Emissions Inventory Guidance

January 23, 2020

Presented by
Oklahoma Department of Environmental Quality
Emissions Inventory Section
Contact Information

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  - Shelby Willeby  Shelby.Willeby@deq.ok.gov
  - Grant Loney  Grant.Loney@deq.ok.gov
Today’s Agenda

- Introduction - Carrie Schroeder (slides 1-36)
- Emissions Inventory (EI) Basics - Shelby Willeby (slides 37-106)
- Break
- Emissions Calculations - Grant Loney (slides 107-150)
- Break
- SLEIS QC and Common Mistakes - Michael Ketcham (slides 151-190)

Q&A scheduled after each presentation
Intro Presentation Objectives

- Emissions Inventory Introduction
- Air Programs - Tier II, Green House Gas Reporting (GHGR), Toxic Release Inventory (TRI)
- ODEQ Website Navigation
- SLEIS
- Invoicing, Ownership, and Responsible Officials
What is an Emissions Inventory?
What is an Emissions Inventory?

- A report of actual emissions of regulated pollutants during the previous year
- Provides a description to DEQ of your facility and its operations
Required to File an Inventory

- The owner or operator of any facility that is a source of Regulated Air Pollutants (RAP)
- Facilities with Individual Permits, or registered under a General Permit. *Facilities registered under a Permit by Rule need only report if they registered in 2019 (whether operating or not in 2019)*
- “Special Inventories” upon request by AQD Director
- Exception: Permit Exempt & De Minimis facilities are not required to file an inventory
Site Specific Questions

Remember Air Quality Rules Always Apply

https://www.deq.ok.gov/asd/rules-and-regulations/
Other Air Programs
Tier II Reporting


- Emergency Planning and Community Right-to-Know Act (EPCRA)
- Established to help communities plan for potential chemical emergencies
- Administered by ODEQ Land Protection Division: Due on March 1 of each year
- Information: 405-702-5100
Toxics Release Inventory (TRI) Program

https://www.epa.gov/toxics-release-inventory-tri-program

The TRI is a resource for learning about toxic chemical releases and pollution activities reported by industrial and federal facilities.
TRI Screening Tool

https://www.epa.gov/toxics-release-inventory-tri-program/tri-threshold-screening-tool
Greenhouse Gas Reporting


- Under the rule, suppliers of fossil fuels or industrial greenhouse gases (GHG), manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions are required to submit annual reports to EPA starting with the 2010 reporting year.

- Pollutants: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFC), perfluorocarbons (PFC), sulfur hexafluoride (SF₆), and other fluorinated gases including nitrogen trifluoride (NF₃) and hydrofluorinated ethers (HFE).
Greenhouse Gas Reporting

- GHGRP is a Federal requirement
- DEQ is not involved in the implementation or reporting of the Greenhouse Gas Inventory
- EPA Greenhouse Gas Reporting Program
- EPA Greenhouse Gas Applicability Tool
- EPA Electronic Greenhouse Gas Reporting Tool (e-GGRT)

www.epa.gov/ghgreporting
EPA’s GHG Reporting Program
https://www.epa.gov/ghgreporting/ghg-reporters

For GHG Reporters

In response to the FY2008 Consolidated Appropriations Act (PDF) (613 pp, 1.3MB, About PDF), (H.R. 2764; Public Law 110-161), EPA issued the Greenhouse Gas Reporting Rule (74 FR 50260) which requires reporting of greenhouse gas (GHG) data and other relevant information from large sources and suppliers in the United States.

The For GHG Reporters section provides information and resources for businesses and institutions that are or may be subject to reporting under the Greenhouse Gas Reporting Program (GHGRP). The pages in this section provide more detailed GHGRP information.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed Rules</td>
<td>Currently active regulatory proposals related to the GHGRP.</td>
</tr>
<tr>
<td>Resources by Subpart</td>
<td>Guidance and supporting materials arranged by industry.</td>
</tr>
<tr>
<td>Training and Testing Opportunities</td>
<td>Current training opportunities and archived training presentations.</td>
</tr>
</tbody>
</table>
EPA’s Applicability Tool

EPA’s e-GRTT

https://ghgreporting.epa.gov/ghg/login.do
Emissions Inventory Webpage Navigation

https://www.deq.ok.gov/air-quality-division/emissions-inventory/
SLEIS

State and Local Emissions Inventory Reporting Tool
What Is SLEIS?

- DEQ purchased and customized SLEIS from Windsor Solutions to replace Redbud
- SLEIS is currently used by several other states
- SLEIS is cross-browser compatible
- SLEIS can accept data through spreadsheet upload
- Companies can submit amendments through SLEIS
- SLEIS provides a streamlined process for DEQ to use in submitting data to the EPA

Welcome to the Oklahoma State and Local Emissions Inventory System (SLEIS), a web-based application that allows permitted facilities to compile and submit point source emissions inventory data in accordance with regulatory reporting.
New in SLEIS

- Spreadsheet upload
- SLEIS user roles
  - Viewer - can view report
  - Editor - can view, start, modify and edit data
  - Administrator - Can change users’ roles
  - Submitter - Can submit inventory, must be an RO
- Greater validation
- Batch Processing
Important SLEIS Differences

- All amendments are now done in SLEIS, we are no longer using Turn Around Documents (TADs)
- If you make an inventory submission in SLEIS and determine you need to change something, you must initiate an inventory amendment to make changes
Webinar Links from our Website

https://www.deq.ok.gov/air-quality-division/emissions-inventory/emissions-inventory-workshop/
Invoicing and Annual Operating Fees
Invoicing

Two years in arrears

- 2018 inventories submitted by April 1, 2019 - billed in 2020
- 2019 inventories submitted by April 1, 2020 - billed in 2021
- This allows the Emission Inventory Section ample time for quality control

The Title V operating fee was set at $32.30 per ton in 2008, and it is adjusted yearly based on the change in the annual Consumer Price Index

- The 2020 Title V fee is $39.86 per ton
- The minor source fee is fixed at $25.12 per ton
Pollutants can not be double billed

- We split your reported Total VOC into HAP and non-HAP VOC for billing
- Only bill for PM-10. (PM-2.5 is a subset of PM-10)

When calculating PBR annual operating fees, the last reported inventory emission amounts are used.
Invoice

- Invoices sent out July 1st
- Vital to have correct Responsible Official information
- A 100-882 must be signed and submitted to designate a Responsible Official
#100-882 Designation of Responsible Official

https://www.deq.ok.gov/air-quality-division/forms-public-participation/air-forms/

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To update the Main Facility Contact, add a consultant, or add an additional SLEIS user submit form 100-733
Ownership & Annual Operating Fee Liability

- Change of ownership - New owners assume liability for payment of the annual operating fees based on emission reported in years of operation prior to transfer of ownership (However purchase contracts can shift the liability to the previous owner)

- To change the ownership of a facility a Form 100-883 must be submitted
Change of Ownership

Responsibilities of the:

- **Transferor (Seller)**
  
  “The transferor shall notify the DEQ using a prescribed form **no later than 30 days** following the change in ownership.”

- **Transferee (Purchaser)**
  
  “The transfer of ownership of a stationary source or a facility is an administrative amendment that shall subject the new owner or operator to existing permit conditions &/or compliance schedules.”
#100-883 Administrative Change Notification (Transfer of Ownership)

https://www.deq.ok.gov/air-quality-division/forms-public-participation/air-forms/

**AIR QUALITY DIVISION**

**ADMINISTRATIVE CHANGE NOTIFICATION**
Request for Transfer and Administrative Amendment of Permit

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### FACILITY INFORMATION

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<thead>
<tr>
<th>Field</th>
<th>Current</th>
<th>New</th>
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<tbody>
<tr>
<td>Name</td>
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<tr>
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<tr>
<td>Zip</td>
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### UTM COORDINATES

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### INFORMATION UPDATE

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<tr>
<th>Field</th>
<th>Previous (Transfer)</th>
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<th>New (Transfers)</th>
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<tbody>
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<tr>
<td>Headquarters/Mailing Address</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>City</td>
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<td></td>
<td></td>
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<tr>
<td>State</td>
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</tr>
<tr>
<td>Zip</td>
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</tr>
</tbody>
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**OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY**

Air Quality Division
707 N Robinson, Suite 4100, P.O. Box 1677
Oklahoma City, Oklahoma 73101-1677

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Important Dates

- 2019 reports created in SLEIS by January 1
- Emission Inventories due April 1
- Deadline with approved 30 day extension - May 1
- Invoices mailed July 1
- Operating Fees due July 31
Resources & Help

- Sometimes the workshop is just a starter
- You can e-mail or call us
- You are welcome to come into our office
  - Schedule a time if you need one-on-one help
  - Bring your laptop, spreadsheets & other pertinent information
General Contact Information

- **Emission Inventory email:** aei@deq.ok.gov
- **Air Quality front desk:** 405-702-4100

Questions on air emission inventory, compliance & enforcement, permitting, rules
Questions?
Emission Inventory Basics

Shelby Willeby
Agenda

- Intro
- Company and Facility Pages
- Emission Unit Page
- Release Point Page
- Control Device Page
- Unit Process Page
- Flares
- Process Emission Page
What is an Emission Inventory?

