

December 9, 2015

Instructions for Submitting Nonroad Inputs for MOVES for the 2014 NEI

The U.S. Environmental Protection Agency (EPA)'s Air Emissions Reporting Rule (<http://www.epa.gov/ttn/chief/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 may be submitted in addition, and will still be accepted as the sole submittal type from tribes. For the 2014 NEI, EPA plans to use the most current version of the Motor Vehicle Emission Simulator (MOVES) model to estimate both onroad and nonroad emissions. However, we will be accepting National Mobile Inventory Model (NMIM) National County Database (NCD) inputs for nonroad and will be converting them for use in MOVES for the 2014 NEI estimation. 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. Agencies that want to submit onroad MOVES CDB inputs, should go to the 2014 NEI webpage (<http://www.epa.gov/ttn/chief/net/2014inventory.html>) for further instructions.

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.

EPA has not yet developed a full set of tools for converting existing nonroad data formatted for NMIM or the stand-alone NONROAD model for use in MOVES. If there are questions about how to use existing data for MOVES, they should be directed by email to the OTAQ Mobile Inbox (mobile@epa.gov).

EPA has not yet provided step-by-step instructions on how to appropriately populate the tables in a nonroad CDB for modeling individual counties. If there are specific questions about how to properly enter data for in the nonroad tables for use in MOVES, they should be directed by email to the OTAQ Mobile Inbox (mobile@epa.gov). Instructions for users will be posted when they become available.

I. NCD SUBMITTALS

State and local agencies that want to submit nonroad inputs using the NMIM format should refer to the document, "Instructions for Submitting NONROAD Inputs for 2014 NEI" found on the NEI webpage (<http://www.epa.gov/ttn/chief/net/2014inventory.html>).

II. MOVES2014 NONROAD CDB CREATION

MySQL county databases are folders that contain MySQL formatted tables. CDB folder names contain specific information about the county, calendar year of the database, and date of creation and must conform to the following structure:

- Must be 23 characters long and contain no spaces.
- For characters 1-6, start with a "c" followed by a five-character FIPS (e.g. c26161) code, including leading zeros, where necessary.

- For characters 7-11, start with a "y" character followed by a four-digit calendar year corresponding to the calendar year of the database (e.g. "y2014").
- For characters 12-23, start with the string "_NR_" followed by an eight-digit date of creation of the form YYYYMMDD (e.g. "_NR_20150601").

The submission quality checks will look for the above criteria and will reject a submission that has an improper name structure.

MOVES2014 (released in October 2014) does not have County Data Managers to assist in creating and populating a set of user-supplied tables containing local nonroad data. The Data Importer (available under the Pre Processing pull down menu of the MOVES graphical user interface (GUI)), however, can be used to create and populate the database with the appropriate tables.

MOVES2014a (released October 2015) includes a Nonroad Data Importer, located in the Pre Processing pull down menu of 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 either the MOVES2014 Data Importer or the MOVES2014a Nonroad Data Importer is opened, data entry tabs for specific inputs, including a Generic tab, are displayed. With either Importer, a user can create a database, create templates for the needed tables, and export the default data into text files or MS Excel spreadsheets. The Generic tab allows the user to import 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 MOVES nonroad CDBs

Table Name	Description
fuelformulation	Describes the available fuels
nrbaseyearequippopulation	Source type 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
nrsourcesequence	Contains user input of annual nonroad activity
nrstatesurrogate	Contains the surrogate data that allocates national activity to counties
zonemonthhour	Contains the temperature and humidity values by hour of the day in each month of the year

MOVES nonroad tables are based on the text files used by the stand-alone NONROAD model and NMIM, and will require some re-arrangement to fit into the MySQL tables used by MOVES. The ZoneMonthHour and FuelFormulation tables are identical in format to the table used for onroad CDBs. Empty tables are allowed and will use MOVES default values in the nonroad calculations.

The MOVES2014 Data Importer will create a database with all of the tables normally found in an onroad CDB. The created tables will initially be empty and extra tables can be ignored. The MOVES2014a Nonroad Data Importer will create a database with only three tables: FuelFormulation, NRFuelSupply and ZoneMonthHour. Both Importers require that additional tables be created using the Generic tab. A full set of all 11 tables must be in the submitted nonroad CDB in order to pass the QA check, even if they are empty.

