April 2024

Instructions for Submitting Nonroad Inputs for MOVES for the 2023 NEI

The U.S. Environmental Protection Agency (EPA)'s [Air Emissions Reporting Rule](https://www.epa.gov/air-emissions-inventories/air-emissions-reporting-requirements-aerr) (https://www.epa.gov/air-emissions-inventories/air-emissions-reporting-requirements-aerr) requires state and local (S/L) agencies who submit to the National Emissions Inventory (NEI) to submit model inputs for mobile sources, rather than emissions. Emissions estimates will still be accepted as the sole submittal type from the state of California and tribes.

For the 2023 NEI, EPA plans to use the most current version of the Motor Vehicle Emission Simulator (MOVES) model, MOVES4.0.1 to estimate both onroad and nonroad emissions. Agencies that want to submit MOVES nonroad inputs as county databases (CDBs) may do so and can follow instructions in this document to create the nonroad CDBs. **Note: MOVES4 nonroad CDB submissions must be checked using a QA script provided by EPA in version MOVES4.0.1.**

If you do not submit nonroad input data, EPA will generate emission estimates using EPA-derived defaults. Agencies may accept the EPA defaults in lieu of submittals by sending a "support request" to Emission Inventory System (EIS) that states this.

If there are specific questions about how to properly enter data for in the nonroad tables in the CDBs for use in MOVES, they should be directed by email to the [OTAQ Mobile Inbox](mailto:mobile@epa.gov) (mobile@epa.gov).

I. MOVES4 NONROAD CDB CREATION

MOVES4 includes a Nonroad Data Importer, available on the Create Input Database Panel in the MOVES GUI, to assist in the creation of nonroad-specific inputs for MOVES. These tools can be used to create a database that contains the tables required for nonroad modeling (Table 1) that incorporates local information.

When the MOVES4 Nonroad Data Importer is opened, data entry tabs for Fuel, Meteorology Data, and Generic are displayed. A user must first create a database and then may either create empty templates or export the default data for any nonroad table into text files or MS Excel spreadsheets. The Generic tab contains an importer to allow the user to bring in local data from text files or spreadsheets to populate specific tables in the database that do not have their own data entry tabs.

Table 1. Tables contained in MOVES4 nonroad CDBs

Table Name	Description
fuelformulation*	Describes the fuel properties
nrbaseyearequippopulation	Source type base year populations for each nonroad SCC
nrdayallocation	Allocation of nonroad activity between day types (weekdays and weekend days)
nrfuelsupply*	Indicates which fuels are used in which months
nrgrowthindex	Growth adjustments to the user supplied populations.

nrhourallocation	Allocation of nonroad activity to each hour of the day
nrmonthallocation	Allocates nonroad activity to each month of the year
nrretrofitfactors	Allow users to discount nonroad emissions to reflect local control scenarios
nrsourceusetype	Contains user input of annual nonroad activity
nrstatesurrogate	Contains the surrogate data that allocates state equipment populations to counties
zonemonthhour*	Contains the temperature and humidity values by hour of the day in each month of the year

* Fuels and meteorology inputs for the nonroad NEI will come from EPA information, not CDB submittals. EPA will be using regional fuel information and grid-based meteorological data converted to county-level, and not data supplied by states in these tables.

The MOVES4 Nonroad Data Importer will create a database with only three tables by default: FuelFormulation, NRFuelSupply, and ZoneMonthHour. Any additional tables that agencies would like to submit must be created using the Generic tab.

Tables can be created using the Generic tab by the following steps:

- Select the table you wish to create from the pull-down Table selection.

- Use the Create Template button to generate an empty template or choose to export default data. The file may be saved as a text file or MS Excel spreadsheet, which you may later open and edit with local data.

- Using the Browse button, select the updated file.

- Use the Import button to create the table in your database. If there are errors and warnings reported by the MOVES Nonroad Data Importer, that may indicate the table is incomplete.

- Use the Clear Imported Data to empty any (bad) data from the table. Your database will now have a new, updated table.

* MOVES-NONROAD CDB DOCUMENTATION

All CDB submissions must include documentation of any local data and MOVES default data. References to additional documents containing more detail are encouraged. These additional files can be in any format (e.g., .pdf or .xls).

