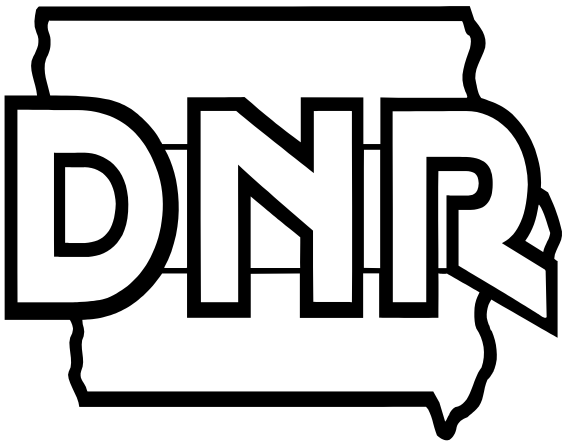
Title V Emissions Inventory Instructions

(August 2024)



Iowa DNR - Air Quality Bureau
http://www.iowacleanair.gov

Submit the Title V Emissions Inventory with relevant supporting documents in SLEIS by March 31.

Emissions Inventory
Air Quality Bureau, DNR
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Table of Contents

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Air Bureau Records Center
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Air Bureau Numbers
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515-725-9501 (fax)

Asbestos Program
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Construction Permit Section
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Compliance Section
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SLEIS Helpdesk
SLEIS electronic resources

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Title V Operating Permits
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Polk County Air Quality
515-286-3705 (phone)
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319-892-6000 (phone)
319-892-6099 (fax)

Online Resources

DNR Air Quality Bureau:
Air Quality Bureau Homepage

eAirServices
Access eAirServices - a secure portal for online business services. It is the entry point for the regulated community and consultants to electronically complete and file air emissions inventories and permit applications.

EPA Emission Factors

Latitude and Longitude
Google Maps
Latitude and Longitude Finder
Google Earth
GPS Visualizer

Facility Classification Systems
SIC Codes
NAICS Association

SCC Codes
For a list of SCC codes visit the Emissions Reporting/Guidance Documents & Reference Material webpage. Scroll down to "Classification Lists and Conversions" , and click on the link for "Updated Source Classification Codes ." Ethanol and Biodiesel plants should click on "Ethanol and Biodiesel Source Classification Code (SCC) List."

Calculation Spreadsheet and Tools
To access calculation spreadsheets for painting operations, haul roads, and asphalt, concrete and limestone processes visit the Emissions Reporting/Guidance Documents & Reference Material webpage. Scroll down to "Emissions Inventory Reporting Documents" then click on the spreadsheet of interest.

Iowa Administrative Code (IAC)
https://www.legis.iowa.gov/law/administrativeRules/agencies See section 567, Chapters 21-33.

General Instructions/Purpose

Introduction

This document contains information needed to complete a ***Title V emissions inventory***. Submitting a complete inventory is required by 21.1(3) of the Iowa Administrative Code. Some companies may be unfamiliar with air quality terms; therefore, a glossary is included in Appendix A. Terms included in the glossary are bolded and italicized. In addition, general air program definitions are found in 567 Iowa Administrative Code (IAC) at the beginning of Chapters 21, 22, 23, and 24. The IAC is available on the internet at https://www.legis.iowa.gov/law/administrativeRules/agencies.

The deadline for submitting a completed Title V Emissions Inventory is March 31.

SLEIS

Emissions inventories are submitted using DNR's online emissions inventory reporting tool called the State & Local Emissions Inventory System (SLEIS). This web-based system has been populated with emissions data and facility equipment information and allows for streamlined reporting. In addition, SLEIS offers the option of importing emissions data via a spreadsheet template, significantly reducing data entry for facilities with a large number of emission processes. See page 7 for information on how to access SLEIS. SLEIS is located at https://programs.iowadnr.gov/sleis/.

SLEIS training sessions will be announced on the eAirServices website under the "Training" tab, and through the DNR's Air Quality listserv. DNR's air quality technical listserv is targeted to the regulated public and consultants to deliver timely regulatory news, program updates, and technical guidance. To subscribe, go to www.IowaCleanAir.gov, scroll down and click on "Sign up for Air Quality News Updates." For more information, please contact DNR's Wendy Walker at 515-250-7534 or wendy.walker@dnr.iowa.gov.

Emissions Reporting

All regulated air pollutants including the seven ***Criteria Pollutants*** *(including* ***PM2.5****),* 188 ***Hazardous Air Pollutants*** (HAPs), and ***Ammonia*** are required to be reported in the inventory. On February 4, 2022, EPA added 1-bromopropane to the list of hazardous air pollutants. This pollutant is available for reporting in SLEIS. The definition of volatile organic compounds (VOC) can be found in Appendix A and a listing of all HAPs can be found in Appendix B. Please consult this list if you are unsure if a pollutant needs to be reported.

Emission estimates should be evaluated for all emission sources at your facility including ***fugitive emissions***.

Actual emissions need to be reported for each emission unit. ***Emissions units*** may be grouped for reporting actual emissions *only* if the emission units and their processes are identical, have identical control equipment, and they exhaust to the same release point. If an emission unit has multiple processes, each process should be reported separately.

Actual Emissions

Actual emissions are the actual rate of pollutant emissions from an emission unit. Actual emissions are calculated using the emission unit's actual operating hours, production rates, and quantities of materials processed, stored, or combusted for the calendar year.

Emissions Estimation Methods

Emissions must be based on the best possible method. Do not use a less preferable method if a more preferable one is available. Using a less preferable or unacceptable method could result in your inventory being returned for revisions.

Regardless of the method used to calculate emissions, supporting documentation must be included with the inventory submittal. This documentation must be sufficient in order to allow DNR to evaluate the emissions calculations.

Methods of Calculating Emissions ***(in order of preference):***

1. Continuous emissions monitoring
2. Valid stack sampling which represents maximum operating conditions
3. Material balance
4. EPA-approved emission factors
5. Vendor supplied emission factors
6. Engineering estimates based on best available process operating data

- ***Continuous Emissions Monitoring*** systems measure pollutant concentrations in the exhaust stack 24 hours per day. There is no better method for determining emissions, however, these systems are very expensive and most facilities do not use them.

- A ***Stack Test*** measures the concentration of pollutants in the exhaust stack during the test period. Test periods can vary from a couple of hours to an entire day. Stack test data that are representative of current conditions can provide an accurate emission rate for many different processes and pollutants.

- ***Material Balance*** can only be used on specific types of emission units. It is most commonly used for surface coating operations (paint booths, dip tanks, etc.). Information must first be gathered on process rates, materials used, and material properties (from ***safety data sheets*** (SDS), usually). By combining this information with the knowledge of the process, an estimation of actual emissions can be made.

- ***EPA-Approved Emission Factors*** are the basis for many calculations. These factors represent industry-wide averages and show the relationship between emissions and a measure of production. You will need to access EPA's emission factors. If you encounter problems finding emission factors for a source you may contact DNR for assistance. When using EPA or other emission factors, you must use the most recently approved version. Sources of emission factors are listed below.

- ***Vendor Supplied Factors*** may be used if a more preferred method is not available. Many manufacturers of industrial equipment provide emission information for their products. This data may be used to calculate emissions only if the manufacturer's data is based on approved stack testing and no significant changes have been made to the emission unit. Supporting documentation must be included in the submittal if vendor supplied factors are used to calculate emissions.

- ***Engineering Estimation*** is allowed if a more preferred method is not available. The DNR realizes some processes exist that have no published guidance regarding the estimation of emissions. In these cases, the estimation must be the best possible assessment given the amount of data available. Supporting documentation must be submitted to show how the estimation was made.

More information about emission factors can be found on the EPA's Air Emissions Factors website.

Sources of Emission Factors

WebFIRE is the internet version of FIRE and it has replaced the software application, FIRE version 6.25, and the Microsoft Access version of the database. An internet version of FIRE allows more frequent updates and easier access. Visit https://cfpub.epa.gov/webfire/ to access WebFIRE.

AP-42 COMPILATION OF AIR POLLUTANT EMISSION FACTORS is the recommended source of air pollutant emission factors, with descriptions of activities emitting criteria and hazardous air pollutants.

TANKS is the model that was developed using a software that is now outdated. Because of this, the model is not reliably functional on computers using certain operating systems such as Windows Vista or Windows 7. EPA anticipates that additional problems will arise as PCs switch to other operating systems. EPA and DNR can no longer provide assistance to users of TANKS 4.09d. The model will remain on the EPA website to be used at your discretion and at your own risk. EPA recommend the use of the equations/algorithms specified in AP-42 Chapter 7 for estimating VOC emissions from storage tanks. The equations specified in AP-42 Chapter 7 (https://www.epa.gov/ttn/chief/ap42/ch07/index.html) can

be employed with many current spreadsheet/software programs. The Tanks 4.09D software estimates VOCs and hazardous air pollutants from vertical and horizontal fixed-roof tanks, internal and external floating-roof tanks, domed external floating roof tanks and underground storage tanks. It is based on the emissions estimation procedures presented in Section 7.1 of AP-42, 5th Edition. If your facility intends to use TANKS 4.09d to estimate emissions, please provide copies of the print outs as an attachment to the emissions inventory and any other documentation used for inputs into the program.

Tips to Avoid Common Mistakes when filling out your Emissions Inventory

1. Use SLEIS.
2. Do not use outdated or old emission factors. The most up-to-date emission factors must be used for accurate emissions calculations. If you are referencing a previous inventory, double-check all emission factors as they may have changed since the last emissions inventory submittal.
3. Many HAPs are also Volatile Organic Compounds (VOCs). List such pollutants as both a HAP and a VOC when reporting emissions.
4. There are two ways to include calculations for reported pollutants in SLEIS:
   a. Using the comments field for the pollutant
   b. Attach a document using the report attachments button. Please include all supporting documentation used to estimate emissions. Supporting documentation includes but is not limited to SDS, stack test summaries and reports, AP-42 table citation, mass balance calculations, and any correspondence with DNR or other air pollution control agencies.
5. If reported control efficiencies are higher than what is given in the Control Efficiency Guidance Document (Appendix C), these control efficiencies must be verified by test data from an EPA-approved method. Please include supporting documentation of the test data, which confirms the reported control efficiency.
6. Make sure $PM_{2.5}$ and Ammonia emissions are included where applicable. If PM_{10} emissions are being reported, remember to also include emissions estimates for $PM_{2.5}$.
7. Use correct units of measure for emission factors and annual throughput. Units of measure need to correspond between emission factors and the annual throughput.

Confidentiality

The DNR recognizes the need to keep certain information about facility operation confidential. If you have any questions about keeping submitted information confidential, contact Kelli Book, DNR legal staff at 515-210-3408 or at kelli.book@dnr.iowa.gov.

SDS

If using mass balance to estimate emissions, then copies of all safety data sheets (SDS) or technical data sheets for materials used at each emission unit during the previous calendar year must be included with the inventory submittal. Also, include the amount of each material used for each product. SDS are needed for a complete review of the submitted inventory. Facilities may submit a paint spreadsheet in lieu of the SDS.

General SLEIS Overview

This document contains specific instructions for an electronic submittal of an emissions inventory in SLEIS starting on page 8.

Accessing SLEIS

To access SLEIS, users must complete the SLEIS Electronic Reporting Registration Form. Email the completed form to sleis@dnr.iowa.gov. You may also mail the form to the address in the form's upper left corner.

Facilities must have a designated Facility Signatory (Responsible Official). A new Facility Signatory must submit a paper copy of the SLEIS Electronic Subscriber Agreement Form to the Iowa DNR. This form is only necessary for users who will be submitting the emissions inventory. Please visit the DNR's Air Quality eAirServices website and click on the "Access Help" link under the SLEIS menu to download the SLEIS access forms.

SLEIS Help Features

SLEIS has four different help features that ensure data being input into the database is accurate.

1. **Help Link:** Every SLEIS page has a help link in the upper right corner. This help link is unique to each page and provides a brief description of the information that can be viewed or edited on the screen.
2. **Tip Tool:** Each data entry field has a tip tool associated with it. The tip tool is a green circle with a question mark in it and is located above the data field. It contains specific information on where to find the data or equations to calculate the required information for the associated field.
3. **Required Data Elements:** Data elements that are required fields are indicated by a red bar on the left side of the required field. Fields without a red bar are optional.
4. **Data Validation Help Text:** SLEIS has multiple data validation checks. If the data entered does not meet validation requirements, the requirements will be shown near the data input field in red font. Pages may contain multiple tabs and all data on the tabs must meet the data validation requirements before a save can be executed for that record. Tabs with fields that do not meet the requirements will have an exclamation point. The fields that don't meet the requirements will have red help text near them.

SLEIS Training

DNR provides multiple in-person SLEIS training sessions every year. Information on SLEIS training sessions as well as recorded sessions and video tutorials are available on the DNR's eAirServices website. Click on the "Training" link under the SLEIS menu to view upcoming training opportunities.

SLEIS Emissions Inventory Instructions

Section Instructions: Facility

1. **Facility Tab:**
   a. **Facility Identifier:** This field is a unique number assigned to your plant and is not editable.
   b. **Facility Name:** This field is assigned by DNR. It can be changed after the inventory has been submitted. Please contact DNR if the official company plant designation for the facility submitting the emissions inventory should be changed.
   c. **Company/Owner Name:** This field is to be completed with the name of the parent company, company owner, or if those don't apply, the facility name may be entered.
   d. **Description:** Enter a brief business description of the facility.
   e. **Status:** Click in the box below and choose the status of the facility for the reporting year.
      i. If the facility operated as a minor source facility during the reporting year, choose "Operating as Minor Source."
      ii. If the facility operated as a Title V facility during the reporting year, choose "Operating as Title V."
      iii. If the facility operated as both a minor source and a Title V facility during the year and was required to submit the Title V emissions inventory, choose "Operating as Title V."
      iv. If the facility operated as both a minor source and a Title V facility during the year but was not required to submit the Title V emissions inventory, choose "Operating as Minor Source."
   f. **Status Year:** If the status is anything other than "Operating as Title V," enter the year that status became applicable. For example, for a minor source facility, choose the year the facility became a minor source, such as the year the facility began operating or the year the facility no longer operated as Title V.
   g. **NAICS:** Please enter the North American Industry Classification System (NAICS) code. Descriptions of the NAICS codes can be found at https://www.census.gov/naics/ or https://www.naics.com/search/.
      i. If the facility has more than one industrial classification, secondary and tertiary NAICS codes may be added by clicking the plus button to the right of the primary NAICS code.
   h. **Comments:** Enter any information about the facility that may be useful to the DNR.

2. **Contacts Tab:**
   a. **Name:** Enter the name of the person who should answer any questions regarding the emissions inventory submitted for this facility.

b. **Contact:** Enter contact information where the contact person can be reached directly. Preferably enter both a phone number and an email address. To add lines to the contact section, click the plus button to the right of the contact field.

3. **Addresses Tab:**
   a. **Location**: Enter the street address of the physical location of the facility.
   b. **Mailing:** Enter the mailing address of the person responsible for submitting the emissions inventory.

4. **Location Tab:**
   a. **Latitude (decimal degrees):** This should be the latitude of approximately the center of your facility. If this is incorrect, please contact DNR.
   b. **Longitude (decimal degrees):** This should be the longitude of approximately the center of your facility.
   c. **UTM X, Y, and Zone:** This will be autopopulated once the Latitude and Longitude are entered.
   d. **Collection Method, Data Collection Date, Geographic Reference point, Geodetic Reference System:** These fields are not required and are populated by DNR if necessary.

5. **Additional Information Tab:** All fields on the additional information tab are not required. Some may have been populated by data from previous inventories or databases. Fields may be completed with any information that may be helpful to the facility or DNR.

6. **Saving the record:** Once all required data has been reviewed and completed, click "Save" in the bottom right corner of the screen to save the record. If the data entered does not meet validation requirements, the requirements will be shown near the data input field in red font. This record contains multiple tabs and all data on all tabs must meet the data validation requirements before a save can be executed for the record. Tabs with fields that do not meet the requirements will have an exclamation point. The fields that don't meet the requirements will have red help text near them.

Section Instructions: Release Points

If the release point in question has a construction permit, most of the information asked for below can be found in the permit.

1. **Release Point Tab**
   a. **Identifier:** This value must be a unique number among release points at the facility and is not editable once it has been included as part of an emissions inventory submittal. This number should be consistent with the number assigned to the release point in the construction permit.
   b. **Type:** Click in the drop-down menu and select the type of release point venting the emission unit.
   c. **Description:** Provide a brief description of the release point (ex. Boiler Stack or Paint Booth Vent).
   d. **Status:** Select the status of the release point for the reporting year. If it operated any time during the year, choose "Operating."
   e. **Status Year:** Enter the year the status became applicable.
   f. **Stack Height:** Enter the distance above ground to the emissions discharge point in feet.
   g. **Stack Shape:** Click the radio button that best describes the shape of the stack opening. Changing the shape of the opening will clear data that has already been entered for the stack diameter or the stack opening length/width.
   h. **Stack Diameter:** If the stack shape is selected as "Circular," enter the inside diameter of the discharge point to the nearest tenth of a foot.
   i. **Stack Opening Length:** If the stack shape is selected as "Rectangular," enter the inside length of the rectangular opening of the discharge point to the nearest tenth of a foot.
   j. **Stack Opening Width:** If the stack shape is selected as "Rectangular," enter the inside width of the rectangular opening of the discharge point to the nearest tenth of a foot.
   k. **Exit Gas Temp:** Enter the gas temperature at the discharge point in degrees Fahrenheit under normal operating conditions.

l. **Exit Gas Flow Rate:** Enter the exit gas flow rate at the discharge point. The exit gas flow rate unit of measure is required and can be selected using the drop-down menu to the right of the exit gas flow rate.
m. **Exit Gas Velocity:** The exit gas velocity is populated and entered in SLEIS if the stack diameter and exit gas flow rate (using ACFM) are entered. This value measures the velocity of the discharged exit gas. The unit of measure is required and can be selected using the drop-down menu to the right of the exit gas velocity.
n. **Fence Line Distance:** The distance to the nearest property line measured in feet. This field is not required.
o. **Related Unit Processes:** A list of unit processes which are being vented to the atmosphere through the release point. This list is populated using data from the Unit Processes button.
p. **Comments:** Enter any information about the release point that may be useful to the DNR. This field is not required.

2. Location Tab

a. **Latitude (decimal degrees):** This should be the latitude of the release point. If this is incorrect, please contact DNR. This field is not required.
b. **Longitude (decimal degrees):** This should be the longitude of the release point. If this is incorrect, please contact DNR. This field is not required.
c. **UTM X, Y, and Zone:** These data fields will be populated once the Latitude and Longitude are entered.
d. **Collection Method, Data Collection Date, Geographic Reference point, Geodetic Reference System:** These fields are not required.

3. Additional Information Tab: All fields on the additional information tab are not required. Some may have been populated by data from previous inventories or databases. Fields may be completed with any information that is helpful to the facility or DNR.

4. Saving the record: Once all required data has been reviewed and completed, click "Save" in the bottom right corner of the screen to save the record. If the data entered does not meet validation requirements, the requirements will be shown near the data input field in red font. This record contains multiple tabs and all data on all tabs must meet the data validation requirements before a save can be executed for the record. Tabs with fields that do not meet the requirements will have an exclamation point. The fields that don't meet the requirements will have red help text near them.

Section Instructions: Control Devices

1. Control Device Tab

a. Identifier: This value must be a unique number among control devices at the facility and is not editable once it has been included as part of an emissions inventory submittal. This number should be consistent with the number assigned to the control device in the construction permit.
b. Description: Provide a brief description of the control device (ex. Baghouse, Scrubber, Cyclone, etc.).
c. **Status:** Select the status of the control device for the reporting year. If it operated any time during the year, choose "Operating."
d. Status Year: Enter the year the status became applicable.
e. Control Measure: Select the control measure used to reduce emissions. This is a type-ahead field.
f. Controlled Pollutants: Enter pollutants controlled by the device. For every pollutant listed, a control percentage must also be listed. Click the add button to include another pollutant. Click the delete button to remove a pollutant.
a. **Related Unit Processes:** A list of unit processes which are being controlled by the device. This list is populated using data from the Unit Processes button.
g. Comments: Enter any information about the control device that may be useful to the DNR. This field is not required.

