Combined Air Emissions Reporting System (CAERS) User's Guide

Version 1.0

Last updated: 5/7/2020

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1 Initial Pre-Reporting Steps

1.1 Software Requirements for CAERS

To use the CAER system, you will need:

- Internet browser and connectivity: This should be a recent version of any internet browser such as Chrome, Explorer, or Firefox. Your internet connectivity will determine how fast data can be uploaded.
- Microsoft Excel: Bulk uploads will be in "XLS" or "XLSX".
- Optional for bulk upload: If you would like to upload your file in JavaScript Object Notation (JSON), send an email to caer@epa.gov with subject line "CAERS JSON Upload".

1.2 Pre-Login Steps for GA Facilities

Your process will begin by logging into Georgia Environmental Connections Online (GECO). GECO will guide you through questions to determine your opt-in status to report to the Emissions Inventory (EI). Once you have opted in, you will be redirected to the CAER system from GECO. This process is outlined in what follows. Please note that if you have not updated your preparer and or certifier contact information, you should reach out to GA DNR to do so before going through this process, and you should have received a registration email.

After logging into GECO you will be taken to a screen to begin your emissions inventory process. Click on the "Begin 2019 EI" button (Figure 1). You will be redirected to a facility information page where your facility information can be reviewed. Figure 2 and Figure 3 show the top and the bottom of the facility information page respectively.

Figure 1. Emissions Inventory Process Screen

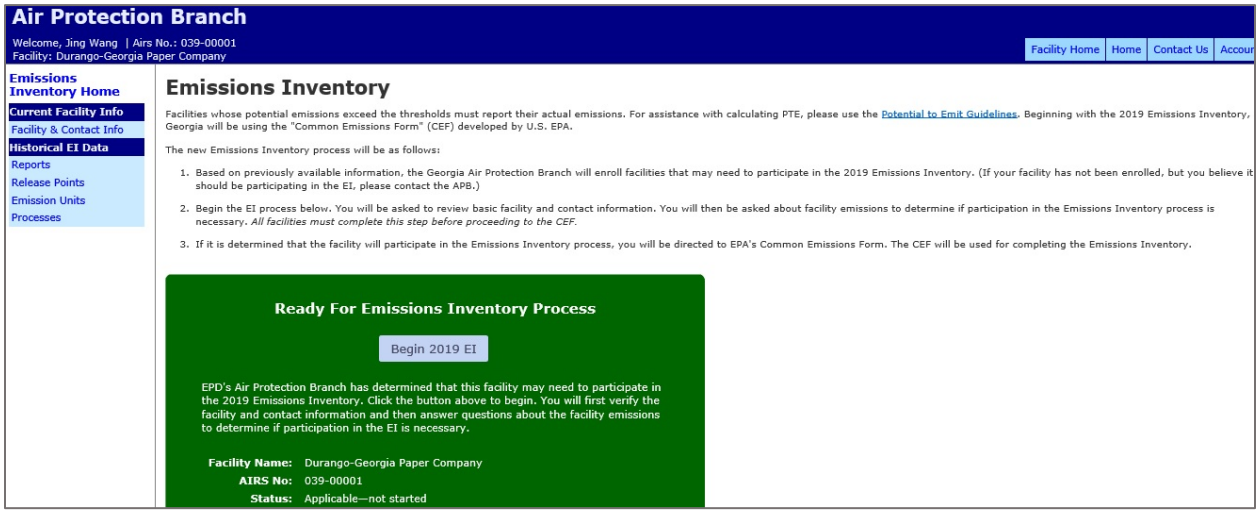


Figure 2. Edit Facility Details in GECO Screen 1

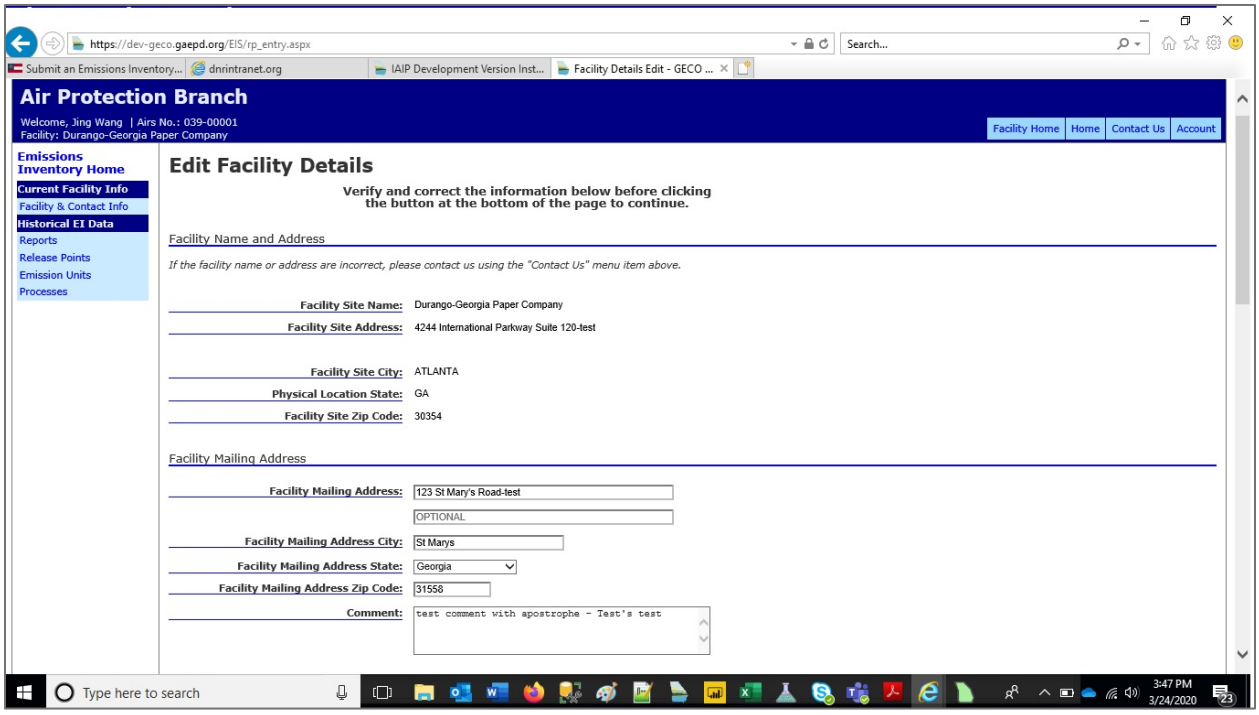


Figure 3. Edit Facility Details in GECO Screen 2

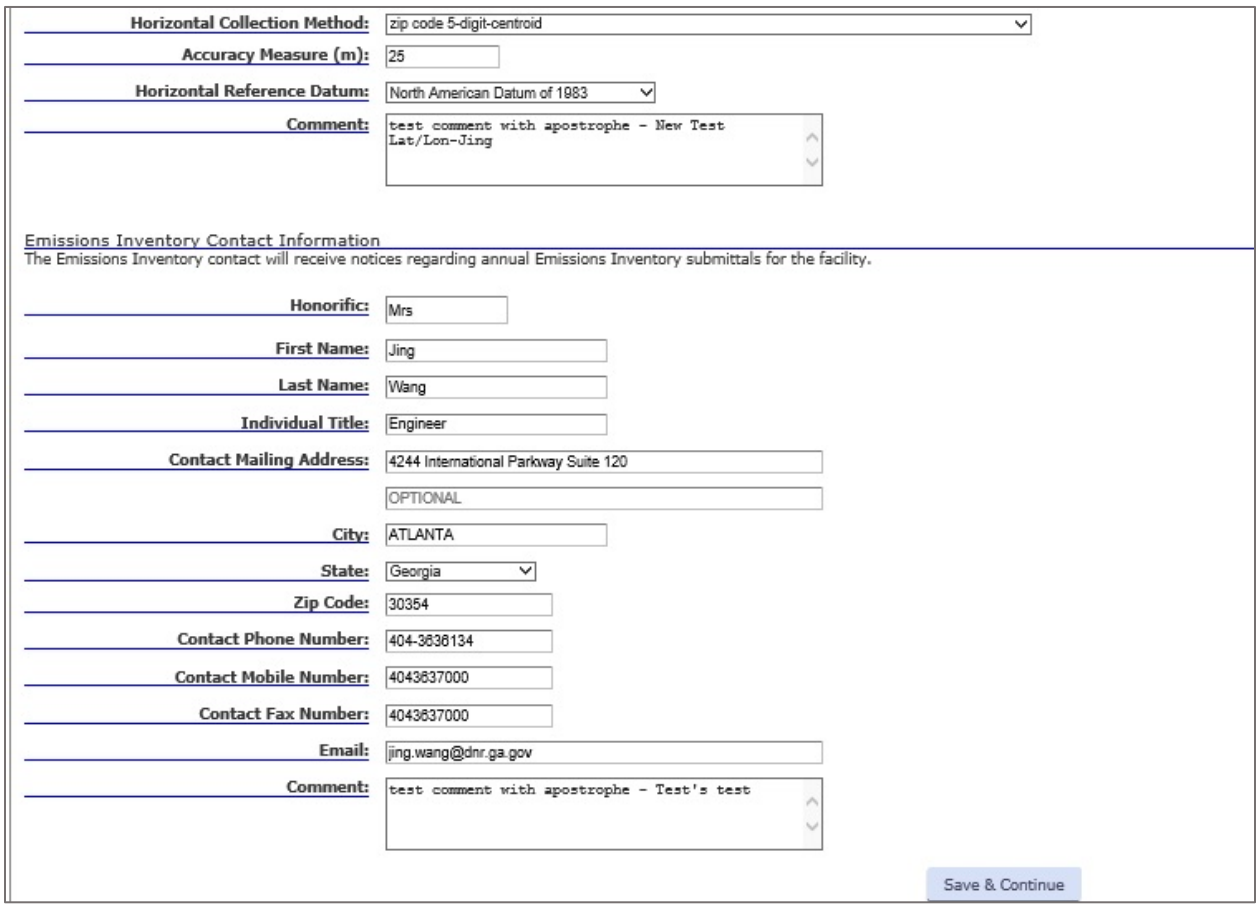
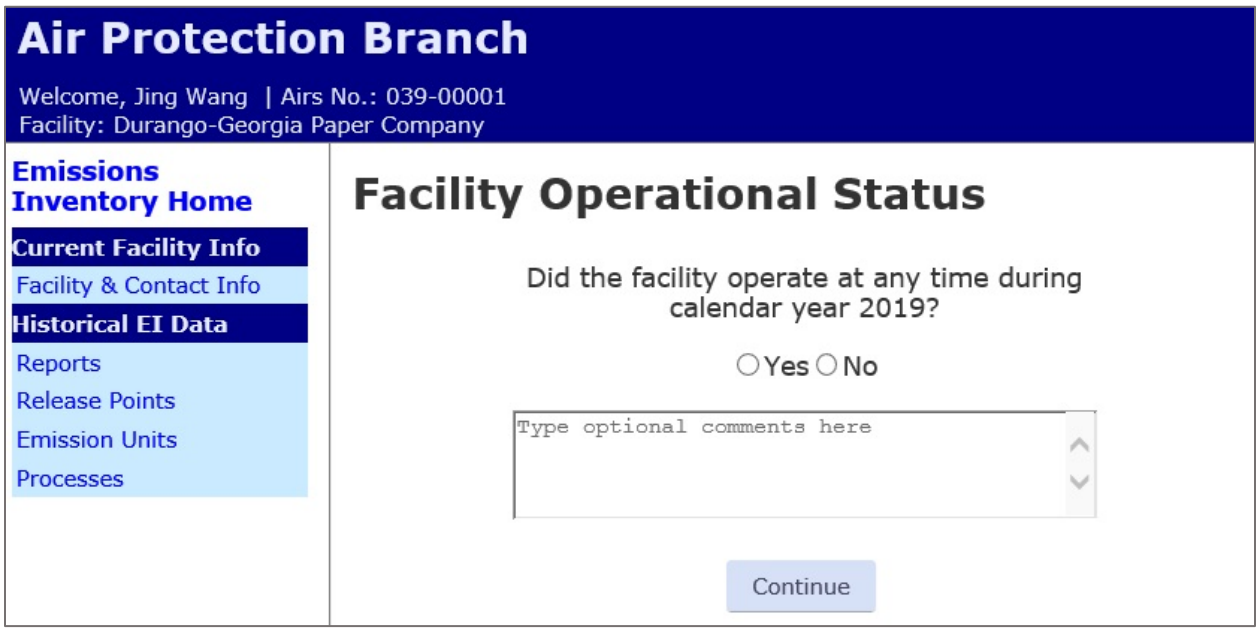


Figure 4. Facility Operational Status



After clicking “Save & Continue” you will be directed to the “Facility Operational Status” page where you will be asked if your facility operated in 2019 (Figure 4).

When there are emissions to report for the facility for 2019, the user will be re-directed to the “Facility Emissions Threshold” screen to answer questions about the facility’s emissions (Figure 5). The user will click on the responses to the threshold question by pollutant (Figure 6) and then click on “Submit”.

Figure 5. Facility Emissions Thresholds Screen

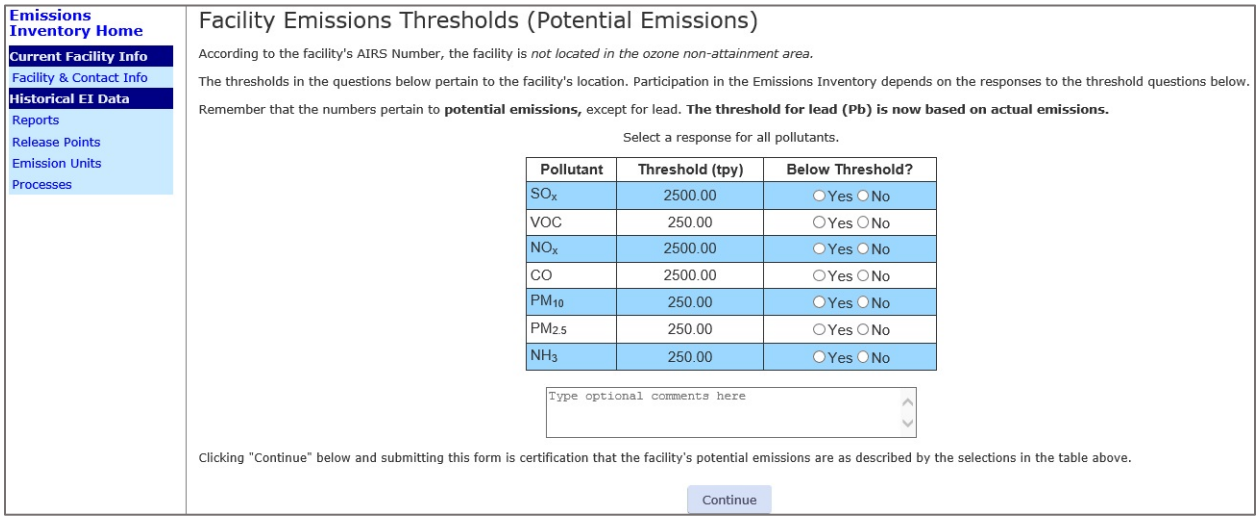
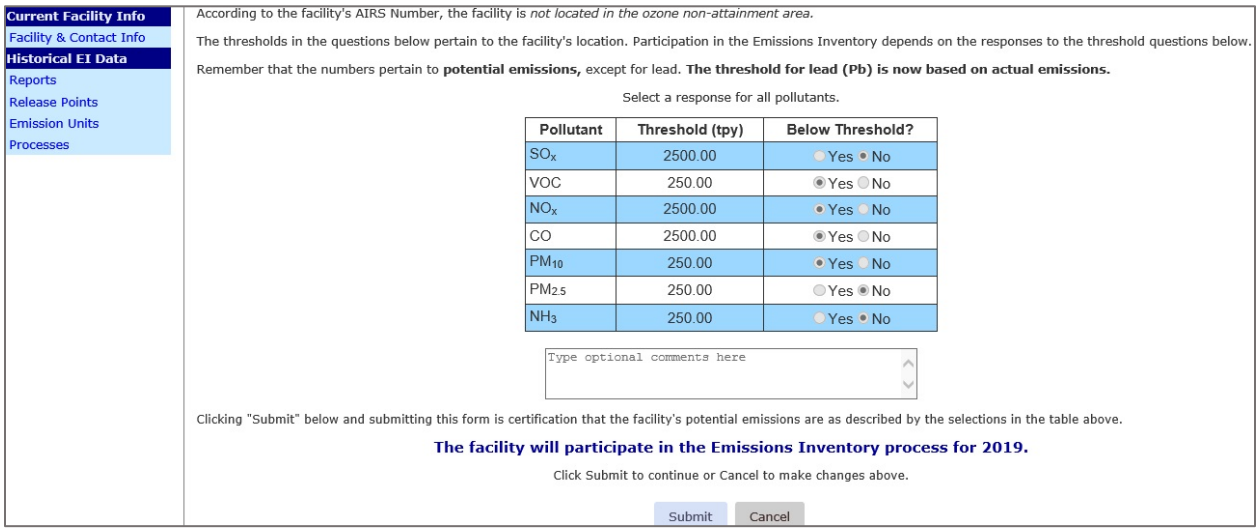
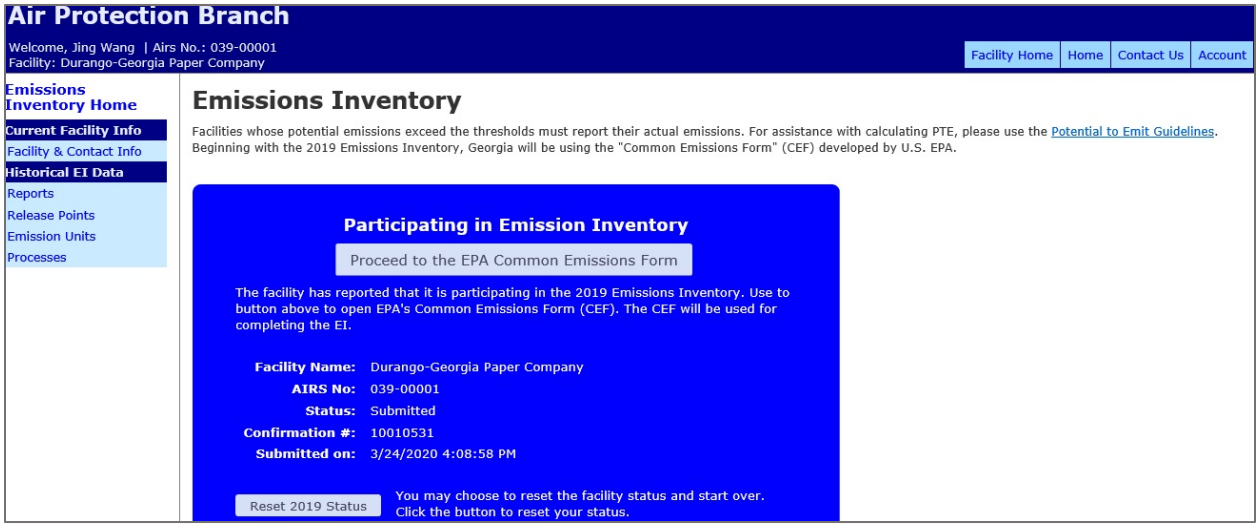


Figure 6. Threshold Questionnaire Example



Once it is determined that emissions from the facility must be reported to the EI, you will be redirected to the screen shown in Figure 7. Note that the CAER System is also referred to as the “Common Emissions Form” or CEF. Click on “Proceed to the EPA Common Emissions Form” or “Proceed to CAERS” and go to Section 1.3 to begin reporting.

Figure 7. Redirect to the EPA CAER System



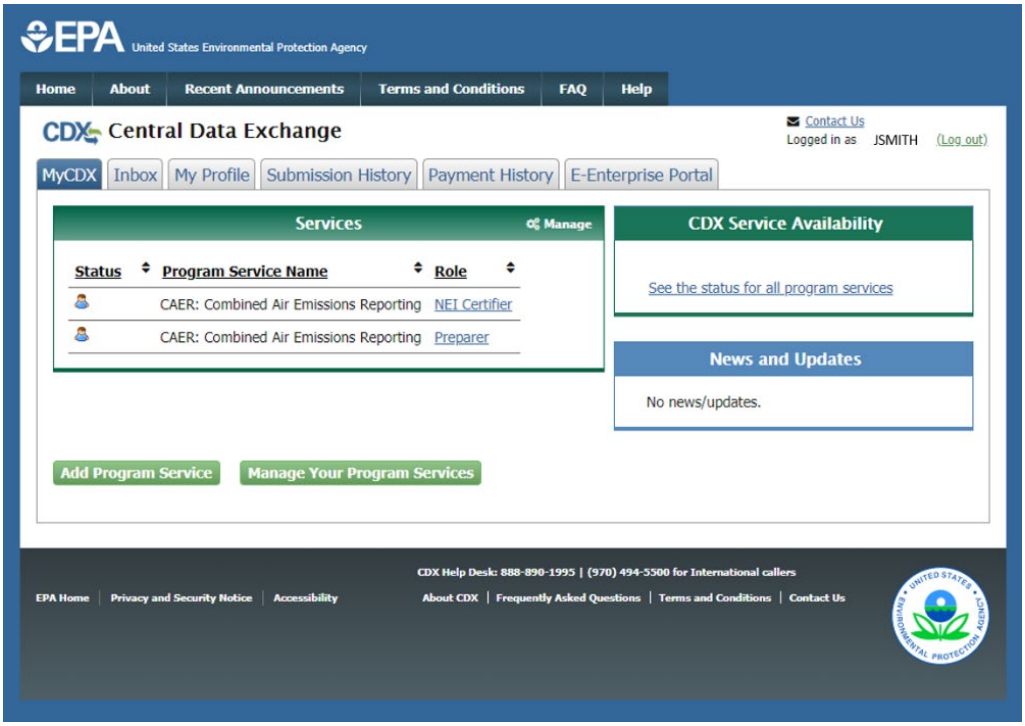
1.3 Logging In

In order to enter CAERS, you will need to be registered in EPA's Central Data Exchange (CDX). In order to do so, even if you already have a CDX account, you should go to the registration email you should have received if you are a current preparer/certifier. If you have not received the email, you should reach out to GA DNR to update your contact information, so the email can be sent to you. Follow the instructions for registration from that email. If you are both an authorized certifier and preparer, you do not need to do the process twice, just register as both in CAERS once you are in.

In CDX, at the login page enter your credentials. CDX forces users to change their password every 90 days, so make sure you have your most recent password available to you. Once you've entered your login and password, you will be taken to your "My CDX" page (Figure 8).

Next to "CAER: Combined Air Emissions Reporting" select your role, "Preparer" or "Certifier". This will take you to the application, where you can review your facility's data and begin/continue reporting from "My Facilities Page" (Section 1.4). If you are both a preparer and a certifier, you'll need to use this page to switch between roles. You can go back to your "My CDX" page from within the CAER application by clicking on the "MyCDX" link at the bottom of the screen. Note, however, that if the preparer and certifier are the same person, you need only be registered as a certifier, as the certifier will be able to act as preparer as well.

Figure 8. My CDX Page

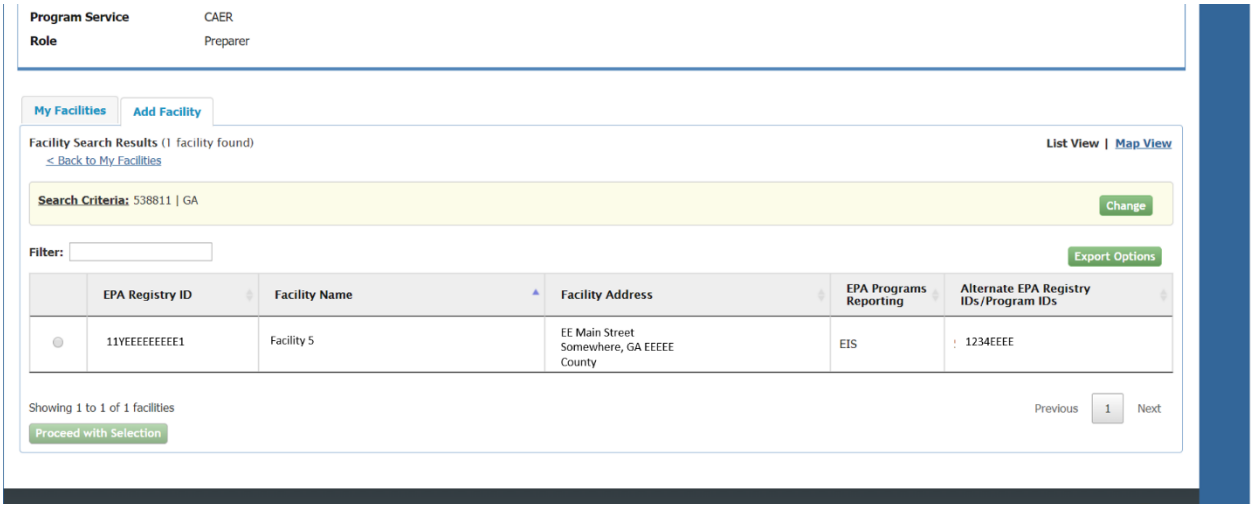


If you are preparer and/or certifier for more than one facility, you can add facilities to your account by going to "Manage Your Program Services" from the "MyCDX" page (Figure 8). Then, from your role click on "Manage Facilities". Note that loading this page could take a moment. To find your facility enter the relevant search terms (Figure 9).

Figure 9. Search for a Facility

Note that CDX will not recognize an AIRS ID so you may need your EIS ID if you search by "Facility ID", and/or other information to find your facility such as name, county, and zip code. Once you have found your facility, select it and click on "Proceed with Selection" (Figure 10). Please do not add a new facility unless GA DNR is aware that you are the preparer and/or certifier for said facility. You should then click on "Save Selected Facility". The new facility will be visible in your list of "My Facilities".

