

March 30, 2017

U.S. Environmental Protection Agency  
Air Quality Assessment Division  
Air Quality Modeling Group  
Research Triangle Park, NC 27711

Submitted via email to George Bridgers (bridgers.george@epa.gov)

*Re: Draft Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and PM<sub>2.5</sub> under the PSD Permitting Program*

Dear Mr. Bridgers:

The Northeast States for Coordinated Air Use Management (NESCAUM) submit the following comments on the U.S. Environmental Protection Agency's (EPA's) draft version of "Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and PM<sub>2.5</sub> under the PSD Permitting Program" dated December 2, 2016 (*hereinafter* "draft MERPs guidance"). NESCAUM is the regional association of state air pollution control agencies representing Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont.

NESCAUM thanks the EPA for its efforts to develop a demonstration tool to assist with assessing the single-source impacts of secondarily-formed pollutants such as ozone and PM<sub>2.5</sub>. NESCAUM also thanks the EPA for the opportunity to comment on the draft MERPs guidance. NESCAUM's comments follow below, and are grouped according to the section numbering of the draft guidance. Please note that some of these comments are of a technical nature while others are strictly editorial.

#### Section 1: Background

1. The first sentence in the 2<sup>nd</sup> paragraph states, "For Tier 1 assessments, EPA generally expects that applicants would use existing empirical relationships between precursors and secondary impacts based on modeling systems appropriate for this purpose." Based on that statement, are the Region 1 and Region 2 states able to continue using the detailed screening technique outlined in NESCAUM's May 30, 2013 comment letter on EPA's March 4, 2013 document *Draft Guidance for PM<sub>2.5</sub> Permit Modeling* if the permitting agency considers it sufficiently conservative?
2. Alternatively, could the NESCAUM screening technique be used in conjunction with the Tier 1 techniques described in this document in a weight-of-evidence analysis, or will the MERPs guidance replace the NESCAUM screening technique?

### Section 2: Ozone and Secondary PM<sub>2.5</sub> Formation in the Atmosphere

3. The draft MERPs guidance focuses on volatile organic compounds (VOCs) and nitrogen oxides (NO<sub>x</sub>) as precursors to ozone, and sulfur dioxide (SO<sub>2</sub>) and NO<sub>x</sub> as precursors to PM<sub>2.5</sub>. However, VOCs can also be precursors to secondary PM<sub>2.5</sub> formation. In fact, EPA mentions on page 7 of the draft MERPs guidance that PM<sub>2.5</sub> in the form of organic carbon can be formed secondarily in the atmosphere by reactions involving VOCs. EPA should provide an example of accounting for VOCs in a demonstration of whether emissions of these precursor pollutants are expected to result in a change in ambient PM<sub>2.5</sub> that would be less than a specific air quality threshold. Alternatively, if EPA feels that VOCs are not significant precursors to secondary PM<sub>2.5</sub>, then EPA should provide a demonstration to that effect.

### Section 4: Single-Source Precursor Emissions and Downwind Ozone and Secondary PM<sub>2.5</sub> Impacts

4. Does EPA envision adding hypothetical sources at additional locations to those already listed in Table 4-1? Adding additional locations would allow for a more accurate estimate of secondary impacts. For example, the two closest locations to New Jersey are Bronx, NY (very urban) and Adams County, PA (rural). Neither of these sites are particularly representative of many parts of New Jersey.
5. In Figure 4-4 on page 15, the figure headings and the related text on page 14 are not consistent. The main figure caption shows “annual average,” but the subfigure headings are labeled as “24-hr.” The text on page 14 specifies that this figure shows maximum annual average impacts.

### Section 5: Framework for Developing MERPs as a Tier 1 Demonstration Tool

6. Section 5.1 of the draft MERPs guidance states, “Neither PM<sub>2.5</sub> sulfate nor PM<sub>2.5</sub> nitrate are assumed to be neutralized by ammonium.” EPA’s Draft PM<sub>2.5</sub> Precursor Demonstration Guidance dated November 17, 2016 states that ammonia has to be addressed in nonattainment New Source Review (NNSR) permitting and attainment planning. Are there plans to include Tier 1 MERPs for ammonia emissions? If there are plans to include MERPs for secondary ammonia emissions, EPA should establish significant emission thresholds for ammonia. Because EPA does not specify a modeled emission rate for ammonia as a precursor of PM<sub>2.5</sub>, and does not establish a significant ammonia emission rate for NNSR permitting, there is a major gap in how to adhere to and demonstrate compliance for major sources of ammonia, including sources with ammonia-emitting NO<sub>x</sub> control systems.

