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

## Version 1.0

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# 1 Initial Pre-Reporting Steps

## 1.1 Software Requirements for CAERS

To use the CAER system, you will need:

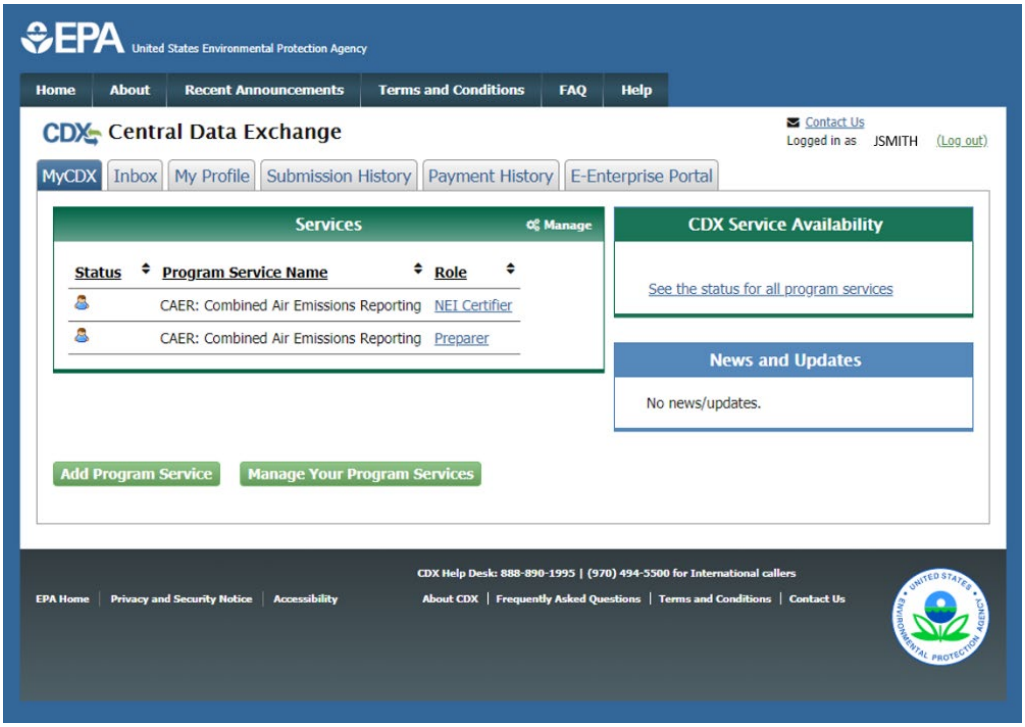
- Internet browser and connectivity: This should be a recent version of any internet browser such as Chrome, Explorer, or Firefox. Your internet connectivity will determine how fast data can be uploaded.
- Microsoft Excel: Bulk uploads will be in "XLS" or "XLSX".
- Optional for bulk upload: If you would 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 Logging In

In order to enter CAERS, you will need to be registered in EPA's Central Data Exchange (CDX): https://cdx.epa.gov/CDX/Login. If you have not already registered for the Common Emissions Form in EPA's CDX environment, you should go to the website and click on "Register with CDX" and follow the prompts. For 2019 reporting to GA DNR (Georgia Department of Natural Resources), you will have been pre-registered.

At the login page put in 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 1).

*Figure 1. My CDX Page*

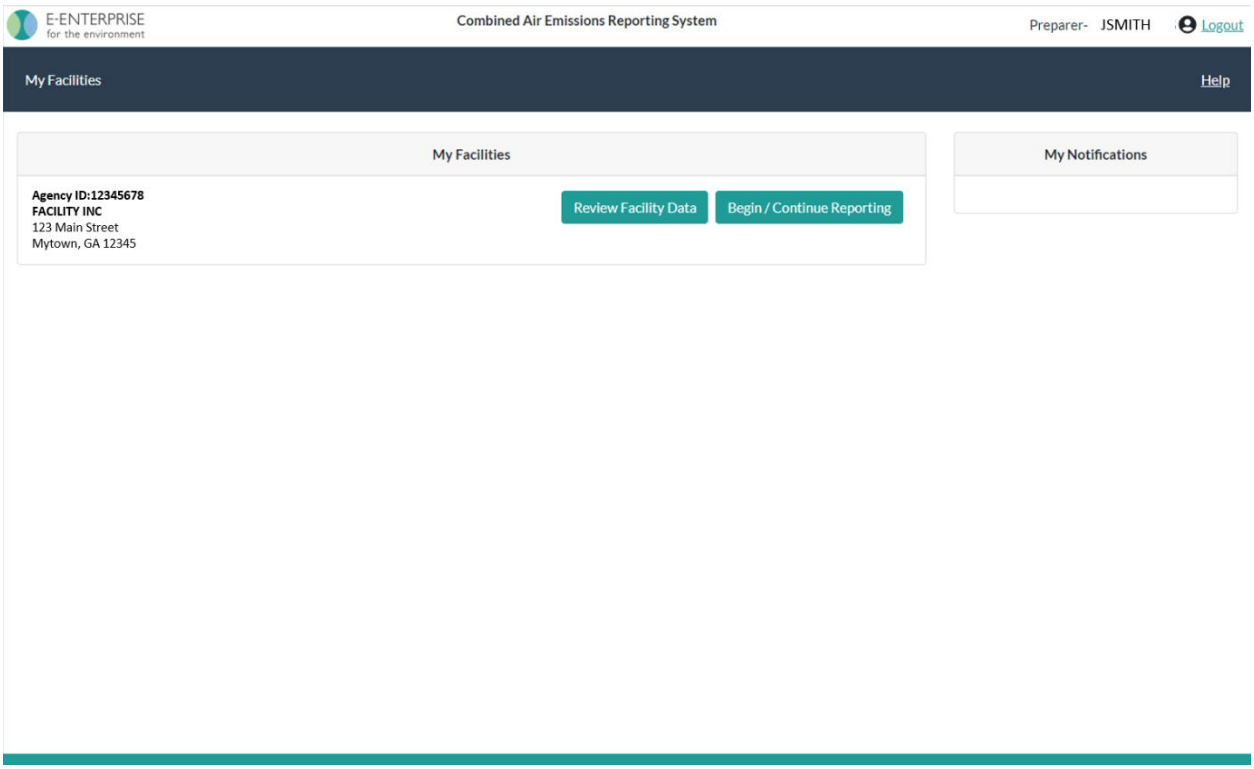


Next to "CAER: Combined Air Emissions Reporting" select your role, "Preparer" or "Certifier". This will take you to the application, where you can review your facility's data and begin/continue reporting from "My Facilities Page" (Section 1.3). If you are both a preparer and a certifier, you can go back to your "My CDX" page from within the CAER application by clicking on the "MyCDX" link at the bottom of the screen.

## 1.3 My Facilities Page

Once you have logged in, you will see a list of facilities that is associated with your role. You will have the option of reviewing facility data (Section 1.4, or beginning/ continuing a report (Section 2.1.1).

*Figure 2. View of "My Facilities" Page*




## 1.4 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 Emissions Reports Page

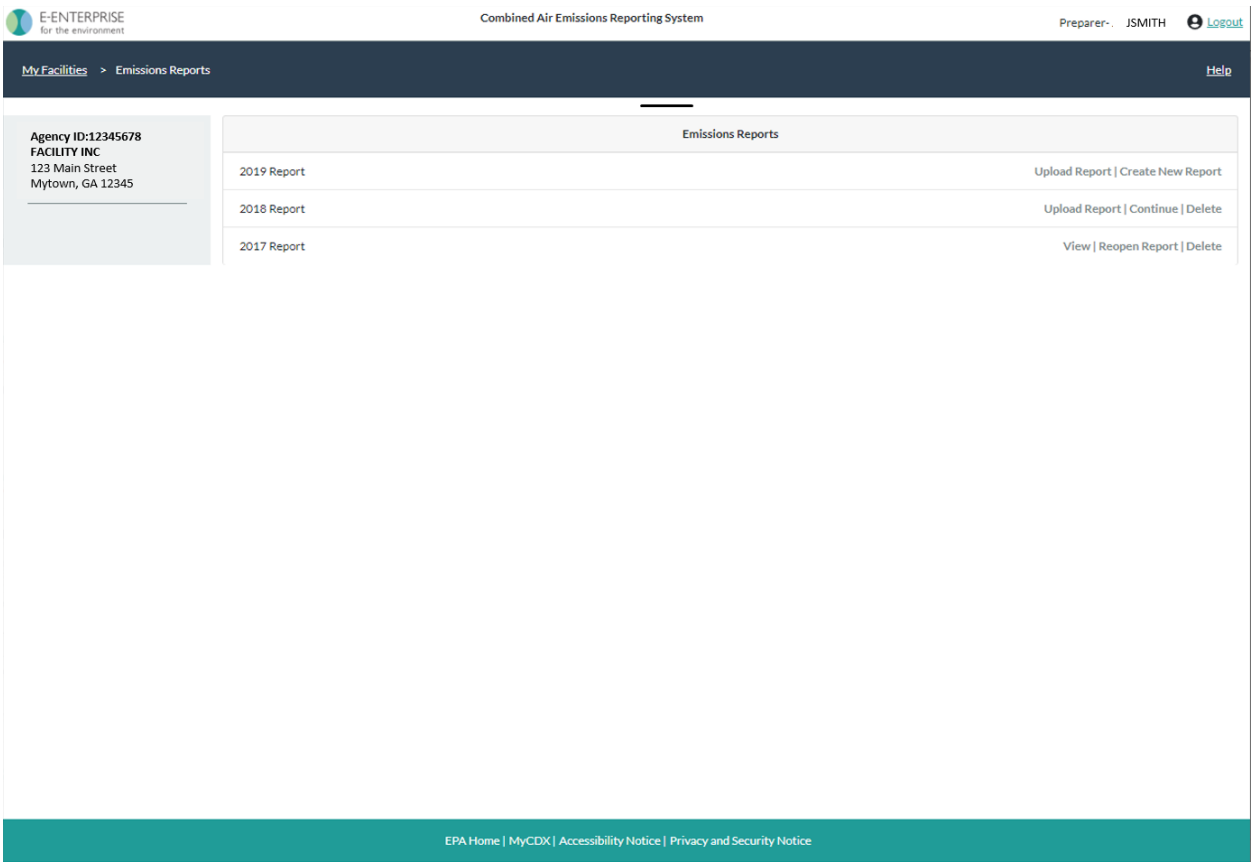
From "My Facilities", click on Begin/Continue Reporting. This will take you to the "Emissions Reports" page (Figure 3), where you can see all the reports for that facility. The CAER system will have

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.

Be aware that deleting any of the reports already in the system may cause you delays in re-instating that data if you later realize that deletion was an error. Furthermore, you will not be able to re-submit a previous year report for a previous reporting year.

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 7 before beginning a report or working on a submission via bulk upload.

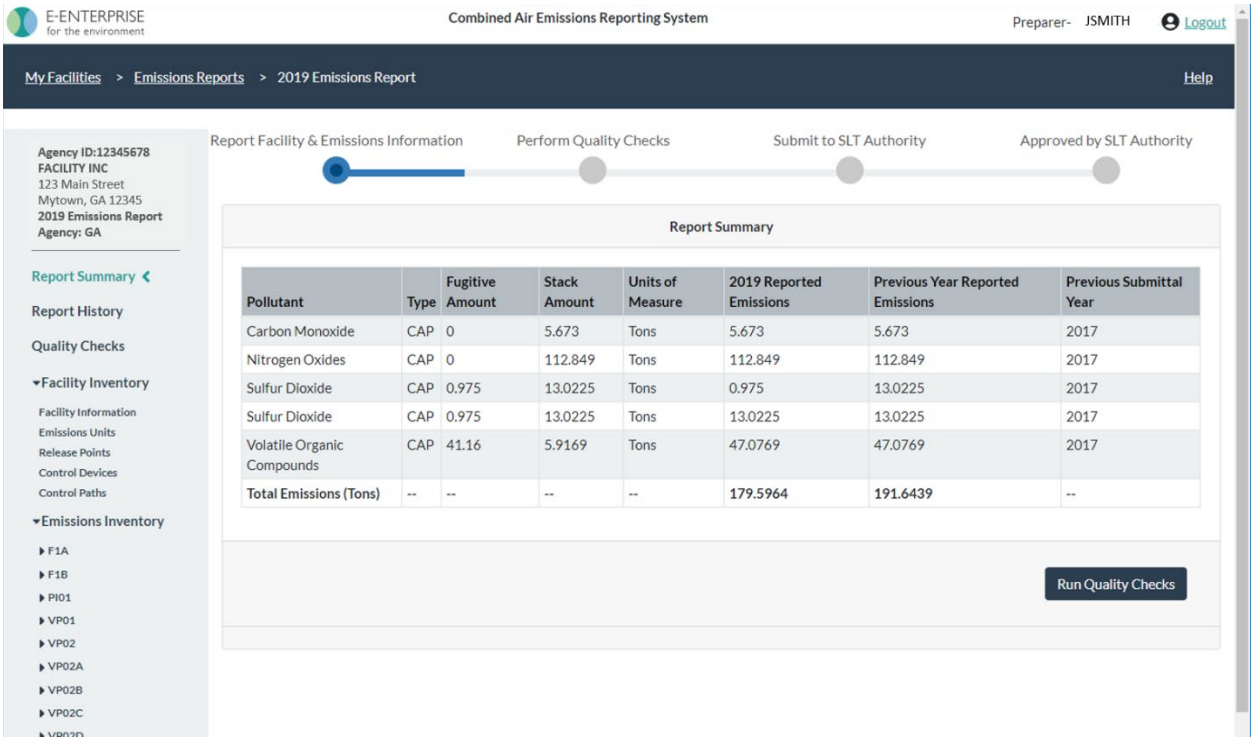
*Figure 3. Emissions Report Page*




### 2.1.2 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 4). 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 4. Facility Report Summary Page*




Note at the top of the screen you will see breadcrumbs displaying 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, e.g. when it was created, submitted, whether the SLT has approved it).
- Quality 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.

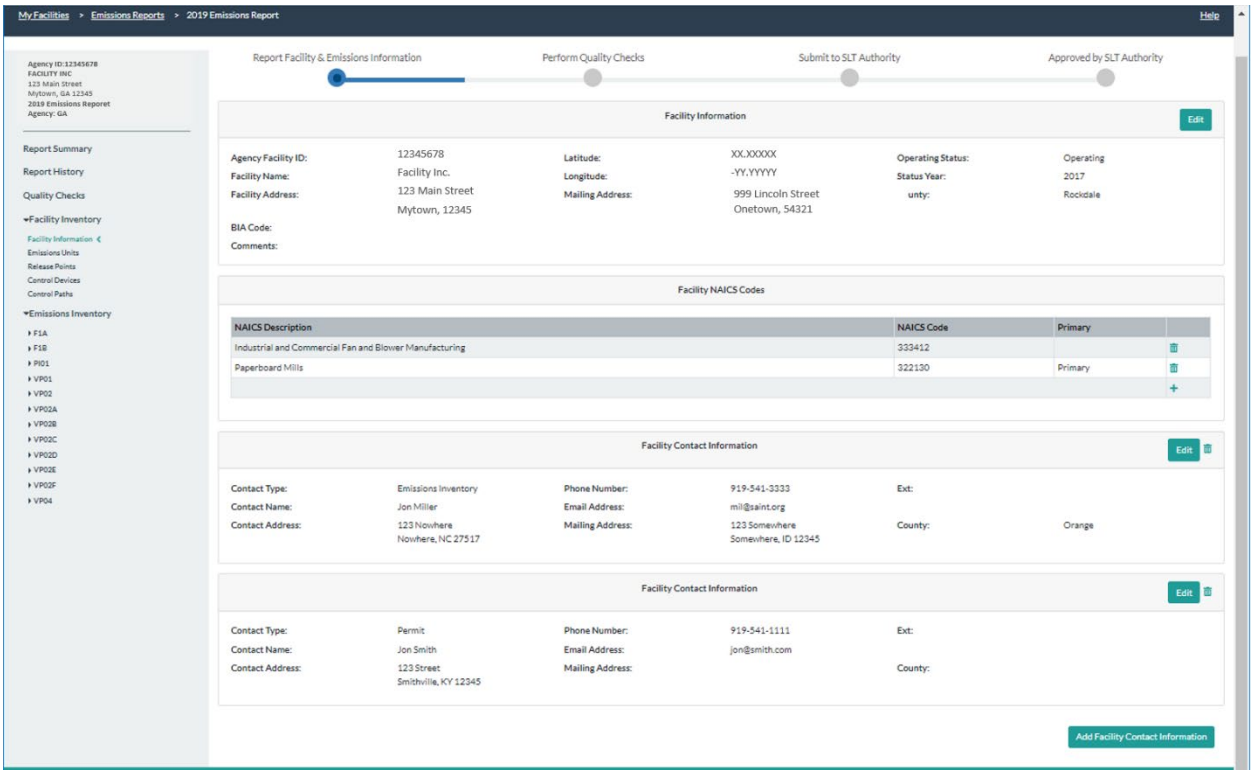
Within the application, you will be able to enter data in a couple of different ways: via the links listed under “Facility Inventory” or via the links under “Emissions inventory”. You will also be able to enter your report via bulk upload (see Section 3).

