Class II

Air Quality Operating Permit

Guidance Document

Guide for completing the application for a Class II Air Quality Operating Permit

NDEP

Nevada Division of Environmental Protection
Bureau of Air Pollution Control
901 South Stewart Street, Suite 4001
Carson City, NV 89701
(775) 687-9349

Our goal is to achieve and maintain levels of air quality that will protect human health, prevent injury to plant and animal life, prevent damage to property, and preserve the scenic, historical, and aesthetic treasures of the state

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ACRONYMS AND ABBREVIATIONS

ACFM	Actual Cubic Feet per Minute
AQOP	Air Quality Operating Permit
BAPC	Bureau of Air Pollution Control
BAQP	Bureau of Air Quality Planning
BPM	Best Practical Methods
CAA	Clean Air Act
CFR	Code of Federal Regulations
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Greenhouse Gases (Carbon Dioxide Equivalent)
DSCFM	Dry Standard Cubic Feet per Minute
EF	Emission Factor
EPA	Environmental Protection Agency
FIN	Facility Identification Number
GHG	Greenhouse Gas
HA	Hydrographic Area (Basin)
HAP	Hazardous Air Pollutant
hp	Horsepower
hr	Hour
H_2S	Hydrogen Sulfide
H_2SO_4	Sulfuric Acid Mist
IA	Insignificant Activity
ID	Identification Number
kW	Kilowatt
L x W x H	Length x Width x Height
lb	Pound
MMBtu	Million British Thermal Units
N/A	Not Applicable
NAC	Nevada Administrative Code
NAD 83	North American Datum of 1983
NESHAP	National Emission Standards for Hazardous Air Pollutants
NDEP	Nevada Division of Environmental Protection
NO_2	Nitrogen Dioxide
N_2O	Nitrous Oxide
NO_X	Oxides of Nitrogen
NRS	Nevada Revised Statutes
NSPS	New Source Performance Standards
ODS	Official Date of Submittal
O_3	Ozone
OP	Other Pollutant
Pb	Lead
PM	Particulate Matter
PM_{10}	Particulate Matter with an Aerodynamic Diameter Less Than or Equal to 10 Micrometers
$PM_{2.5}$	Particulate Matter with an Aerodynamic Diameter Less Than or Equal to 2.5 Micrometers
PSI(A)	Pounds per Square Inch (Absolute)
PTE	Potential to Emit
RICE	Reciprocating Internal Combustion Engine
RO	Responsible Official
SCC	Source Classification Code
SCF	Standard Cubic Feet
SIC	Standard Industrial Classification
SF_6	Sulphur Hexafluoride
SO_2	Sulfur Dioxide
TBD	To Be Determined
USC	United States Code
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
VOC	Volatile Organic Compounds

INTRODUCTION

This document is a detailed guide for completing an application for a Class II Air Quality Operating Permit. Each major section (numbered) covers one of the multiple forms and supplemental documents will be submitted as part of the application. This application requires precise calculations and extensive details about the facility.

For additional questions, call (775) 687-9349.

This guide and its associated application forms can be found on the Nevada Division of Environmental Protection (NDEP) website.

3 THINGS TO REMEMBER BEFORE STARTING

1. When filling out the application, complete every blank or explain why no information is provided. Specify "N/A" (Not Applicable) if necessary. **Any field left blank may cause the application to be deemed incomplete.** If the application is deemed incomplete, the application fee will be returned to the facility along with a checklist that shows which items are missing.
2. The Bureau of Air Pollution Control (BAPC) treats **permit renewals** just like new applications. Make sure to submit all pages of the application and all required attachments.
3. If **revising a permit**, the facility must still submit all pages of the application and attachments. However, only include emission unit forms for new or revised units.

WHAT IS A CLASS II SOURCE?

On November 2, 2016, the definition of a Class II source of air pollutants changed under NAC 445B.037. The new definition set thresholds based on a source's potential to emit (PTE) — the maximum capacity of a facility to emit a regulated air pollutant under its physical and operational design.[1]

The facility is a Class II source if its PTE is greater than or equal to the following thresholds, but less than the Class I source thresholds (greater than or equal to 100 tons per year of any regulated pollutant), for any regulated pollutant:

[1] NAC 445B.138

Table 1: Class II Thresholds		
Pollutant		**Class II Threshold PTE (tons per year)**
Particulate Matter with an Aerodynamic Diameter Less Than or Equal to 2.5 Micrometers	$PM_{2.5}$	5
Particulate Matter with an Aerodynamic Diameter Less Than or Equal to 10 Micrometers	PM_{10}	5
Carbon Monoxide	CO	50
Volatile Organic Compounds	VOC	20
Nitrogen Oxides	NO_x	5
Sulfur Dioxide	SO_2	5
Lead	Pb	0.3
Hydrogen Sulfide	H_2S	1

When determining PTE, treat any physical or operational limitation on the capacity of the facility to emit a pollutant as part of its design. These limitations may include equipment that controls air pollution, restrictions on the hours of operation, or limits on the type or amount of material combusted, stored, or processed.

Think the facility falls below Table 1 thresholds?

If the facility thinks the emissions of the facility are below the Table 1 thresholds, complete a Class II Air Quality Operating Permit Applicability Determination Form and submit it to the BAPC. This form will help determine if an air quality operating permit is needed.

Find the form on the NDEP website

APPLICATION SUBMITTAL AND PROCESSING TIMELINE

In order to start processing the application, both the application packet and fee must be received in accordance with NAC 445B.327.

Mail or hand deliver the application and fee(s), payable by check, to the following address:

Nevada Division of Environmental Protection
Bureau of Air Pollution Control, Class II Permitting Branch
901 South Stewart Street, Suite 4001
Carson City, Nevada 89701-5249

Fees may also be submitted online.

When submitting an electronic payment, include the facility's name and, if applicable, its existing permit number and facility identification number.

The application and fees are date stamped when received. The regulatory time frame allocates 10 working days to determine if the application is complete or incomplete.[2] The day the application is deemed complete is called the official date of submittal (ODS). After the ODS, it takes 60 calendar days to review and finally issue the Class II permit.[3] If a public notice is required, it takes 90 calendar days after the ODS to issue the permit.

Bind the physical copies of the application.

Ensure the physical application contains the wet signature of the responsible official on the Certification Document page (See "Application Certification Document").

A 30 day public notice is required in the following situations:

- If the facility is a new Class II source;
- If the facility is within 1,000 feet of a school, hospital, or residential area;
- If revising a Class II permit and the new emission rates exceed the thresholds in Table 2: [4]

[2] NAC 445B.3457
[3] NAC 445B.3457.3
[4] NAC 445B.3457.5

Table 2: Class II Public Notice Thresholds		
Pollutant		Class II Threshold PTE (tons per year)
Particulate Matter	$PM_{2.5}$	10
Particulate Matter	PM_{10}	15
Carbon Monoxide	CO	40
Volatile Organic Compounds	VOC	40
Nitrogen Oxides	NO_x	40
Sulfur Dioxide	SO_2	40
Lead	Pb	0.6

REGULATIONS AND STATUTES BEHIND THIS APPLICATION

There are a few important Nevada Administrative Code (NAC) and Nevada Revised Statute (NRS) chapters that need to be reviewed before beginning this application:

- **Regulations on this application and processing fees** — NAC 445B.3453 and NAC 445B.327
- **Statement of purpose** — NRS 445B.100 through 445B.640, and NAC 445B.001 through 445B.3689.
- **Nevada Standards of Quality for Ambient Air and allowable emission concentrations** — NAC 445B.22097

1. COVER PAGE

The cover page is the first page of the application, which includes the type of application and whether the facility is new or existing.

Facility Name – A company may have several facilities. Provide the name of the facility. If there is no facility name available, write the company name here. The company name will also be requested on page 3 of the application.

Existing Facility ID – A facility identification number (FIN) is only required if the facility already has a permit. On existing operating permits, the FIN is in the header section as Facility ID No. AXXXX (**Example:** A1234). If the facility currently does not have a permit, specify "N/A."

Existing Class II AQOP – This refers to the existing permit number located in the header section (**Example:** Permit No. AP1499-3576). If the facility does not currently have a Class II Air Quality Operating Permit, specify "N/A."

Type of Facility – Specify the general activity at this facility (e.g. Gold Mine).

Number of Units (including IA's) in Facility and Number of Units (including IA's) Affected in Action – Specify how many emission units are in the application. This will also include insignificant activities.

Application Type – The facility may submit an application for a new permit, to revise an existing permit, or to renew an existing permit. Check the box(s) for all that apply to the current application.

2. IMPORTANT INFORMATION

The application contains a section titled "Important Information." Read this information carefully before completing the application. It contains a list of application forms, due dates, regulations, and fee(s) associated with a permit.