Empty tables can be created using the Generic tab

- Select the table you wish to create from the pull down Table selection.
- Use the Create Template button to generate an empty template.
- Using the Browse button, select the template file.
- Use the Import button to create the table in your database. Since there is no data in the file, there may be errors and warnings reported.
- Use the Clear Imported Data to empty any (bad) data from the table. Your database will now have an empty table.

If you wish, you can use the template files to enter data into the tables you have created.

Development of nonroad input values should follow the guidance provided in other EPA documents available on the Office of Transportation and Air Quality (OTAQ) webpage for the stand-alone NONROAD model (<http://www3.epa.gov/otaq/nonrdmdl.htm>).

EPA recommends using the default fuel supply and fuel formulation data provided by EPA in MOVES. If you are not using EPA default fuel information, be sure to document this option in your submission. The temperature and humidity values in the ZoneMonthHour table should be identical to those provided for the onroad sources.

III. MOVES NONROAD CDB DOCUMENTATION

All submissions must include documentation. At a minimum, the documentation should address all of the changes made by the State to the EPA-provided CDBs. For each change, the document should briefly state the source of the State-supplied information used to populate the CDB.

For CDBs created from scratch (not editing the EPA provided data), please document instances where local data were used and where default data from MOVES were used.

References to other documents with more detail are encouraged. These additional files can be in any format (e.g., .pdf or .xls).

The documentation file name should contain an agency Program System Code (PSC) followed by “NR_Documentation.doc (or .docx)”. For example, Delaware's state agency PSC is “DEDNR” and their documentation would be named “DEDNR_NR_Documentation.doc”. Any additional files provided can keep their original names and do not need to conform to any standard.

IV. 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

in any format, but 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. 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 – National_County_NRChecklist_2014.xlsx – can be downloaded from the 2014 NEI webpage (<http://www.epa.gov/ttn/chief/net/2014inventory.html>). 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 of 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 – National County Nonroad Checklist

County				MOVES Nonroad County Database											
stateid	statename	countyid	countyname	Accept EPA Default Values	MOVES fuelformulation (available fuels)	MOVES nrbaserequippopulation (source populations)	MOVES nrdayallocation (allocation to day type)	MOVES nrfuelsupply (allocation of fuels)	MOVES nrgrowthindex (population growth)	MOVES nrhourallocation (allocation to diurnal pattern)	MOVES nrmonthallocation (seasonal allocation)	MOVES nrretrofitfactors (retrofit information)	MOVES nrsourceusetype (yearly activity)	MOVES nrstatesurrogate (allocations to counties)	MOVES zonemonthhour (monthly temperatures)
1	ALABAMA	1001	Autauga County												
2	ALABAMA	1003	Baldwin County												
3	ALABAMA	1005	Barbour County												
4	ALABAMA	1007	Bibb County												
5	ALABAMA	1009	Blount County												
6	ALABAMA	1011	Bullock County												
7	ALABAMA	1013	Butler County												
8	ALABAMA	1015	Calhoun County												
9	ALABAMA	1017	Chambers County												
10	ALABAMA	1019	Cherokee County												
11	ALABAMA	1021	Chilton County												

Nonroad CDB submissions must be checked using the QA checking script provided by EPA. The QA check script ([QA_NDB_2014_v3.sql](#)) will check the contents of each of the tables in the database. CDBs must include all of the tables in the list above, even if the tables are empty (no-user supplied data). The QA script will provide a warning that the tables are empty, but this will not prevent the nonroad data from being submitted to the EIS. The EIS submission must have a QA script report for each CDB submitted.

Download and unzip “MOVES_Input_QA_NRChecks_2014_v1.zip” from the 2014 NEI webpage. This file contains the QA Tool (MOVES_Input_QA_NRTool_2014_v1.sql) and an example batch file (Example_Run_QA_NRChecks_2014_v1.bat). The batch file shows how to generate a QA report text file from the MySQL table after running the QA script and demonstrates how to automate the QA process for more than one county. Running the script will create the QA Report that is required in your MOVES CDB submittal. The report confirms that each CDB contains the appropriate tables and that the values checked within those tables are valid. 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. Format for the report

generated by the batch file is .txt, but this file can be opened as a table using Microsoft Excel to make it more readable.

