

WA 1-14: Peer Review of MOVES Nonroad Update Reports

Peer Review Charge

1. Purpose

Over 125 million Americans live in areas that experience unhealthy levels of air pollution. Nonroad engine and equipment exhaust is a particularly important source of exposure to pollutants as the U.S. Environmental Protection Agency (EPA) ratchets down on other sources, such as the passenger car and truck fleets, through motor vehicle pollution standards. EPA's Office of Transportation and Air Quality (OTAQ) is tasked with identifying policy options to reduce ozone, particulate matter, and nitrogen dioxide emissions, among other pollutants, from nonroad engines and equipment in the U.S. As new policy options are brought forward, there is a need to evaluate their soundness and utility.

Models can be used to help address questions that may be too large to study directly but may yield to approximations from smaller sets of real data. These models can provide insights into how owners/operators will change their equipment operating patterns in response to, for example, a required increase in fuel economy across the nonroad engine and equipment fleet. Tools, like EPA's MOtor Vehicle Emissions Simulator (MOVES), describe the result of various inquiries into the nature of fuel and engine emission interactions. Specifically, the MOVES model estimates the air quality impact of the nonroad engine and equipment fleet.

EPA is updating the MOVES model to include information from three documents, referred to collectively as, "Nonroad Update Reports," and thereby refine the model's ability to estimate accurately the emissions impacts of nonroad engines and equipment. The three documents describe proposed updates to MOVES data and methods.

ICF, which is under contract with OTAQ to facilitate a peer review of the aforementioned documents, has selected you as a reviewer. This charge letter provides you with a detailed scope of services for this review. It includes:

- A description of the materials for review;
- A list of both general and specific questions for your review, with instructions;
- The peer review schedule;
- Drafts of the three documents for review; and
- A list of materials, including a Conflict of Interest (COI) form, to be submitted to ICF at the conclusion of the review.

2. Description of Peer Review Materials

EPA is seeking your review of and comments on the following three documents:

1. Nonroad Engine Population Growth Estimates in MOVES201X

- Review the entire report (i.e., 18 pages).

2. Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling – Compression-Ignition in MOVES201X

- Sections 1 and 2 (on pp. 3-12): Review all of Sections 1 and 2, with a focus on the proposed updates made for MOVES201X related to Tier 4 nonroad engines.

- Section 4.4 (on page 29): Evaluate updates to the Tier 4 engine emission rates.
- Table A1 (on pp. A2-A10): Evaluate the updated nonroad CI technology distributions for 2011+ model years among certification levels and aftertreatment configurations.
- Table A4 & Figure 2 (on pp. A15-A30): Evaluate updates to the Tier 4 engine emission rates.

3. Speciation Profiles and Toxic Emission Factors for Nonroad Engines in MOVES201X

- Sections 3.1, 3.2, and 3.3 (on pp. 13-20): Evaluate updated VOC toxics, PAH, and metal emission rates for Tier 4 engines to account for different aftertreatment configurations.
- Appendix B (on p. 68): Evaluate the updated speciation profile assignments to TOG emissions for Tier 4 nonroad engines.

3. Charge Questions

EPA is seeking your review of and comments on selected methods and underlying assumptions, their consistency with the current science as you understand it, and the clarity and completeness of the presentation. For this review, no independent data analysis is required. Rather, EPA asks that you assess whether the information provided is representative of the state of current understanding, and whether incorporating the information into the MOVES model will result in appropriate predictions and conclusions.

Although the peer review charge is limited to specific sections of two of the three documents, we have provided you with the full draft reports for context. Comments made on the other sections/chapters in these two draft reports are outside the scope of the peer review, and any comments made outside of the charge will be addressed at EPA's discretion. All three draft reports reference other MOVES201X draft reports. We will provide these to you at your request, but we do not anticipate they will be needed for this work.

Your written comments should address, sequentially, the substantive content of the draft reports that you are charged with reviewing. Comments on organization, formatting, and other minor issues are welcome, but should be provided separately.

EPA has provided the following general and specific charge questions to define the scope of your review. EPA does not expect individual responses to the general questions, but would like these questions to help guide your comments. EPA does, however, seek individual responses to the specific questions. Please note that you are welcome to identify additional topics or depart from the questions as necessary to best apply your particular area(s) of expertise. You may also include any additional comments that are not specific to the charge questions using the table provided.

In your written comments, you should distinguish between recommendations for clearly defined improvements that can be readily made based on data or literature reasonably available to EPA, and improvements that are more exploratory or dependent on information not readily available to EPA. Your comments should be sufficiently clear and detailed to allow readers to understand thoroughly their relevance to the subject report.