3. GENERAL COMPANY INFORMATION FORM

The General Company Information Form requests a brief description of the operations of the facility, the contact and mailing information of the company, the responsible official (RO) of the facility, the plant manager or other appropriate contact, and the location and driving directions to the facility.

Section 1: Facility's process — Provide an overview of the facility's operations (**Example**: "The facility mines and processes iron ore"). This description should be brief. More detail will be given in the process narrative (see "Process Narrative"). A list of Standard Industrial Classification (SIC) numbers and a list of numbers from the North American Industry Classification System (NAICS) can be found online. Provide both SIC and NAICS.

Section 2: Company name and address — Provide the company name and address as you want it to appear on the permit.

Section 3: Owner's name and address — Provide the name and address of the company owner. The owner is the person who owns, leases, operates, controls, or supervises the facility or a stationary source.

Section 4: Facility name and address — Provide the facility name and address if it is different than the company name and address in Section 2, or write "same as above."

Section 5: Records location — Provide the location where all records required by the permit will be stored. If they will be on-site, rewrite the information from Section 4. If records will be stored at another location, insert the information for the location.

Section 6: Responsible official — Provide the name, title, and mailing address for the responsible official (RO). If the facility already has an air permit, the RO should be the same as what the BAPC already has on file.

Does the RO need to change?

Attach the RO Request Form stating who the new RO will be. This should be signed by the appropriate individual.

The RO can be:[5]

1. For a corporation:
    (a) A president;
    (b) A vice president in charge of a principal business function;
    (c) A secretary;
    (d) A treasurer; or
    (e) An authorized representative of such a person who is responsible for the overall operation of the facility and who is designated in writing by an officer of the corporation and approved in advance by the director of the Nevada Department of Conservation and Natural Resources.
2. For a partnership or sole proprietorship, a general partner or the proprietor, respectively.
3. For a municipality or a state, federal, or other public agency, a ranking elected official or a principal executive officer, including, for a federal agency, a chief executive officer who has responsibility for the overall operations of a principal geographic unit of the agency.
4. For an affected source, the designated representative or his or her alternate, as defined in 42 U.S.C. § 7651a(26).

Section 7: Plant manager or other appropriate contact — This is the person the BAPC will communicate with when on site if the RO is not available. Provide the name, title, and contact information for a plant manager or other appropriate contact from the facility if it will not be the RO. For example, if the company president is the RO but is not physically at the facility, provide an appropriate contact who works on-site.

Section 8: Location and driving directions to the facility:

- Provide the hydrographic area (HA) number(s) and name(s), township(s), range(s), and section(s) of the facility;
- Provide the Universal Transverse Mercator (UTM) coordinates of the front gate of the facility. The UTM coordinates must be in metric units using North American Datum of 1983 (NAD 83), Zone 11;
- Describe the location of the facility with respect to the nearest road and city (such as 8th Street, Wells, Nevada) and the county the facility is located in;
- Provide driving directions from Carson City, Nevada to the facility.

Find the right maps.

The BAPC keeps online maps that can help determine HA basin number and names; township, section, and range; and UTM coordinates.

Maps can be found online

[5] NAC 445B.156

Section 9: Emissions cap — Check the appropriate box when requesting an emissions cap. A federally enforceable emissions cap is a voluntary condition of the air quality operating permit which limits how much the facility can emit. This request is independent of any applicable requirement(s).[6] It is recommended that the facility contacts the BAPC before requesting an emissions cap. If the facility is requesting an emissions cap, at a minimum, cover these points in the process narrative (see "Process Narrative"):[7]

1. State each applicable requirement which the facility seeks to avoid;
2. Show that the facility will meet any applicable requirements not avoided by the cap;
3. Explain proposed conditions of the permit which will ensure compliance with any applicable requirement, including monitoring and recordkeeping conditions for each proposed federally enforceable emissions cap;
4. Give any additional information that NDEP or BAPC may determine necessary to process the application.

Section 11: Location — If the facility is located within 1,000 feet of a school, hospital, or residential area, check the appropriate box. The 1,000 feet will begin at the fence line of the facility.

Section 12: Controls and limit restrictions — Check the appropriate box if the facility requires controls or emission limit restrictions (**Example:** limits on hours of operation) to be considered a Class II facility (see "Is My Facility a Class II Source?").[8]

The EPA describes a "synthetic minor" source as a source that otherwise has the potential to emit regulated NSR pollutants in amounts that are at or above 250 tons per year or 100 tons per year for the 28 source categories, but has taken a restriction so that its potential to emit is less than such amounts for major sources (Pursuant to 40 CFR 49.167, 40 CFR 52.21 or 40 CFR 71.2). Such restrictions must be enforceable as a practical matter.

Section 13: Non-Combustion Baghouse Testing — The information provided will be used to determine testing frequencies of particulate matter emissions for non-combustion baghouses. Non-combustion baghouses that only control laboratories or silos that are not in constant use are exempt from this program. One of the main factors in determining testing frequency is the air dispersion model. The facility may choose to opt-in to a special program and model all applicable non-combustion baghouses as individual sources. This could potentially increase testing frequencies of applicable baghouses that contribute more emissions to the ambient air quality and potentially decrease frequencies of other applicable baghouses. A facility that wants to utilize this program must submit air dispersion modeling files for all applicable baghouses.

Failing to provide all required documents may result in a delay in permit issuance or the application being deemed incomplete. A rolling 60-month period for compliance history will also be used to determine testing frequencies. Facilities that maintain good compliance status will have reduced testing requirements. Facilities that do not maintain compliance may have increased testing requirements. All testing requirement changes will occur through a Notice of Findings and Order. If additional information is desired, contact the permitting or compliance

[6] NAC 445B.070
[7] NAC 445B.296(2)
[8] NAC 445B.037

branch and see the **Baghouse TDS guidance document** located under Resources for All Sources of https://ndep.nv.gov/air/permitting/download-permit-forms.

4. EMISSION UNIT APPLICATION FORMS

An emission unit is part of a facility which emits or has the potential to emit any regulated air pollutant.[9] There are four different emission unit forms:

- **Industrial Process Application Form —** used for equipment that emits PM, PM_{10}, and $PM_{2.5}$ like hoppers, crushers, screens, and conveyor drop points. The equipment may be controlled by baghouses, water sprays, enclosures, or other methods. See Appendix 1 for an example of a completed Industrial Process Application Form.
- **Combustion Equipment Application Form —** used for heaters, engines, generators, emergency generators, and different control equipment such as thermal oxidizers. The equipment can be fueled with diesel oil, natural gas, propane, etc. See Appendix 2 for an example of a Combustion Equipment Application Form.
- **Storage Silo Application Form —** used for storage silo loading and unloading. The emissions commonly exit through a silo stack, chimney, or vent during these processes.
- **Liquid Storage Tank Application Form —** used for tanks storing liquid materials such as fuel, asphalt, waste oil, etc. The facility is not required to complete this form if the tank is attached to a unit (Example: a belly tank).

The facility must complete a form for every emission unit and transfer point. If the facility has more than one emission unit of a given type (**Example:** multiple liquid storage tanks), the facility must complete a separate form for each. Include as many additional forms as needed.

The facility must also complete separate forms for every unit considered an insignificant activity (see page 10). Print out and attach additional forms as necessary. Any field left blank may cause the application to be deemed incomplete.

In the detailed emission calculations, include the emission calculations for all emission units (see "Detailed Emission Calculations").

If the permit is being revised, only complete emission unit forms for the units that plan to be changed, upgraded, or revised. Detail these revisions in the process narrative (see "Process Narrative").

Remember to fill out every field!

Empty fields may make the application incomplete, resulting in delays and the return of the application.

[9] NAC 445B.059

GENERAL APPLICATION FORM INFORMATION

Each of the four emission unit application forms require the same information on the top of the page before the detailed table.

System Number and Name — Give each system a number and name a group of one or more units. A system contains emission units that are part of the same process (**Example:** Secondary Crusher and Associated Transfers).

Emission Unit Description — Give each emission unit a name and a system number for units in the same system. A system contains emission units that are part of the same process (**Example:** a screening process and associated conveyors) or are controlled by the same air pollution control equipment (**Example:** all stacks lead to one baghouse). Emission units can be grouped in systems (**Example:** System 1 – Conveyor 1; System 1 – Screen 1; etc.). If a system has multiple units, please provide an emission unit application form for each unit.

Alternative Operating Scenario — Check "Yes" if the emission unit is part of an alternative process or can operate in multiple ways. "Yes" signifies that there is an alternative operating scenario, and the forms are filled out the same as for any other permitted unit. An example of an alternative operating scenario is a heater that can operate on natural gas or propane.

Insignificant Activity — Check "Yes" or "No" to indicate if the emission unit is considered an insignificant activity (IA) pursuant to NAC 445B.288. Provide the appropriate emission unit form for all IA emission units.[10] The BAPC use these forms for air dispersion modeling.