If your state has many counties, you may wish to automate the checking process. Below is an example of a batch file written to check the three counties for the State of Delaware. The batch file deletes the old version of the report text file (named with the PSC), clears the MySQL buffer of previous work, and drops the database used to store any previous aggregated results from the individual checks. Then MySQL is directed to each county database (i.e., c10001y2014_20150601) using the QA Tool script. Note that the directory path must be included so that the file can be properly located by MySQL. The path you use can be different than the location (F:\Work) shown in this example. The final line in the batch file exports the MySQL results into the report text file. A directory path can be added to this file name as well to help locate the file once it has been populated.

```
del DEDNR_QA_NRRReport.txt
mysql -uXXXXXX -pYYYYY -e "flush tables;"
mysql -uXXXXXX -pYYYYY -e "drop database if exists all_nrcdb_checks;"
mysql -uXXXXXX -pYYYYY c10001y2014_20151211 < F:\Work\MOVES_Input_QA_NRTTool_2014_v1.sql
mysql -uXXXXXX -pYYYYY c10001y2014_20151211 < F:\Work\MOVES_Input_QA_NRTTool_2014_v1.sql
mysql -uXXXXXX -pYYYYY c10001y2014_20151211 < F:\Work\MOVES_Input_QA_NRTTool_2014_v1.sql
mysql -uXXXXXX -pYYYYY -e "select * from all_nrcdb_checks.all_county_database_checks;" > DEDNR_QA_NRRReport.txt"
```

The XXXXX value is the MySQL user name and the YYYYY value is the MySQL password. The file generated by this script (DEDNR_[NR](#)_QA_Report.txt) is the quality assurance (QA) report required by the EIS process for your MOVES nonroad CDB submittal.

Example of QA Report Results

	A	B	C	D	E	F	G	H	I
1	countyID	status	tableID	tableName	checkNumber	testDescription	testValue	count	dataBaseName
2	10001	Completed	11	nrbaseyearequippopulation	1	Table Check	NULL	NULL	c10001y2011_nr_20150601
3	10001	Completed	13	nrmonthallocation	3	Table Check	NULL	NULL	c10001y2011_nr_20150601
4	10001	Completed	14	nrdayallocation	4	Table Check	NULL	NULL	c10001y2011_nr_20150601
5	10001	Completed	15	nrHourAllocation	5	Table Check	NULL	NULL	c10001y2011_nr_20150601
6	10001	Warning	16	nrretrofitfactors	6	Empty Table	NULL	NULL	c10001y2011_nr_20150601
7	10001	Completed	17	nrsouceusetype	7	Table Check	NULL	NULL	c10001y2011_nr_20150601
8	10001	Completed	18	nrStateSurrogate	8	Table Check	NULL	NULL	c10001y2011_nr_20150601
9	10003	Completed	11	nrbaseyearequippopulation	1	Table Check	NULL	NULL	c10003y2011_nr_20150601
10	10003	Completed	13	nrmonthallocation	3	Table Check	NULL	NULL	c10003y2011_nr_20150601
11	10003	Completed	14	nrdayallocation	4	Table Check	NULL	NULL	c10003y2011_nr_20150601
12	10003	Completed	15	nrHourAllocation	5	Table Check	NULL	NULL	c10003y2011_nr_20150601
13	10003	Warning	16	nrretrofitfactors	6	Empty Table	NULL	NULL	c10003y2011_nr_20150601
14	10003	Completed	17	nrsouceusetype	7	Table Check	NULL	NULL	c10003y2011_nr_20150601
15	10003	Completed	18	nrStateSurrogate	8	Table Check	NULL	NULL	c10003y2011_nr_20150601
16	10005	Completed	11	nrbaseyearequippopulation	1	Table Check	NULL	NULL	c10005y2011_nr_20150601
17	10005	Completed	13	nrmonthallocation	3	Table Check	NULL	NULL	c10005y2011_nr_20150601
18	10005	Completed	14	nrdayallocation	4	Table Check	NULL	NULL	c10005y2011_nr_20150601
19	10005	Completed	15	nrHourAllocation	5	Table Check	NULL	NULL	c10005y2011_nr_20150601
20	10005	Warning	16	nrretrofitfactors	6	Empty Table	NULL	NULL	c10005y2011_nr_20150601
21	10005	Completed	17	nrsouceusetype	7	Table Check	NULL	NULL	c10005y2011_nr_20150601
22	10005	Completed	18	nrStateSurrogate	8	Table Check	NULL	NULL	c10005y2011_nr_20150601
23									