- Detailed estimate of the amounts of regulated air pollutants released into the atmosphere
- Provides enough information to show:
  - Where and when emissions occurred
  - What processes produced emissions
  - Calculation methods for determining emissions
Note on First Inventories

- If a facility is submitting an Emissions Inventory for the first time, SLEIS will have no information populated for emission units, processes, or emissions
  - See permit or permit application for a list of emission units and information about them. * This might not have all units though*

- After the first inventory, most data are copied forward to the next year
  - Key exceptions: annual process rates, annual hours of operation, annual emission amounts

<table>
<thead>
<tr>
<th>Point</th>
<th>Source</th>
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<tr>
<td>E-1</td>
<td>25-hp Kohler CH730S engine</td>
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<tr>
<td>E-2</td>
<td>203-hp Caterpillar 3306TA</td>
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<tr>
<td></td>
<td>Produced Water Tank(s)</td>
</tr>
<tr>
<td></td>
<td>Fugitive Emissions</td>
</tr>
</tbody>
</table>
Company and Facility Data

- Largely unchanged from year to year, with a few things to watch out for
  - Make sure the appropriate Responsible Official has been designated
    - Form #100-882 is used for Responsible Official changes

- Make sure all change of ownership paperwork has been submitted to the DEQ before preparing emissions inventories
  - Form #100-883 is used for ownership changes
  - The new owner assumes responsibility for reporting, paying fees, and compliance schedules, unless specifically written into the purchase agreement
Welcome

Welcome to the Oklahoma DEQ State and Local Emissions Inventory System (SLEIS), a web-based application that allows permitted facilities to compile and submit point source emissions inventory data. SLEIS replaces Redbud, OKDEQ's previous web-based emissions reporting application. Companies may submit Inventory amendments through SLEIS at any time after notifying and receiving approval from OKDEQ.

Please Note
Minimum browser requirements for SLEIS are Chrome, Mozilla Firefox or Microsoft Edge.

Locked Accounts
SLEIS accounts will be locked after 5 unsuccessful attempts accessing SLEIS. Contact aer@deq.ok.gov or 405-702-4100 to reset your password.

SLEIS User Registration
Accounts have been created for all existing Responsible Officials (RO) and Main Facility Contacts (MFC). Access the login page and choose “Forgot Password?”. You will receive email instructions. New ROs should request a SLEIS user account by completing Form 109-882, Designation of Responsible Official/SLEIS User Registration Form. Other company representatives should complete Form 109-733, SLEIS User Registration Form. Mail or email the completed forms to the address indicated on the form. An email link to create your initial account password will be sent.

SLEIS Supporting Documentation
The following documents are provided as supporting materials that may be useful when reviewing an emissions inventory report.

- SLEIS Facility Application Guide - version 2.5
- SLEIS Code Tables (Excel Workbook)
- SLEIS File Import Specification - (Batch/Bulk Import) - version 2.5
- SLEIS File Import Specification - (Report/Import) - version 2.5
- Regulated Air Pollutants (RAFs)
- Emissions Inventory Frequently Asked Questions (FAQs)
- External Resources including NAICS, SIC, SCC and AP-42 Emission Factor searchable databases
- Guide to Determining Oil and Gas Facility Categories

Submit general questions and/or comments
## My Companies Page

![My Companies Page](image)

### My Companies Table

<table>
<thead>
<tr>
<th>Identifier</th>
<th>Name</th>
<th>Company Roles</th>
<th>Actions</th>
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<tbody>
<tr>
<td>3327</td>
<td>EMISSIONS INVENTORY TEST CO</td>
<td>Administrator, Editor, Submitter</td>
<td></td>
</tr>
<tr>
<td>4446</td>
<td>TEST - OK DEQ AQ COMPANY - C</td>
<td>Administrator, Editor, Submitter</td>
<td></td>
</tr>
<tr>
<td>3431</td>
<td>TESTCO - DEQ</td>
<td>Administrator, Editor, Submitter</td>
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</table>
## My Facilities Page

### TESTCO - DEQ Facilities

<table>
<thead>
<tr>
<th>Identifier</th>
<th>Name</th>
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<tr>
<td>20970</td>
<td>TEST - GENERIC COMPRESSOR STATION 1</td>
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<td></td>
<td></td>
</tr>
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<td>20971</td>
<td>TEST - GENERIC COMPRESSOR STATION 2</td>
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<td>20976</td>
<td>TEST - GENERIC POWER PLANT 1</td>
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<tr>
<td>20977</td>
<td>TEST - GENERIC POWER PLANT 2</td>
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</tr>
<tr>
<td>20978</td>
<td>TEST - GENERIC REFINERY</td>
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<tr>
<td>10023</td>
<td>TESTMHCAN</td>
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</tbody>
</table>
SLEIS Facility Home Page
Facility Tab

To update the facility or company name submit form 100-883
Facility Address Tab

To update the facility address email: aei@deq.ok.gov
Facility Location Tab

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
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<tbody>
<tr>
<td>Latitude (decimal degrees)</td>
<td>35.822</td>
</tr>
<tr>
<td>Longitude (decimal degrees)</td>
<td>-96.745</td>
</tr>
<tr>
<td>UTM X (meters)</td>
<td>703710.232219</td>
</tr>
<tr>
<td>UTM Y (meters)</td>
<td>3966552.837495</td>
</tr>
<tr>
<td>UTM Zone</td>
<td>14</td>
</tr>
<tr>
<td>Collection Method</td>
<td>028 - GPS with unspecified parameters</td>
</tr>
<tr>
<td>Data Collection Date</td>
<td>06-25-2018</td>
</tr>
<tr>
<td>Geographic Reference Point</td>
<td>103 - Boundary point for a facility or System (Facility boundary points can be singular, or part of a series of boundary points)</td>
</tr>
</tbody>
</table>
Facility Additional Information Tab

<table>
<thead>
<tr>
<th>General Facility Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facility</td>
</tr>
</tbody>
</table>

**Oil & Gas Facility Category:**
Oil/NG Well Site

**Permit Number(s):**
2018-1150-NOI

**API/US Well Number:**
3501725214, 3501725215

**SIC Number:**
1311

**TRI Identifier (ID):**
Oil and Gas Facility Category

- Oil/NG - Well Site
- Central Tank Battery
- Produced Water Injection Facility
- NG - Gathering Compressor Station
- NG - Treatment Without Compression
- NG Plant - Transmission Compressor Station
- NG - Underground Storage Facility
- Oil - Pipeline Breakout Facility/Truck Station
- Oil - Tank Farm
- Oil/NGL/Refined Petroleum - Pipeline Pump Station
- Oil Refinery
- Refined Petroleum - Product Terminal
- Oil/NG/NGL - Other
Oil and Gas Facility Category

- A guide to classifying oil and gas facility categories can be found on our website and on the SLEIS homepage
API Number

- Please provide all API numbers for your facility. API numbers are very important for improving the accuracy of our oil and gas emission submittal to the National Emission Inventory.

- All API numbers supplied by industry and many API numbers that we found on the OK Corporation Commission website are already loaded into SLEIS.
  - Please review the API numbers already loaded into SLEIS.