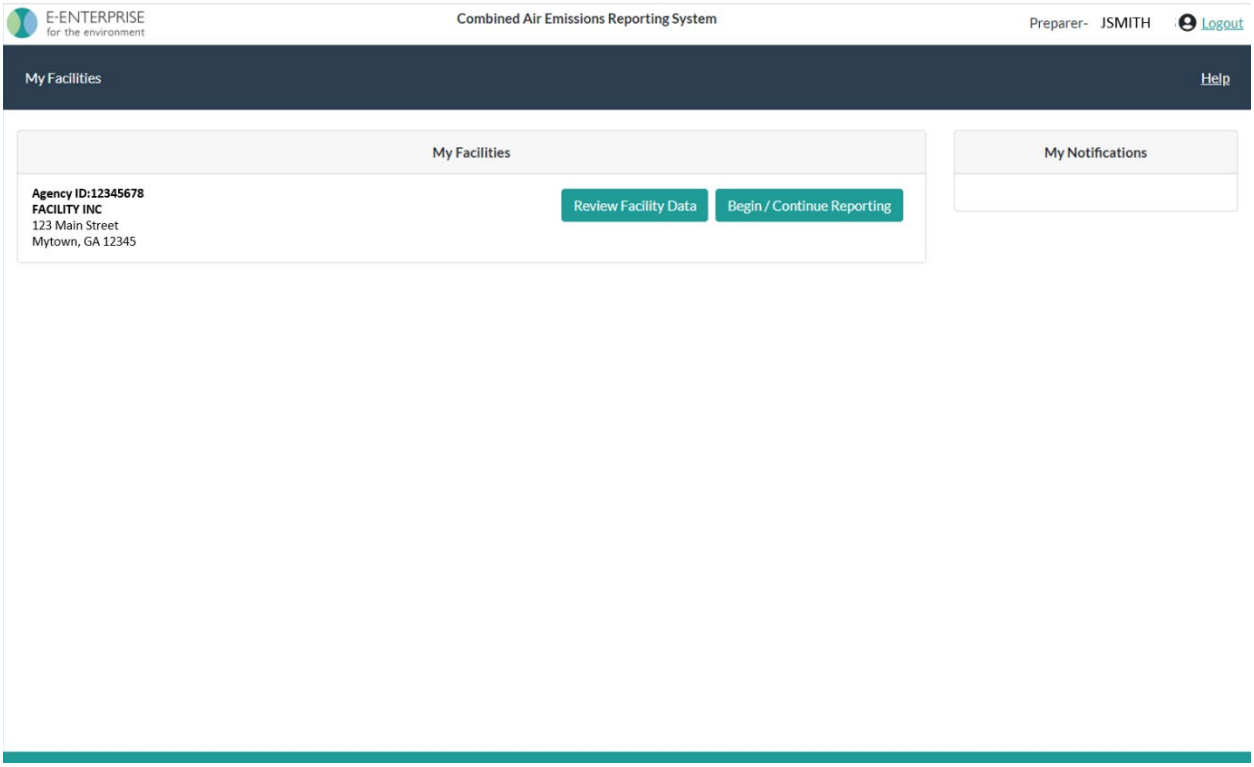
Figure 10. Select a Facility to Add



1.4 My Facilities Page

Once you have logged in, you will see a list of the facilities that are associated with your role. You will have the option of reviewing facility data (Section 1.5, or beginning/ continuing a report (Section 2.1.2).

Figure 11. View of "My Facilities" Page



1.5 Reviewing Facility Data

If you select the "Review Facility Data" button, you will be taken to a separate page that contains general information about your facility, together with a map of its location. New functionality will be added to this page in future versions of the CAER system.

2 Reporting Emissions and Facility Information via the User Interface

2.1 Navigating the User Interface

2.1.1 General Description of User Interface Features

While the User Interface (UI) has many pages and data entry points, there are some common themes throughout the UI. This list will help you understand the general layout of the UI and its characteristics. Specific features are explained in more detail, including screenshots, in subsequent sections and are not duplicated here to avoid repetition.

General features (refer to Section 2.1.3, Figure 12 and Figure 13):

- Breadcrumbs at the top of the screens displaying the path that got you to the current screen from previous screens
- Submission steps bar at the top of the screen that indicates what step you are on in the submission process
- A menu of links to different facility and emissions data pages on the left-hand side of the screen, that will help you find the relevant screens to view and enter data. Where multiple units exist, the menu can be expanded and collapsed.
- Link to "MyCDX" at the bottom of the screen.
- Link to "Help" at the top right of your screen that takes you to a page containing the help desk contact information and additional resources.

Data entry features:

- Organization of data in each screen in boxes. For example, facility information that is organized in the following boxes: Facility Information, Facility North American Industry Classification System (NAICS) Codes, Contact Information (Section 2.2.1, Figure 14). Greyed out data entry boxes indicating where data is not expected to be changed by the user (Section 2.2.1, Figure 15, for example).
- Drop down menus in some of the data entry boxes to assist the user in entering the relevant data without errors (Section 2.2.1, Figure 15, for example).
- Pop-up windows directing the user to make a choice or enter specific information related to the page the user is in (Section 2.2.1, Figure 15 and Figure 17, for example).
- Data entry quality checks (warnings in purple, critical errors in red) to help the user to address issues and corrections before submission (Section 2.2.2, Figure 20, for example)
- "Trash can" icons to delete specific sub-facility components. These are not be used when that component existed in a previous submission. If data was entered in error during the current submission, the trash can should be used. If the data existed in a previous submission, then the

component operating status should be changed to temporarily or permanently shut down (as the case may be), and the year of that change should be recorded as well.

- Edit icons next to sub-facility components on screen lists to indicate the user can edit them from the screen the user is in.
- Process of adding sub-facility components. These must be added first before they can be associated with other components. When a component is added, the associations won't show up on the screen for that component until the component information has been filled out and saved (for example, compare screens for Figure 20 and Figure 21). Then, the component page can be opened and boxes for the associations will appear.

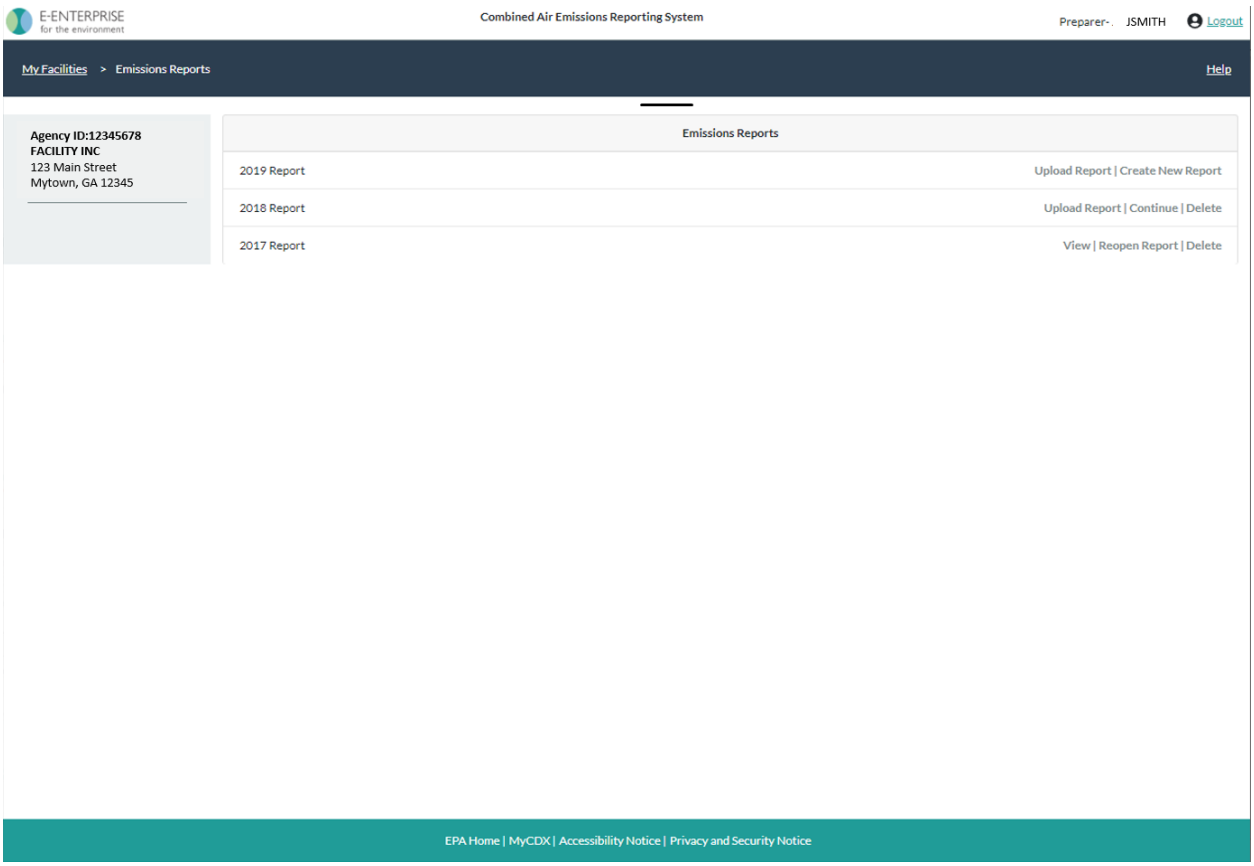
2.1.2 Emissions Reports Page

From "My Facilities", click on Begin/Continue Reporting. This will take you to the "Emissions Reports" page (Figure 12), where you can see all the reports for that facility. The CAER system will have your last submission from a previous year's report, and it will allow you to begin a new report for the inventory year you are reporting.

In order to start or continue a new report click on "Create New Report" or "Continue". You will be re-directed to the facility "Report Summary" page. If you are using bulk upload to enter your report, refer to Section 3. However, because there are some new features to annual reports with respect to how controls information should be entered, you should refer to Section 8 before beginning a report or working on a submission via bulk upload.

If you begin your current inventory year report and find that you wish to delete it to start over, you can do so by clicking on the garbage can icon. Once you have deleted it, the "Create" link will re-appear, and by clicking on it, you will be able to carry forward your previous year reported data to help you get started. Be aware that deleting any previous year reports already in the system may cause you delays in re-instating that data if you later realize that deletion was an error. Also, at this time, you will not be able to re-submit a previous year report for a previous reporting year.

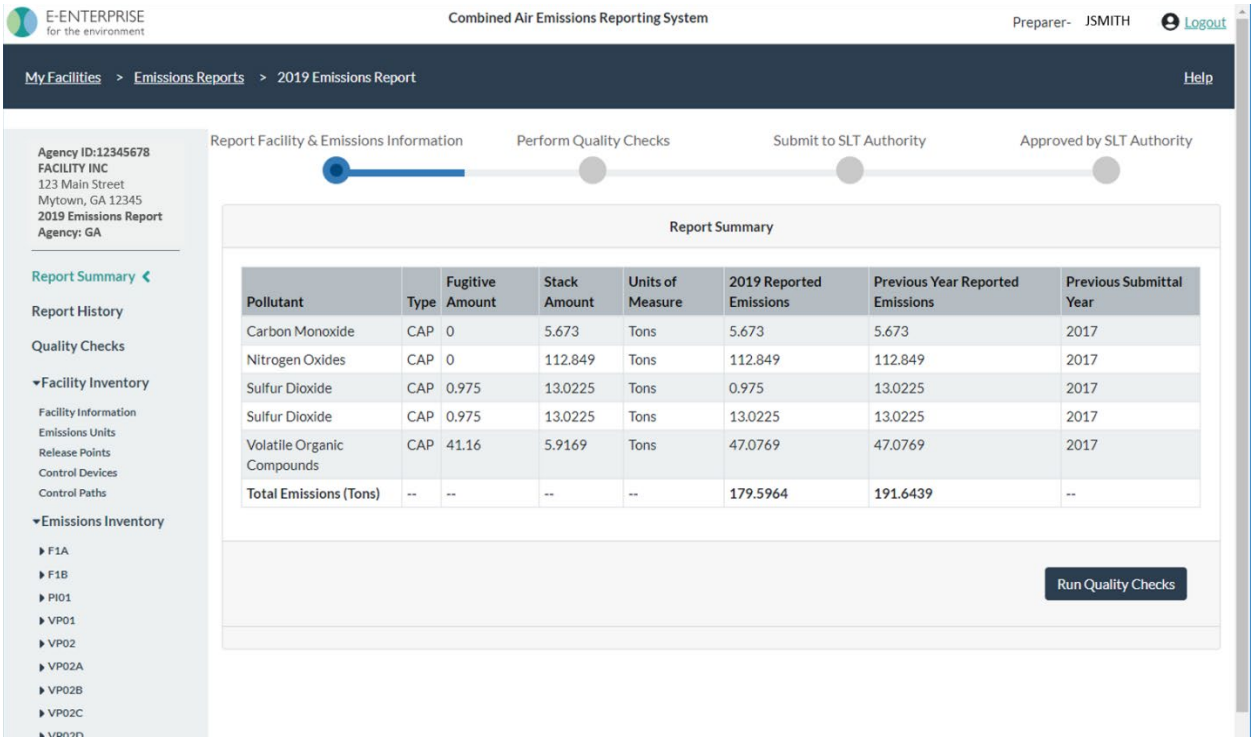
Figure 12. Emissions Report Page



2.1.3 Report Summary Page

Once you have selected a facility and report from the "My Facilities" page, you will be taken to a "Report Summary" page (Figure 13). Your new report will be preloaded based on your previous year submission, with a list of pollutants for that facility, the reported emissions in the current report, and the tons reported in your previous submission.

Figure 13. Facility Report Summary Page



You will see breadcrumbs in the dark blue bar at the top of the screen. These display the path that got you to the current screen from the "My Facilities" page. By clicking on any of the links, you will be returned to a previous page. For example, from "2019 Emissions Report" you can click on "Emissions Reports" to be taken back to that page.

Below the breadcrumbs, at the top center of the screen, you'll see a bar showing the four main steps of submission that will help guide you through the submission process:

- Report Facility & Emissions Information,
- Perform Quality Checks,
- Submit to SLT (your State, Local, or Tribal) Authority, and
- Approved by SLT Authority.

On the left-hand side you will see an expandable menu with links that will take you to different pages:

- Report History (shows a list of actions associated with the report over time and who performed them, for example, when it was created, submitted, whether the SLT has approved it).
- Quality Assurance (QA) Checks (takes you to the list of QA checks that your report, as it stands, is currently generating) see Section 4.
- Facility Inventory data (with summary pages at different levels of detail: facility information, emissions units, release points, control devices, control paths) see Section 2.2.1.
- Emissions Inventory (a collapsible list of units that you can expand to view the processes associated with each unit) see Section 2.3.

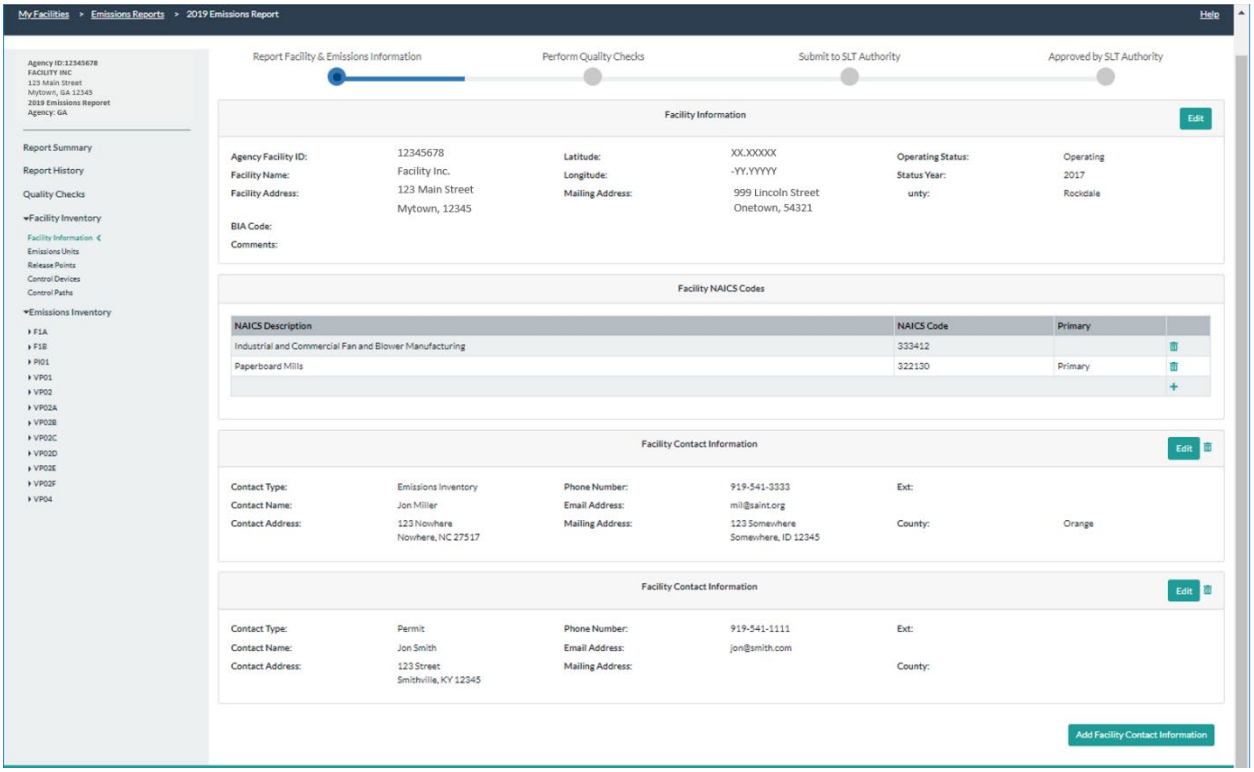
Within the application, you will be able to enter data in a couple of different ways: via the links listed under “Facility Inventory” or via the links under “Emissions inventory”. You will also be able to enter your report via bulk upload (see Section 3).

2.2 Facility Inventory

2.2.1 Facility Information

From the left-hand side menu, click on “Facility Inventory” to expand that menu. Click on “Facility Information” to get to the facility information screen (Figure 14). Note this is different from the facility page described in Section 1.5.

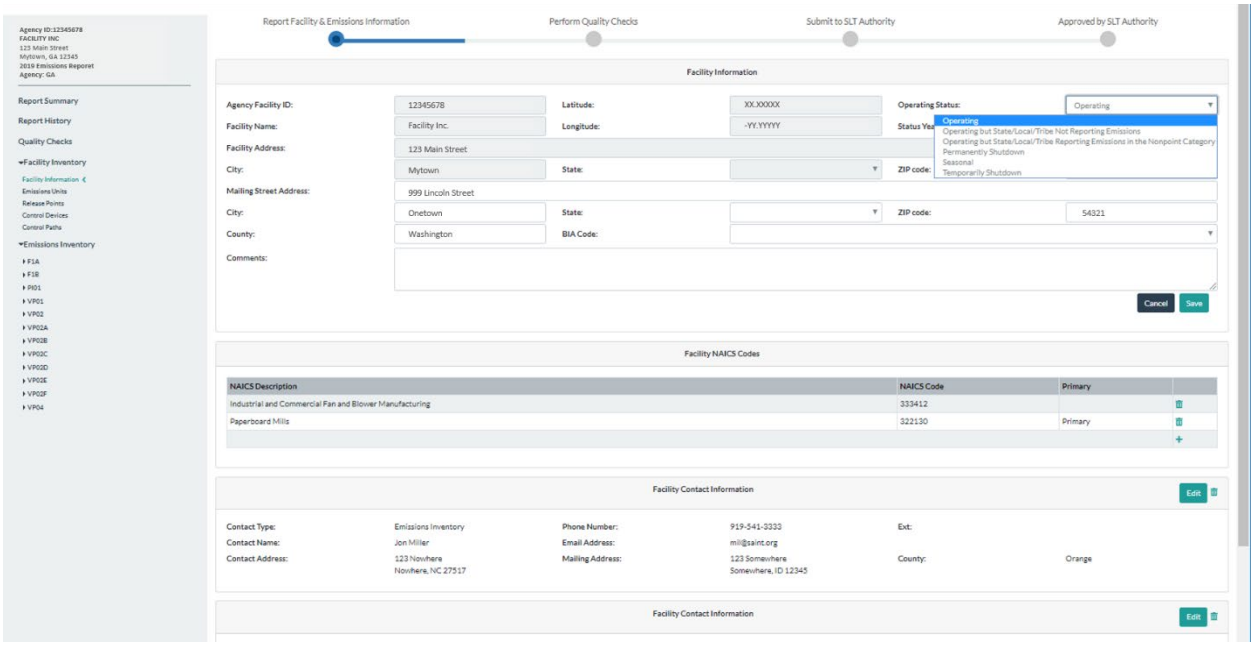
Figure 14. Facility Information Page



You will be able to edit facility information by clicking on the “Edit” button at the far right, which will take you to the facility information edit page (Figure 15). Note that fields that have been locked will not be editable. They will appear in gray. You should contact your SLT authority (for example, GA DNR) if you think there is an error in locked fields. A gray arrow within a data field box indicates a drop-down menu is available to choose your entry.

If the facility operated partially in the reporting year and was permanently shut down in the reporting year, you will need to leave the “Operating” status unchanged for the year you are reporting, and change it the following reporting year. Once you change the operating status to “Permanently Shutdown”, all units, processes, controls and release points will also be automatically set to “Permanently Shutdown”, and you will no longer be able to enter data for the facility. For example, if the facility was operated in part in 2019 and shut down for the rest of 2019, you would change its status to permanently shut down in 2020.

Figure 15. Editing Facility Information



Under the "Facility Information" box, you will be able to add a NAICS code. More than one NAICS are allowed as secondary NAICS codes, but a single NAICS should be designated as the primary NAICS code. When you click the "+" button at the bottom right of that box, a pop-up window will appear to help you search for your NAICS (Figure 16). Type the digits of your NAICS and a menu for the NAICS that contain those numbers will appear to help you select the correct code (Figure 17). Once you've selected your NAICS, click the "Submit" button. If you have questions about NAICS you can reference the U.S. Census Bureau. NAICS change every 5 years. At the time this document was written, the codes being referenced were from 2017

Below the NAICS code box, you should find the "Facility Contact Information" box(es). You can enter as many contacts for the facility as you need. Click on the "Add Facility Contact Information" at the bottom right of the screen to open a window to enter new facility contact information (Figure 18). Enter all relevant information such as name, number, and make sure to select a "Contact Type".

Figure 16. Edit Facility NAICS codes

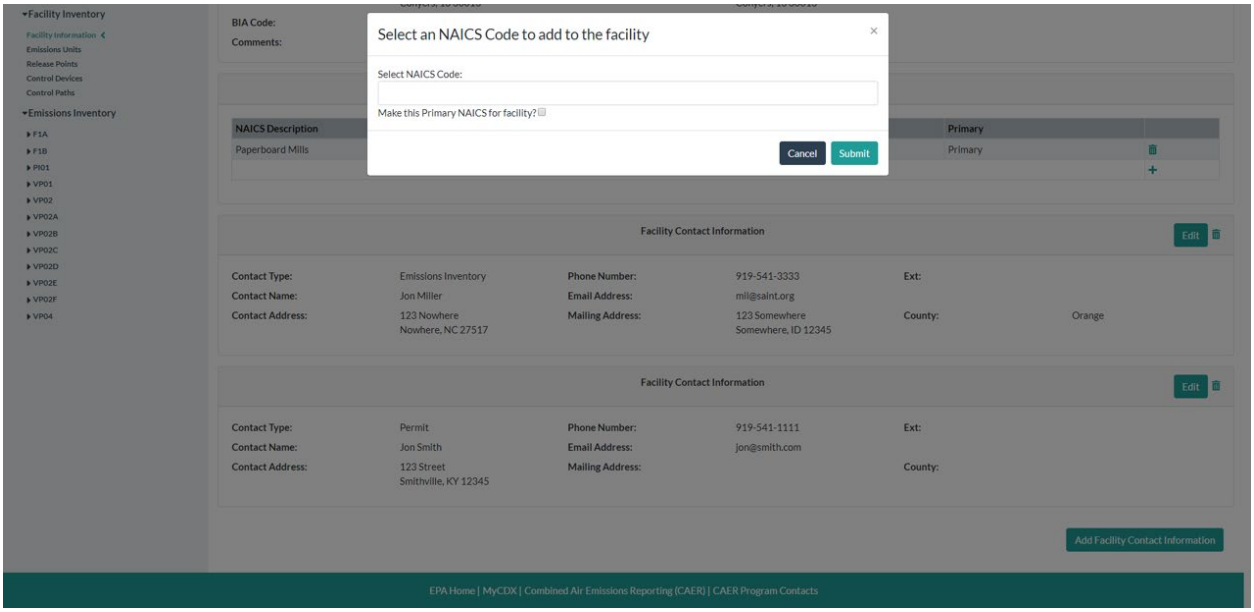
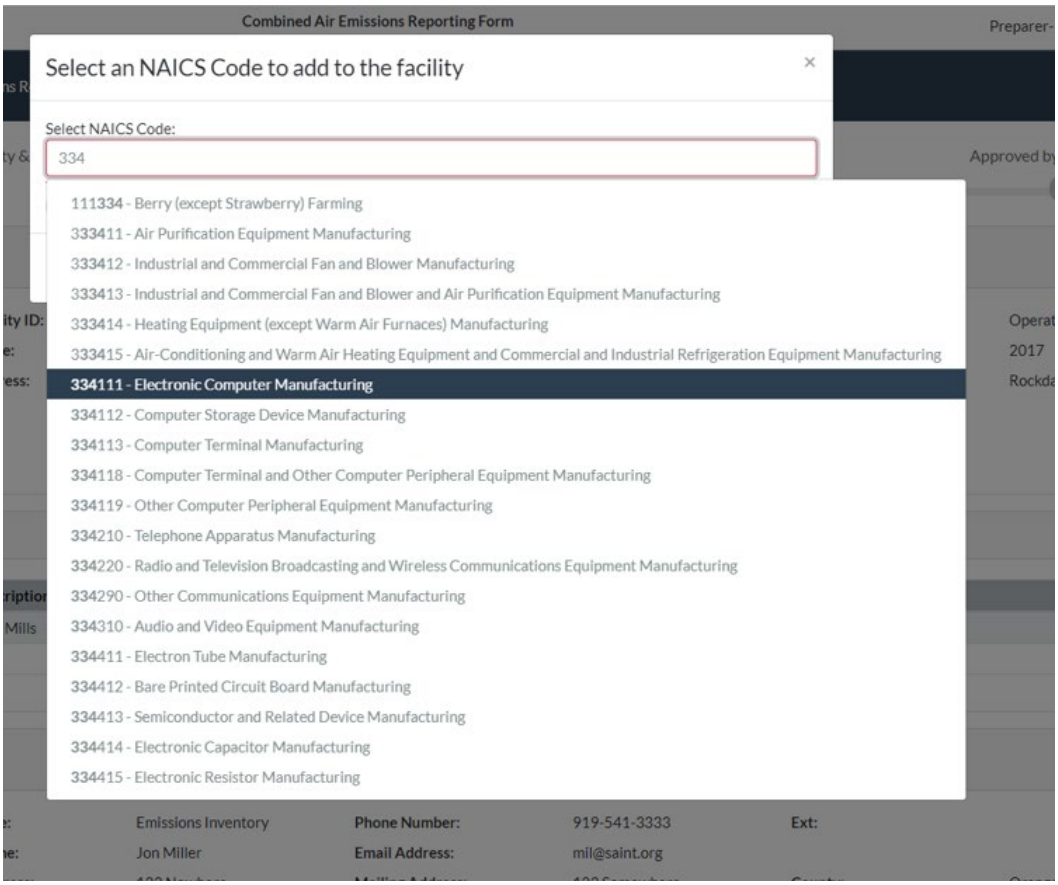


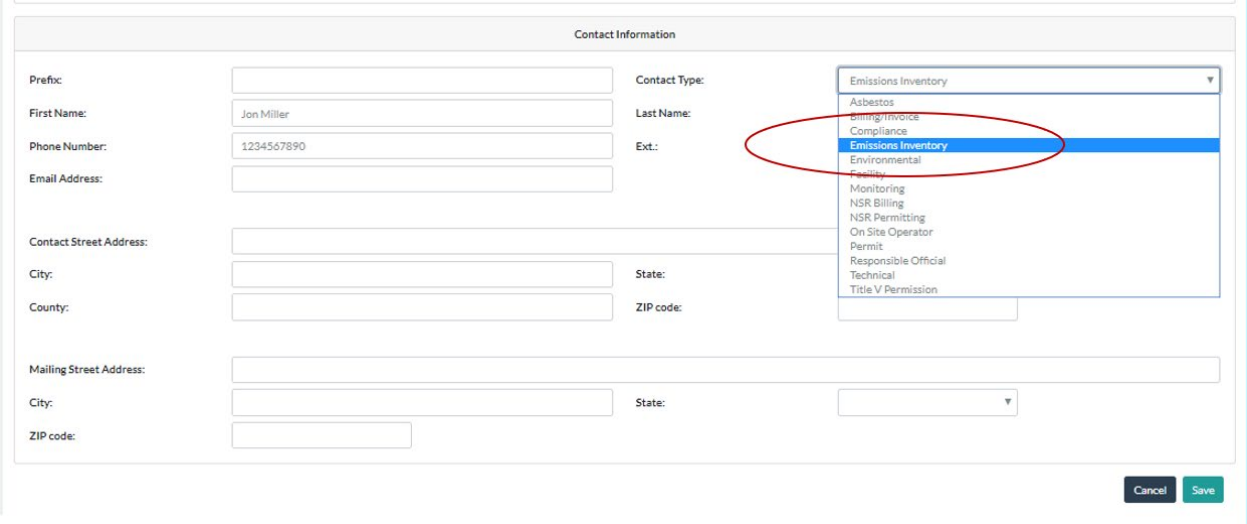
Figure 17. Find and Select NAICS Code



You will be required to enter at least one contact for National Emissions Inventory (NEI) reporting. This should be the person that your SLT authority can reach out to if they have questions about the

submission. If a contact person for the NEI is missing, a QA error will appear at the top of the "Facility Information" page. For the NEI contact select contact type: "Emissions Inventory". Click "Save" after adding the information. The application will automatically take you back to the "Facility Information" page and you should be able to see your contact information displayed at the bottom of the page. You can also edit an existing contact by clicking on the "Edit" button for that contact. This will take you to that contact's edit page where you will be able to make changes.