2. Additional Information Tab: All fields on the additional information tab are not required. Some may have been populated by data from previous inventories or databases. Fields may be completed with any information that is helpful to the facility or DNR.

3. **Saving the record:** Once all required data has been reviewed and completed, click "Save" in the bottom right corner of the screen to save the record. If the data entered does not meet validation requirements, the requirements will be shown near the data input field in red font. This record contains multiple tabs and all data on all tabs must meet the data validation requirements before a save can be executed for the record. Tabs with fields that do not meet the requirements will have an exclamation point. The fields that don't meet the requirements will have red help text near them.

Section Instructions: Emission Units

1. **Emission Unit Tab**
   a. **Identifier:** This value must be a unique number among emission units at the facility and is not editable once it has been included as part of an emissions inventory submittal. This number should be consistent with the number assigned to the emission unit in the construction permit.
   b. **Type:** Select the type of emission unit. This is a type-ahead field.
   c. **Description:** Provide a brief description of the emission unit (ex. Boiler, Paint Booth, Welder, etc.).
   d. **Status:** Select the status of the emission unit for the reporting year. If it operated any time during the year, choose "Operating."
   e. **Status Year:** Enter the year the status became applicable.
   f. **Operation Start Date:** Enter the date the emission unit began operation. This field is not required.
   g. **Design Capacity:** Enter the maximum hourly design capacity of the emission unit. This is the true maximum hourly design capacity if it operated at 100% capacity. This is NOT the average hourly operating rate during the year. Remember to include the unit of measure field if the design capacity value is entered. These fields are not required.
   h. **Related Unit Processes:** A list of unit processes which are occurring at the emission unit. This list is populated using data from the Unit Processes button.
   i. **Comments:** Enter any information about the emission unit that may be useful to the DNR. This field is not required.

2. **Additional Information Tab:** All fields on the additional information tab are not required. Some may have been populated by data from previous inventories or databases. Fields may be completed with any information that is helpful to the facility or DNR.
3. **Saving the record:** Once all required data has been reviewed and completed, click "Save" in the bottom right corner of the screen to save the record. If the data entered does not meet validation requirements, the requirements will be shown near the data input field in red font. This record contains multiple tabs and all data on all tabs must meet the data validation requirements before a save can be executed for the record. Tabs with fields that do not meet the requirements will have an exclamation point. The fields that don't meet the requirements will have red help text near them.

Section Instructions: Unit Processes

1. **Unit Process Tab**
   a. **Process Identifier:** This value must be a unique number among unit processes at the facility and is not editable once it has been included as part of an emissions inventory submittal.
   b. **Emission Unit Identifier:** Select the previously created identifier from the drop down menu that the unit process is associated with. If the emission unit identifier does not exist in the drop down menu, go back to the emission units button and create the identifier, save it, and then return to the unit processes button and make the connection between unit process and emission unit.
   c. **SCC Code:** There are two options of entering this code:
      i. Enter the 8-digit number into the "Code" field. A list of codes may be downloaded from Emissions Estimate Tools (iowadnr.gov). Scroll down to the "Classification Lists and Conversions" heading and click the "Updated Source Classification Codes" link.
      ii. Use the drop-down menus and select all four level descriptions that best describe the process. As each level description is selected, the SCC code will begin to populate. All four levels must be selected.

d. **Description:** Provide a brief description of the unit process (ex. natural gas combustion, surface coating etc.). This field is not required.
e. **Status:** Select the status of the unit process for the reporting year. If it operated any time during the year, choose "Operating."
f. **Status Year:** Enter the year the status became applicable.
g. **Related Process Emission:** A link to the unit process emissions contained in the emissions inventory. This list is populated using data from the Process Emissions button.
h. **Comments:** Enter any information about the unit process that may be useful to the DNR. This field is not required.

2. **Regulatory Programs Tab**
   a. **Regulatory Programs:** Enter the regulatory program the process is subject to. This is a type-ahead field. To add a regulatory program, click the add button on the right side of the screen. To remove a program, click the delete button on the right side of the screen. This field is not required.

3. **Control Approach Tab**
   a. **Not Controlled?:** Check the box if the process is not being controlled. If the process is being controlled, make sure to uncheck the box. This checkbox determines whether control efficiency is being applied when SLEIS auto-calculates emissions. This field is not required.
   b. **Control Approach Description:** Provide a brief description of the control approach associated with the unit process (ex. Baghouse, Scrubber, Cyclone, etc.). This field is not required.
   c. **Control Device:** If the "Not Controlled" checkbox is left unchecked, select the control device in the dropdown menu that is controlling emissions for the process.

4. **Release Point Apportionment Tab**
   a. **Release Point:** Select the release point identifier venting emissions from the unit process. To add a release point, click the add button on the right side of the screen. To remove a release point, click the delete button on the right side of the screen.
   b. **Apportionment Percentage:** Enter the percent of the emissions being vented to the release point selected. The total apportionment for all release points combined must equal 100%.

5. **Additional Information Tab:** All fields on the additional information tab are not required. Some may have been populated by data from previous inventories or databases. Fields may be completed with any information that is helpful to the facility or DNR.
6. **Saving the record:** Once all required data has been reviewed and completed, click "Save" in the bottom right corner of the screen to save the record. If the data entered does not meet validation requirements, the requirements will be shown near the data input field in red font. This record contains multiple tabs and all data on all tabs must meet the data validation requirements before a save can be executed for the record. Tabs with fields that do not meet the requirements will have an exclamation point. The fields that don't meet the requirements will have red help text near them.

Section Instructions: Process Emissions

1. **Process Tab**
   a. **Process Identifier:** This value must be a unique number among unit processes at the facility and is not editable once it has been included as part of an emissions inventory submittal. The identifier is included in the Process Emissions listing if it has a status of operating or if the status year is greater than the year of the emissions report being submitted.
   b. **Emission Unit Identifier:** This value must be a unique number among emission units at the facility and is not editable once it has been included as part of an emissions inventory submittal. The connection between emission unit and unit process identifier is made in the Unit Processes button.
   c. **SCC:** The SCC number displayed on this screen is determined in the Unit Processes button when the unit process identifier is created.

d. **Process is Reported?:** This box is automatically checked. If the process is still present at the facility but not reporting emissions uncheck the box. Unchecking the box will delete all data from the record but will still allow for comments to be entered in the comments field. A pop-up box will appear when the box is unchecked asking if the user wants to permanently remove pollutants. If the record is saved, future inventories will not have the throughput unit of measure, throughput material, operations, pollutants, and emission factors pre-filled. To keep this data but report zero emissions, keep the checkbox checked and report the annual throughput as zero.
e. **Annual Throughput:** Enter the amount of material used or stored, fuel burned, vehicle miles traveled, or the amount of product produced during the emissions year.
f. **Throughput Unit of Measure:** Select the unit of measure for the annual throughput from the dropdown menu.
g. **Throughput Type:** Select the code indicating whether the material measured is an input to the process, an output of the process or a static count.
h. **Throughput Material:** Enter the material being processed. This is a type-ahead field.
i. **Supplemental Calculation Parameters:**
    i. %Ash: Enter the ash content of the material being processed. This field is not required but can be helpful when estimating emissions from combustion processes.
    ii. %Sulfur: Enter the sulfur content of the material being processed. This field is not required but can be helpful when estimating emissions from combustion processes.
    iii. Heat Content (MMBtu/Unit): Enter the heat content of the material being processed. This field is not required but can be helpful when estimating emissions from combustion processes.
j. **Comments:** Enter any information about the unit process that may be useful to the DNR. This field is not required.

2. **Operations Tab**
    a. **Average Hours/Day:** Enter the average hours per day the equipment operated during the emissions year.
    b. **Average Days/Week:** Enter the average days per week the equipment operated during the emissions year.
    c. **Average Weeks/Year:** Enter the average weeks per year the equipment operated during the emissions year.
    d. **Actual Hours/Year:** Enter the actual hours the equipment operated during the emissions year. This field can be manually entered but must be within +/- 0.5% of the calculated value when multiplying average hours/day, average days/week, and average weeks/year.
    e. **Seasonal Operations:**
        i. December-February: Enter the percentage of total throughput processed during the months of January, February, and December combined.
        ii. March-May: Enter the percentage of total throughput processed during the months of March, April, and May combined.
        iii. June-August: Enter the percentage of total throughput processed during the months of June, July, and August combined.
        iv. September-November: Enter the percentage of total throughput processed during the months of September, October, and November combined.

3. **Emissions Tab**
    a. **Pollutant Code:** To add a pollutant, click the “Add” button in the lower left corner of the screen. Then enter the pollutant(s) emitted from the process. This is a type-ahead field. At least one pollutant must be entered.
    b. **Calculation Method:** Select the code describing the type of emissions factor being used, including whether the emissions factor is pre-control or post-control. US EPA EF includes emission factors from WebFIRE and AP-42. For more complicated emissions estimates, select the calculation method code that does not include an emissions factor. These are indicated by “no EF” in parentheses. In that case, enter the emissions calculations in the comments field or attach them to the inventory under the “Report Attachments” button.
    c. **Emission Factor (Lbs/Unit):** If the selected calculation method code enables the “Emission Factor” field, enter the emission factor. The numerator unit of measure is always considered to be pounds.
    d. **Emission Factor Unit:** If the emission factor is enabled, the emission factor unit of measure must also be entered. The value entered should be the denominator.
    e. **Estimated Emissions (Tons):** If the calculation method allows an emissions factor to be entered and the emission factor unit entered is the same as the throughput unit of measure, this field will be automatically calculated by

SLEIS and not editable. If the calculation method does not allow an emission factor to be entered (i.e.: methods listed as "(no EF)") or the unit of measure does not match the throughput unit of measure, this is a required field and must be hand-entered. Please note the estimated emissions unit of measure is always tons.

f. **Overall Control Efficiency (%):** This field will only be displayed if a control device is linked to the process (see above Section Instructions for Unit Processes – Control Approach Tab). To change the overall control efficiency for a pollutant, go to the Control Device button, select the Control Device tab, then change the control efficiency percentage for the pollutant. SLEIS will automatically include the control percentage when estimating emissions.
g. **Comment:** Enter any calculations and supporting documentation for the estimated emissions value. This field is not required.

Section Instructions: Report Attachment

1. **Report Attachments Screen**
   a. This screen contains all documents attached to the report. To attach a document to the report, click the "Add" button in the lower right corner of the screen. To download an attachment, click the "Download" button on the far right side of the document. To edit the document's description, click the "Edit" button next to the "Download" button.
   b. To add a document to a report, after clicking the "Add" button described above, click the "Browse" button and a window will pop up. Browse your computer to locate the file you want to attach and click "Open." Then enter a description of the document in the field labeled "Description." Click the save button to complete the report attachment process.

Example Calculations and SLEIS Screen Shots

Introduction

This section provides example calculations and SLEIS screen shots to show how emission estimation methods are used to develop an emissions inventory for actual emissions. There are six basic approaches or methods used to develop emission estimates and inventories. These methods are:

- Continuous emissions monitoring
- Stack test data
- Material balance
- EPA-approved emission factors
- Vendor supplied factors
- Engineering estimates based on best available process operating data

Most sources will use material balance or EPA-approved emission factors for estimating emissions. These two methods will be the focus of this section. Each example calculation shows how the method may be used for a specific emissions source category. It is intended that the reader use the information to apply the methods to other applicable source categories.

Actual Emissions

Actual emissions are the actual rate of air pollution from an emission unit. They are calculated using the emission unit's actual operating hours, production rates, and types of materials processed, stored, or combusted for the calendar year.

General equation for calculating actual emissions with control equipment:

(Annual Throughput) x (Emission Factor) x (Control Efficiency) x (conversion factor to tons) = tons per year

***Annual Throughput*:** Amount of material actually used for the calendar year such as gallons per year, tons per year, million cubic feet per year, etc.

Emission factors are values based on the amount of pollution produced and the raw material processed such as lb/ton, lb/gal, or lb/MMcf.

Control Efficiency is the control equipment pollutant removal efficiency.

To convert to tons, see the conversion factors listed on page 91 in Appendix D.

Example Calculations

The following examples show how calculations are performed and where data is reported in SLEIS.

ACME Corporation manufactures grain wagons and has three reportable emission units including a welding station, paint booth, and No. 2 fuel oil-fired boiler. Each emission unit has one release point associated with it. The release points, emission units, and control devices were identified and assigned a number.

ACME Hospital has four reportable emission units including a natural gas-fired boiler, two diesel-fired generators, and a dual-fuel fired generator.

For each release point, information was gathered on the stack opening, height, flow rate (fan rating), and temperature. Information gathered for each emission unit included a description of the process and raw materials used. If there is an air quality construction permit for the emission source, most of this information can be found in the permit.

The next step was finding emission factors in EPA documents for each pollutant produced by the boiler and welding station. A mass balance calculation was performed using Safety Data Sheets (SDS) information to estimate emission factors for the paint booth.

The following calculations were performed and entered in SLEIS for ACME Corporation and ACME Hospital:

2022 Emissions Report

In Process

Release Points

Release Point | Location | Additional Information

Identifier:
EP-001

Type:
Vertical

Description:
Diesel Generator Stack

Status:
Operating

Status Year:

Stack Height:
67.0 FEET

Stack Shape:
(•) Circular ( ) Rectangular

Stack Diameter:
0.50 FEET

Exit Gas Temp:
400 °F

Exit Gas Flow Rate:
7795 ACFM - ACTUAL CUBIC FEET PER

Exit Gas Velocity:
39699.609 FPM - FEET PER MINUTE

Fence Line Distance:
FEET

Related Unit Processes:
EU-001 - Diesel Generator, EU-001 -1 - Diesel Generator

Comments:

2022 Emissions Report

In Process

Emission Units

Emission Unit | Additional Information

Identifier:

EU-001

Type:

160 - Reciprocating IC Engine

Description:

Diesel Generator

Status:

OP - Operating

Status Year:

Operation Start Date:

01-01-2010

Design Capacity

Related Unit Processes:

EU-001 -1 - Diesel Generator

Comments:

Delete | Cancel | Save

2022 Emissions Report

In Process

Unit Processes

Unit Process | Regulatory Programs | Control Approach | Release Point Apportionment | Additional Information

Process Identifier:
EU-001 -1

Emission Unit Identifier:
EU-001 - Diesel Generator

SCC:

Code: 20200102 ~ or ~

- Internal Combustion Engines
- Industrial
- Distillate Oil (Diesel)
- Reciprocating

Description:
Diesel Generator

Status:
OP - Operating

Status Year:

Related Process Emission:
EU-001 -1 - Diesel Generator

2022 Emissions Report

In Process

Unit Processes

Unit Process | Regulatory Programs | Control Approach | Release Point Apportionment | Additional Information

Release Point Apportionment:

Release Point	%
EP-001 - Diesel Genera	100

2022 Emissions Report

In Process

Process Emissions

Process | Operations | Emissions

Process Identifier:

EU-001 -1 - Diesel Generator

Emission Unit Identifier:

EU-001 - Diesel Generator

SCC:

20200102

Internal Combustion Engines-Industrial-Distillate Oil (Diesel)-Reciprocating

Process is Reported?:

☑ Uncheck this box if there are no reportable emissions for the reporting year

Annual Throughput:

140

Throughput Unit of Measure:

E6BTU - MILLION BTUS

Throughput Type:

I - Input

Throughput Material:

44 - Diesel

Supplemental Calculation Parameters:

% Ash	% Sulfur	Heat Content (MMBTU/Unit)

Comments:

1,000 gallons fuel used * 0.14 MMBtu/Gal = 140 MMBtu

Next | Cancel | Save

2022 Emissions Report

In Process

Process Emissions

Process | **Operations** | Emissions

Average Hours/Day:
1.06

Average Days/Week:
1.00

Average Weeks/Year:
8.00

Actual Hours/Year:
8.5

Seasonal Operations:

December-February	March-May	June-August
25.5 %	23.5 %	23.5 %

September-November
27.5 %

2022 Emissions Report

In Process

Process Emissions

Process | Operations | **Emissions**

Filter:

Pollutant:	Emis. Factor (Lbs/Unit):	Emis. Factor UOM:	Calculation Method:	Estimated Emis. (Tons):
PM25-PRI	0.31	E6BTU	28 - USEPA EF (pre-control)	0.0217
PM10-PRI	0.31	E6BTU	28 - USEPA EF (pre-control)	0.0217
SO2	0.29	E6BTU	28 - USEPA EF (pre-control)	0.020299999999999
NOX	4.41	E6BTU	28 - USEPA EF (pre-control)	0.308699999999999
VOC	0.35	E6BTU	28 - USEPA EF (pre-control)	0.0245
CO	0.95	E6BTU	28 - USEPA EF (pre-control)	0.0665

2022 Emissions Report

In Process

Process Emissions

Process | Operations | **Emissions**

Filter:

Pollutant:	Emis. Factor (Lbs/Unit):	Emis. Factor UOM:	Calculation Method:	Estimated Emis. (Tons):
PM25-PRI	0.31	E6BTU	28 - USEPA EF (pre-control)	0.0217

Pollutant Code:
PM25-PRI - PM2.5 Primary (Filt + Cond)

Calculation Method:
28 - USEPA EF (pre-control)

Emission Factor (Lbs/Unit):
0.31

Emission Factor Unit:
E6BTU - MILLION BTUS

Estimated Emissions (Tons):
0.0217

Overall Control Efficiency (%):
0%

Comment:
0.31 lbs PM2.5/MMBtu diesel burned 0.31 lb/MMBtu * 140 MMBtu * 1 ton/2000 lbs = 0.02 tons PM2.5

PM10-PRI	0.31	E6BTU	28 - USEPA EF (pre-control)	0.0217

Pollutant Code:
PM10-PRI - PM10 Primary (Filt + Cond)

Calculation Method:
28 - USEPA EF (pre-control)

Emission Factor (Lbs/Unit):
0.31

Emission Factor Unit:
E6BTU - MILLION BTUS

Estimated Emissions (Tons):
0.0217

Overall Control Efficiency (%):
0%

Comment:
0.31 lbs PM10/MMBtu diesel burned 0.31 lb/MMBtu * 140 MMBtu * 1 ton/2000 lbs = 0.02 tons PM10

SO2	0.29	E6BTU	28 - USEPA EF (pre-control)	0.020299999999999

Pollutant Code:
SO2 - Sulfur Dioxide

Calculation Method:
28 - USEPA EF (pre-control)

