Appendix 2: Common Emissions Form

Calculation Requirements

In the review of data field requirements by the PDT Data Model Team, the requirements for the calculation module in the Common Emissions Form (CEF) were discussed. The team felt that this was a necessary requirement to document for the CEF. The following are the results from those discussions.

The calculation module will be a separate application from the CEF that is downloadable by the filer. It will contain the fields necessary for emissions calculations for a single process (SCC, calculation material type, I/O, throughput, ash/sulfur percentages, emissions factors, emissions calculation methodology type, non-annual emissions, and other process identifiers). After the user enters their data and calculates their emissions the module transfers all the data back to the CEF (except for fields identified as Confidential Business Information (CBI) which will be discussed later).

Global features of the CEF apply to this module:

State/Local/Tribal air agencies (SLT) can specify whether fields are required or not.

SLT-specific help functions, and QA criteria/messaging exist.

QA includes warnings and full-stop criteria and messaging.

Totals of emissions by unit and by facility are displayed on the CEF. The totals are automatic summations of the underlying process emissions and are not editable (exception below).

Where emissions are allowed/required to be entered at the facility level (or facility level stack and fugitive) user has ability to override automatic summation to allow for facility or release point emissions to be added into the sum of the process emissions as required by SLT.

Attachments are handled in the CEF, but the module will have a field to indicate where the user has attached additional documentation for their calculations which may be required by an SLT agency.

User Experience

Upon opening the CEF, the user would review the pre-filled (FRS) facility information and update/add any records necessary to bring the record up to date (as allowed by SLT). User will have ability to create a new process in the CEF (where allowed by SLT). The process will be defined by specifying the SCC, calculation material type, I/O, and any required fields specified by both EPA and SLTs. Business rules for how these updates and additions are processed will be addressed by the Facility IPT.

After this review, the user would select a process for emissions entry. Upon opening the calculator module for the selected process, the user would see the previously entered throughput and emissions information from the last reporting period (read only).

To enter emissions data for the process, the user will trigger the calculation module through a “button” (or other method TBD).

Calculation Module

The calculation module will display fields with data prefilled from the previous inventory year including process information, throughput, emission factors, pollutants and total emissions.

A potential enhancement is that the pollutants displayed could be all pollutants in the previous National Emission Inventory (NEI) including EPA augmented pollutants. The module will include SLT-specific instructions as to whether the SLT requires reporting or correction of augmented emissions. Users will be able to enter current year values for these pollutants including those produced by augmentation. An additional potential enhancement would be to have the module calculate the values for any pollutants that would be included in EPA's augmentation for the current year so that the user could review them and make corrections in their submittal.

Calculation Type

The user will choose an emissions calculation methodology (for each pollutant) based on whether they want to use a factor:

1. Supplied by the CEF module (EPA, SLT);
2. Supply their own factor (e.g. site-specific or manufacturer's specification) but using the module to do the calculation;
3. Enter emissions directly (and not supply a factor).

The calculation method type also indicates whether the factor is controlled or uncontrolled. The module will present emission calculation methodology choices to the user as a first step (e.g., in a drop menu).

Using EPA or SLT supplied emission factor

If the user choses an emission calculation methodology type for a CEF-supplied factor, then the module will retrieve factors based on the SCC and emissions calculation methodology type (e.g., controlled or uncontrolled) available from:

i. WebFIRE web service
ii. Emission Factor Compendium web service

Emission factors could be displayed in a ranking order by a pre-determined criterion. For instance, WebFIRE may have multiple emission factors for a given SCC/pollutant combination. Each emission factor is "graded" as to its quality. These could be listed in the pick order of highest to lowest.

The SLT has the option to specify or limit the available emission factors from either WebFIRE or the compendium (or both) that are available for selection by the user.

User-supplied factor

If permitted by the SLT air agencies, a user may also enter their own emission factor by indicating this with the selection of emission calculation methodology types such as "Site Specific Emission Factor" or "Manufacturer Specification" or "Emission Factor Based on Hours of Operation". The module will then calculate the emissions based on the user-supplied emission factor.

