



# **MOBILE5**

## **Information Sheet #5**

### ***Inclusion of New 2004 NO<sub>x</sub> Standard for Heavy-Duty Diesel Engines in MOBILE5a and MOBILE5b Modeling***

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#### **I. Introduction**

MOBILE5 Information sheets are a series of documents intended to give users detailed information about techniques that can be used to more accurately model highway mobile source emissions and avoid potential errors or resolve limitations to modeling capabilities. When referring to MOBILE5 in this and other Information Sheets, we will mean the latest officially released version of the MOBILE model, unless otherwise specifically noted. At the time of this Information Sheet, two versions of the model were actively being used. The most current version of the model, MOBILE5b, was released in October of 1996 while the other version, MOBILE5a, was released in March of 1993.

All of the MOBILE5 Information Sheets will be made available on the EPA Office of Mobile Sources site on the World Wide Web (WWW). The WWW site is available to users 24 hours a day, 7 days a week, and may be reached at "<http://www.epa.gov/OMSWWW/>".

If you would like to be added to our mailing list, please follow the instructions included in the last section of the Information Sheet. This only need be done once. You do not need to send in this information if you are already on our mailing list.

#### **II. Problem Description**

In October 1997, EPA promulgated a new combined emission standard for emissions of oxides of nitrogen (NO<sub>x</sub>) and non-methane hydrocarbons (NMHC) from model year 2004 and later heavy-duty diesel engines used in trucks and buses (additional information about this rulemaking may be found on the EPA Internet server on the World Wide Web at "<http://www.epa.gov/OMSWWW/hd-hwy.htm>"). Manufacturers of such engines have the choice of certifying their new engines to either a 2.4 g/bhp-hr NMHC plus NO<sub>x</sub> standard, or to a

2.5 g/bhp-hr NMHC plus NO<sub>x</sub> standard with a limit of 0.5 g/bhp-hr on NMHC. In EPA's analysis of the emission impacts of the new standard and the technologies which are likely to be employed to meet that standard, EPA has deemed it reasonable to model the impact of the combined standard as equivalent to that of a distinct 2.0 g/bhp-hr NO<sub>x</sub> standard and a 0.5 g/bhp-hr NMHC standard. The analysis also indicated that these technologies would result in very large NO<sub>x</sub> reductions for all heavy-duty diesel engine families, but rather small NMHC emission reductions for only some engine families. EPA projects that the impact of the new NMHC plus NO<sub>x</sub> standard is an approximately fifty-percent reduction in NO<sub>x</sub> emissions from the 1998 and later model year NO<sub>x</sub> standard of 4.0 g/bhp-hr for heavy-duty diesels. As a result of these findings, EPA is providing MOBILE5a and MOBILE5b users with guidance that allows the user to only model the impact of the effective NO<sub>x</sub> standard.

Currently, neither version of the model includes the emissions impact of the recently finalized EPA rulemaking on the new on-highway emission standard for heavy-duty diesel engines. This Information Sheet provides users of either MOBILE5a or MOBILE5b with guidance for including the effects of the new standard in their modeling.

MOBILE5a and MOBILE5b handle emission factor estimation for heavy-duty diesel vehicles (HDDVs) differently for model years 1990 and later (see the MOBILE5b User's Guide at "<http://www.epa.gov/OMSWWW/m5.htm>" for further information). MOBILE5b currently provides a more accurate assessment of HDDV emissions; however, there are still many users of MOBILE5a. The guidance that follows for modeling the 2004 NO<sub>x</sub> standard also includes a change that will account for the difference between the two models, thereby ensuring the same results for heavy-duty vehicle emission factors from either version. However, users of MOBILE5a should note that, to properly calculate the benefit of the new NO<sub>x</sub> standard for HDDVs, they must use the base year emission factors that result from running the model using the guidance below; it is inappropriate to use the base year HDDV emission factors that were previously computed by MOBILE5a.