Emission Factor (Lbs/Unit):
0.29

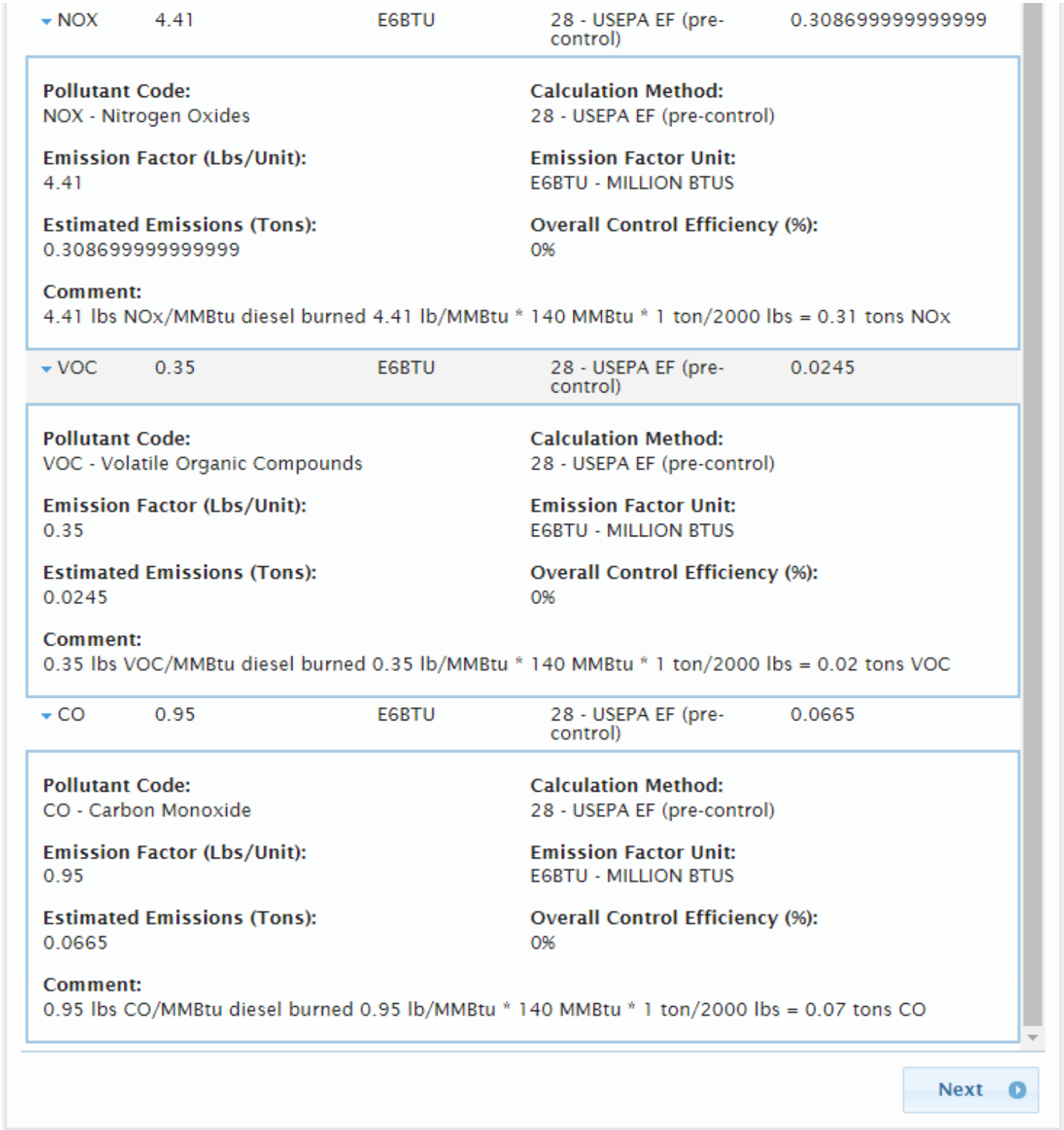
Emission Factor Unit:
E6BTU - MILLION BTUS

Estimated Emissions (Tons):
0.020299999999999

Overall Control Efficiency (%):
0%

Comment:
0.29 lbs SO2/MMBtu diesel burned 0.29 lbs SO2/MMBtu * 140 MMBtu * 1 ton/2,000 lbs = 0.02 tons

Individual pollutant calculations continued:



NOX	4.41	E6BTU	28 - USEPA EF (pre-control)	0.308699999999999

Pollutant Code: NOX - Nitrogen Oxides
Calculation Method: 28 - USEPA EF (pre-control)
Emission Factor (Lbs/Unit): 4.41
Emission Factor Unit: E6BTU - MILLION BTUS
Estimated Emissions (Tons): 0.308699999999999
Overall Control Efficiency (%): 0%
Comment: 4.41 lbs NOx/MMBtu diesel burned 4.41 lb/MMBtu * 140 MMBtu * 1 ton/2000 lbs = 0.31 tons NOx

VOC	0.35	E6BTU	28 - USEPA EF (pre-control)	0.0245

Pollutant Code: VOC - Volatile Organic Compounds
Calculation Method: 28 - USEPA EF (pre-control)
Emission Factor (Lbs/Unit): 0.35
Emission Factor Unit: E6BTU - MILLION BTUS
Estimated Emissions (Tons): 0.0245
Overall Control Efficiency (%): 0%
Comment: 0.35 lbs VOC/MMBtu diesel burned 0.35 lb/MMBtu * 140 MMBtu * 1 ton/2000 lbs = 0.02 tons VOC

CO	0.95	E6BTU	28 - USEPA EF (pre-control)	0.0665

Pollutant Code: CO - Carbon Monoxide
Calculation Method: 28 - USEPA EF (pre-control)
Emission Factor (Lbs/Unit): 0.95
Emission Factor Unit: E6BTU - MILLION BTUS
Estimated Emissions (Tons): 0.0665
Overall Control Efficiency (%): 0%
Comment: 0.95 lbs CO/MMBtu diesel burned 0.95 lb/MMBtu * 140 MMBtu * 1 ton/2000 lbs = 0.07 tons CO

Next

2022 Emissions Report

In Process

Release Points

Release Point | Location | Additional Information

Identifier:
EP-001

Type:
Vertical with Rain Cap

Description:
Boiler Stack

Status:
Operating

Status Year:

Stack Height:
35.0 FEET

Stack Shape:
(•) Circular ( ) Rectangular

Stack Diameter:
2.00 FEET

Exit Gas Temp:
350 °F

Exit Gas Flow Rate:
6100 ACFM - ACTUAL CUBIC FEET PER

Exit Gas Velocity:
1941.69031 FPM - FEET PER MINUTE

Fence Line Distance:
FEET

Related Unit Processes:
EU-001 - Fuel Oil Boiler, EU-001 -1 - Fuel Oil Combustion

Comments:

2022 Emissions Report

In Process

Emission Units

Emission Unit | Additional Information

Identifier:

EU-001

Type:

100 - Boiler

Description:

Fuel Oil Boiler

Status:

OP - Operating

Status Year:

Operation Start Date:

Design Capacity

Related Unit Processes:

EU-001 -1 - Fuel Oil Combustion

Comments:

Delete | Cancel | Save

2022 Emissions Report

In Process

Unit Processes

Unit Process | Regulatory Programs | Control Approach | Release Point Apportionment | Additional Information

Process Identifier:
EU-001 -1

Emission Unit Identifier:
EU-001 - Fuel Oil Boiler

SCC:

Code: 10200502 ~ or ~

- External Combustion
- Industrial: Boilers
- Distillate Oil
- 10-100 Million BTU/hr

Description:
Fuel Oil Combustion

Status:
OP - Operating

Status Year:

Related Process Emission:
EU-001 -1 - Fuel Oil Combustion

Comments:

2022 Emissions Report

In Process

Unit Processes

Unit Process | Regulatory Programs | Control Approach | Release Point Apportionment | Additional Information

Release Point Apportionment:

Release Point	%
EP-001 - Boiler Stack	100

2022 Emissions Report

In Process

Process Emissions

Process | Operations | Emissions

Process Identifier:

EU-001 -1 - Fuel Oil Combustion

Emission Unit Identifier:

EU-001 - Fuel Oil Boiler

SCC:

10200502

External Combustion-Industrial: Boilers-Distillate Oil-10-100 Million BTU/hr

Process is Reported?:

☑ Uncheck this box if there are no reportable emissions for the reporting year

Annual Throughput:

5

Throughput Unit of Measure:

E3GAL - 1000 GALLONS

Throughput Type:

I - Input

Throughput Material:

IA49 - FUEL OIL

Supplemental Calculation Parameters:

% Ash | % Sulfur | Heat Content (MMBTU/Unit)

Comments:

Next | Cancel | Save

2022 Emissions Report

In Process

Process Emissions

Process | **Operations** | Emissions

Average Hours/Day:
24.00

Average Days/Week:
7.00

Average Weeks/Year:
38.00

Actual Hours/Year:
6384.0

Seasonal Operations:

December-February	March-May	June-August
35.0 %	21.7 %	15.0 %

September-November
28.3 %

2022 Emissions Report

In Process

Process Emissions

Process | Operations | **Emissions**

Filter:

Pollutant:	Emis. Factor (Lbs/Unit):	Emis. Factor UOM:	Calculation Method:	Estimated Emis. (Tons):
PM25-PRI	1.55	E3GAL	8 - USEPA EF (post-control)	0.003874999999999
PM10-PRI	2.3	E3GAL	8 - USEPA EF (post-control)	0.005749999999999
SO2	142	E3GAL	8 - USEPA EF (post-control)	0.354999999999999
NOX	20	E3GAL	8 - USEPA EF (post-control)	0.05
VOC	0.2	E3GAL	8 - USEPA EF (post-control)	0.0005
CO	5	E3GAL	8 - USEPA EF (post-control)	0.0125
NH3	0.8	E3GAL	8 - USEPA EF (post-control)	0.002

2022 Emissions Report

In Process

Process Emissions

Process | Operations | Emissions

Filter:

Pollutant:	Emis. Factor (Lbs/Unit):	Emis. Factor UOM:	Calculation Method:	Estimated Emis. (Tons):
PM25-PRI	1.55	E3GAL	8 - USEPA EF (post-control)	0.003874999999999

Pollutant Code:
PM25-PRI - PM2.5 Primary (Filt + Cond)

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
1.55

Emission Factor Unit:
E3GAL - 1000 GALLONS

Estimated Emissions (Tons):
0.003874999999999

Comment:
1.55 lbs PM2.5/1,000 gal * 5 1,000 gal * 1 ton/2,000 lbs = 0.004 tons PM 2.5

PM10-PRI	2.3	E3GAL	8 - USEPA EF (post-control)	0.005749999999999

Pollutant Code:
PM10-PRI - PM10 Primary (Filt + Cond)

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
2.3

Emission Factor Unit:
E3GAL - 1000 GALLONS

Estimated Emissions (Tons):
0.005749999999999

Comment:
2.3 lbs PM10/1,000 gal * 5 1,000 gal * 1 ton/2,000 lbs = 0.006 tons PM 10

SO2	142	E3GAL	8 - USEPA EF (post-control)	0.354999999999999

Pollutant Code:
SO2 - Sulfur Dioxide

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
142

Emission Factor Unit:
E3GAL - 1000 GALLONS

Estimated Emissions (Tons):
0.354999999999999

Comment:
142 lbs SO2/1,000 gal * 5 1,000 gal * 1 ton/2,000 lbs = 0.35 tons SO2

NOX	20	E3GAL	8 - USEPA EF (post-control)	0.05

Pollutant Code:
NOX - Nitrogen Oxides

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
20

Emission Factor Unit:
E3GAL - 1000 GALLONS

Estimated Emissions (Tons):
0.05

Comment:
20 lbs NOx/1,000 gal * 5 1,000 gal * 1 ton/2,000 lbs = 0.05 tons NOx

VOC	0.2	E3GAL	8 - USEPA EF (post-control)	0.0005

Pollutant Code:
VOC - Volatile Organic Compounds

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
0.2

Emission Factor Unit:
E3GAL - 1000 GALLONS

Estimated Emissions (Tons):
0.0005

Comment:
0.2 lbs VOC/1,000 gal * 5 1,000 gal * 1 ton/2,000 lbs = 0.0005 tons VOC

CO	5	E3GAL	8 - USEPA EF (post-control)	0.0125

Pollutant Code:
CO - Carbon Monoxide

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
5

Emission Factor Unit:
E3GAL - 1000 GALLONS

Estimated Emissions (Tons):
0.0125

Comment:
5 lbs CO/1,000 gal * 5 1,000 gal * 1 ton/2,000 lbs = 0.0125 tons CO

NH3	0.8	E3GAL	8 - USEPA EF (post-control)	0.002

Pollutant Code:
NH3 - Ammonia

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
0.8

Emission Factor Unit:
E3GAL - 1000 GALLONS

Estimated Emissions (Tons):
0.002

Comment:
0.8 lbs NH3/1,000 gal * 5 1,000 gal * 1 ton/2,000 lbs = 0.8 tons NH3

2022 Emissions Report

In Process

Release Points

Release Point | Location | Additional Information

Identifier:
EP-002

Type:
Vertical

Description:
Dual Fuel Generator Stack

Status:
Operating

Status Year:

Stack Height:
30.0 FEET

Stack Shape:
(•) Circular ( ) Rectangular

Stack Diameter:
1.25 FEET

Exit Gas Temp:
500 °F

Exit Gas Flow Rate:
4000 SCFM - STANDARD CUBIC FEET PI

Exit Gas Velocity:

Fence Line Distance:
FEET

Related Unit Processes:
EU-002 - Dual Fuel Generator, EU-002 -1 - Diesel Combustion
EU-002 - Dual Fuel Generator, EU-002 -2 - Dual Fuel Combustion

Comments:

2022 Emissions Report

In Process

Emission Units

Emission Unit | Additional Information

Identifier:

EU-002

Type:

160 - Reciprocating IC Engine

Description:

Dual Fuel Generator

Status:

OP - Operating

Status Year:

Operation Start Date:

Design Capacity

Related Unit Processes:

EU-002 -1 - Diesel Combustion

EU-002 -2 - Dual Fuel Combustion

Comments:

Delete | Cancel | Save

2022 Emissions Report

In Process

Unit Processes

Unit Process | Regulatory Programs | Control Approach | Release Point Apportionment | Additional Information

Process Identifier:

EU-002 -1

Emission Unit Identifier:

EU-002 - Dual Fuel Generator

SCC:

Code: 20200401 ~ or ~

- Internal Combustion Engines
- Industrial
- Other Fuels
- Diesel: Large Bore Engine

Description:

Diesel Combustion

Status:

OP - Operating

Status Year:

Related Process Emission:

EU-002 -1 - Diesel Combustion

2022 Emissions Report

In Process

Unit Processes

Unit Process | Regulatory Programs | Control Approach | Release Point Apportionment | Additional Information

Release Point Apportionment:

Release Point	%
EP-002 - Dual Fuel Gen	100

2022 Emissions Report

In Process

Unit Processes

Unit Process | Regulatory Programs | Control Approach | Release Point Apportionment | Additional Information

Process Identifier:
EU-002 -2

Emission Unit Identifier:
EU-002 - Dual Fuel Generator

SCC:

Code: 20200402 ~ or ~

- Internal Combustion Engines
- Industrial
- Other Fuels
- Dual Fuel (Oil/Gas): Large Bore Engine

Description:
Dual Fuel Combustion

Status:
OP - Operating

Status Year:

Related Process Emission:
EU-002 -2 - Dual Fuel Combustion

Comments:

2022 Emissions Report

In Process

Unit Processes

Unit Process | Regulatory Programs | Control Approach | Release Point Apportionment | Additional Information

Release Point Apportionment:

Release Point	%
EP-002 - Dual Fuel Gen	100

2022 Emissions Report

In Process

Process Emissions

Process | Operations | Emissions

Process Identifier:

EU-002 -1 - Diesel Combustion

Emission Unit Identifier:

EU-002 - Dual Fuel Generator

SCC:

20200401

Internal Combustion Engines-Industrial-Other Fuels-Diesel: Large Bore Engine

Process is Reported?:

☑ Uncheck this box if there are no reportable emissions for the reporting year

Annual Throughput:

2100

Throughput Unit of Measure:

E6BTU - MILLION BTUS

Throughput Type:

I - Input

Throughput Material:

44 - Diesel

Supplemental Calculation Parameters:

% Ash	% Sulfur	Heat Content (MMBTU/Unit)

Comments:

15,000 gallons diesel * 0.14 MMBtu/gal = 2,100 MMBtu

Previous | Next | Cancel | Save

2022 Emissions Report

In Process

Process Emissions

Process | **Operations** | Emissions

Average Hours/Day:

2.50

Average Days/Week:

4.00

Average Weeks/Year:

20.00

Actual Hours/Year:

200.0

Seasonal Operations:

December-February	March-May	June-August
25.0 %	25.0 %	25.0 %

September-November

25.0 %

2022 Emissions Report

In Process

Process Emissions

Process | Operations | **Emissions**

Filter:

Pollutant:	Emis. Factor (Lbs/Unit):	Emis. Factor UOM:	Calculation Method:	Estimated Emis. (Tons):
PM25-PRI	0.05	E6BTU	8 - USEPA EF (post-control)	0.052499999999999
PM10-PRI	0.14	E6BTU	8 - USEPA EF (post-control)	0.146999999999999
SO2	0.505	E6BTU	8 - USEPA EF (post-control)	0.530249999999999
NOX	3.2	E6BTU	8 - USEPA EF (post-control)	3.36
VOC	0.0819	E6BTU	8 - USEPA EF (post-control)	0.085995
CO	0.85	E6BTU	8 - USEPA EF (post-control)	0.892499999999999

Individual pollutant calculations for Diesel Combustion (SCC 20200401):

2022 Emissions Report

In Process

Process Emissions

Process | Operations | Emissions

Filter:

Pollutant:	Emis. Factor (Lbs/Unit):	Emis. Factor UOM:	Calculation Method:	Estimated Emis. (Tons):
PM25-PRI	0.05	E6BTU	8 - USEPA EF (post-control)	0.052499999999999

Pollutant Code:
PM25-PRI - PM2.5 Primary (Filt + Cond)

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
0.05

Emission Factor Unit:
E6BTU - MILLION BTUS

Estimated Emissions (Tons):
0.052499999999999

Comment:
0.05 lbs PM2.5/MMBtu * 2,100 MMBtu * 1 ton/2,000 lbs = 0.05 tons PM2.5

PM10-PRI	0.14	E6BTU	8 - USEPA EF (post-control)	0.146999999999999

Pollutant Code:
PM10-PRI - PM10 Primary (Filt + Cond)

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
0.14

Emission Factor Unit:
E6BTU - MILLION BTUS

Estimated Emissions (Tons):
0.146999999999999

Comment:
0.14 lbs PM10/MMBtu * 2,100 MMBtu * 1 ton/2,000 lbs = 0.17 tons PM10

SO2	0.505	E6BTU	8 - USEPA EF (post-control)	0.530249999999999

Pollutant Code:
SO2 - Sulfur Dioxide

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
0.505

Emission Factor Unit:
E6BTU - MILLION BTUS

Estimated Emissions (Tons):
0.530249999999999

Comment:
SO2 emissions factor is (1.01* % sulfur) lbs/MMBtu. Low sulfur diesel is 0.5% sulfur 1.01 * 0.5 = 0.505 lbs/MMBtu 0.505 lbs SO2/MMBtu * 2,100 MMBtu * 1 ton/2,000 lbs = 0.53 tons

Individual pollutant calculations for Diesel Combustion (SCC 20200401) (cont'd):

NOX	3.2	E6BTU	8 - USEPA EF (post-control)	3.36

Pollutant Code:
NOX - Nitrogen Oxides

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
3.2

Emission Factor Unit:
E6BTU - MILLION BTUS

Estimated Emissions (Tons):
3.36

Comment:
3.2 lbs NOx/MMBtu * 2,100 MMBtu * 1 ton/2,000 lbs = 3.36 tons NOx

VOC	0.0819	E6BTU	8 - USEPA EF (post-control)	0.085995

Pollutant Code:
VOC - Volatile Organic Compounds

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
0.0819

Emission Factor Unit:
E6BTU - MILLION BTUS

Estimated Emissions (Tons):
0.085995

Comment:
0.0819 lbs VOC/MMBtu * 2,100 MMBtu * 1 ton/2,000 lbs = 0.09 tons VOC

CO	0.85	E6BTU	8 - USEPA EF (post-control)	0.892499999999999

Pollutant Code:
CO - Carbon Monoxide

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
0.85

Emission Factor Unit:
E6BTU - MILLION BTUS

Estimated Emissions (Tons):
0.892499999999999

Comment:
0.85 lbs CO/MMBtu * 2,100 MMBtu * 1 ton/2,000 lbs = 0.89 tons CO

2022 Emissions Report

In Process

Process Emissions

Process | Operations | Emissions

Process Identifier:

EU-002 -2 - Dual Fuel Combustion

Emission Unit Identifier:

EU-002 - Dual Fuel Generator

SCC:

20200402

Internal Combustion Engines-Industrial-Other Fuels-Dual Fuel (Oil/Gas): Large Bore Engine

Process is Reported?:

☑ Uncheck this box if there are no reportable emissions for the reporting year

Annual Throughput:

2100

Throughput Unit of Measure:

E6BTU - MILLION BTUS

Throughput Type:

I - Input

Throughput Material:

827 - Dual Fuel (Gas/Oil)

Supplemental Calculation Parameters:

% Ash	% Sulfur	Heat Content (MMBTU/Unit)

Comments:

1,900,000 cubic feet natural gas * 0.00105 MMBtu/cubic feet = 1,995 MMBtu
750 gallons diesel * 0.140 MMBtu/gallon = 105 MMBtu
Total throughput of 1,995 MMBtu + 105 MMBtu = 2,100 MMBtu

Previous | Next | Cancel | Save

2022 Emissions Report

In Process

Process Emissions

Process | Operations | Emissions

Average Hours/Day:
2.50

Average Days/Week:
4.00

Average Weeks/Year:
20.00

Actual Hours/Year:
200.0

Seasonal Operations:

December-February	March-May	June-August
10.0 %	30.0 %	40.0 %

September-November
20.0 %

2022 Emissions Report

In Process

Process Emissions

Process | Operations | Emissions

Filter:

Pollutant:	Emis. Factor (Lbs/Unit):	Emis. Factor UOM:	Calculation Method:	Estimated Emis. (Tons):
PM25-PRI	0.0556	E6BTU	8 - USEPA EF (post-control)	0.058379999999999
PM10-PRI	0.0573	E6BTU	8 - USEPA EF (post-control)	0.060164999999999
SO2	0.025	E6BTU	8 - USEPA EF (post-control)	0.026249999999999
NOX	2.7	E6BTU	8 - USEPA EF (post-control)	2.835
VOC	0.2	E6BTU	8 - USEPA EF (post-control)	0.209999999999999
CO	1.16	E6BTU	8 - USEPA EF (post-control)	1.218
Benzene	0.00445	E6BTU	8 - USEPA EF (post-control)	0.0046725
Formaldehyde	0.0054	E6BTU	8 - USEPA EF (post-control)	0.005669999999999
Toluene	0.00523	E6BTU	8 - USEPA EF (post-control)	0.005491499999999

Individual pollutant calculations for Diesel Combustion (SCC 20200402):

2022 Emissions Report

In Process

Process Emissions

Process | Operations | **Emissions**

Pollutant:	Emis. Factor (Lbs/Unit):	Emis. Factor UOM:	Calculation Method:	Estimated Emis. (Tons):
PM25-PRI	0.0556	E6BTU	8 - USEPA EF (post-control)	0.058379999999999

Pollutant Code:
PM25-PRI - PM2.5 Primary (Filt + Cond)

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
0.0556

Emission Factor Unit:
E6BTU - MILLION BTUS

Estimated Emissions (Tons):
0.058379999999999

Comment:
0.0556 lbs PM25/MMBtu * 2,100 MMBtu * 1 ton/2,000 lbs = 0.06 tons PM 2.5

PM10-PRI	0.0573	E6BTU	8 - USEPA EF (post-control)	0.060164999999999

Pollutant Code:
PM10-PRI - PM10 Primary (Filt + Cond)

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
0.0573

Emission Factor Unit:
E6BTU - MILLION BTUS

Estimated Emissions (Tons):
0.060164999999999

Comment:
0.0573 lbs PM10/MMBtu * 2,100 MMBtu * 1 ton/2,000 lbs = 0.06 tons PM 10

SO2	0.025	E6BTU	8 - USEPA EF (post-control)	0.026249999999999

Pollutant Code:
SO2 - Sulfur Dioxide

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
0.025

Emission Factor Unit:
E6BTU - MILLION BTUS

Estimated Emissions (Tons):
0.026249999999999

Comment:
EPA emissions factor is (0.05 * % sulfur) lbs/MMBtu. Low sulfur diesel is up to 0.5% sulfur 0.05 * 0.5 = 0.025 lbs/MMBtu 0.025 lbs/MMBtu * 2,100 MMBtu * 1 ton/2,000 lbs = 0.03 tons

Individual pollutant calculations for Diesel Combustion (SCC 20200402) (cont'd):

NOX	2.7	E6BTU	8 - USEPA EF (post-control)	2.835

Pollutant Code:
NOX - Nitrogen Oxides

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
2.7

Emission Factor Unit:
E6BTU - MILLION BTUS

Estimated Emissions (Tons):
2.835

Comment:
2.7 lbs/MMBtu * 2,100 MMBtu * 1 ton/2,000 lbs = 2.84 tons

VOC	0.2	E6BTU	8 - USEPA EF (post-control)	0.209999999999999

Pollutant Code:
VOC - Volatile Organic Compounds

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
0.2

Emission Factor Unit:
E6BTU - MILLION BTUS

Estimated Emissions (Tons):
0.209999999999999

Comment:
0.2 lbs/MMBtu * 2,100 MMBtu * 1 ton/2,000 lbs = 0.21 tons

CO	1.16	E6BTU	8 - USEPA EF (post-control)	1.218

Pollutant Code:
CO - Carbon Monoxide

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
1.16

Emission Factor Unit:
E6BTU - MILLION BTUS

Estimated Emissions (Tons):
1.218

Comment:
1.16 lbs/MMBtu * 2,100 MMBtu * 1 ton/2,000 lbs = 1.22 tons

Individual pollutant calculations for Diesel Combustion (SCC 20200402) (cont'd):

Benzene	0.00445	E6BTU	8 - USEPA EF (post-control)	0.0046725

Pollutant Code:
71432 - Benzene

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
0.00445

Emission Factor Unit:
E6BTU - MILLION BTUS

Estimated Emissions (Tons):
0.0046725

Comment:
0.00445 lbs/MMBtu * 2,100 MMBtu * 1 ton/2,000 lbs = 0.00 tons benzene

Formaldehyde	0.0054	E6BTU	8 - USEPA EF (post-control)	0.005669999999999

Pollutant Code:
50000 - Formaldehyde

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
0.0054

Emission Factor Unit:
E6BTU - MILLION BTUS

Estimated Emissions (Tons):
0.005669999999999

Comment:
0.0054 lbs/MMBtu * 2,100 MMBtu * 1 ton/2,000 lbs = 0.01 tons formaldehyde

Toluene	0.00523	E6BTU	8 - USEPA EF (post-control)	0.005491499999999

Pollutant Code:
108883 - Toluene

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
0.00523

Emission Factor Unit:
E6BTU - MILLION BTUS

Estimated Emissions (Tons):
0.005491499999999

Comment:
0.00523 lbs/MMBtu * 2,100 MMBtu * 1 ton/2,000 lbs = 0.01 tons toluene

2022 Emissions Report

In Process

Release Points

Release Point | Location | Additional Information

Identifier:
EP-001

Type:
Vertical with Rain Cap

Description:
Boiler Stack

Status:
Operating

Status Year:

Stack Height:
35.0 FEET

Stack Shape:
(•) Circular ( ) Rectangular

Stack Diameter:
2.00 FEET

Exit Gas Temp:
350 °F

Exit Gas Flow Rate:
6100 ACFM - ACTUAL CUBIC FEET PER

Exit Gas Velocity:
1941.69031 FPM - FEET PER MINUTE

Fence Line Distance:
FEET

Related Unit Processes:
EU-001 - Fuel Oil Boiler, EU-001 -1 - Fuel Oil Combustion

Comments:

2022 Emissions Report

In Process

Emission Units

Emission Unit | Additional Information

Identifier:

EU-001

Type:

100 - Boiler

Description:

Fuel Oil Boiler

Status:

OP - Operating

Status Year:

Operation Start Date:

Design Capacity

Related Unit Processes:

EU-001 -1 - Fuel Oil Combustion

Comments:

Delete | Cancel | Save

2022 Emissions Report

In Process

Unit Processes

Unit Process | Regulatory Programs | Control Approach | Release Point Apportionment | Additional Information

Process Identifier:
EU-001 -1

Emission Unit Identifier:
EU-001 - Fuel Oil Boiler

SCC:

Code: 10200502 ~ or ~

- External Combustion
- Industrial: Boilers
- Distillate Oil
- 10-100 Million BTU/hr

Description:
Fuel Oil Combustion

Status:
OP - Operating

Status Year:

Related Process Emission:
EU-001 -1 - Fuel Oil Combustion

Comments:

2022 Emissions Report

In Process

Unit Processes

Unit Process | Regulatory Programs | Control Approach | Release Point Apportionment | Additional Information

Release Point Apportionment:

Release Point	%
EP-001 - Boiler Stack	100

2022 Emissions Report

In Process

Process Emissions

Process | Operations | Emissions

Process Identifier:

EU-001 -1 - Fuel Oil Combustion

Emission Unit Identifier:

EU-001 - Fuel Oil Boiler

SCC:

10200502

External Combustion-Industrial: Boilers-Distillate Oil-10-100 Million BTU/hr

Process is Reported?:

☑ Uncheck this box if there are no reportable emissions for the reporting year

Annual Throughput:

5

Throughput Unit of Measure:

E3GAL - 1000 GALLONS

Throughput Type:

I - Input

Throughput Material:

IA49 - FUEL OIL

Supplemental Calculation Parameters:

% Ash | % Sulfur | Heat Content (MMBTU/Unit)

Comments:

Next | Cancel | Save

2022 Emissions Report

In Process

Process Emissions

Process | **Operations** | Emissions

Average Hours/Day:
24.00

Average Days/Week:
7.00

Average Weeks/Year:
38.00

Actual Hours/Year:
6384.0

Seasonal Operations:

December-February	March-May	June-August
35.0 %	21.7 %	15.0 %

September-November
28.3 %

2022 Emissions Report

In Process

Process Emissions

Process | Operations | **Emissions**

Filter:

Pollutant:	Emis. Factor (Lbs/Unit):	Emis. Factor UOM:	Calculation Method:	Estimated Emis. (Tons):
PM25-PRI	1.55	E3GAL	8 - USEPA EF (post-control)	0.003874999999999
PM10-PRI	2.3	E3GAL	8 - USEPA EF (post-control)	0.005749999999999
SO2	142	E3GAL	8 - USEPA EF (post-control)	0.354999999999999
NOX	20	E3GAL	8 - USEPA EF (post-control)	0.05
VOC	0.2	E3GAL	8 - USEPA EF (post-control)	0.0005
CO	5	E3GAL	8 - USEPA EF (post-control)	0.0125
NH3	0.8	E3GAL	8 - USEPA EF (post-control)	0.002

2022 Emissions Report

In Process

Process Emissions

Process | Operations | Emissions

Filter:

Pollutant:	Emis. Factor (Lbs/Unit):	Emis. Factor UOM:	Calculation Method:	Estimated Emis. (Tons):
PM25-PRI	1.55	E3GAL	8 - USEPA EF (post-control)	0.003874999999999

Pollutant Code:
PM25-PRI - PM2.5 Primary (Filt + Cond)

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
1.55

Emission Factor Unit:
E3GAL - 1000 GALLONS

Estimated Emissions (Tons):
0.003874999999999

Comment:
1.55 lbs PM2.5/1,000 gal * 5 1,000 gal * 1 ton/2,000 lbs = 0.004 tons PM 2.5

PM10-PRI	2.3	E3GAL	8 - USEPA EF (post-control)	0.005749999999999

Pollutant Code:
PM10-PRI - PM10 Primary (Filt + Cond)

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
2.3

Emission Factor Unit:
E3GAL - 1000 GALLONS

Estimated Emissions (Tons):
0.005749999999999

Comment:
2.3 lbs PM10/1,000 gal * 5 1,000 gal * 1 ton/2,000 lbs = 0.006 tons PM 10

SO2	142	E3GAL	8 - USEPA EF (post-control)	0.354999999999999

Pollutant Code:
SO2 - Sulfur Dioxide

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
142

Emission Factor Unit:
E3GAL - 1000 GALLONS

Estimated Emissions (Tons):
0.354999999999999

Comment:
142 lbs SO2/1,000 gal * 5 1,000 gal * 1 ton/2,000 lbs = 0.35 tons SO2

Individual pollutant calculations (cont'd):

NOX	20	E3GAL	8 - USEPA EF (post-control)	0.05

Pollutant Code:
NOX - Nitrogen Oxides

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
20

Emission Factor Unit:
E3GAL - 1000 GALLONS

Estimated Emissions (Tons):
0.05

Comment:
20 lbs NOx/1,000 gal * 5 1,000 gal * 1 ton/2,000 lbs = 0.05 tons NOx

VOC	0.2	E3GAL	8 - USEPA EF (post-control)	0.0005

Pollutant Code:
VOC - Volatile Organic Compounds

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
0.2

Emission Factor Unit:
E3GAL - 1000 GALLONS

Estimated Emissions (Tons):
0.0005

Comment:
0.2 lbs VOC/1,000 gal * 5 1,000 gal * 1 ton/2,000 lbs = 0.0005 tons VOC

CO	5	E3GAL	8 - USEPA EF (post-control)	0.0125

Pollutant Code:
CO - Carbon Monoxide

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
5

Emission Factor Unit:
E3GAL - 1000 GALLONS

Estimated Emissions (Tons):
0.0125

Comment:
5 lbs CO/1,000 gal * 5 1,000 gal * 1 ton/2,000 lbs = 0.0125 tons CO

NH3	0.8	E3GAL	8 - USEPA EF (post-control)	0.002

Pollutant Code:
NH3 - Ammonia

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
0.8

Emission Factor Unit:
E3GAL - 1000 GALLONS

Estimated Emissions (Tons):
0.002

Comment:
0.8 lbs NH3/1,000 gal * 5 1,000 gal * 1 ton/2,000 lbs = 0.8 tons NH3

2022 Emissions Report

In Process

Release Points

Release Point | Location | Additional Information

Identifier:
EP-003

Type:
Vertical

Description:
Boiler Stack

Status:
Operating

Status Year:

Stack Height:
20.0 FEET

Stack Shape:
(•) Circular ( ) Rectangular

Stack Diameter:
1.50 FEET

Exit Gas Temp:
300 °F

Exit Gas Flow Rate:
3600 ACFM - ACTUAL CUBIC FEET PER

Exit Gas Velocity:
2037.18327 FPM - FEET PER MINUTE

Fence Line Distance:
FEET

Related Unit Processes:
EU-003 - Natural Gas Boiler, EU-003 -1 - Natural Gas Combustion

Comments:

2022 Emissions Report

In Process

Emission Units

Emission Unit | Additional Information

Identifier:

EU-003

Type:

100 - Boiler

Description:

Natural Gas Boiler

Status:

OP - Operating

Status Year:

Operation Start Date:

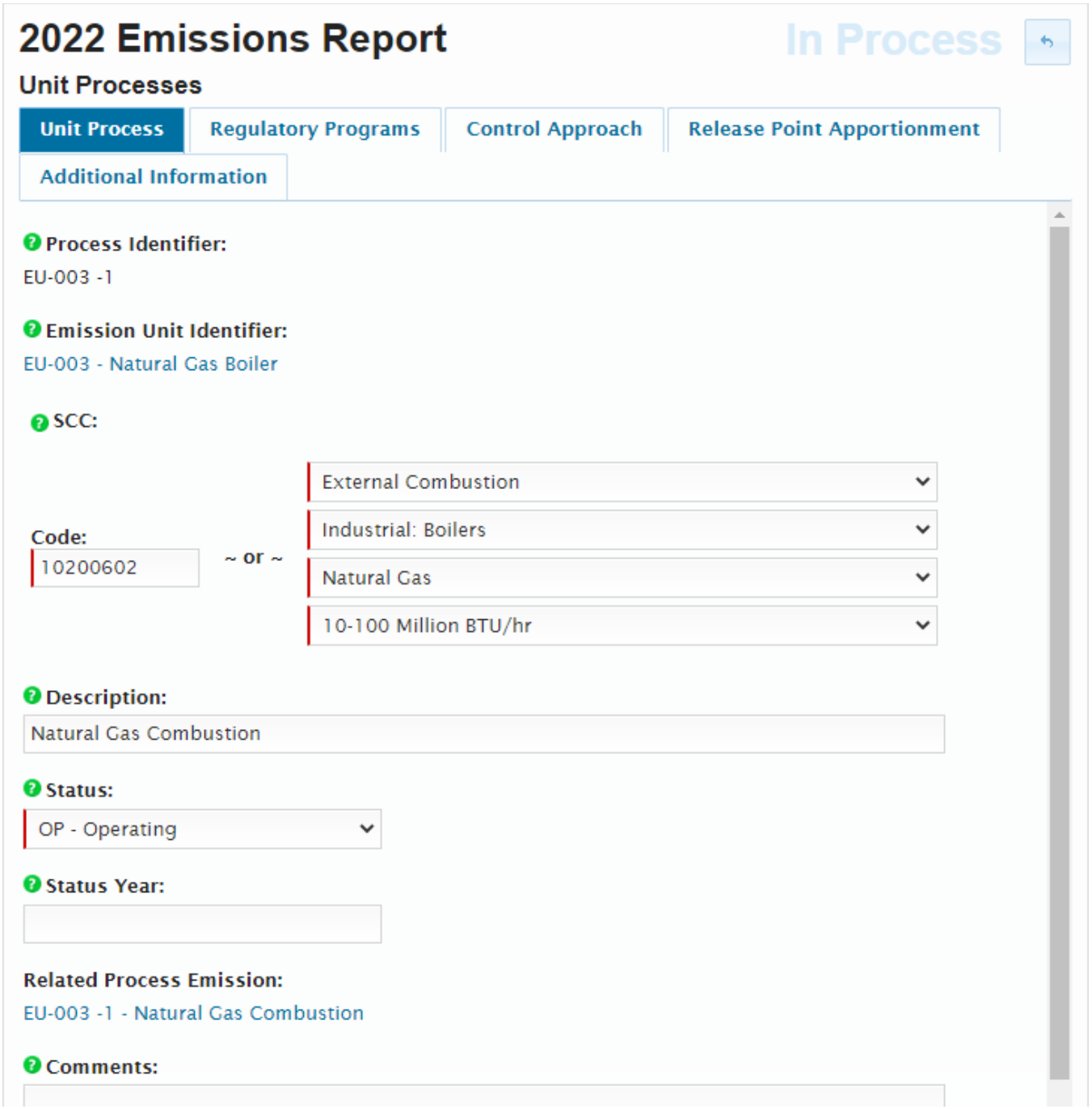
Design Capacity

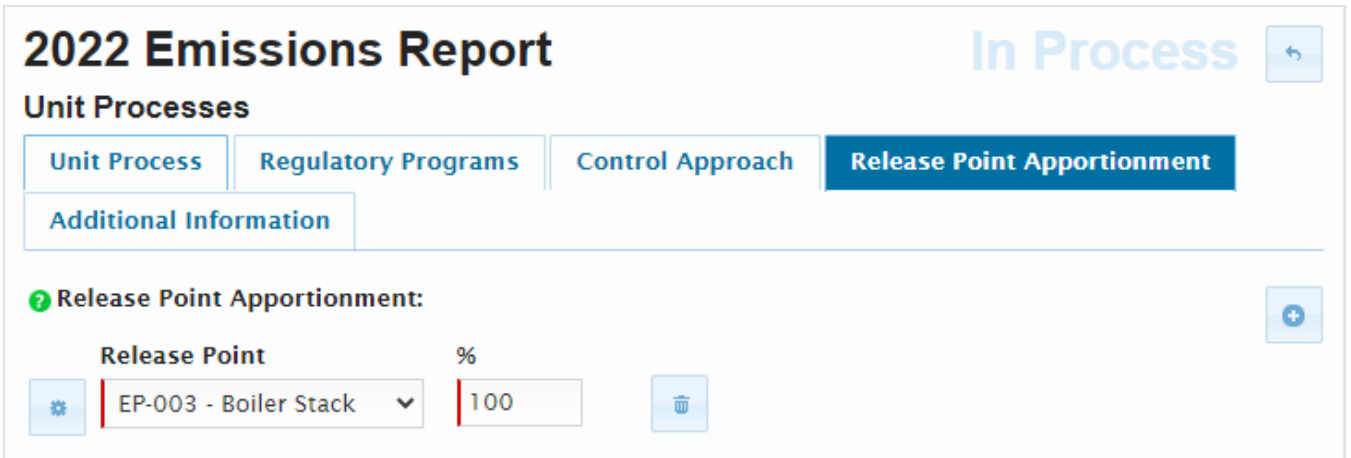
Related Unit Processes:

EU-003 -1 - Natural Gas Combustion

Comments:

Delete | Cancel | Save


2022 Emissions Report
In Process
Unit Processes
Unit Process
Regulatory Programs
Control Approach
Release Point Apportionment
Additional Information
Process Identifier:
EU-003 -1
Emission Unit Identifier:
EU-003 - Natural Gas Boiler
SCC:
Code:
10200602
~ or ~
External Combustion
Industrial: Boilers
Natural Gas
10-100 Million BTU/hr
Description:
Natural Gas Combustion
Status:
OP - Operating
Status Year:
Related Process Emission:
EU-003 -1 - Natural Gas Combustion
Comments:


2022 Emissions Report
In Process
Unit Processes
Unit Process
Regulatory Programs
Control Approach
Release Point Apportionment
Additional Information
Release Point Apportionment:
Release Point
%
EP-003 - Boiler Stack
100

2022 Emissions Report

In Process

Process Emissions

Process | Operations | Emissions

Process Identifier:

EU-003 -1 - Natural Gas Combustion

Emission Unit Identifier:

EU-003 - Natural Gas Boiler

SCC:

10200602

External Combustion-Industrial: Boilers-Natural Gas-10-100 Million BTU/hr

Process is Reported?:

☑ Uncheck this box if there are no reportable emissions for the reporting year

Annual Throughput:

24.5

Throughput Unit of Measure:

E6FT3 - MILLION CUBIC FEET

Throughput Type:

I - Input

Throughput Material:

209 - Natural Gas

Supplemental Calculation Parameters:

% Ash | % Sulfur | Heat Content (MMBTU/Unit)

Comments:

Cancel | Save

2022 Emissions Report

In Process

Process Emissions

Process | **Operations** | Emissions

Average Hours/Day:

8.00

Average Days/Week:

5.00

Average Weeks/Year:

52.00

Actual Hours/Year:

2080.0

Seasonal Operations:

December-February	March-May	June-August
25.0 %	25.0 %	25.0 %

September-November

25.0 %

2022 Emissions Report

In Process

Process Emissions

Process | Operations | **Emissions**

Filter:

Pollutant:	Emis. Factor (Lbs/Unit):	Emis. Factor UOM:	Calculation Method:	Estimated Emis. (Tons):
PM25-PRI	7.6	E6FT3	8 - USEPA EF (post-control)	0.093099999999999
PM10-PRI	7.6	E6FT3	8 - USEPA EF (post-control)	0.093099999999999
SO2	0.6	E6FT3	8 - USEPA EF (post-control)	0.007349999999999
NOX	100	E6FT3	8 - USEPA EF (post-control)	1.225
VOC	5.5	E6FT3	8 - USEPA EF (post-control)	0.067375
CO	84	E6FT3	8 - USEPA EF (post-control)	1.029
NH3	3.2	E6FT3	8 - USEPA EF (post-control)	0.0392
Hexane	1.8	E6FT3	8 - USEPA EF (post-control)	0.02205

2022 Emissions Report

In Process

Process Emissions

Process | Operations | Emissions

Filter:

Pollutant:	Emis. Factor (Lbs/Unit):	Emis. Factor UOM:	Calculation Method:	Estimated Emis. (Tons):
PM25-PRI	7.6	E6FT3	8 - USEPA EF (post-control)	0.093099999999999

Pollutant Code:
PM25-PRI - PM2.5 Primary (Filt + Cond)

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
7.6

Emission Factor Unit:
E6FT3 - MILLION CUBIC FEET

Estimated Emissions (Tons):
0.093099999999999

Comment:
7.6 lbs PM2.5/MMBtu natural gas * 24.5 MMBtu * 1 ton/2,000 lbs = 0.09 tons PM 2.5

Pollutant:	Emis. Factor (Lbs/Unit):	Emis. Factor UOM:	Calculation Method:	Estimated Emis. (Tons):
PM10-PRI	7.6	E6FT3	8 - USEPA EF (post-control)	0.093099999999999

Pollutant Code:
PM10-PRI - PM10 Primary (Filt + Cond)

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
7.6

Emission Factor Unit:
E6FT3 - MILLION CUBIC FEET

Estimated Emissions (Tons):
0.093099999999999

Comment:
7.6 lbs PM10/MMBtu natural gas * 24.5 MMBtu * 1 ton/2,000 lbs = 0.09 tons PM 10

Pollutant:	Emis. Factor (Lbs/Unit):	Emis. Factor UOM:	Calculation Method:	Estimated Emis. (Tons):
SO2	0.6	E6FT3	8 - USEPA EF (post-control)	0.007349999999999

Pollutant Code:
SO2 - Sulfur Dioxide

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
0.6

Emission Factor Unit:
E6FT3 - MILLION CUBIC FEET

Estimated Emissions (Tons):
0.007349999999999

Comment:

Individual pollutant calculations (cont'd):

NOX	100	E6FT3	8 - USEPA EF (post-control)	1.225

Pollutant Code:
NOX - Nitrogen Oxides

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
100

Emission Factor Unit:
E6FT3 - MILLION CUBIC FEET

Estimated Emissions (Tons):
1.225

Comment:

VOC	5.5	E6FT3	8 - USEPA EF (post-control)	0.067375

Pollutant Code:
VOC - Volatile Organic Compounds

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
5.5

Emission Factor Unit:
E6FT3 - MILLION CUBIC FEET

Estimated Emissions (Tons):
0.067375

Comment:

CO	84	E6FT3	8 - USEPA EF (post-control)	1.029

Pollutant Code:
CO - Carbon Monoxide

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
84

Emission Factor Unit:
E6FT3 - MILLION CUBIC FEET

Estimated Emissions (Tons):
1.029

Comment:

2022 Emissions Report

In Process

Release Points

Release Point | Location | Additional Information

Identifier:
EP-002

Type:
Vertical with Rain Cap

Description:
Paint Booth Stack

Status:
Operating

Status Year:

Stack Height:
18.0 FEET

Stack Shape:
(•) Circular ( ) Rectangular

Stack Diameter:
2.50 FEET

Exit Gas Temp:
68 °F

Exit Gas Flow Rate:
18000 ACFM - ACTUAL CUBIC FEET PER

Exit Gas Velocity:
3666.92989 FPM - FEET PER MINUTE

Fence Line Distance:
FEET

Related Unit Processes:
EU-002 - Paint Booth, EU-002 -1 - Spray Painting

Comments:

2022 Emissions Report

In Process

Control Devices

Control Device | Additional Information

Identifier:

CE-002

Description:

Paint Booth Filter

Status:

OP - Operating

Status Year:

Control Measure:

313 - Spray booth and Filter

Controlled Pollutants:

PM10-PRI	95	%	PM10 Primary (Filt + Cond)
PM25-PRI	95	%	PM2.5 Primary (Filt + Cond)

Related Unit Processes:

EU-002 - Paint Booth, EU-002 -1 - Spray Painting

Comments:

Delete | Cancel | Save

2022 Emissions Report

In Process

Emission Units

Emission Unit | Additional Information

Identifier:
EU-002

Type:
450 - Spray Booth or Coating Line

Description:
Paint Booth

Status:
OP - Operating

Status Year:

Operation Start Date:

Design Capacity

Related Unit Processes:
EU-002 -1 - Spray Painting

Comments:

Delete | Cancel | Save

2022 Emissions Report

In Process

Unit Processes

Unit Process | Regulatory Programs | Control Approach | Release Point Apportionment | Additional Information

Process Identifier:

EU-002 -1

Emission Unit Identifier:

EU-002 - Paint Booth

SCC:

Code: 40202501

~ or ~

Chemical Evaporation

Surface Coating Operations

Miscellaneous Metal Parts

Coating Operation

Description:

Spray Painting

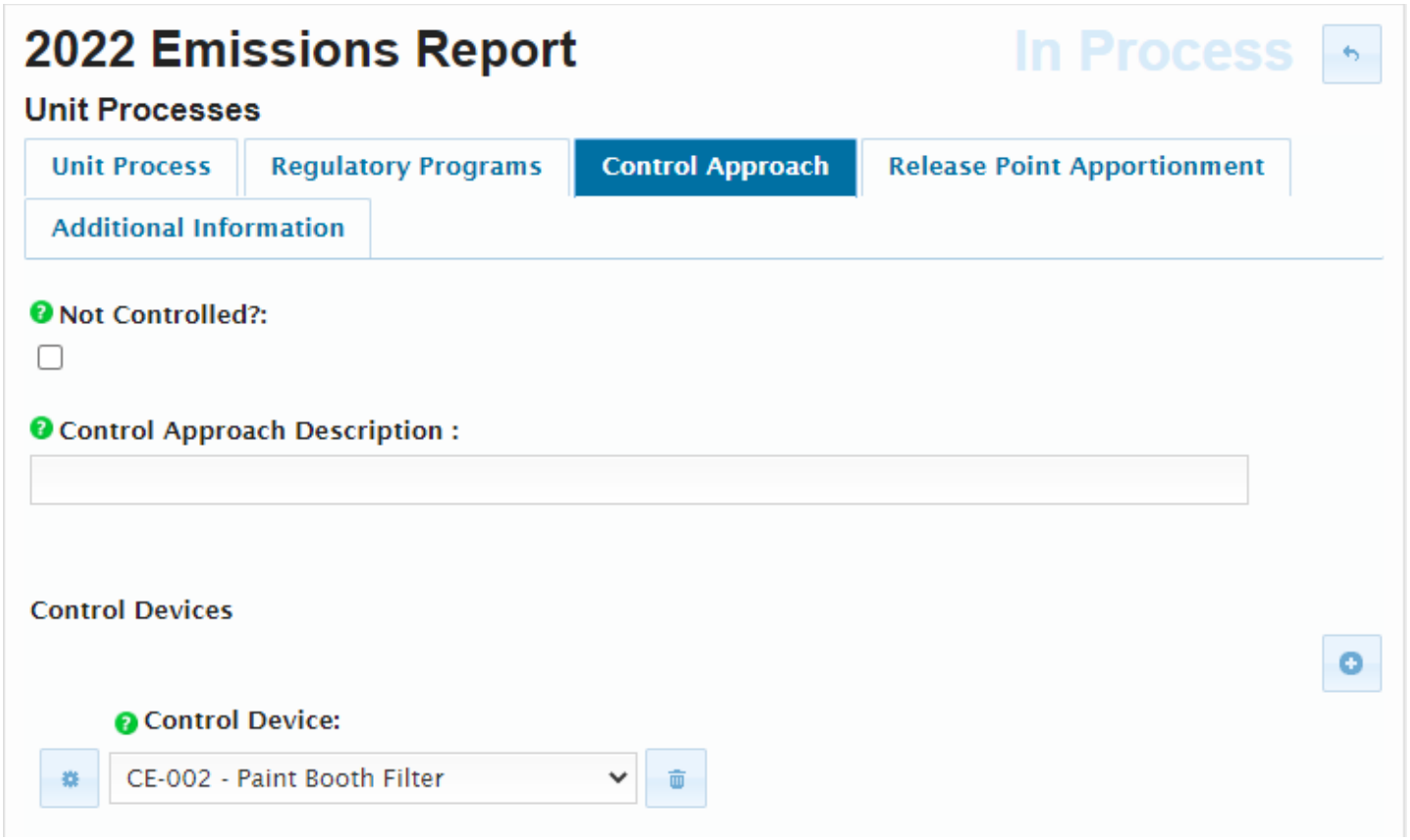
Status:

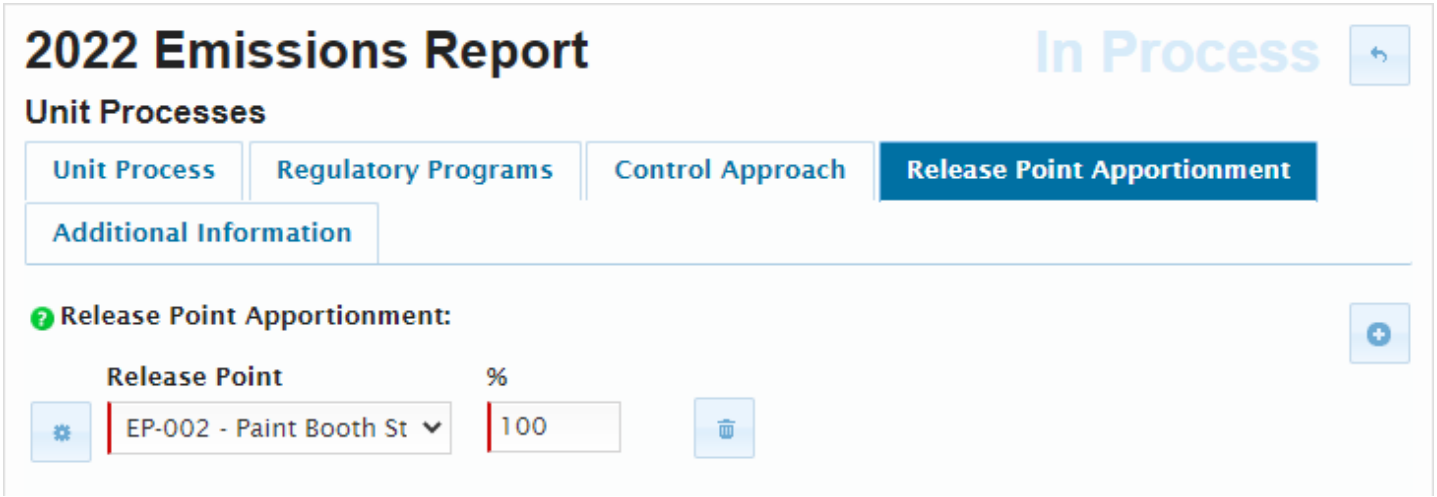
OP - Operating

Status Year:

Related Process Emission:

EU-002 -1 - Spray Painting


2022 Emissions Report
In Process
Unit Processes
Unit Process
Regulatory Programs
Control Approach
Release Point Apportionment
Additional Information
Not Controlled?:
Control Approach Description :
Control Devices
Control Device:
CE-002 - Paint Booth Filter


2022 Emissions Report
In Process
Unit Processes
Unit Process
Regulatory Programs
Control Approach
Release Point Apportionment
Additional Information
Release Point Apportionment:
Release Point
%
EP-002 - Paint Booth St
100

2022 Emissions Report

In Process

Process Emissions

Process | Operations | Emissions

Process Identifier:

EU-002 -1 - Spray Painting

Emission Unit Identifier:

EU-002 - Paint Booth

SCC:

40202501

Chemical Evaporation-Surface Coating Operations-Miscellaneous Metal Parts-Coating Operation

Process is Reported?:

☑ Uncheck this box if there are no reportable emissions for the reporting year

Annual Throughput:

1300

Throughput Unit of Measure:

GAL - GALLONS

Throughput Type:

I - Input

Throughput Material:

225 - Paint

Supplemental Calculation Parameters:

% Ash | % Sulfur | Heat Content (MMBTU/Unit)

Comments:

Previous | Next | Cancel | Save

2022 Emissions Report

In Process

Process Emissions

Process | **Operations** | Emissions

Average Hours/Day:
8.00

Average Days/Week:
5.00

Average Weeks/Year:
52.00

Actual Hours/Year:
2080.0

Seasonal Operations:

December-February	March-May	June-August
25.0 %	25.0 %	25.0 %

September-November
25.0 %

2022 Emissions Report

In Process

Process Emissions

Process | Operations | **Emissions**

Filter:

Pollutant:	Emis. Factor (Lbs/Unit):	Emis. Factor UOM:	Calculation Method:	Estimated Emis. (Tons):
PM25-PRI	2.1525	GAL	3.2 - Material Balance (pre-control)	0.069956249999999
PM10-PRI	2.1525	GAL	3.2 - Material Balance (pre-control)	0.069956249999999
VOC	2.51	GAL	3.2 - Material Balance (pre-control)	1.6315
Toluene	0.42	GAL	3.2 - Material Balance (pre-control)	0.273
Xylenes (Mixed Isomers)	0.49	GAL	3.2 - Material Balance (pre-control)	0.3185

2022 Emissions Report

In Process

Process Emissions

Process | Operations | Emissions

Filter:

Pollutant:	Emis. Factor (Lbs/Unit):	Emis. Factor UOM:	Calculation Method:	Estimated Emis. (Tons):
PM25-PRI	2.1525	GAL	3.2 - Material Balance (pre-control)	0.069956249999999

Pollutant Code:
PM25-PRI - PM2.5 Primary (Filt + Cond)

Calculation Method:
3.2 - Material Balance (pre-control)

Emission Factor (Lbs/Unit):
2.1525

Emission Factor Unit:
GAL - GALLONS

Estimated Emissions (Tons):
0.069956249999999

Overall Control Efficiency (%):
95%

Comment:
PM2.5 emissions factor includes 65% transfer efficiency 6.15 lbs solids/gal * (1-0.65 transfer efficiency) = 2.1525 lbs/gal 2.1525 lbs/gal * 1,300 gal * (1-0.95 control efficiency) * 1 ton/2,000 lbs = 0.07 tons PM 2.5

PM10-PRI	2.1525	GAL	3.2 - Material Balance (pre-control)	0.069956249999999

Pollutant Code:
PM10-PRI - PM10 Primary (Filt + Cond)

Calculation Method:
3.2 - Material Balance (pre-control)

Emission Factor (Lbs/Unit):
2.1525

Emission Factor Unit:
GAL - GALLONS

Estimated Emissions (Tons):
0.069956249999999

Overall Control Efficiency (%):
95%

Comment:
PM10 emissions factor includes 65% transfer efficiency 6.15 lbs solids/gal * (1-0.65 transfer efficiency) = 2.1525 lbs/gal 2.1525 lbs/gal * 1,300 gal * (1-0.95 control efficiency) * 1 ton/2,000 lbs = 0.07 tons PM 10

VOC	2.51	GAL	3.2 - Material Balance (pre-control)	1.6315

Pollutant Code:
VOC - Volatile Organic Compounds

Calculation Method:
3.2 - Material Balance (pre-control)