- To add new API numbers to SLEIS, please enter the API number as a string separated by commas with no spaces.
  - For Example: 35XXXXXXX,35XXXXXXX
Emission Unit
Emission Units
Emission Unit

- Physical object or group of objects that produces emissions

- Many Types
  - Engines, storage tanks, stock piles, paint booths, etc

- Each emission unit has one or more release points

- Report operating status for both the emission unit and the release point
# Emission Unit

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<thead>
<tr>
<th>Identifier:</th>
<th>162223</th>
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<tbody>
<tr>
<td>Type:</td>
<td>Reciprocating IC Engine</td>
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<tr>
<td>Description:</td>
<td>Compressor Engine</td>
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<tr>
<td>Status:</td>
<td>Operating</td>
</tr>
<tr>
<td>Design Capacity:</td>
<td>457 HORSEPOWER</td>
</tr>
<tr>
<td>Related Unit Processes:</td>
<td>285840 - Compressor Engine</td>
</tr>
</tbody>
</table>

**Comments:**
Design Capacity

- Maximum output a machine, tool, or other component can achieve under ideal conditions with unlimited resources
- Engines, process heaters, and flares have design capacities
Design Capacity

Redbud

➤ Design capacity was listed at the process level

SLEIS

➤ Design Capacity is listed at the emission unit level

➤ For instances where an emission unit had two or more processes that listed different design capacities in Redbud, no design capacity was loaded into SLEIS
Grouping Emission Units

- Some small sources of emissions should be logically grouped into one source
  - An individual emission unit may not have emissions above the reporting threshold but a group of that emission unit type might
  - For example 20 similar process heaters at a facility could be logically grouped together

- How to report grouped emission units
  - Include number of units being grouped in the name
  - Fugitive release point includes total length and width of all units and the average height
  - Process rates, operating hours, and design capacity should be reported as an average
  - Actual emissions determined by actual process rates of each unit, not average emissions
Release Point
Release Points
Release Point

- The point at which emissions are emitted to the atmosphere
- Can be either fugitive or stack
  - Stacks have a distinct point where emissions are emitted to the atmosphere
  - Fugitives are emitted over a wide area and do not have a distinct point where emissions are emitted
- Fugitive release point examples
  - Leaks from pressurized equipment
  - Stockpiles
  - Material handling that cannot be easily funneled into a stack or control device
Release Points

Redbud

- Release points were listed at each emission unit record
- A release point could only be associated with one emission unit

SLEIS

- Release Points are listed separately from the emission unit. At the unit process page the release point is associated with the appropriate process
- The same release point can be associated with multiple emission units and processes
Fugitive Release Point Fields

- **Fugitive Length**
  - The length of the fugitive release in the North-South direction

- **Fugitive Height**
  - The fugitive release height above ground level

- **Fugitive Width**
  - The width of the fugitive release in the East-West direction

- **Fugitive Angle**
  - The orientation angle for the area in degrees from North, measured positive in the clockwise direction. Should be between 0 and 179 inclusive
# Release Points

<table>
<thead>
<tr>
<th>Release Points</th>
</tr>
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<tbody>
<tr>
<td><strong>Identifier:</strong></td>
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<td><strong>Description:</strong></td>
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<tr>
<td><strong>Status:</strong></td>
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<tr>
<td><strong>Stack Height:</strong></td>
</tr>
<tr>
<td><strong>Stack Shape:</strong></td>
</tr>
<tr>
<td><strong>Stack Diameter:</strong></td>
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<tr>
<td><strong>Exit Gas Temp:</strong></td>
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<tr>
<td><strong>Exit Gas Flow Rate:</strong></td>
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<tr>
<td><strong>Exit Gas Velocity:</strong></td>
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<tr>
<td><strong>Related Unit Processes:</strong></td>
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<td><strong>Comments:</strong></td>
</tr>
</tbody>
</table>
Release Point Location Tab

### 2017 Emissions Report

**Release Points**

- Release Point
- Location
- Additional Information

- Release point utilizes facility coordinates?: Yes

### Location Details

- **Latitude (decimal degrees):** 35.822
- **Longitude (decimal degrees):** -96.745
- **UTM X (meters):** 703710.232210
- **UTM Y (meters):** 3906552.037490
- **UTM Zone:** 14
- **Datum:** North American 1983

### Collection Method

- **028 - GPS with unspecified parameters**

### Data Collection Date

- **06-25-2018**

### Geographic Reference Point

- **103 - Boundary point for a facility or System (Facility boundary points can be singular, or part of a series of boundary points)**

### Geodetic Reference System

- **003 - World Geodetic System of 1984**
Control Device
Control Devices
Control Device Definitions

▶ Control Device/Scenario
  ▶ The control system, abatement equipment, or approach applied to reduce emissions of the pollutant

▶ Capture Efficiency
  ▶ The percentage of air emission that is directed to the control equipment

▶ Control Efficiency
  ▶ The percentage by which a control device or technique reduces the emissions from a stationary source
## Control Device

### Control Devices

<table>
<thead>
<tr>
<th>Control Device</th>
<th>Additional Information</th>
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<tr>
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<tr>
<td>Description:</td>
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<td>Status:</td>
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<tr>
<td>Control Measure:</td>
<td>Condenser</td>
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</table>

**Controlled Pollutants:**
- 100414 (Ethylbenzene): 80.00%
- 108883 (Toluene): 80.00%
- 110543 (Hexane): 80.00%
- 1330207 (Xylenes (mixed isomers)): 80.00%
- 71432 (Benzene): 80.00%
- VOC (Total VOC): 80.00%

**Related Unit Processes:**
- 18513D - Glycol Dehydrator Reboiler and Still Vent, 311154 - Natural Gas Production - Glycol Dehydrator Reboiler Still Stack
Changes to Control Devices

Rebud

» Control Devices were listed at each emission record

SLEIS

» Control Devices are listed separately from the process and emissions

» At the Unit Process page the control device is associated with the appropriate process

» The same control device can be associated with multiple processes
Unit Processes
Unit Process
Emission Process

- Activity at an emission unit that produces emission

- Associated with a specific Source Classification Code (SCC)

- An emission unit can have multiple emission processes
  - An engine can have two processes if it burns both natural gas and diesel
  - Storage Tanks can have three processes working, breathing, and flashing losses
Reporting Fixed Roof Tanks

- Grouping Fixed-Roof Tanks
  - A group of fixed-roof tanks that share a common header can be reported as a single emission unit if the combined total of emissions is less than or equal to 6 tons.
  - If the combined total of emissions for the group of tanks is greater than 6 tons, the tanks must be reported separately.

- Reporting Fixed Roof Tanks
  - If emissions from the tank or group of tanks is greater than 6 tons then separate processes for working, breathing, and flashing losses need to be reported.
  - If emissions from the tank or group of tanks is less than 6 tons then only one process using the combined source classification code for working, breathing, and flashing losses need be reported.
## Unit Process

<table>
<thead>
<tr>
<th>Unit Process</th>
<th>Control Approach</th>
<th>Release Point Apportionment</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Identifier:</td>
<td>285840</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Emission Unit Identifier:**

162223 - Compressor Engine

**SCC:**

20200253
Internal Combustion Engines-Industrial-Natural Gas-4-cycle Rich Burn

**Description:**

Compressor Engine

**Last/Final Emissions Year:**

<table>
<thead>
<tr>
<th>Related Process Emission:</th>
<th>285840 - Compressor Engine</th>
</tr>
</thead>
</table>

**Comments:**
# Unit Process Control Approach Tab

<table>
<thead>
<tr>
<th>Unit Process</th>
<th>Control Approach</th>
<th>Release Point Apportionment</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Not Controlled:**
  - Yes

- **Control Approach Description:**
  - Control approach not specified. Assumes not controlled.
Unit Process Control Approach Tab
New Fields

- **Sequence**
  - Indicates the order by which control devices will be used to calculate overall control efficiency. Different control devices with identical sequence numbers will be processed in parallel. Different sequence values will be processed sequentially.

- **Uptime Percentage**
  - An estimate of the percentage of the reporting year that the overall control system was operating as designed.

