

US EPA ARCHIVE DOCUMENT

Emissions Inventories for State Implementation Plans

EPA Region 4/State/Local Modelers Workshop

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Emissions Data

- Emissions inventory and source emission rate data serve as the foundation for modeling and other analyses that enable air agencies to:
 - estimate the degree to which different sources within a nonattainment area contribute to violations within the affected area; and
 - assess the expected improvement in air quality within the nonattainment area due to the adoption and implementation of control measures.
 - Assess whether the impact of new or modified sources on all applicable National Ambient Air Quality Standards (NAAQS) and/or Prevention of Significant Deterioration (PSD) increments will be met after construction or modification.

Two Groups of Inventories

- Planning inventories

- Submitted with SIP revisions for approval by EPA with detailed documentation
 - Require public hearing notification
 - E.g., base year, attainment, redesignations, conformity, periodic, baseline, projected, nonattainment, statewide etc.
- Not usually submitted with SIP for permitting
 - Require public hearing notification

- Modeling Inventories

- Used by State/Local agencies in their planning and compliance SIPs, permitting, or special projects.
- Depending on the application the emissions used can be based on actual, typical or allowable emissions
 - E.g., photochemical modeling use actuals; dispersion-based NAAQs use allowables
- SIP revision may be required (attainment, redesignations, maintenance, conformity, etc.)
- Public notice for hearing required for permitting and SIPs

Emissions Inventories – the backbone of an environmental program

CAA Section 172(c)(3) and Section 182(a)(1)

- **Section 172(c)(3)** is a part of Part D, Subpart 1, which describes NAA SIP requirements for all criteria air pollutants (CAPs) – carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur.
- **Section 172(c)(3) requires** a comprehensive, accurate, and current inventory of actual (current) emissions of all sources of relevant pollutants. (i.e., point, nonpoint, nonroad and onroad mobile sources) within the nonattainment area
- **Section 182(a)(1)** requires a current and comprehensive inventory of actual emissions of all sources of ozone precursors to be included in a SIP.
- Must be submitted even if area is redesignated prior to submittal date of attainment SIP or a Clean Data

Base Year Inventory for Attainment SIPs

- Section 172(c)(3) of CAA is an emissions inventory requirement for all NAAQS pollutants and precursors
- Actual and Comprehensive emissions
 - All sectors (including biogenics and fires for ozone and PM_{2.5})
 - *De minimus* sources acknowledged and justified
- For the NAA only
- Includes “seasonal” emissions and method for estimating seasonal conditions
- Uses MOVES2014 for on-road emissions
- Representative Inventory year
- Pollutants and precursors included
- Detailed Documentation on approaches for estimating different source categories (i.e., point, nonpoint, nonroad, onroad)
 - What about the NEI?
- Consistent with modeled emissions (where applicable)
- Quality assurance steps taken and documented

Base Year Inventory for Attainment SIPs

- Submit Base Year EI: A comprehensive, accurate and current inventory of actual emissions from all sources of SO₂ emissions NAA which may affect attainment in the area. (per 172(c)(3) and Guidance for 1-hr SO₂ SIP Submittals)
 - Includes all SO₂ Sources in the NAA, as well as
 - Any sources located outside the NAA which have an impact on the affected nonattainment area.

Emissions Inventories - Attainment

- Submit an accurate projected (i.e., attainment) inventory to identify the level of emissions in the area sufficient to attain the NAAQS
 - Reflect enforceable national, regional, or local rules that will be in place within the timeframe for demonstrating attainment (i.e., modelling) of the standard.
 - maximum allowable emissions levels consistent with Table 8-1 of Appendix W.
 - Sources both inside NAA and outside if impacting NAA
- Consistent with the EPA's most recent guidance on emissions inventories.
 - Permanent and enforceable: Shutdowns, control measures and reductions,
 - Expected emission increases due to new sources or growth by existing sources
 - Enforceable 1-hr S₀₂ emission rates (i.e., "allowable" or "permitted") for the S₀₂ sources located in the nonattainment area