Figure 18. Enter Facility Contact Information



2.2.2 Emission Units Page

Click on "Emissions Units" to go to a list of units in your facility (Figure 19). To add a unit, click on the plus sign at the bottom of the list. This will take you to a blank unit page (Figure 20). Add all the data fields. Messages will appear where required information is missing. When you have entered all unit information, click "Save" and this will take you back to the Units page. Note that an error message will appear if data is missing. After you have finished with your entries or edits, click "Save" to go back to the "Emissions Units" page. Your new unit will now be listed on that page as an existing unit. If you are entering new unit data and find you have begun entering it in error, click "Cancel" to take you back to the "Emissions Units" page without saving any edits.

Figure 19. Emissions Units Page

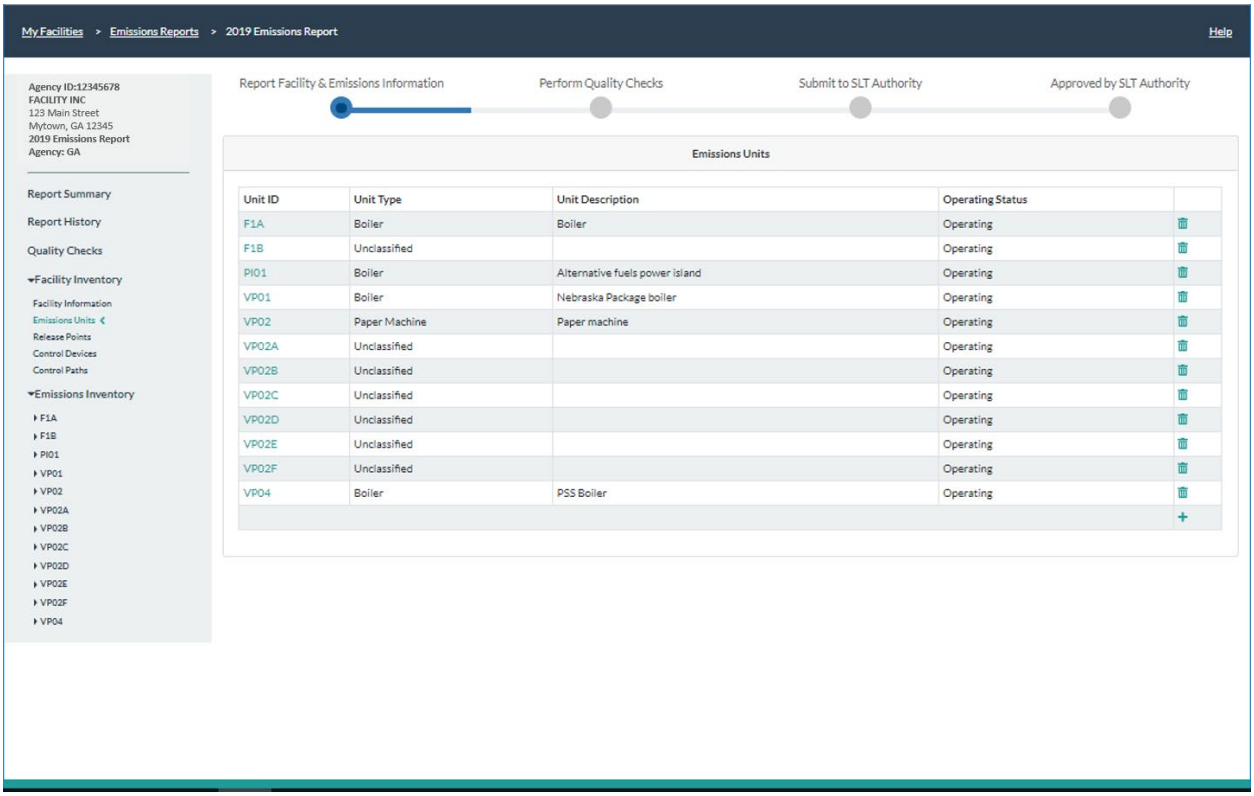
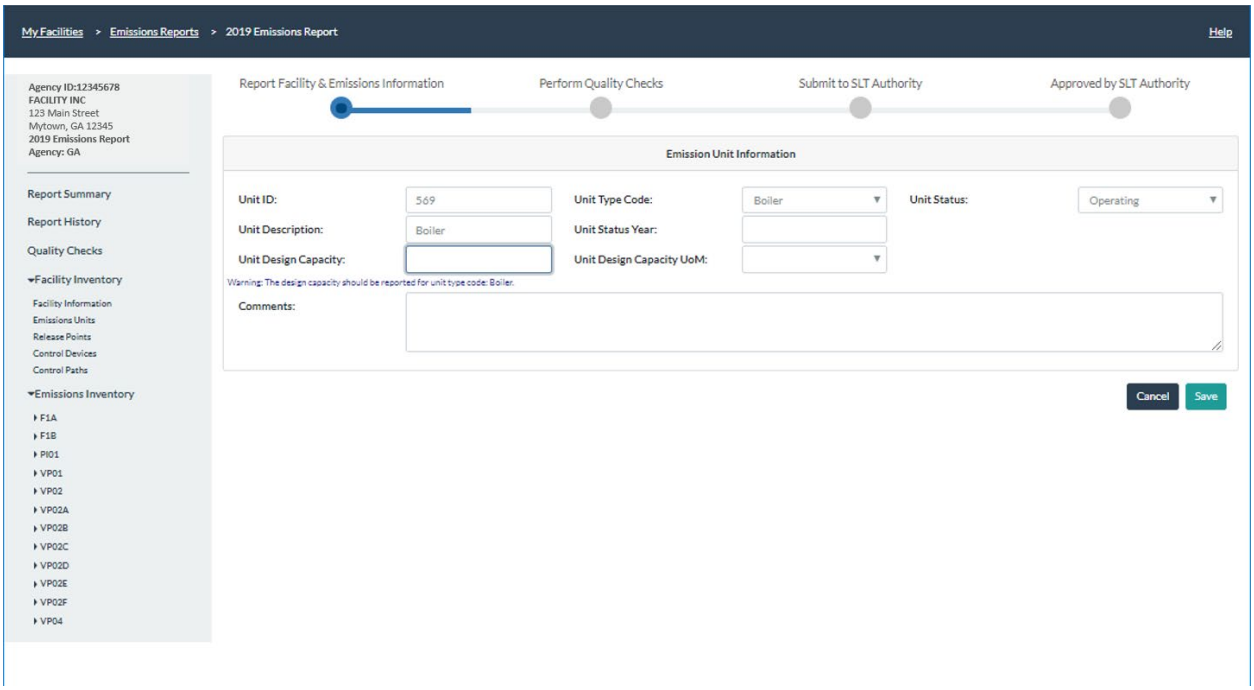


Figure 20. Adding a New Unit



To edit an existing unit, from the “Emissions Units” page click on the corresponding unit ID to be taken to that unit’s page (Figure 21). On the unit page, you’ll see the “Emission Unit Information” box. Click on the “Edit” button at the top right of the screen to make changes to the emissions unit information. This will take you to that unit’s edit screen (Figure 22). When you are finished with your edits click “Save” to take you back to the “Emissions Units” page. If you entered data by mistake, you can click “Cancel”, the changes will not be saved, and you will be returned to the “Emissions Units” page.

Figure 21. Example of a Page for a Specific Unit

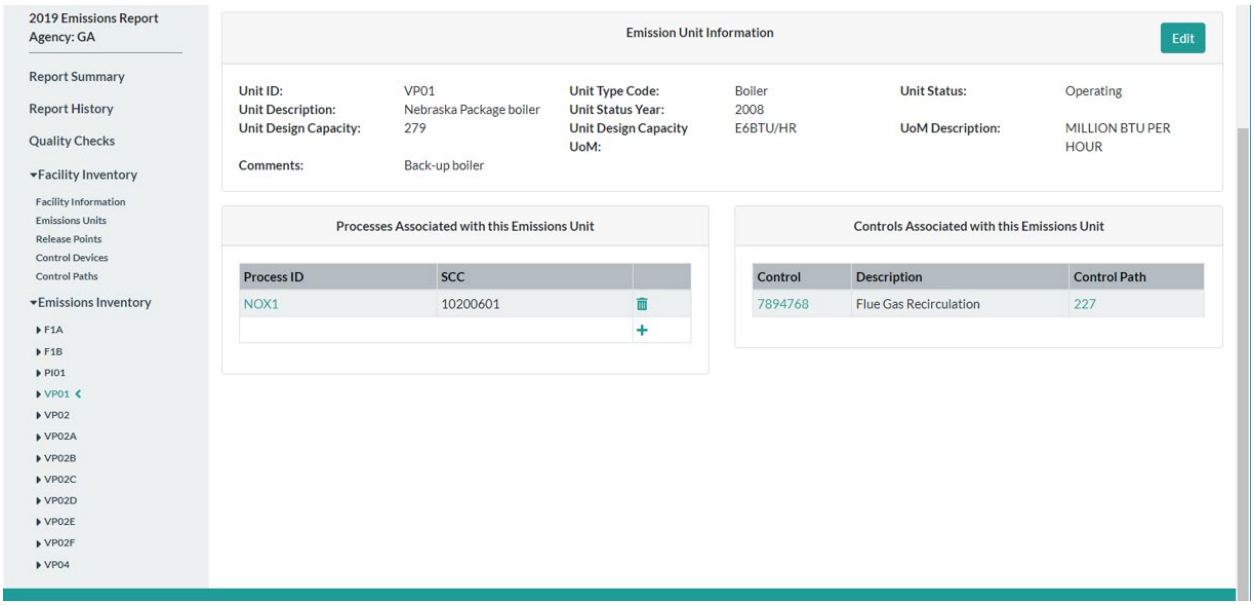
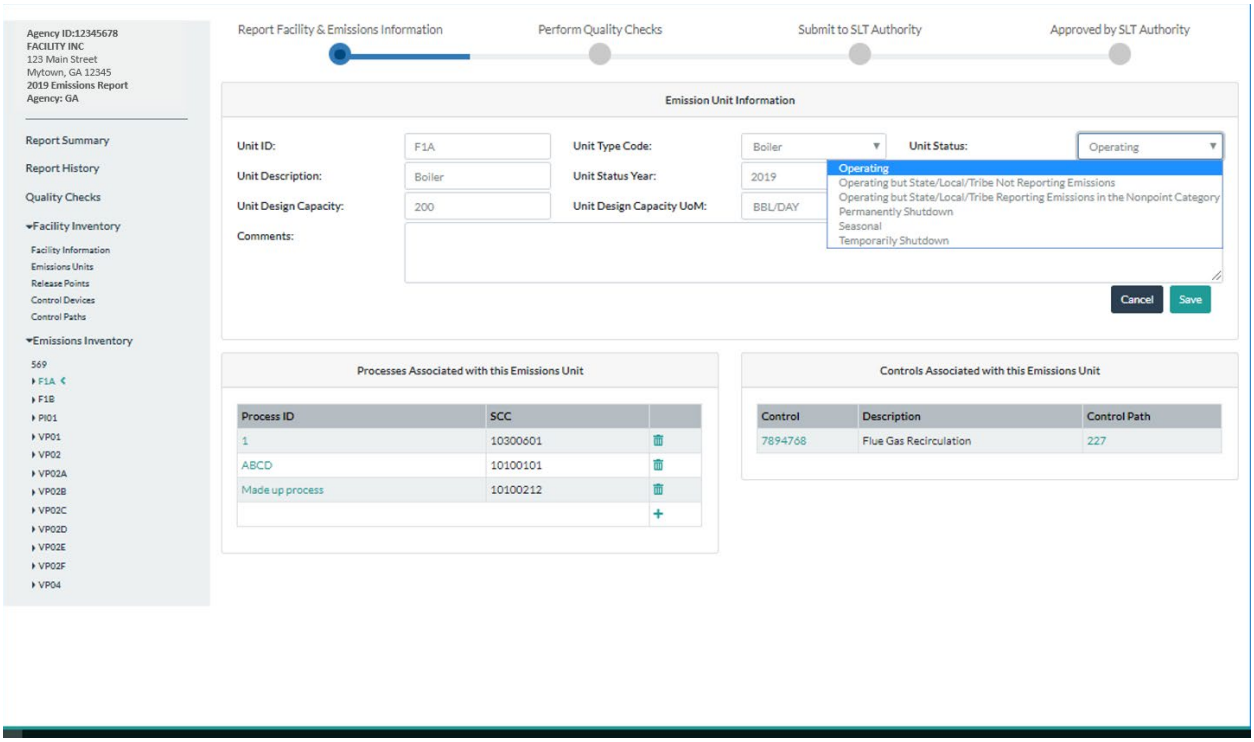


Figure 22. Editing a Unit



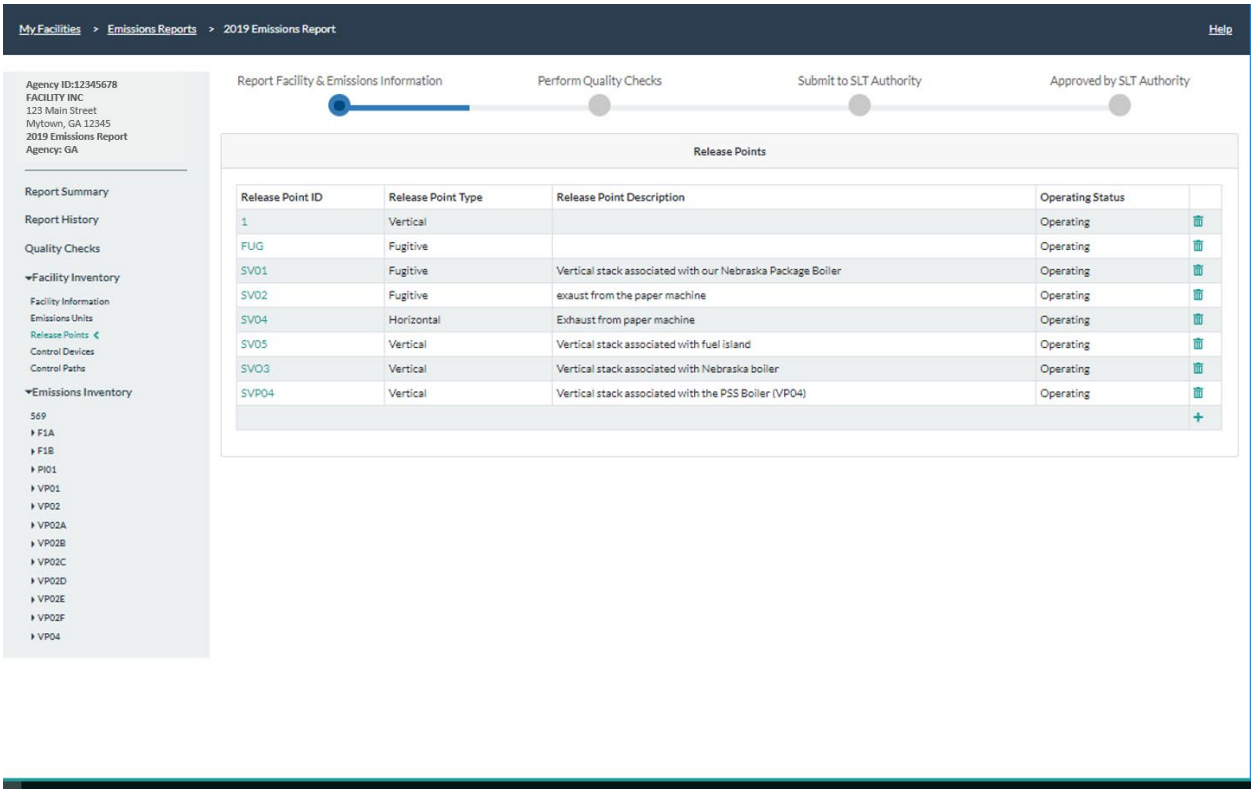
You should only delete a unit using the garbage can icon if you added it to this year's report and that addition was an error. If the unit existed in a previous year's report, and is no longer in use, you can click on its ID and change its status from "Operating" to "Permanently Shutdown".

At the bottom of each unit's page, you will also see processes and controls associated with that unit. You can add, edit, or delete processes associated with this unit from this page by clicking on the process ID. See section 2.3.2 to learn how to add, edit, or delete processes. You can also edit controls from this page. Note that if no controls appear on the unit's page, but there are existing controls that should be associated with this unit, you must add those controls to the system first. They will appear on this unit page once you have done so. See section 2.2.4 to learn how to add, edit or delete controls.

2.2.3 Release Points Page

From the left-hand side menu, click on "Release Points" under the "Facility Inventory" heading. You will see a list of release points associated with the facility (Figure 23).

Figure 23. Release Points Page



You can add a new release point by clicking on the "+" sign at the bottom right of the list. This will take you to a blank release point page. Enter all relevant information. Messages will appear for required fields. Dropdown menus are available for some data fields by clicking on the arrow in the data field box (Figure 24). Click "Save" to take you back to the "Release Points" page. Your new release point will now appear in the list of existing release points. If you entered new release point data by mistake, click "Cancel" so the changes will not be saved. You will be taken back to the "Release Points" page.

To edit an existing release point, click on the release point ID. This will take you to that release point's information page (Figure 25).

Figure 24. Adding a New Release Point

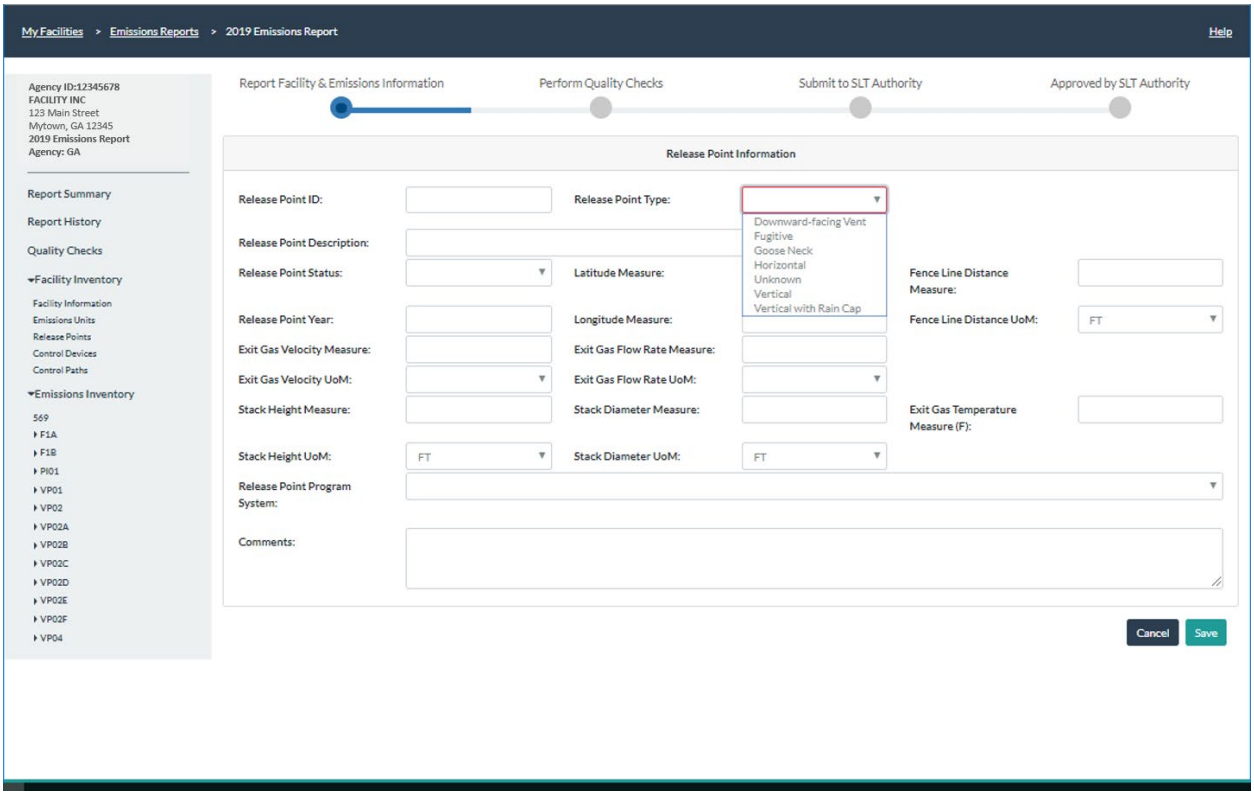
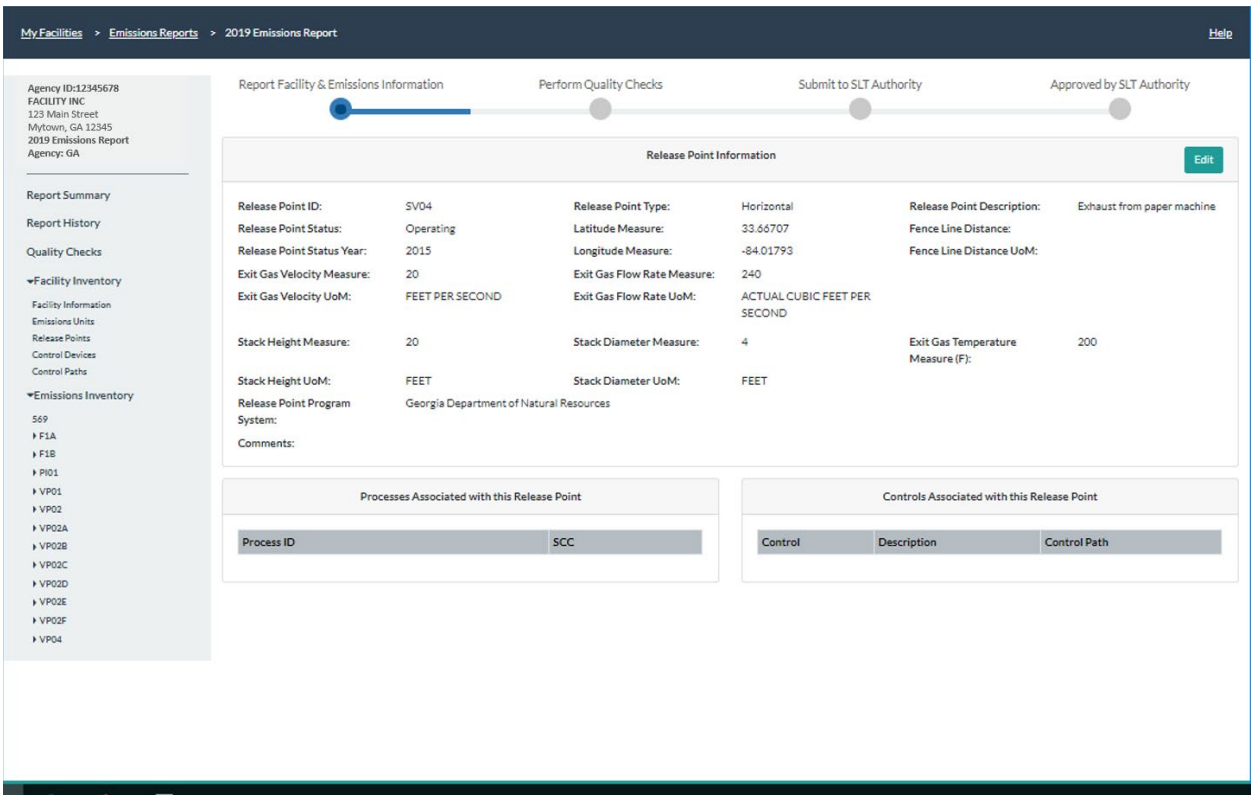


Figure 25. Example of a Page for a Release Point

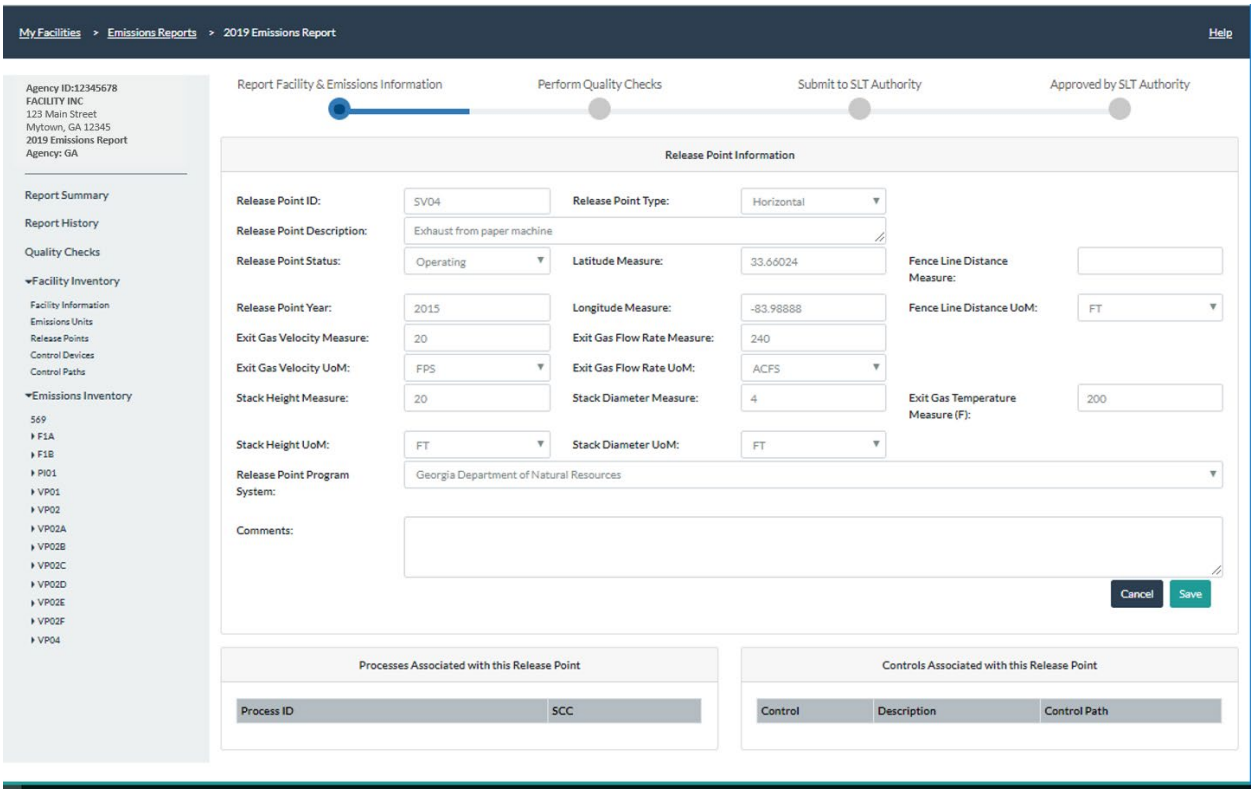


To edit a release point, click on “Edit” at the top right of the screen for that release point. You will also be taken to the release point page (similar to that of a new release point), where you will enter all relevant information about that release point (Figure 26). A gray arrow icon next to a data field indicates a drop-down menu that will allow you to make a choice.