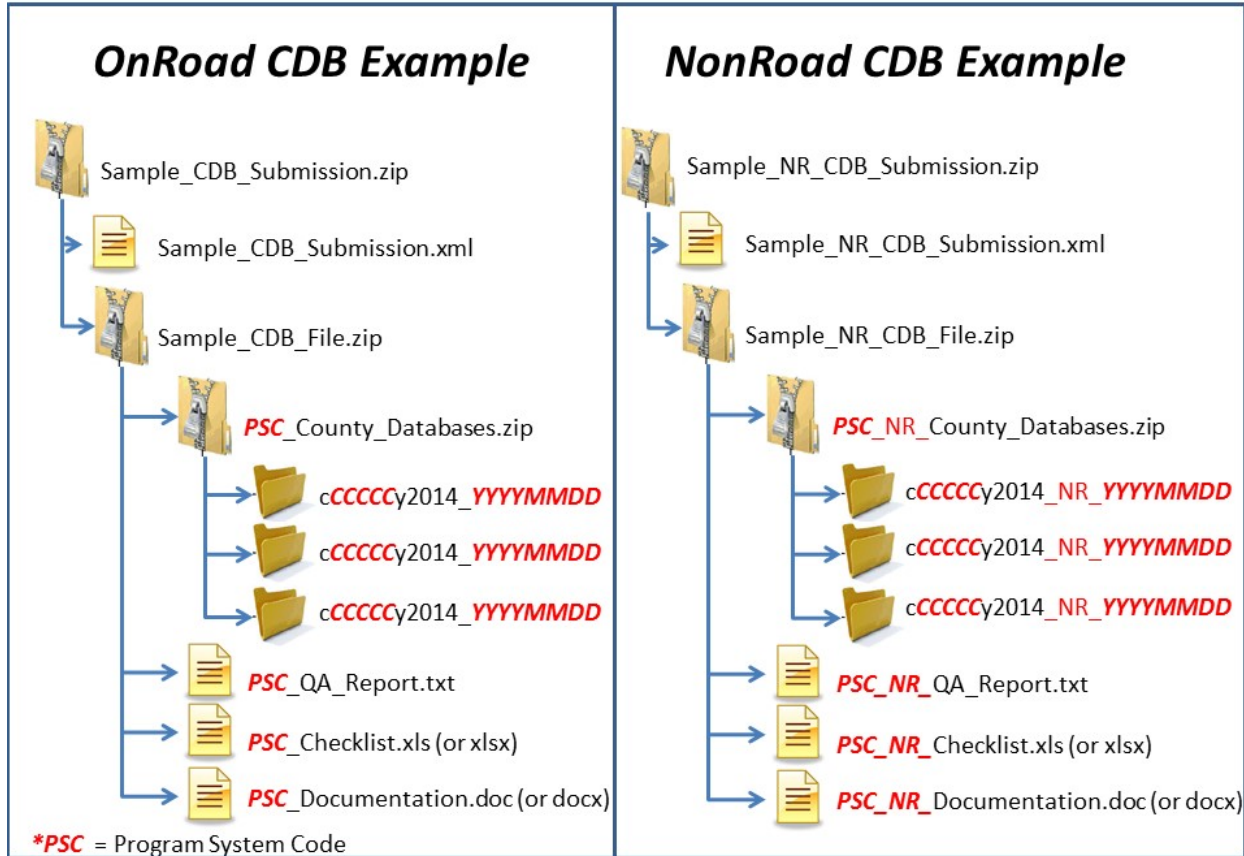
In this example QA report, all of the checks for all three counties have been successful. In the case of the nrretrofitfactors, the table was empty, which generated a Warning in the Status column. The Warning is informational for the state to indicate where data has not been provided. MOVES will use 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.

V. Bundle NR CDB Submittal Components and Create the XML 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 MySQL/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.

The graphic 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.