Proposed insignificant activities not listed under NAC 445B.288(2) must be submitted, under separate cover pursuant to NAC 445B.288(4), to the BAPC for approval.

In the proposal, include a clear description of the emission unit(s), all emissions calculations based on unlimited annual hours of operation (see "Detailed Emission Calculations"), and emission factor references pursuant to NAC 445B.288(4). If the IA has been previously approved by the BAPC, send us a copy of the original approval letter. Engines, generators, and gasoline tanks subject to federal regulations cannot be considered IAs.

Subject to a Federal Regulation (40 CFR Part 60, 61, or 63) — Check the appropriate box to indicate if the emission unit is subject to any of these federal regulations:

- 40 CFR Part 60 — Standards for Performance for New Stationary Sources
- 40 CFR Part 61 — National Emission Standards for Hazardous Air Pollutants
- 40 CFR Part 63 — National Emission Standards for Hazardous Air Pollutants for Source Categories

Include calculations for IA emission limits in the detailed emission calculations (see "Detailed Emission Calculations").

In addition, include the total IA emission limits in the Facility-Wide Potential to Emit Table (see, "Facility-Wide Potential to Emit"). Make sure to include the VOCs calculated from the tank emissions.

[10] NAC 445B.288(1) and NAC 445B.288(2)

4.1 Equipment Description

Each of the four emission unit application forms have a section titled "Equipment Description". While much of this information is the same for all four forms, there is some unique information. We've indicated unique information in italics, below.

BAPC Emission Unit ID and System Number — Write "N/A" if the emission unit is not currently in the permit or if this is an application for a new permit. If the facility has an existing permit, use the pre-existing emission unit IDs and system numbers. The facility may choose to change emission unit IDs and system numbering, but must still reference pre-existing emission unit IDs and system number. Emission unit IDs are assigned based on release type (**Example:** if the release type is a stack, the emission unit ID will be formatted as S2.XXX. Process fugitive release will be formatted as PF1.XXX. IA will be formatted as IA1.XXX).

Source Classification Code (SCC) — The Environmental Protection Agency uses source classification codes to categorize sources of air pollution. The facility may find the appropriate SCC online.

MORE ON SCCs

There are four levels of source description, associated with the first 1, 3, 6, and 8 digits of the codes:

The first level (and digit) describes the most general information on the category of the emissions.

The second level (and first 3 digits) subdivides the five major categories into major industry groups (Example: 1-02 indicates external combustion in industrial boilers).

The third level (and first 6 digits) specifies the industry or emission source category (Example: 1-02-010 indicates it is for electric generation and uses liquefied petroleum gas).

The fourth level (all 8 digits) specifies the particular emitting process within the third-level source category (Example: 1-02-010-02 specifies it is propane).

Manufacturer — Provide the name of the manufacturer of the equipment. Write "unknown" if the manufacturer of the equipment is unknown.

Date Manufactured — Provide the year and, if possible, the month when the equipment was manufactured. Write "unknown" if the manufactured date of the equipment is unknown.

Model Number (*For Industrial Process, Storage Silo, and Liquid Storage Tank Only*) — Provide the model number of the equipment. Write "unknown" if the model number of the equipment is unknown.

Model and Serial Number *(For Combustion Equipment Only)* — Provide the model and the serial number of the equipment. Write "unknown" if the model or serial number of the equipment is unknown.

Equipment Dimensions *(For Industrial Process, Storage Silo, and Liquid Storage Tank Only)* — Provide the length (L), width (W), and height (H) of the equipment in feet.

Drop Dimensions *(For Industrial Process and Storage Silo Only)* — The drop length is the distance the material falls at a transfer point. The drop height indicates the distance relative to the ground. The drop height can be measured from the top of the drop length, the middle of the drop length, or the bottom of the drop length. The horizontal dimensions refers to the width of the transfer point. Refer to Figures 1 and 2:

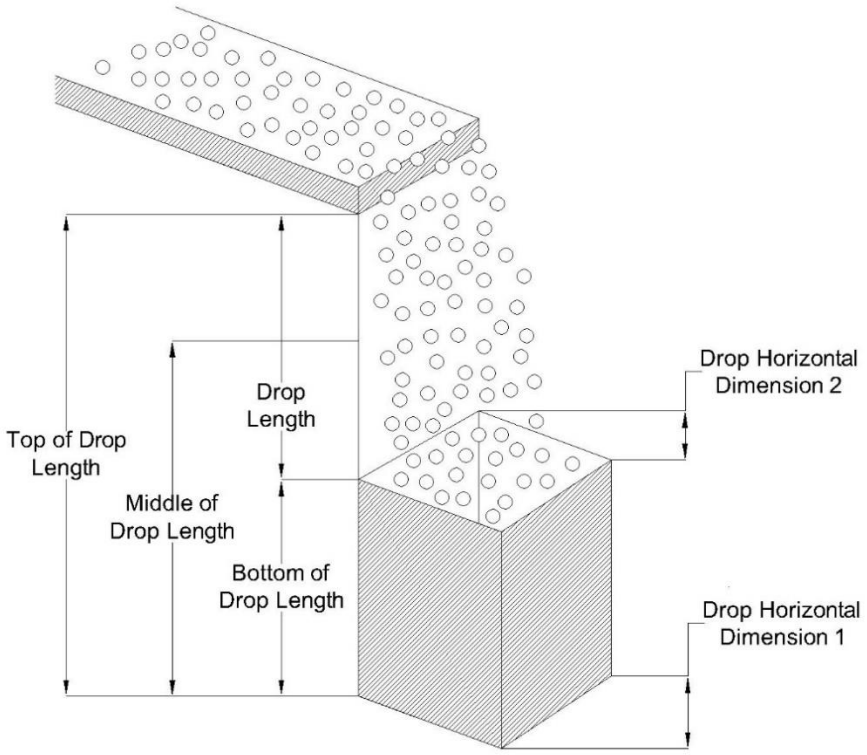

Figure 1: Drop Dimensions Diagram - Pile

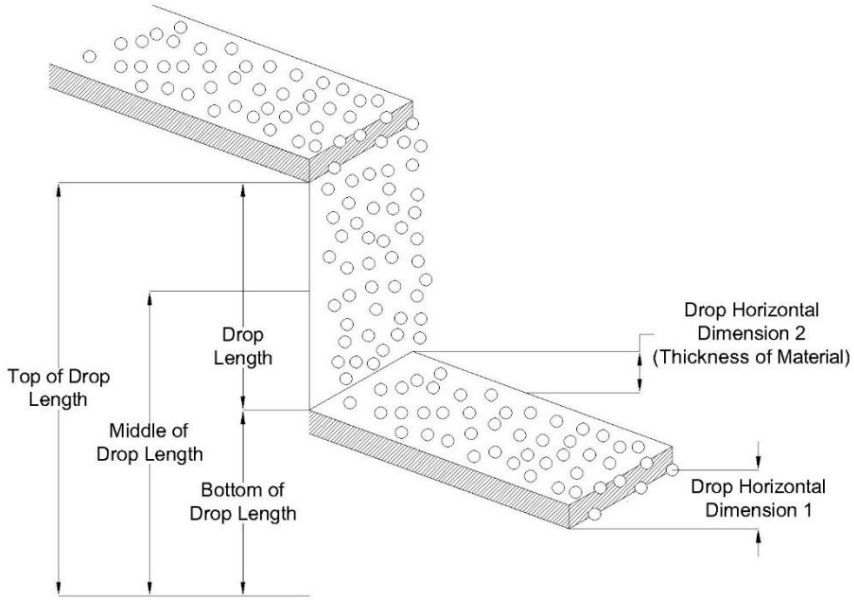

Figure 2: Drop Dimensions Diagram – Conveyor

Emissions Released Inside Building? *(For Industrial Process, Combustion Equipment, and Storage Silo Only)* — Specify "Yes" if emissions are released inside a building. If not, specify "No."

Heated or Non-Heated Tank *(For Liquid Storage Tank Only)* — Specify if the emission unit is a heated or non-heated storage tank.

Shell Height *(For Liquid Storage Tank Only)* — Provide the shell height of the storage tank in feet.

Shell Diameter *(For Liquid Storage Tank Only)* — Provide the shell diameter of the storage tank in feet.

Maximum Liquid Height *(For Liquid Storage Tank Only)* — Provide the maximum liquid height of the stored material in feet.

Average Liquid Height *(For Liquid Storage Tank Only)* — Provide the average liquid height of the stored material in feet.

Capacity of Tank *(For Liquid Storage Tank Only)* — Provide the capacity of the storage tank in gallons.

Shell Color *(For Liquid Storage Tank Only)* — Provide the color of the shell (white, gray, aluminum, red primer, etc.).