EPA requests that you treat all materials as confidential. Do not release or discuss with others the peer review materials or your comments. Your comments will be listed as an appendix to EPA's final published report, along with EPA's responses to them.

If you are unclear about what is required to complete this review or need additional background material, please contact Ira Dassa at ICF by telephone (443-573-0551) or email (Ira.Dassa@icf.com).

Charge Questions

General Questions to Consider:

1. Does the presentation describe the selected data sources sufficiently to allow the reader to form a general view of the quantity, quality, and representativeness of data used in the analysis? Are you able to recommend alternate data sources that might better allow the model to estimate national or regional default values?
2. Is the description of analytic methods and procedures clear and detailed enough to allow the reader to develop an adequate understanding of the steps taken and assumptions made by EPA while developing the model inputs? Are examples selected for tables and figures well-chosen and effective in improving the reader's understanding of approaches and methods?
3. Are the methods and procedures employed technically appropriate and reasonable with respect to the relevant disciplines, including physics, chemistry, engineering, mathematics, and statistics? Are you able to suggest or recommend alternate approaches that might better achieve the goal of developing accurate and representative model inputs? In making recommendations, please distinguish between instances involving reasonable disagreement in adoption of methods as opposed to instances where you conclude that current methods involve specific technical errors.
4. Where EPA has concluded that applicable data is meager or unavailable, and consequently has made assumptions to frame approaches and arrive at solutions, do you agree that the assumptions are appropriate and reasonable? If not, and you are able to do so, please suggest alternative assumptions that might lead to more reasonable or accurate model inputs.
5. Are the resulting model inputs appropriate and, to the best of your knowledge and experience, reasonably consistent with physical and chemical processes involved in mobile source emissions, formation, and control? Are the resulting model inputs empirically consistent with the body of data and literature with which you are familiar?

Specific Questions:

In addition to the general review, EPA requests specific responses to the following questions:

Nonroad Engine Population Growth Estimates in MOVES201X

1. This report describes a method for aggregating Fuel Oil and Kerosene Sales (FOKS) data to generate growth indices for various nonroad equipment sectors. Are there better or alternative methods for aggregating time series data such as the FOKS dataset?

2. Are the data sources that EPA selected to serve as surrogates for historical and future growth indices appropriate for the nonroad equipment sectors to which they are assigned?

Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling – Compression-Ignition in MOVES201X

1. Due to limited resources and data, EPA has not updated the transient adjustment factors, deterioration factors, sulfur adjustments, and crankcase emission factors for Tier 4 nonroad engines (Sections 6, 7, 8, and 10). For example, for Tier 4 engines, EPA assumes a transient adjustment factor = 1. The current deterioration factors for Tier 4 engines are unchanged from Tier 3 engines. EPA is currently assuming a crankcase emission factor = 0% for Tier 4 engines. How appropriate are the current assumptions for these adjustments and factors for Tier 4 engines? Are there data available for informing updates to these adjustment and factors?

ADDITIONAL OVERALL COMMENTS PROVIDED (NOT CHARGE QUESTION-SPECIFIC):
ADDITIONAL COMMENTS BY SPECIFIC REPORT CHAPTER:

4. Schedule

The schedule for this peer review is as follows:

- January 10, 2018 (tentative): Conference call with EPA, ICF, and all reviewers to address any preliminary questions.
- February 5, 2018: Comments/review due to ICF via email (send to Ira.Dassa@icf.com, with a cc to Lindsay.Kirschner@icf.com).

ICF will arrange the teleconference between the reviewers, relevant EPA staff, and ICF. The purpose of this teleconference will be to answer any questions you and the other reviewer may have regarding the EPA peer review process and the particular material you are reviewing. ICF will contact you in advance to assess the best time for you and the other reviewer to participate in the conference call.

Any questions that you have after this teleconference should be directed to ICF, which will then seek resolution from EPA. Any answer provided and the question to which it refers will be shared with the other reviewer.

5. Materials to Submit

Upon completion of your review, please submit the following to ICF:

1. A cover letter that states:
 - Your name; and
 - The name and address of your organization.
2. A completed COI form (attached).
3. Your written comments.

6. Material for Review

The following files are appended for your review:

- *Peer Review - Nonroad Engine Population Growth Estimates in MOVES201X.docx*
- *Peer Review - Exhaust and Crankcase Emission Factors for Nonroad Engine M....docx*
- *Peer Review - Speciation Profiles and Toxic Emission Factors for Nonroad E....docx*

Additional attachment:

- *COI Form.pdf* (please complete this and submit it with your review)

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