Emission Factor (Lbs/Unit):
2.51

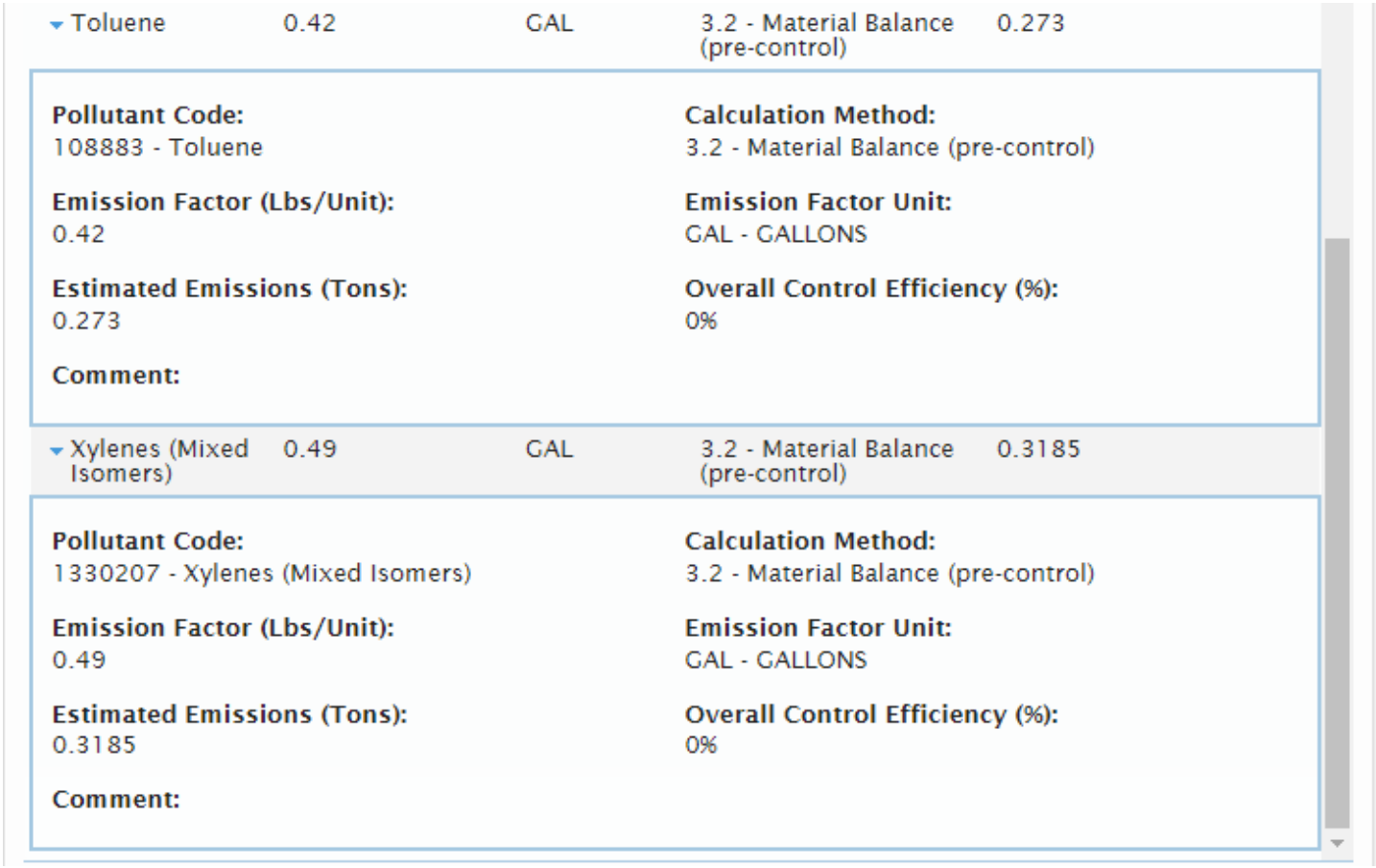
Emission Factor Unit:
GAL - GALLONS

Estimated Emissions (Tons):
1.6315

Overall Control Efficiency (%):
0%

Comment:
There are no controls for VOC 2.51 lbs VOC/gal * 1,300 gal * 1 ton/2,000 lbs = 1.63 tons

Individual pollutant calculations (cont'd):



2022 Emissions Report

In Process

Release Points

Release Point | Location | Additional Information

Identifier:
EP-003

Type:
Horizontal

Description:
Welding Vent

Status:
Operating

Status Year:

Stack Height:
12.0 FEET

Stack Shape:
○ Circular ◉ Rectangular

Stack Opening Length:
0.67 FEET

Stack Opening Width:
0.83 FEET

Equivalent Diameter:
0.84 FEET

Exit Gas Temp:
68 °F

Exit Gas Flow Rate:
900 ACFM - ACTUAL CUBIC FEET PER

Exit Gas Velocity:
1624.03003 FPM - FEET PER MINUTE

Fence Line Distance:
FEET

Related Unit Processes:
EU-003 - Welding, EU-003 -1 - GMAW

2022 Emissions Report

In Process

Emission Units

Emission Unit | Additional Information

Identifier:

EU-003

Type:

690 - Other process equipment

Description:

Welding

Status:

OP - Operating

Status Year:

Operation Start Date:

Design Capacity

Related Unit Processes:

EU-003 -1 - GMAW

Comments:

Delete | Cancel | Save

2022 Emissions Report

In Process

Unit Processes

Unit Process | Regulatory Programs | Control Approach | Release Point Apportionment | Additional Information

Process Identifier:
EU-003 -1

Emission Unit Identifier:
EU-003 - Welding

SCC:

Code: 30905212 ~ or ~

- Industrial Processes
- Fabricated Metal Products
- Gas Metal Arc Welding (GMAW)
- E308l Electrode

Description:
GMAW

Status:
OP - Operating

Status Year:

Related Process Emission:
EU-003 -1 - GMAW

2022 Emissions Report

In Process

Unit Processes

Unit Process | Regulatory Programs | Control Approach | Release Point Apportionment | Additional Information

Release Point Apportionment:

Release Point	%
EP-003 - Welding Vent	100

2022 Emissions Report

In Process

Process Emissions

Process | Operations | Emissions

Process Identifier:

EU-003 -1 - GMAW

Emission Unit Identifier:

EU-003 - Welding

SCC:

30905212

Industrial Processes-Fabricated Metal Products-Gas Metal Arc Welding (GMAW)-E308l Electrode

Process is Reported?:

☑ Uncheck this box if there are no reportable emissions for the reporting year

Annual Throughput:

40

Throughput Unit of Measure:

E3LB - 1000 POUNDS

Throughput Type:

I - Input

Throughput Material:

77 - Electrode

Supplemental Calculation Parameters:

% Ash | % Sulfur | Heat Content (MMBTU/Unit)

Comments:

Electrode E308

Cancel | Save

2022 Emissions Report

In Process

Process Emissions

Process | **Operations** | Emissions

Average Hours/Day:
8.00

Average Days/Week:
6.00

Average Weeks/Year:
52.00

Actual Hours/Year:
2496.0

Seasonal Operations:

December-February	March-May	June-August
25.0 %	25.0 %	25.0 %

September-November
25.0 %

2022 Emissions Report

In Process

Process Emissions

Process | Operations | **Emissions**

Filter:

Pollutant:	Emis. Factor (Lbs/Unit):	Emis. Factor UOM:	Calculation Method:	Estimated Emis. (Tons):
PM25-PRI	5.4	E3LB	8 - USEPA EF (post-control)	0.107999999999999
PM10-PRI	5.4	E3LB	8 - USEPA EF (post-control)	0.107999999999999
Chromium Compounds	0.524	E3LB	8 - USEPA EF (post-control)	0.010479999999999
Manganese Compounds	0.346	E3LB	8 - USEPA EF (post-control)	0.006919999999999
Nickel	0.184	E3LB	8 - USEPA EF (post-control)	0.003679999999999

2022 Emissions Report

In Process

Process Emissions

Process | Operations | Emissions

Filter:

Pollutant:	Emis. Factor (Lbs/Unit):	Emis. Factor UOM:	Calculation Method:	Estimated Emis. (Tons):
PM25-PRI	5.4	E3LB	8 - USEPA EF (post-control)	0.107999999999999

Pollutant Code:
PM25-PRI - PM2.5 Primary (Filt + Cond)

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
5.4

Emission Factor Unit:
E3LB - 1000 POUNDS

Estimated Emissions (Tons):
0.107999999999999

Comment:
5.4 lbs PM2.5/1,000 lbs electrode * 40 1,000 lbs * 1 ton/2,000 lbs = 0.11 tons PM 2.5

PM10-PRI	5.4	E3LB	8 - USEPA EF (post-control)	0.107999999999999

Pollutant Code:
PM10-PRI - PM10 Primary (Filt + Cond)

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
5.4

Emission Factor Unit:
E3LB - 1000 POUNDS

Estimated Emissions (Tons):
0.107999999999999

Comment:
5.4 lbs PM10/1,000 lbs electrode * 40 1,000 lbs * 1 ton/2,000 lbs = 0.11 tons PM 10

Chromium Compounds	0.524	E3LB	8 - USEPA EF (post-control)	0.010479999999999

Pollutant Code:
7440473 - Chromium Compounds

Calculation Method:
8 - USEPA EF (post-control)

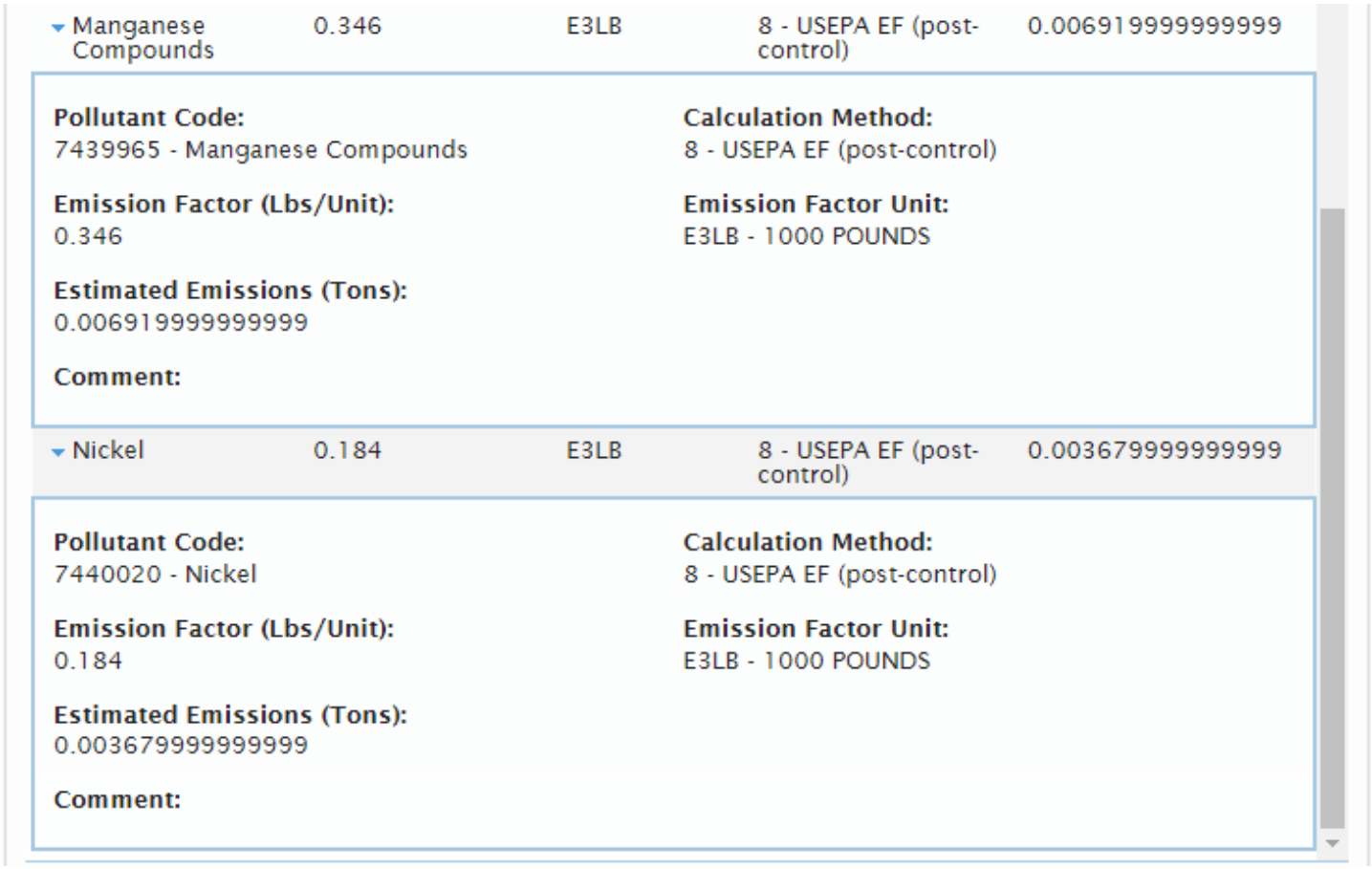
Emission Factor (Lbs/Unit):
0.524

Emission Factor Unit:
E3LB - 1000 POUNDS

Estimated Emissions (Tons):
0.010479999999999

Comment:

Individual pollutant calculations (cont'd):



Manganese Compounds	0.346	E3LB	8 - USEPA EF (post-control)	0.006919999999999

Pollutant Code:
7439965 - Manganese Compounds

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
0.346

Emission Factor Unit:
E3LB - 1000 POUNDS

Estimated Emissions (Tons):
0.006919999999999

Comment:

Nickel	0.184	E3LB	8 - USEPA EF (post-control)	0.003679999999999

Pollutant Code:
7440020 - Nickel

Calculation Method:
8 - USEPA EF (post-control)

Emission Factor (Lbs/Unit):
0.184

Emission Factor Unit:
E3LB - 1000 POUNDS

Estimated Emissions (Tons):
0.003679999999999

Comment:

Appendices

APPENDIX A: Air Quality Glossary

ACFM Actual cubic feet per minute. A measurement of exhaust rate from a release point.

Act refers to the 1990 Clean Air Act Amendments

Actual Emissions are the actual rate of emissions of a pollutant from an emission unit calculated using the emission unit's actual operating hours, production rates, and types of materials processed, stored, or combusted for the calendar year.

Annual Throughput is the quantity of raw material processed, handled, or used in an emission unit, such as fuels, solvents, coatings, or quantity of dust-producing material processed, handled, or transferred.

Air Pollutant is generally any substance in the air not part of the naturally occurring makeup of ambient air or that occurs in un-natural concentrations. In Iowa, this usually refers to hazardous air pollutants and criteria air pollutants.

Allowable Emissions is the emissions rate that represents a limit on the emissions that can occur from an emissions unit. This limit may be based on a federal, state, or local regulatory emission limit determined from state or local regulations and/or 40 Code of Federal Regulations (CFR).

Ambient Standards limit the concentration of a given pollutant in the ambient air. Ambient standards are not emissions limitations on sources, but usually result in such limits being placed on source operation as part of a control strategy to achieve or maintain an ambient standard.

Ammonia is a colorless gas with a very distinct odor. Ammonia emissions are important to air quality analyses because ammonia is involved in the formation of sulfate and nitrate, which are precursors for $PM_{2.5}$. Only primary ammonia needs to be reported. Primary ammonia means it is in the same chemical form as when it was emitted into the atmosphere. Secondary ammonia, such as ammonium sulfate and ammonium nitrate, is formed by chemical reactions in the atmosphere.

Attainment Area is an area considered to have air quality as good as or better than the National Ambient Air Quality Standards (NAAQS) as defined in the Act. An area may be in attainment for one or more pollutants but be a nonattainment area for one or more other pollutants.

Capture Efficiency is the percentage of pollutant emitted from an emission unit that is caught or captured by a pickup hood or other collection mechanism. An example is a fume hood.

Carbon Monoxide (CO) is a colorless, odorless gas that depletes the oxygen-carrying capacity of blood. Example sources of CO emissions include industrial boilers, incinerators, and motor vehicles.

CAS Number refers to the Chemical Abstract Services number. CAS numbers are often found on Safety Data Sheets and are sometimes used as a way to identify air pollutants.

CFR is the Code of Federal Regulations. This is a book of rules published by the federal government. Title 40 of the CFR pertains to Protection of the Environment.

Continuous Emissions Monitoring Equipment that measures the concentration or emission rate of a gas or particulate matter using analyzer measurements and a conversion equation, graph, or computer program. Installation and operation of a CEM may be required by EPA or DNR in order to determine compliance with specific standards. Operation

of a CEM must meet performance specifications, certification procedures, and recordkeeping and reporting requirements as specified in applicable regulations.

Construction Permits are permits required before installing or altering equipment or control equipment, with a goal of prevention of significant deterioration or degrading of clean air areas from new industrial development or expansion.

Control Efficiency is the emission reduction efficiency, and is a percentage value representing the amount of emissions that are controlled by a control device.

Criteria Pollutant refers to a pollutant for which a National Ambient Air Quality Standard has been set. Criteria pollutants are carbon monoxide, lead, nitrogen oxides, ozone, particulate matter with aerodynamic diameter less than or equal to 10 micrometers or less than or equal to 2.5 micrometers, and sulfur dioxide.

Dual Fuel refers to fuel burned at a ratio of 95% natural gas and 5% diesel fuel.

Emergency Generator …any generator of which the sole function is to provide emergency backup power during an interruption of electrical power from the electrical utility. An emergency generator does not include peaking units at electrical utilities, generators at industrial facilities that typically operate at low rates, but are not confined to emergency purposes; or any standby generators that are used during times when power is available from the electric utility. An emergency is an unforeseeable condition that is beyond the control of the owner or operator.

Emission means pollution discharged into the atmosphere from smokestacks, other vents, and surface areas of commercial or industrial facilities; from residential chimneys; and from motor vehicle, locomotive, aircraft, or other nonroad engines.

Emission Factors The relationship between the amount of pollution produced and the amount of raw material processed. For example – pounds of CO per ton of coal fired.

Emission Inventory is a listing, by source, of the amount of air pollutants discharged into the atmosphere.

Emission Limits are limits on emissions that may be federally enforceable and exist in a permit. Such limits are usually expressed as a rate, generally in pounds per hour of emissions or as a concentration such as grains per dry standard cubic foot (7,000 grains is one pound).

Emission point is the point where emissions enter the atmosphere such as stacks, vents and ventilation exhausts. The term emission point is used interchangeably with release point.

Emission Unit is a piece of equipment where emissions are generated. Emission units may have one or more processes with actual emissions. Some examples of an emission unit with one or more processes are boilers (the ability to burn both natural gas and fuel oil), generators (the ability to burn both fuel oil and dual fuel), and grain dryers (the ability to dry grain and burn natural gas).

Engineering Estimate is a term commonly applied to the best approximation that can be made when the specific emission estimation techniques such as stack testing, material balance, or emission factors are not available. This estimation is usually made by an engineer familiar with the specific process, and is based on process information.

Federally Enforceable means all limitations and conditions that are enforceable by the administrator including, but not limited to, the requirements of new source performance standards, national emission standards for hazardous air pollutants, state rules, administrative orders, construction permits, and operating permits.

Fugitive Emissions are emissions that cannot reasonably pass through a stack, chimney, duct, vent or other opening. Fugitive emission sources can include haul roads, exposed storage piles, and wastewater retention ponds, etc.

HAP or Hazardous Air Pollutants are any of the 188 pollutants listed in Section 112 of the 1990 Clean Air Act Amendments. HAPs are known or suspected of being toxic or carcinogenic.

Indirect Heating occurs when the material being heated does not come in direct contact with the combustion gas, such as a hot water boiler.

Iowacleanair.gov is the web site for the DNR's Air Quality Bureau with forms, assistance and guidance data.

MMcf equals 1,000,000 cubic feet. This unit of measure is most typically associated with the amount of natural gas combusted.

Material Balance or Mass Balance A process of estimating emissions using knowledge of the process, process rate, material used, and material properties.

Manually Operated Equipment means a machine or tool that is hand-held, such as a hand-held circular saw or compressed air chisel; a machine or tool for which the work piece is held or manipulated by hand, such as a bench grinder; a machine or tool for which the tool or bit is manipulated by hand, such as a lathe or drill press; any dust collection system which is part of such machine or tool; but not including any machine or tool for which the extent of manual operation is to control power to the machine or tool and not including any central dust collection system serving more than one machine or tool.

MACT or Maximum Achievable Control Technology are standards set under Title III of the 1990 Clean Air Act Amendments with an emphasis on control of hazardous air pollutants.

Maximum Hourly Design Rate is the highest amount of raw material processed or production achieved per hour based on manufacturer's data.

Maximum True Vapor Pressure means the equilibrium partial pressure of the material considering 1) for a material stored at ambient temperature, the maximum monthly average temperature as reported by the National Weather Service, or 2) for a material stored above or below the ambient temperature, the temperature equal to the highest calendar-month average of the material storage temperature.

National Ambient Air Quality Standards (NAAQS) are the ambient standards for the following six criteria pollutants: carbon monoxide, lead, nitrogen oxides, ozone, sulfur dioxide, and particulate matter with an aerodynamic diameter less than or equal to 10 micrometers or less than or equal to 2.5 micrometers.

National Emission Standards for Hazardous Air Pollutants (NESHAP) are health-based standards set under the 1970 Clean Air Act for beryllium, mercury, vinyl chloride, benzene, arsenic, asbestos, radon, radionuclides and other HAPs. Under the 1990 Act, roughly 170 source categories are identified for eventual MACT regulations. See MACT definition on this page above. The NESHAPs are published in 40 CFR Parts 61 and 63.

New Source Performance Standards (NSPS) are promulgated for criteria, hazardous, and other pollutant emissions from new, modified, or reconstructed sources that the U.S. EPA determines contribute significantly to air pollution. These are typically emission standards, but may be expressed in other forms such as concentration and opacity. The NSPS are published in 40 CFR Part 60.