- **Release Point Apportionment**
  - The average annual percent of an emissions process that is vented through a release point.
Capture Efficiency

Redbud

- The capture efficiency was listed at each emission record
- The capture efficiency could be different at each emission record

SLEIS

- The capture efficiency is listed on the Unit Process Control Approach page
- The capture efficiency is the same for all pollutants associated with a control device
Control Efficiency

Redbud

- The control efficiency was listed at each emission record

SLEIS

- The control efficiency for all pollutants are listed at the control device
- The control device is then associated to the process
- One control device may be associated to multiple processes
Unit Process Release Point Apportionment

Release Point Apportionment:
161616 - Compressor Engine Stack: 100%
Flares
Tank-Flare System

- Fugitive uncaptured VOC
  - Reported as one process for fugitive VOC
- Tank Fugitive Release Point
  - (100% Release Point Apportionment)

- Captured VOC routed to Flare

- Un-combusted VOC, combustion emissions, and pilot light emissions
  - Reported as one or two processes
- Vertical Release point
  - (100% Release Point Apportionment)

98% Capture

98% Control Efficiency
Flare Unit Process - One Process

- Report one process
  - This process represents NOx and CO emissions due to combustion of the captured gas stream, un-combusted VOC emissions, and pilot light NOx, CO, and VOC emissions
  - Instead of using the actual throughput that enters the flare over the reporting year, multiply the maximum flare design capacity by the hours of operation to get the yearly throughput for the flare
    - This is a conservative estimate so pilot light emissions are assumed to be accounted for and do not need to be calculated and reported under a different process
  - The NOx and CO emissions are accounted for using either AP-42 or TCEQ emission factors and multiplying by the maximum annual heat input
  - Un-combusted VOC emissions can be estimated by taking a percentage (2% if the flare combustion destruction efficiency is 98%) of the captured emissions from the emission units that route to the flare
Flare Unit Process - 2 Processes

- One process for NOX, CO, and VOC combustion emissions associated with the pilot light
- The other process is for un-combusted VOC emissions and NOx and CO emissions associated with the combustion of the gas stream
- The NOx and CO emissions are accounted for using either AP-42 or TCEQ emission factors and multiplying by the maximum annual heat input
- Un-combusted VOC emissions can be estimated by taking a percentage (2% if the flare combustion destruction efficiency is 98%) of the captured emissions from the emission units that route to the flare
Process Emissions
Process Emissions
What Pollutants Need to be Reported

» Permit

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Natural Gas</th>
<th></th>
<th>#2 Fuel Oil</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Factor</td>
<td>Emissions</td>
<td>Factor</td>
</tr>
<tr>
<td></td>
<td>Lb/MMBtu</td>
<td>Lb/hr</td>
<td>TPY</td>
</tr>
<tr>
<td>NO\textsubscript{2}</td>
<td>0.035</td>
<td>0.72</td>
<td>3.16</td>
</tr>
<tr>
<td>CO</td>
<td>0.037</td>
<td>0.75</td>
<td>3.28</td>
</tr>
<tr>
<td>VOC</td>
<td>0.018</td>
<td>0.33</td>
<td>1.43</td>
</tr>
<tr>
<td>SO\textsubscript{2}</td>
<td>0.001</td>
<td>0.02</td>
<td>0.08</td>
</tr>
<tr>
<td>PM</td>
<td>0.010</td>
<td>0.20</td>
<td>0.89</td>
</tr>
</tbody>
</table>

» List of Regulated Air Pollutants


» EPA Webfire Database

» https://cfpub.epa.gov/webfire/

Welcome to WebFIRE

WebFIRE is the EPA's online database that contains emissions factors for criteria and hazardous air pollutants (HAP) for industrial and non-industrial processes and multiple reports submitted to the EPA using the Compliance and Emissions Data Reporting Interface (CEDRI) in response to regulatory requirements under Parts 60 and 63 of Title 40 of the U.S. Code of Federal Regulations (CFR). WebFIRE also allows you to register to receive periodic email notifications when reports are submitted to WebFIRE and to prepare batch downloads of WebFIRE emissions and facility information.

- Search for emissions factors
- Search for reports
- Register for email notifications
- Download WebFIRE data in bulk
### Process Emissions

**Process Identifier:**
311151 - Natural Gas - 4-cycle Lean Burn

**Emission Unit Identifier:**
183127 - Compressor Engine NO 391 - Caterpillar 3516B LE, 1380 hp

**SCC:**
20200254
Internal Combustion Engines-Industrial-Natural Gas-4-cycle Lean Burn

**Process is Reported?**
No

**Throughput:**

**Throughput Unit of Measure:**

**Throughput Type:**

**Throughput Material:**

**Process is CBI?**
No

### Supplemental Calculation Parameters:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Contribution Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Ash</td>
<td>% Sulfur</td>
</tr>
<tr>
<td>% Moisture</td>
<td>% Silt</td>
</tr>
<tr>
<td>Mean Vehicle Speed</td>
<td>Mean Vehicle Weight</td>
</tr>
<tr>
<td>Precipitation days</td>
<td>Silt Loading</td>
</tr>
<tr>
<td>% VOC</td>
<td>Density (lbs/unit)</td>
</tr>
<tr>
<td>Yeast Hours</td>
<td>Spiking Time</td>
</tr>
<tr>
<td>% Final Yeast</td>
<td>Horiz. Area</td>
</tr>
<tr>
<td>Sulfur Content (gr/100 ft³)</td>
<td>% Carbon</td>
</tr>
<tr>
<td>Molar Calcium/Sulfur ratio</td>
<td>% Chlorine in fuel</td>
</tr>
</tbody>
</table>

**Comments:**
none
Supplemental Calculation Parameters

- Fuel Heat
  - The heat content of fuel, which is the amount of heat released during combustion

- % Ash, % Sulfur, % Moisture, % Silt, Mean Vehicle Speed, Mean Vehicle Weight, Precipitation Days, Silt Loading, % VOC, Density, % Initial Yeast, Yeast Hours, % Final Yeast, Spiking Time, Horiz. Area, Wind Speed, Drop Height, Sulfur Content, % Carbon, % Chlorine, Molar Calcium/Sulfur Ratio
Fuel Heat Content

Redbud
- Fuel heat content was listed at the process level.
- The options for units included HP, MW, and MMBTU/HR

SLEIS
- Fuel heat content is listed with the supplement calculation parameters on the process emissions page.
- The fuel heat content units can not be chosen and are assumed to be the units of the MMBTU/throughput.
Reporting Threshold

If emissions for the process are below the reporting threshold of .1 tons, uncheck the box. Unchecking the box will zero out any emissions, hours of operation, and throughput data at the process.
If you would like to keep information about a process confidential, select the ‘Process is CBI’ checkbox. No throughput or emission factor data will be submitted to EPA or made available to the public if the checkbox is selected.
Throughput

### Process Emissions

<table>
<thead>
<tr>
<th>Process</th>
<th>Operations</th>
<th>Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Identifier:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>311337 - Building A Diesel Engine Test Cell 1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Emission Unit Identifier:**

185295 - Building A Diesel Engine Test Cell 1

**SCC:**

20300101

**Internal Combustion Engines-Commercial/Institutional-Distillate Oil (Diesel)-Reciprocating**

**Process is Reported?:**

- [ ] Uncheck this box if there are no reportable emissions for the reporting year

**Annual Throughput:**

8

**Throughput Combination:** *(Select to populate Throughput Unit of Measure, Type, and Material)*

- E3CAL - 1000 CALLONS | I - Input | 57 - Distillate Oil (Diesel)
- E3CAL - 1000 CALLONS | I - Input | 57 - Distillate Oil (Diesel)
- E6BTU - MILLION BTUS | I - Input | 142 - Heat
- HP-HR - HORSEPOWER-HOURS | O - Output | 959 - Energy

**Throughput Type:**

- I - Input
## Hours of Operation

<table>
<thead>
<tr>
<th>Process Emissions</th>
<th>Process</th>
<th>Operations</th>
<th>Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Days/Week</td>
<td>7.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Hours/Day</td>
<td>24.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Weeks/Year</td>
<td>52.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual Hours/Year</td>
<td>8760.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seasonal Operations</td>
<td>December-February</td>
<td>March-May</td>
<td>June-August</td>
</tr>
<tr>
<td></td>
<td>25.0 %</td>
<td>25.0 %</td>
<td>25.0 %</td>
</tr>
</tbody>
</table>
Calculating Emissions
Emission Factor

- An emission factor is a representative value that attempts to relate the quantity of a pollutant release with an activity associated with the release of that pollutant.