## 2.2 Facility Inventory

### 2.2.1 Facility Information

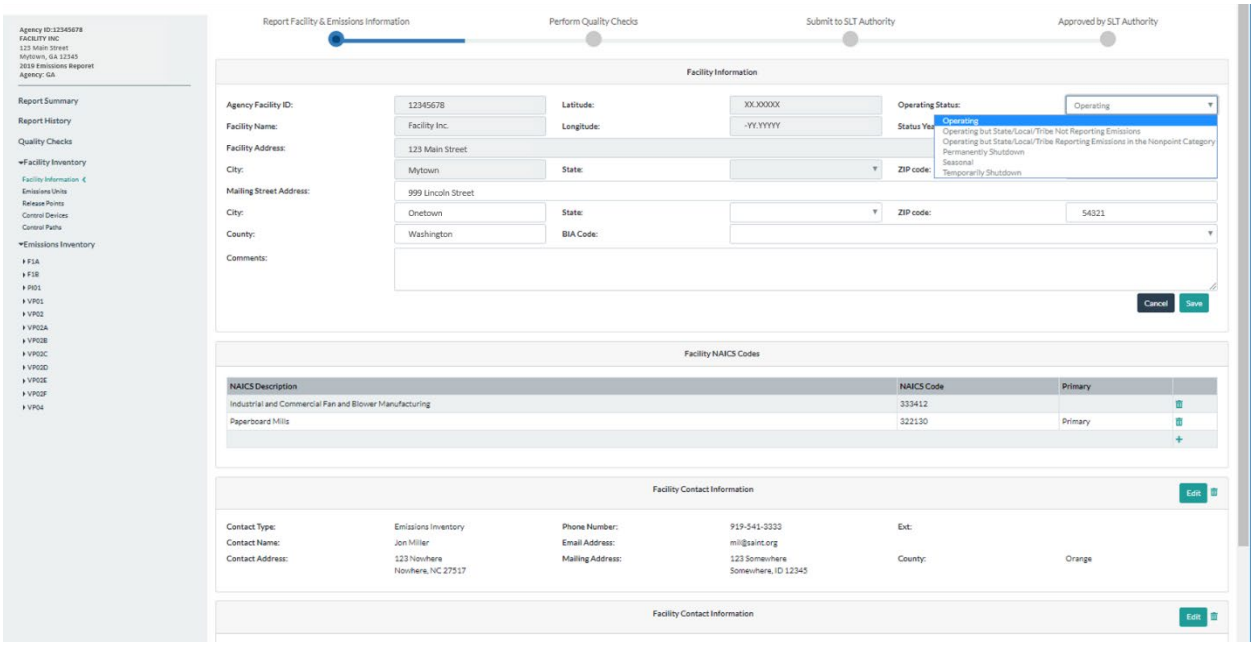
From the left-hand side menu, click on “Facility Inventory” to expand that menu. Click on “Facility Information” to get to the facility information screen (Figure 5). Note this is different from the facility page described in Section 1.4.

*Figure 5. Facility Information Page*




You will be able to edit facility information by clicking on the “Edit” button. This will take you to the facility information edit page (Figure 6). Note that fields that have been locked will not be editable. You should contact your SLT authority (e.g. GA DNR) if you think there is an error in locked fields. Note that a gray arrow within a data field box indicates a drop-down menu is available to choose your entry.

*Figure 6. Editing Facility Information*




Under the "Facility Information" box, you will be able to add a NAICS code. More than one NAICS is 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 modal window will appear to help you search for your NAICS (Figure 7). 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 8). Once you've selected your NAICS, click the "Submit" button. If you have questions about NAICS you can reference https://www.census.gov/cgi-bin/sssd/naics/naicsrch?chart=2017.

*Figure 7. Edit Facility NAICS codes*

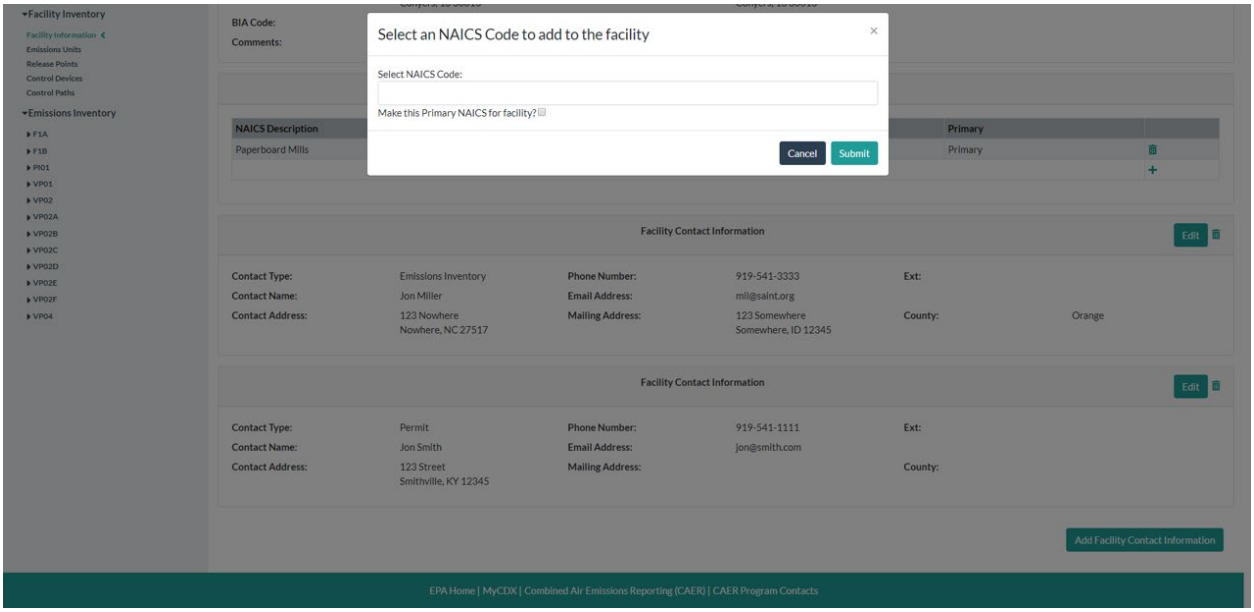
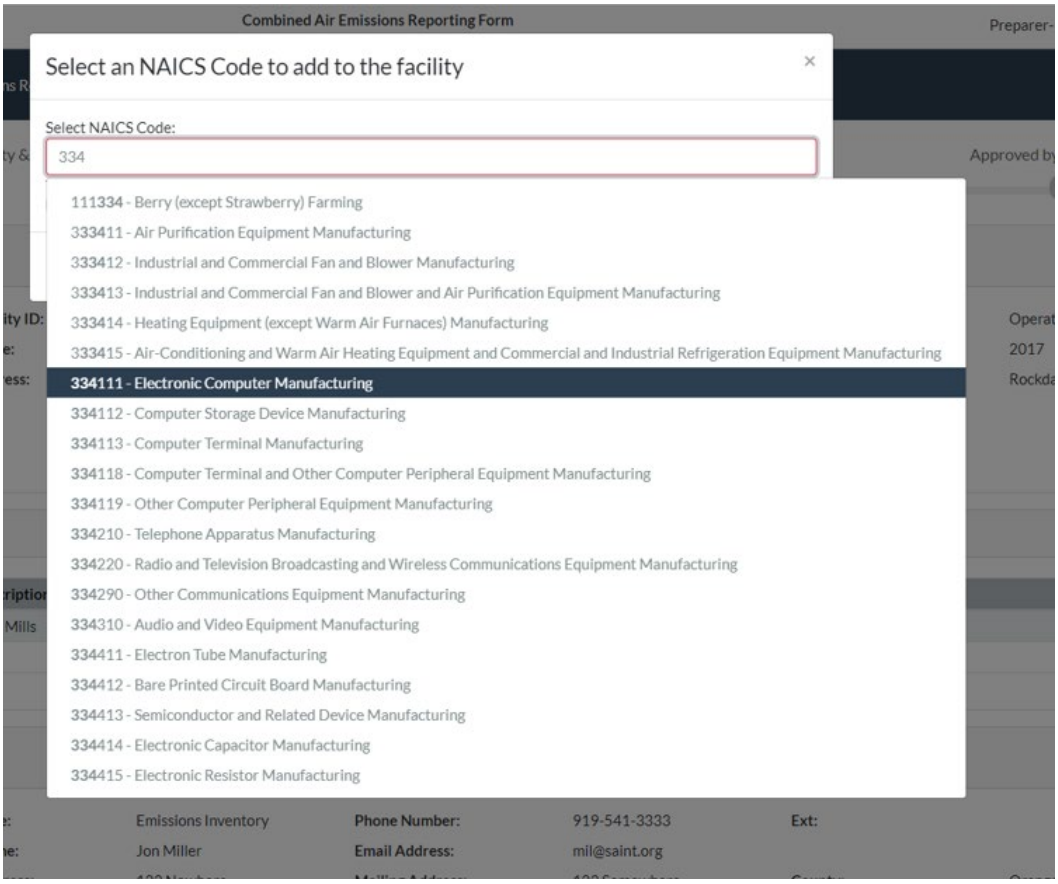



*Figure 8. Find and Select NAICS Code*

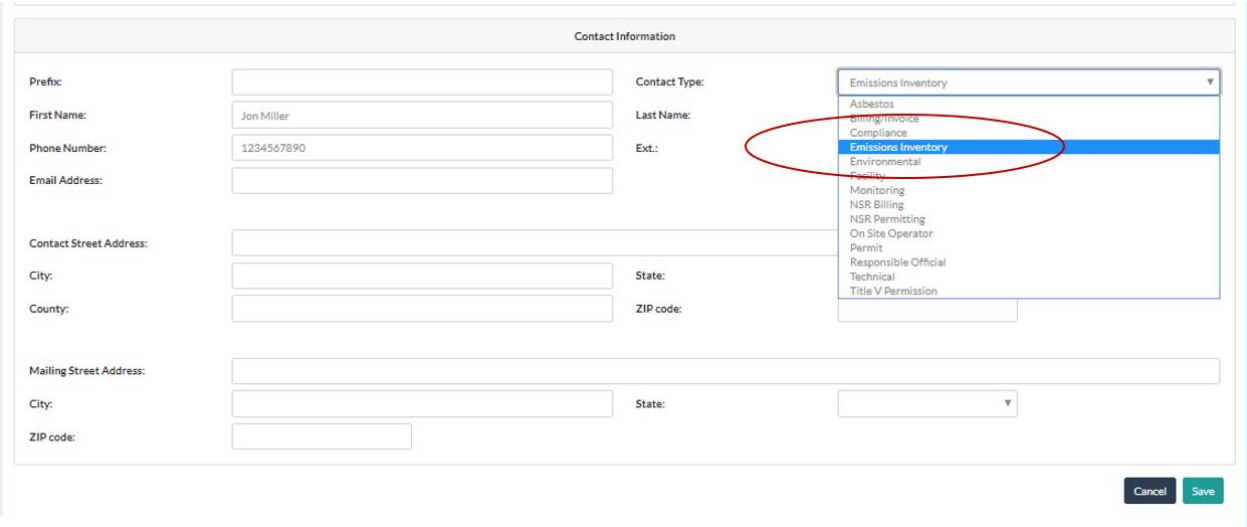



Below the NAICS code box, you should find the “Facility Contact Information” box(es). You can enter as many contacts for the facility as you need. Click on the “Add Facility Contact Information” at the bottom

right of the screen to open a window to enter new facility contact information (Figure 9). Enter all relevant information such as name, number, and make sure to select a "Contact Type".

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 9. 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 10). 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 11). Add all the data fields. Checks 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 10. Emissions Units Page*

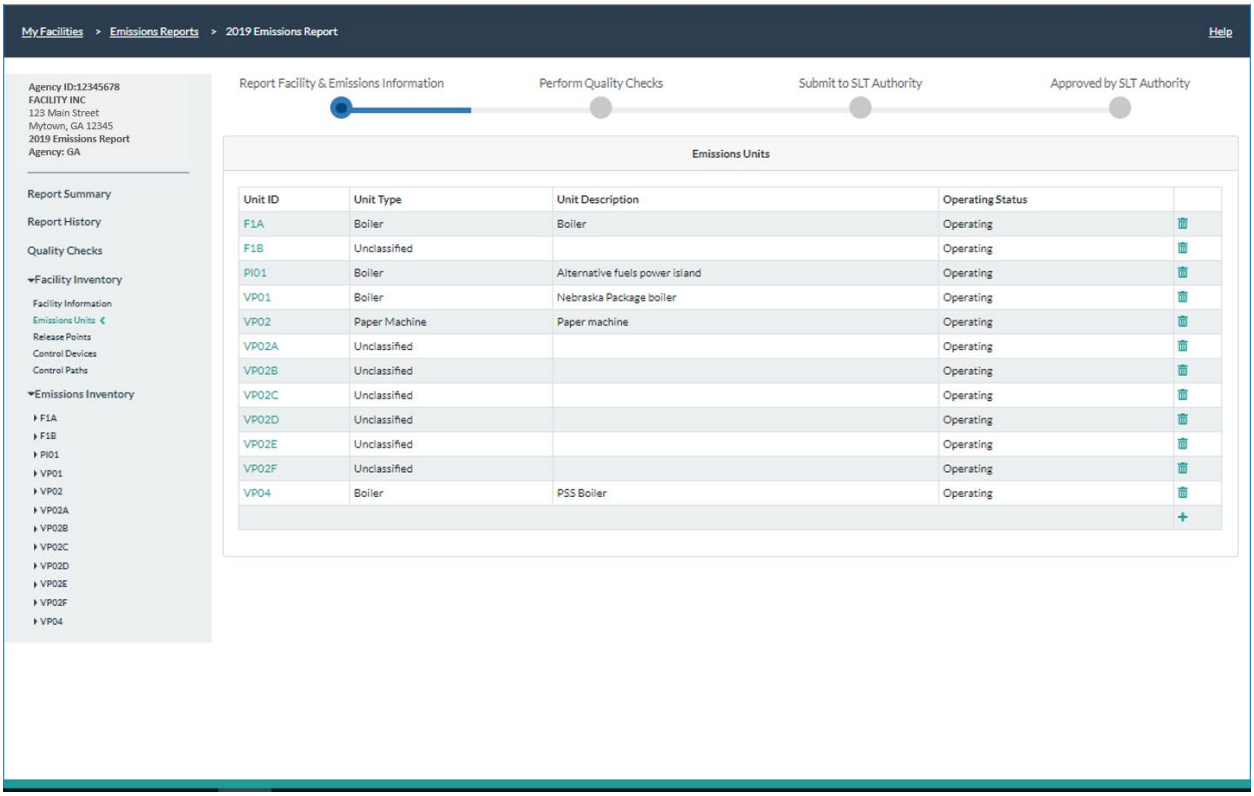
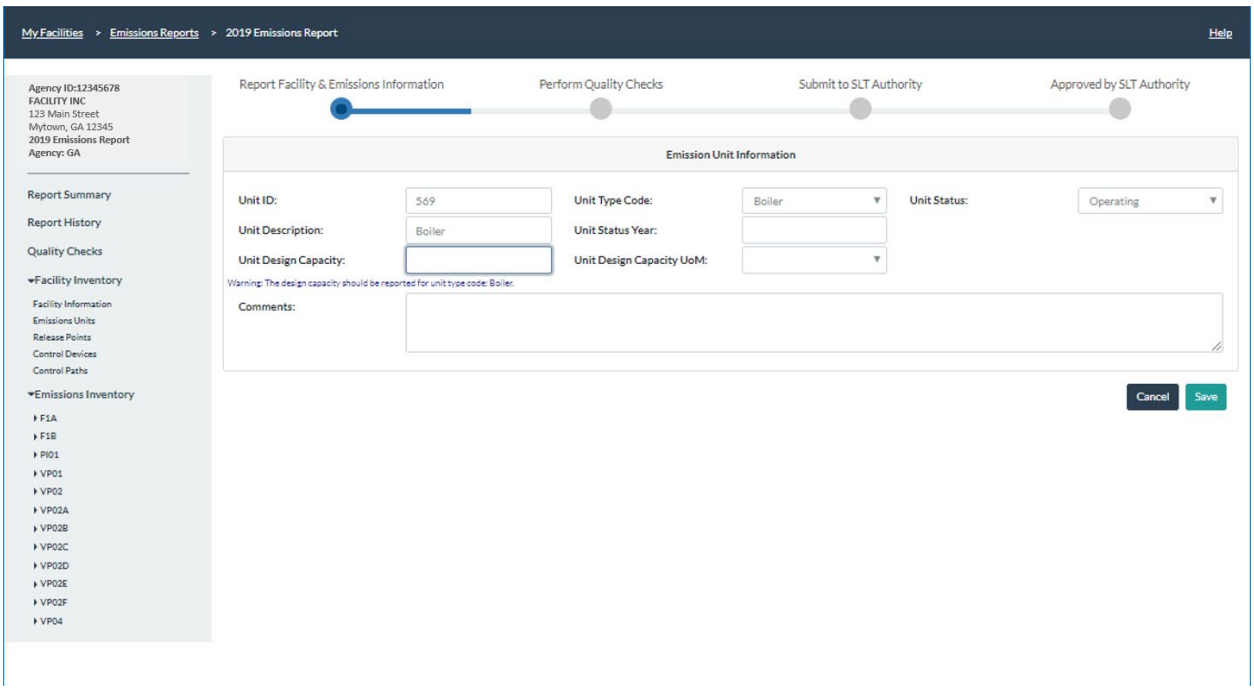



*Figure 11. Adding a New Unit*



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 12). 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 13). 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 12. Example of a Page for a Specific Unit*