CDB Submission Example



VI. Creating the EIS/CDX-required XML

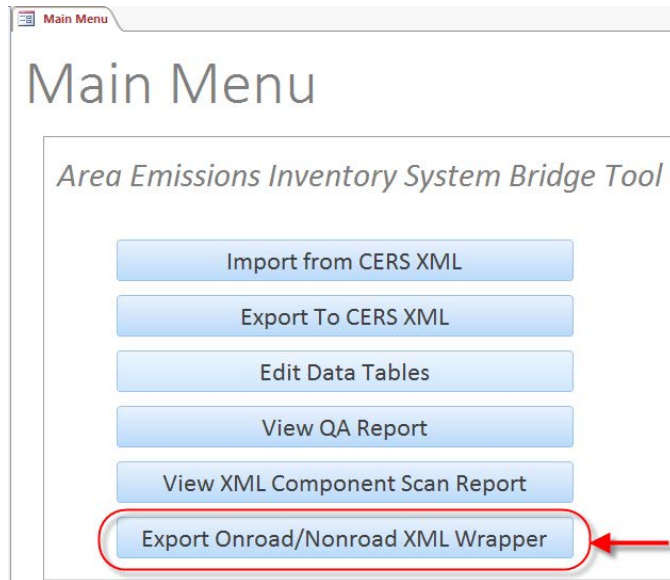
There are two ways to create the xml file

1. Use notepad or other editing software to edit the sample xml **[cdb_sampleheader.xml]** which you can download from the 2011 NEI webpage.

Edit the red text shown below: UPDATE DATES

```
<hdr:Document id="IDxx" xmlns:hdr="http://www.exchangenetwork.net/schema/header/2"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.exchangenetwork.net/schema/header/2
  http://www.exchangenetwork.net/schema/header/2/header_v2.0.xsd">
<hdr:Header>
  <hdr:AuthorName>Your Name</hdr:AuthorName>
  <hdr:OrganizationName>Your Organization</hdr:OrganizationName>
  <hdr:DocumentTitle>EIS</hdr:DocumentTitle>
  <hdr:CreationDateTime>2014-10-10T14:02:39</hdr:CreationDateTime>
  <hdr:Keywords></hdr:Keywords>
  <hdr:Comment></hdr:Comment>
  <hdr>DataFlowName>EIS_v1_0</hdr>DataFlowName>
  <hdr:Property>
    <hdr:PropertyName>SubmissionType</hdr:PropertyName>
    <hdr:PropertyValue>QA</hdr:PropertyValue>
  </hdr:Property>
  <hdr:Property>
    <hdr:PropertyName>DataCategory</hdr:PropertyName>
    <hdr:PropertyValue>Nonroad</hdr:PropertyValue>
  </hdr:Property>
  <hdr:Property>
    <hdr:PropertyName>CDBDataFile</hdr:PropertyName>
    <hdr:PropertyValue>Sample_CDB_File.zip</hdr:PropertyValue>
  </hdr:Property>
</hdr:Header>
<hdr:Payload>
  <cer:CERS xmlns:cer="http://www.exchangenetwork.net/schema/cer/1"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:schemaLocation="http://www.exchangenetwork.net/schema/cer/1
    http://www.exchangenetwork.net/schema/cer/1/index.xsd">
    <cer:UserIdentifier>youruserid@xyz.gov</cer:UserIdentifier>
    <cer:ProgramSystemCode>yourPSC</cer:ProgramSystemCode>
    <cer:EmissionsYear>2011</cer:EmissionsYear>
  </cer:CERS>
</hdr:Payload>
</hdr:Document>
```

2. Use the EIS Access Bridge Tool
 - a. Download the “Area Emissions Inventory Bridge Tool” from <http://www.epa.gov/ttn/chief/software/>.
 - b. Open the file in Microsoft Access.
 - c. Choose the “Export Onroad/NonRoad XML Wrapper” from the Main Menu



d. Fill out the form with the appropriate information



Export CERS XML Wrapper for Activity Data

Export CERS XML Wrapper for Activity Data

File Location:

Complete / Verify Header Information

Data Category:

Emissions Year:

Submission Type:

Activity Database Type:

Activity Database File:

User Identifier:

Author Name:

Organization Name:

Program System Code:

EPA Dataset:

Keywords:

Comment:

- i. File Location = The name and location where the resulting XML file will be generated.
- ii. Data Category: Choose either “Onroad” or “Nonroad”
- iii. Emissions Year: Set to 2014
- 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_Submission.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.

VII. Additional Resources

For additional Assistance contact

Submittal Issues

-Sally Dombrowski – dombrowski.sally@epa.gov; 919-541-3269

Inventory Issues

-Laurel Driver – driver.lael@epa.gov; 919-541-2859

CDB Content Issues

-David Brzezinski – Brzezinski.david@epa.gov, 734-214-4235

MOVES Issues

-mobile@epa.gov