- SLEIS has 3 subtypes emission factor:
  - No Control Emission factor
  - Pre-Control Emission Factor
  - Post Control Emission Factor
Calculation Methods with Emission Factors

- Industry Publication
  - No EF, No Control EF, pre-Control EF, post-Control EF
- Mass Balance
  - No EF, pre-Control EF, post-Control EF
- Manufacturer Test Data With OK DEQ Approval
  - No Control EF, pre-Control EF, post-Control EF
- Stack Test - US EPA Reference Method
  - No Control EF, pre-Control EF, post-Control EF
- US EPA Documents incl. AP-42 & Webfire
  - No EF, No Control EF, pre-Control EF, post-Control EF
- OK DEQ Approved Method
  - No EF, No Control EF, pre-Control EF, post-Control EF
Calculation Methods without Emission Factors

- Continuous Emission Monitoring System (CEMS)
- Portable Electrochemical Analyzer (PEA) Tests
- Speciation Profile
- AMINECalc
- E&P TANKS
- US EPA TANKS 4.09
- ProMax
- Vasquez-Beggs Equation
# Emissions Tab

![Emissions Tab Image](image-url)

## Process Emissions

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Emis. Factor (Lbs/Unit)</th>
<th>Emis. Factor UOM</th>
<th>Calculation Method</th>
<th>Estimated Emis. (Tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOC</td>
<td>2.4</td>
<td></td>
<td>ESCAL</td>
<td></td>
</tr>
</tbody>
</table>

### Emission Data Fields

1. **Pollutant Code**
2. **Calculation Method**
3. **Emission Factor (Lbs/Unit)**
4. **Emission Factor Unit**
5. **Estimated Emissions (Tons)**
6. **Comment**
Auto-Calculation
Auto-Calculation

![2019 Emissions Report](image)

**2019 Emissions Report**

<table>
<thead>
<tr>
<th>Pollutant Code</th>
<th>Calculation Method</th>
<th>Emission Factor Unit</th>
<th>Estimated Emissions (Tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>8.0 - US EPA Documents incl. AP-42 &amp; WebFIRE (no EF)</td>
<td>EGI73 - MILLION CUBIC FEET</td>
<td>5.0</td>
</tr>
<tr>
<td>VOC</td>
<td>8.2 - US EPA Documents incl. AP-42 &amp; WebFIRE (pre-Control EF)</td>
<td>EGI73 - MILLION CUBIC FEET</td>
<td>2.75</td>
</tr>
</tbody>
</table>

**Pollutant Code:**
- CO - Total CO
- VOC - Total VOC

**Emission Factor (Lbs/Unit):**
- 5.0
- 2.75

**Comment:**
- None provided.
Emissions With Associated Control Device

![Process Emissions Table]

- **Pollutant**: CO
  - Emis. Factor (Lbs/Unit): 3.51
  - Emis. Factor UOM: E6BTU
  - Calculation Method: 8.2 - USEPA EF (pre-control EF)
  - Estimated Emissions (Tons): 30.7476

- **Pollutant**: SO2
  - Emis. Factor (Lbs/Unit): 0.000588
  - Emis. Factor UOM: E6BTU
  - Calculation Method: 8.2 - USEPA EF (pre-control EF)
  - Estimated Emissions (Tons): 0.021462

Note: Calculation Method: 8.2 - USEPA EF (pre-control EF)

Comment: Overall Control Efficiency (%): 70%
Summary

- Review data loaded from Redbud as the applications have very different data structures
  - Control devices, release points, design capacity, fuel heat content, etc.

- When creating new records is best to progress from left to right to avoid later validation and linking issues
  - Facility - Release Point - Control Device - Emission Unit - Unit Process - Process Emissions

- The SLEIS homepage and emission inventory website have additional resources to aid in creating your inventory
Questions?
Emissions Calculations

Grant Loney, Environmental Programs Specialist
Outline

- Overview of General Equation
- Calculation Methods available in SLEIS
- Emission Factors in SLEIS
- Example calculations
  - Calculation of CO, NOx, and Benzene from an Emergency Engine
  - Calculation of Total VOC and Formaldehyde from a Compressor Engine
  - Calculation of PM-10 and PM-2.5 from Grain Receiving
  - Calculation of PM-10 and PM-2.5 from a Limestone Conveyor
  - Calculation of Hexavalent Chromium from Shielded Metal Arc Welding
  - Calculation of Total VOC and Xylenes from a Paint Booth
  - Calculation of Total VOC from a Tank-Flare system
General Equation

\[ A \times EF = E \]

A is Activity Rate
EF is Emission Factor
E is calculated Emissions

All three have units!
Overview of General Equation

\[ A \times EF = E \]

**A** is Activity Rate

Activity Rate refers to the amount of the activity that occurs in a given year that is associated with emissions.

Examples include:

- Million standard cubic feet of natural gas burned by an engine
- Vehicle miles travelled on a dirt road
- Barrels of hydrocarbon in a storage tank
- Gallons of paint used in a spray booth
- Tons of rock crushed
- And many more…
Overview of General Equation

\[ A \times EF = E \]

**EF is Emission Factor**

Use the most accurate Emission Factor available to you!

**Calculation Methods**

- Continuous Emission Monitoring System (CEMS)
- Stack Test - US EPA Reference Method
- Stack Test, Similar Unit - US EPA RM
- Manufacture Test Data
- ProMax
- US EPA TANKS 4.09d
- Mass Balance
- US EPA Documents (AP 42, Webfire, etc.)
Overview of General Equation

\[ A \times EF = E \]

- Calculated Emissions will always be reported in units of tons.

- The correct Emission Factor and a little bit of unit analysis will help you get from the units of the Activity Rate to tons of emissions.
Helpful Documents and Links

- DEQ Permitting Advice Documents
  https://www.deq.ok.gov/air-quality-division/air-permits/permit-guidance/

- DEQ Reporting Guidance and FAQs
  https://www.deq.ok.gov/air-quality-division/emissions-inventory/reporting-guidance/

- EPA Webfire
  https://cfpub.epa.gov/webfire/

- EPA SCC Search
  https://ofmpub.epa.gov/sccwebservice/sccsearch/

- Your Permit/Permit Application
SLEIS Calculation Methods

- More Calculation Methods than there were previously. Some are familiar, some are new.
- Stack tests now require stack test date!
- New attribute of calculation methods.
  - No EF
  - No Control EF
  - Pre-Control EF
  - Post-Control EF
Emission Factors in SLEIS

- All emission factors in SLEIS **MUST** be in units of pounds/unit.
  - Pounds/MMBTU
  - Pounds/MMSCF
  - Pounds/ton
  - Pounds/gallon
  - Grams/horsepower-hour

  **Pounds/hp-hr = (grams/hp-hr) / 453.592**
Emergency Engine

- Activity Information
- Source Classification Code: 20200102
- Process Material: Diesel Fuel
- Process Rate: 500 gallons
- Annual Hours of Operation: 50 hours
- Design Capacity (if applicable): 400 hp
- Fuel Data (if applicable): 140 MMBTU/1,000 gal
- Control Scenario (if applicable): none
Emergency Engine

- Relevant Emission Factors
  - Carbon Monoxide (CO): \(1.3 \times 10^2\) Lb per 1000 gallons = 130 pounds/1,000 gal
  - Nitrogen Oxides (NOx): \(6.04 \times 10^2\) Lb per 1000 gallons = 604 pounds/1,000 gal
  - Benzene: \(9.33 \times 10^{-4}\) Lb per Million BTUs = 0.000933 pounds/MMBTU

Emergency Engine

Carbon Monoxide Calculation

Process Rate (i.e. throughput)  Emission Factor  Convert to tons

500 gallons  130 pounds  1 ton

1,000 gallons  2,000 pounds

= 0.033 tons
Emergency Engine

NOx Calculation

500 gallons = 604 pounds = 1 ton = 0.151 tons

1,000 gallons = 2,000 pounds
Emergency Engine

**Benzene Calculation**

Fuel Data
(i.e. fuel heat content)

- 500 gallons = 140 MMBTU = 0.000933 pounds = 1 ton
- 1,000 gallons = 1 MMBTU = 2,000 pounds

0.000033 tons

Reporting Threshold
Activity Information

- SCC: 20200254
- Process Material: Natural Gas
- Annual Process Rate: 115 MMscf
- Annual Hours of Operation: 8,760 hours
- Design Capacity: 1,380 hp
- Fuel Data: 1,020 MMBtu/MMscf
- Control Scenario: Oxidation Catalyst (100% capture, 50% control)
Compressor Engine

- Total VOC-Potential EF Problems
  - Emission Factor for Total VOC obtained from a Stack Test using Method 25A
    - Methods 18 and 25A are known to not detect formaldehyde, which is a VOC. Because of this you must add a formaldehyde emission factor to the factor generated by the stack test when calculating Total VOC.
    - Total VOC factor from Stack Test: 0.15 grams/horsepower-hour
    - Formaldehyde factor from Manufacturer data: 0.44 g/hp-hr

Don’t forget the control scenario, or to convert EF to pounds/hp-hr!
Compressor Engine

- Formaldehyde emission factor from Manufacturer data: 0.44 g/hp-hr
- Control scenario: 100% capture, 50% control
- Formaldehyde emission factor with control: 
  \[0.44 \text{ g/hp-hr} \times (1 - (100\% \times 50\%)) = 0.22 \text{ g/hp-hr}\]
- Combined emission factor for Total VOC: 
  \[0.15 + 0.22 = 0.37 \text{ g/hp-hr}\]
- Formaldehyde emission factor used in SLEIS: 
  \[
  \frac{0.22 \text{ g/hp-hr}}{453.592 \text{ g/pound}} = 0.000485 \text{ pounds/hp-hr}
  \]
- Total VOC emission factor used in SLEIS: 
  \[
  \frac{0.37 \text{ g/hp-hr}}{453.592 \text{ g/pound}} = 0.0008157 \text{ pounds/hp-hr}
  \]
Compressor Engine