Roof Condition *(For Liquid Storage Tank Only)* — Provide a description of the condition of the roof (bad, good, excellent, etc.).

Roof Type *(For Liquid Storage Tank Only)* — Indicate if the tank has a cone, dome, external, or internal floating roof.

Roof Height *(For Liquid Storage Tank Only)* — For a cone or dome roof, specify the roof height in feet.

Cone Roof Slope *(For Liquid Storage Tank Only)* — For a cone roof, specify the roof slope in feet per feet (ft/ft).

Dome Roof Radius *(For Liquid Storage Tank Only)* — For a dome roof, specify the radius of the roof in feet.

True Vapor Pressure of Liquid *(For Liquid Storage Tank Only)* — Provide the true vapor pressure of the liquid stored in pounds per square inch absolute (psia). The true vapor pressure is a measure of the volatility of petroleum distillate fuels.

Reid Vapor Pressure Liquid *(For Liquid Storage Tank Only)* — Provide the Reid vapor pressure of the liquid stored in pounds per square inch (psi). The Reid vapor pressure is a measure of the volatility of gasoline. It it the absolute vapor pressure exerted by a liquid at 100 °F.

Orientation of Tank *(For Liquid Storage Tank Only)* — Specify the orientation of the tank (horizontal or vertical).

Submerged Fill *(For Liquid Storage Tank Only)* — Provide information on the method of filling the storage tank.[11]

4.2 For Reciprocating Internal Combustion Engines (RICE) Only

This section is only relevant to internal combustion engines and only appears on the Combustion Equipment Application Form. Most of this information may be found within the engine specification sheets provided by the manufacturer or on the engine nameplate. For extra guidance, please see RICE Frequently Asked Questions for Stationary Internal Combustion Engines.

Type of Engine Code — Provide the engine code (from the table below) that corresponds to the emission unit (**Example:** an emergency spark ignition 4-stroke rich burn engine would have the code E-SI4SRB).

Table 3: Type of Engine Code

Code	Description	Code	Description
LU	Limited Use	**E-SI**	Emergency Spark Ignition
LDG	Landfill/Digester Gas	**SI4SRB**	Spark Ignition 4-Stroke Rich Burn
NECI	Non-Emergency Compression Ignition	**SI4SLB**	Spark Ignition 4-Stroke Lean Burn
ECI	Emergency Compression Ignition	**SI2SLB**	Spark Ignition 2-Stroke Lean Burn

Date Constructed — Provide the date the unit was originally constructed.

Cylinder Displacement — Provide the cylinder displacement of the RICE in liters per cylinder.

EPA Tier # — The EPA Tier Number refers to applicable 40 CFR Subpart regulations. For example, Table 1 of 40 CFR Part 89.112 has standards for oxides of nitrogen, carbon monoxide,

[11] NAC 445B.22093(3)

hydrocarbon, and particulate matter exhaust. Typical subparts for RICEs include 40 CFR Part 60 Subparts IIII and JJJJ and 40 CFR Part 63 Subpart ZZZZ.

4.3 Location of Emission Source

All four emission unit application forms — Industrial Process, Combustion Equipment, Storage Silo, and Liquid Storage Tank — require the exact Universal Transverse Mercator (UTM) coordinates for the emission unit. The northing and easting UTM coordinates must be in metric units NAD 83 / UTM Zone 11. The BAPC uses each emission unit's unique UTM coordinates for air dispersion modeling (even when modeling is not required by the applicant).

4.4 Operating Parameters or Operating Parameters/Fuel Usage

All four emission unit application forms have an "Operating Parameters" section or an "Operating Parameters/Fuel Usage" section. While much of this information is the same for all four forms, there is some unique information. Unique information has been indicated below in italics.

Material Type Processed *(For Industrial Process and Storage Silo Only)* — Provide the type of material processed such as aggregate, gold ore, gypsum, limestone, lime, prill, etc.

Batch Process *(For Industrial Process and Storage Silo Only)* — Batch processes measure material in batches instead of a continual hourly basis. Provide the amount of material used for each batch and the unit.

Material Type *(For Liquid Storage Tanks Only)* — Provide the material type processed or stored in the storage tank such as asphalt, recycled fuel oil, etc. If the stored material is a combination of multiple materials, list each material and its percentage of the total mass.

Fuel Type *(For Combustion Equipment Only)* — Provide the type of fuel the combustion unit will operate on. If more than one type of fuel is burned under the same operating scenario, specify the primary fuel and the percentage. If the primary fuel is a blend of multiple fuels, then identify the percentage of each fuel in the blend.

Fuel Flow Meter Installed *(For Combustion Equipment Only)* — Indicate to the BAPC if the facility is using a fuel flow meter on the combustion unit to track fuel usage.

Sulfur Content *(For Combustion Equipment Only)* — Provide the sulfur content, which can be obtained from the fuel supplier. This is the nominal percent, by weight, of sulfur in the fuel supply.

Heat Content *(For Combustion Equipment Only)* — Provide the heat content of the fuel being used. This value should be listed in the amount of heat (BTU) per unit of fuel combusted (pound, gallon, scf). If the facility includes a heat content value other than a default value listed below, provide documentation from the fuel supplier that shows the nominal heat content of the fuel. The facility must also give supporting documents if the facility prefers coal with a different heat content. The default heat content values are listed below:[12]

[12] AP-42: Appendix A Miscellaneous Data And Conversion Factors, https://www3.epa.gov/ttn/chief/ap42/appendix/appa.pdf

Table 4: Heat Content				
Coal	**Diesel #2**	**Gasoline**	**Natural Gas**	**Propane**
(BTU/lb)	(BTU/gal)	(BTU/gal)	(BTU/scf)	(BTU/gallon)
13,000	140,000	125,251	1,020	91,500

Maximum Throughput *(For Liquid Storage Tanks Only)* — Provide the maximum throughput of the stored material in gallons per month and gallons per year.

Start Time *(For Industrial Process, Combustion Equipment, and Storage Silo Only)* — Provide the start time in this section. Specify "N/A" for the facility to have the flexibility to operate the equipment at any time and not have the start and end times listed in the permit. If the facility does not request a piece of equipment to operate 24 hours per day, the facility must list the exact hours of operation that the equipment will operate, such as 6:00 AM – 10:00 PM or 0600 – 2200.

End Time *(For Industrial Process, Combustion Equipment, and Storage Silo Only)* — Provide the end time in this section. Specify "N/A" if the facility would prefer to have the flexibility to operate the equipment at any time and not have the start and end times listed in the permit. If the facility does not request an emission unit to operate 24 hours per day, the facility must list the exact hours of operation that the equipment will operate, such as 6:00 AM – 10:00 PM or 0600 – 2200.

4.5 Control Equipment

Manufacturer — Provide the name of the company that manufactured the control equipment. Write "unknown" if the manufacturer of the equipment is unknown.

Manufacturer's Guarantee Included? — If the facility is using a control efficiency from a manufacturer's guarantee, provide a copy of the guarantee. The BAPC will not accept a control efficiency from a manufacturer's guarantee without a copy of this information. The guarantee should be provided immediately after the form.

4.6 Stack Parameters

This section only appears on the Industrial Process, Combustion Equipment, and Storage Silo Process application forms.

Stack Height — Provide the height of the stack in feet.

Stack Inside Diameter — Provide the inside diameter of the stack in feet. If the diameter is non-cylindrical, provide the actual dimensions (LxW).

Stack Temperature — Provide the temperature of the pollutant exiting the stack in degrees Fahrenheit. Write "ambient" if the stack temperature is the same as the ambient air temperature.

Stack Exit Velocity — Provide the exit velocity of the pollutant exiting the stack in feet per second (ft/sec).

Stack Release Type — A vertical stack release type is the most common release type and is the default value when the Bureau of Air Quality Planning (BAQP) completes modeling. If the stack

is capped, indicate if it is fixed or a flapper type. Contact the BAQP Modeling Group with any questions.

5. DETAILED EMISSION CALCULATIONS

A table for detailed emission calculations has been provided to correspond with each type of emission unit application form. The submitted detailed emission calculations do not need to follow the same format as those provided by the BAPC, as long as all of the information is included.

5.1 System Number and Name

See description provided in Section 4.

5.2 Emission Unit Description

See description provided in Section 4.

5.3 Operating Hours

Daily – Provide how many hours a day the equipment will be operating.

Annual – If the unit will operate 24 hours per day, 365 days per year, the Annual Operating Hours is 8,760 hours/year. If the unit will operate less, multiply the hours per day and the days per year of operation to obtain the Annual Operating Hours.

5.4 Throughput

Hourly – The Hourly Throughput Rate is the weight of material processed in one hour by the listed equipment.