Note: Time-based emissions factors will require the user to enter a value for the actual hours of operation in the year field. NEI will need to add calculation method type of time-based factor ("Emission Factor Based on Hours of Operation") to calculation method type list to allow the calculator to determine whether to use the actual operating hours or the throughput in the calculation.

CBI

Where an SLT allows a user to declare an emission factor to be CBI, the module provides an indicator/flag where the user can indicate CBI. The emission factor will not be transferred to CEF when the user has finished using the module for this process.

No emission factor

If the user is not using an emission factor as basis for their calculation, or does not want the CEF to do the calculation, they may opt to enter only the emission value (if permitted by the SLT agency). In this case the user would select emission calculation methodologies such as "Engineering Judgement", "CEMS", "Stack test" or "Material Balance". Use of this method may result in a warning to the user that the SLT air agency may require documentation of their calculation through a hard copy report.

Throughput

User enters throughput for current year in the field provided. The user then enters throughput units of measure. Units of measure must:

1. Match the units of measure of any EPA/SLT factor selected by the user in the emissions factor fields, OR
2. Be within the list of units that the module can convert from (i.e. if emission factor is in lbs/tons throughput must be in tons, lbs, or grams, etc.). If user is supplying their own factor or no factor, then the units may be any in the CEF unit table.

Throughput is a required for an emission factor to be selected to complete the emission calculations. If an SLT elects to make throughput optional, calculations cannot be performed if the user does not enter throughput.

CBI: Where an SLT allows user to declare throughput to be CBI, the module provides and indicator/flag where the user can indicate CBI. If throughput is flagged, the data field will not be transferred to CEF when the user has finished using the module for this process.

Reporting Periods

The use of reporting periods other than annual, such as 5 Month Ozone Season, Average Season Day, etc., will need further end user discussion as to whether it is a part of the calculator due to the complexities involved in introducing this functionality. For the pilot, we will use a reporting period of annual.

Comment

Each process record should have a comment data field to allow the filer to provide explanations of any issues with the calculations. (e.g., large differences between a previous inventory year submission and

the current emission estimate). For example, a difference in emission totals could be the result of new controls or the process was not operating the full year.

Calculation of Emissions

User then triggers the calculation function [how TBD] and the module uses the emissions calculation methodology type (controlled/uncontrolled), the emission factor, and throughput to calculate emissions for the filer. The module will require ash and sulfur be entered for calculation to function where SLT or WebFIRE formula requires them. Units of ash and sulfur will be in percentages.

The module default calculation is:

Total Emissions = emission factor x throughput x (1 – control efficiency).

Control Efficiency is only used if emissions calculation type indicates emission factor is **uncontrolled or pre-control**.

Module will convert throughput units where different from the denominator of the emission factor for calculation.

User will have ability to transfer data from the module to the CEF (i.e., their draft submittal in progress) at any point in this process. Data transferred will not include any flagged as CBI.

CBI: Calculator will allow user option to produce a report of calculations, that includes CBI data fields. This will be saved locally on the users drives and may be printed. This will allow the user to conveniently produce a version of the calculation to send to the SLT air agency separately from the on-line CEF submittal. See illustrations below.

Note: The CBI features are not expected to have wide-spread use as SLTs are moving away from granting CBI rights to users.

Functionality Required for Pilot

At a minimum the pilot calculator should be able to:

1. Display the process information such as identifier, SCC, and process description to help the user in remembering which process is being worked on.
2. Emission Calculation Methodology types need to be available through a drop-down mechanism for selection by the user. The type of methodology will dictate the formula used in the calculation.
3. The minimum data fields needed for the calculation are required.
    a. Emission Factor
    b. Emission Factor Numerator
    c. Emission Factor Denominator
    d. Throughput
    e. Unit of Measure
    f. Material Code
    g. Input/output
4. Calculator should be able to distinguish between controlled and uncontrolled formulas based on the emission calculation methodology selected.
5. Calculator should be able to display emission factors from WebFIRE based on the SCC chosen through web services.
6. Calculator should be able to display the emission factor, emission factor numerator, emission factor denominator, throughput, throughput unit of measure, pollutants, and emissions from the previously submitted inventory cycle as a quality check against the new estimations.

Not required for the pilot . . .

CBI handling
Global functions not available in pilot
Unit conversions
Calculation based on time