1380 hp  8,760 hours  0.000485 pounds  1 ton  =  2.932 tons formaldehyde

1 hp-hr  2000 pounds

1380 hp  8,760 hours  0.0008157 pounds  1 ton  =  4.93 tons Total VOC

1 hp-hr  2000 pounds

*Remember, as with all VOC HAPs, formaldehyde should be reported individually, AND as part of Total VOC.
Grain Receiving

Activity Information

- SCC: 30200552
- Process Material: Grain
- Annual Process Rate: 260,816 tons
- Hours of Operation: 932 hours
- Control Scenario: Baghouse (100% capture, 90% control)
Grain Receiving

- How to find the AP-42 Emission Factor for Grain Receiving from a Hopper Truck

AP 42, Fifth Edition Compilation of Air Pollutant Emissions Factors, Volume 1: Stationary Point and Area Sources

Chapter | Title
--- | ---
Cover page and Table of Contents | Cover page, detailed Table of Contents, Publications in Series, Insertion Instructions, and Key Word Index (PDF) (20 pp, 128 K, About PDF). This is current through the Fifth Edition, Supplement C of AP 42. For sections and chapters added after November 1997, see the chapter web pages below.
Chapter 7 | Liquid Storage Tanks
Chapter 8 | Inorganic Chemical Industry
Chapter 9 | Food and Agricultural Industries
Chapter 10 | Wood Products Industry

Grain Receiving

- How to find the AP-42 Emission Factor for Grain Receiving from a Hopper Truck

[Links to EPA website for AP-42 information]

Grain Receiving

- How to find the AP-42 Emission Factor for Grain Receiving from a Hopper Truck

PM-10 EF: 0.0078 lbs/ton
PM-2.5 EF: 0.0013 lbs/ton

Grain Receiving

260,816 tons | 0.0078 pounds | 1 ton
1 ton | 2,000 pounds

1.017 tons PM-10

260,816 tons | 0.0013 pounds | 1 ton
1 ton | 2,000 pounds

0.1695 tons PM-2.5

We’re not done yet! Don’t forget to apply the Control Scenario!
Grain Receiving

Uncontrolled PM-10 Emissions = 1.017 tons
Uncontrolled PM-2.5 Emission = 0.1695 tons
Control Scenario: 100% Capture; 90% Control

Reportable PM-10 Emissions: $1.017 \times (1 - (100\% \times 90\%)) = 1.017 \times 0.1 = 0.102$ tons

Reportable PM-2.5 Emissions: $0.1695 \times (1 - (100\% \times 90\%)) = 0.1695 \times 0.1 = 0.017$ tons
## Grain Receiving

### 2019 Emissions Facility Inventory

#### Control Devices

<table>
<thead>
<tr>
<th>Control Device</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identifier:</td>
<td>151670</td>
</tr>
<tr>
<td>Description:</td>
<td>Baghouse</td>
</tr>
<tr>
<td>Status:</td>
<td>OP - Operating</td>
</tr>
<tr>
<td>Status Date:</td>
<td></td>
</tr>
<tr>
<td>Control Measure:</td>
<td>127 - Fabric Filter / Baghouse</td>
</tr>
</tbody>
</table>

**Controlled Pollutants:**

- **PM10-FRI**: 90.00 %
  - PM-10 (All Particulate Matter <10 microns)

**Related Unit Processes:**

- 185777 - Grain Receiving, 311717 - Grain Receiving

**Comments:**
Grain Receiving

2019 Emissions Report

Facility Inventory
- Facility
- Release Points
- Control Devices
- Emission Units
- Unit Processes

Emissions
- Process Emissions
- Report Attachments

More Actions
- Download Template
- Import Data
- Validate Report
- Initiate Submission
- Print Report
# Grain Receiving

## Unit Processes

<table>
<thead>
<tr>
<th>Control Approach</th>
<th>Release Point Apportionment</th>
<th>Additional Information</th>
</tr>
</thead>
</table>

### Not Controlled?:

- [ ]

### Control Approach Description:

Baghouse

### Control Devices

<table>
<thead>
<tr>
<th>Control Device</th>
<th>Sequence</th>
<th>Capture (%)</th>
<th>Uptime (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>151570 - Baghouse</td>
<td>1</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

## Emissions

- [ ] Download Template
- [ ] Import Data

## More Actions

- [ ] Validate Report
- [ ] Initiate Submission
- [ ] Print Report
Grain Receiving
Grain Receiving

Process Emissions

<table>
<thead>
<tr>
<th>Process</th>
<th>Operations</th>
<th>Emissions</th>
</tr>
</thead>
</table>

Process Identifier:
311717 - Grain Receiving

Emission Unit Identifier:
185777 - Grain Receiving

SCC:
30200552

Industrial Processes-Food and Agriculture-Feed and Grain Terminal Elevators-Unloading (Receiving) from Hopper Trucks

Process is Reported?:
- Uncheck this box if there are no reportable emissions for the reporting year

Annual Throughput:
260816

Throughput Combination: (Select to populate Throughput Unit of Measure, Type, and Material)
- TON - TONS
- O - Output
- 133 - Grain

In Process
### Grain Receiving

#### Process Emissions

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PM10-PRI</td>
<td>0.0078</td>
<td>TON</td>
<td>10.2 - OK DEQ Approved Method (pre-Control EF)</td>
<td>0.1017182399999999</td>
</tr>
</tbody>
</table>

**Pollutant Code:** PM10-PRI - PM-10 (All Particulate Matter <10 microns)

**Emission Factor (Lbs/Unit):** 0.0078

**Estimated Emissions (Tons):** 0.1017182399999999

**Comment:** EF from AP-42 Table 9.9.1-1

**Annual Throughput:**

260816

**Throughput Combination:** (Select to populate Throughput Unit of Measure, Type, and Material)

TON - TONS | O - Output | 133 - Grain
Limestone Conveyor

Activity Information

- SCC: 30510105
- Process Material: Limestone
- Annual Process Rate: 5,261,305 tons
- Hours of Operation: 6,782 hours
- Control Scenario: Dust Suppression
Limestone Conveyor

- Relevant Emission Factors
  - PM-10: 0.000046 pounds/ton
  - PM-2.5: 0.000013 pounds/ton
- Factors from AP-42 11.19.2
- Both of these are Controlled Factors
  - Do I need to apply my Control Scenario?
  - What is the correct calculation method to select?
Limestone Conveyor

\[
\begin{array}{ccc}
5,261,305 \text{ tons} & 0.000046 \text{ pounds} & 1 \text{ ton} & 0.121 \text{ tons PM-10} \\
1 \text{ ton} & 2,000 \text{ pounds} \\
\end{array}
\]

\[
\begin{array}{ccc}
5,261,305 \text{ tons} & 0.000013 \text{ pounds} & 1 \text{ ton} & 0.034 \text{ tons PM-2.5} \\
1 \text{ ton} & 2,000 \text{ pounds} \\
\end{array}
\]
Notes About PM

PM-2.5 is a subset of PM-10. This means:

1. PM-10 will ALWAYS be greater than or equal to PM-2.5
2. If PM-2.5 is reported, PM-10 MUST also be reported.
Shielded Metal Arc Welding

Activity Information

- SCC: 30905120
- Process Material: Shielded Metal Arc Welding Electrode E316
- Annual Process Rate: 27,000 pounds
- Hours of Operation: 1820 hours
- Control Scenario: Uncontrolled
Shielded Metal Arc Welding

- Relevant Emission Factors
  - Chromium VI: 0.332 lbs/1,000 lbs

AP 42, Fifth Edition Compilation of Air Pollutant Emissions Factors, Volume 1: Stationary Point and Area Sources

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover page</td>
<td>Cover page, detailed Table of Contents, Publications in Series, Insertion Instructions, and Key Word Index (PDF) (26 pp, 128 K, about PDF), This is current through the Fifth Edition, Supplement C of AP 42. For sections and chapters added after November 1997, see the chapter web pages below.</td>
</tr>
<tr>
<td>Chapter 11</td>
<td>Mineral Products Industry</td>
</tr>
<tr>
<td>Chapter 12</td>
<td>Metallurgical Industry</td>
</tr>
<tr>
<td>Chapter 13</td>
<td>Miscellaneous Sources</td>
</tr>
</tbody>
</table>

Note: Report Chromium or Chromium VI. Do not report both!
Shielded Metal Arc Welding