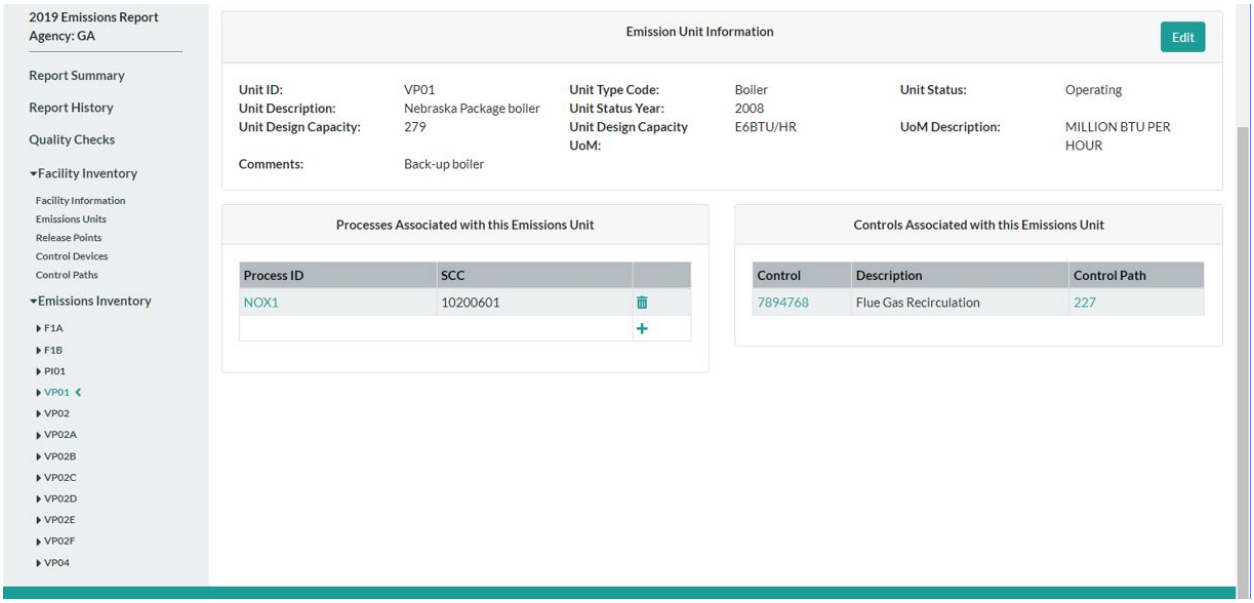
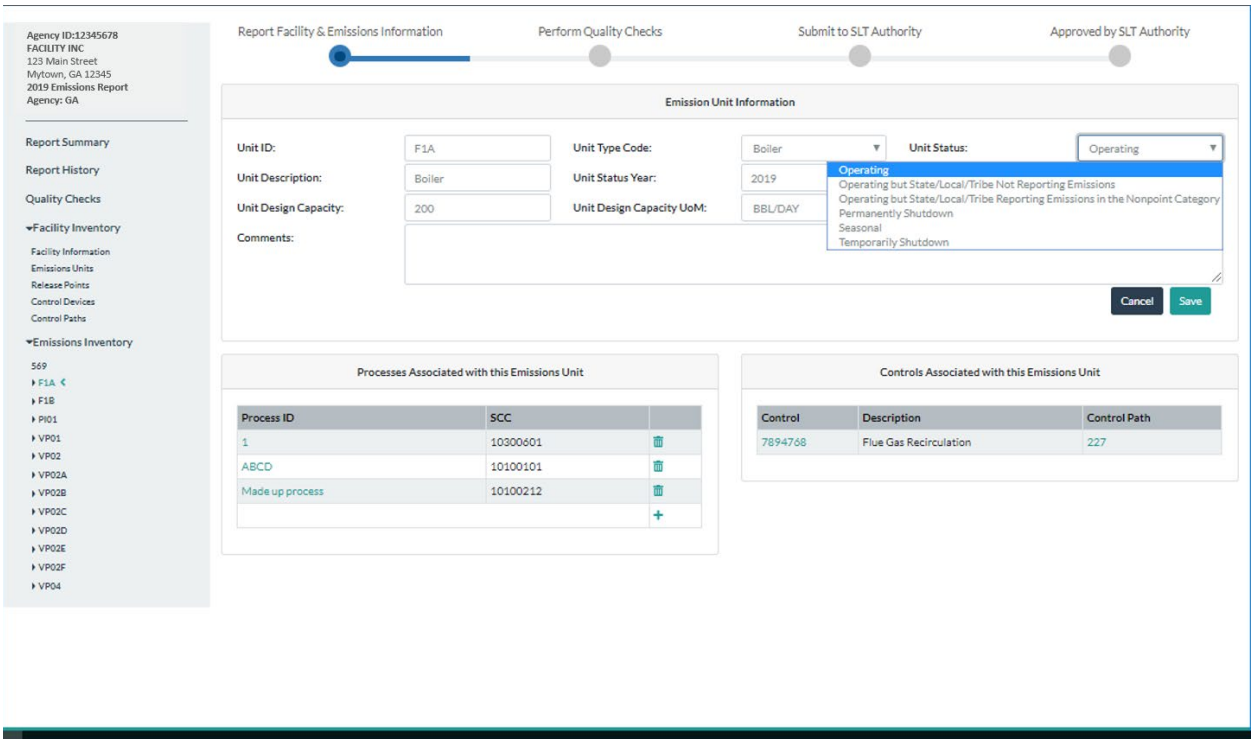



*Figure 13. Editing a Unit*



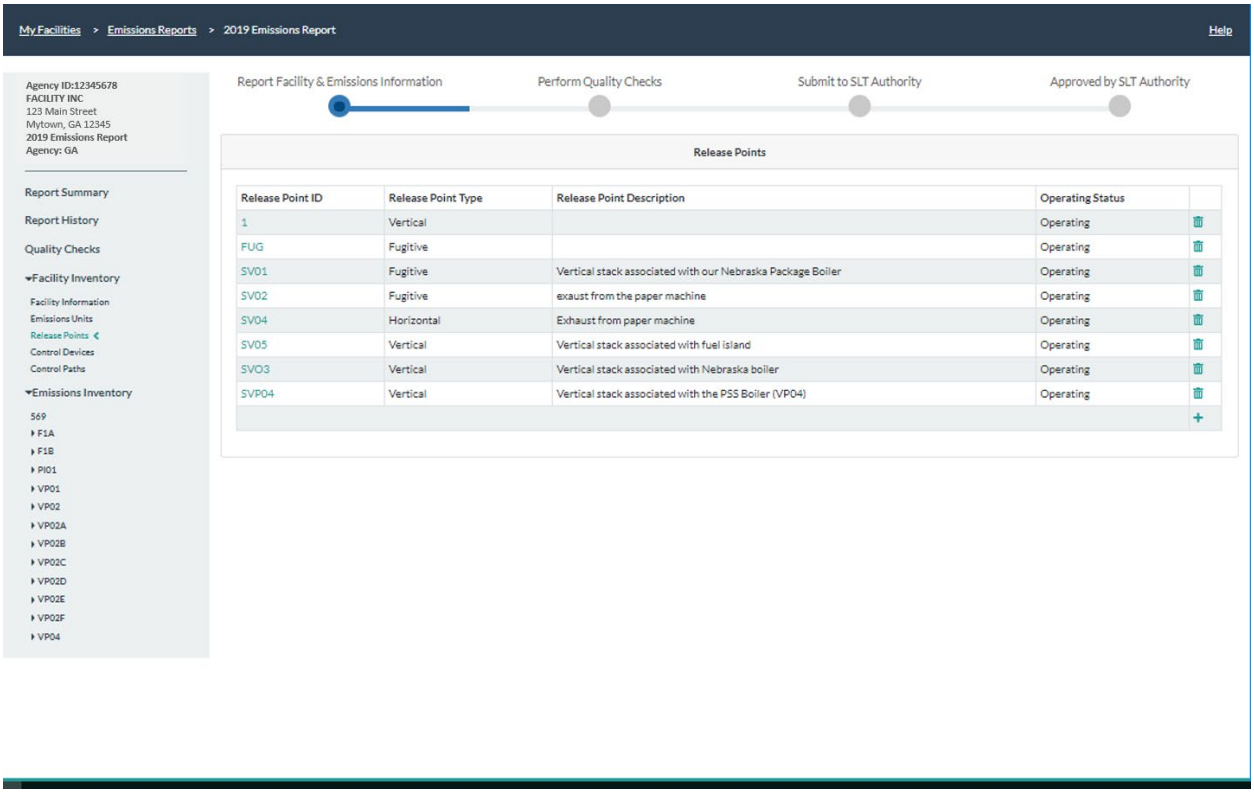
You should only delete a unit using the garbage can icon if you added it to this year's report and that addition was an error. If the unit existed in a previous year's report, and is no longer in use, you can click on its ID and change its status from "Operating" to "Permanently Shutdown".

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 them first. They will appear 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 14).

*Figure 14. 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 15). 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 are entering 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 16).

*Figure 15. Adding a New Release Point*

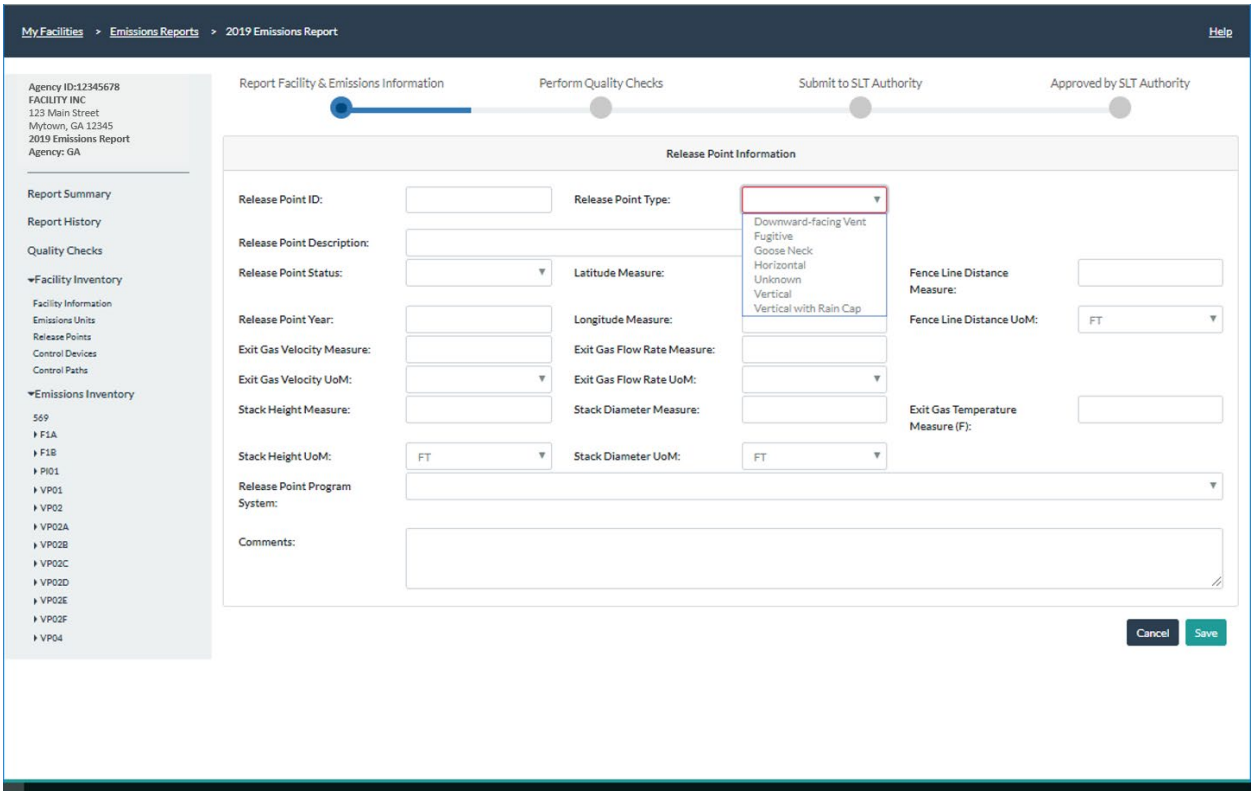
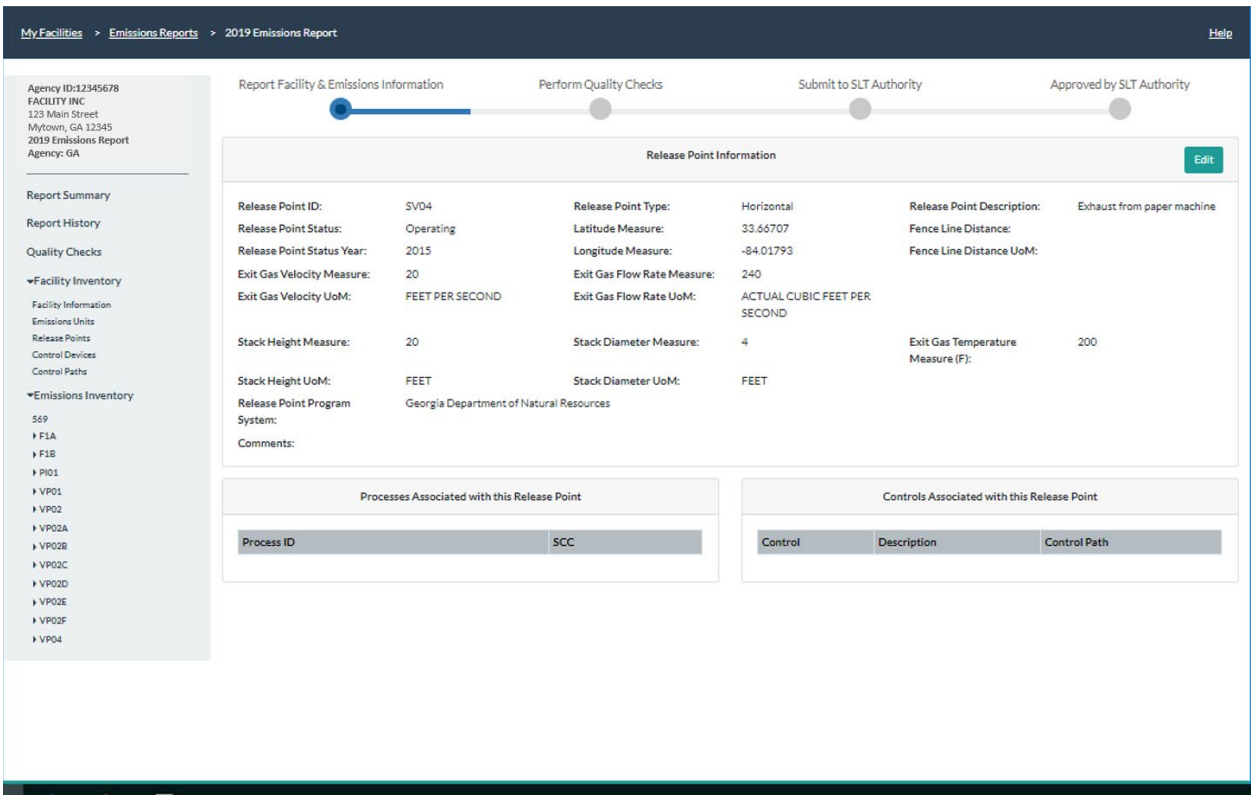



*Figure 16. Example of a Page for a Release Point*

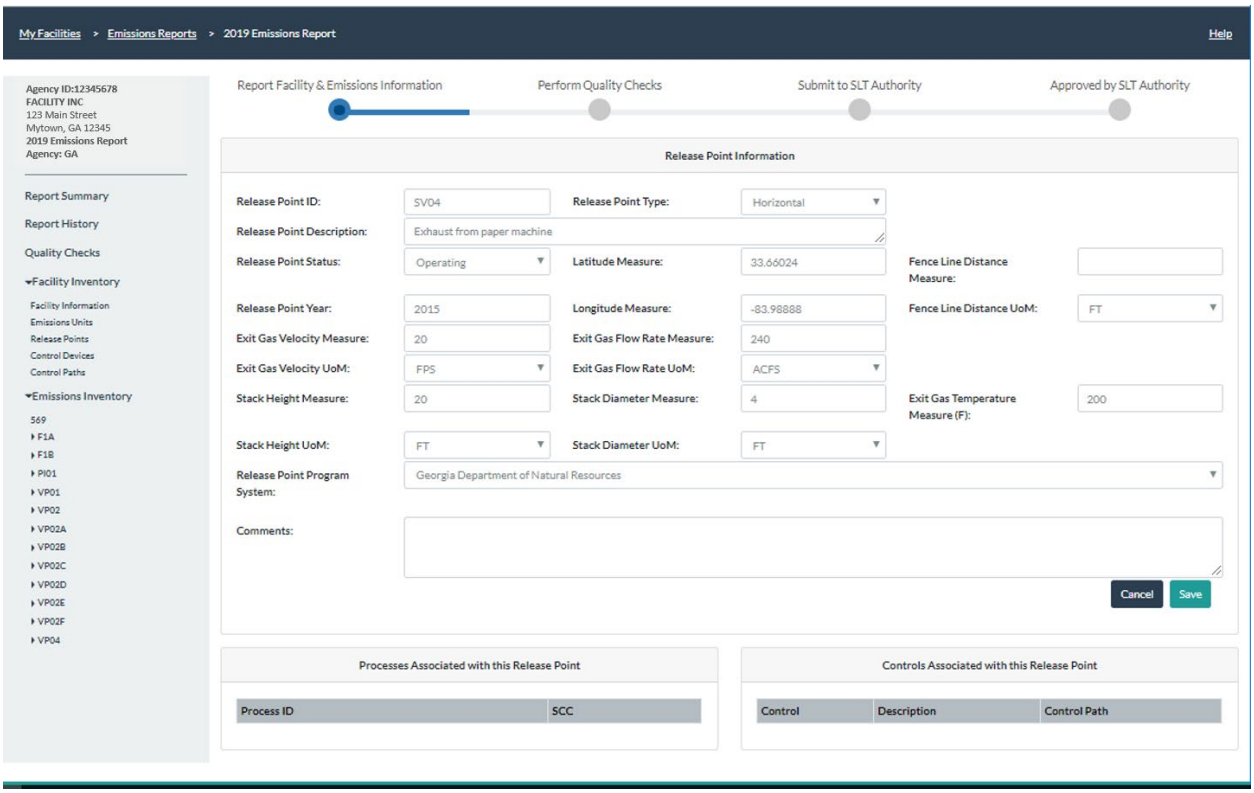


To edit a release point, click on "Edit" at the top right of the screen for that release point. You will also be taken to the release point page (similar to that of a new release point), where you will enter all relevant information about that release point (Figure 17). A gray arrow icon next to a data 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 17. Editing a Release Point*