Nitrogen Oxides (NOx) are a class of compounds that are respiratory irritants that react with volatile organic compounds (VOC's) in the presence of sunlight to form Ozone. NOx compounds are also precursors to acid rain. Motor vehicles, power plants, and other stationary combustion facilities emit large quantities of NOx.

North American Industrial Classification System (NAICS) A North American system for classifying industries by a six-digit code. This six-digit hierarchical structure allows greater coding flexibility than the four-digit structure of the SIC.

Opacity means the degree to which emissions reduce the transmission of light and obscure the view of an object in the background. Opacity can be measured by properly trained observers. The validity of such measurements has been well established in the courts, including the U.S. Supreme Court. DNR field inspectors often take opacity readings during inspections.

Operating Permits are permits required by Title V of the 1990 Act for major sources. Operating permits are for the facility as a whole and differ from construction permits, which are issued for individual release points.

Overall Control Efficiency is obtained by multiplying the capture efficiency by the control equipment's control efficiency to provide the overall control efficiency for reporting emissions.

Ozone (O3) is a colorless gas that damages lungs and can damage materials and vegetation. It is the primary constituent of smog, and is formed primarily when nitrogen oxides (NOx) and volatile organic compounds (VOCs) react in the presence of sunlight.

Particulate Matter of aerodynamic diameter less than or equal to 10 micrometers (PM10) is a measure of small solid matter suspended in the atmosphere. Small particles can penetrate deeply into the lung where they can cause respiratory problems. Emissions of PM-10 are significant from fugitive dust, power plants, commercial boilers, metallurgical industries, mineral industries, fires, and motor vehicles.

Particulate Matter of aerodynamic diameter less than or equal to 2.5 micrometers (PM2.5) is another measure of small solid matter suspended in the atmosphere. Primary PM-2.5 results largely from combustion of fossil fuels or biomass, although selected industrial processes can also be significant in some areas. The sources of PM-2.5 include, but are not limited to, gasoline and diesel exhaust, wood stoves and fireplaces, land clearing, wildland prescribed burning, and wild fires. Sources of primary particulate including fugitive emissions from paved and unpaved roads, dust from ore processing and refining, and to a lesser extent, crustal material from construction activities, agricultural tilling, wind erosion and other crustal sources are less important based on their relatively small contribution to ambient PM-2.5 concentrations. The condensable components are largely made up of semi-volatile organic compounds that condense at ambient temperature to form aerosol.

Release Point is the point where emissions enter the atmosphere such as stacks, vents and ventilation exhausts. The term release point is used interchangeably with emission point.

Reported Emissions are emissions estimates that are submitted to a regulatory agency. Emissions inventories are used for a variety of purposes such as planning pollution control programs, promoting compliance with laws and regulations, and conducting permit reviews.

SDS or Safety Data Sheets are an information source with details about chemical substances such as chemical composition and other environmental information. SDS can be a useful source of emissions information and are available for all chemical substances from the supplier of the material.

Source Classification Codes (SCCs) are codes defined by EPA that classify air emissions sources by individual processes and/or operations.

Stack Tests A test that measures the concentration of pollutants in the exhaust stack. Measurements are performed following procedures specified and developed by the US EPA and/or DNR. Such testing is required by DNR to be conducted by various stationary sources to determine compliance with applicable air emissions limits.

SCFM Standard cubic feet per minute. A measurement of exhaust rate from a release point.

Standard Industrial Classification (SIC) A United States government system for classifying industries by a four-digit code.

SLEIS State and Local Emissions Inventory System. SLEIS is the online emissions inventory reporting tool.

State Implementation Plan (SIP) is a state plan approved by EPA for the establishment, regulation, and enforcement of air pollution standards.

Stationary Source is any building, structure, facility or installation that emits or may emit any air pollutant subject to regulation under the Clean Air Act. It includes all pollutant-emitting activities which belong in the same major industrial grouping as identified by the first two digits in the facilities SIC code, are located on one or more contiguous or adjacent properties and are under common ownership or control. Mobile sources such as cars, trains, and forklifts are not regulated by DNR.

Sulfur Oxides (SOx) are a class of colorless, pungent gases that are respiratory irritants and precursors to acid rain. Sulfur oxides are emitted from various combustion or incineration sources, particularly from coal combustion.

Tertiary-Butyl Acetate (TBAC) is a pollutant common to surface coating operations that is neither a VOC nor a HAP. However, EPA still requires that TBAC emissions be reported on the emissions inventory as an "additional pollutant."

Threshold is a level of emissions that once reached, triggers requirements to obtain a permit or report emissions.

Transfer Efficiency is the percentage of sprayed material such as paint or solvent that is actually adhered to the intended surface.

Twelve-Month Rolling Period is a period of 12 consecutive months determined on a rolling basis.

Volatile Organic Compounds (VOCs) are organic compounds that contribute to ground-level ozone or smog formation. Ground level ozone is a strong lung oxidant. Large amounts of VOCs are emitted from fuel distribution, chemical manufacturing, motor vehicles, and a wide variety of industrial, commercial, and consumer solvent uses.

1000gal equals 1,000 gallons. This unit of measure is most typically associated with the amount of fuel oil or LPG combusted.

APPENDIX B: List of Criteria Pollutants, Chemicals Not Considered VOCs, and Hazardous Air Pollutants

Criteria Pollutants

$PM_{2.5}$..... Particulate Matter less than or equal to 2.5 micrometers in diameter
PM_{10} ..... Particulate Matter less than or equal to 10 micrometers in diameter
SO_2..... Sulfur Dioxide
NO_x ..... Nitrogen Oxides
VOC ..... Volatile Organic Compound
CO ..... Carbon Monoxide
Pb ..... Lead

Chemicals Not Considered Volatile Organic Compounds (VOCs) – from paragraphs 40 CFR 51.100 (s):

(1) This includes any such organic compound other than the following, which have been determined to have negligible photochemical reactivity: Methane; ethane; methylene chloride (dichloromethane); 1,1,1-trichloroethane (methyl chloroform); 1,1,2-trichloro-1,2,2-trifluoroethane (CFC-113); trichlorofluoromethane (CFC-11); dichlorodifluoromethane (CFC-12); chlorodifluoromethane (HCFC-22); trifluoromethane (HFC-23); 1,2-dichloro 1,1,2,2-tetrafluoroethane (CFC-114); chloropentafluoroethane (CFC-115); 1,1,1-trifluoro 2,2-dichloroethane (HCFC-123); 1,1,1,2-tetrafluoroethane (HFC-134a); 1,1-dichloro 1-fluoroethane (HCFC-141b); 1-chloro 1,1-difluoroethane (HCFC-142b); 2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124); pentafluoroethane (HFC-125); 1,1,2,2-tetrafluoroethane (HFC-134); 1,1,1-trifluoroethane (HFC-143a); 1,1-difluoroethane (HFC-152a); parachlorobenzotrifluoride (PCBTF); cyclic, branched, or linear completely methylated siloxanes; acetone; perchloroethylene (tetrachloroethylene); 3,3-dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca); 1,3-dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb); 1,1,1,2,3,4,4,5,5,5-decafluoropentane (HFC 43-10mee); difluoromethane (HFC-32); ethylfluoride (HFC-161); 1,1,1,3,3,3-hexafluoropropane (HFC-236fa); 1,1,2,2,3-pentafluoropropane (HFC-245ca); 1,1,2,3,3-pentafluoropropane (HFC-245ea); 1,1,1,2,3-pentafluoropropane (HFC-245eb); 1,1,1,3,3-pentafluoropropane (HFC-245fa); 1,1,1,2,3,3-hexafluoropropane (HFC-236ea); 1,1,1,3,3-pentafluorobutane (HFC-365mfc); chlorofluoromethane (HCFC-31); 1 chloro-1-fluoroethane (HCFC-151a); 1,2-dichloro-1,1,2-trifluoroethane (HCFC-123a); 1,1,1,2,2,3,3,4,4-nonafluoro-4-methoxy-butane ($C_4F_9OCH_3$ or HFE-7100); 2-(difluoromethoxymethyl)-1,1,1,2,3,3,3-heptafluoropropane ($(CF_3)_2CFCF_2OCH_3$); 1-ethoxy-1,1,2,2,3,3,4,4,4-nonafluorobutane ($C_4F_9OC_2H_5$ or HFE-7200); 2-(ethoxydifluoromethyl)-1,1,1,2,3,3,3-heptafluoropropane ($(CF_3)_2CFCF_2OC_2H_5$); methyl acetate; 1,1,1,2,2,3,3-heptafluoro-3-methoxy-propane (n-C3F7OCH3, HFE-7000); 3-ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-(trifluoromethyl) hexane (HFE-7500); 1,1,1,2,3,3,3-heptafluoropropane (HFC 227ea); methyl formate (HCOOCH3); 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-trifluoromethyl-pentane (HFE-7300); propylene carbonate; dimethyl carbonate; *trans*-1,3,3,3-tetrafluoropropene; HCF_2OCF_2H (HFE-134); $HCF_2OCF_2OCF_2H$ (HFE-236cal2); $HCF_2OCF_2CF_2OCF_2H$ (HFE-338pcc13); $HCF_2OCF_2OCF_2CF_2OCF_2H$ (H-Galden 1040x or H-Galden ZT 130 (or 150 or 180)); *trans* 1-chloro-3,3,3-trifluoroprop-1-ene; 2,3,3,3-tetrafluoropropene; 2-amino-2-methyl-1-propanol; t-butyl acetate; 1,1,2,2- Tetrafluoro -1-(2,2,2-trifluoroethoxy) ethane; and perfluorocarbon compounds which fall into these classes:
   (i) Cyclic, branched, or linear, completely fluorinated alkanes;
   (ii) Cyclic, branched, or linear, completely fluorinated ethers with no unsaturations;
   (iii) Cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations; and
   (iv) Sulfur containing perfluorocarbons with no unsaturations and with sulfur bonds only to carbon and fluorine.

The following chemicals have been added to the definition of chemicals not considered VOC:

- HFE-7300 - January 18, 2007
- Propylene carbonate (108-32-7) - January 21, 2009
- Dimethyl carbonate (616-38-6) - January 21, 2009
- HFO-1234ze - July 23, 2012HCF2OCF2H (HFE-134) - March 14, 2013
- HCF2OCF2OCF2H (HFE-236cal2) - March 14, 2013
- HCF2OCF2CF2OCF2H (HFE-338pcc13) - March 14, 2013
- HCF2OCF2OCF2CF2OCF2H (H-Galden 1040X or H-Galden ZT 130 (or 150 or 180)) - March 14, 2013

- Trans 1-chloro-3,3,3-trifluoroprop-1-ene (Solstice™ 1233zd(E)) - September 27, 2013
- 2,3,3,3-tetrafluoropropene (HFO-1234yf) - November 21, 2013
- 2-amino-2-methyl-1-propanol (AMP) - March 27, 2014
- 1,1,2,2-Tetrafluoro-1-(2,2,2-trifluoroethooxy) Ethane (HFE-347pcf2) - September 30, 2016
- cis-1,1,1,4,4,4-hexafluorobut-2-ene (HFO-1336mzz-Z) - January 28, 2019

Hazardous Air Pollutants – alphabetical listing

Note: 1-Bromopropane was added to the list of HAPs on 2/4/22.

CAS Number	Chemical Name
A	
75-07-0	Acetaldehyde
60-35-5	Acetamide
75-05-8	Acetonitrile
98-86-2	Acetophenone
53-96-3	2-Acetylaminofluorene
107-02-8	Acrolein
79-06-1	Acrylamide
79-10-7	Acrylic acid
107-13-1	Acrylonitrile
107-05-1	Allyl chloride
92-67-1	4-Aminobiphenyl
62-53-3	Aniline
90-04-0	o-Anisidine
0	Antimony Compounds
0	Arsenic Compounds
1332-21-4	Asbestos (friable)
B	
71-43-2	Benzene
92-87-5	Benzidine
98-07-7	Benzoic trichloride
100-44-7	Benzyl chloride
0	Beryllium Compounds
92-52-4	Biphenyl
111-44-4	Bis(2-chloroethyl) ether
542-88-1	Bis(chloromethyl) ether
75-25-2	Bromoform
74-83-9	Bromomethane (Methyl Bromide)
106-94-5	1-Bromopropane
106-99-0	1,3-Butadiene
106-88-7	1,2-Butylene oxide (1,2-Epoxybutane)
C	
0	Cadmium Compounds
156-62-7	Calcium cyanamide
133-06-2	Captan
63-25-2	Carbaryl
75-15-0	Carbon disulfide
56-23-5	Carbon tetrachloride
463-58-1	Carbonyl sulfide
120-80-9	Catechol
133-90-4	Chloramben
57-74-9	Chlordane
7782-50-5	Chlorine
79-11-8	Chloroacetic acid
532-27-4	2-Chloroacetophenone
108-90-7	Chlorobenzene
510-15-6	Chlorobenzilate
75-00-3	Chloroethane (Ethyl chloride)
67-66-3	Chloroform
74-87-3	Chloromethane (Methyl chloride)
107-30-2	Chloromethyl methyl ether
126-99-8	Chloroprene
0	Chromium Compounds
0	Cobalt Compounds
0	Coke Oven Emissions
1319-77-3	Cresol/Cresylic acid (isomers/mixtures)
108-39-4	m-Cresol
95-48-7	o-Cresol
106-44-5	p-Cresol
98-82-8	Cumene
0	Cyanide Compounds
D	
94-75-7	2,4-D, salts and esters
3547-04-4	DDE
117-81-7	Di(2-ethylhexyl) phthalate (DEHP)
334-88-3	Diazomethane
132-64-9	Dibenzofuran
96-12-8	1,2-Dibromo-3-chloropropane
106-93-4	1,2-Dibromoethane (Ethylene dibromide)
84-74-2	Dibutyl phthalate
106-46-7	1,4-Dichlorobenzene(p)
91-94-1	3,3'-Dichlorobenzidine
75-34-3	1,1-Dichloroethane (Ethylidene dichloride)
107-06-2	1,2-Dichloroethane (Ethylene dichloride)
75-09-2	Dichloromethane (Methylene chloride)
78-87-5	1,2-Dichloropropane (Propylene dichloride)
542-75-6	1,3-Dichloropropylene
62-73-7	Dichlorvos
111-42-2	Diethanolamine
121-69-7	N,N-Dimethylaniline
64-67-5	Diethyl sulfate
119-90-4	3,3'-Dimethoxybenzidine
60-11-7	4-Dimethylaminoazobenzene
119-93-7	3,3'-Dimethylbenzidine

CAS Number	Chemical Name
68-12-2	Dimethyl formamide
57-14-7	1,1-Dimethyl hydrazine
534-52-1	4,6-Dinitro-o-cresol
51-28-5	2,4-Dinitrophenol
121-14-2	2,4-Dinitrotoluene
E	
106-89-8	Epichlorohydrin
140-88-5	Ethyl acrylate
100-41-4	Ethylbenzene
107-21-1	Ethylene glycol
75-21-8	Ethylene oxide
96-45-7	Ethylene thiourea
151-56-4	Ethyleneimine
F	
0	Fine Mineral Fibers
50-00-0	Formaldehyde
G	
Glycol Ethers (See page 85)	
H	
76-44-8	Heptachlor
87-68-3	Hexachloro-1,3-butadiene
118-74-1	Hexachlorobenzene
77-47-4	Hexachlorocyclopentadiene
67-72-1	Hexachloroethane
822-06-0	Hexamethylene-1,6-diisocyanate
680-31-9	Hexamethylphosphoramide
110-54-3	Hexane
302-01-2	Hydrazine
7647-01-0	Hydrochloric acid
7664-39-3	Hydrogen fluoride
123-31-9	Hydroquinone
I	
78-59-1	Isophorone
L	
0	Lead Compounds
58-89-9	Lindane
M	
108-31-6	Maleic anhydride
0	Manganese Compounds
0	Mercury Compounds
67-56-1	Methanol
72-43-5	Methoxychlor
60-34-4	Methyl hydrazine
74-88-4	Methyl iodide
108-10-1	Methyl isobutyl ketone
624-83-9	Methyl isocyanate
80-62-6	Methyl methacrylate
1634-04-4	Methyl tert-butyl ether
101-14-4	4,4'-Methylenebis(2-chloroaniline)
101-68-8	Methylenebis (phenylisocyanate)
101-77-9	4,4'-Methylenedianiline
N	
91-20-3	Naphthalene
0	Nickel Compounds
98-95-3	Nitrobenzene
92-93-3	4-Nitrobiphenyl
100-02-7	4-Nitrophenol
79-46-9	2-Nitropropane
62-75-9	N-Nitrosodimethylamine
59-89-2	N-Nitrosomorpholine
684-93-5	N-Nitroso-N-methylurea
P	
56-38-2	Parathion
87-86-5	Pentachlorophenol
108-95-2	Phenol
106-50-3	p-Phenylenediamine
75-44-5	Phosgene
7803-51-2	Phosphine
7723-14-0	Phosphorus (yellow or white)
85-44-9	Phthalic anhydride
85-44-9	Phthalic anhydride
1336-36-3	Polychlorinated biphenyls
0	Polycyclic Organic Matter
1120-71-4	Propane sultone
123-38-6	Propionaldehyde
57-57-8	beta-Propiolactone
114-26-1	Propoxur
75-56-9	Propylene oxide
75-55-8	Propyleneimine
Q	
91-22-5	Quinoline
106-51-4	Quinone
82-68-8	Quintozene
R	
0	Radionuclides (including Radon)
S	
0	Selenium Compounds
100-42-5	Styrene

CAS Number	Chemical Name
96-09-3	Styrene oxide
T	
1746-01-6	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)
79-34-5	1,1,2,2-Tetrachloroethane
127-18-4	Tetrachloroethylene
7550-45-0	Titanium tetrachloride
108-88-3	Toluene
95-80-7	2,4-Toluene diamine (2,4-Diaminotoluene)
584-84-9	2,4-Toluene diisocyanate
95-53-4	o-Toluidine
800-135-2	Toxaphene
120-82-1	1,2,4-Trichlorobenzene
71-55-6	1,1,1-Trichloroethane
79-00-5	1,1,2-Trichloroethane
79-01-6	Trichloroethylene
95-95-4	2,4,5-Trichlorophenol
88-06-2	2,4,6-Trichlorophenol
121-44-8	Triethylamine
1582-09-8	Trifluralin
540-84-1	2,2,4-Trimethylpentane
U	
51-79-6	Urethane
V	
108-05-4	Vinyl acetate
593-60-2	Vinyl bromide
75-01-4	Vinyl chloride
75-35-4	Vinylidene chloride
X	
1330-20-7	Xylene (mixed isomers)
108-38-3	m-Xylene
95-47-6	o-Xylene
106-42-3	p-Xylene

Hazardous Air Pollutants - by CAS Number

Note: Methyl ethyl ketone (MEK) is no longer considered to be a HAP as of 12/19/05. 1-Bromopropane added to the list of HAPs on 2/4/22.