On an existing release point’s page, you can view processes and controls associated with that particular release point. See Section 2.3.2 on how to edit processes and Section 2.2.4 on how to edit controls. Once you have done so, they will appear in the release points page.

Note that the garbage can icon on the “Release Points” page should only be used if you added a release point by mistake during this submission. If you are retiring a release point, then you must go into that release point’s screen by clicking on the release point ID from the list and change the operating status to “Permanently Shutdown”.

Figure 26. Editing a Release Point



2.2.4 Control Devices Page

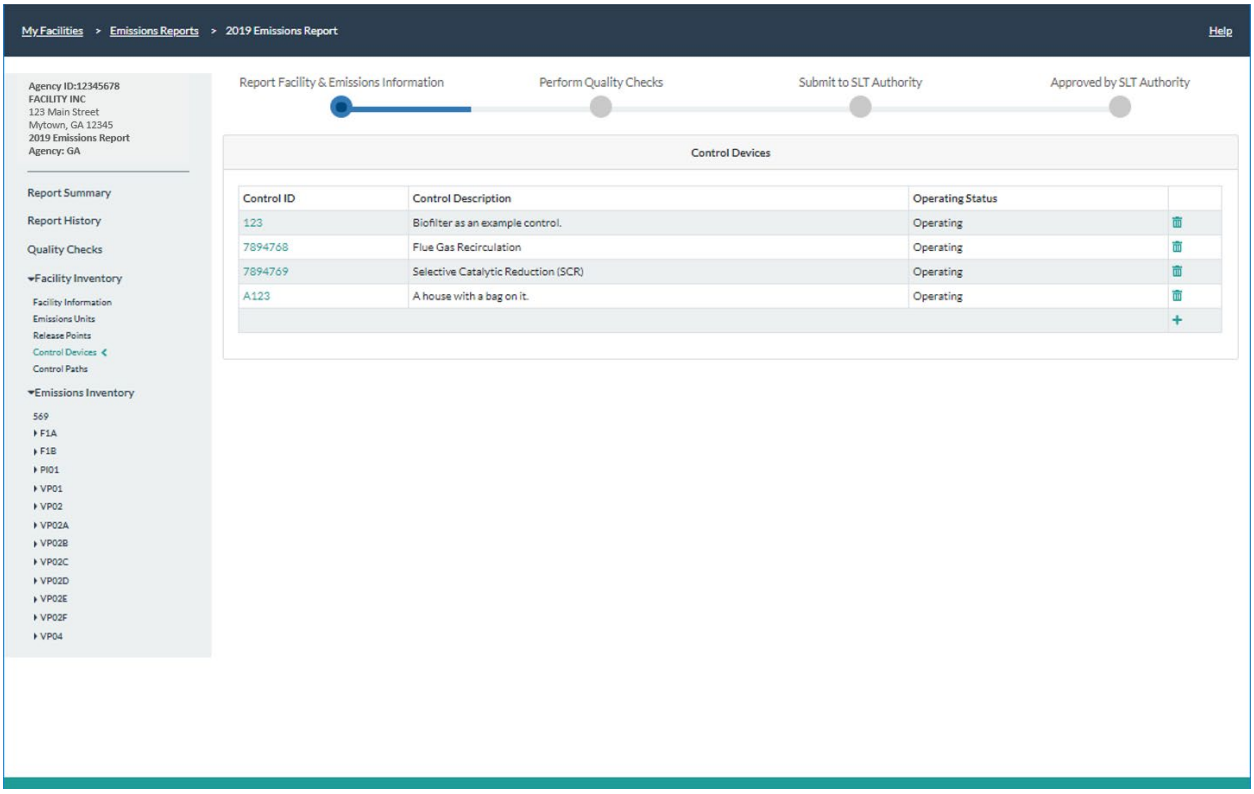
Control devices will be reported differently than in previous years. Section 8 in this document explains the concepts surrounding controls. You should familiarize yourself with that section before proceeding to set up your facility’s controls.

From the left-hand side menu, click on “Control Devices” under the “Facility Inventory” heading. You will see a list of control devices associated with the facility (Figure 27). Previously reported control data will appear for your facility, unless previously reported controls were marked as obsolete in your last report. However, you will need to review the data and edit it to reflect your controls in the new

framework. You should start by deleting any controls that are duplicated. Then, add any controls that are missing from the list.

To add a new control device, click on the "+" sign at the bottom right of the list of controls. This will take you to a blank control page. As with other sub-facility components, drop-down menus are available for fields that require a selection. For example, to select the operating status click on the gray arrow icon.

Figure 27. Control Devices Page



Note that the control ID for each individual control must be unique within the facility. On the control's page, you will add the percent captured and the percent effectiveness. Add all relevant information, QA check messages will appear for data fields that are required, for value ranges (for example, percentages must be greater than zero and less than 100%), and for other errors. Click on "Save" to add the new control to the list of existing controls. If you find you have started to enter a new control in error, you can click "Cancel" to avoid saving the changes, and you will be returned to the "Control Devices" page.

Now that the control has been added to the list of controls, you can edit it. In addition, you will be able to add pollutants controlled by the device from that control's information page. Also, when you associate the relevant pollutant with a control, you will add the percent control efficiency for that pollutant. Resources to find out information about your control equipment capture and control efficiency can include vendor specifications, and trade associations that may be able to provide you with averages for the industry. However, you should consult with staff at GADNR with your questions about controls and your planned approach to make sure they approve of it before you have submitted the data. Note that the overall percent controlled, as described in Section 2.3.2.2, will be the value factored

into the emissions calculations when the calculation method calls for its application. For example, the overall control % will not be applied to your calculations if you are reporting stack test data.

To edit a control device or add controlled pollutants, click on that control device's ID from the list of controls in the "Control Devices" page. This will take you to that control device's information page (Figure 29).

Figure 28. Adding a New Control

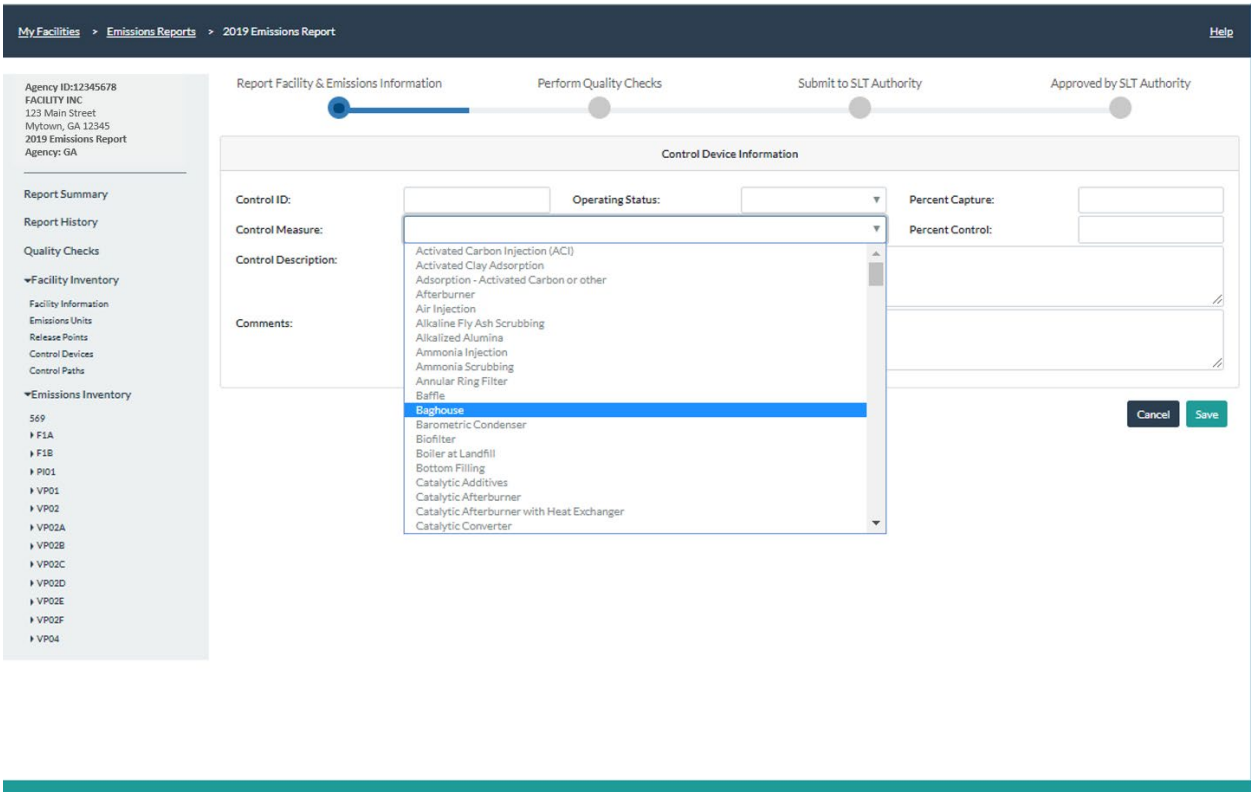
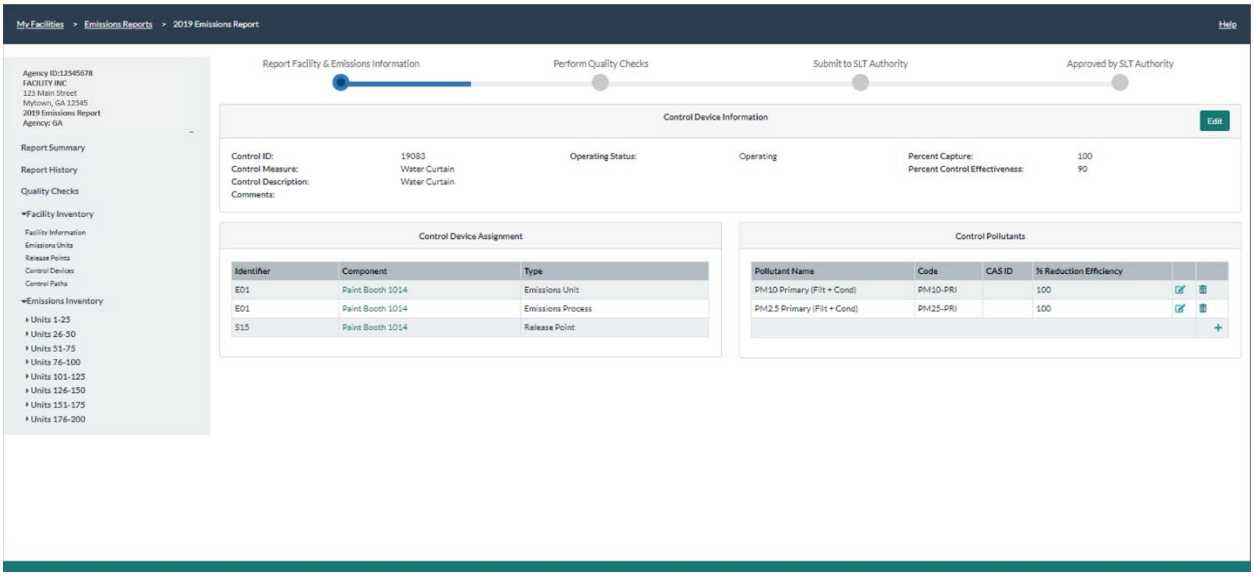
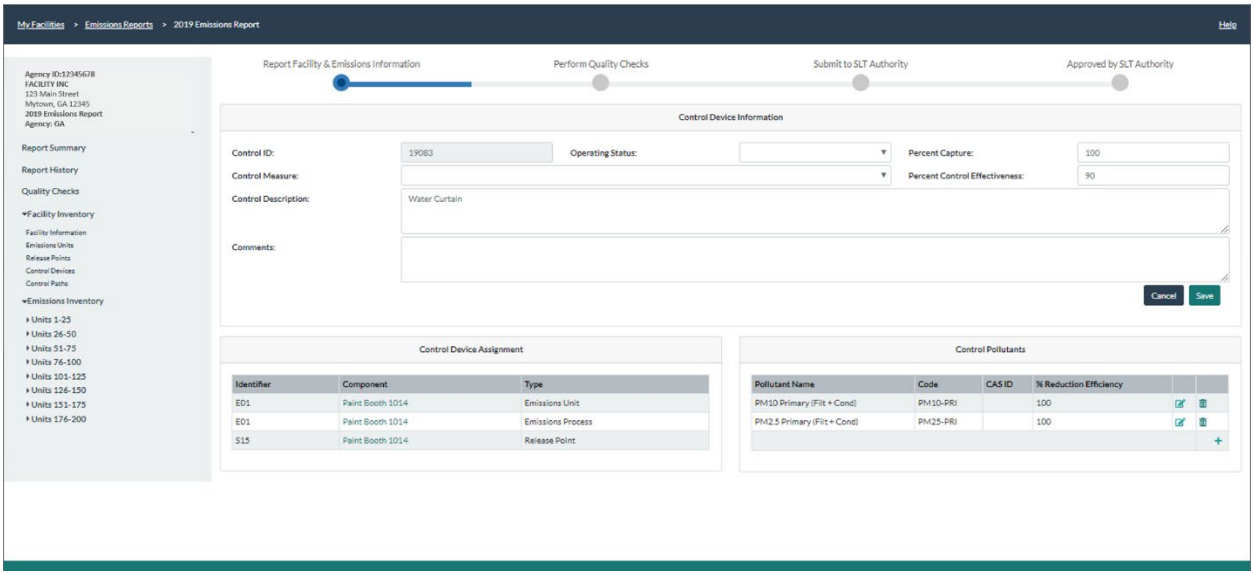


Figure 29. Example of a Page for a Control Device



To edit information for each control device, click on "Edit" to edit the control device information (Figure 30).

Figure 30. Editing a Control Device

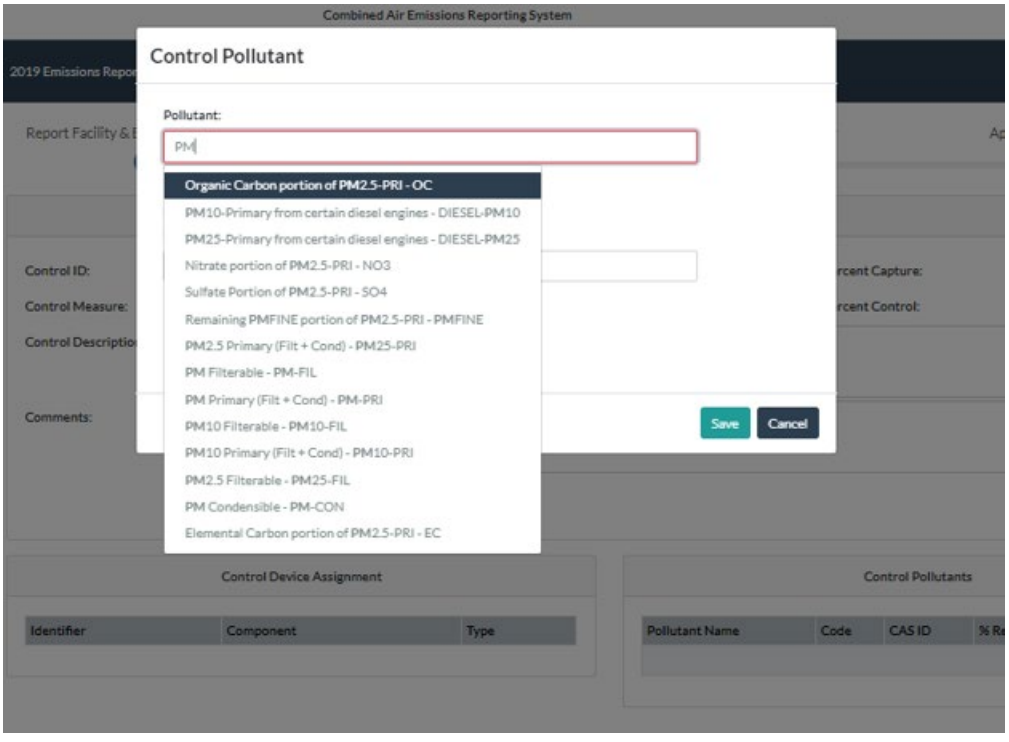


To associate a pollutant with this control device, click on the "+" sign at the bottom right of the "Control Pollutants" box. You will be taken to a pop-up window that will allow you to select a pollutant. Start typing the name of the pollutant or its abbreviation (for example, PM) and a list of possible pollutants will appear for you to make your selection(Figure 31). When you have chosen the pollutant and entered the control efficiency (percent reduction), click "Save" and you will be returned to the control device's information page. Now, the pollutant you entered will appear in the list of pollutants.

You will enter the percent reduction efficiency of the control when you enter the pollutant. However, for version 1 of CAERS, this percent efficiency will not be used directly in the calculation of emissions. Rather, the overall % efficiency you enter when calculating emissions will contain the percent efficiency as described in Section 2.3.2.2). Even though only the overall % efficiency will be used for the calculations, the data you have entered for each control in version 1 will be ready for your submissions in later versions of CAERS in future reporting years, where the calculations on controls will be done by CAERS.

Also note that the page for each control device also shows the control device assignment list. The Control Device Assignment box will show the components that are related to the control. For example, it will show the release point, emission unit, and emission process that are used by the control. You have the ability associate the control with these components through the Control Paths page (section 2.2.5). Also note that if the control device is being retired, you must go into the screen for that control device by clicking on the control ID from the list and change its operating status to "Permanently Shutdown".

Figure 31. Associating a Pollutant and Control Efficiency to a Control



2.2.5 Control Paths Page

Control devices will be reported differently than in years prior to the 2019 inventory year, and this includes associating controls with specific paths. Section 8 in this document explains the concepts surrounding controls and control paths. You should familiarize yourself with that section before proceeding to set up your facility's control paths. A path can include one or more controls as well as another path.

From the left-hand side menu, click on “Control Paths” under the “Facility Inventory” heading. You will be taken to the control paths page (Figure 32), where you will be able to see a list of control paths associated with that facility. If this is your first time reporting paths, you will not see any paths displayed, and you will be creating paths and populating that list from this screen.

To add a new control path, click on the “+” sign. This will take you to a blank path page (Figure 33). You will be asked to enter a Path ID, which should be unique within the facility, and a brief description to help identify which path it is. Click “Save” and this will take you back to the Control Paths page. Now your new path will appear in the list of existing paths and you will be able to edit it.

As you create paths, keep in mind that while one path may contain other paths, ultimately, you will want to ensure that you’ve created a path that includes all controls leading from a process to a release point. Each relationship between an emissions process and a release point (i.e. the release point apportionment) can only be associated with one control path. All processes from a unit to a release point can share the same path.

Figure 32. Control Paths Page

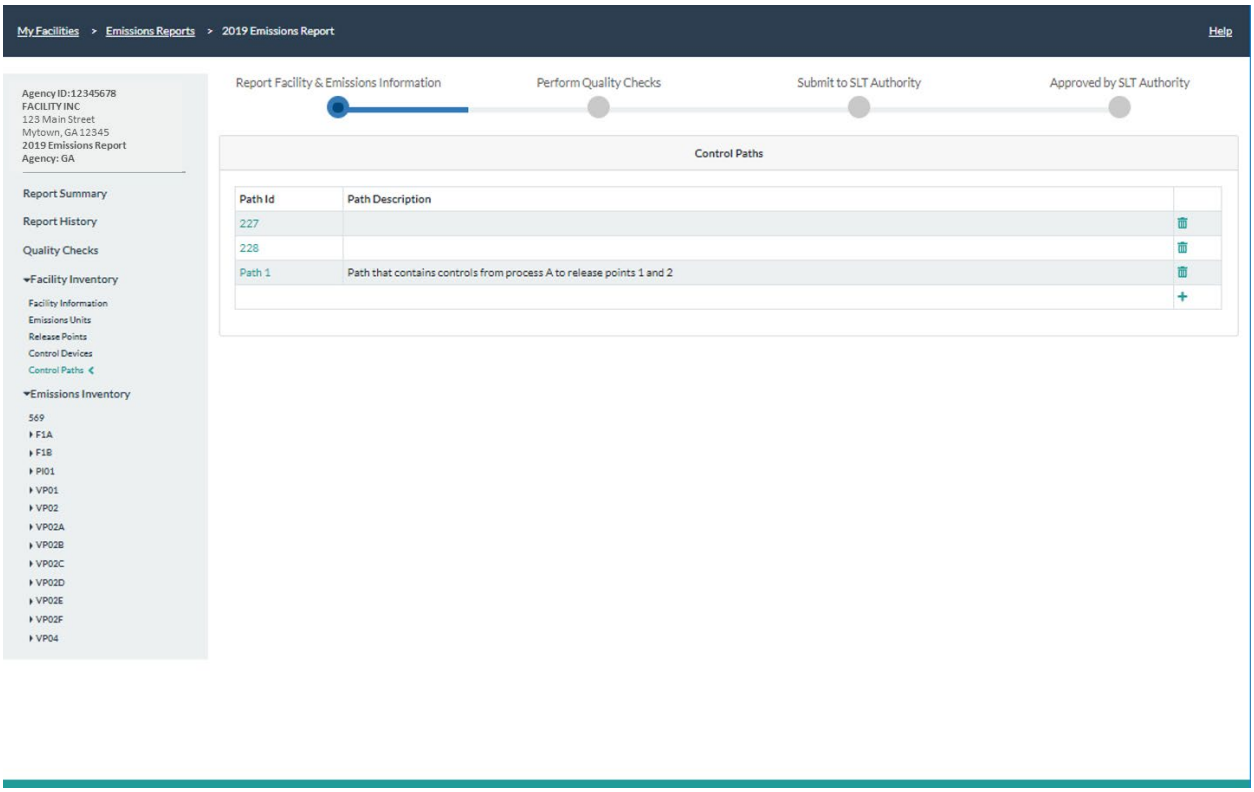
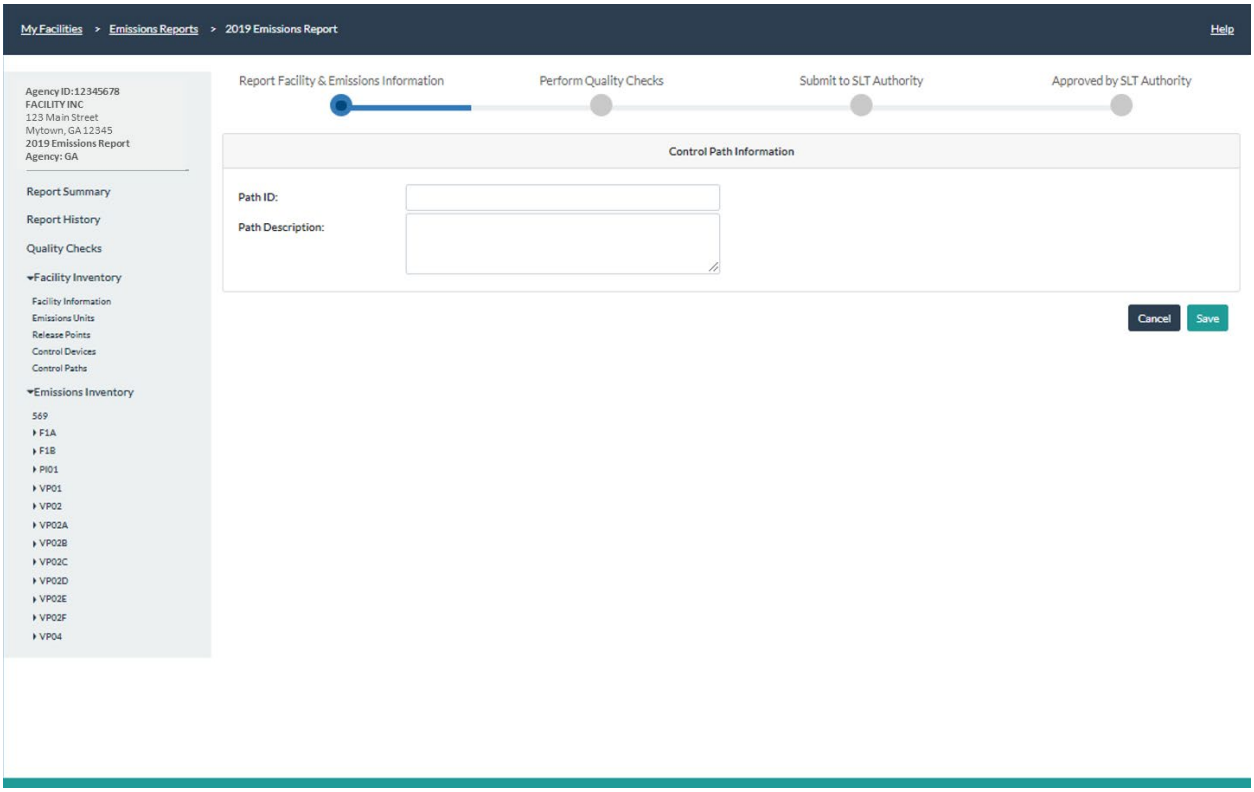
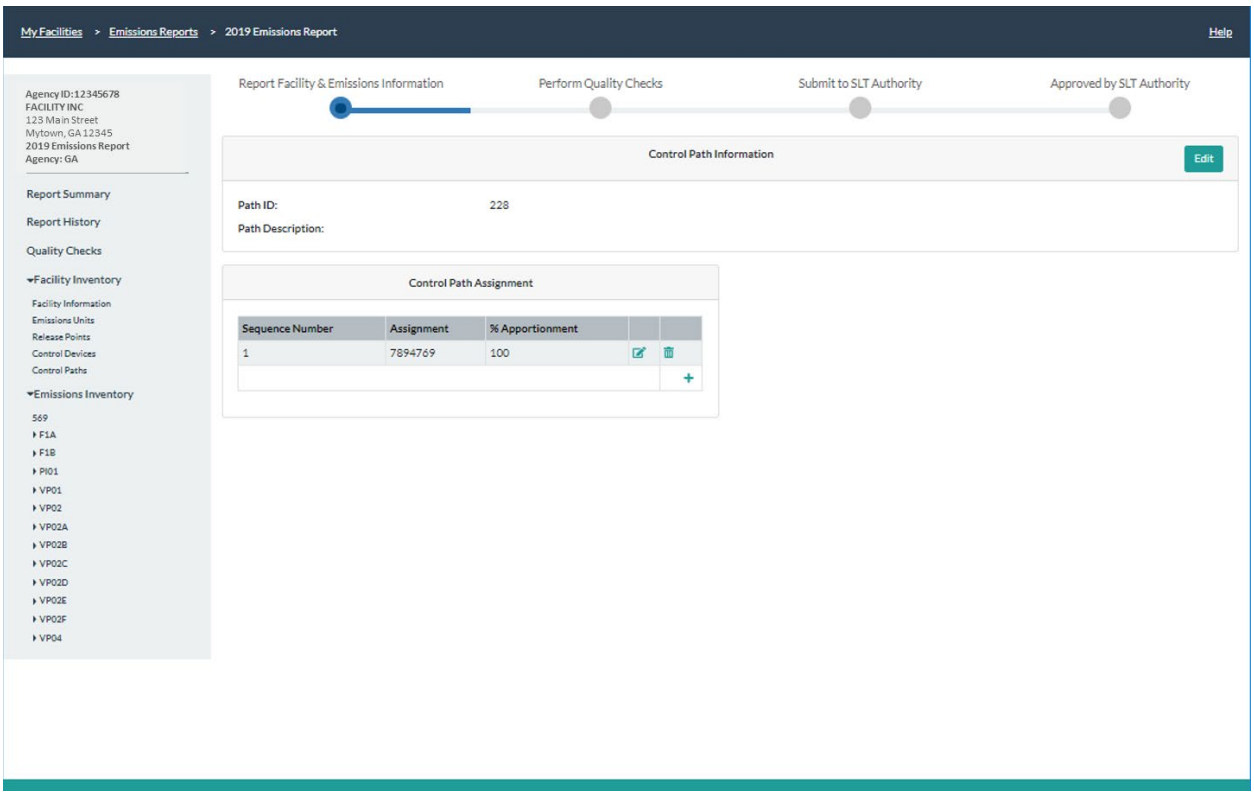


Figure 33. Adding a New Path



If you need to edit a path, click on its ID from the "Control Paths" page and you will be taken to that path's information page (Figure 34). Click on "Edit" to edit the path information (Figure 35). When you are finished with your edits click "Save". This will take you back to the information page for that path. If the changes are an error, you can click "Cancel".