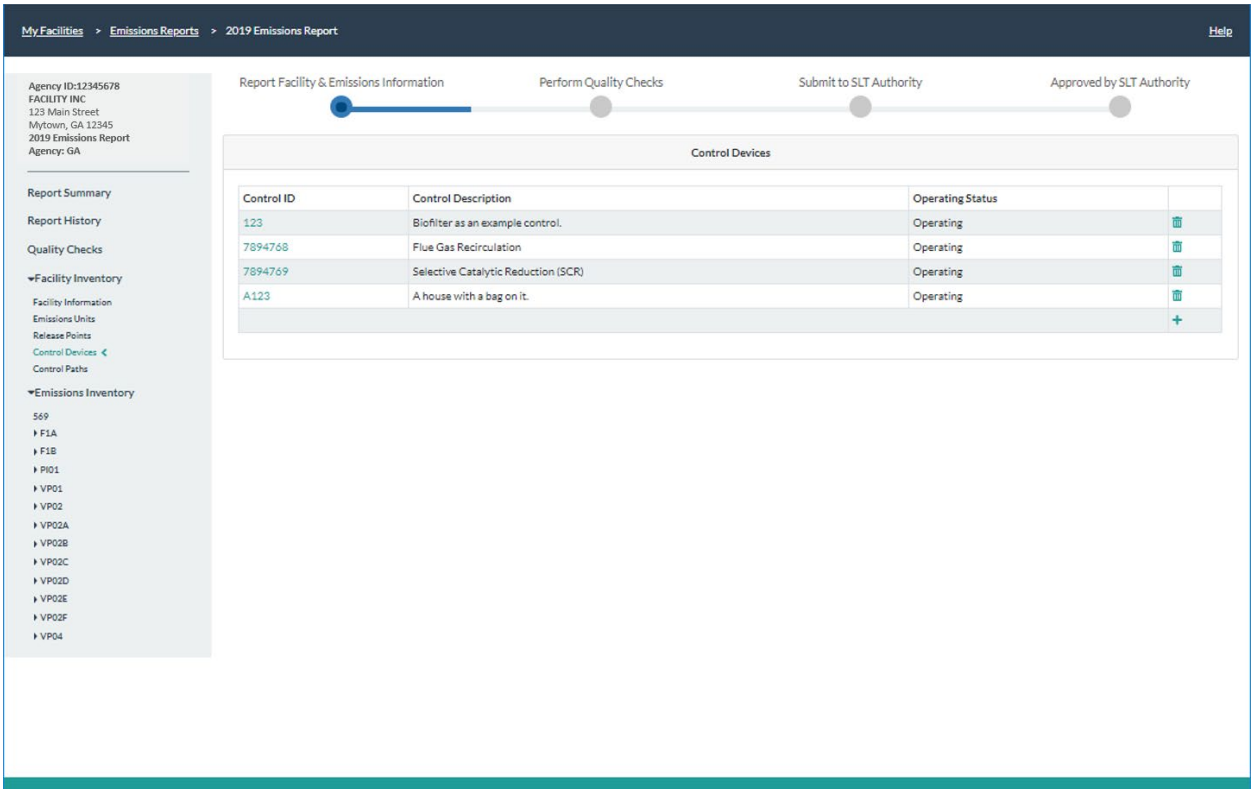

## 2.2.4 Control Devices Page

Control devices will be reported differently than in previous years. Section 7 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 18). You should delete any controls that are duplicated.

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 18. 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 checks will appear for data fields that are required, for value ranges (e.g. 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 been entering 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 as existing, 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 this control, you will add the percent efficiency with that pollutant. 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 20).

*Figure 19. Adding a New Control*

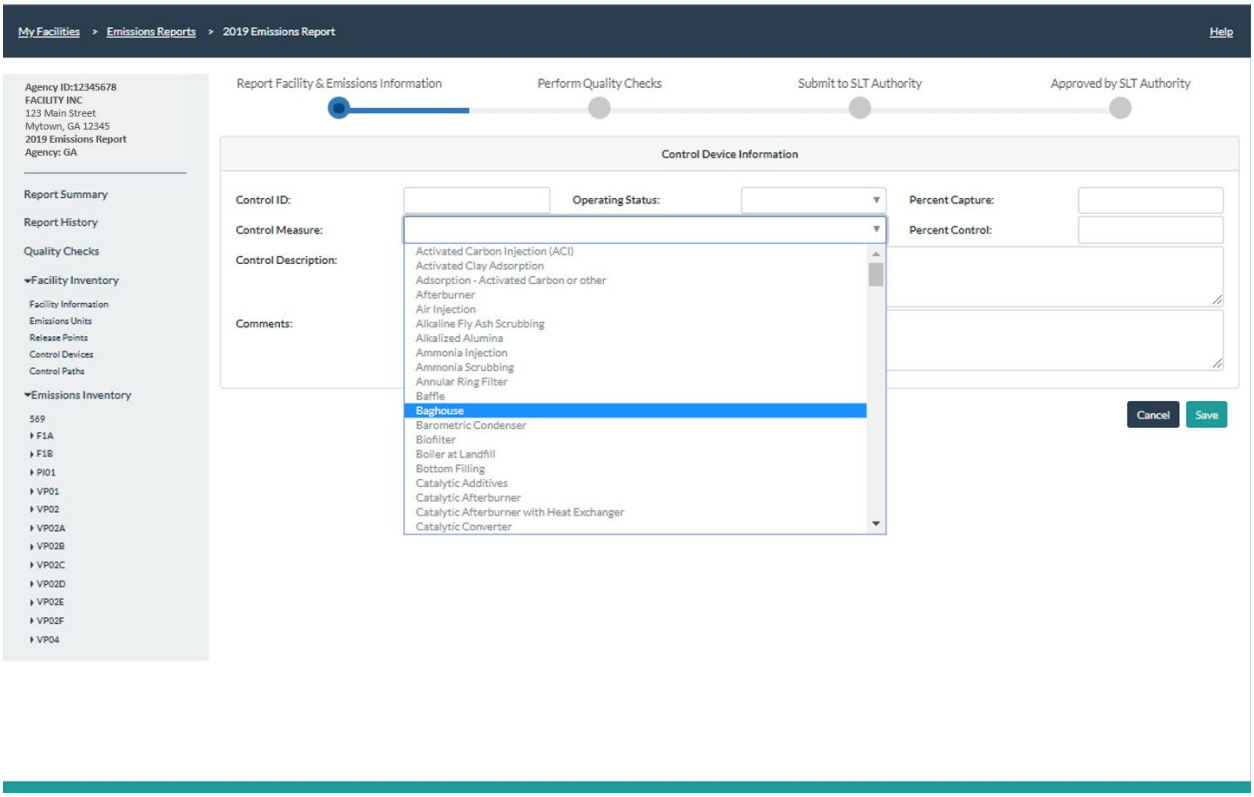
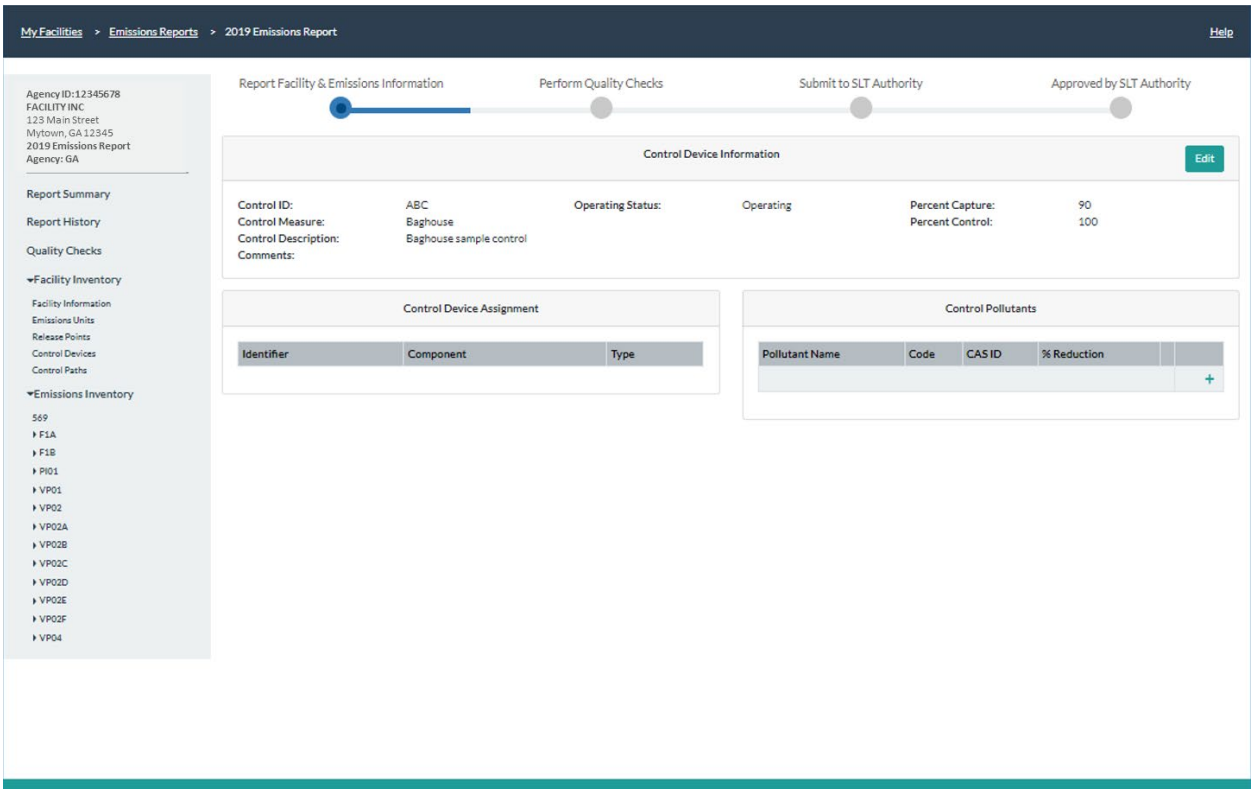
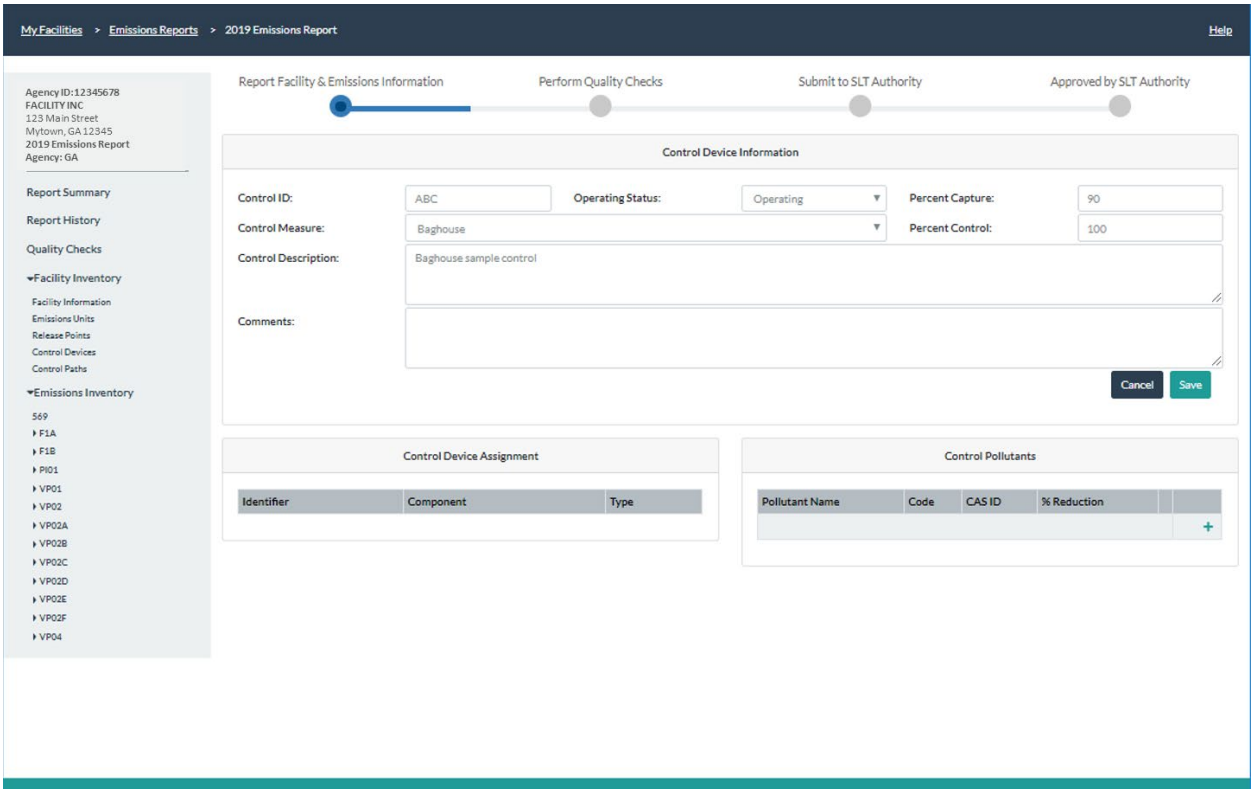



*Figure 20. Example of a Page for a Control Device*



To edit information for each control device, click on “Edit” to edit the control device information (Figure 21).

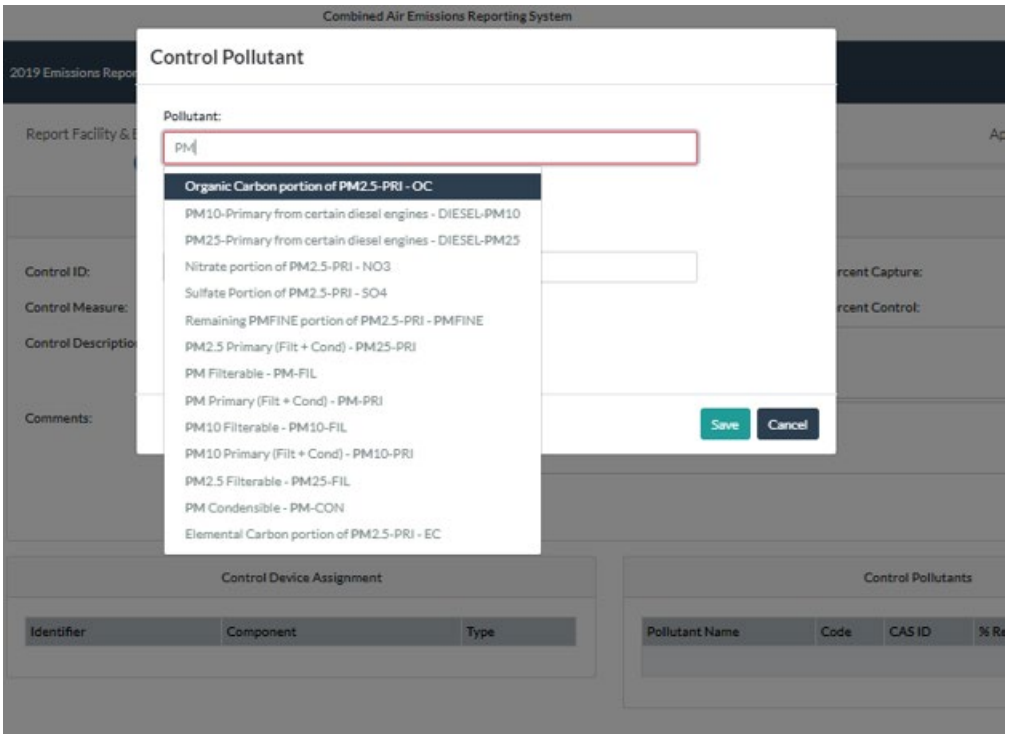
*Figure 21. Editing a Control Device*




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 (e.g. PM) and a list of possible pollutants will appear for you to choose from (Figure 22). 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.

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 is being retired, you must go into that control’s screen by clicking on the control ID from the list and change its operating status to “Permanently Shutdown”.

*Figure 22. 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 7 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. It is important to note that 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 23), 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 be creating that list from this screen.