27,000 pounds + 0.332 pounds + 1 ton = 0.004 tons Chromium VI

1,000 pounds + 2,000 pounds
Paint Booth

Activity Information:

- Source Classification Code: 40200101
- Process Material: ZINC CLAD Epoxy Primer
- Process Rate: 800 gallons
- Hours Process Occurred: 2,080 hours
- Control Scenario (if applicable): none
# Paint Booth

## SECTION 1 — PRODUCT AND COMPANY IDENTIFICATION

<table>
<thead>
<tr>
<th>PRODUCT NUMBER</th>
<th>B89V100</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRODUCT NAME</td>
<td>ZINC CLAD® III HS Organic Zinc-Rich Epoxy Primer (Part B), Hardener</td>
</tr>
<tr>
<td>MANUFACTURER’S NAME</td>
<td>THE SHERWIN-WILLIAMS COMPANY</td>
</tr>
<tr>
<td></td>
<td>101 Prospect Avenue N.W.</td>
</tr>
<tr>
<td></td>
<td>Cleveland, OH 44115</td>
</tr>
</tbody>
</table>

## SECTION 2 — COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>% by Weight</th>
<th>CAS Number</th>
<th>Ingredient</th>
<th>Units</th>
<th>Vapor Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>100-41-4</td>
<td>Ethylbenzene</td>
<td></td>
<td>7.1 mm</td>
</tr>
<tr>
<td>12</td>
<td>1330-20-7</td>
<td>Xylene</td>
<td></td>
<td>5.0 mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>% by Weight</th>
<th>CAS Number</th>
<th>Ingredient</th>
<th>Units</th>
<th>Vapor Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>PRODUCT WEIGHT</th>
<th>7.85 lb/gal</th>
<th>940 g/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECIFIC GRAVITY</td>
<td>0.94</td>
<td></td>
</tr>
<tr>
<td>BOILING POINT</td>
<td>174 - 300 °F</td>
<td></td>
</tr>
<tr>
<td>MELTING POINT</td>
<td>Not Available</td>
<td></td>
</tr>
<tr>
<td>VOLATILE VOLUME</td>
<td>68%</td>
<td></td>
</tr>
<tr>
<td>EVAPORATION RATE</td>
<td>Slower than ether</td>
<td></td>
</tr>
<tr>
<td>VAPOR DENSITY</td>
<td>Heavier than air</td>
<td></td>
</tr>
<tr>
<td>SOLUBILITY IN WATER</td>
<td>N.A.</td>
<td></td>
</tr>
<tr>
<td>VOLATILE ORGANIC COMPOUNDS (VOC Theoretical - As Packaged)</td>
<td>4.73 lb/gal / 567 g/l</td>
<td>Emitted VOC</td>
</tr>
</tbody>
</table>
Paint Booth

800 gallons 4.73 pounds 1 ton = 1.892 tons Total VOC
1 gallon 2,000 pounds

800 gallons 7.85 pounds 0.12 pounds 1 ton = 0.377 tons Xylenes
1 gallon 1 pound 2,000 pounds

Product Weight Percent Xylenes
Tank-Flare System

- Process simulation software or AP-42 Chapter 7 can be used to calculate uncontrolled VOC emissions from a tank.
  - Assume process simulation has been run and indicates 100 tons of VOC emissions, if the system has no controls.
  - Vapor collection system has 98% capture efficiency.
  - Flare has a 98% control efficiency for VOC.
Tank-Flare System

2 tons fugitive VOC

98% Capture
100 tons of VOC without controls

98 tons routed to flare

1.96 tons uncombusted VOC

98% Control Efficiency

98 tons x (100% - 98%) = 1.96 tons

100 tons x (100% - 98%) = 2 tons
Questions?

▶ Ask now or contact us at:
  ▶ aei@deq.ok.gov - common inbox for Emissions Inventory Section
  ▶ (405) 702-4100 - Air Quality Front Desk
SLEIS Data Validation & Quality Control (QC)

Michael Ketcham, Environmental Programs Specialist
SLEIS Data Validation
Data Validation Within SLEIS

• SLEIS has some data validation built into the application.
  • Takes place on individual pages as you save & a final validation before you can submit
• When 2018 data was loaded, all reports were sent through the final validation process to see what issues came up.
• Some issues are due to differences between SLEIS & the previous data structure. These will have to be addressed before you can submit your 2019 report.
<table>
<thead>
<tr>
<th>Error</th>
<th># of hits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Emission Operations Actual Hours must be within 90%-110% of calculated total</td>
<td>14920</td>
</tr>
<tr>
<td>Process Emission Emission Factor Unit is required</td>
<td>11678</td>
</tr>
<tr>
<td>Process Emission Emission Factor is required</td>
<td>11678</td>
</tr>
<tr>
<td>Unit Process Control Device efficiency must not exceed 100% within a given sequence.</td>
<td>7199</td>
</tr>
<tr>
<td>The Release Point Stack Diameter, Flow Rate and/or Velocity are invalid.</td>
<td>6483</td>
</tr>
<tr>
<td>Process Emission Stack Test Date is required</td>
<td>4893</td>
</tr>
<tr>
<td>Control Device Pollutant Reduction Efficiency must be &gt;= 5 and &lt;= 99.99</td>
<td>3233</td>
</tr>
<tr>
<td>Process Emission Operations Actual Hours is required</td>
<td>2703</td>
</tr>
<tr>
<td>Control Device Pollutant Reduction Efficiency is required</td>
<td>2733</td>
</tr>
<tr>
<td>Process Emission Operations Average Days Per Week is required</td>
<td>1581</td>
</tr>
<tr>
<td>Process Emission Operations Average Hours/Day is required</td>
<td>1578</td>
</tr>
<tr>
<td>Process Emission Operations Average Weeks/Year is required</td>
<td>1551</td>
</tr>
<tr>
<td>Release Point Exit Gas Flow Rate or Exit Gas Velocity is required</td>
<td>1348</td>
</tr>
</tbody>
</table>
Validation Hits Breakdown

- Release Points: 11%
- Control Devices: 8%
- Unit Processes: 10%
- Process Emissions: 71%
Release Point Issues

6483
The Release Point Stack Diameter, Flow Rate and/or Velocity are invalid.

1348
Release Point Exit Gas Flow Rate or Exit Gas Velocity is required
The Release Point Stack Diameter, Flow Rate and/or Velocity are invalid

• SLEIS validates the calculation for flow rate or velocity based on entered information.
  • Redbud did not validate these & DEQ QC didn’t heavily focus on these.
• Many of these are likely historical inaccuracies that need to be corrected in 2019.
• SLEIS will auto-calculate as you fill in; you can overwrite these but they must pass validation.
Release Point Exit Gas Flow Rate or Exit Gas Velocity is required

- One or both of these must be reported; can not be 0.
- SLEIS will auto-calculate these based off of entered release point parameters.
Control Device Issues

Control Device Pollutant Reduction Efficiency must be $\geq 5$ and $\leq 99.99$

Control Device Pollutant Reduction Efficiency is required
Control Devices

• Control devices are now a unique object in SLEIS
  • Previously, these were reported at the pollutant level
• Because of this, control devices were created in SLEIS based upon how they were previously reported in Redbud
  • Control devices were created for each process to ensure that all controlled emissions were associated with a control device.
• In reality, your facility likely has multiple processes leading to one control device.
The newly created control devices will need cleaned up to match what is actually present at your facility

- These will be critical validation errors that must be fixed before submission
- To clean up, pollutants may need moved to appropriate control devices & excess control devices can be set to Permanently Shutdown
Control Device Pollutant Reduction Efficiency must be $\geq 5\%$ and $\leq 99.99\%$

- Control devices were often reported incompletely in Redbud with incorrect/missing efficiencies
- These must be reported within the $5\%$-$99.99\%$ range
  - The pollutants can be removed from the control device or moved to another control device if they shouldn’t be associated with that device
Control Device Pollutant Reduction Efficiency is required

• Similar to the previous issue; these are instances where no efficiency was reported

• It was previously acceptable that if the factor included the control efficiency, then no efficiency needed to be reported. That is not the case with SLEIS though. An efficiency must always be reported

• SLEIS will not save the page without an efficiency reported
Unit Process Issues

Unit Process Control Device efficiency must not exceed 100% within a given sequence.
Unit Process Control Device efficiency must not exceed 100% within a given sequence

