

Instructions for Using the EPA Oil and Natural Gas Emissions Tool

1.0 Introduction

Under Work Assignment with U.S. EPA, Eastern Research Group, Inc. (ERG) was tasked to develop a tool that state, local, and tribal (SLT) agencies could use to develop an area source emission inventory for upstream oil and natural gas activities. To this end, ERG prepared the EPA Oil and Natural Gas Emission Inventory Tool for the 2011 base year to assist agencies in compiling, allocating, and adjusting upstream oil and natural gas activity data, and developing county-level area source emission estimates. The tool generates estimates for 52 source classification codes (SCCs) and 51 pollutants.

2.0 MS-Access Database

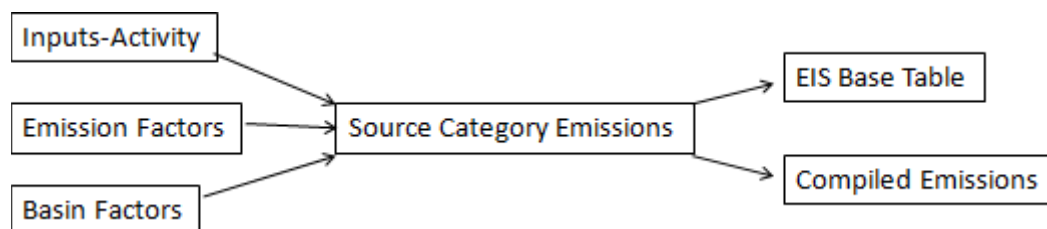
The Oil and Gas Emission Inventory Tool was programmed in MS-Access. This platform offered several advantages, particularly in accessibility (software is available to most users), familiarity (MS-Access is used by most SLT agencies in preparation of Emission Inventory System (EIS) data files), and portability (the tool can be e-mailed as a zipped file that is approximately 5 MB in size). Included with the tool is the Nonpoint Emissions blank staging tables which are to be used for preparation of EIS data files.

The MS-Access database contains 10 primary groups of tables and queries.

- 1) Group 1A: Input Activity Data Table
 - a. Inputs Activity
 - b. Glossary of terms in the Inputs Activity table
 - c. Data Field References
- 2) Group 1B: Emission Factor Data Tables
 - a. Emission factors for each source category
 - b. Glossary of terms in the Emission Factors tables
- 3) Group 1C: Basin Factor Data Tables
 - a. Basin factors for each source category
 - b. Glossary of terms in the Basin Factor tables
- 4) Group 2: Category and Geographic Selection – allows the User to select the upstream oil and gas source categories and geographic level (e.g., nationwide, state, RPO, basin, EPA Region, etc.) of the emission inventory
- 5) Group 3: Point Source Activity Adjustments
 - a. Nonpoint sources SCC to point sources SCC crosswalk
 - b. Input tables for point source activity adjustments by source category
- 6) Group 4: Run Estimation Queries for each source category
- 7) Group 5: Point Source Emission Adjustments
- 8) Group 6: Finalize Emission Estimates
- 9) Group 7A: Compiled Emissions and Summary Data
- 10) Group 7B: EIS Data Tables (linked to the Nonpoint Emissions Staging Tables)
- 11) Group 7C: EIS Coding Tables
- 12) Group 8: Clear Source Category and EIS Data tables
- 13) Group 9: Emission Estimation Queries by Source Category and Compiling Emissions Data
- 14) Group 10: Background Data Tables and Queries