Click on the "+" sign to be taken to add a new control path from a blank path page (Figure 24). 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 23. Control Paths Page*

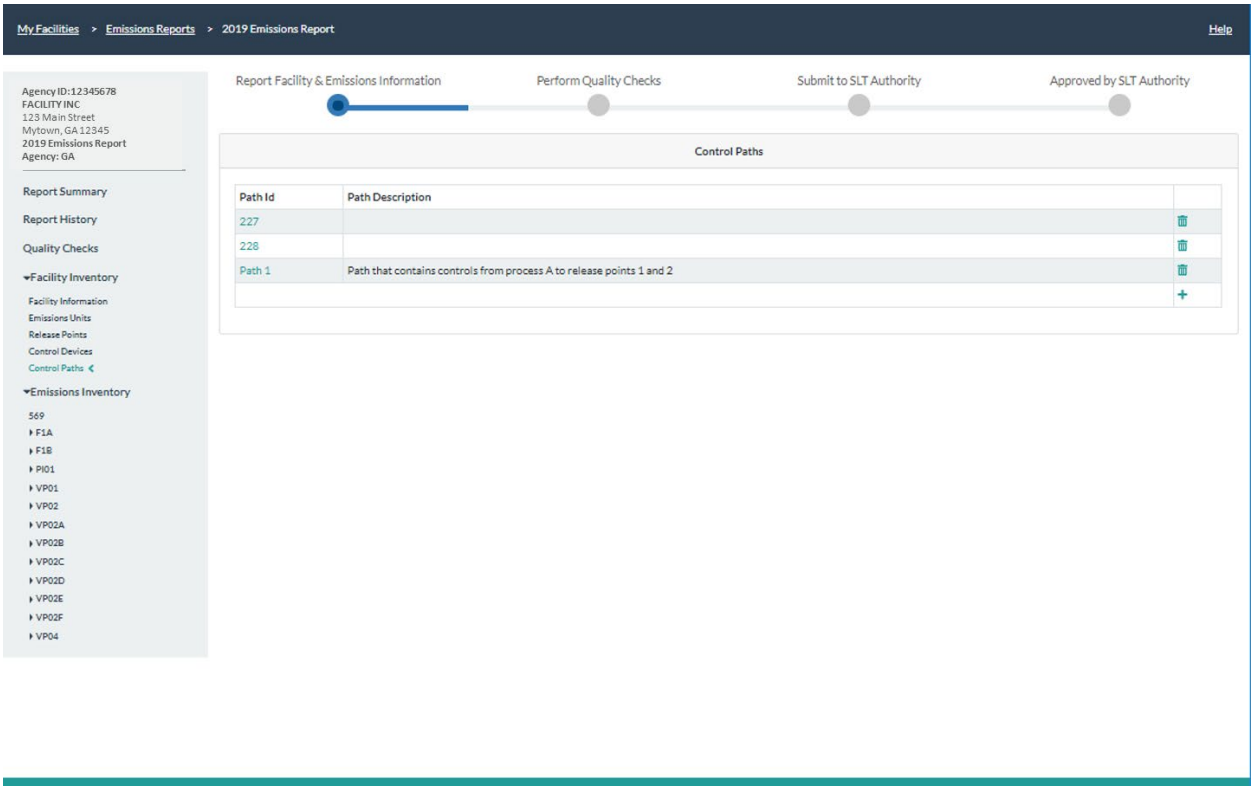
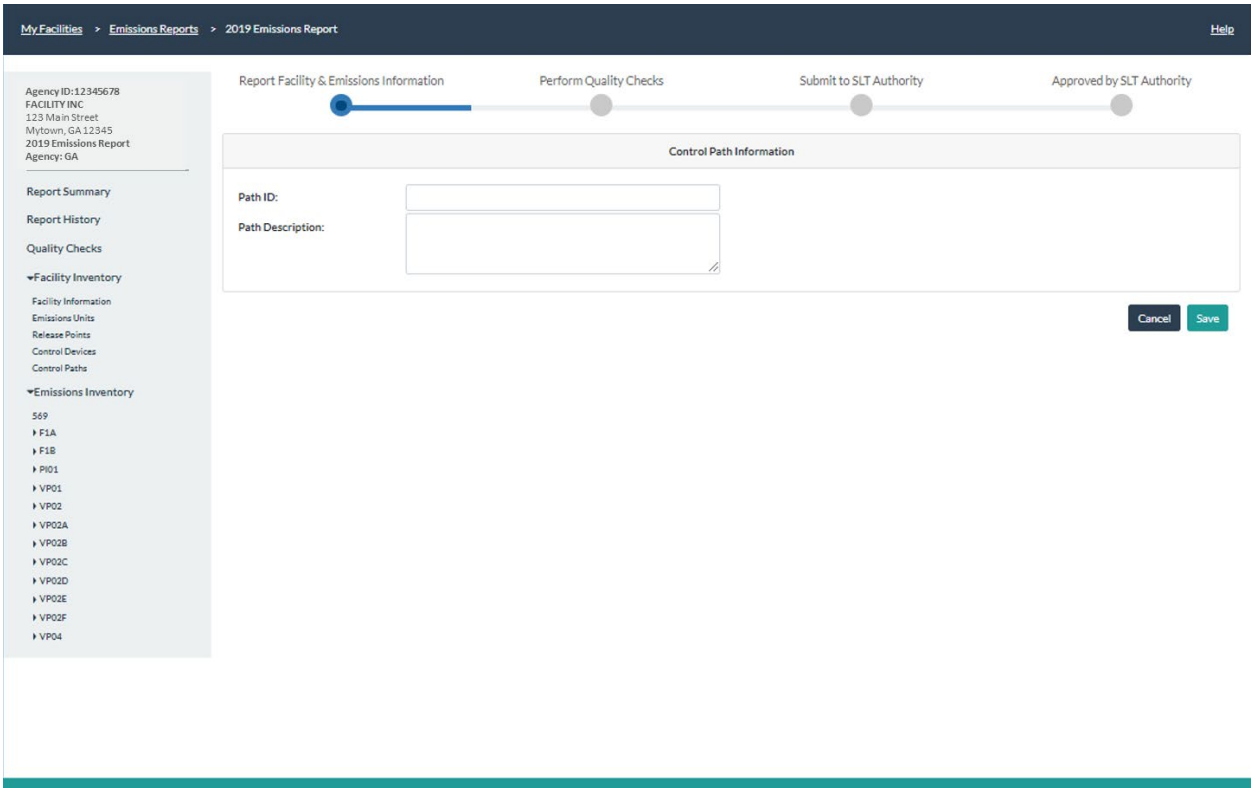
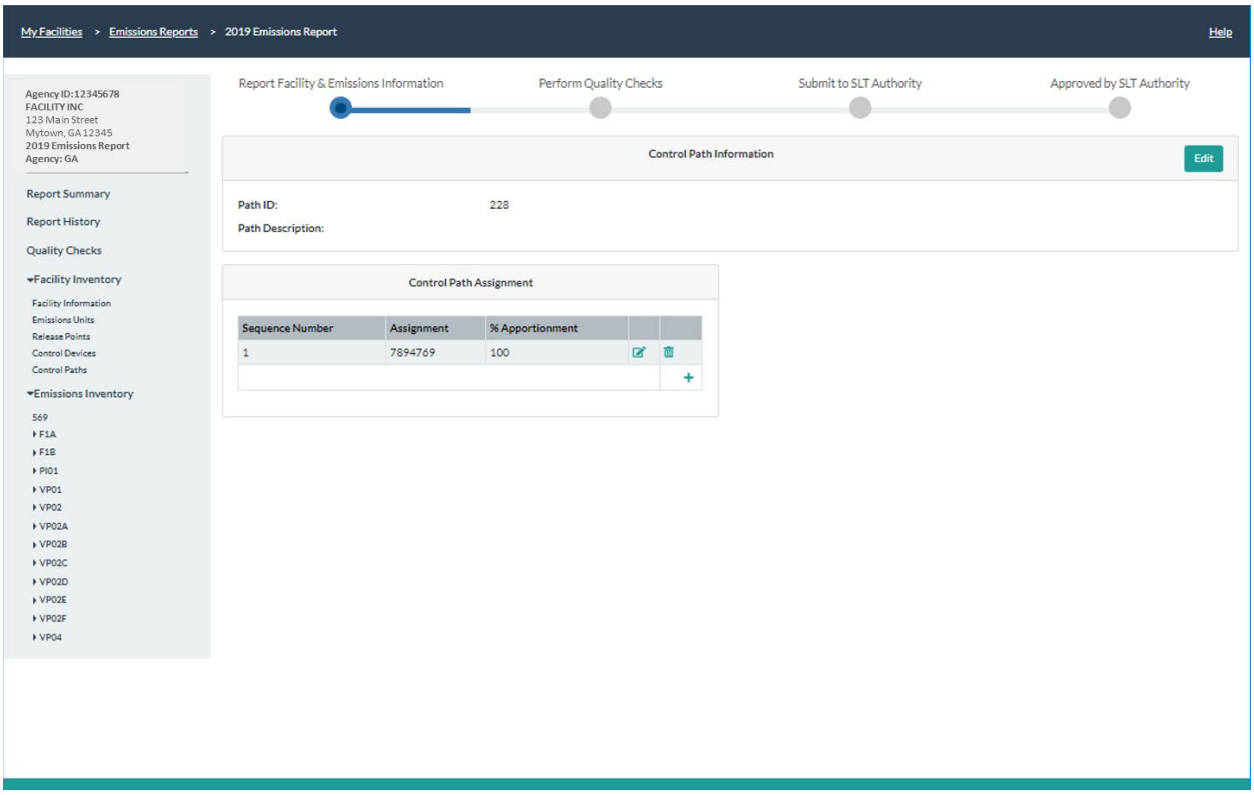



*Figure 24. Adding a New Path*



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 25). Click on “Edit” to edit the path information (Figure 26). 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 25. Example of a Page for a Control Path*




The next step is to ensure that all existing paths have their assigned controls and paths. To do this, click on an existing path from the "Control Paths” page. This will take you to that path’s information page (Figure 25). 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 27).

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, but not both. 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. If necessary, you must build smaller paths first, before building paths that are larger and contain the smaller paths.

*Figure 26. Editing a Path.*

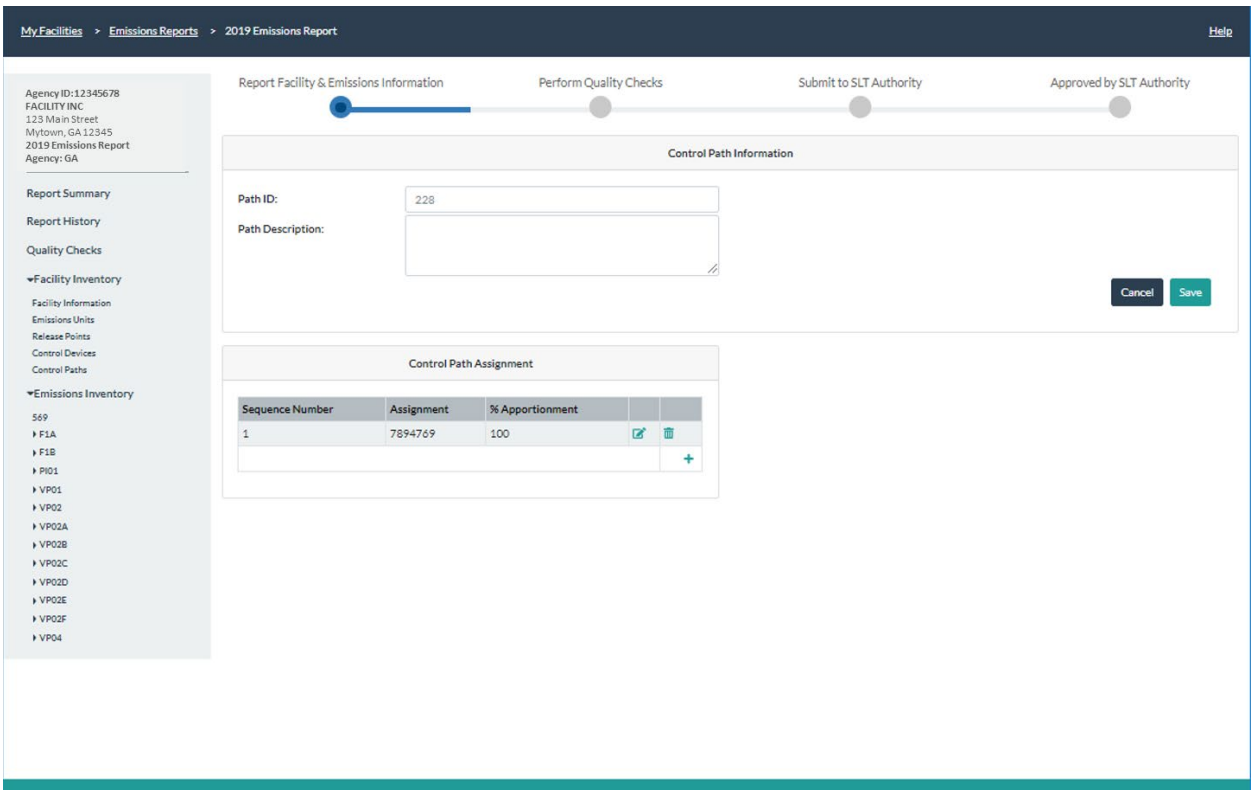
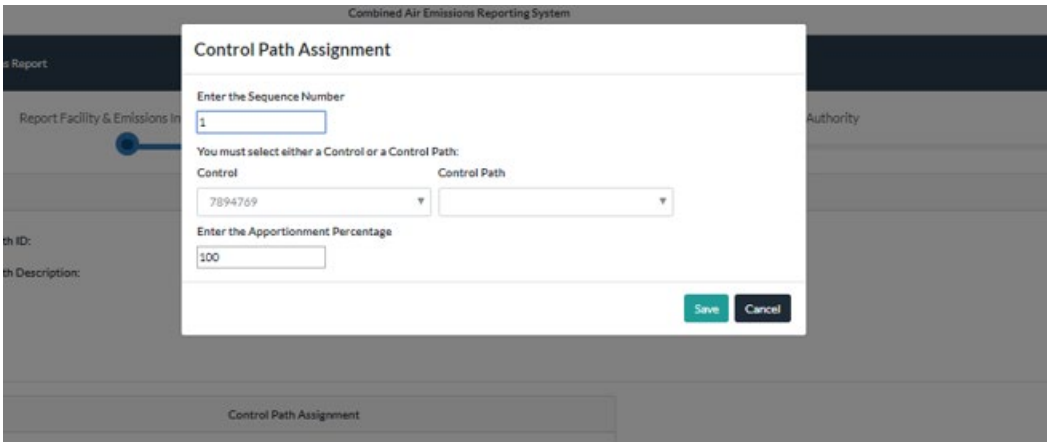



*Figure 27. Adding a Path Assignment*

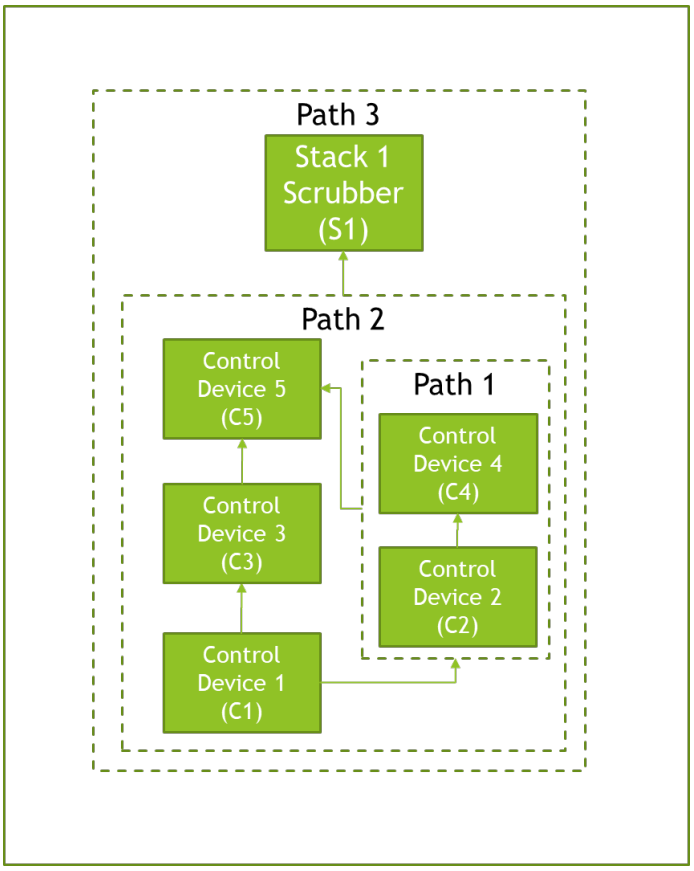



Enter the apportionment percentage. For example, if the control device or path you have selected will be receiving 100% of the emissions from the emissions process, or a previous control device or path in the sequence, enter 100. If the control will be receiving 50% of the emissions from the emissions process, or a previous control device 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 7, Figure 44). For the example facility, controls are configured as shown in Figure 28.

Additionally, Control Device 1 sends 60% of its emissions to Path 1 and 40% of its emissions to Control Device 3.

*Figure 28. Example of a Facility with Complex Controls*




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:

*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 |

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.

*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.

