# Effective Permitting Tools for Fine Particulate Matter under the Prevention of Significant Deterioration Permitting Program

## Fact Sheet

On February 7, 2024, the U.S. Environmental Protection Agency (EPA) strengthened the National Ambient Air Quality Standards (NAAQS) for fine particle pollution ($PM_{2.5}$) by revising the level of the primary (health-based) annual $PM_{2.5}$ standard to 9.0 micrograms per cubic meter (µg/m3).[1] On and after the May 6, 2024 effective date of the final rule, any permit issued under the Prevention of Significant Deterioration (PSD) program will need to include, among other things, a demonstration that the proposed emissions would not cause or contribute to a violation of the revised primary annual $PM_{2.5}$ NAAQS.

Regulations, guidance, and technical tools are available to implement the strengthened primary annual $PM_{2.5}$ NAAQS under the PSD program. Included on this page is a reference list of policy and technical guidance, models, and tools to assist stakeholders in identifying and accessing these resources as part of a PSD permitting action. EPA staff are available to consult with permit reviewing authorities and individual sources on a case-by-case basis to identify the existing data, models, and tools to demonstrate compliance and, as appropriate, exercise the inherent discretion and flexibilities within the permitting process to best evaluate impacts from a proposed new major source or major modification of an existing source. Air agencies and permit applicants seeking to obtain EPA assistance should contact their appropriate EPA Regional office.

### Air Permitting Policy

- **PSD Applicability.** An applicability analysis is the process of determining whether a preconstruction review should be conducted by, and a permit issued to, a proposed new source or a modification of an existing source by the permitting authority, pursuant to PSD requirements. The purposes of a PSD applicability determination are (1) to determine if a proposed new source is a "major stationary source," or if a proposed modification to an existing source is a "major modification," (2) to determine if proposed conditions and restrictions, that will limit emissions from a new or existing source that is proposing modification to a level that avoids preconstruction review requirements, are legally and practicably enforceable, and (3) to determine which pollutants are subject to preconstruction review.
    - **Common Elements in a New Source Applicability Determination.** Chapter A of the NSR Workshop Manual (DRAFT October 1990) provides detailed information on the four elements for new source applicability: defining the source, determining the source's potential to emit, determining which major thresholds the source is subject to, and which NSR requirements apply based on the attainment designation of the local area and the pollutants emitted by the source. For additional and more recent guidance on NSR applicability and other

[1] See "Reconsideration of the National Ambient Air Quality Standards for Particulate Matter" (89 FR 16202) March 6, 2024.

NSR topics, see the EPA's New Source Review Policy and Guidance Document Database.

- **Applicability determinations using Project Emissions Accounting**. A 2018 guidance and 2020 final rule affirmed there is flexibility for existing major sources to consider both emission increases and well as decreases from a proposed project at Step 1 of the NSR major modification applicability process.
- **Plantwide Applicability Limitation (PAL) flexibility**. The PAL provisions in the EPA PSD regulations offer an optional alternative applicability mechanism for existing major sources. A PAL is a plantwide emission limit, in tons per year, for a regulated NSR pollutant that can include $PM_{2.5}$ direct emissions and the regulated $PM_{2.5}$ precursors, $NO_x$ and $SO_2$. Once established, a PAL allows the source to manage physical and operational changes at the facility without triggering PSD permitting or conducting project-by-project applicability analysis, so long as overall emissions do not increase above the PAL. PALs require the source to conduct monitoring, recordkeeping, and reporting of actual emissions of applicable NSR pollutant(s) on a 12-month rolling basis. Additional information about PAL requirements can be found in the EPA's 2020 PAL guidance.

- **Best Available Control Technology (BACT)**. Any major stationary source or major modification subject to PSD must conduct an analysis to ensure the application of BACT.
  - **"Top-Down" BACT Analysis Procedure**. Chapter B of the NSR Workshop Manual (DRAFT October 1990) provides the key elements of the top-down BACT analysis procedure with brief descriptions of each step. Furthermore, EPA released a guidance document (PSD and Title V Permitting Guidance for Greenhouse Gases) that provides additional and more recent information on BACT and the five step analytical process.
  - **Cost Considerations in BACT Analyses**. EPA's Air Pollution Control Cost Manual provides guidance for the development of accurate and consistent costs for air pollution control devices. The Control Cost Manual focuses on point source and stationary source air pollution controls for pollutants including particulate matter.

- **Revised Policy on Exclusions from "Ambient Air."** In 2019, EPA issued a memorandum that updated its policy on the exclusion of certain areas from the scope of "ambient air." The revised ambient air policy, consistent with the discretion available under the regulatory definition of ambient air, is that *the atmosphere over land owned or controlled by the stationary source may be excluded from ambient air where the source employs measures, which may include physical barriers, that are effective in precluding access to the land by the general public*.

- **Mitigation through Offsets**. Where analysis indicates that a new major source or major modification may cause or contribute to a NAAQS violation in any area, the permit applicant may work with other emission sources in the nearby area to obtain offsetting emission reductions, sometimes referred to as PSD offsets, to mitigate adverse impacts

and enable the source to qualify for a PSD permit. If the resulting emissions reduction(s) compensate for the adverse impact of the proposed source, the permitting authority may issue the PSD permit if all other requirements are satisfied. See 40 CFR 51.165(b)(3). EPA is committed to working with permitting authorities and applicants to identify ways to apply offsets under the PSD program as necessary to meet PSD requirements.

