

Emission Inventory Graphic User Interface for Point Sources

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ABSTRACT

The Idaho Department of Environmental Quality (DEQ) has created a software program used to gather point source data for annual and periodic emissions inventories. This online graphic user interface (GUI) allows facilities to log into a DEQ server using a unique user ID and password provided by the agency. The GUI layout follows the requirements in the final Consolidated Emission Reporting Rule (CERR); therefore, providing the exact data, in the appropriate format, that the Environmental Protection Agency (EPA) is looking to gather data for the National Emissions Inventory (NEI). The program limits the amount of quality assurance (QA) needed on the data by controlling each submission field. Data, once submitted by the facility, is automatically placed into a SQL server database. These data tables can easily be moved into Access in order to make any necessary corrections and to run the EPA QA tool program.

INTRODUCTION

The GUI was created to solve data collection problems DEQ experienced in past emission inventory projects. Several spreadsheets and automated data collection programs had been tried, but failed to provide a seamless avenue for point sources to enter their actual emissions. Problems arose with program compatibility and QA of numerous uncontrolled data fields. Complaints from facility personnel about the shortcomings of our collection methods pushed DEQ toward the GUI as a method to ease the inventory process as well as solving the QA problems.

BODY

The online interface was developed to mirror the requirements of the CERR, which will provide the most complete inventory possible for the NEI. Facilities in Idaho are reluctant to provide DEQ with information on their throughput, emissions, and possible trade secrets, but all are familiar with the new CERR and the fact DEQ must provide this data to EPA. Therefore, DEQ believes facilities will be faster to comply with our request for emissions data if the GUI directly matches the EPA requirements of the CERR.

The GUI program is written in ColdFusion with use of some Java script to create an emission inventory tree on the main page with subfolders for Facility Information, Stack Data, and Point Data. DEQ will load the GUI software onto a server, mail letters to each facility in the state providing their login information, and let them submit emissions data for a 90-day period. The GUI is directly tied to a SQL database for storage.

Following submission of facility emissions data for calendar year 2002 into the GUI and SQL database, DEQ will pull the data from the SQL tables into Access tables and begin QA of each calculation, verify control measures reported, and run the EPA QA tool on the data. DEQ will save both the raw data and the new data that passed through QA. The quality assured data would then be formatted and shipped to EPA before the June 1, 2004, deadline.

Goals of the GUI

- Solve point source data collection problems experienced in the past
- Ensure data submitted by point sources matches the requirements of the CERR
- Automatically place emissions data into EPA's NIF 3.0 eight-table format in database
- Provide a user-friendly method for facility personnel to submit emissions data
- Reduce the amount of QA needed by controlling what can be entered in each data entry field
- Allow data received to be manipulated or corrected in Access format while storing the data in a SQL server database compatible with the in-house database system

Implementing and Using the Program

Just before kicking off the calendar year 2002 periodic inventory, each facility on the 2002 Idaho Title V fee list will receive a letter from DEQ. This letter will include the URL for the server where the GUI is located, a unique user name, and a password. Facilities will be encouraged to login and have a look around. The opening page of the interface has a welcome message and fields for entry of the provided username and password.

After successful login, the next screen asks what calendar year the facility wishes to review or enter data for, 1999, 2001, or 2002. The 1999 and 2001 data can only be reviewed. The 2002 pages are live and allow for data entry as well as review of data "forced out" to facilities from previous inventory submissions. The forced out data provided in the 2002 pages includes facility contact, mailing address, and location address; stack parameters; emission sources (points); and hazardous air pollutants. This information was forced out via the GUI to assist the facility by shortening data entry time. The forced out information regarding the facility must be verified and resubmitted or corrected and submitted before the next page of the interface will open.

The next screen is for stack entry. Some of this information was also pulled from the 1999 and 2001 inventories and forced out. The facility will again verify or correct the forced out information for calendar year 2002. The GUI also allows facilities to add or delete stacks as needed.

Once the stack information is submitted, the next screen is for individual emission points at the facility. Point data has also been forced out for verification and correction. The GUI allows for points to be added or deleted as needed. Each point cannot be submitted until the accompanying screens have been completed - process and pollutant.

The process page allows a facility to add a process or processes tied to the specific point. The process page cannot be completed and submitted until each pollutant emitted from the process/point is entered on the pollutant page attached to the process page. The GUI follows a cycle once the facility and stack data have been completed and submitted - point, process, and pollutants. This cycle of point, processes, and pollutants should be repeated as many times as needed for each facility.

Once the pollutants, processes, and points are complete, the facility must submit them. When all of the data fields are filled and the GUI indicates through the use of symbols (checkmarks and X's) that data entry was complete and in the proper format, all of the data is ready for submission to DEQ.

By clicking the "submit" button on the main menu page, the final data submittal is made. A message from the GUI tells the facility the submittal was a success and a form pops up on the screen for the facility to print, sign, and mail to DEQ. The form states that the data is accurate and true to the best of the facility's knowledge.

CONCLUSIONS

The on-line GUI was used in-house during May 2003 to enter the 2001 annual emission inventory data that had been received on paper worksheets. At that time, the GUI was attached to an Access database and this test indicated the need for a few changes. The database needed to match the new SQL server construction of our DEQ Air Quality database, so Access was abandoned. Also, DEQ updated the function of the user help messages when it was discovered that pull-down menus covered them, making some help messages unreadable. These changes, as well as cosmetic upgrades to make the interface more attractive, printable, and easier for facility personnel to navigate, were completed by December 2003. The GUI will go live on the Web in early January 2004. Facilities will be given three months to enter and submit their actual emissions.

The GUI is a practical, user friendly system with numerous built-in quality assurance features. The on-line location of the interface will allow all facilities to access the Web and enter their actual emissions with no worry of program format incompatibility.

REFERENCES

None

KEYWORD

Emission Inventories
National Emissions Inventory
NEI
Consolidated Emissions Reporting Rule
CERR
Point Source