### **III. Remedy**

#### *MOBILE5a and MOBILE5b Guidance*

The following guidance will allow users of either MOBILE5a or MOBILE5b to account for the impacts of the new NO<sub>x</sub> standard beginning in model year 2004. Users of either model should alter their input files in the following manner:

- Set NEWFLG to 2 in the CONTROL section. This flag setting allows the user to enter new emission rates that override those in the block data. See Section 2.1.8 of the User's Guide for further detail on this flag.
- In the ONE TIME DATA section, add one line giving the number of emission rates that are to be changed. In this case, this number will be four. The next four records in the

One Time Data section will describe the changes that will be made to the emission rates. The following information is included in each of the three records: region being modeled (1=low altitude), vehicle type (7=HDDV), pollutant (3=NOx), starting model year (two digits), ending model year (two digits), new zero-mile value, and new deterioration rate (both in g/bhp-hr for heavy-duty vehicles). See Section 2.2.4 of the User's Guide for further detail.

The new emission rates are given below along with the other input changes.

```

2          NEWFLAG      ← Control Section
.          .....
.          .....
.          .....
004
1 7 3 90 90 05.639 00.000
1 7 3 91 97 04.598 00.000
1 7 3 98 03 03.679 00.000 ← One Time Data Section
1 7 3 04 50 01.840 00.000 *
```

\*Note: Users of MOBILE5a **must** make the following change to the last line of the "One Time Data Section" or an error message will appear in the output file:

```
1 7 3 04 20 01.840 00.000
```

**IV. Additional Information/ Listserver Subscription**

The Emission Inventory Group, Assessment and Modeling Division, EPA Office of Mobile Sources is sponsoring a listserver named EPA-MOBILENEWS. A listserver is an electronic mailing list service that will send messages to the all of the persons with e-mail addresses who have "subscribed" to that particular listserver. The Emission Inventory Group would like to see this listserver largely replace physical mailings of information to parties currently on the MOBILE model mailing list, as well as others interested in general mobile source emission factor and inventory information (including particulate emissions and the PART emission factor model, and nonroad mobile sources).

To subscribe to the EPA-MOBILENEWS listserver send the following message:

```
subscribe EPA-MOBILENEWS FIRSTNAME LASTNAME
```

where FIRSTNAME and LASTNAME is your name (for example: Fred Flintstone) to the EPA List server address. The list server e-mail address is:

listserv@unixmail.rtpnc.epa.gov

Your e-mail address will then be added to the list of subscribers and a confirmation message will be sent to your e-mail address. Whenever a message is posted to the EPA-MOBILENEWS listserv by the listserv owner (The Assessment and Modeling Division of the EPA Office of Mobile Sources), a copy of that message will be sent to every person who has subscribed.

You can remove yourself from the list by sending another message to the listserv address. This message must be sent from the same e-mail address that you used to subscribe, and should contain the message:

unsubscribe EPA-MOBILENEWS

The Emission Inventory Group encourages all persons interested in highway vehicle emission factors, including particulate matter, the MOBILE and PART emission factor models, and non-road vehicle emission factors and modeling, as well as guidance issued from OMS on the use of these models and development of emission inventories for all mobile sources, to take advantage of the EPA-MOBILENEWS listserv as the best and most efficient way to get up-to-date information about these issues.

We recognize that some parties interested in these topics may not be able to subscribe to the listserv, and will continue to mail paper copies of information to those parties on request. If you cannot subscribe to the EPA-MOBILENEWS listserv at this time and wish to continue to receive paper copies of information by regular mail, please mail or fax your current information (name, company name, mailing address, phone and fax numbers) to us at the address below and clearly indicate that you wish to continue receiving paper copies of all information distributed over the listserv. Send this request to:

MOBILE/PART Mailing Lists  
US EPA NVFEL  
Assessment and Modeling Division  
2565 Plymouth Road  
Ann Arbor, MI 48105

or fax the information to: 313/741-7939

and note "Attention: MOBILE/PART Mailing Lists" on the fax.