Annual – For the Annual Throughput Rate, multiply the Hourly Throughput Rate by the Annual Operating Hours and convert to tons per year.

Units – The measurement of the throughput material (lbs, tons, gallons, scf, etc).

5.5 Control Equipment

Type of Control — Provide the type of control equipment used (baghouse, bin vent, enclosure, water spray, wet scrubber, thermal oxidizer, carbon vessel, etc.) and add a label and number (Baghouse BH-1). If an emission unit is not equipped with control equipment, write "no control" in this section.

Control Efficiency — Control efficiencies may be utilized for various types of controls including water sprays, enclosures, bin vents, etc. For baghouses, a manufacturer's guarantee or source test is required if using an efficiency better than the default control efficiency. The BAPC will accept the following default control efficiencies:

Emission Control Technology	Control Efficiency Rating
Water Sprays	**75%**
Enclosure	**50%**
Baghouse	**0.02 grains/dscf**

Pollutant(s) Controlled — List the regulated air pollutants controlled by the control equipment. For example: PM, PM_{10} and $PM_{2.5}$.

Gas Volume Flow Rate — Provide the gas volume flow rate through the stack in actual cubic feet per minute (acfm) and in dry standard cubic feet per minute (dscfm).

5.6 Regulated Air Pollutants

Emission factors are used to calculate the requested emission limits for regulated and non-regulated pollutants. The throughput rate or fuel usage rate combined with the emission factor gives the emission limit of a pollutant (see "Operating Parameters or Operating Parameters/Fuel Usage").

The facility may apply a safety factor to increase the emission limit. But make sure the emission limit doesn't exceed any applicable standard (see "Standards of Quality for Ambient Air").

Emission limits of applicable regulated air pollutants are required for each emission unit. The facility may have to calculate limits for multiple pollutants:

Particulate matter (PM): material, except uncombined water, that exists in a finely divided form as a liquid or solid (i.e. steam) at reference conditions (NAC 445B.129).

PM_{10}: particulate matter in the atmosphere with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by an approved reference method or equivalent method based on 40 CFR Part 50, Appendix J and designated in accordance with 40 CFR Part 53 (NAC 445B.135).

$PM_{2.5}$: particulate matter in the atmosphere with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers as measured by an approved reference method or equivalent method based on 40 CFR Part 50, Appendix L and designated in accordance with 40 CFR Part 53 (NAC 445B.1348).

Nitrogen oxides: all oxides of nitrogen, except nitrous oxide, as measured by test methods approved by the EPA (NAC 445B.109).

Volatile organic compounds (VOCs): any compound of carbon — excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate — which participates in atmospheric photochemical reactions (40 CFR § 51.100(s)).

Greenhouse gas: any of the following gases, either alone or in combination (NRS 445B.137):

- Carbon dioxide (CO_2)
- Hydrofluorocarbons
- Methane (CH_4)
- Nitrous oxide (N_2O)
- Perfluorocarbons
- Sulphur hexafluoride (SF_6)

Other pollutants: these may include carbon monoxide (CO), sulfur dioxide (SO_2), lead (Pb), and hydrogen sulfide (H_2S).

5.7 Emission Factor

Choose the appropriate emission factor for each emission unit and insignificant activity. Provide the calculations for the emission limits in both lb/hr and tons/year (See "Emission Factor"). The BAPC prefers these calculations in spreadsheet form and have provided a template with minimum requirements in the application. Example calculations have been provided in Appendices 3 through 9.

An emission factor is a measurement ratio that helps estimate how much of a pollutant is released over time. It links the *quantity* of a pollutant released to the atmosphere with an *activity* that generates the pollutant. The emission factor will help determine the emission rate. Emission factors are commonly expressed as a weight divided by a unit, volume, distance, or duration such as lb/MMBtu, lb/ton, or lb/1000 gallons.

There is only one row for the emission factors associated with Carbon Dioxide Equivalent (CO_2e) and there are multiple CO_2e pollutants. Calculate each CO_2e pollutant in the Greenhouse Gas (GHG) Detailed Calculations.

There are a few ways the facility can find the appropriate emission factor for each pollutant:

- AP-42: Compilation of Air Emissions Factors
- Manufacturer's specification sheets
- Source tests
- Guidance on Emission Factors for the Mining Industry

5.8 Emission Factor Reference

Provide a reference to the source where the facility found the emission factor (**Example:** AP-42 Ch. 11.19.2, Table 11.19.2-2). Emission factors should be chosen in accordance with NAC 445B.239.

For liquid storage tanks, use the EPA TANKs 4.09d (TANKs) software to calculate emission limits and determine emission factor back-calculations for volatile organic compounds (VOCs). The results from TANKs are reported in lb/year, and the facility must also convert the results to tons/year. Attach the TANKs report to the application.

TANKs software is available from the EPA's website.

The facility may also use methods described in AP-42 Chapter 7 if the facility chooses not to use TANKS to estimate VOC emissions from the storage tank. Make sure to provide supporting documents for all parameters.

5.9 Emission Limits

The emission limit should be calculated in units of pounds per hour (lb/hr) and tons per year (tpy) for each air pollutant for the emission unit. Example calculations have been provided in Appendices 3 through 9.

5.10 HAPs and Other Pollutant(s)

Combustion units typically emit more than one Hazardous Air Pollutant (HAP). Include each individual HAP in the HAPs Detailed Calculations.

6. FACILITY-WIDE POTENTIAL TO EMIT TABLE

The Facility-Wide Potential to Emit (PTE) Table should record the total emissions per pollutant. In this table, include the sum of the emissions from all units — both permitted and insignificant activities. If the facility has air pollutants other than those listed in the table, include them under "Other Regulated Pollutants."

If the facility is **revising** the permit, provide the PTE changes in the second table, titled "Revision Table." In the "Change in Facility-Wide PTE" category, include the difference between the permitted PTE and the new, proposed PTE. For each pollutant, also write if these changes will increase or decrease the permitted PTE (+ / –). Add more columns for other regulated air pollutants, if needed.

7. SURFACE AREA DISTURBANCE FORM

By law, a facility may not cause or permit the handling, transporting or storing of any material in a manner which allows or may allow controllable particulate matter to become airborne.[13] There are multiple proven methods for reducing airborne dust:

- Water trucks or water spray systems to control wind-blown dust
- Soil binding agents or chemical surfactants to treat roadways and areas of disturbed soil
- Wind-breaks or wind-limiting fences that are designed to limit wind erosion of soils

The Surface Area Disturbance Form requests the following information if the facility will produce dust:

Total Acres of the Facility Site — Provide the total size of the site in acres. Specify the total acreage within the fence line of your facility, including undisturbed areas, the facility area, and any asphalted areas.

Total Acres Disturbed — Provide the information of the total acres disturbed. When calculating the total acreage, all ground being disturbed, and all ground previously disturbed but not stabilized, must be measured.

Surface Area Disturbance Location — Provide the surface area disturbance location as Township(s), Range(s), and Section(s). Fill this form out even if the surface area disturbance will be less than 5 acres.

[13] NAC 445B.22037

8. PLANT BOUNDARY COORDINATES FORM

Provide the UTM coordinates of each corner of the plant boundary. UTM coordinates must be in the NAD 83 Zone 11 datum. Areas considered "ambient air" — as defined in 40 CFR Part 50.1(e) and NAC 445B.018 — may not be included within the plant boundary. This is only required if an environmental analysis is not submitted.

9. PLANT BUILDING PARAMETERS FORM

Provide UTM coordinates for each building corner. This is only required if an environmental analysis is not submitted.

Building Tier — Provide the building height and UTM coordinates for each tier separately.

Roof Height — Provide the roof height measured from ground level.

Building Diameter — Provide the building diameter. Only required for cylindrical buildings (i.e., silos).

Building UTM Coordinates — UTM coordinates must be in the NAD 83 Zone 11 datum. Provide the UTM coordinates of the center of the building for cylindrical buildings/tiers. Provide sufficient UTM coordinates to define the footprint of the building/tier for all other buildings/tiers.

10. ADDITIONAL REQUIRED ATTACHMENTS

There are several other attachments that support and contextualize the information the facility provides elsewhere in the application. The BAPC uses these attachments to inform the public of facilities that need permits, prepare the technical review supporting the permit, verify data used in the application, and write permit conditions. Please draft the required attachments in a readable format, with both appropriate font and size.

These attachments are an important part of the application.

The BAPC may have to reject the application if the required attachments are illegible or incomplete.

PROCESS NARRATIVE

The process narrative should describe all processes in the application and any renewal or revision details. The goal is to give the BAPC a clear picture of the process of the facility so the BAPC can understand how the facility will monitor emissions and know what to write into the permit. Make sure the process narrative matches the process flow diagram.