Figure 34. Example of a Page for a Control Path



The next step is to add control devices and paths to each new path. To do this, click on an existing path from the "Control Paths" page. This will take you to that path's information page (Figure 34). On the bottom right of the "Control Path Assignment" box, click on the "+". This will take you to a pop-up window that will allow you to include a control or another path in this path (Figure 36).

Enter the sequence number for it. For example, if it is the second control device in the path you will enter 2. Next, enter either a control device or a control path (you must select one or the other, but not attempt to enter both a control and a path here). Drop-down menus will allow you to select either an existing control device or an existing path. You must enter the controls first, so they will appear in the corresponding menu. You must build smaller (children) paths first, before building larger (parent) paths that contain the smaller paths.

Figure 35. Editing a Path

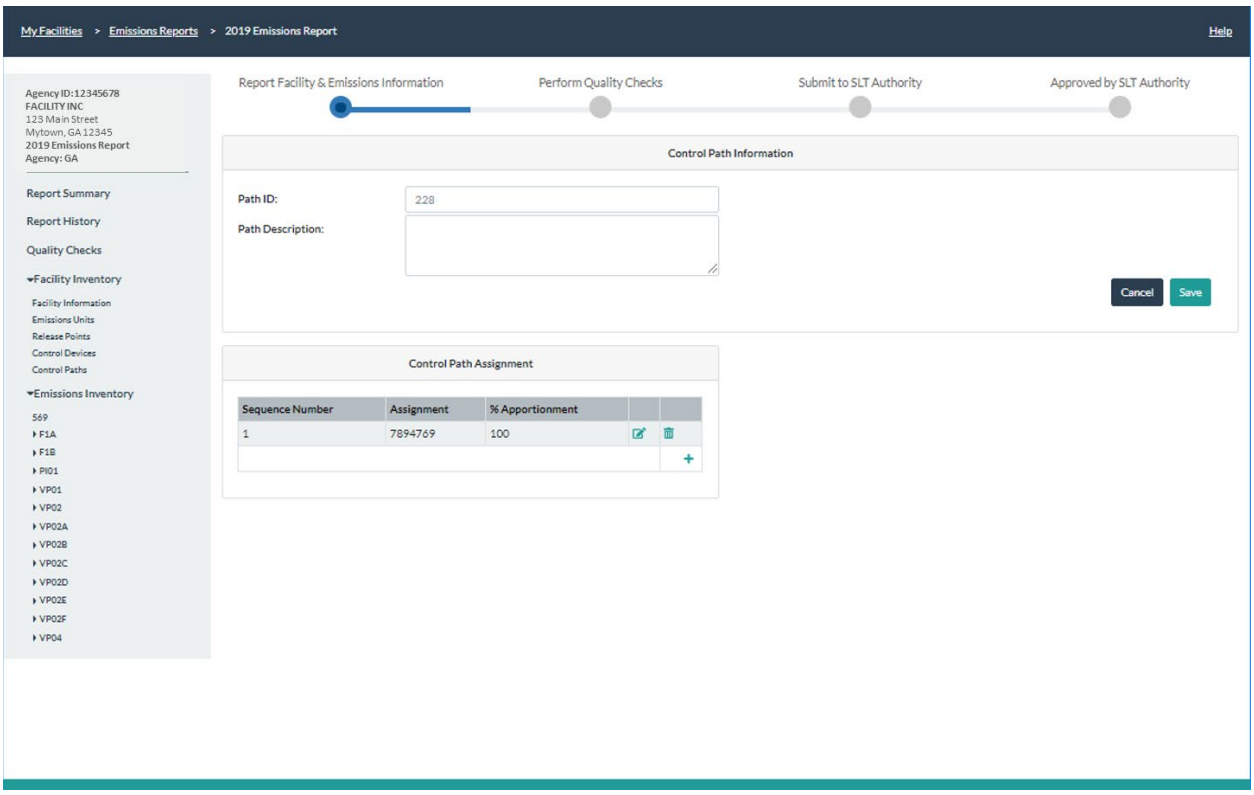
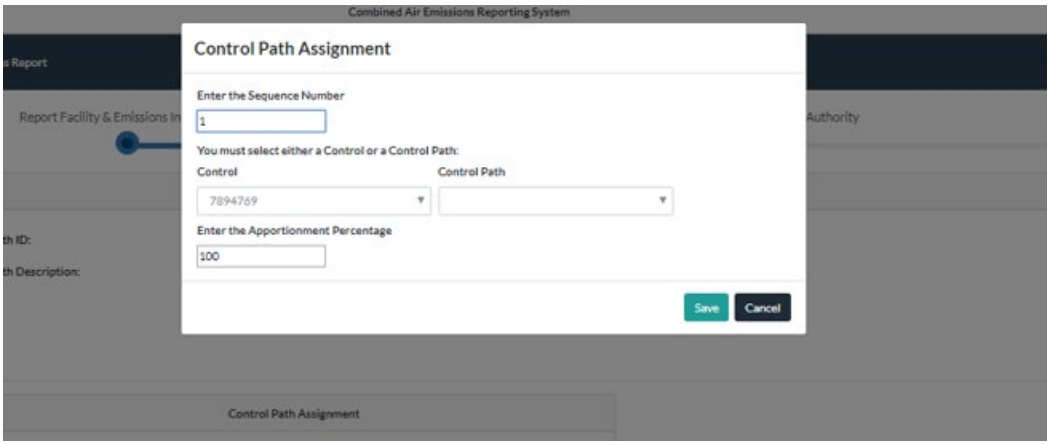


Figure 36. Adding a Path Assignment



Enter the control apportionment percentage. For example, if the control device or path you have selected will be first in the sequence and will be receiving 100% of the emissions from the emissions process, you would enter 100. If a control receives all emissions from the previous control device or path in the sequence, enter 100. If the control will be receiving 50% of the emissions from the previous control or path in the sequence, enter 50. Click "Save" to go back to that path's screen. Your assignment should appear in the list of assignments.

Here is an example of how data would be entered for a facility with complex controls (see the example facility in Section 8, (Figure 59). For the example facility, controls are configured as shown in Figure 37.

Additionally, Control Device 1 sends 60% of its emissions to Path 1 and 40% of its emissions to Control Device 3. Controls 2 and 4 are configured in sequence, and would be added to Path 1 from Path 1's screen as shown in Table 1. In Path 2, Path 1 and Control 3 run in parallel and thus, have the same sequence number. Path 2 would include the following as shown in Table 2 where Path 1 and Control 3 have been highlighted.

Figure 37. Example of a Facility with Complex Controls

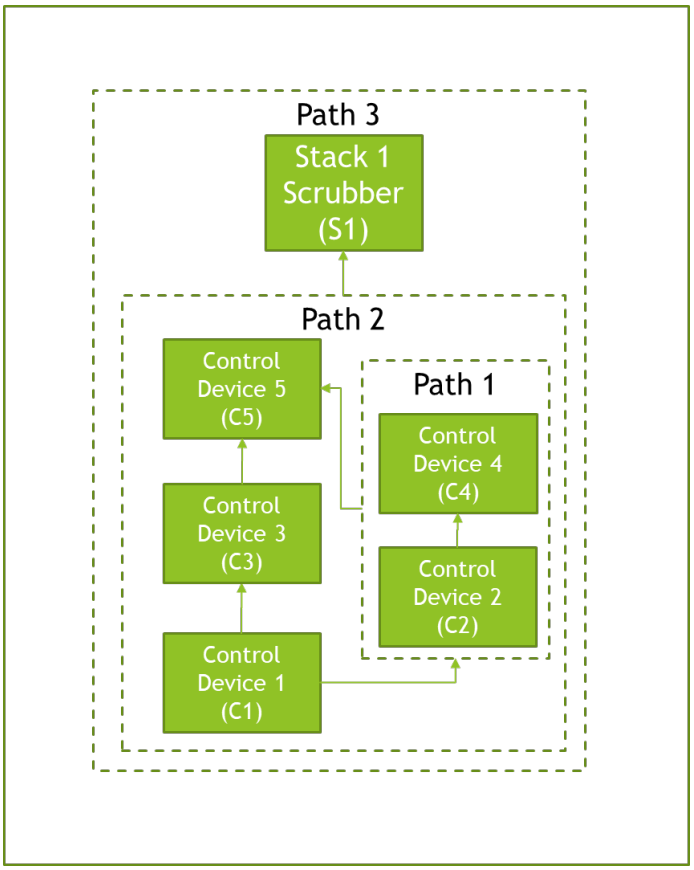


Table 1. Example of Data Entry for Controls in Sequence

Control or Control Path	Sequence Number	% Apportionment
Control 2	1	100
Control 4	2	100

Table 2. Example of Data Entry for an Assignment including a Control and a Path Running in Parallel

Control or Control Path	Sequence Number	% Apportionment
Control 1	1	100
Path 1	2	60
Control 3	2	40
Control 5	3	100

For these numerical examples, the Control Path Assignment box at the bottom of each control path's page would now reflect the following information as shown in Table 3 and Table 4 (where Path 1 and Control 3 have been highlighted):

Table 3. Example of Data Display for Controls in Sequence

Sequence Number	Assignment	Apportionment
1	Control 2	100
2	Control 4	100

Table 4. Example of Data Display for an Assignment including a Control and a Path Running in Parallel

Sequence Number	Assignment	Apportionment
1	Control 1	100
2	Path 1	60
2	Control 3	40
4	Control 5	100

To associate the control path to one or more processes and release points, select the relevant unit from the "Emissions Inventory" menu on the left-hand side or from the list in the "Emissions Unit" page under "Facility Inventory". Then, choose the relevant process for that unit that you want to associate and follow the instructions in Section 2.3.2 on how to associate a release points with processes.

2.3 Emissions inventory

The left-hand side menu of the application shows a list of units for the facility under "Emissions Inventory". You can click on the arrow to the left of the Unit ID to show a list of processes associated with that unit. Click on any one of those units or processes to show the unit's information.

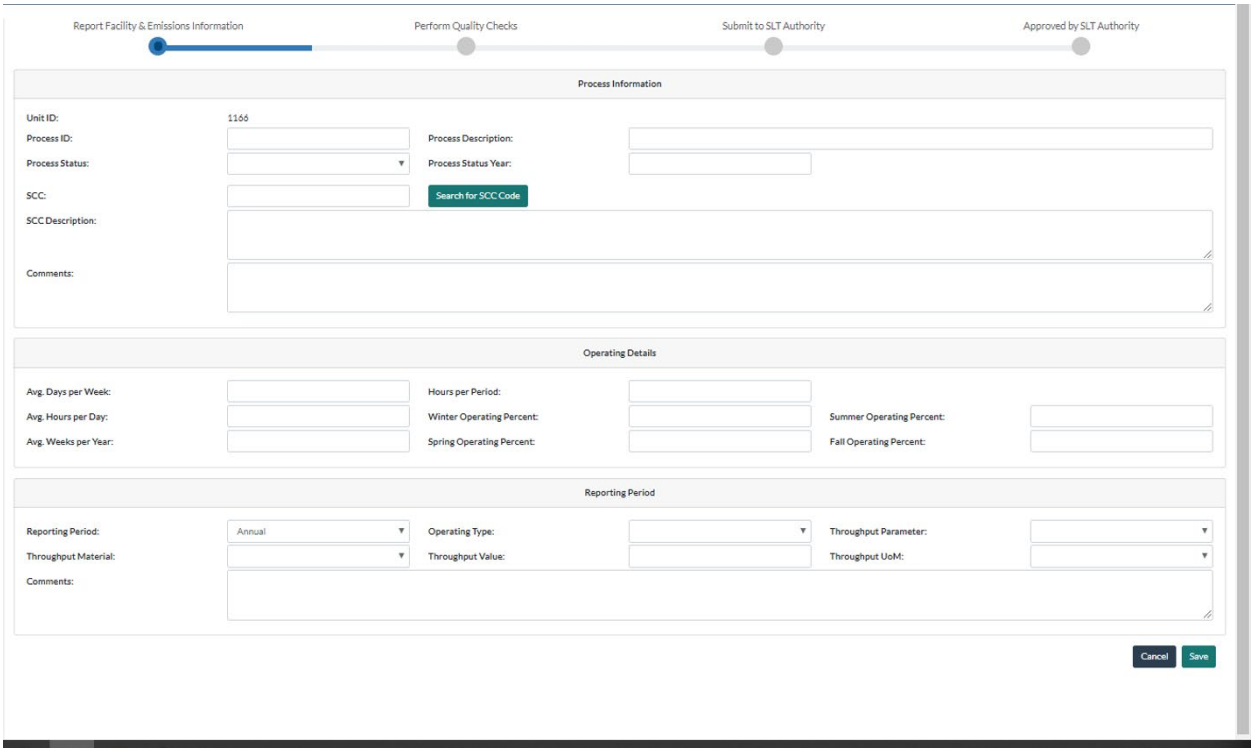
2.3.1 Units

Click on the unit you are interested in. This will take you to that unit's information page. Click on the "Edit" button at the top right of the screen to make changes to the emissions unit information. For more information on adding or editing a unit, see Section 2.2.2.

2.3.2 Processes

From the left-hand side menu, click on the relevant unit. Once you are in that unit's information page, you will be able to add or edit a process. To add a process, click on the "+" at the bottom of the list of processes in the "Processes Associated with this Emissions Unit" box. This will take you to a process page (Figure 38) where you can enter all relevant information for that process. Drop-down menus will assist you in selecting some data fields. Error messages will appear for items that have been entered incorrectly or for missing fields that are required.

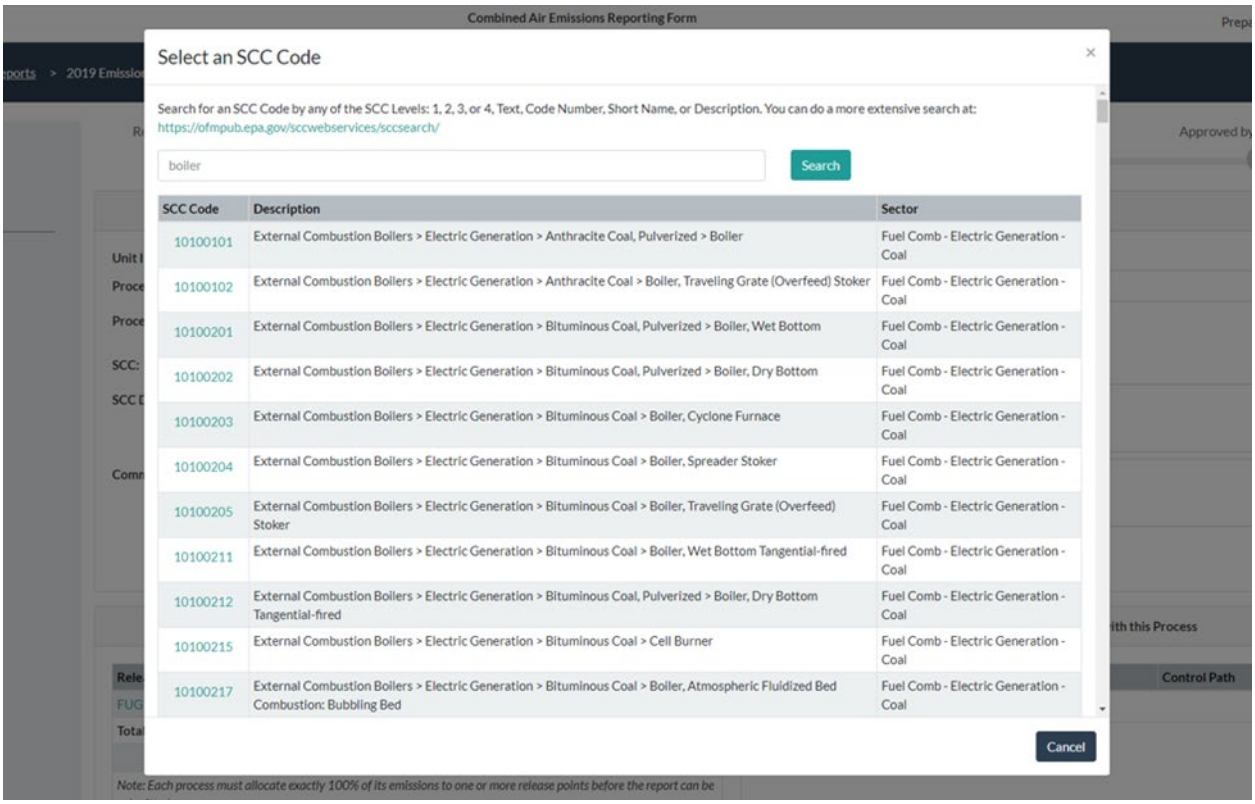
Figure 38. Adding a New Process



Note that your process Source Classification Code (SCC) can be found via search. Click on the "Search for SCC Code" button and enter a search term (for example, boiler). The search will be performed and return a list of options for you to choose from. Click on the SCC you want to use. Note that the SCC Level descriptions for that code will pre-populate in the SCC Description box. You may also enter an SCC if you already know it (for example, 10100201). See Figure 39.

The form will crosscheck that the code you are entering is a valid point source code and is a code that has not been retired before the inventory year you are reporting. A warning will be displayed if the selected SCC is being retired the year of your report, or in the future, but you will still be able to use that code. However, if the SCC you select was retired before the year of your report, you will see a critical error. If you want to see a full list of codes or perform different searches, go to https://epa.gov/scc.

Figure 39. SCC Search



Once you add a process, it will appear in the list of processes associated with that unit on the unit's information page.

From the unit's information page, you can also edit a process. Click on the process you want to edit. This will take you to a page with all the information about that process (Figure 40). Click on the "Edit" button at the top right of the screen to make changes to the process information (Figure 41).

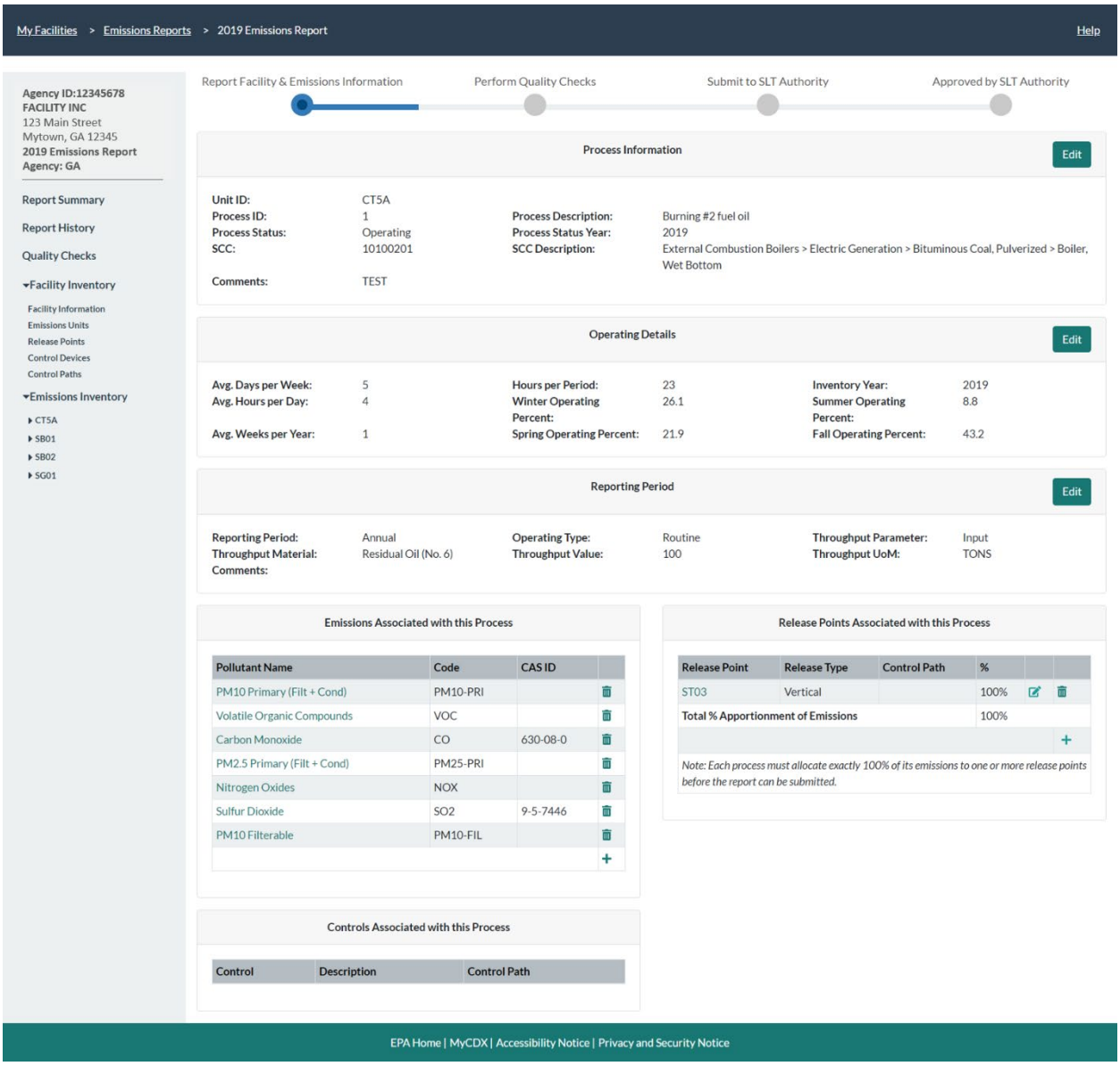
Similarly, you can also edit operating details and reporting period information by clicking on "Edit" in each of those boxes. Note that Version 1 of the CAER System is for annual reporting only. Future versions of the system will offer more reporting periods. Click "Save" when your edits are finished. Click "Cancel" if you find your edits are an error and wish to discard them.

From a unit's page, you should only delete a process using the garbage can icon if you added it to this year's report and that addition was an error. If the process existed in a previous year's report, and is no longer in use, you can click on its ID and change its status from "Operating" to "Permanently Shutdown". Once you have done so, the data on the operating details and reporting period for that process will be hidden from view. However, the "Release Point Apportionment" and "Controls Associated with this Process" will remain.

When throughput for a process is changed, the CAER system will automatically calculate the emissions for all pollutants associated with the process, where this is possible. A message in a green box will appear at the top right of the screen indicating that calculations were successful. If a calculation is not

possible, an orange or red box will appear with an error message indicating the problem encountered with the calculation.

Figure 40. Example of a Page for a Process

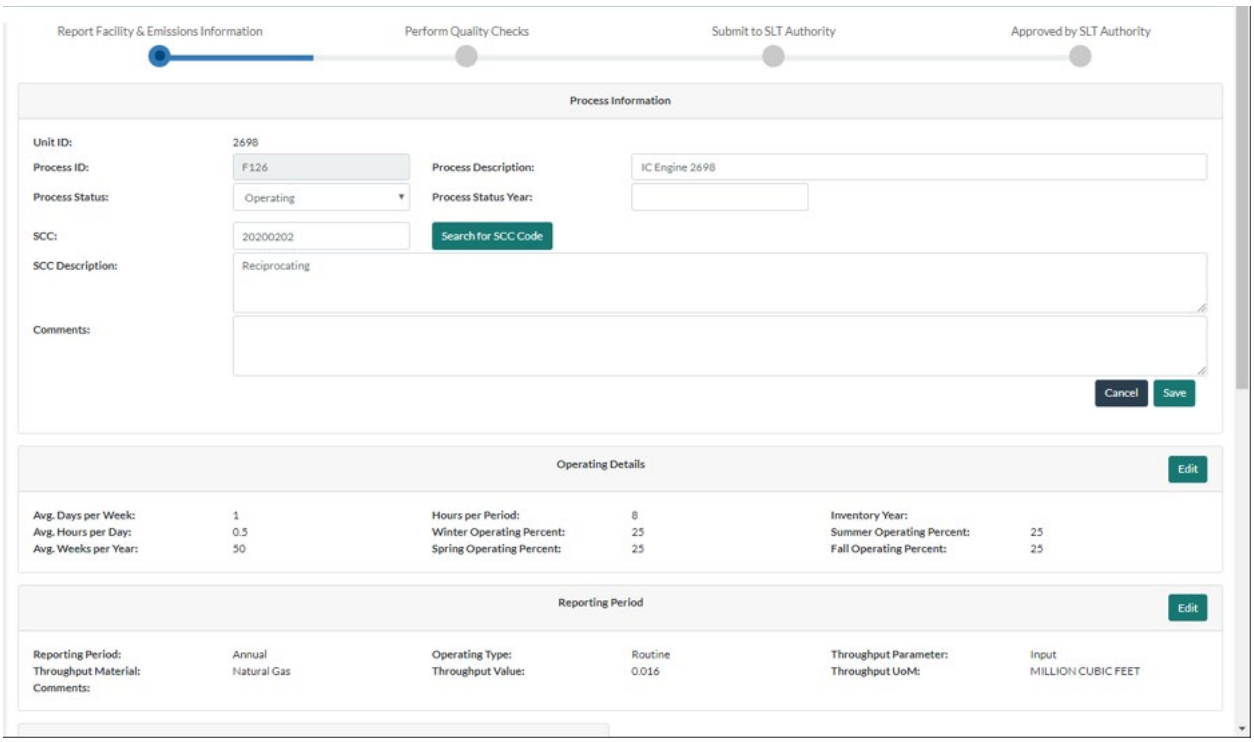


In the page for that process, you will also see pollutants, release points, and controls associated with the process.

