitoring organization and the reviewing authority should discuss the audit process prior to the planned PE and develop a plan that addresses the number of audits, the planned audit schedule, and the contingency measures to be taken in the event that concentrations below the stated limits are recorded during an audit. As mentioned above and in Section 2.3.1 of appendix B, the PSD monitoring organization has the ability, with the approval of the reviewing authority, to redefine the DQO acceptance level if it is believed to be inappropriate. If additional audits are needed, such audits should be performed as soon as practicable.

Section 2.5 - Technical Systems Audit Program

Q20. Are technical systems audits (TSAs) required for PSD operations? If so, who is responsible for performing the TSA?

The reviewing authority is ultimately responsible for assuring that PSD air monitoring operations meet the requirements of the approved QAPP. It is the reviewing authority's responsibility to determine the type and frequency of audit necessary to ensure conformance with the approved QAPP. For information on performing TSAs please refer to the "*EPA Quality Assurance Handbook for Air Pollution Measurement Systems Volume II – Ambient Air Monitoring Program*", EPA-454/B-13-003, May 2013⁵

Q21. What is the scope of PSD TSAs? Is there a required process for conducting a TSA? Do auditors need to use the 'long form' questionnaire provided in the QA Handbook?

The PSD TSA is a detailed assessment of a PSD air monitoring program that looks at all facets of the program to verify that it is being operated according to the requirements of the QAPP. The EPA does provide an example process for performing a TSA within the QA Handbook, and is currently working on a stand-alone guidance document which the reviewing authority can use as a guide.

Q22. Are the PSD monitoring organizations required to participate in the Ambient Air - Protocol Gas Verification Program (AA-PGVP)?

The AA-PGVP is a voluntary program. PSD monitoring organizations or their contractor can participate in this program if they desire, however, PSD monitoring organizations should only be using protocol gases from gas producers who are taking part in the AA-PGVP. In addition, the PSD monitoring organization must provide information to the reviewing authority on the gas vendors they are using for the duration of the monitoring project. For further information on the AA-PGVP, please visit < <http://epa.gov/ttn/amtic/aapgvp.html>> or contact Solomon Ricks at 919-541-5242.

Section 3.2 - Measurement Quality Checks of Automated Methods

Q23. Do the ten gas performance evaluation audit levels apply to PSD monitoring organizations (given they are not yet codified)?

Yes the 2016 rule included the 10 audit levels. The quarterly PE audits must be performed by a qualified individual, group, or organization that is not part of the organization directly performing and accountable for the work being assessed. The person or entity performing the quarterly PE must not be involved with the generation of the routinely-collected ambient air monitoring data. A PSD monitoring organization can conduct the quarterly PE itself if it can meet this definition and has a management structure that, at a minimum, will allow for the separation of its routine sampling personnel from its auditing personnel by two levels of management. The quarterly PE also requires a set of equipment and standards independent from those used for routine calibrations or zero, span or precision checks. The evaluation is made by challenging the monitor with audit gas standards of known concentration from at least three audit levels. One point must be within two to three times the method

⁵ <https://www3.epa.gov/ttn/amtic/files/ambient/pm25/qa/QA-Handbook-Vol-II.pdf>

detection limit of the instruments within the PQAOs network, the second point will be less than or equal to the 99th percentile of the data at the site or the network of sites in the PQAo or the next highest audit concentration level. The third point can be around the primary NAAQS or the highest 3- year concentration at the site or the network of sites in the PQAo. An additional 4th level is encouraged for those PSD organizations that would like to confirm the monitor's linearity at the higher end of the operational range.

Q24. If a PSD monitoring organization chooses to operate its PM sampler(s) on a daily schedule, which is more frequent than required by permit or regulation, does this monitoring organization have the option to operate its collocated audit sampler on the less frequent non-daily schedule?

No; sections 3.2.3.2 and 3.3.3.2 are clear that audit monitors collocated with a PM_{2.5} or PM₁₀ daily monitor must sample at least every three days.

Section 5. - PSD Reporting Requirements

Q25. Are PSD monitoring organizations required to submit their data to AQS?

By regulation, the EPA does not require PSD monitoring organizations to submit their data to AQS; rather these data must be submitted to the reviewing authority. The reviewing authority may stipulate that data be submitted in AQS format to either AQS or the reviewing authority.

Q26. What report(s) are required to ensure achievement of DQOs?

The PSD monitoring organization's QAPP identifies what data quality reporting is required to be submitted to the reviewing authority to assure that the QAPP-approved DQOs are being met. The EPA encourages reporting PSD data to AQS, which would allow the use of the AMP256 DQO report by the reviewing authority to verify the QA data and to ensure that the QAPP specified DQOs are being met.