Here's a basic outline to follow when drafting the process narrative:

- Specify the location of the facility and its parent company, if part of a larger business (**Example**: Arturo Mine is located 45 miles Northwest of Elko in Elko County, Nevada, Hydrographic Area 61 – Boulder Flat. The mine is part of the Nevada Gold, LLC.).
- Describe what the facility does (**Example:** mining gold ore, crushing and screening aggregates, etc).
- Describe the emission units (equipment) used at the facility. Make sure to discuss both permitted units and insignificant activity units. The description should outline how the emission units work together as part of a larger process. Include information that helps describe what the facility does and how it functions.
- Characterize all regulated air pollutants that may be emitted by each emission unit.
- Discuss the emissions cap, if applicable (See "Section 9: Emissions Cap" under "General Company Information Form")
- If the facility is requesting a revision, explain what is going to change and why it is necessary.
- Outline how and where the facility will be monitoring throughputs to show compliance.

PROCESS FLOW DIAGRAM(S)

A process flow diagram is a drawing that illustrates how all processes are interconnected. The process flow diagram should include each emission unit(s), drop point(s), and minimum requirements as described in https://ndep.nv.gov/uploads/air-aqm-docs/guidance-process-flow-diagram.pdf.

Only include information that is relevant to air pollution control. The facility does not need to include the locations of valves and electrical and water plans.

SITE PLANS

Provide the site plan of the entire facility (drawn to scale). Include the dimensions scale and north arrow. The site plan should include the UTM coordinates (NAD 83 / UTM Zone 11) as well as the dimensions and heights of buildings, though this can be formatted as an excel table for UTM coordinates (NAD 83 / UTM Zone 11) and dimensions and heights of buildings. Make sure the facility site plan indicates and labels the locations of systems.

MAPS: FACILITY LOCATION AND AREA MAP OF THE FACILITY

Submit the following maps as visible, readable printouts (color optional):

1. A vicinity map that shows the location of the facility with respect to the nearest recognizable city, town, and major road, all labeled. Outline the facility.
2. An area map of the facility with a closer, aerial view that includes the fence line, all buildings, the location of the front gate, and emission unit locations (clearly labeled).

ENVIRONMENTAL EVALUATION (AERMOD AIR DISPERSION MODELING REPORT AND ELECTRONIC INPUT FILES)

Air dispersion modeling is part of routine environmental evaluations[14] to make sure facilities in Nevada meet air quality standards (see "Standards of Quality for Ambient Air"). Such models give us a technical basis for issuing a Class II air permit. The facility must submit an environmental evaluation if: [15]

1. The facility is renewing a permit or seeking a new permit for a facility that emits, or has the potential to emit, greater than 25 tons of a regulated air pollutant per year; and
2. The facility is revising a permit for a facility with a proposed emissions increase greater than 10 tons per year of a regulated air pollutant.

While the BAPC uses the Environmental Protection Agency's AERMOD modeling system to model the movement of regulated air pollutants, the facility may use other modeling platforms with approval from the EPA Model Clearinghouse. For questions regarding environmental evaluations and modeling, please contact the NDEP Bureau of Air Quality Planning at (775) 687-9349 and ask for the modeling supervisor.

[14] NAC 445B.311(4).
[15] NAC 445B.310, NAC 445B.311

10.1 **Standards of Quality for Ambient Air**

		NEVADA STANDARDS[A]		NATIONAL STANDARDS[B]		
POLLUTANT	**AVERAGING TIME**	**CONCENTRATION[C]**	**METHOD[D]**	**PRIMARY[C, E]**	**SECONDARY[C, F]**	**METHOD[D]**
Ozone	8 hours	0.075 ppm	Chemiluminescence	0.070 ppm	Same as primary	Chemiluminescence
Ozone-Lake Tahoe Basin, #90	1 hour	0.10 ppm (195 µg/m^3)	Ultraviolet absorption	--	--	--
Carbon monoxide less than 5,000′ above mean sea level	8 hours	9 ppm (10,500 µg/m^3)	Nondispersive infrared photometry	9 ppm (10 mg/m^3)	None	Nondispersive infrared photometry
At or greater than 5,000′ above mean sea level		6 ppm (7,000 µg/m^3)				
Carbon monoxide at any elevation	1 hour	35 ppm (40,500 µg/m^3)		35 ppm (40 mg/m^3)		
Nitrogen dioxide	Annual arithmetic mean	0.053 ppm (100 µg/m^3)	Gas phase chemiluminescence	53 ppb[G]	Same as primary	Gas phase chemiluminescence
	1 hour	100 ppb	--	100 ppb	None	
Sulfur dioxide	Annual arithmetic mean	0.030 ppm (80 µg/m^3)	Ultraviolet fluorescence	0.03 ppm[H] (1971 standard)	None	Spectrophotometry (Pararosaniline method)
	24 hours	0.14 ppm (365 µg/m^3)		0.14 ppm[H] (1971 standard)		
	3 hours	0.5 ppm (1,300 µg/m^3)		None	0.5 ppm	
	1 hour	75 ppb	--	75 ppb	None	
Particulate matter as PM_{10}	Annual arithmetic mean	None	High volume PM_{10} (sampling)	None	None	--
	24 hours	150 µg/m^3		150 µg/m^3	Same as primary	High or low volume PM_{10} sampling
Particulate matter as $PM_{2.5}$	Annual arithmetic mean	12.0 µg/m^3	--	12.0 µg/m^3	Same as primary	Low volume $PM_{2.5}$sampling
	24 hours	35 µg/m^3	--	35 µg/m^3	Same as primary	
Lead (Pb)	Rolling 3 mo. average	0.15 µg/m^3	High volume sampling, acid extraction and atomic absorption spectrometry	0.15 µg/m^3	Same as primary	High volume sampling, acid extraction and atomic absorption spectrometry
Hydrogen sulfide	1 hour	0.08 ppm (112 µg/m^3)[I]	Ultraviolet fluorescence	--	--	--

10.2 **Information Required by the BAPC for Modeling Purposes**

Provide the following information as an attachment for all permitted and IA emission units (unless the requested information is already given in another section of the application):

- Emission limit calculations, in spreadsheet form, of all regulated air pollutants (in pounds per hour (lb/hr)).
- UTM coordinates (in meters, NAD 83 / UTM Zone 11) of the locations of all the permitted and IA emission units.
- Stack parameters (height, diameter (or stack dimensions if non-circular), flow rate, temperature, location, etc.).
- Release dimensions for process fugitive emissions (transfer release height, drop distance, width of transfer).
- Tank dimensions and their UTM coordinates.
- Building height in feet and the NAD 83 UTM coordinates of each corner of each building.
- For tanks with a capacity greater than 10,000 gallons: tank height in feet and the NAD 83 UTM coordinates of each corner of the tank if the tank is rectangular or the tank height and radius along with the UTM coordinates of the center if the tank is cylindrical.
- Facility plot plan with fence line boundary and UTM coordinates as requested in Chapter 8 Plant Boundary Coordinates Form and Chapter 9 Plant Building Parameters Form.
- Topographic Map (with scale and North arrow) as requested in Chapter 10.5 Maps.

10.3 **Air Dispersion Modeling Submitted by Applicant**

Provide all model input files required to perform the air dispersion modeling performed with the latest version of AERMOD. Provide a digital copy and a written report containing all the information above, as well as the meteorological data, terrain, receptors and grid spacing, the pollutants the model was run for, and the results table showing either passing or failing the Standards of Quality for Ambient Air in accordance with NAC 445B.22097.

MANUFACTURER'S GUARANTEE CERTIFICATIONS AND EQUIPMENT SPECIFICATION SHEETS

There are three instances when the facility should include a manufacturer's guarantee:

1. **To show emission limits** for all engines required to meet emission limits from a federal subpart.
2. **To show maximum fuel usage** for engines without a fuel flow meter or a procedure to determine their fuel usage (see "Operating Parameters or Operating Parameters/Fuel Usage").
3. **To support control efficiency or emissions calculations** for all other emission units based on a manufacturer's guarantee (see "Guidance on Emission Factors for the Mining Industry").

Attach these documents after the corresponding application forms.

Manufacturer's guarantees are important.

The BAPC may be required to apply the uncontrolled emission factor to calculate the emission limit(s) if the facility does not attach these documents.

SOURCE (STACK) TESTING DATA

Attach any source testing data used to estimate emissions.

TANKS EMISSIONS ESTIMATES

Perform TANKs modeling in order to estimate emission limits from liquid storage tanks storing petroleum or VOCs. TANKs 4.0.9d modeling software can be found on EPA's website. The TANKs report will show the VOC emission limit in pounds. Use this value to calculate the VOC emission limit in pounds per hour (lb/hr) and tons per year (tpy) and to back-calculate the emission factor for the storage tank.