7. If the conversion of the sulfate ion to ammonium sulfate and ammonium bisulfate was included, the secondary PM<sub>2.5</sub> impacts due to SO<sub>2</sub> emissions would be significantly higher. This will be due to the higher molecular weight of ammonium sulfate [(NH<sub>4</sub>)SO<sub>4</sub>] and ammonium bisulfate [(NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>]. This is similarly the case for nitrate ion converting to higher molecular weight ammonium nitrate [NH<sub>4</sub>NO<sub>3</sub>], particularly in the winter months. EPA should include a statement in the guidance that states PM<sub>2.5</sub> impacts due to SO<sub>2</sub> and NO<sub>x</sub> emissions listed in Tables A-1, A-2, and A-3 may be underestimated in areas with ammonia emissions.

#### Section 6: Recommended Method for Developing MERPs as a Tier 1 Demonstration Tool

8. From reading the draft MERPs guidance, it appears that stakeholders may perform their own modeling to derive MERPs for use in a Tier 1 demonstration, or they may use, as appropriate, MERP values derived by EPA from its modeling of hypothetical sources (particularly the most conservative illustrative MERP values presented in Table 7-1 on page 30, but also the values in Appendix A). While this section focuses on the general framework for developing MERPs, there is no actual guidance discussion on whether and when the MERPs in Section 7 and Tables A-1, A-2, and A-3 can be used instead of developing source-specific MERPs. We request that EPA add language to the body of the guidance to make this clearer.
9. Section 6.1 on pages 27 to 29 presents a general framework for stakeholders to use when performing modeling to derive their own Tier 1 demonstration tool. Five basic steps are provided for 8-hour ozone, daily PM<sub>2.5</sub>, and annual PM<sub>2.5</sub>. Other than pollutant and averaging period, the five steps are identical. For conciseness, these three sets of five steps could be condensed into a single set of steps applicable to all of the relevant pollutants/averaging periods.
10. Is EPA going to provide more resources and training to help states apply the MERPs guidance?

#### Section 7: Illustrative MERP Tier 1 Demonstrations Based on the EPA Modeling for Example PSD Permit Scenarios

11. For Table 7.1, if the lowest (most conservative) MERP among all of the regions of the U.S. is to be used for the first step of the Tier 1 demonstration, the examples illustrating the use of MERP values are not consistent with this criterion. Perhaps the lowest (most conservative) MERP value for each pollutant and averaging period should be listed in bold to emphasize its use in a Tier 1 demonstration, or the table should be reduced to the lowest MERP values for each pollutant, regardless of the region.
12. For Scenario B, the facility is located in the southeast region and the additive secondary impacts on daily PM<sub>2.5</sub> are taken from the western US. While the Tier 1 comparison of

the daily PM MERPs uses the lowest (most conservative) of any source modeled in the continental U.S., the additive secondary impacts for annual PM<sub>2.5</sub> do not follow this criterion. The annual SO<sub>2</sub> from the source was compared to the annual PM MERP from the western US of 2,289 tpy. However, the lowest annual PM MERP for SO<sub>2</sub> is 1,795 tpy from the central US.

13. Also for Scenario B, the example PM<sub>2.5</sub> analysis ends abruptly. We suggest adding a summary sentence after each example calculation to emphasize that because the resulting percentage (in this case, 60% for daily and 13% for annual) is less than 100%, the critical air quality threshold is not expected to be exceeded.
14. For Scenario C, the discussion states that source 19 from the eastern US is being used, but the equation lists source 16 from the western US, with a MERP value of 1.31 ppb for a 1,000 tons per year elevated source.
15. For Scenario D, it is initially confusing to determine where the 60% secondary impact comes from. We suggest adding wording to refer the reader back to the Scenario B example calculations at the top of page 32. We also recommend continuing the Scenario D example to include annual PM<sub>2.5</sub>.
16. In Table 7.1 and Appendix A Tables A-1, A-2, and A-3, the 24-hour PM<sub>2.5</sub> and 8-hour ozone Tier 1 impacts are based on the source's tons per year emissions of NO<sub>x</sub>, SO<sub>2</sub>, and VOC. Given that these NAAQS are short-term (24-hour and 8-hour), a source's impact might be considered more a function of its lbs per hour emission rates rather than its tons per year emissions, and using tons per year values may underestimate impacts. Assume, for example, a source is only permitted to operate 2,000 hours per year. Applying a lbs per hour emission rate from the Tier 1 hypothetical source modeling will result in an emission rate less than 25 percent of the actual lbs per hour emission rate.
17. Tables A-1, A-2, and A-3 in Appendix A would be easier to read if the column headers were listed on each page of the table instead of just on the first page.

If you have any questions concerning these comments, please contact Paul Miller, NESCAUM Chief Scientist, [pmiller@nescaum.org](mailto:pmiller@nescaum.org).

Sincerely,



Paul J. Miller