To add a release point to a process, see Section 2.3.2.1. Associated control paths and controls will appear once the process has been associated to the release point as described in Section 2.3.2.1.

To add pollutants to a process, see Section 2.3.2.2.

Figure 41. Editing a Process



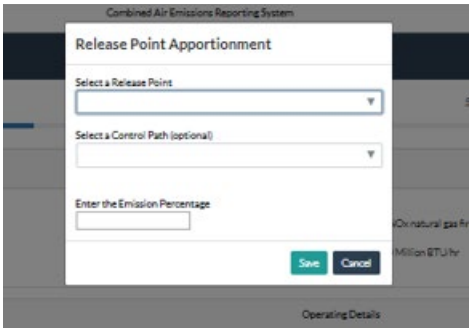
2.3.2.1 Associating a Process to a Release Point

Go to the process information page (Figure 40). You can get there by clicking on the corresponding unit from the left-hand side menu, and then clicking on the relevant process ID. First, in the "Release Points Associated with this Process" box, click on the "+" sign to add a release point associated with the current process. A pop-up window will appear requesting information about the release point, the control path (optional), and the percentage of the process' emissions being directed to that release point (Figure 42).

If there are not controls between the process and a release point, you do not have to enter a control path. You will simply apportion the corresponding emissions to the release point.

If there are controls to associate the control path to one or more processes and release points, you should associate them here. Note that the control and path assignments should have been defined before attempting this step (Sections 2.2.4 and 2.2.5). This will allow you to select from existing release points, and control paths. All emissions from the process must be apportioned to a release point so that 100% of total emissions have been assigned to one or more release points.

Figure 42. Release Point Apportionment



After entering the relevant information, click "Save". Now you will be able to see, in the "Controls Associated with this Process" box at the bottom left of the screen, the path you have associated with the release point and process.

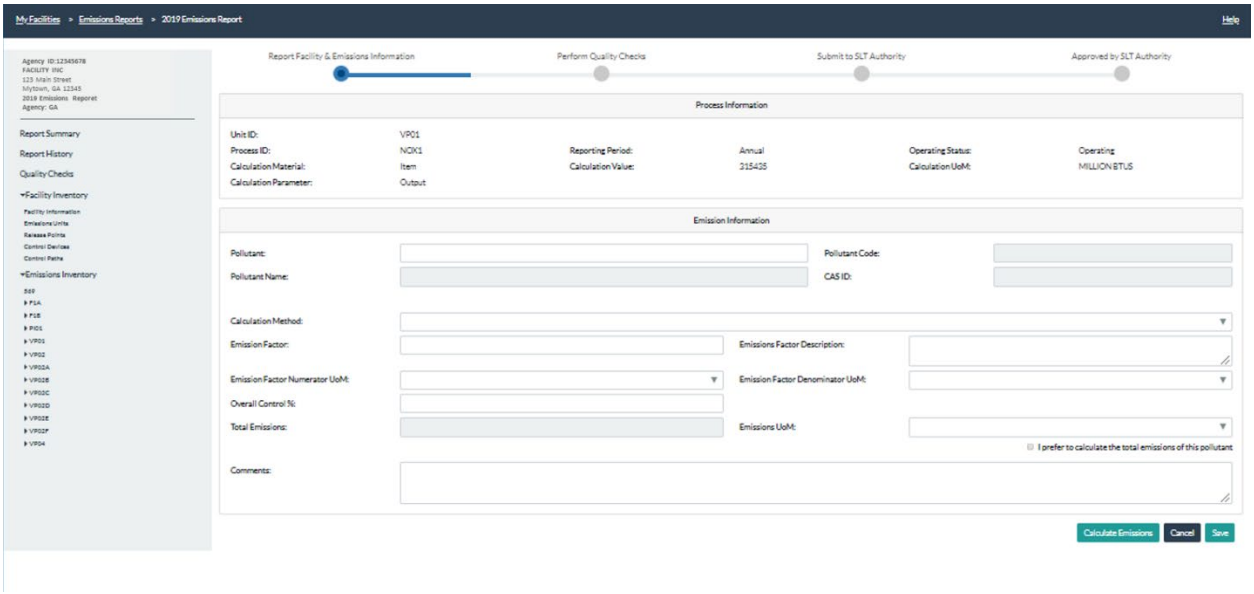
You will not be able to edit the controls associated with the process from this page. If you need to edit the controls and/or paths, you must ensure you have entered the relevant control devices and their paths as in the steps described above, and that you have associated them to the relevant process.

2.3.2.2 Entering and Calculating Emissions

In the page for that process, go to the "Emissions Associated with this Process" box in the lower left side of the screen (Figure 43). Click the "+" sign to add emissions. This will take you to a new pollutant page. In the "Pollutant" data field start typing in the name, code, or CAS number. The form will assist in finding the name of the pollutant. Once you have found the pollutant you are looking for, select it. The form will then prepopulate the other pollutant data fields: Pollutant Code, Pollutant Name, and CAS ID if it exists. For example, typing in sulfur will render Sulfur Hexafluoride – SF6, and Sulfur Dioxide – SO2-9-5-7446. Note that some pollutants, such as Volatile Organic Compounds (VOC) do not have a CAS number because they are groups of pollutants, as opposed to single pollutants. You will still be able to select such pollutants even if the CAS number field appears blank.

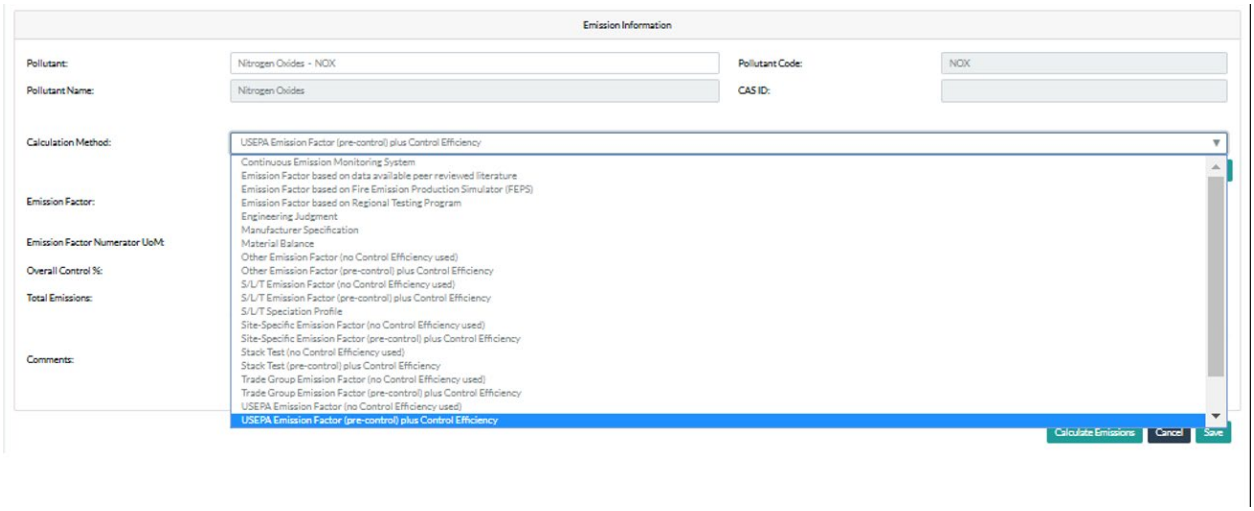
EPA augments triannual reports to reflect Hazardous Air Pollutants (HAPS). Alternatively, if you wish to reflect your own HAP calculations instead of EPA's, you will be able to do so by entering your own HAP data when entering pollutant emissions (see Section 2.3.2.2).

Figure 43. Adding a New Pollutant



Next, select calculation method from the drop-down menu. The form will require the user to enter specific data fields according to the calculation method selected. If you have selected a USEPA Emission Factor, the form will allow you to search for an emission factor by clicking on the corresponding box under the calculation method.

Figure 44. Selecting a Calculation Method



Note that some factor searches will return formulas. The form will require the user to then supply additional parameters for that formula. For example, sulfur content %. If the emission factor units of measure (UoM) is different from the throughput UoM's, the form will return an error. However, the form will perform a simple conversion for units of the same kind (for example, weight UoM conversions from lbs to tons). See Section 9.3.2 for more information on conversions in CAERS. After entering all required fields, click on "Calculate Emissions" and the form will calculate the emissions for you. A green

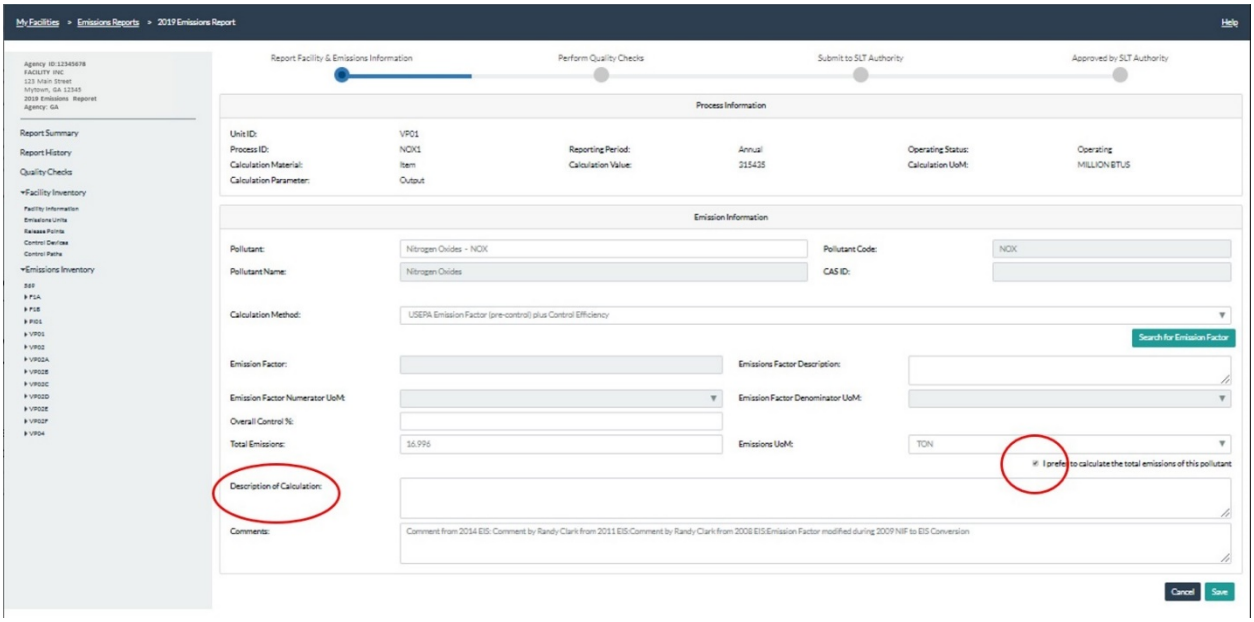
confirmation message at the top right of your screen will appear to indicate the calculations have been performed. Click “Save” to be taken back to the emission unit information page.

If you have selected an EPA emission factor because one exists but the UoM conversion is not straightforward (i.e. the emission factor is in tons but the throughput is in hours), you can click the box ”I prefer to calculate the total emissions of this pollutant” located under the Emissions UoM box, and the calculator will disengage. If you disengage the calculator, you must enter a description of your calculation process in “Description of Calculation” box to justify the use of an alternative emission factor or total emissions you calculated (Figure 45).

If controls are present (associated with this process via a path), enter the overall control efficiency for the path in the “Overall Control %” box. For a single control this is equal to the multiplication of: (percent capture) x (percent effectiveness) x (percent efficiency). For more than one control (including control paths) it is the total percent of the pollutant that is removed by the controls (or control paths). You should reach out to GA DNR if you have questions about how to calculate this value for your specific controls configuration. For a numerical example on controls, see Section 9.3.5.

Note that your previous system may have rounded the emission factor and/or emissions totals. In that case, re-select or re-enter the rounded values to eliminate rounding.

Figure 45. Using EPA Emission Factor Alternative



For any estimation method that does not involve an emission factor, you will be required to enter a comment. You may enter “None” or “NA” if no comment is needed or you believe entering a comment is not applicable. However, for the method “Engineering Judgement” you should always enter an explanation as to how you arrived at your emissions estimate. You may also attach a file with an explanation. You should write “See file attachment: “ and the name of the file in the “Explanation of Calculations” box.

3 Reporting Emissions and Facility Information Using Bulk Upload

3.1 The Bulk Upload Template

If you will have relatively few changes between your previous year report and your current year report, we encourage you to use the user interface instead of bulk upload because this may be more time saving for you. If you chose bulk upload, you will be able to use it to upload all your data into the system. There is a special template for bulk upload in Excel format. You should use extreme care when entering data into the spreadsheet making sure you have not created an error in the template inadvertently. You should familiarize yourself with this section of the instructions before attempting to use the bulk upload feature. Also, tips and tools for data entry that have been explained in the User Interface portion of this guide (Section 2) will be helpful.

For CAERS Version 1, new facilities will be provided a template by GA DNR. Facilities that have reported in previous years will be provided a pre-loaded template file with their previous year annual emissions (National Emissions Inventory) report. We strongly recommend that you make a copy of that pre-loaded template and work with the copy, in case you need to revert to the original.

When you open your file, if a yellow bar appears at the top asking if you want to enable content or allow edits, click on the button provided to enable content or edits. Once you have your Excel file template open, you should enter your edits into this file, to reflect the current year submission data.

The template contains several tabs (Figure 46). There are two sets of tabs:

Data entry tabs are highlighted in blue. Each tab contains specific types of data to be submitted. Drop-down menus help you avoid errors when entering codes, by displaying the allowed choices. The data entry tabs are:

- Facility
- Facility Contacts
- NAICS
- Release Points
- Emission Units
- Emission Processes
- Controls
- Control Paths
- Control Assignments
- Control Pollutants
- Apportionment
- Reporting Period
- Operating Details
- Emissions
- Emission Formula Variables

The rest of the tabs (in gray) are a Worksheet Map and lists of codes for entry of different data fields. Please do not attempt to edit these lists as they are part of the data validation for the data entry tabs. The list of tabs is as follows:

- Worksheet Map (containing JSON Keys)
- Aircraft Engine Type Code (for airport SCCs only)
- Calculation Material Code
- Calculation Method Code
- Calculation Parameter Type Code
- Contact Type Code
- Control Measure Code
- Emission Factor Code
- Emission Formula Variable Code
- Emissions Operating Type Code
- Facility Category Code
- Facility Source Type Code
- FIPS County Code
- FIPS State Code
- HAP Facility Category Code
- NAICS Code
- Operating Status Code
- Pollutant
- Program System Code
- Release Point Type Code
- Reporting Period Type Code
- Source Classification Code
- Tribal Code
- Unit of Measure Code
- Unit Type Code

The blue data entry worksheets have the same entities that are presented in the web application, for example: facility level data, release points, and emissions units. There are several fields that are required in the spreadsheet so that it can be used in CAERS successfully. These fields are denoted by an asterisk in the column header (row 10). Be sure to enter values or select an option from the dropdown menu in each of the required fields.

There are also relationships among some of the blue data entry worksheets. For example, the "Emission Processes" worksheet will ask for the corresponding Unit ID for each process row. The options in the "Unit ID" dropdown menu on the "Emission Processes" worksheet are based on the units that are available on the "Emission Units" worksheet. As new units are added on the "Emission Units" worksheet, they will be automatically added to the "Unit ID" dropdown menu on the "Emission Processes" worksheet. Therefore, you need to enter your emission units before they are available in the "Emission Processes" worksheet. Other instances where fields are dependent on other worksheets include:

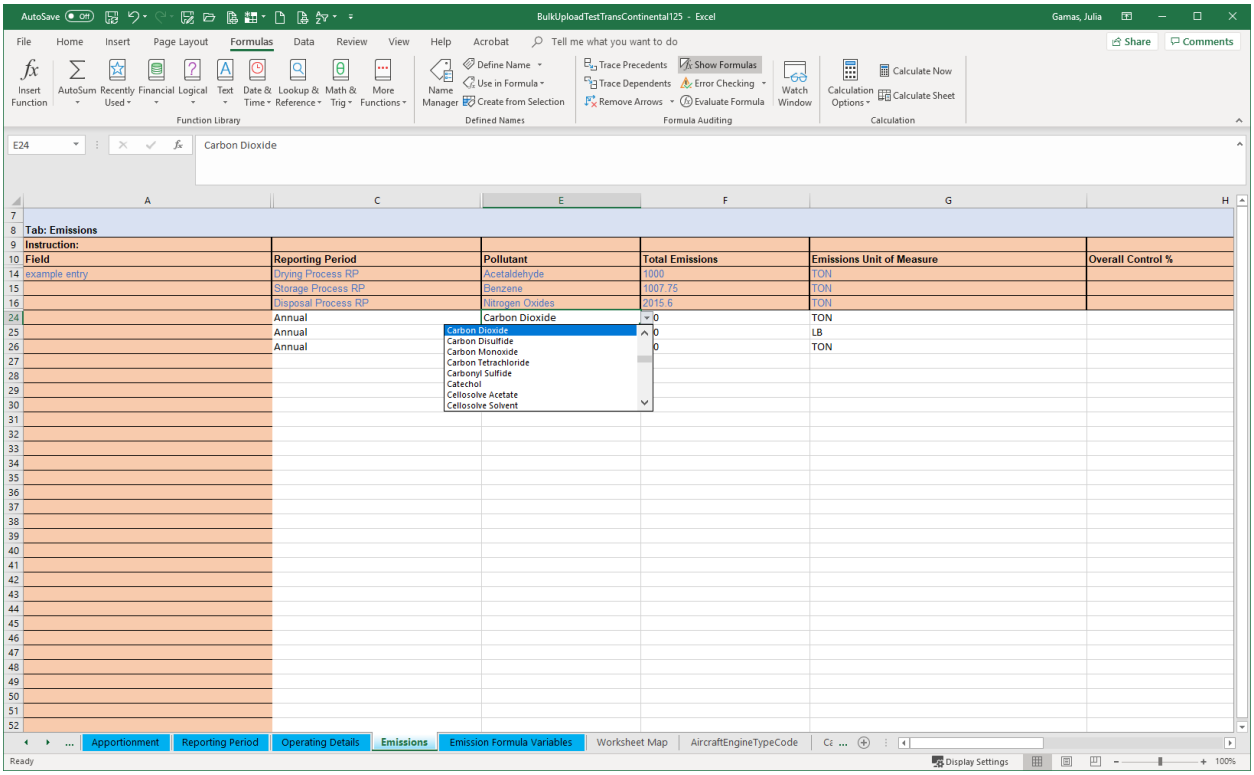
- Control Assignments worksheet:
    - Path ID relies on entries from the Control Paths worksheet,
    - Control ID relies on entries from the Controls worksheet,
    - Control Path (Child) relies on entries from the Control Paths worksheet

- Control Pollutants worksheet: Control ID relies on entries from the Controls worksheet
- Apportionment worksheet:
    - Release Point ID relies on entries from the Release Points worksheet,
    - Process ID relies on entries from the Emission Processes worksheet,
    - Control Path ID relies on entries from the Control Paths worksheet
- Reporting Period worksheet: Process ID relies on entries from the Emission Processes worksheet
- Operating Details worksheet: Reporting Period relies on entries from the Reporting Periods worksheet
- Emissions worksheet: Reporting Period relies on entries from the Reporting Periods worksheet;
- Emission Formula Variables worksheet: Reporting Period Name relies on entries from the Emissions worksheet

There is special formatting in the bulk upload template, such as hidden fields and formulas. Ensure that you are keeping with the correct format for each data field and are using the codes as indicated by the drop-down menus. Many fields that are required by the CAER System are hidden from view in the spreadsheet to help avoid uploading mismatched data, for example associating an emissions process to the wrong emissions unit. Use caution when performing certain actions within the bulk upload spreadsheet. Here are examples of potential risks:

- **Overriding formulas:** Within Excel, if you copy several horizontally adjacent cells of data and paste them into the CAERS Bulk Upload spreadsheet then you risk overwriting a necessary formula in a hidden field. However, you can safely copy and paste data vertically within a column.
- **Overriding drop-down menu values:** Pasting data into a field which has a drop-down menu will allow you to enter any data; however, if the value does not precisely match one of the values in the drop-down menu then the upload will return an error.
- **Deleting drop-down menu:** Deleting a cell that has a drop-down menu can potentially delete the drop-down menu completely. While deleting the entire cell will cause a problem, deleting the content of the cell is not a problem. For example, if cell E24 has a value of “CAP” then you can delete “CAP” but should not delete cell E24.
- **Overlooking changes to other worksheets:** when an error is fixed in a parent cell, connected cells do not refresh automatically. Be sure to update the connected cells even if the change doesn’t alter the connected cells. For example, when you enter a Unit ID on the “Emission Units” tab, that value will be available as an option in the Unit ID dropdown menu on the “Emission Processes” tab. If you navigate back to the “Emission Units” tab and change a Unit ID then you will need to manually update all of the rows on the “Emission Processes” tab that have the unit chosen. There may be a cascading effect with this example if the process has already been chosen from the Process ID dropdown menu on the “Apportionment” tab. In this scenario, you would need to update the Unit ID on the “Emission Units” tab, reselect the unit from the Unit ID dropdown on the “Emission Processes” tab, and reselect the Process ID on the “Apportionment” tab.

Figure 46. Example of Bulk Upload Template Worksheet



3.2 Bulk Upload Steps

Once your data is ready in the bulk upload template, from the ”Emissions Reports” screen click on “Upload Report”. Click on the “Browse” button to find the location of your bulk upload workbook on your computer. Once you have found the workbook, select it and the file name will now appear on your screen. Click the “Upload” button. A pop-up window will appear to show that the workbook is being uploaded. The speed at which this happens will depend on your internet connectivity speed. The upload may take several minutes depending on the size of the file.

It is good practice to give yourself extra time to address any errors that may emerge when using bulk upload. CAERS will run validations checks on your Excel file before allowing you to submit it, such as verifying that the required fields are present and that text fields do not exceed maximum lengths. These validation checks will be different than the QA checks that will be run on the data contents once it has been uploaded. Validation checks are run for the data file structure and format, whereas QA checks are run on the data contained in the file.

If the uploaded spreadsheet has errors that keep it from uploading to CAERS successfully then you will see a list of “Data Errors” on the screen. Each error will indicate the worksheet and row in error, as well as a brief message describing the error. After all the errors have been resolved, you can attempt to upload the file again. If there are not any errors in the uploaded spreadsheet then you will be brought directly to the “Report Summary” for the uploaded report. At this stage you can navigate the CAER System as described in Section 2.

4 Performing Quality Checks

When you have finished entering or uploading your data, the next step is to run the quality checks. Click on "Report Summary" on the left-hand side menu of your screen to go to the Report Summary page. Click on the "Run Quality Checks" button below the "Report Summary" table. This will take you to a "Quality Review" page where you will see two types of errors listed (Figure 47):

- **Critical errors** will appear in red. These errors must be addressed for the report to go through.
- **Warnings** will appear in purple. These errors will not prevent you from submitting the report, but they will alert you to potential issues you may want to address before submitting.

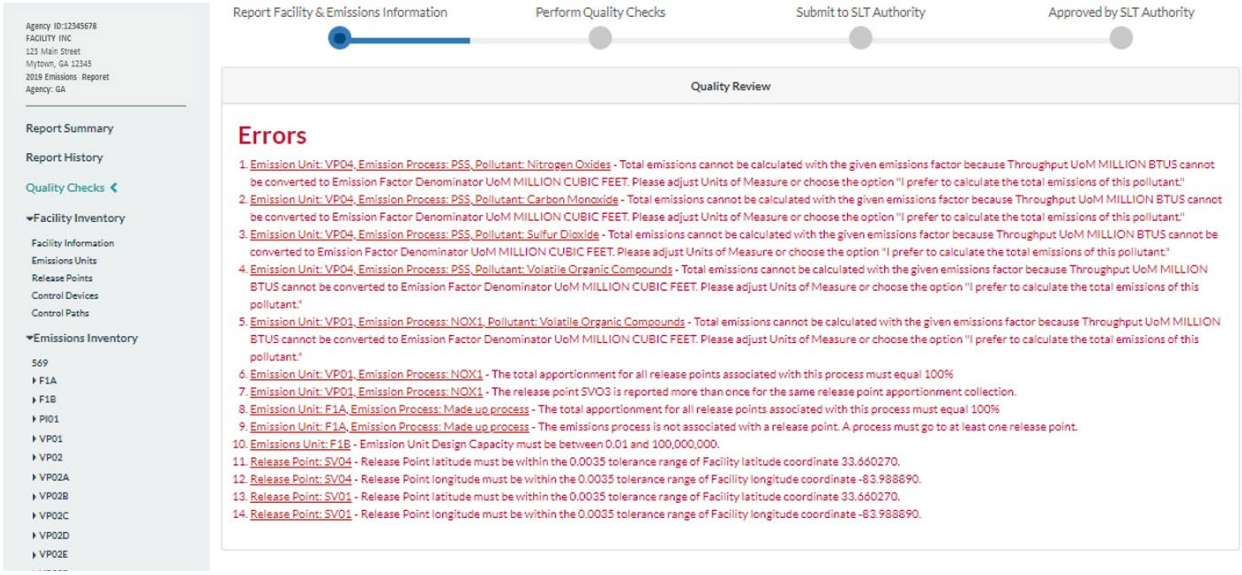
Broadly speaking, error messages fit in one of the following categories:

- **Calculation errors -** Data calculated outside the form that doesn't match up with what the CAERS is calculating, for example:
    - your reported emissions for a process and pollutant are not within 1% (warning) or 5% (critical) of the emissions CAERS is calculating.
- **Inconsistent data entries -** Data entered is not possible given some physical or temporal constraint, for example:
    - 100% of annual emissions for 52 weeks of operation have been entered as occurring during the Winter season;
    - the latitude for a release point has been reported but is too far from the facility (outside of its facility latitude threshold);
    - an emission factor was provided, but its denominator is in different units of measure than throughput, so a simple conversion is not possible; and
    - the reported emissions previous year reported emissions are identical to the previous inventory year reported emissions.
- **Expected information is missing -** Data are expected to be entered, but the data field is empty. This includes data fields that are conditional on the entry of others. Examples include:
    - in the EPA emission factor, the "I prefer to calculate the total emissions of this pollutant" has been checked but the "Description of Calculation" box has not been populated;
    - controls exist that have not been assigned to a path; and
    - if a release point stack diameter is reported, then exit gas flow rate and exit gas velocity should also be reported.
- **Incorrect format -** Data must be entered in a specific format, for example:
    - postal code must be in five-digit or nine-digit format; and
    - value for a year must be four digits.
- **Data is not allowed –** Data entered is not allowed, for example:
    - duplicate ID was entered for the same component (unit, release point, process, or control), but ID's for sub-facility components must be unique within the facility;
    - units of measure that are not supported are being used; and

- SCC entered has been retired in a year prior to the inventory year being reported.

In the case of data that are not allowed, some legacy data may have been carried into the CAER System. While the old data will be displayed, the system may require you to update it. For example, in a previous submission you used a unit of measure code “Million BTUS”, but the system now requires you to enter the new code “E6BTU”. Be sure to update the information by selecting a valid code from the drop-down list.