## 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.

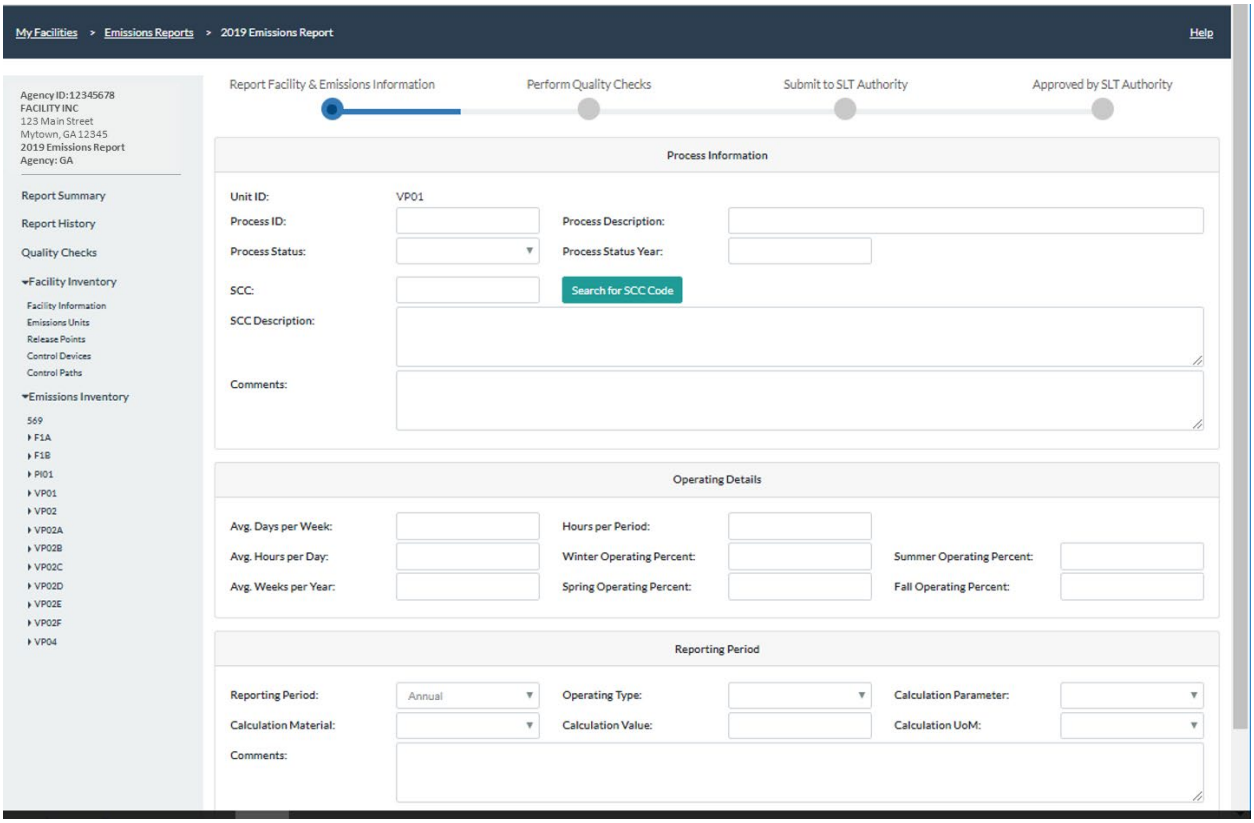
### 2.3.1 Units

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 29) 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.

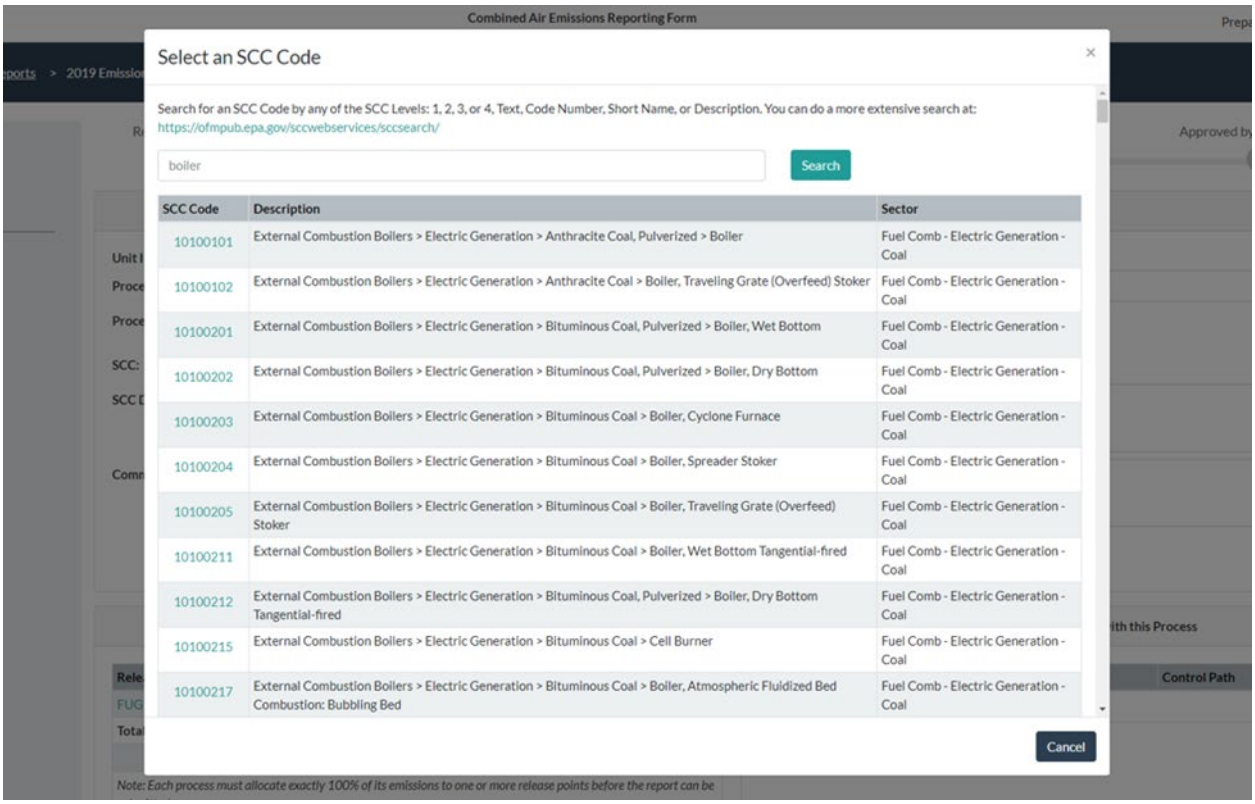
*Figure 29. Adding a New Process*




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 (e.g. 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 (e.g. 10100201). See Figure 30.

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 30. SCC Search*

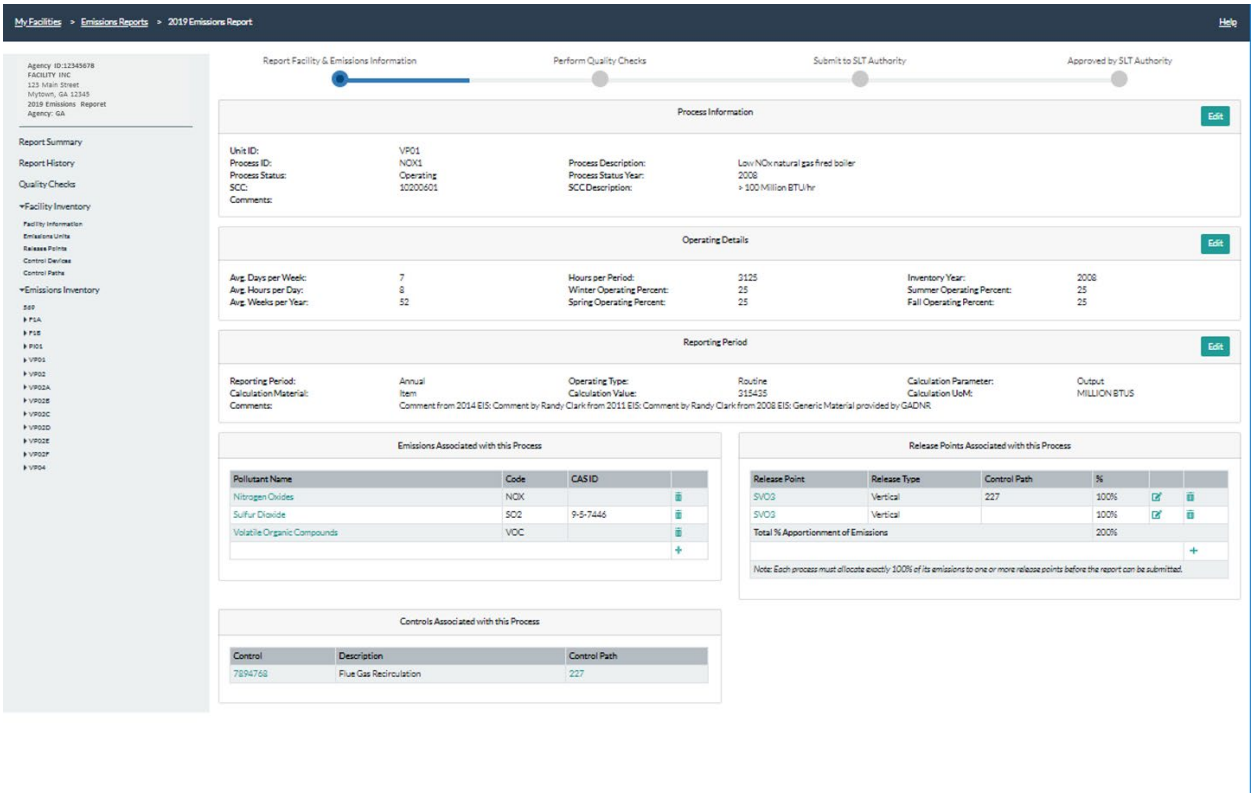



Once you add a process, it will appear in the list of processes associated with that unit on the unit's information page.

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 31). Click on the "Edit" button at the top right of the screen to make changes to the process information (Figure 32).

Similarly, you can also edit operating details and reporting period information by clicking on "Edit" in each of those boxes. Click "Save" when your edits are finished. Click "Cancel" if you find your edits are an error and wish to discard them.

*Figure 31. Example of a Page for a Process*

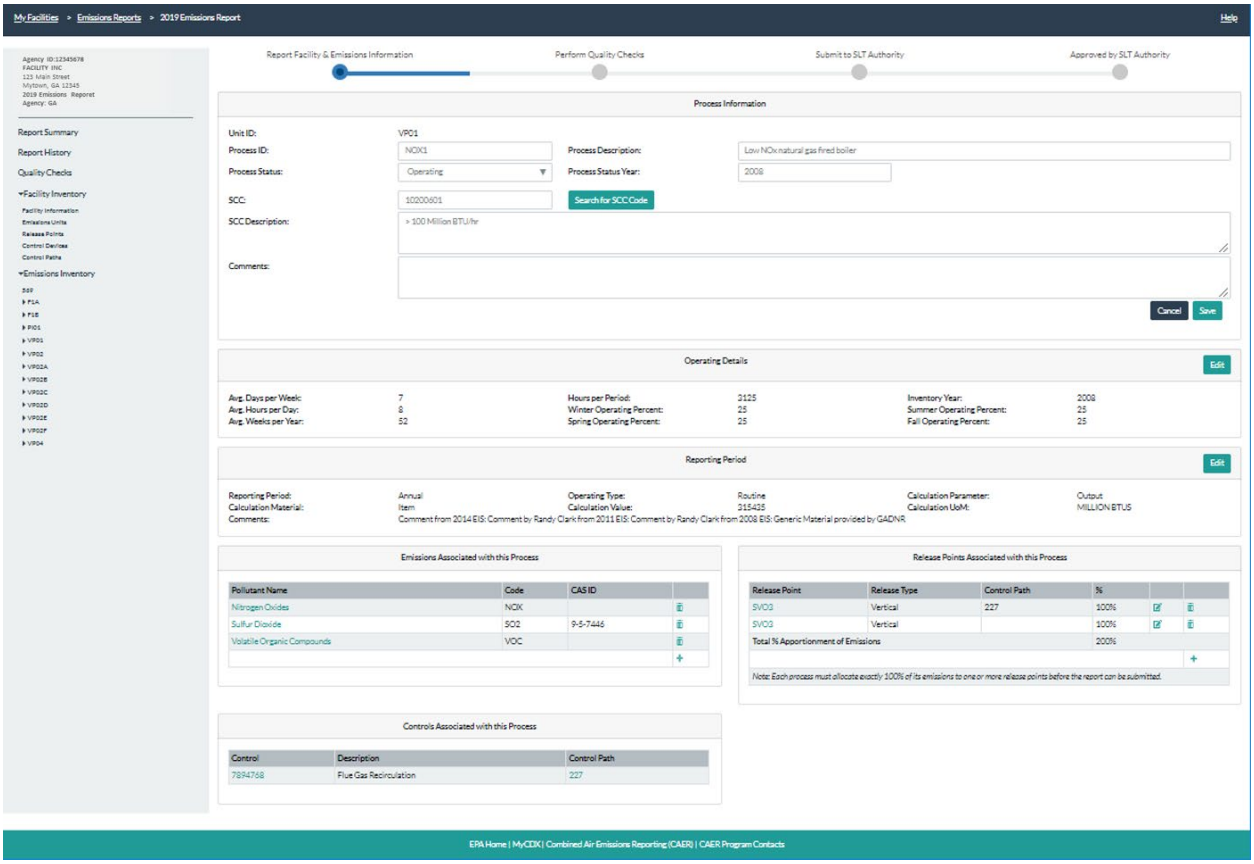



In the page for that process, you will also see emissions, release points, and controls associated with the process.

To add a release point, 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, see Section 2.3.2.2.

*Figure 32. Editing a Process*



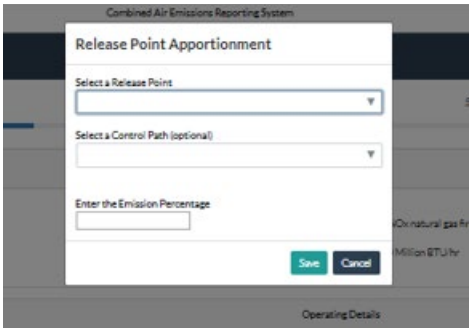

### 2.3.2.1 Associating a Process to a Release Point

Go to the process information page (Figure 31), 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 33).

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 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 33. Release Point Apportionment*



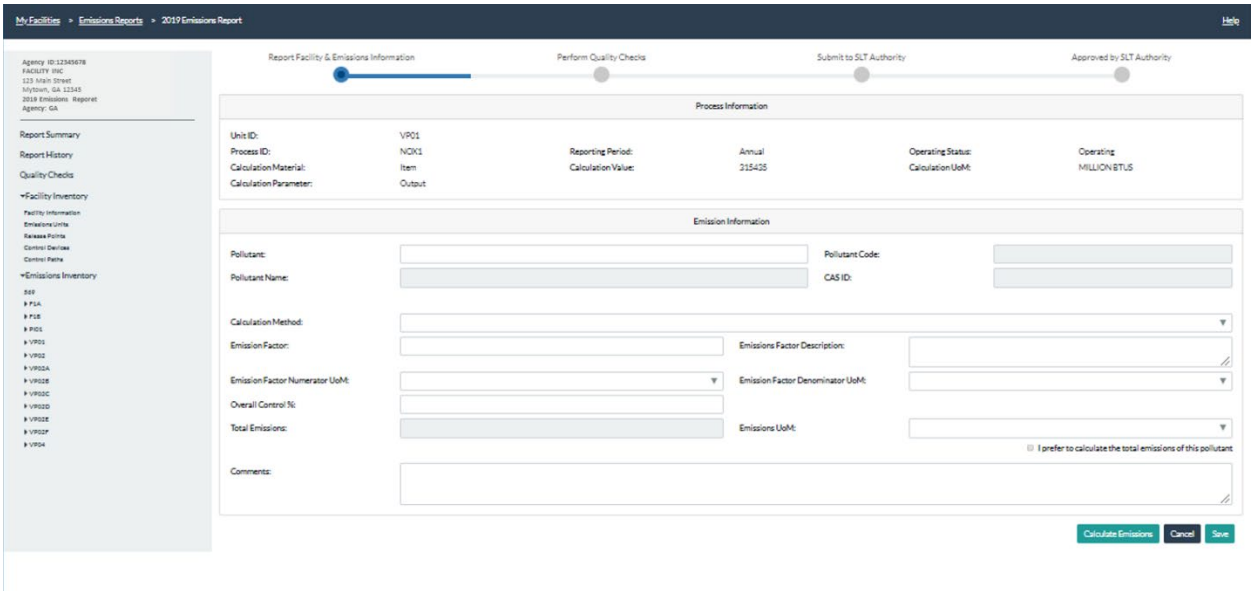

After entering the relevant information, click "Save". Now you will be able to see, in the "Controls Associated with this Process" box at the bottom left of the screen, the path you have associated with the release point and process.

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 (Figure 34). Click the "+" sign to add emissions. This will take you to the page for that pollutant. 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. E.g. typing in sulfur will render Sulfur Hexafluoride – SF6, and Sulfur Dioxide – SO2-9-5-7446.