3.0 Tool Data Flow

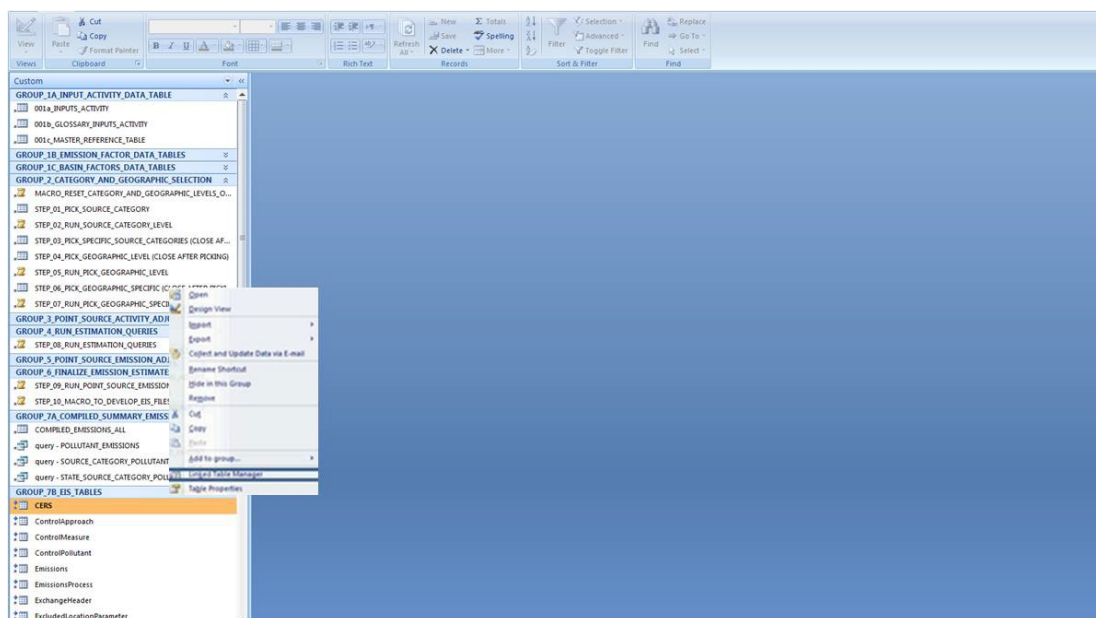
The basic concept of the tool is to calculate the source category emissions using the data from Groups 1A, 1B, and 1C input data sheets. Emissions and activity data are summarized in the Group 7A and 7B data tables. A conceptual flow is:



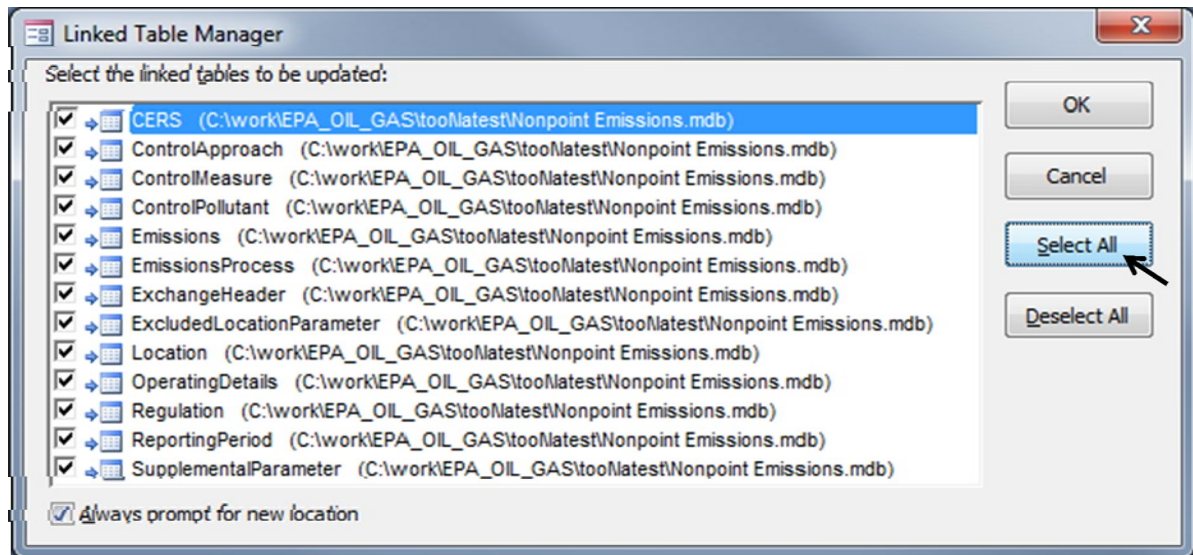
4.0 Steps for Using the Oil and Natural Gas Tool to Generate Emissions

Prior to running the Oil and Natural Gas Emissions Tool, the User must properly link the data tables in the Nonpoint Emissions Staging Tables within the Tool.