CAS Number	Chemical Name	CAS Number	Chemical Name
0	Antimony Compounds	75-01-4	Vinyl chloride
0	Arsenic Compounds	75-05-8	Acetonitrile
0	Beryllium Compounds	75-07-0	Acetaldehyde
0	Cadmium Compounds	75-09-2	Dichloromethane (Methylene chloride)
0	Chromium Compounds		
0	Cobalt Compounds	75-15-0	Carbon disulfide
0	Coke Oven Emissions	75-21-8	Ethylene oxide
0	Cyanide Compounds	75-25-2	Bromoform
0	Fine Mineral Fibers	75-34-3	1,1-Dichloroethane (Ethylidene dichloride)
0	Glycol Ethers (See page 85)		
0	Lead Compounds	75-35-4	Vinylidene chloride
0	Manganese Compounds	75-44-5	Phosgene
0	Mercury Compounds	75-55-8	Propyleneimine
0	Nickel Compounds	75-56-9	Propylene oxide
0	Polycyclic Organic Matter	76-44-8	Heptachlor
0	Radionuclides (including Radon)	77-47-4	Hexachlorocyclopentadiene
0	Selenium Compounds	77-78-1	Dimethyl sulfate
50-00-0	Formaldehyde	78-59-1	Isophorone
51-28-5	2,4-Dinitrophenol	78-87-5	1,2-Dichloropropane (Propylene dichloride)
51-79-6	Urethane		
53-96-3	2-Acetylaminofluorene	79-00-5	1,1,2-Trichloroethane
56-23-5	Carbon tetrachloride	79-01-6	Trichloroethylene
56-38-2	Parathion	79-06-1	Acrylamide
57-14-7	1,1-Dimethyl hydrazine	79-10-7	Acrylic acid
57-57-8	beta-Propiolactone	79-11-8	Chloroacetic acid
57-74-9	Chlordane	79-34-5	1,1,2,2-Tetrachloroethane
58-89-9	Lindane	79-44-7	Dimethylcarbamyl chloride
59-89-2	N-Nitrosomorpholine	79-46-9	2-Nitropropane
60-11-7	4-Dimethylaminoazobenzene	80-62-6	Methyl methacrylate
60-34-4	Methyl hydrazine	82-68-8	Quintozene
60-35-5	Acetamide	84-74-2	Dibutyl phthalate
62-53-3	Aniline	85-44-9	Phthalic anhydride
62-73-7	Dichlorvos	87-68-3	Hexachloro-1,3-butadiene
62-75-9	N-Nitrosodimethylamine	87-86-5	Pentachlorophenol
63-25-2	Carbaryl	88-06-2	2,4,6-Trichlorophenol
64-67-5	Diethyl sulfate	90-04-0	o-Anisidine
67-56-1	Methanol	91-20-3	Naphthalene
67-66-3	Chloroform	91-22-5	Quinoline
67-72-1	Hexachloroethane	91-94-1	3,3'-Dichlorobenzidine
68-12-2	Dimethyl formamide	92-52-4	Biphenyl
71-43-2	Benzene	92-67-1	4-Aminobiphenyl
71-55-6	1,1,1-Trichloroethane	92-87-5	Benzidine
72-43-5	Methoxychlor	92-93-3	4-Nitrobiphenyl
74-83-9	Bromomethane (Methyl Bromide)	94-75-7	2,4-D, salts and esters
74-87-3	Chloromethane (Methyl chloride)	95-47-6	o-Xylene
74-88-4	Methyl iodide	95-48-7	o-Cresol
75-00-3	Chloroethane (Ethyl chloride)	95-53-4	o-Toluidine

CAS Number	Chemical Name	CAS Number	Chemical Name
95-80-7	2,4-Toluene diamine (2,4-Diaminotoluene)	119-90-4	3,3'-Dimethoxybenzidine
		119-93-7	3,3'-Dimethylbenzidine
95-95-4	2,4,5-Trichlorophenol	120-82-1	1,2,4-Trichlorobenzene
96-09-3	Styrene oxide	121-14-2	2,4-Dinitrotoluene
96-12-8	1,2-Dibromo-3-chloropropane	121-44-8	Triethylamine
96-45-7	Ethylene thiourea	121-69-7	N,N-Dimethylaniline
98-07-7	Benzoic trichloride	122-66-7	1,2-Diphenylhydrazine
98-82-8	Cumene	123-31-9	Hydroquinone
98-86-2	Acetophenone	123-38-6	Propionaldehyde
98-95-3	Nitrobenzene	123-91-1	1,4-Dioxane
100-02-7	4-Nitrophenol	126-99-8	Chloroprene
100-41-4	Ethylbenzene	127-18-4	Tetrachloroethylene
100-42-5	Styrene	131-11-3	Dimethyl phthalate
100-44-7	Benzyl chloride	132-64-9	Dibenzofuran
101-14-4	4,4'-Methylenebis(2-chloroaniline)	133-06-2	Captan
		133-90-4	Chloramben
101-68-8	Methylenebis (phenylisocyanate)	140-88-5	Ethyl acrylate
101-77-9	4,4'-Methylenedianiline	151-56-4	Ethyleneimine
106-42-3	p-Xylene	156-62-7	Calcium cyanamide
106-44-5	p-Cresol	302-01-2	Hydrazine
106-46-7	1,4-Dichlorobenzene(p)	334-88-3	Diazomethane
106-50-3	p-Phenylenediamine	463-58-1	Carbonyl sulfide
106-51-4	Quinone	510-15-6	Chlorobenzilate
106-88-7	1,2-Butylene oxide (1,2-Epoxybutane)	532-27-4	2-Chloroacetophenone
		534-52-1	4,6-Dinitro-o-cresol
106-89-8	Epichlorohydrin	540-84-1	2,2,4-Trimethylpentane
106-93-4	1,2-Dibromoethane (Ethylene dibromide)	542-75-6	1,3-Dichloropropylene
		542-88-1	Bis(chloromethyl) ether
106-94-5	1-Bromopropane	584-84-9	2,4-Toluene diisocyanate
106-99-0	1,3-Butadiene	593-60-2	Vinyl bromide
107-02-8	Acrolein	624-83-9	Methyl isocyanate
107-05-1	Allyl chloride	680-31-9	Hexamethylphosphoramide
107-06-2	1,2-Dichloroethane (Ethylene dichloride)	684-93-5	N-Nitroso-N-methylurea
		822-06-0	Hexamethylene-1,6-diisocyanate
107-13-1	Acrylonitrile	1120-71-4	Propane sultone
107-21-1	Ethylene glycol	1319-77-3	Cresol/Cresylic acid (isomers and mixture)
107-30-2	Chloromethyl methyl ether		
108-05-4	Vinyl acetate	1330-20-7	Xylene (mixed isomers)
108-10-1	Methyl isobutyl ketone	1332-21-4	Asbestos (friable)
108-31-6	Maleic anhydride	1336-36-3	Polychlorinated biphenyls
108-38-3	m-Xylene	1582-09-8	Trifluralin
108-39-4	m-Cresol	1634-04-4	Methyl tert-butyl ether
108-88-3	Toluene	1746-01-6	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)
108-90-7	Chlorobenzene		
108-95-2	Phenol	3547-04-4	DDE
110-54-3	Hexane	7550-45-0	Titanium tetrachloride
111-42-2	Diethanolamine	7647-01-0	Hydrochloric acid
111-44-4	Bis(2-chloroethyl) ether	7664-39-3	Hydrogen fluoride
114-26-1	Propoxur	7723-14-0	Phosphorus (yellow or white)
117-81-7	Di(2-ethylhexyl) phthalate (DEHP)	7782-50-5	Chlorine
118-74-1	Hexachlorobenzene	7803-51-2	Phosphine

CAS Number	Chemical Name
8001-35-2	Toxaphene
120-80-9	Catechol

Glycol Ethers*

Chemical Name	CAS Number
Diethylene glycol dimethyl ether	111-96-6
Diethylene glycol monobutyl ether acetate	124-17-4
Diethylene glycol monobutyl ether	112-34-5
Diethylene glycol monoethyl ether acetate	112-15-2
Diethylene glycol monoethyl ether	111-90-0
Diethylene glycol monohexyl ether	112-59-4
Diethylene glycol monomethyl ether acetate	629-38-9
Diethylene glycol monomethyl ether	111-77-3
Ethylene glycol dibutyl ether	112-48-1
Ethylene glycol diethyl ether	629-14-1
Ethylene glycol dimethyl ether	110-71-4
Ethylene glycol monoacetate	542-59-6
Ethylene glycol monobutyl ether acetate	112-07-2
Ethylene glycol monoethyl ether acetate	111-15-9
Ethylene glycol monoethyl ether	110-80-5
Ethylene glycol monohexyl ether	112-25-4
Ethylene glycol monomethyl ether acetate	110-49-6
Ethylene glycol monomethyl ether	109-86-4
Ethylene glycol monooctyl ether	10020-43-6
Ethylene glycol monophenyl ether	122-99-6
Ethylene glycol monopropyl ether	2807-30-9
Triethylene glycol	112-27-6
Triethylene glycol dimethyl ether	112-49-2
Triethylene glycol monoethyl ether	112-50-5
Triethylene glycol monomethyl ether	112-35-6

*This is a partial list of common glycol ethers. A complete listing can be found on line at https://www3.epa.gov/ttn/atw/glycol2000.pdf

APPENDIX C: Iowa DNR Control Efficiency Guidance

Details

Facilities can control the amount of pollutants emitted to the atmosphere by installing air pollution control equipment. The level of control depends on various factors. These include: the type of equipment used; the design of the equipment; the process involved; temperature; air flow rates; raw materials; combustion products, etc.; as well as the pollutant(s) targeted for control. Control efficiency is contaminant specific.

DNR staff has prepared a general guidance document identifying typical control efficiencies achieved by different generic types of control equipment. The control efficiency values identified in the table represent single pieces of control equipment. Multiple pieces of control equipment in series should be evaluated on a case-by-case basis.

This control efficiency guidance document is used in reviewing emission inventories by comparing the facility's claimed control efficiency with the guidance document's value. If the facility claims higher control efficiency for a particular piece of equipment, DNR staff will request supporting information to substantiate the facility's claim. This supporting information would consist of test results either from a previous stack test, continuous emission monitoring, or from any other verifiable source of information.

The $PM_{2.5}$ control efficiency is currently assumed equal to the PM_{10} control efficiency due to a lack of documentation. If a facility has any questions regarding $PM_{2.5}$ control efficiency, please call the emissions inventory staff.

Control Efficiency Table

Control Device or Practice	Control Efficiency (%)						
	TSP	PM_{10}	SOx	NOx	VOC	CO	Pb
Wet Scrubber - high efficiency	note 1		note 2				
Wet Scrubber - med efficiency	note 1		note 2				
Wet Scrubber - low efficiency	note 1		note 2				
Gravity Collector	3[a]	--	--	--	--	--	2[a]
Centrifugal Collector (cyclone)-high efficiency*	95[c]	80[a]	--	--	--	--	65[a]
Centrifugal Collector (cyclone)-med efficiency*	75[c]	50[a]	--	--	--	--	40[a]
Centrifugal Collector (cyclone)-low efficiency*	35[c]	10[a]	--	--	--	--	8[a]
Electrostatic Precipitator-high efficiency**	95[a]	95[a]	--	--	--	--	75[a]
Electrostatic Precipitator-medium efficiency**	80[a]	80[a]	--	--	--	--	65[a]
Electrostatic Precipitator-low efficiency**	70[a]	70[a]	--	--	--	--	55[a]
Fabric Filter	99[a]	95[c]	--	--	--	--	80[a]
Catalytic Afterburner	--	--	--	--	95[c]	--	--
Direct Flame Afterburner	--	--	--	--	95[c]	--	--
Flaring	--	--	--	--	90[a]	--	--
Low NOx Burners	--	--	--	note 3	--	--	--
Staged Combustion	--	--	--	40[a]	--	--	--
Flue Gas Recirculation	--	--	--	50[a]	--	--	--
Reduced Combustion Air Preheat	--	--	--	note 4	--	--	--
Steam or Water Injection	--	--	--	65[a]	--	--	--
Low Excess Air Firing	--	--	--	30[a]	--	--	--
Fuel with low Nitrogen Content	--	--	--	50[a]	--	--	--
Sulfuric Acid Plant-Single Contact Process	--	--	50[a]	--	--	--	--
Sulfuric Acid Plant-Double Contact Process	--	--	95[a]	--	--	--	--
Vapor Recovery System (Condensers)	--	--	--	--	note 5	--	--
Activated Carbon Adsorption	--	--	note 6				--
Gas Absorption Column-packed	90[a]	90[a]	note 2				--
Gas Absorption Column-tray type	25[a]	25[a]	note 2				--
Spray Tower	20[a]	20[a]	note 2				--
Venturi Scrubber	90[a]	90[a]	note 2				--
Impingement Plate Scrubber	note 7		--	--	--	--	--
Mat or Panel Filter	90[c]	90[c]	--	--	--	--	--
Dust Suppression by Water Spray	40[a]	40[a,d]	--	--	--	--	--
Dust Suppression by Chemical or Wetting Agents	40[a]	40[a,d]	--	--	--	--	--
Catalytic Reduction	--	--	--	note 8	--	--	--
Wet Lime Slurry Scrubbing	--	--	85[c]	--	--	--	--
Multiple Cyclone w/o Fly Ash Reinjection	80[a]	80[a]	--	--	--	--	65[a]
Multiple Cyclone with Fly Ash Reinjection	50[a]	50[a]	--	--	--	--	40[a]
Water Curtain	50[c]	10[a]	--	--	--	--	--

[a]Control efficiency was taken from a literature review and developmental work by the Minnesota Pollution Control Agency
[b]Control efficiency was taken from AP-42
[c]Control efficiency was developed from the combination of a literature review and developmental work by the Minnesota Pollution Control Agency, AP-42, and staff judgment
[d]Unless a higher efficiency is required as an operating condition of a DNR construction permit

*****Low, medium, and high efficiency cyclones will be defined based on pressure drop. The ranges of pressure drops are as follows:

Low-efficiency cyclones	2-4 inches water
Medium-efficiency cyclones	4-7 inches water
High-efficiency cyclones	7-10 inches water

****** Low, medium, and high efficiency electrostatic precipitators (ESP) will be defined based on the specific collection area (SCA). The SCA is the total collector plate area divided by the gas volume flow rate. It is usually expressed in terms of square feet per 1000 acfm of gas flow. For example, the SCA of an ESP with a gas flow rate of 250,000 acfm and collection plate area of 100,000 square feet is:

$100{,}000\ ft^2 / 250{,}000\ acfm \times 0.001 = 400\ ft^2/thousand\ acfm$

The ranges of SCA for low, medium, and high efficiency ESPs are as follows:

Low-efficiency ESP	< 400
Medium-efficiency ESP	400 - 700
High-efficiency ESP	> 700

Typical control efficiencies were not assigned to all control devices because some efficiencies strongly depend on source specific parameters. In these instances, the table will refer to one of the notes listed below for additional information.

Note 1. Particulate control equipment represented by these classifications should be included in the other, more specific categories (i.e., venturi scrubbers or packed bed absorption columns).

Note 2. The achievable gaseous pollutant control efficiencies for these types of control equipment will depend on the pollutant solubility, the solvent used, the vapor-liquid contact time, and the contact area. These devices are normally designed to achieve a promulgated control efficiency rather than the maximum achievable reduction. Control efficiencies for these devices should be evaluated on a case-by-case basis.

Note 3. Low NOx burners (LNB) have been developed by many boiler and burner manufacturers for both new and retrofit applications. Low NOx burners limit NOx formation by controlling both the stoichiometric and temperature profiles of the combustion process. This control is achieved with design features that regulate the aerodynamic distribution and mixing of the fuel and air, yielding one or more of the following conditions:

1. Reduced O_2 in the primary combustion zone, which limits fuel NOx formation;
2. Reduced flame temperature, which limits thermal NOx formation; and
3. Reduced residence time at peak temperature, which limits thermal NOx formation.

The amount of NOx reduction achievable is dependent upon the combustion system and burner design, actual operating practices, and fuel characteristics. The amount of reduction should be based on the manufacturer's demonstration.

Note 4. The amount of NOx reduction achievable from reducing preheating of combustion air will vary according to the temperatures before and after the modification. Therefore, efficiencies for this process should be evaluated on a case-by-case basis.

Note 5. Control efficiencies for a particular condenser will vary for different VOC compounds and depends on both the partial pressure of the pollutant and the operating parameters of the condenser. Efficiencies should be evaluated on a case-by-case basis.

Note 6. Since the overall control efficiency will depend on source specific parameters such as the physical characteristics of the absorbent bed and gaseous stream, the temperature, and the choice of regeneration technique, efficiencies should be evaluated on a case-by-case basis.

Note 7. Depending on the application, control efficiencies may range from 25-99%. Efficiencies should be evaluated on a case-by-case basis.

Note 8. Generic classification; recommend specific technologies be addressed on an individual basis. Two widely used NOx control technologies include Selective Catalytic Reduction (SCR) and Selective Noncatalytic Reduction (SNCR). SCR can obtain reductions of 60-90%. Urea based SNCR can achieve reductions of 30-80% and ammonia based 55-85%.

APPENDIX D: Abbreviations, Conversion Factors, and Spray Painting Transfer Efficiencies

Abbreviations

ACFM	Actual cubic feet per minute
CAA	Clean Air Act
CAS	Chemical Abstract Service Registry number
CFR	Code of Federal Regulation
CHIEF	Clearinghouse for Inventories and Emission Factors
CO	Carbon Monoxide
DNR	Iowa Department of Natural Resources
gr./dscf	grains per dry standard cubic foot
HAP	Hazardous Air Pollutant
IAC	Iowa Administrative Code
lbs/hr	pounds per hour
lbs/MMBtu	pounds per million British thermal units
lbs/MMcf	pounds per million cubic feet
MACT	Maximum Achievable Control Technology
NAAQS	National Ambient Air Quality Standards
NAICS	North American Industrial Classification System
NESHAP	National Emission Standards for Hazardous Air Pollutants
NOx	Nitrogen Oxides
NSPS	New Source Performance Standards
NSR	New Source Review
˚F	degrees Fahrenheit
PM10	Particulate Matter less than or equal to 10 micrometers in diameter
PM2.5	Particulate Matter less than or equal to 2.5 micrometers in diameter
ppmv	parts per million by volume
SCC	Source Classification Code
SCFM	Standard cubic feet per minute
SDS	Safety Data Sheet
SIC	Standard Industrial Classification
SLEIS	State and Local Emissions Inventory System
SO2	Sulfur Dioxide
TPY	Tons per year
TSP	Total Suspended Particulates
USEPA	United States Environmental Protection Agency
VOCs	Volatile Organic Compounds

Conversion Factors*

**Additional conversion factors are located in AP-42, Appendix A.*

- 1,050 Btu per ft^3 (Natural Gas)
- 0.0905 MMBtu per gallon (Propane)
- 0.140 MMBtu per gallon (No.2 Fuel Oil)
- 0.140 MMBtu per gallon (Diesel Fuel)
- 1 pound is equal to 7,000 grains
- 1 ton is equal to 2,000 pounds
- 1 gallon is equal to 3.785 liters
- 1 gallon of water is equal to 8.345 pounds
- To convert ounces into pounds multiply by 0.0625
- 56 pounds per bushel (corn)
- 60 pounds per bushel (soybeans)
- To convert g/L to lbs/gal: lbs/gal = (g/L) x .008345
- To convert scfm to acfm at standard pressure: Acfm = (actual temp. (°F) + 460) x scfm (standard temp. (°F) + 460)
- standard temperature = 70 °F

Spray Painting Transfer Efficiencies

Transfer Efficiency as a function of Spraying Method and Sprayed

Method of Spraying	Flat Surface (%)	Table Leg Surface (%)	Bird Cage Surface (%)
Air atomized	50	15	10
Airless	75-80	10	10
Electrostatic:			
Disk	95	90-65	90-95
Airless	80	70	70
Air atomized	75	65	65

Source: Air Pollution Engineering Manual (1992), Table 2, pg. 362

APPENDIX E: SLEIS Completeness Checklist

SLEIS Completeness Checklist
Have you updated…

Facility Reports Screen
☐ The list of facility users
☐ Information in your user profile

Facility Button
☐ The company/owner name if applicable
☐ The emissions contact name and contact information
☐ The mailing address of the facility
☐ Your statewide company employee count

Release Points Button
☐ Stack characteristics to match the most recent construction permit issued

Control Devices Button
☐ The list of controlled pollutants

Unit Processes Button
☐ The list of release points venting emissions from the process

Process Emissions Button
☐ The annual throughput for each process
☐ The actual operating schedule
☐ PM-2.5 and Ammonia emissions where applicable

Report Attachments Button
☐ All safety data sheets, if applicable
☐ For paint booths, a list containing the amount of each paint and solvent used
☐ All calculations shown in full, including engineering estimates

Other Reminders
☐ Are your control efficiencies acceptable according to the control efficiency guidance document?
☐ Did you use the most recent emission factors available?