Include the TANKs report for all permitted and IA storage tanks within the application. If the facility does not want to use TANKS to estimate annual VOC emissions from the storage tank, the methodology outlined in AP-42 Chapter 7 can be used. (see "Detailed Emission Calculations")

11. APPLICATION CERTIFICATION DOCUMENT

The last page of the Class II air permit application packet is the Application Certification Document — a short summary of the required documents in the application. It must be signed *in ink* by the responsible official (RO) of the company or facility.

Check the boxes next to each submitted document, and make sure the Application Certification Document is signed by the RO listed in Section 6 of the General Company Information Form. Create a digital copy of the application, including all requested documents, and submit a digital and hard copy of the application with the application processing fee. The complete application package can be mailed or hand delivered to the BAPC office (see "Application Submittal and Processing Timeline").

12. MAINTENANCE/ANNUAL FEES

See Permit Fees online under "Permit Guidance".

Appendix 1

INDUSTRIAL PROCESS APPLICATION FORM EXAMPLE

INDUSTRIAL PROCESS APPLICATION FORM
CLASS II OPERATING PERMIT

System Number and Name: **System 1 – North Creek Crusher Circuit**

Emission Unit Description: **Conveyor C-3 to Conveyor C-4**

Alternative Operating Scenario: ☐ **Yes** ☒ **No**

Insignificant Activity: ☐ **Yes** ☒ **No** If yes, identify exemption regulation: _____

Subject to a Federal Regulation (40 CFR Part 60, 61, or 63): ☐ **Yes** ☒ **No** If yes, identify in attached Process Narrative.

Description			Data
Equipment Description	BAPC Emission Unit ID *Applicable for Renewal or Revision*	eg. Unit ID: S2.001, PF1.001	S2.001
	Source Classification Code (SCC)	e.g. *3-03-024-04 for Conveyors*	3-05-002-17
	Manufacturer		Industrial Products Inc.
	Date Manufactured		2006
	Model Number		HF938271-d
	Equipment Dimensions (LxWxH)	Feet	2’ x 2’ x 9’
	Drop Length *if applicable*	Feet	5’
	Drop Height *if applicable*	Feet	5’
	The drop height is measured from the ☐ top of the drop length ☐ middle of the drop length ☐ bottom of the drop length, in reference to the ground. *Choose one, if applicable*		
	Drop Horizontal Dimension 1 *if applicable*	Feet	10’
	Drop Horizontal Dimension 2 *if applicable*	Feet	5’
	Emissions Released Inside building?	yes/no	No
Location of Emission Source	UTM Northing (NAD 83, Zone 11)	M	4,410,203
	UTM Easting (NAD 83, Zone 11)	M	331,732
Operating Parameters	Material Type Processed		Aggregate
	Batch Process *if applicable*	*unit* /batch	N/A
	Start Time *if operating less than 24 hours/day*	hour:minute	N/A
	End Time *if operating less than 24 hours/day*	hour:minute	N/A
Control Equipment	Manufacturer		Water Co.
	Manufacturer’s Guarantee Included? *If “yes”, attach manufacturer’s sheets immediately after these forms.*	yes/N/A	N/A
Stack Parameters	Stack Height	Feet	N/A
	Stack Inside Diameter	Feet	N/A
	Stack Temperature	ºF	N/A
	Stack Exit Velocity	feet/second	N/A
	Actual Gas Volume Flow Rate	Acfm	N/A
	Dry Gas Volume Flow Rate *If not included in detailed calculations.*	Dscfm	N/A
	Stack Release Type		☐ vertical ☐ capped ☐ horizontal

1. How will throughput be monitored for this emission unit? Identify if the throughput will be monitored at this emission unit or at another emission unit and the method (e.g. weigh belt).
   A weigh belt on Conveyor C-4 will be installed.

Appendix 2

COMBUSTION EQUIPMENT APPLICATION FORM EXAMPLE

COMBUSTION EQUIPMENT APPLICATION FORM
CLASS II OPERATING PERMIT

System Number and Name: **System 2 – Emergency Diesel Generator**
Emission Unit Description: **Emergency Diesel Generator**
Alternative Operating Scenario: ☐ **Yes** ☒ **No**
Insignificant Activity: ☐ **Yes** ☒ **No** If yes, identify exemption regulation: _____
Subject to a Federal Regulation (40 CFR Part 60, 61, or 63): ☒ **Yes** ☐ **No** If yes, identify in process narrative.

Description			Data
Equipment Description	BAPC Emission Unit ID *Applicable for Renewal or Revision*	eg. Unit ID: S2.001	S2.002
	Source Classification Code (SCC)	e.g. *3-03-024-04 for Conveyors*	2-01-001-02
	Manufacturer		Cummins
	Date Manufactured		2007
	Model and Serial Number		Model SD048, Serial 159df6
	Emissions Released Inside building?	yes/no	No
For Reciprocating Internal Combustion Engines (RICE) Only	Type of Engine Code (See Notes*)		ECI
	Date Constructed	month/day/yr	8/26/2007
	Cylinder Displacement	liter/cylinder	< 10
	EPA Tier #		2
Location of Emission Source	UTM Northing (NAD 83, Zone 11)	m	4,493,382
	UTM Easting (NAD 83, Zone 11)	m	588,574
Operating Parameters /Fuel Usage	Fuel Type		Fuel Oil #2 (Diesel)
	Fuel Flow Meter Installed?	yes/no/NA	24
	Sulfur Content	%	100
	Heat Content	Btu/gallons	151.0
	Start Time *if operating less than 24 hours/day*	hour:minute	N/A
	End Time *if operating less than 24 hours/day*	hour:minute	N/A
Control Equipment	Manufacturer		Cummins
	Manufacturer's Guarantee Included? *If "yes", attach manufacturer's sheets immediately after these forms.*	yes/N/A	N/A
Stack Parameters	Stack Height	feet	7.1
	Stack Inside Diameter	feet	0.83
	Stack Temperature	°F	893
	Stack Exit Velocity	feet/second	74
	Actual Gas Volume Flow Rate	acfm	14,920
	Dry Gas Volume Flow Rate *If not included in detailed calculations.*	dscfm	4,770
	Stack Release Type		☒ vertical ☐ capped ☐ horizontal

Notes*

Code	Description	Code	Description
LU	Limited Use	E-SI	Emergency Spark Ignition
LDG	Landfill/Digester Gas	SI4SRB	Spark Ignition 4-Stroke Rich Burn
NECI	Non-Emergency Compression Ignition	SI4SLB	Spark Ignition 4-Stroke Lean Burn
ECI	Emergency Compression Ignition	SI2SLB	Spark Ignition 2-Stroke Lean Burn

COMBUSTION EQUIPMENT APPLICATION FORM
CLASS II OPERATING PERMIT (continued)

Emission Unit Description: **Emergency Diesel Generator**

1. How will fuel consumption be monitored for this emission unit? (e.g. maximum fuel consumption rate supplied by manufacturer, fuel flow meter).
   Fuel Flow Meter

2. Does this unit have the capability to bypass air pollution controls in an emergency situation as defined under NAC 445B.056?:
   ☐ **Yes** ☒ **No**

Appendix 3

EXAMPLE OF EMISSION LIMIT CALCULATIONS FOR CONVEYOR TRANSFER POINTS

Unit No.	Unit Description	Operating Hours		Throughput			Controls		Emissions					References
		Daily	Annual	Hourly	Annual	Units	Type	Efficiency or Dry Volume Flow Rate	Pollutant	Factor	Unit	Hourly Rate (lbs/hr)	Yearly Rate (tons/yr)	
System No. & Name:		System 01 - Conveyor Transfer and Loading												
PF1.001	Load Transfer to Feed Hopper	10	2,600	350	100,000	Tons of Rock	Water Sprays	75%	PM	0.003	lb/ton	0.26	0.038	AP-42 Ch. 11.19.2-2 Conveyor Transfer Point (Uncontrolled) *w/ 75% control reduction*
									PM_{10}	0.0011	lb/ton	0.096	0.014	AP-42 Ch. 11.19.2-2 Conveyor Transfer Point (Uncontrolled) *w/ 75% control reduction*
									$PM_{2.5}$	0.00017	lb/ton	0.015	0.002	PM2.5=(PM10)*(0.53/0.035) *w/ 75% control reduction*
System No. & Name:		System 01 - Conveyor Transfer and Loading												
PF1.002	Feed Hopper Transfer to Feed Hopper Conveyor	10	2,600	350	100,000	Tons of Rock	Water Sprays	75%	PM	0.003	lb/ton	0.26	0.038	AP-42 Ch. 11.19.2-2 Conveyor Transfer Point (Uncontrolled) *w/ 75% control reduction*
									PM_{10}	0.0011	lb/ton	0.096	0.014	AP-42 Ch. 11.19.2-2 Conveyor Transfer Point (Uncontrolled) *w/ 75% control reduction*
									$PM_{2.5}$	0.00017	lb/ton	0.015	0.002	PM2.5=(PM10)*(0.53/0.035) *w/ 75% control reduction*
System No. & Name:		System 01 - Conveyor Transfer and Loading												
PF1.003	Feed Hopper Conveyor and Transfer to Main Conveyor	10	2,600	350	100,000	Tons of Rock	Water Sprays	75%	PM	0.003	lb/ton	0.26	0.038	AP-42 Ch. 11.19.2-2 Conveyor Transfer Point (Uncontrolled) *w/ 75% control reduction*
									PM_{10}	0.0011	lb/ton	0.096	0.014	AP-42 Ch. 11.19.2-2 Conveyor Transfer Point (Uncontrolled) *w/ 75% control reduction*
									$PM_{2.5}$	0.00017	lb/ton	0.015	0.002	PM2.5=(PM10)*(0.53/0.035) *w/ 75% control reduction*