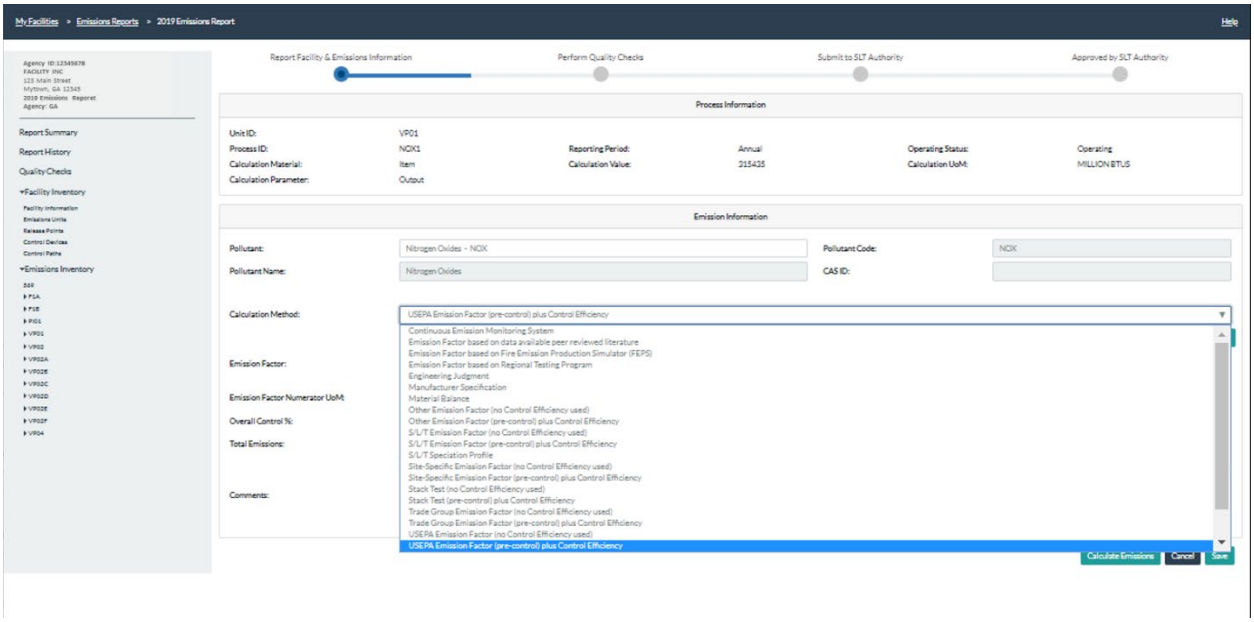
*Figure 34. Adding a New Pollutant*




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.

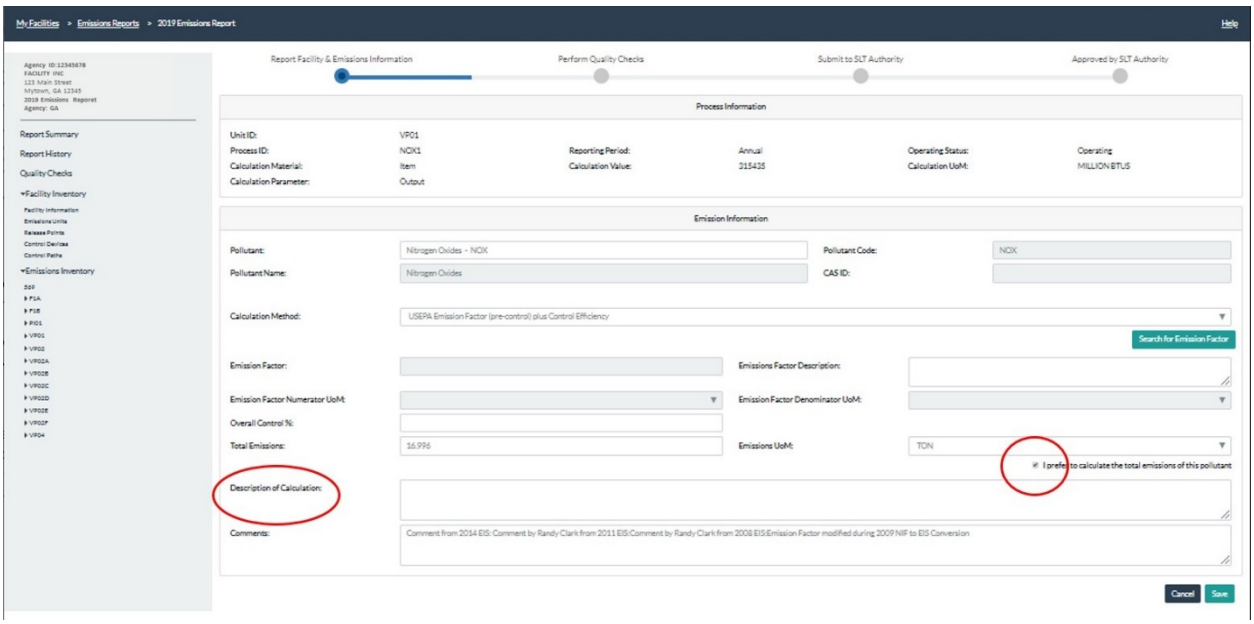
*Figure 35. Selecting a Calculation Method*




Note that some factor searches will return formulas. The form will require the user to then supply additional parameters for that formula. E.g. sulfur content %. Also note that 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 (e.g. weight UoM conversions from lbs to tons). 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 36). If controls are present (associated with this process via a path), enter the overall control efficiency for the path in the "Overall Control %" box.

*Figure 36. Using EPA Emission Factor Alternative*




# 3 Reporting Emissions and Facility Information Using Bulk Upload

## 3.1 The Bulk Upload Template

You will be able to use the bulk upload feature 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 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 do your bulk upload.

The template contains several tabs (Figure 37). There are two sets of tabs:

Highlighted in blue are data entry tabs. Each tab contains specific types of data to be submitted. Drop-down menus allow the user to 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. 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

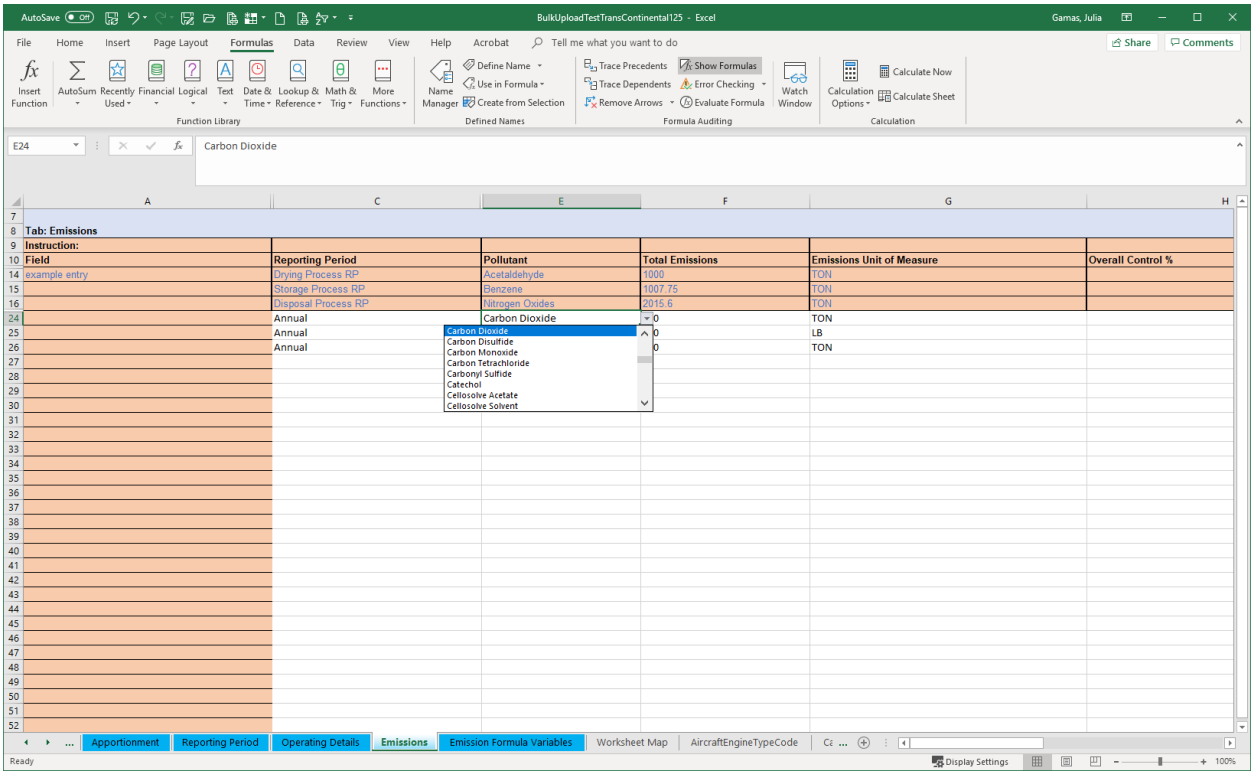
For CAERS Version 1, new facilities will be provided an empty template. Facilities that have reported in previous years will be provided a pre-loaded template file with their previous year annual emissions (National Emissions Inventory) report. We strongly recommend that you make a copy of that pre-loaded template and work with the copy, in case you need to revert to the original. Once you have the Excel file you will be working with, you should enter your edits into this file, to reflect the current year submission data. If you will have relatively few changes we encourage you to use the user interface instead. Also, when you open your file, if a yellow bar appears at the top asking if you want to enable content, click to enable it.

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 adjacent cells of data and paste them into the CAERS Bulk Upload spreadsheet then you risk overwriting a necessary formula in a hidden field.
- **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.

*Figure 37. Example of Bulk Upload Template*




## 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. 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.

CAERS will run validations checks on your file before allowing you to submit it. Examples of the validation checks run at this point are verifying the required fields are present and that text fields do not exceed maximum lengths. Note these validation checks will be different than the QA checks that will be run on the submission itself once it has been uploaded. Validation checks are run on the Excel file (data format) itself. QA checks are run on the data contained in the file towards an error free submission. therefore, it is a good idea to give yourself extra time to address any errors that may emerge.

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 using the instructions above. If there are not any errors in the uploaded spreadsheet then you will be brought directly to the Report Summary for the uploaded report and 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 38):

- **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 will alert you to potential issues you may want to address before submitting.

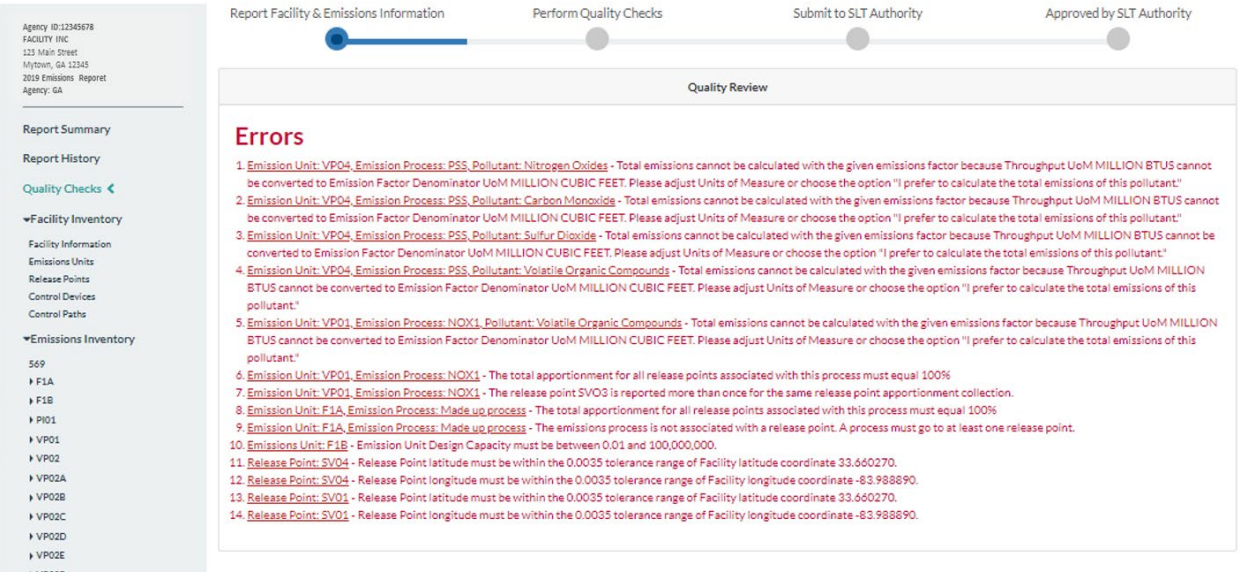
Broadly speaking, error messages fit in one of the following categories:

- **Calculation errors -** Data calculated outside the form 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 happening in the Winter season;
    - the latitude for a release point has been reported but is too far from the facility (outside of its facility threshold);
    - an emission factor was provided, but its denominator is in different units of measure than throughput, so a simple conversion is not possible;
    - previous year reported emissions are identical to current inventory year reported emissions.
- **Expected information is missing -** Data is expected to be entered but the data field is empty, for example:

- in the EPA emission factor the ”I prefer to calculate the total emissions of this pollutant” as been checked but the “Description of Calculation” box has not been populated;
- controls exist that have not been assigned to a path;
- if a release point stack diameter is reported, then exit gas flow rate and exit gas velocity should also be reported.

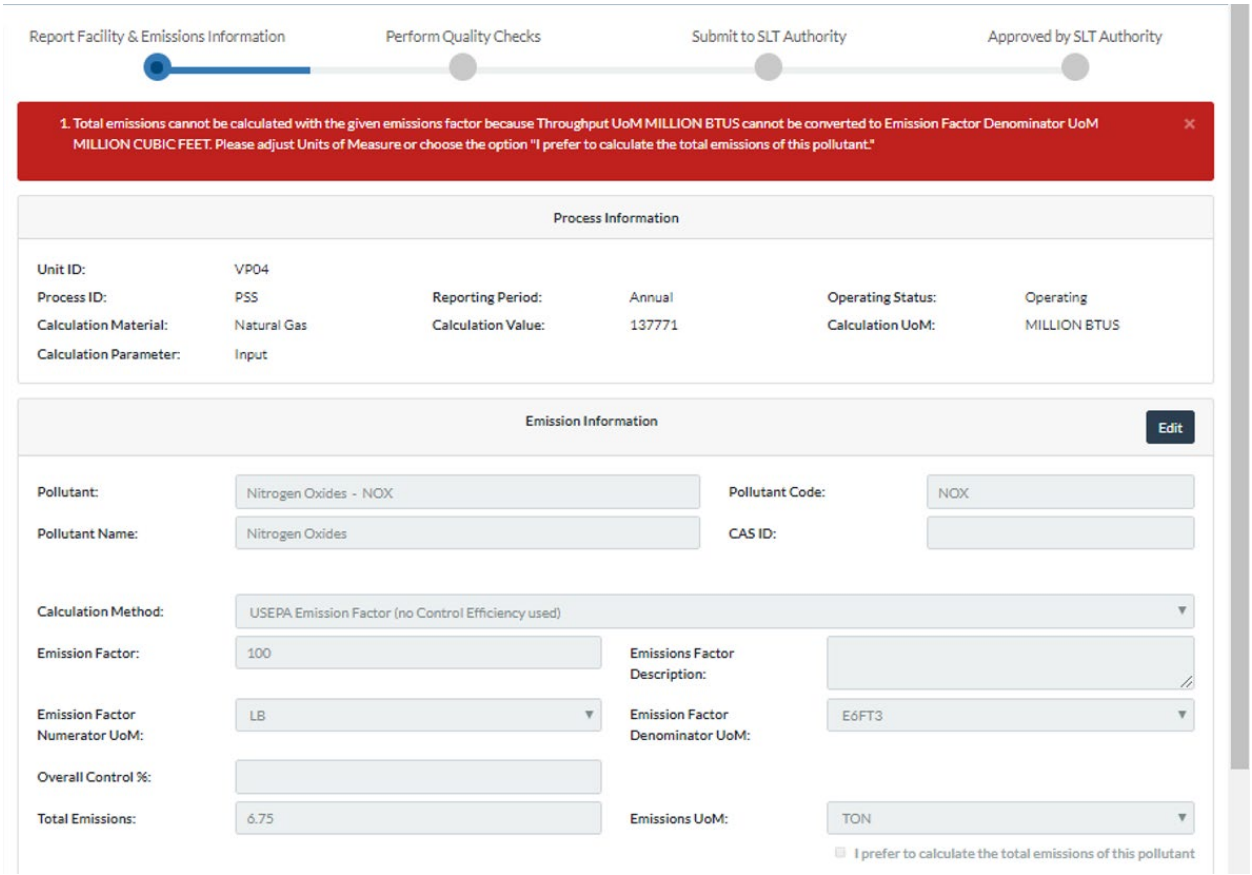
- **Incorrect format -** Data must be entered in a specific format, for example:
  - postal code must be in five-digit or nine-digit format;
  - value for a year must be four digits.
- **Data is not allowed –** Data entered is not allowed, for example:
  - duplicate ID was entered, but ID’s for sub-facility components must be unique for a facility;
  - units of measure that are no longer supported are still being used;
  - SCC entered has been retired in a previous year to the inventory year being reported.

*Figure 38. Quality Review Page*




Click on the name of the error (underlined), to be taken to the screen where the error is occurring (Figure 39). 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.