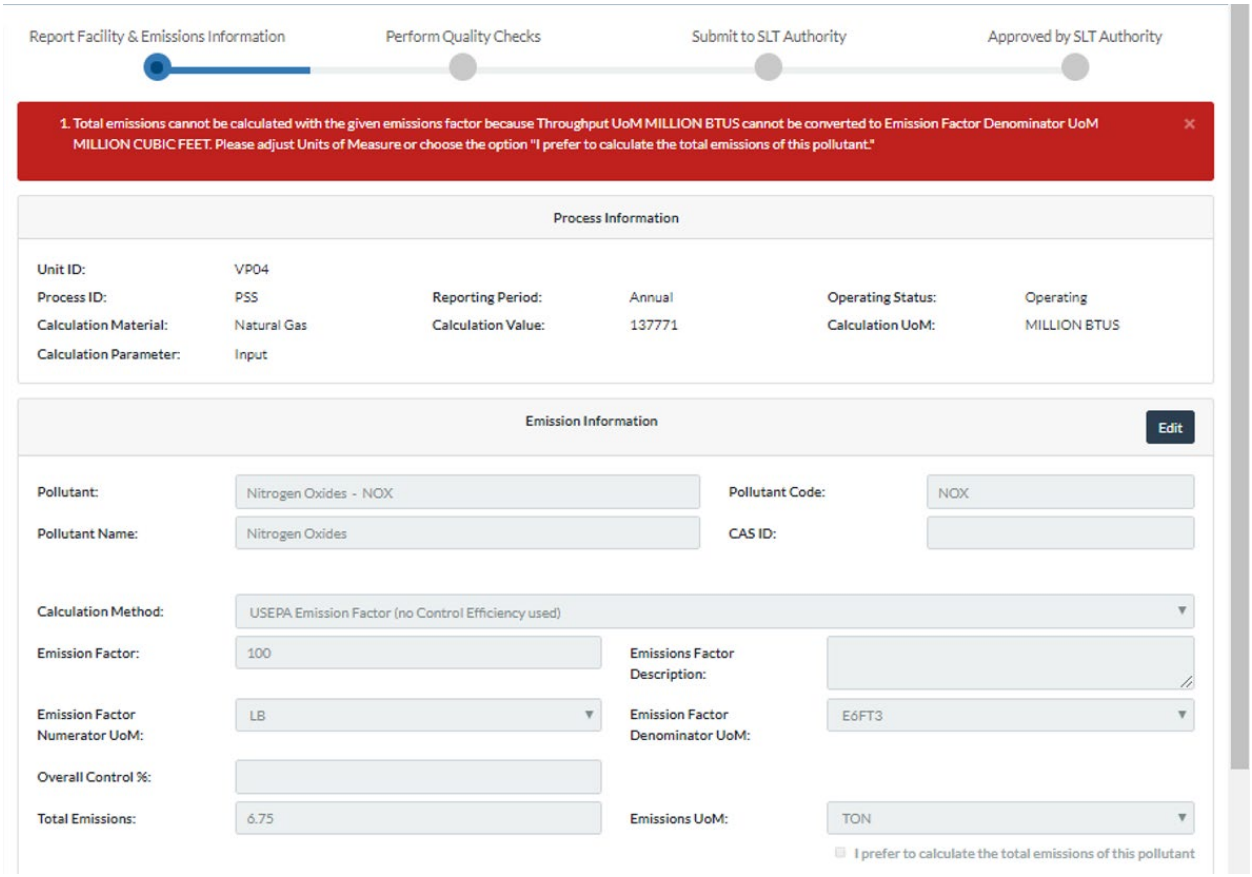
Figure 47. Quality Review Page



Note: Example errors here are not comprehensive in this figure.

Click on the name of the error (underlined), to be taken to the screen where the error is occurring (Figure 48). You will see a red bar at the top of your screen containing the error to be addressed. Click on the “Edit” button of the relevant box to make your edits, then click “Save”. You can now click on the “x” at the top right of the error message in the red box to remove it from view.

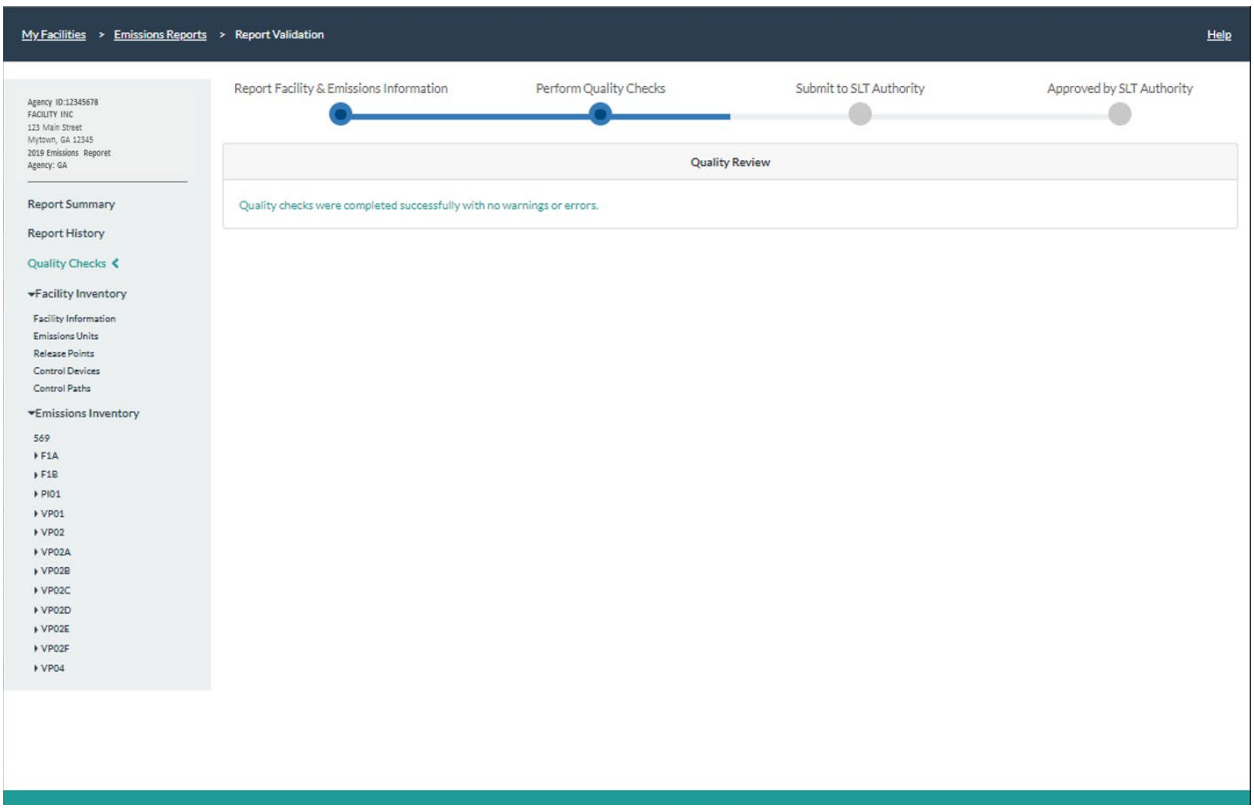
Figure 48. Correcting an Error



Click on “Quality Checks” link on the left-hand side of your screen to return to the “Quality Review” page. When you return to the “Quality Review” screen the error will have disappeared. Once you have finished correcting your errors you should re-run the quality checks. Once you have addressed all errors you will see the “Quality Review” screen devoid of error messages (Figure 49). You will also see the blue line has advanced on the top of your screen to show that the quality checks step has been completed.

While you will be able to use the bulk upload feature, at this time, the application will not be able to bulk download your submission into the Excel template format. Consequently, if you choose to edit your errors from the user interface, you will not be able to download those edits to continue your edits in the bulk upload template. If you submitted your report using bulk upload, you may want to do all edits in the template and upload it again. Such an approach ensures that your bulk upload template is correct, to make it easier to use if you have other corrections or data to submit through bulk upload.

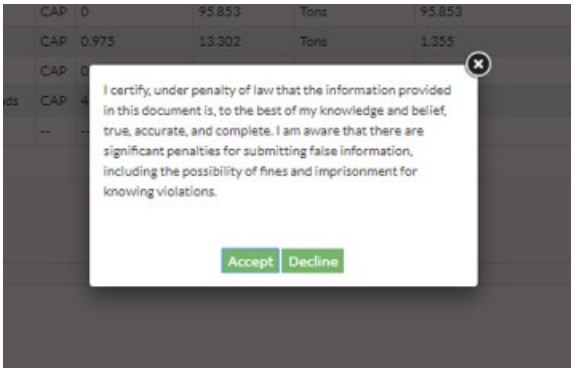
Figure 49. Completing Quality Checks



5 Certifying and Submitting to your State, Local, or Tribal Authority

As a certifier, you will log into CAERS and chose the "certifier" role from the "My CDX" page (Figure 8). You will see the same screens as the preparer. However, when you are in the "Report Summary" page, you will see an additional button "Certify and Submit to SLT" (SLT stands for State, Tribal, or Local authority). When you are ready to certify that your submission is complete and accurate, click on that button. This will take you to a three-stage (CROMERR) process. First, it will request your password, then it will ask you to answer a security question. Finally, it will ask you to click certify (Figure 50). You will see a "please wait" sign while you are waiting. Once the submission has been certified, a message will appear in green at the top right of your screen. The progress bar at the top of your screen will have changed and "Submit to SLT Authority" will now be highlighted in blue.

Figure 50. Submission Certification



After certifying, your report will be available for you to either reopen or review. We do not recommend reopening your report unless you have an edit, as it will have to be re-certified and re-submitted. You should contact your SLT authority if that is the case, to notify them of any changes you intend to make. You will also want to reopen the report to make corrections, if your submission has been sent back to you.

Once you have submitted your report, you will be able to click the "Report" button to obtain a summary report for your records.

6 Submission Approval

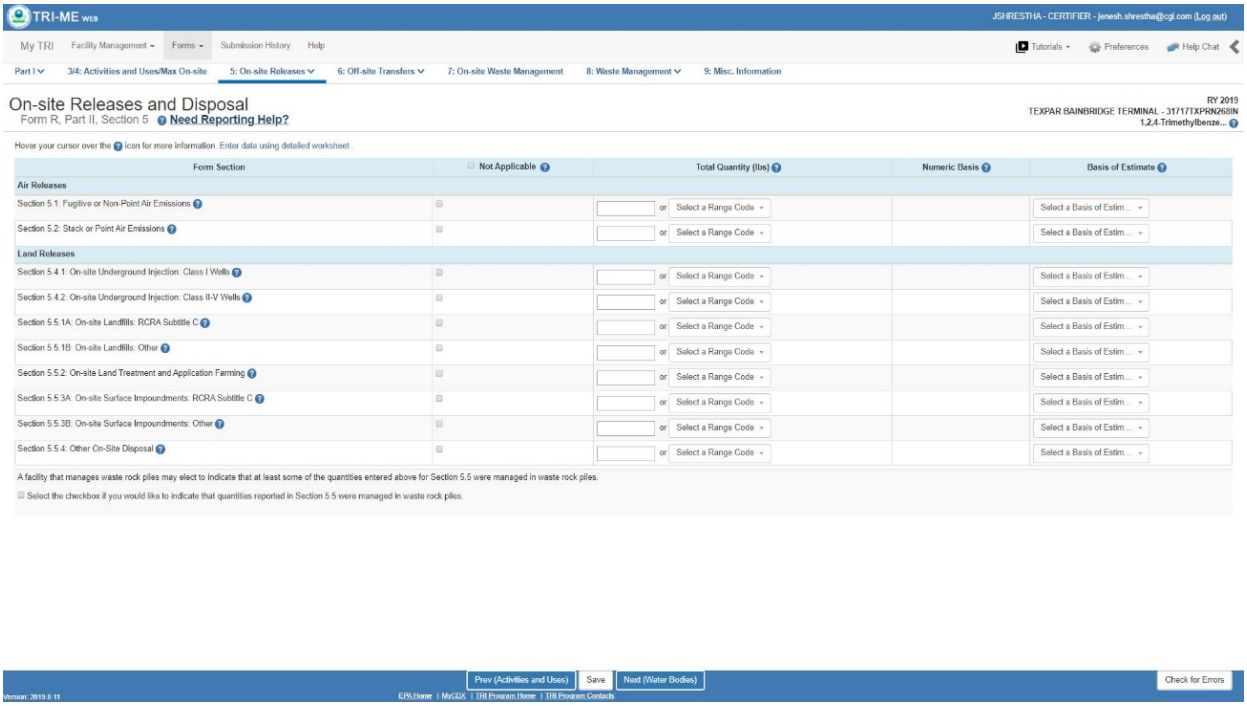
Once the report has been submitted, your SLT Authority (GA DNR) will review the report. The person listed under "Emissions Inventory" contact for your facility will be notified of whether the report was approved or rejected. If rejected, comments in the email will explain the issue(s) to be addressed. At that point you should re-open your report and issue the corrections indicated by your SLT Authority. If your contact person will change at any time after the report was submitted, please let staff at GA DNR know so the new contact person can be approved to enter CAERS and issue any corrections as needed.

7 Using Data Reported in CAERS for a TRI-MEweb submission

If you are an NEI-TRI facility reporter, you may start a TRI and NEI reportable chemical Reporting Year (RY) 2019 Form R in TRI-MEweb at anytime before the July 1 TRI reporting deadline. You should follow these steps to use data reported to CAERS in TRI-MEweb to save time reporting to both systems.

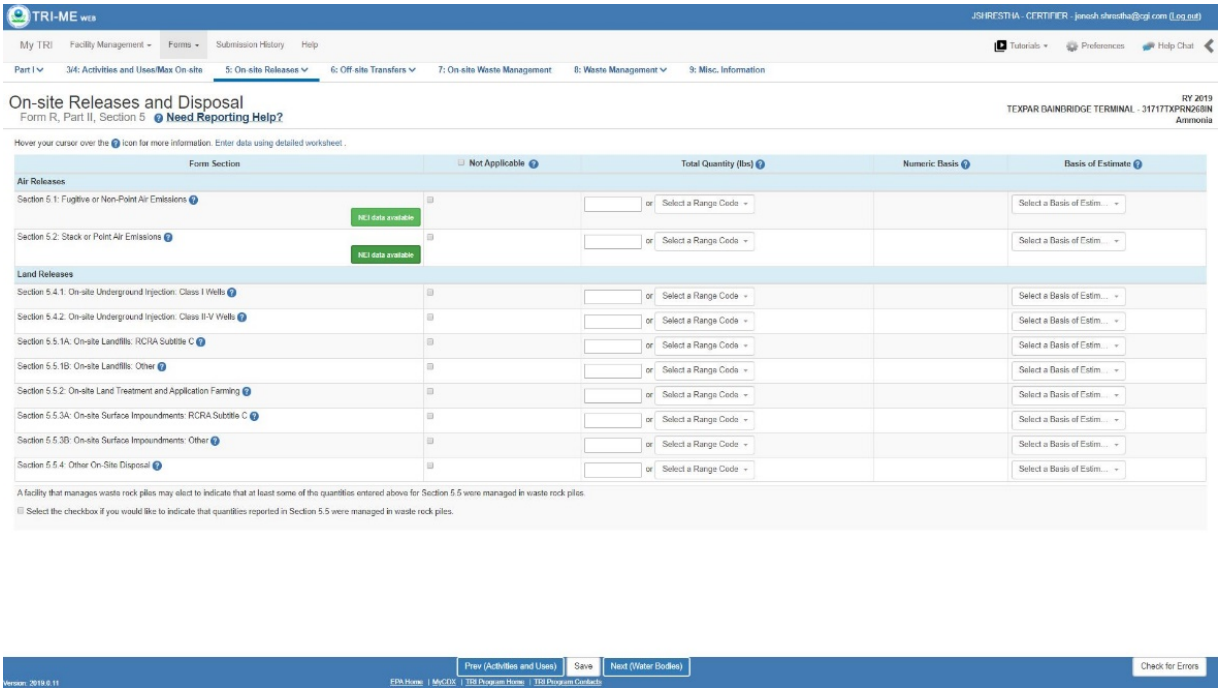
1. Upon arriving to Section 5 of the RY 2019 TRI Form R, an API call will verify if your EPA Facility Registration ID and CAS number match any data point in the CAERS database. Data in the CAERS database must be certified for it to be used in TRI-MEweb. See Figure 51.

Figure 51. Example of Section 5 Form R Screen in TRI-MEweb



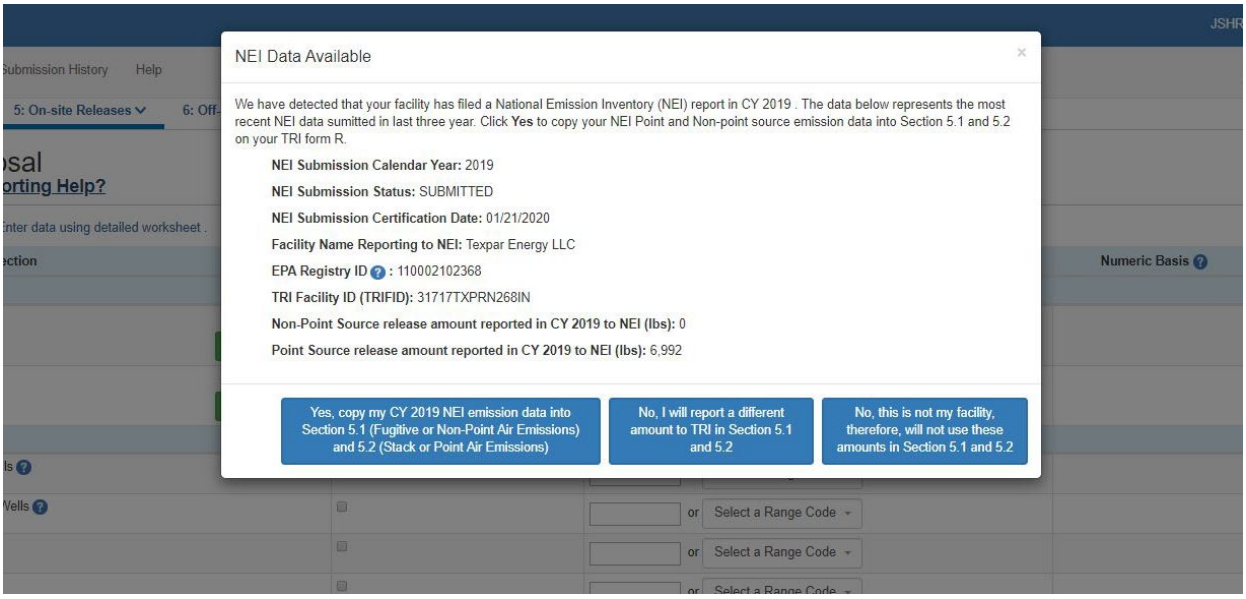
2. After a few seconds, if there is a match between the TRI-MEweb facility and chemical profile with the CAER database, a green icon titled “NEI data available” will appear (Figure 52).
3. As the preparer of the TRI Form R, click on the green button to call the NEI widget to appear on the Section 5 page of TRIMeweb.

Figure 52. Example of "NEI Data Available" Screen



4. The following pop-up will appear (Figure 53). It contains the most recent active record that is found in the CAERS database: Reporters for large NEI faciities will see the most recent annual submission that is available in the CAER system.

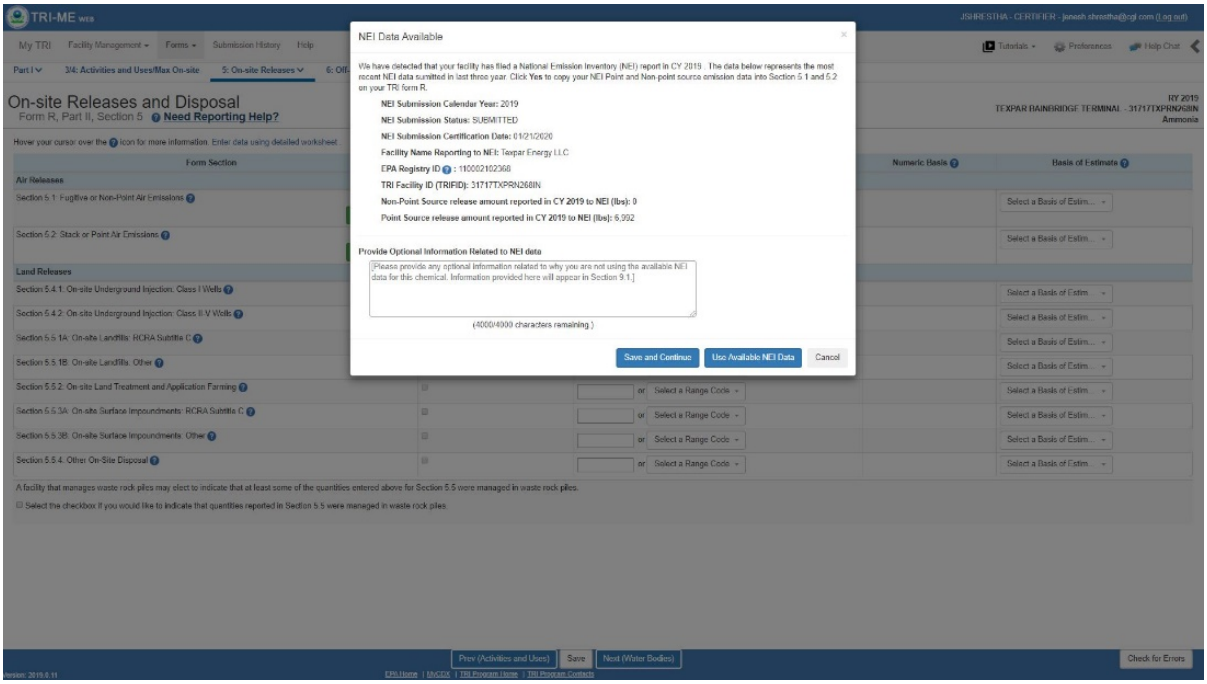
Figure 53. Example NEI Data Availability Pop-Up Window



5. If you decide, for whatever reason, not to transfer the amount that was shown in the pop-up or the facility information in the pop-up is inaccurate, a comment box will appear so that you can provide a rationale for why the NEI data point was not used (Figure 54). This comment will be

collected in Section 9.1 of the TRI Form R. We would like to make the submission process easier for you, and we appreciate knowing how we can improve this process for you.

Figure 54. Example Pop-Up Window for Comment



6. If you select “Yes, copy my CY [year] NEI emission data into Section 5.1 and 5.2”, the quantities will be copied into the TRI form R. You will then need to complete Form R, validate, and certify to complete their TRI reporting requirement.

8 Understanding Controls

The U.S. EPA is moving to a new way of representing controls in the National Emissions Inventory (NEI). In this section, we introduce the new concepts regarding controls to help you understand how to set the controls up for your facility in the CAERS.

It is important to capture the overall control reduction percentage for a given Process-Release Point-Pollutant combination, and thus, capture emissions totals correctly.

In the previous controls requirements for the NEI, we were not able to:

- Describe how controls are configured at a facility
- Define the relationship among Controls and Units, Processes, and / or Release Points
- Reuse the Definition a Control in the data, so that the same Control Equipment can be used by many components (Units, Processes, and Release Points)
- Change the values of controls data fields easily

The new way of setting up controls for emissions reporting will include the following features:

- A list of controls can exist for the facility as those controls exist in the real world.
- A control will only define one single piece of control equipment.
- Only the pollutants impacted by this piece of equipment will be listed with the control.
- The percent reduction for the pollutant will be the amount of emissions reduced due to this one piece of equipment.
- The "path" of can be described with the data:
    - In series
    - In parallel

There will be three new items to track in the new controls approach that are worth explaining. A few examples are included to illustrate the application of the concepts:

1. **Control Path:** defined as one or more controls at a facility that are linked. The path will allow the user to define multiple kinds of control setups. A path can consist of controls or other "children" paths. A path cannot refer to itself (or another path that contains it). Ultimately, there should be a "master path" that will define the controls that are encountered from the emissions generation point to the release point. That is, there should ultimately be at least one master path between a unit and a release point. These concepts will become clearer in the examples to follow.
2. **Control Apportionment:** defined as the percentage of the emissions that flows to the next control or path. For example, if emissions coming out of one control flow into one other control in a series, then the control apportionment is 100%. If emissions from one control flow to two or more other controls or paths, then the combined apportionment of those emissions to the other controls or paths must be equal to 100%. For example, 60% of emissions move from control 1 to control 2, and 40% of emissions flow from control 1 to control 3.
3. **Control Assignment:** defines the sequence or order in which controls are configured within a path. The first control in a path would have sequence number 1, the second control would have sequence number 2, and so forth. If there is a path within the path, that path will also have a sequence number.

8.1 Example of a Facility with No Controls

A facility that has no controls does not need to create any paths. All the user must do is provide a release point apportionment for the process(es) that send emissions to one or more release points. Figure 55 shows a graphic example of a facility with no controls. The red arrow represents emissions that ultimately move from the process to the release point: in this case all Process 1 emissions go to Stack 1. Table 5 shows how the data would be entered into the CAERS (or the bulk upload template) for the facility absent any controls. In this example, emissions from Process 1 are sent to Stack 1, so Stack 1 is apportioned 100% of Process 1 emissions.

Figure 55. Example of a Facility with No Controls

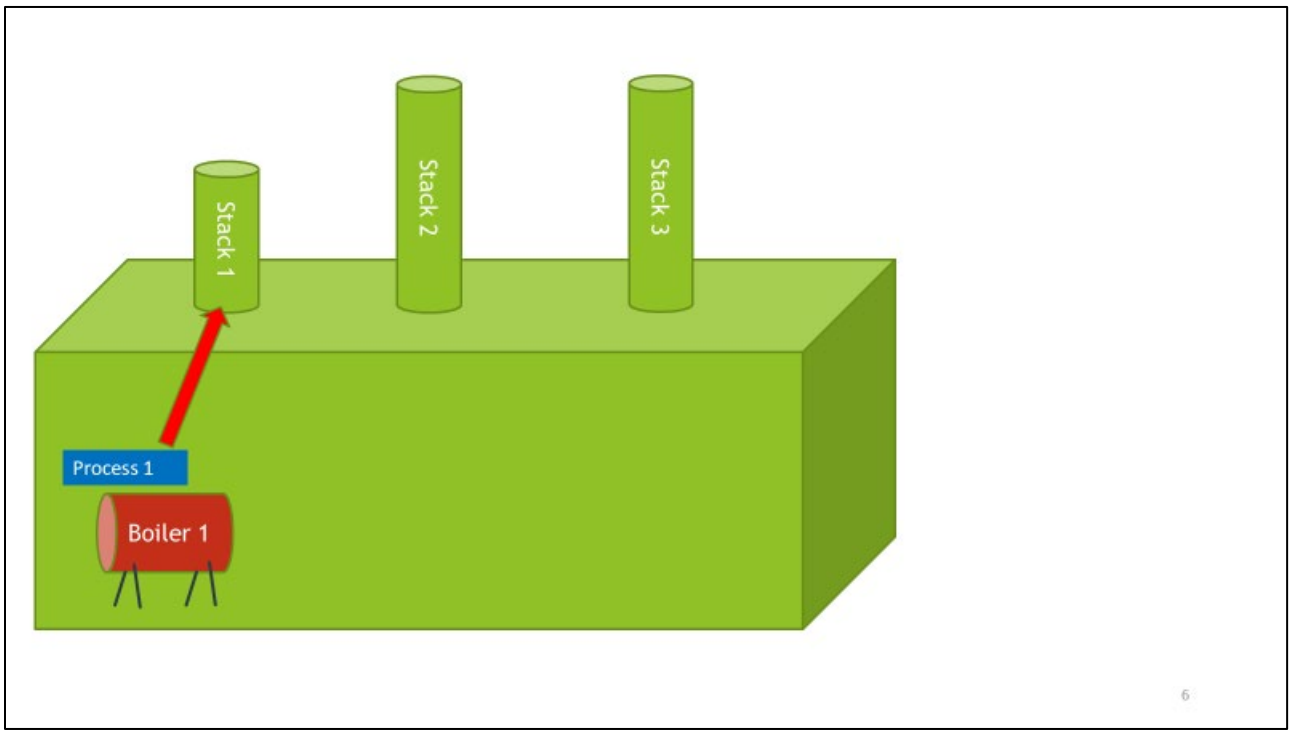


Table 5. Example Associations for a Facility with No Controls

Unit ID	Process ID		Path ID	Release Point ID	Release Point Apportionment
Boiler 1	Process 1			Stack 1	100%

If the process emits to more than one release point, then the relevant percentage of emissions ultimately moving from Process 1 to each release point would need apportionment percentages. For example, assume that Process 1 emissions ultimately go to all three stacks with 50% going to Stack 1, 25% of its emissions going to Stack 2 and 25% going to Stack 3. In this case, the release point apportionments would be as shown in Table 6.