To keep track of the thousands of CDBs used in the NEI calculations, EPA has established a naming convention for CDBs that differentiate between databases and make automation of running and processing the inputs and outputs from MOVES easier.

The naming convention for each CDB folder has 23 characters. The first 6 characters consist of the letter c followed by the 5-digit Federal Information Processing Standard (FIPS) code for the county, including a leading zero when necessary. The next 5 characters are the letter y, followed by a 4-digit calendar year. This calendar year indicates the calendar year of the data contained in the database. A CDB should only contain data from a single calendar year. The "_nr" differentiates these as nonroad files. The last 8 digits, following an underscore character, are the date on which the database was created in a YYYYMMDD format.

An example of a CDB name is c26161y2023_nr_20240601 where this CDB names indicates c26161 refers to the county FIPS code (Washtenaw County, Michigan). y2020 refers to the calendar year for the CDB and 20210601 identifies the database modification date of June 1, 2024.

III. MOVES-NONROAD CDB SUBMISSION

All data submissions should include documentation of the data sources and processes used to organize the information into the required format. This documentation may include existing presentations and papers and should include a summary that explicitly connects the documentation with specific tables provided.

The submission must also contain a spreadsheet checklist that indicates what county-specific data are provided (see example Figure 1). The purpose of the checklist is to provide a method to determine which parts of the overall submission contain new information. This will assist EPA in making projections to other calendar years. The checklist – MOVES4_Nonroad_County_Checklist.xlsx – can be downloaded from the 2023 NEI FTP site (https://gaftp.epa.gov/air/nei/2023/doc/supporting_data/nonroad/). As shown in the example below, the checklist contains rows of counties and columns of CDBs. Place an "x" in each appropriate cell to indicate what data are provided for each county. If no data are provided, place an "x" in the cell which indicates that all EPA estimates are accepted for this county. The spreadsheet may be trimmed to include only the counties in your jurisdiction. (Note that even if CDBs are submitted for a portion of the counties in your jurisdiction, the final checklist **must** include all the counties in your jurisdiction.)

The checklist file name should contain an agency Program System Code (PSC) followed by "_NR_Checklist.xls (or .xlsx)". For example, Delaware's state agency PSC is "DEDNR", so their checklist would be named "DEDNR_NR_Checklist.xls".

Figure 1. CDB Checklist

Nonroad CDB submissions must be checked using the QA checking script. The QA check script will check the contents of each of the tables in the database. The QA script will provide a warning if any of the tables listed in Figure 1 or Table 1 are empty or missing, but this will not prevent the nonroad CDBs from being submitted to the EIS. The EIS submission must have a QA script report for each CDB submitted.

The MOVES NEI Submissions Quality Assurance (QA) Tool includes scripts to review onroad and nonroad CDB submissions for the 2023 NEI. The QA report generated by the QA Tool verifies that any CDB table(s) meet the naming convention, format, data validity, and other checks. It is very important that the QA Tool be run for each submitted CDB.

The QA Tool is run in MOVES via the command line, using Ant, the MOVES dependency manager and command line interface tool. For general information on MOVES' command line tools, see CommandLineMOVES.md.

In order to run the NEI QA Tool on a CDB, MOVES version 3.0.1 or greater must be installed. The QA Tool also assumes the CDB has already been built using the MOVES Nonroad Data Importer and is ready to be checked. The QA Tool will not aid in creating CDBs.

For complete instructions it is recommended to view NEI QA Instructions on the GitHub site.

https://github.com/USEPA/EPA_MOVES_Model/blob/master/docs/NEIQAInstructions.md

Running the script in the instructions will create the QA Report that is required in your MOVES CDB submittal. The report confirms that each CDB contains valid values for any table(s) included in the database. EIS will check to see that each county listed in the report has an associated CDB in the submission. Only include counties in the QA report that you will be submitting. If the counties in the QA report do not match those in the CDB folder, or if any errors are indicated in the QA report, EIS will indicate a critical error and will not accept the submission.