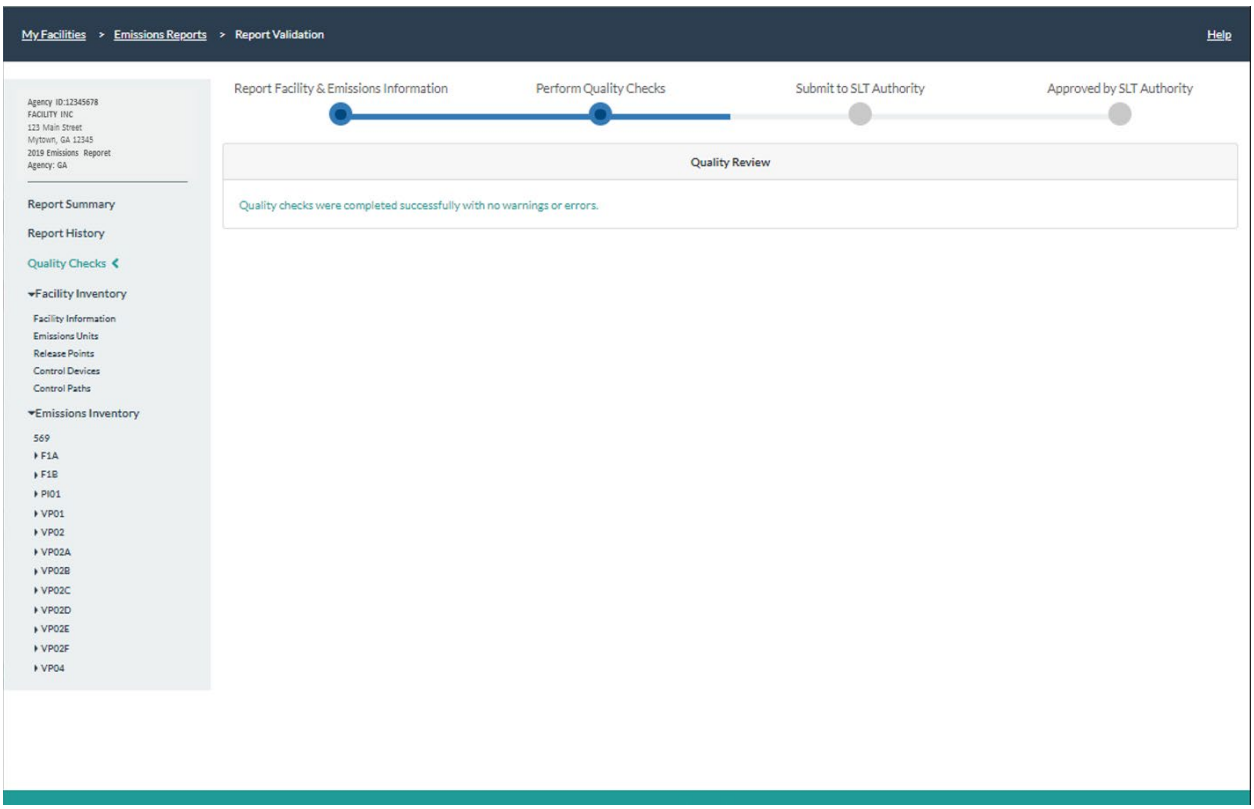
*Figure 39. Correcting an Error*




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 40). 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.

At this time, the application will not be able to bulk download your submission. Please note that 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.

*Figure 40. Completing Quality Checks*




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

As a certifier, 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 "sign". You will see a "please wait" sign while you are waiting. When you have 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.

From here you will be able to either reopen your report or review it. We do not recommend reopening your report unless you have an edit. You should contact your SLT authority if that is the case to notify them of the change. You will also want to reopen the report if you have been notified by them that a change is needed.

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.

# 7 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 will introduce the new concepts regarding controls to help you understand how to set the controls up for your facility in the CAERS.

Controls are important because 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 set up, we were not able to:

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

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

- A list of controls will exist for the facility
- A control will only define one single piece of control equipment
- Only the pollutants controlled 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 controls will be trackable:
    - 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. Ultimately, the path will define the controls that are encountered from the emissions generation point to the release point. A path can consist of controls or other paths. The path will allow the user to define multiple kinds of control setups.
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%. E.g. 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 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.

## 7.1 Example of a Facility with a Single Control

Figure 41 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 5 shows the assignment of the control. Table 6 shows the associations for that control and the other relevant sub-facility components.

*Figure 41. Example of a Facility with a Single Control*

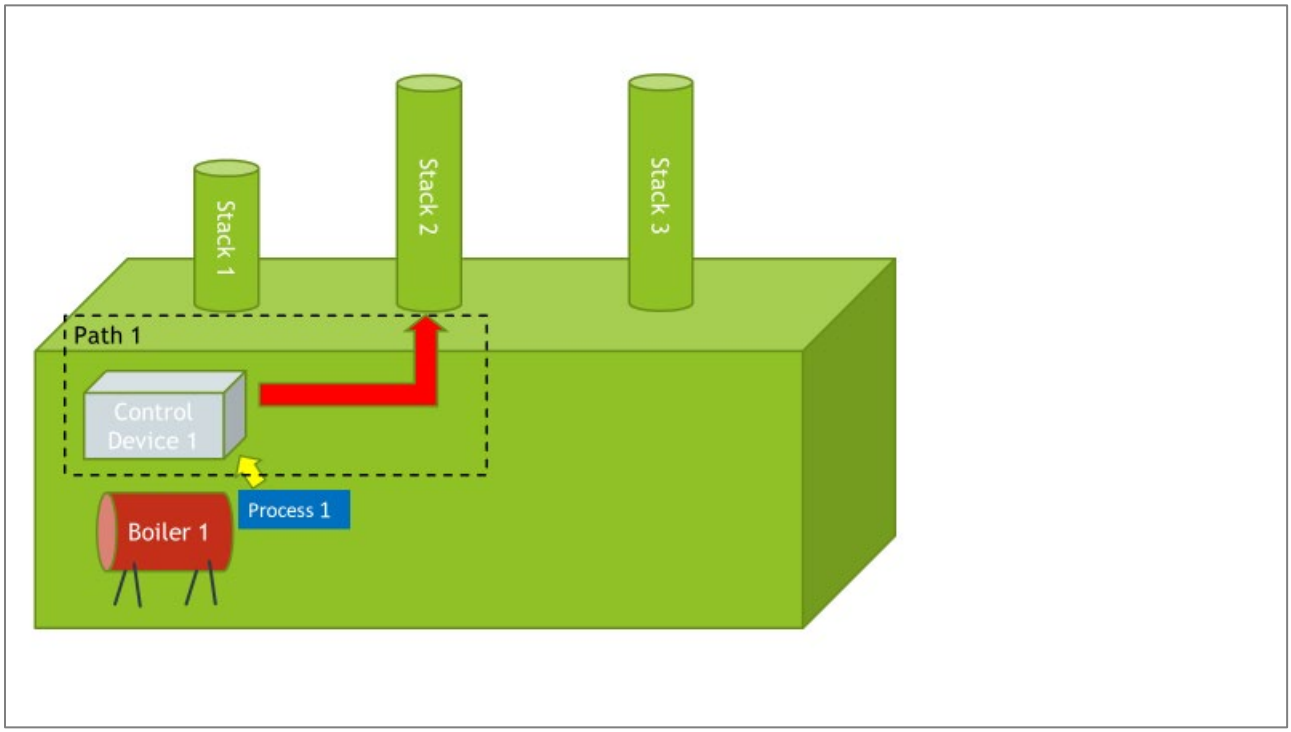



*Table 5. Example Path for a Facility with a Single Control*

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

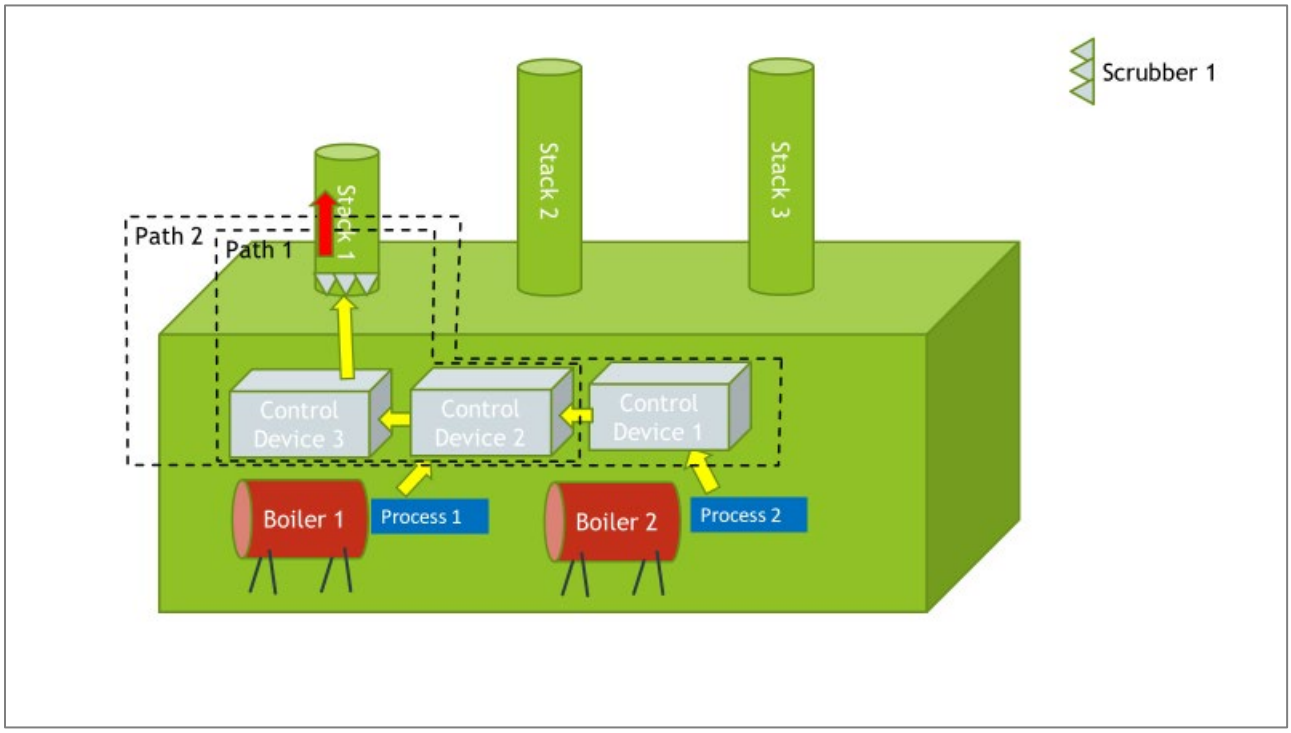
*Table 6. Example Associations for a Facility with a Single Control*

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

## 7.2 Example of a Facility with Controls in Series

In Figure 42 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. 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. Whenever there are controls, there should ultimately be one master path between a unit and a release point. If more than one process is being run from the unit, then all the processes would be associated with the controls in the same manner as Process 1.

*Figure 42. Example of a Facility with Controls in Series*




For this example, we can see in Figure 42 that because all emissions flow directly from one control to the other, 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 Control Scrubber 1 is third. Table 7 shows the assignment for this facility. Table 8 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 43. Path Assignments for a Facility with Controls in Series*

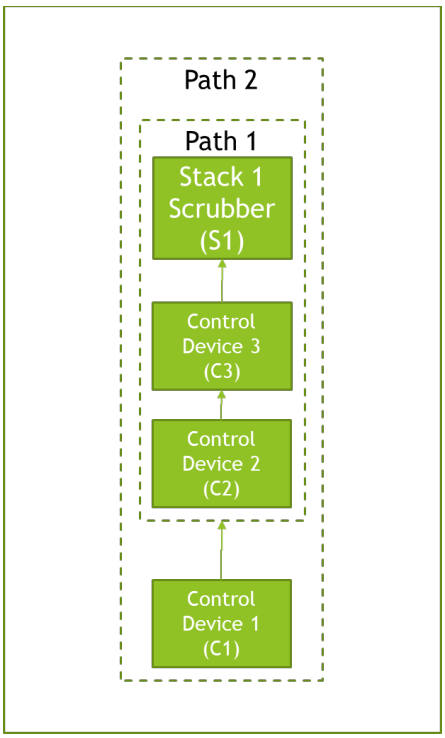



*Table 7. Example Paths for a Facility with Controls in Series*

| 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 8. 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% |

## 7.3 Example of a Facility with Complex Controls

In Figure 44 a more complex controls set up is represented. Again, assume one process for the unit, but bear in mind that all processes associated with that unit 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, and Control 5. Path 3 contains Path 2, and Scrubber 1.

*Figure 44. Example of Complex Controls*

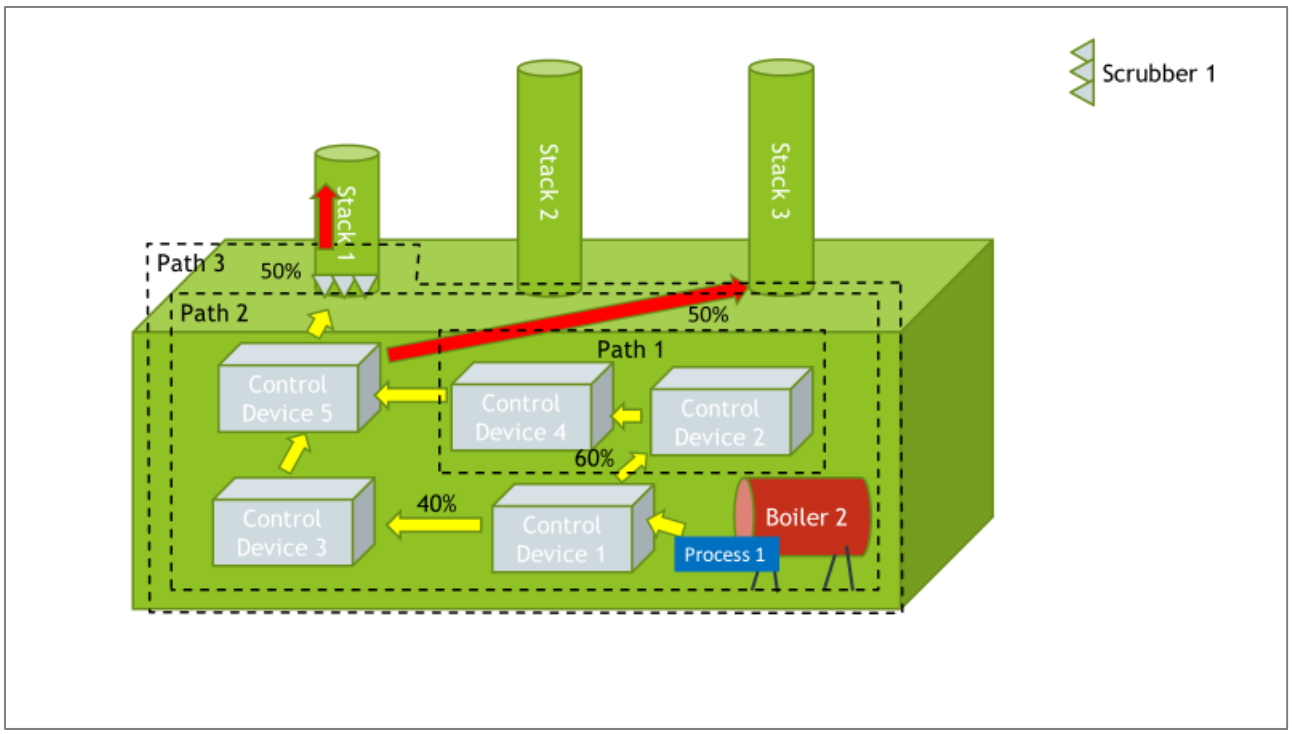



Figure 45 shows the different assignments and apportionments given this set up. In Path 1, Control 2 is first in the sequence, and Control 4 is second, and 100% of emissions flow from Control 2 to Control 4, and from Control 4 to Control 5 in Path 1. In Path 2, Control 1 sends 60% of its emissions to 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 Control 5 emissions go to Path 3 (in Path 3, the Scrubber is second in the sequence and Path 2 is first in the sequence). Assignments are shown in Table 9. How the different sub-facility components are associated is shown in Table 10. 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 44).

*Figure 45. Path Assignment for a Facility with a Complex Controls*

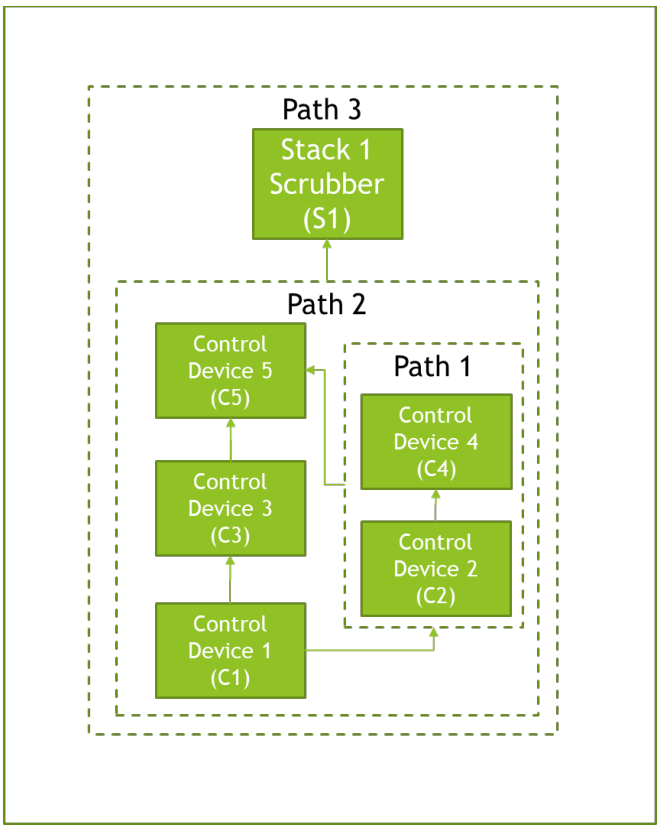



*Table 9. Example Paths for a Facility with Complex Controls*

| 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 10. 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% |

# 8 Where to Go for Help

## 8.1 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.

## 8.2 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

## 8.3 Additional Resources

### 8.3.1 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.

### 8.3.2 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 (s).

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.

### 8.3.3 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" ( https://www.epa.gov/e-enterprise/product-design-team. 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.