Table 8-1—Model Emission Input Data for Point Sources - SIPs

Averaging time	Emission limit(#/MMBtu) ²	×	Operating level(MMBtu/hr) ²	×	Operating factor(e.g., hr/yr, hr/day)
<i>Stationary Point Source(s) Subject to SIP Emission Limit(s) Evaluation for Compliance with Ambient Standards (Including Areawide Demonstrations)</i>					
Annual & quarterly	Maximum allowable emission limit or federally enforceable permit limit.		Actual or design capacity (whichever is greater), or federally enforceable permit condition.		Actual operating factor averaged over most recent 2 years. ³
Short term	Maximum allowable emission limit or federally enforceable permit limit.		Actual or design capacity (whichever is greater), or federally enforceable permit condition. ⁴		Continuous operation, i.e., all hours of each time period under consideration (for all hours of the meteorological data base). ⁵
<i>Nearby Source(s) 6,7</i>					
Same input requirements as for stationary point source(s) above.					
<i>Other Source(s)⁷</i>					
If modeled (subsection 8.2.3), input data requirements are defined below.					
Annual & quarterly	Maximum allowable emission limit or federally enforceable permit limit. ⁶		Annual level when actually operating, averaged over the most recent 2 years. ³		Actual operating factor averaged over the most recent 2 years. ³
Short term	Maximum allowable emission limit or federally enforceable permit limit. ⁶		Annual level when actually operating, averaged over the most recent 2 years. ³		Continuous operation, i.e., all hours of each time period under consideration (for all hours of the meteorological data base). ⁵

TABLE 8-2—Point Source Model Emission Input Data for NAAQS Compliance in PSD Demonstrations

Averaging time	Emission limit(#/MMBtu) 1	×	Operating level(MMBtu/hr) 1	×	Operating factor(e.g., hr/yr, hr/day)
<i>Proposed Major New or Modified Source</i>					
Annual & quarterly	Maximum allowable emission limit or federally enforceable permit limit.		Design capacity or federally enforceable permit condition.		Continuous operation (<i>i.e.</i> , 8760 hours). 2
Short term (≤ 24 hours)	Maximum allowable emission limit or federally enforceable permit limit.		Design capacity or federally enforceable permit condition. 3		Continuous operation, <i>i.e.</i> , all hours of each time period under consideration (for all hours of the meteorological data base). 2
<i>Nearby Source(s)</i> 4,6					
Annual & quarterly	Maximum allowable emission limit or federally enforceable permit limit. 5		Actual or design capacity (whichever is greater), or federally enforceable permit condition.		Actual operating factor averaged over the most recent 2 years. 7,8
Short term (≤ 24 hours)	Maximum allowable emission limit or federally enforceable permit limit. 5		Actual or design capacity (whichever is greater), or federally enforceable permit condition. 3		Continuous operation, <i>i.e.</i> , all hours of each time period under consideration (for all hours of the meteorological data base). 2
<i>Other Source(s)</i> 6,9					
Annual & quarterly	Maximum allowable emission limit or federally enforceable permit limit. 5		Annual level when actually operating, averaged over the most recent 2 years. 7		Actual operating factor averaged over the most recent 2 years. 7,8
Short term (≤ 24 hours)	Maximum allowable emission limit or federally enforceable permit limit. 5		Annual level when actually operating, averaged over the most recent 2 years. 7		Continuous operation, <i>i.e.</i> , all hours of each time period under consideration (for all hours of the meteorological data base).

Redesignation SIP Emissions Inventories

- Redesignations are based on Section 107(d)(3)(E) and 175A of CAA and as clarified in "[Procedures for Processing Requests to Redesignate Areas to Attainment](#)," (PDF) [Calcagni memo]
- Attainment emissions inventory to identify the level of actual emissions in the area sufficient to attain the NAAQS
 - Representative of the time period associated with monitoring data showing attainment
 - For NAA only
- Accurate: based on credible approaches and consistent with model recent EI guidance, and emissions models.
- Consistent with modeled emissions (where applicable)
- Projection years EI for Maintenance demonstration
- Pollutants and precursor pollutants included
- Detailed Documentation on approaches for estimating different source categories
 - (i.e., point, nonpoint, nonroad, onroad)
 - Models: MOVES2014, EDMS, IPM. etc.
 - Permanent and enforceable reductions
 - Growth, new sources
- Quality assurance steps taken and documented

Documentation is Important

- Modeling documentation included in a SIPs (as well as permit) with specific details is crucial for understanding and limiting comments by reviewers.
- Details to support assumptions and inputs are important to document.
- Stating that the data were obtained from a state is not an adequate reason to support:
 - Meteorology representativeness
 - Emissions inventory and emissions rate adequacy
 - Background concentration choices
 - Sources of data, Projection assumptions....

Questions ??