In the example QA report (Figure 2) below, the checks for Kent County (10001) have been successful. In the case of the nrretrofitfactors, the table was empty, which generated a Warning in the Status column (B). The Warning is informational for the state to indicate where data has not been provided. MOVES will use default values in cases where tables are left empty. However, only a Status of ***Error*** will prevent the report from being acceptable to the EIS. If an Error occurs, the problem must be identified, corrected and the script re-run to generate a report with no Errors.

Figure 2. Example of QA Report Results

IV. BUNDLING CDB COMPONENTS FOR EIS SUBMITTAL

Once you have prepared the parts of your submittal, you'll need to zip them together in a specific way and reference them with the EIS/CDX required XML file. The CDBs are folders located in the MariaDB/data directory on your system. Once you have completed creating/editing the CDBs for your state, these folders and their contents are to be included in the zip file for submission. Figure 3 below shows that the individual CDBs are zipped into one zip file. That zip file and the remaining parts (QA report, checklist, and documentation) are then zipped into a zip folder.
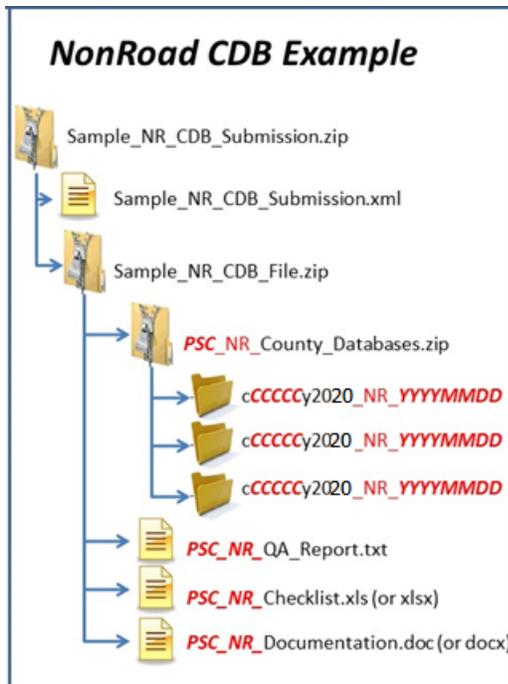
Figure 3. Nonroad CDB Zipping Example

V. CREATING THE EIS/CDX-REQUIRED XML

To create the XML file, use

1. Use the EIS Bridge Tools
   a. Download the "Nonpoint/Onroad/Nonroad Bridge Tool" from the EIS Bridge Tools.
   b. Open the file in Microsoft Access.
   c. Choose the "Export Onroad/NonRoad XML Wrapper" from the Main Menu (Figure 4).

Figure 4. Main Menu Bridge Tool

d. Fill out the form with the appropriate information (Figure 5).

Figure 5. CERS XML Wrapper

      i. File Location = The name and location where the resulting XML file will be generated.

     ii. Data Category: Choose "Nonroad"

   iii. Emissions Year: Set to 2023

   iv. Submission Type: Choose either "QA" or "Production"

     v. Activity Database Type: Set to "CDB"
     vi. Activity Database File: The name of the packaged set of zip files. Using the earlier example: "Sample_CDB_File.zip"
     vii. User Identifier: Your EIS User ID
     viii. Author Name: Your name (optional)
     ix. Organization Name: The name of your organization (optional)
     x. Program System Code: The program system code of your organization
     xi. EPA Dataset: Leave blank
     xii. Keywords: Any keywords you would like to submit about the document (optional)
     xiii. Comment: Any comments about the document (optional)

    e. Press the "Begin Export" button. Your file will be generated to the location specified.

NOTE: Each CDB submittal is a total replacement to any CDBs previously submitted by that agency. Thus, if a state submits every county in one submittal, then submits only one county in a subsequent submittal, only the one county will be present in EIS.

VI. ADDITIONAL RESOURCES

For additional assistance contact:

Submittal Issues:

    Janice Godfrey – Godfrey.janice@epa.gov; 919-541-3391

Inventory Issues:

    Janice Godfrey – Godfrey.janice@epa.gov; 919-541-3391

CDB Content Issues:

    Jaehoon Han – Han.Jaehoon@epa.gov; 734-214-4299

MOVES Issues: mobile@epa.gov