- This issue deals with control devices but is found on the Unit process page
- As seen earlier, control devices are now a stand-alone piece of equipment
- Control devices can now be set in sequence
  - This issue occurs when control devices are in sequence & their efficiencies add to >100%
  - If this were the case there would be no emissions; totally controlled
- Again, control devices will need cleaning up due to data migration
Unit Process Control Device efficiency must not exceed 100% within a given sequence (cont.)
Process Emissions Issues

1. Process Emission Operations Actual Hours must be within 90%-110% of calculated total
2. Process Emission Operations Actual Hours is required
3. Process Emission Operations Average Days Per Week is required
4. Process Emission Operations Average Hours/Day is required
5. Process Emission Operations Average Weeks/Year is required
6. Process Emission Emission Factor Unit is required
7. Process Emission Emission Factor is required
8. Process Emission Stack Test Date is required
Process Emission Operations Actual Hours must be within 90%-110% of calculated total

• This is by far the most numerous issue
• SLEIS validates that average days/week, hours/day, & weeks/year calculate to match reported actual hours/year
  • SLEIS will auto-fill the actual hours/year based on inputs
    • You can overwrite this but it must still pass validation
• You will not be able to save the process emissions information until the validation is satisfied
Process Emission Operations Requirements

- Process Emission Operations Actual Hours is required
- Process Emission Operations Average Days Per Week is required
- Process Emission Operations Average Hours/Day is required
- Process Emission Operations Average Weeks/Year is required
Process Emission Operations Requirements (cont.)

- All 4 of these are related, they often occur together
- Must be reported; as mentioned earlier SLEIS will use entered values to calculate Actual Hours/Year
  - Again, you can overwrite this but still must be within the 90%-110% of calculated total
- If the process had no hours, uncheck the “Process Is Reported?” box
Process Emission Operations Requirements (cont.)

**2019 Emissions Report**

**Process Emissions**

<table>
<thead>
<tr>
<th>Process</th>
<th>Operations</th>
<th>Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Identifier:</td>
<td>310580 - Natural Gas - General</td>
<td></td>
</tr>
<tr>
<td>Emission Unit Identifier:</td>
<td>184727 - CO2 Plant EUG-3</td>
<td></td>
</tr>
<tr>
<td>SCC:</td>
<td>39000699</td>
<td></td>
</tr>
<tr>
<td>Industrial Processes-In-process Fuel Use-Natural Gas-General</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

? Process is Reported?:

- Uncheck this box if there are no reportable emissions for the reporting year
Process Emission Emission Factor Unit is required & Process Emission Emission Factor is required

- These two have the exact same number of hits because they occur in tandem
- Emission factors & units are required for certain calculation methods
- Emission factors & units are carried forward, so there will be some cleanup from when data was migrated into SLEIS
  - Also some issues from changes to requirements for different calculation methods
  - You will not be able to save the emissions page until these are corrected
### Pollutant: VOC

<table>
<thead>
<tr>
<th>Pollutant Code:</th>
<th>Calculation Method:</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOC - Total VOC</td>
<td>7.0 - Manufacturer Test Data with OK DEQ Approval (no Control EF)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Emission Factor (Lbs/Unit):</th>
<th>Calculation Method:</th>
</tr>
</thead>
<tbody>
<tr>
<td>E3GAL</td>
<td>7.0 - Manufacturer Test Data with OK DEQ Approval (no Control EF)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Emission Factor Unit:</th>
<th>Calculation Method:</th>
</tr>
</thead>
<tbody>
<tr>
<td>E3GAL - 1000 GALLONS</td>
<td>7.0 - Manufacturer Test Data with OK DEQ Approval (no Control EF)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Estimated Emissions (Tons):</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Comment:</th>
</tr>
</thead>
</table>

### Pollutant: VOC

<table>
<thead>
<tr>
<th>Pollutant Code:</th>
<th>Calculation Method:</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOC - Total VOC</td>
<td>54.0 - US EPA TANKS 4.09</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Emission Factor (Lbs/Unit):</th>
<th>Calculation Method:</th>
</tr>
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<td>E3GAL</td>
<td>54.0 - US EPA TANKS 4.09</td>
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<th>Emission Factor Unit:</th>
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</tr>
</thead>
<tbody>
<tr>
<td>E3GAL - 1000 GALLONS</td>
<td>54.0 - US EPA TANKS 4.09</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Estimated Emissions (Tons):</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Comment:</th>
</tr>
</thead>
</table>
Process Emission Stack Test Date is required

- This is a new field in SLEIS that did not previously exist
- When using a stack test emission factor, you must report the stack test date
  - You will not be able to save the process emissions page until this is done
Quality Control (QC) by DEQ
Emissions Inventory Section
Significant change in emissions from previous reporting year

- Often, we see emissions at an emission unit increase or decrease significantly without any significant changes in throughput or operating time
  - If you have excess emissions, then report them in your emission inventory
- We email companies to verify that the emissions are accurate and if so to explain the change in emissions
  - Typos are often encountered in this check
- Providing a detailed note helps us validate these situations!
“DEQ Approved Method”

• “DEQ Approved Method” should only be selected if no other calculation method is applicable

• A comment should be added to instances where “DEQ Approved Method” is chosen

• Remember, you have to get DEQ approval before selecting this method!
HAPs & Total VOC

- Volatile Organic Compounds (VOCs) are organic compounds that contain carbon and react in the presence of sunlight with NOx to form ozone.

- Hazardous Air Pollutants (HAPs) are compounds that have been included on EPA’s list of 187 pollutants that can have a detrimental effect on humans and the environment.
  - Many HAPs are also VOCs.
  - Both HAPs and Total VOC must be reported.
  - You will not be double billed.
HAPs & Total VOC (cont.)

- Total VOC amount should be greater than or equal to the total of the individual HAPs
Inconsistent Status

• If an emission unit is Operating...
  • Annual process rate & annual operating hours cannot be 0
• If an emission unit is Temporarily/Permanently Shutdown...
  • Annual throughput, actual hours/year, & estimated emissions must all be 0
• If the equipment ran more than 0 hours at any point in the year status must be Operating!!
Inconsistent Status (cont.)

- **Status Date**
  - “When the emission unit/release point/control device status was last set. The status date is not a required field when the status is operating. If the emission unit operated at all during the current calendar year then the emission unit needs to be reported, and the status date for the temporarily or permanently shutdown designation will be January 1st of the next calendar year. For example an emission unit that stops operating in June of 2018 will report a status date of January 1, 2019 in the 2019 emission inventory.”

- **Last/Final Emissions Year**
  - “The last/final year that this process will ever be reported. If the process operated at all during the current calendar year then the process needs to be reported, and the last inventory year will be the next calendar year. For example a process that stops operating in June of 2018 will have a 2019 last inventory year.”
Reporting the same throughput, annual hours, & emissions as the previous year

• For most emission units the throughput, annual hours, & emissions should vary from year to year
  • Emissions may be quite similar but not exact
• Some emission units like emergency engines that are tested on a regular schedule may have the same values
Produced Water Tank Emissions

- Permits may not reference produced water tanks
- If VOC emissions are greater than 0.1 tons, the produced water emissions must be reported
- To calculate produced water emissions:
  - The volume of produced water can be entered into the TANKS program as if it were condensate/crude oil
  - 1% of the resultant value can be utilized as the produce water emissions
New/Existing Equipment

- Your inventory should be an accurate reflection of the equipment at your facility
- Be sure to add new equipment when appropriate
  - New equipment should be created from scratch
  - Do not convert an existing emission unit to a new piece of equipment; equipment is tracked historically
Amendments
How do I amend my inventory?

• Amendments are now done in SLEIS
  • Can be requested at anytime during the year
  • Inventories from 2013-2018 are loaded into SLEIS

• SLEIS roles still apply
  • Must be Editor or Submitter to request amendment
  • Must be Submitter to submit
How do I amend my inventory? (cont.)

- On each report year page, click the “Request Amendment” button on the right.
- Please include reason for amendment, if you are adding previously unreported equipment & if the amendment stems from an enforcement case/inspector.
  - Equipment should have the same unique identifier in each year, DEQ staff will have to correct this.
- If granted, you will receive an email & can then make any needed changes and resubmit the report.
How do I amend my inventory? (cont.)
Your inventory is important!!

- Missing or incorrect release point data leads to errors in geographical location of emissions and impacts photochemical modeling and health risk assessments.
- Missing or incorrect hours and season percentages lead to errors in temporal distribution of emissions.
- Errors in SCCs and SICs impact control strategy development and attainment plans.
- Missing or incorrect control equipment data impacts rule development.
- Good data leads to effective air quality regulation!
Questions?

• Contact us at:
  • aei@deq.ok.gov
  • (405) 702-4100