Technical Assistance

To help address some of the requirements in Section 165 of the Clean Air Act (CAA), EPA established the *Guideline on Air Quality Models* ("Appendix W" to 40 CFR Part 51, or *Guideline*), that provides the models, tools, and methods for use in regulatory air quality programs under the CAA and lists EPA's preferred air quality models for use in the PSD program. The *Guideline* is periodically revised through regulatory action to update the preferred air quality models and the methods applied by permit applicants to meet program requirements for PSD demonstrations.

- **Air Quality Analysis Checklist.** The NSR/PSD Air Quality Analysis Checklist supports permit authorities and applicants in developing PSD compliance demonstrations by identifying necessary elements for an appropriate air quality assessment.

- **$PM_{2.5}$ Emissions Measurements**. Source characterization and emissions inputs for modeling are described in Section 8 of the *Guideline*. The Air Emission Measurement Center (EMC) provides information on test methods for measuring pollutants from stacks and other industrial sources. EPA developed test methods for stationary sources to quantify actual stack emissions of filterable and condensable PM. Method 201A describes the procedures of measuring filterable PM, which includes $PM_{2.5}$. Method 202 describes the procedures for measuring condensable PM, which is assumed to be in the $PM_{2.5}$ size fraction.
    - **Condensable PM Adjustment for Ammonium Sulfate Formation in Method 202 Test Results.** In November 2024, EPA released a memorandum that provides sources with an optional approach to refine the quantification of $PM_{10}$ and $PM_{2.5}$ emissions where ammonia is present in the source effluent. This is only appropriate under certain conditions as stated in the memo and for quantifying condensable PM in the context of NSR permitting on a prospective basis, such as to determine applicability of NSR permitting requirements, support a permit application, or derive emissions limitations in a permit.

- **Modeling Protocol and Data Input Flexibility.** Modeling the fate and transport of air emissions can be a complex exercise involving proper use of scientific tools and expert judgment by qualified professionals. Nearly every modeling effort involves unique inputs and case-specific considerations. EPA rules and guidance provide significant flexibility to permit authorities and applicants to properly characterize both routine and unique situations.

- **Basic Model Selection Choices**. Permit applicants have flexibility to appropriately characterize the configuration and nature of the new or modifying source emissions (elevated, ground-level, temporal profile, emission rates, etc.). EPA's preferred dispersion models, as established in the *Guideline*, provide a scientifically credible treatment and allow modeling point, area, volume, and line source types with varying degrees of specificity to best represent the new or modifying source.
- **Alternative Models and Techniques**. EPA's *Guideline* also allows for alternative models and techniques to be approved for use in demonstrating compliance in situations when the preferred dispersion models may not be appropriate for a case-specific situation. In such cases, the requirements found in the *Guideline*, Section 3.2 should be closely followed, including early engagement with the respective EPA Regional Office and the EPA Model Clearinghouse.

- **Multi-stage Demonstration Approach**. EPA recommends a multi-stage approach for demonstrating compliance with air quality standards in the PSD program, starting with a source impact analysis and subsequently, if necessary, a cumulative impact analysis. Each stage involves increasing complexity and rigor, as required, to fully demonstrate that a new or modifying source will not cause or contribute to a violation of the NAAQS.
  - **Using SILs for Air Quality Impact Demonstration**. In 2018, EPA issued a guidance document and supporting documents that provide permit applicants and permitting authorities policy, technical, and legal support for using SILs to make the required demonstration for $PM_{2.5}$ in particular PSD permitting actions. EPA recently released a supplement to this guidance which reassesses the recommended SIL values considering the revision to the $PM_{2.5}$ NAAQS and more recent ambient air quality data. The SILs guidance and supporting documents can be found within the EPA NSR Permitting website.

  - **Area-wide Background Pollutant Concentrations**. As part of the recent proposed regulatory revisions to the *Guideline*, EPA released guidance in November 2024 that provides a framework for developing background pollutant concentrations for cumulative assessments under the PSD program.
    - This guidance reinforces the need to exercise discretion in selecting representative monitoring data and determining the "few" nearby sources to explicitly model.
    - Delegated and approved permitting authorities and permit applicants have discretion in developing representative background concentrations for cumulative assessments. Monitoring data can be adjusted to be representative under the Additional Methods, Determinations, and Analyses to Modify Air Quality Data Beyond Exceptional Events memorandum with justification found in EPA's *Guideline*.

- **Modeling Guidance Specific to $PM_{2.5}$**. EPA has released several modeling guidance documents for modeling $PM_{2.5}$ under the PSD program, including but not limited to:
  - Guidance for Ozone and Fine Particulate Matter Permit Modeling

- Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program
    - Online MERPS View Qlik application to access EPA's hypothetical single source modeled impacts of $O_3$ and $PM_{2.5}$ to support PSD applications.
- Guidance on the Use of Models for Assessing the Impacts of Emissions from Single Sources on the Secondarily Formed Pollutants: Ozone and $PM_{2.5}$