- 1) Place both the "Tool_O&G_V2_20140331.accdb" and the "Nonpoint Emissions.mdb" database tables in the same directory. It is recommended that the User creates an "EPA_OIL_GAS" directory on their hard drive.
- 2) Open the "Tool_O&G_V2_20140331.accdb" database. You will need to "Enable Macros" if the message pops up.
- 3) Open up the "GROUP_7B_EIS_TABLES" dropdown. Right-click anywhere on the left pane. A pop-up list will be shown (see figure below). Click on "Linked Table Manager".



- 4) A “Linked Table Manager” window will appear listing all the EIS data tables. Check mark all the boxes by pushing the “Select All” button on the right (see below), including the “Always prompt for new location” selection. Click “OK”



- 5) After clicking “OK”, a new window will appear. Map to the directory which contains the “Nonpoint Emissions.mdb” database and select the “Nonpoint Emissions.mdb” file. After the tables are linked, a message box will appear confirming that the tables were successfully refreshed. Click “OK”. Close the “Linked Table Manager” window. The Tool is ready to generate emissions.
- 6) In the “Inputs-Activity” table (Group 1A); Users can update the data fields in this table. The data sources for the 2011 base year are presented in the Documentation Report. Emission factors (Group 1B) and basin factors (Group 1C) can also be updated by the User.
- 7) In Group 2, Users can select the source categories (all or select) and geographic area for the emissions inventory (Steps 1-7). Users can run the “MACRO_RESET_CATEGORY_AND_GEOGRAPHIC_LEVELS_OF_INTEREST” macro to reset choices.
- 8) After the source categories and geographic area have been chosen, proceed to the Group 3 which includes point source activity adjustment tables by source category. Currently, ALL point source activity adjustments (e.g. county-level point source gas well counts, county-level point source oil well counts, county-level barrels of oil, etc.) are defaulted to zero (i.e., no point source activity adjustments). **It is encouraged that point source activity adjustments have priority over point source emission adjustments. Additionally, Users should pay careful attention to ensure that the point source activity data is entered in the same units as the nonpoint activity data.** Users should refer to the “004_NONPOINT_POINT_SOURCE_CROSSWALK” to identify point source SCCs.
- 9) After any point source activity adjustments have been made directly in the Group 3 data tables, proceed to Group 4 “Run Estimation Queries”. Run Step 8 to generate the unadjusted nonpoint emission estimates.
- 10) Proceed to Group 5 to make any point source emission adjustments directly in the emission tables. Point source emission estimates are to be entered in the “POINT_EMISSIONS_TPY” field. **It is important to note that if point source activity adjustments were made in the Group 3 tables, then point source emission adjustments should NOT be made in these tables for overlapping SCCs. Also, point source emission adjustments need to be entered as tons per year (TPY).**

- 11) After point source emission adjustments are made (if applicable), then the User should proceed to Group 6.
- 12) Run Step 9 to finalize the county-level emissions. Run Step 10 to generate the Emission Inventory System (EIS) data tables.
- 13) After running Step 10, the User will be prompted to enter information in the CERS and ExchangeHeader staging tables. Once completed, the EIS Staging Tables are ready.

Additional notes:

- 1) Group 7A provides the emissions in standardized format, as well as selected summary queries.
- 2) In the EIS data tables (Group 7B), the CERS, ControlApproach, ControlMeasure, ControlPollutant, Emissions, EmissionsProcess, ExchangeHeader, Location, and ReportingPeriod are populated.
- 3) EPA's EIS Bridge Tool (<https://eis.epa.gov/eis-system-web/downloads/bridge.jnlp>) can be used to generate the .xml file needed for EIS upload.
- 4) Group 7C are the EIS code tables provided for reference.
- 5) If the User wishes to reset the tool, and regenerate the emissions, the following steps are recommended:
 - a. Run the Group 8 Macros
 - b. Compact and Repair the database
 - c. Proceed to the Group 2 Macros to reset the geographic levels of interest.
- 6) Groups 9 and 9A-9R contains the algorithm queries needed to generate the emissions.
- 7) Group 9Z contains routines to compile emissions into the "COMPILED_EMISSIONS_ALL" table.
- 8) Group 10 contains additional background information and routines needed to populate the emissions in standardized formats.