Table 6. Example of Associations with No Controls and Three Release Point Apportionments

Unit ID	Process ID		Path ID	Release Point ID	Release Point Apportionment
Boiler 1	Process 1			Stack 1	50%
Boiler 1	Process 1			Stack 2	25%
Boiler 1	Process 1			Stack 3	25%

8.2 Example of a Facility with a Single Control

Figure 56 shows the example of a facility with a single control. The yellow arrow indicates emission moving from the process to the control device. The red arrow shows the emissions moving to

the release point. In this scenario, assume there is one process, Process 1. The Control 1 is placed in Path 1. The control apportionment is 100% and the control assignment sequence number is 1. Table 7 shows the assignment of the control. Table 8 shows the associations for that control and the other relevant sub-facility components.

Figure 56. Example of a Facility with a Single Control

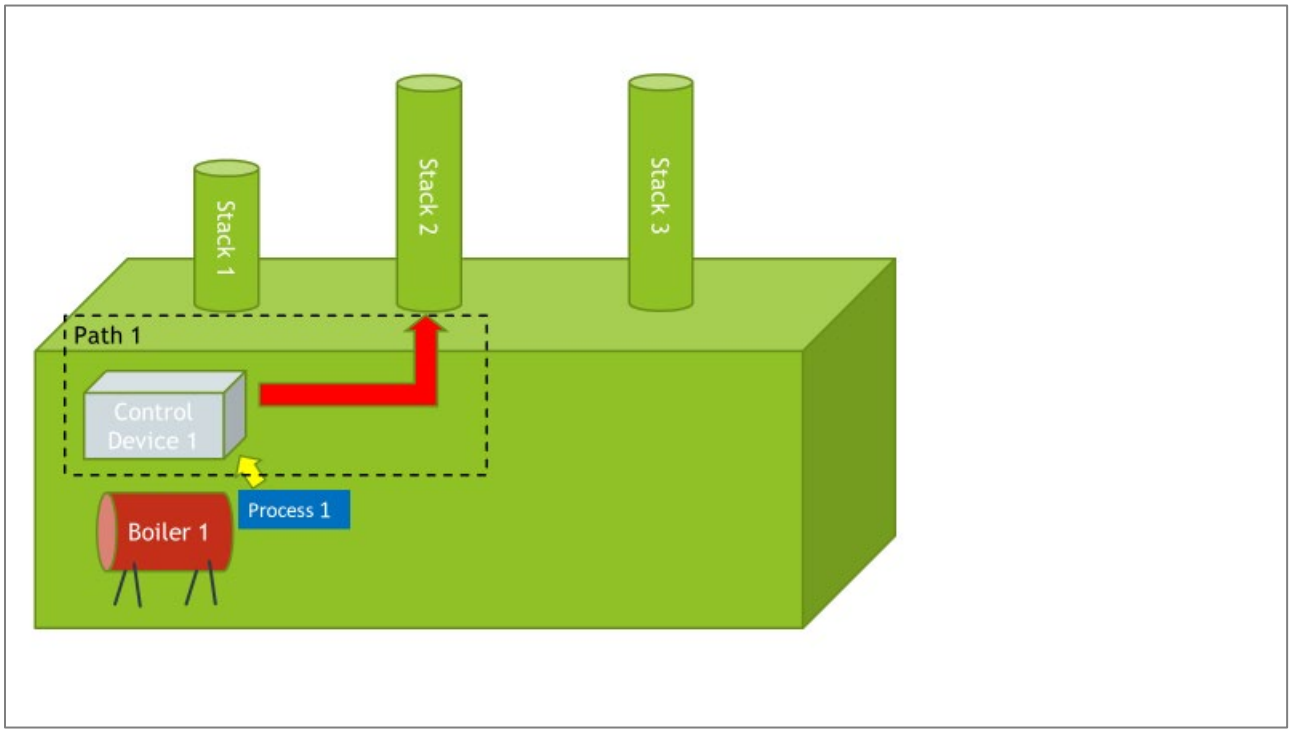


Table 7. Example Path for a Facility with a Single Control

Path ID	Sequence Number	Assignment (Control or Path)	Apportionment (for Control or Path)
Path 1	1	Control Device 1	100%

Table 8. Example Associations for a Facility with a Single Control

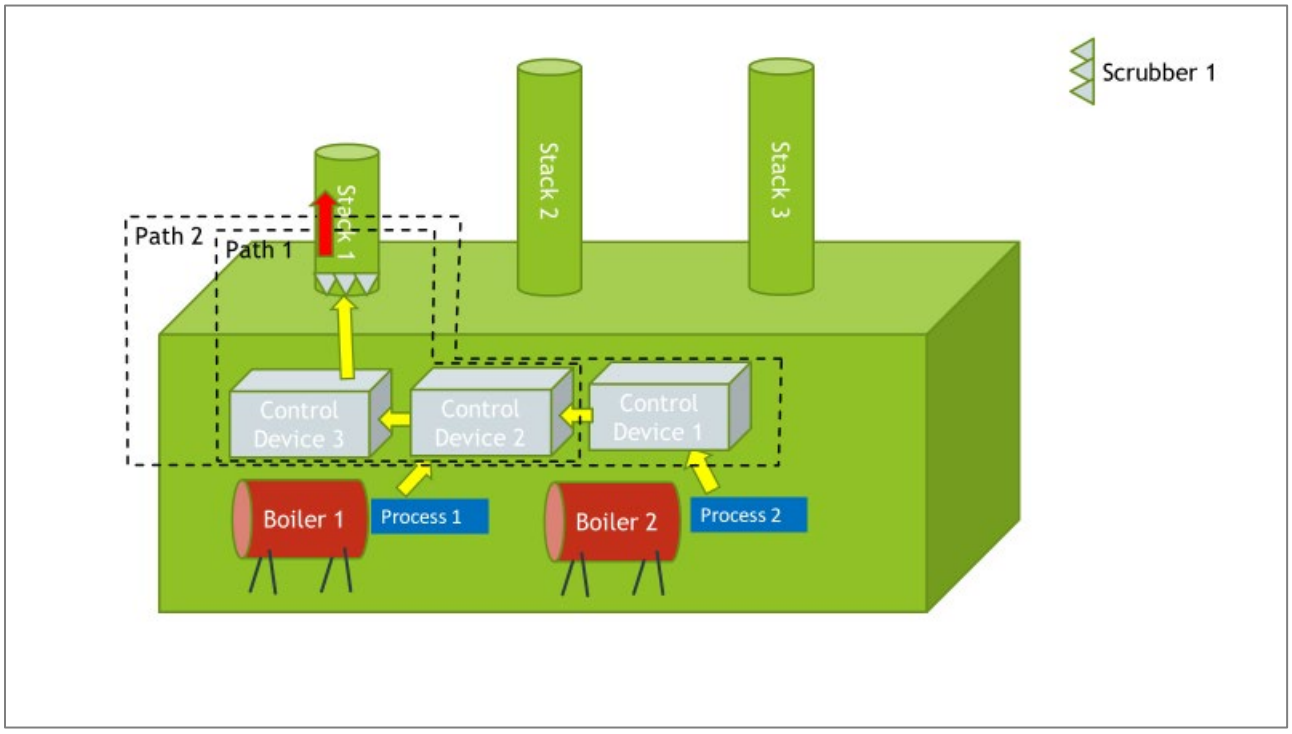
Unit ID	Process ID	Path ID	Release Point ID	Release Point Apportionment
Boiler 1	Process 1	Path 1	Stack 2	100%

8.3 Example of a Facility with Controls in Series

In Figure 57 we can see an example of a facility that has controls in series. Assume there is one process per unit, Process 1 and Process 2 for Boiler 1 and Boiler 2 respectively. In this case, there are three controls. Controls 2 and 3 have been placed in Path 1. Path 2 contains Control Device 1 and Path 1. Path 1 is a child path of Path 2.

You should configure your controls into paths is a matter of how your controls are laid out in the facility from the units to the release points. There should ultimately be one master path between a unit and a release point. In this case, that master path is Path 2. If more than one process is being run from the unit, then all the processes would be associated with the control path in the same manner as Process 1.

Figure 57. Example of a Facility with Controls in Series



For this example, we can see in Figure 57 that the controls are in series. The emissions flow directly from one control to the other. Thus, the control apportionment for Control 1 to Path 1 is 100%, and the control apportionment for each control within Path 1 is 100%. In Path 1, Control 2 is first in the sequence, Control 3 is second. In Path 2, Control 1 is first in the sequence, Path 1 is second in the sequence, and, and Scrubber 1 is third. Table 9 shows the assignment for this facility. Table 10 shows the associations for the different sub-facility components. Also, note that all emissions enter Stack 1 after leaving Path 2 (as indicated by the red arrow). Note that 100% of emissions from Process 1 went to Stack 1, and 100% of emissions from Process 2 also went to Stack 1.

Figure 58. Path Assignments for a Facility with Controls in Series

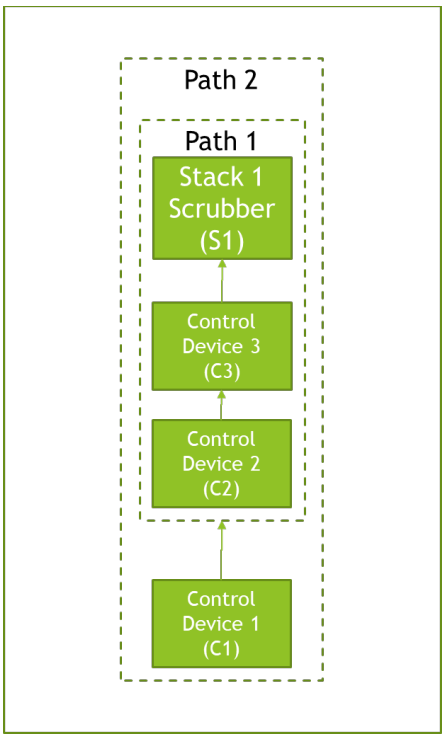


Table 9. Example Paths for a Facility with Controls in Series

Path ID	Sequence Number	Assignment (Control or Path)	Apportionment (for Control or Path)
Path 1	1	Control Device 2 (C2)	100%
Path 1	2	Control Device 3 (C3)	100%
Path 1	3	Scrubber 1 (S1)	100%
Path 2	1	Control Device 1 (C1)	100%
Path 2	2	Path 1	100%

Table 10. Example Associations for a Facility with Controls in Series

Unit ID	Process ID	Path ID	Release Point ID	Release Point Apportionment
Boiler 1	Process 1	Path 1	Stack 1	100%
Boiler 2	Process 2	Path 2	Stack 1	100%

8.4 Example of a Facility with Complex Controls

In Figure 59 represents a more complex controls set up. Again, we show just one process for the unit, but all processes associated with that unit (if shown) would be treated in the same way as Process 1. This controls setup is a combination of controls in series and parallel. Path 1 contains Control 2 and

Control 4. Path 2 contains Control 1, Control 3, and Path 1 (child path), and Control 5. Path 3 contains Path 2 (child path), and Scrubber 1.

Figure 59. Example of Complex Controls

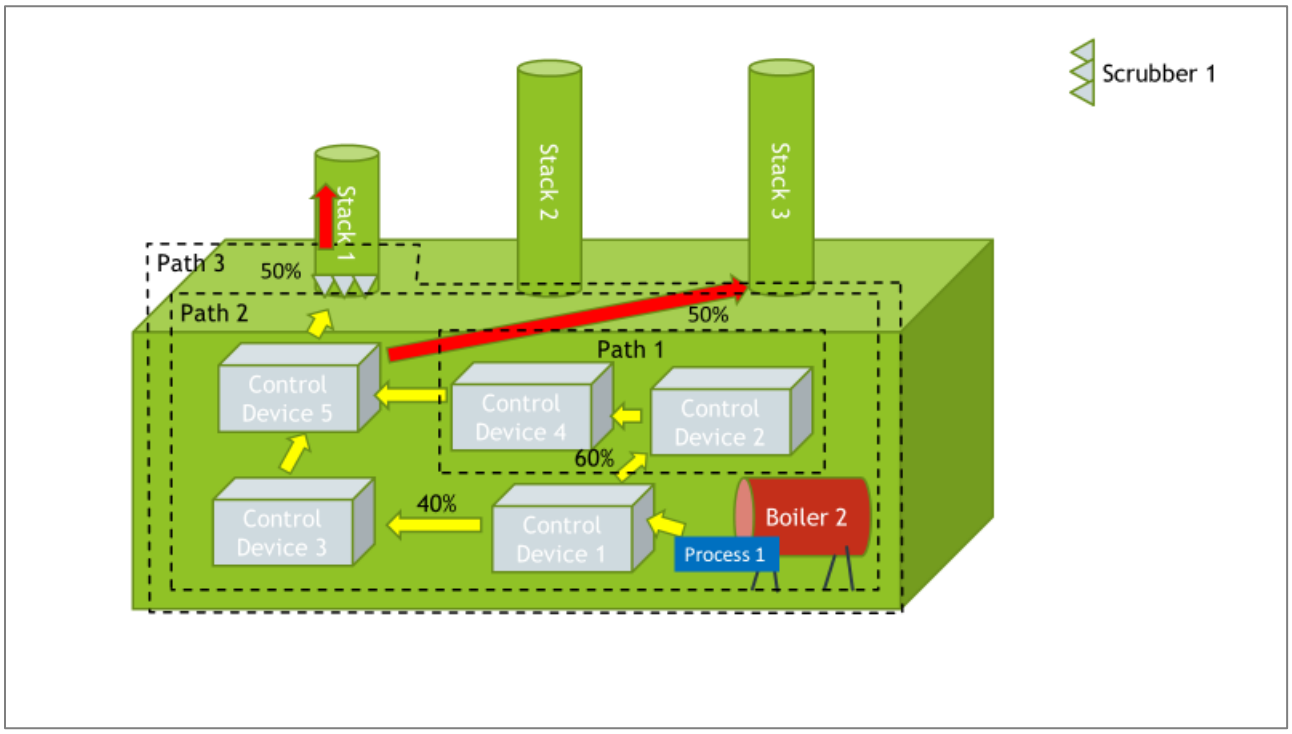


Figure 60 shows the different assignments and apportionments given this set up. In Path 1, Control 2 is first in the sequence, Control 4 is second, and 100% of emissions flow from Control 2 to Control 4, and 100% of the emissions flow to Control 5 from Path 1. Path 1 is a child path of Path 2. In Path 2, Control 1 sends 60% of its emissions to Path 1 (where Control 2 is first in the sequence), and 40% of its emissions go on to Control 3. Then 100% of emissions go from Control 3 to Control 5, 100% of emissions exit Path 2 (via Control 5) to Path 3. In Path 3, Path 2 (child path) is first in the sequence, then the Scrubber is second in the sequence. Assignments are shown in Table 11. How the different sub-facility components are associated is shown in Table 12. Note that 50% of emissions from Process 1 go to Stack 1, and 50% of emissions from Process 1 went to Stack 3 (as indicated by the red arrows in Figure 59).

Figure 60. Path Assignment for a Facility with a Complex Controls

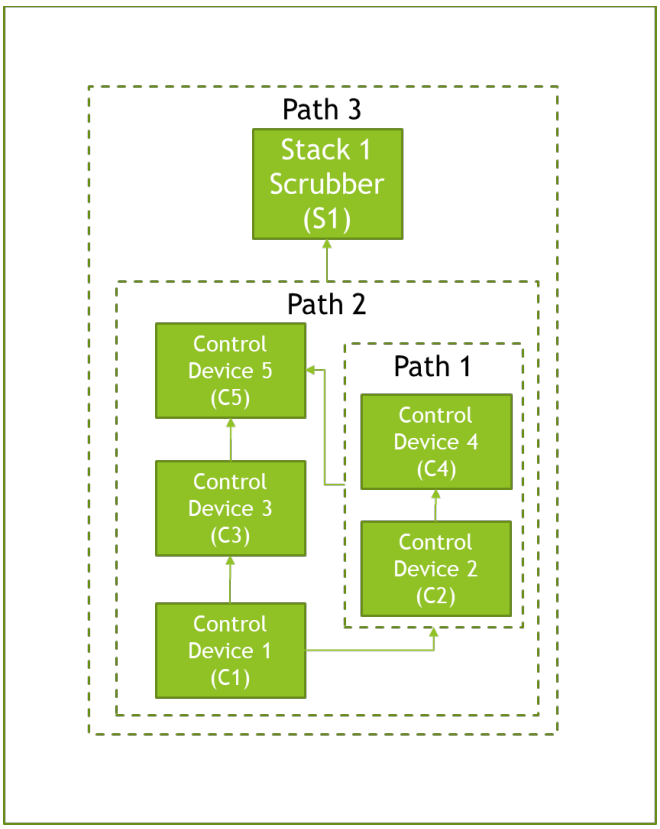


Table 11. Example Paths for a Facility with Complex Controls

Path ID	Sequence Number	Assignment (Control or Path)	Apportionment (for Control or Path)
Path 1	1	Control Device 2 (C2)	100%
Path 1	2	Control Device 4 (C4)	100%
Path 2	1	Control Device 1 (C1)	100%
Path 2	2	Control Device 3 (C3)	40%
Path 2	2	Path 1	60%
Path 2	3	Control Device 5 (C5)	100%
Path 3	1	Path 2	100%
Path 3	2	Scrubber 1 (S1)	100%

Table 12. Example Associations for a Facility with Complex Controls

Unit ID	Process ID	Path ID	Release Point ID	Release Point Apportionment
Boiler 2	Process 1	Path 2	Stack 3	50%
Boiler 2	Process 1	Path 3	Stack 1	50%

9 Where to Go for Help

9.1 Help with the CAERS application itself.

Reach out to the help desk for questions about how to enter data into CAERS:

1. **By Telephone:** Person-to-person telephone support is available from 8:00 am to 6:00 pm (EST/EDT). Call our toll-free line at 888-890-1995 or our direct line at (970) 494-5500 for International callers.
2. **By E-mail:** Send e-mail to Technical Support at helpdesk@epacdx.net

This includes the following types of issues:

- Questions about logging into your CDX account
- Unexplained errors while using the application
- How to enter a specific piece of data
- How to navigate from one screen to another

Note that the help desk above is not the right resource for questions about the data itself. Those questions should be referred to your SLT Authority.

9.2 Help with programmatic questions:

Reach out to Jing Wang (jing.wang@dnr.ga.gov) from GA DNR.

- Critical errors will appear in red. These errors must be addressed for the report to go through.
- Selecting an appropriate SCC and/or emission factor
- Finding out the unit capacity measure of a unit
- The appropriateness of a specific type of conversion for a specific kind of process

9.3 Additional Resources

9.3.1 General Energy Conversions

The CAER System will allow you to do simple conversions within the same type of measure, for example conversions between different units of measure for weight. For energy related conversions, visit: https://www.eia.gov/energyexplained/units-and-calculators/energy-conversion-calculators.php. The website contains information about conversions and a conversion calculator. Note that ultimately, conversions between quantities of fuel and heat will depend on the specific conditions in which the processes involved are being conducted. You should consult GA DNR for guidance as to whether a certain type of conversion is appropriate for a specific process. You can include assumptions about conversions in the Comment fields provided in CAERS.

9.3.2 Conversions in the CAER System

The following is a list of simple conversions that the CAER system can perform on units of measure to the level of detail (decimal values) that the form is performing them:

Table 13. List of Simple Conversions in CAERS

Type of conversion:	Amount to convert from:	Units to convert from:	Amount to convert to (application conversion):	Units to convert to:
Area	1	ACRES	43560	SQUARE FEET
Area	1	SQUARE YARDS	9	SQUARE FEET
Area	1	ACRES	4840	SQUARE YARDS
Length	1	MILES	5280	FEET
Mass	1	KILOGRAMS	1000	GRAMS
Mass	1	POUNDS	0.45359237	KILOGRAMS
Mass	1	GRAMS	0.000001	MEGAGRAMS
Mass	1	KILOGRAMS	.001	MEGAGRAMS
Mass	1	POUNDS	.00045359237	MEGAGRAMS
Mass	1	GRAMS	1000000	MICROGRAMS
Mass	1	KILOGRAMS	1000000000	MICROGRAMS
Mass	1	POUNDS	453592370	MICROGRAMS
Mass	1	MEGAGRAMS	1E+12	MICROGRAMS
Mass	1	MILLIGRAMS	1000	MICROGRAMS
Mass	1	NANOGRAMS	0.001	MICROGRAMS
Mass	1	TONS	907,184,740,000	MICROGRAMS
Mass	1	GRAMS	1000	MILLIGRAMS
Mass	1	KILOGRAMS	1000000	MILLIGRAMS
Mass	1	POUNDS	453592.37	MILLIGRAMS
Mass	1	MEGAGRAMS	1000000000	MILLIGRAMS
Mass	1	GRAMS	1000000000	NANOGRAMS
Mass	1	KILOGRAMS	1E+12	NANOGRAMS
Mass	1	POUNDS	453592370000	NANOGRAMS
Mass	1	MEGAGRAMS	1E+15	NANOGRAMS
Mass	1	MILLIGRAMS	1000000	NANOGRAMS
Mass	1	GRAMS	.0022046226218488	POUNDS
Mass	1	TONS	2000	POUNDS
Mass	1	GRAMS	.000001102311310924388	TONS
Mass	1	KILOGRAMS	.0011023113109244	TONS
Mass	1	MEGAGRAMS	1.102311310924388	TONS
Mass	1	MILLIGRAMS	.000000001102311310924388	TONS
Mass	1	NANOGRAMS	.000000000000001102311310924388	TONS
Volume	1	CUBIC FEET	.028316846592	CUBIC METERS
Volume	1	GALLONS	.00378541178	CUBIC METERS
Volume	1	CUBIC FEET	.037037037037037	CUBIC YARDS
Volume	1	GALLONS	.004951131682011	CUBIC YARDS

Type of conversion:	Amount to convert from:	Units to convert from:	Amount to convert to (application conversion):	Units to convert to:
Volume	1	CUBIC METERS	1.307950619314392	CUBIC YARDS
Volume	1	CUBIC FEET	7.480519488424055	GALLONS

9.3.3 Volume Conversions for Natural Gas

Volumetric conversions of natural gas depend on the physical conditions of the natural gas as follows.

To convert the volume of natural gas below 60 psia:

Under these conditions the Ideal Gas Law can be applied. Subscript 1 indicates gas at one set of conditions of absolute temperature (T) in degrees Rankine (˚R), and absolute pressure (P) in pounds per square inch absolute (psia), subscript 2 indicates the same gas at a different set of conditions for the gas.

V1 = T1/P1 (P2 V2/T2), to get V1 in cubic feet (cf).

A standard cubic foot (scf) of gas is defined as a cubic foot at a temperature of 21 °C (70 °F or 530 ˚R) and a pressure of 101.325 kilopascals [kPa] (14.696 psia), except for liquefied petroleum gas.

So if converting from a gas with volume V2 at standard cubic feet of gas to V1, the formula to apply would be:

V1=T1/P1 (14.696 x V2)/530

To convert the volume of natural gas above 60 psia:

Natural gas does not behave like an ideal gas in this case. The formula requires a compressibility factor (Z).

V1=V2(Z1 T1 P2)/(Z2 T2 P1), to get V1 in cf,

where Z1/Z2 is the compressibility ratio.

For example: If converting from a gas with volume V2 at 60 ˚F (or 520 ˚R) and 14.73 psia to another volume, the formula would be:

V1=V2(Z1 x T1 x 14.73)/(Z2 x 520 x P1),

Sources:

Paul R. Ludtke, Natural Gas Handbook, National Bureau of Standards, U.S. Department of Commerce, Boulder, CO, August 1986. p 14.

NIST, Uniform Laws and Regulations in the Areas of Legal Metrology and Engine Fuel Quality (2017 ed.). National Institute of Standards and Technology (NIST). November 2016. p. 120. doi:10.6028/NIST.HB.130-2017. Retrieved 21 November 2017.

9.3.4 State Emission Factor Compendium

If your SLT Authority allows it, you may use emission factors available from other states. To browse the Emission Factor Compendium, go to the CAER website and look under the "Development of a State-Local-Tribal Emission Factors Compendium". You will find three spreadsheets (from Minnesota, Michigan and South Carolina), that may contain an emission factor your SLT deems appropriate for you to use.

9.3.5 Example of Controls Calculations

The following example may help you understand how the different percentages involved in controls calculations are related. This example may help you estimate your "Overall Control %" for your individual control and/or control path. The example is illustrative, you should work with your SLT authority to determine the best way to do these calculations for your specific controls configuration.

The following definitions are used in this example:

Percent Capture Efficiency: The percentage of an exhaust gas stream that is actually collected for routing to a set of control devices. This value could be obtained from the vendor, or measured at the facility.

Percent Control Effectiveness: The percentage of time or activity throughput that a control approach is operating as designed, including the capture and reduction devices. This percentage accounts for the fact that controls typically are not 100 percent effective because of equipment downtime, upsets and decreases in control efficiencies. This could be estimated from the amount of time the control is operational, versus down for maintenance or repairs.

Percent Reduction Efficiency: The percent reduction achieved for the pollutant when all control measures are operating as designed. This could be obtained from the vendor.

Assume you have a control or control path for Particulate Matter with the following:

- capture efficiency (cap) is 90%,
- control effectiveness (effect) is 80%,
- control efficiency (effic) is 95%, and
- uncontrolled (unc) or pre-control emissions total 100 tons.

Then:

"Post control" emissions = unc x cap x effect x (1-effic) = 100 x 0.9 x 0.8 x (1-0.95) = 3.6 tons.

Controlled emissions = unc x cap x effect x (effic) = 100 x 0.9 x 0.8 x 0.95 = 68.4

Non-captured emissions = unc x (1-cap) = 100 x (1-0.9) = 10 tons. Non-captured emissions when the device is effective would be 8 tons: unc x (1-cap) x effect. The rest (2 tons) would also be downtime emissions.

"Downtime emissions": The emissions released when the 95% control device and/or its capture device are not operating properly = unc x (1-effect) = 100 x (1-0.8) = 20 tons.