Formulas Used for Calculating Emission Limits

$$EL_{\frac{lb}{hr}} = (Th_{hour} * EF) * (1 - C_{eff})$$

$$EL_{\frac{ton}{year}} = \frac{(Th_{year} * EF) * (1 - C_{eff})}{2{,}000\ \frac{lb}{ton}}$$

Where:

C_{eff} = *The listed Control Efficiency for a given control and pollutant.*

EF = *The listed Uncontrolled Emission Factor for a given pollutant.*

$EL_{\frac{lb}{hr}}$ = *The requested Permit Emission Limit for a given pollutant in pounds per hour.*

$EL_{\frac{ton}{year}}$ = *The requested Permit Emission Limit for a given pollutant in tons per year.*

Th_{hour} = *The Throughput of Material through the system in tons per hour.*

Th_{year} = *The Throughput of Material through the system in tons per year.*

Example Calculation:

$$EL_{\frac{lb}{hr}} of\ PM = \left(350\ \frac{tons}{hour} * 0.0030\ \frac{lb}{ton}\right) * (1 - 0.750) = 0.263\ \frac{lb}{hour}$$

$$EL_{\frac{ton}{year}} of\ PM = \frac{100{,}000\ \frac{tons}{year} * 0.0030\ \frac{lb}{ton} * (1 - 0.750)}{2{,}000\ \frac{lb}{ton}} = 0.0375\ \frac{ton}{year}$$

Notes: The end result emission limits were intentionally rounded up in the table so that all emissions were included, even when the answer is held to two significant figures.

In this example $C_{eff} = 75.0\% = 0.750$.

Appendix 4

EXAMPLE OF EMISSION LIMIT CALCULATIONS FOR NON-METALLIC CRUSHING

Unit No.	Unit Description	Operating Hours		Throughput			Controls		Emissions					References
		Daily	Annual	Hourly	Annual	Units	Type	Efficiency or Dry Volume Flow Rate	Pollutant	Factor	Unit	Hourly Rate (lbs/hr)	Yearly Rate (tons/yr)	
System No. & Name:		System 02 - Cone Crusher												
PF1.004	Cone Crusher Including Associated Transfers (in from Main Conveyor and Discharge to Conveyor C-1)	10	2,600	350	100,000	Tons of Aggregate	Water Sprays	75%	PM	0.0054	lb/ton	0.47	0.068	AP-42 Ch. 11.19.2-2 Tertiary Crushing (Uncontrolled) *w/ 75% control reduction*
									PM_{10}	0.0024	lb/ton	0.21	0.030	AP-42 Ch. 11.19.2-2 Tertiary Crushing (Uncontrolled) *w/ 75% control reduction*
									$PM_{2.5}$	0.00036	lb/ton	0.032	0.0045	PM2.5=(PM10)*(0.53/0.035) *w/ 75% control reduction*

Formulas for calculating Emission Limits

$$EL_{\frac{lb}{hr}} = (Th_{hour} * EF) * (1 - C_{eff}) \qquad EL_{\frac{ton}{year}} = \frac{(Th_{year} * EF) * (1 - C_{eff})}{2{,}000\,\frac{lb}{ton}}$$

Where:

C_{eff} = *The listed Control Efficiency for a given control and pollutant.*

EF = *The listed Uncontrolled Emission Factor for a given pollutant.*

$EL_{\frac{lb}{hr}}$ = *The requested Permit Emission Limit for a given pollutant in pounds per hour.*

$EL_{\frac{ton}{year}}$ = *The requested Permit Emission Limit for a given pollutant in tons per year.*

Th_{hour} = *The Throughput of Material through the crusher in tons per hour.*

Th_{year} = *The Throughput of Material through the crusher in tons per year.*

Example Calculation:

$$EL_{\frac{lb}{hr}}\,of\ PM = \left(350\ \frac{tons}{hour} * 0.0054\ \frac{lb}{ton}\right) * (1 - 0.750) = 0.473\,\frac{lb}{hour}$$

$$EL_{\frac{ton}{year}}\,of\ PM = \frac{100{,}000\,\frac{tons}{year} * 0.0054\,\frac{lb}{ton} * (1 - 0.750)}{2{,}000\,\frac{lb}{ton}} = 0.068\ \frac{ton}{year}$$

Notes: The end result emission limits were intentionally rounded up in the table so that all emissions were included, even when the answer is held to two significant figures.

In this example $C_{eff} = 75.0\% = 0.750$

Appendix 5

EXAMPLE OF EMISSION LIMIT CALCULATIONS FOR NON-METALLIC SCREENING

Unit No.	Unit Description	Operating Hours		Throughput			Controls		Emissions					References
		Daily	Annual	Hourly	Annual	Units	Type	Efficiency or Dry Volume Flow Rate	Pollutant	Factor	Unit	Hourly Rate (lbs/hr)	Yearly Rate (tons/yr)	
System No. & Name:		System 03 - Screen												
PF1.005	Screen Including Associated Transfers (in from Conveyor C-1 and Discharge to Conveyor C-2 and Crusher Feed Conveyor C-3)	10	2,600	350	100,000	Tons of Aggregate	Water Sprays	75%	PM	0.025	lb/ton	2.19	0.31	AP-42 Ch. 11.19.2 Crushed Stone and Pulverized Mineral Processing (Uncontrolled) *w/ 75% control reduction*
									PM_{10}	0.0087	lb/ton	0.76	0.11	AP-42 Ch. 11.19.2 Crushed Stone and Pulverized Mineral Processing (Uncontrolled) *w/ 75% control reduction*
									$PM_{2.5}$	0.00132	lb/ton	0.12	0.017	PM2.5=(PM10)*(0.53/0.035) *w/ 75% control reduction*

Formulas Used for Calculating Emission Limits

$$EL_{\frac{lb}{hr}} = (Th_{hour} * EF) * (1 - C_{eff}) \qquad EL_{\frac{ton}{year}} = \frac{(Th_{year} * EF) * (1 - C_{eff})}{2{,}000\ \frac{lb}{ton}}$$

Where:

C_{eff} = *The listed Control Efficiency for a given control and pollutant .*

EF = *The listed Uncontrolled Emission Factor for a given pollutant.*

$EL_{\frac{lb}{hr}}$ = *The requested Permit Emission Limit for a given pollutant in pounds per hour.*

$EL_{\frac{ton}{year}}$ = *The requested Permit Emission Limit for a given pollutant in tons per year.*

Th_{hour} = *The Throughput of Material through the screen in tons per hour.*

Th_{year} = *The Throughput of Material through the screen in tons per year.*

Example Calculation:

$$EL_{\frac{lb}{hr}} of\ PM = \left(350\ \frac{tons}{hour} * 0.025\ \frac{lb}{ton}\right) * (1 - 0.750) = 2.188\ \frac{lb}{hour}$$

$$EL_{\frac{ton}{year}} of\ PM = \frac{100{,}000\ \frac{tons}{year} * 0.025\ \frac{lb}{ton} * (1 - 0.750)}{2{,}000\ \frac{lb}{ton}} = 0.313\ \frac{ton}{year}$$

Notes: The end result emission limits were intentionally rounded up in the table so that all emissions were included, even when the

Appendix 6

EXAMPLE OF EMISSION LIMIT CALCULATIONS FOR BAGHOUSE CONTROLLED SYSTEM

Unit No.	Unit Description	Operating Hours		Throughput			Controls		Emissions					References
		Daily	Annual	Hourly	Annual	Units	Type	Efficiency or Dry Volume Flow Rate	Pollutant	Factor	Unit	Hourly Rate (lbs/hr)	Yearly Rate (tons/yr)	
System No. & Name:		System 03 - Screen												
S2.001	Crusher Feed Conveyor C-3	24	8,400	40	336,000	Tons of Aggregate	Baghouse BH-1	2,500 DSCFM	PM	0.02	gr/dscf	0.43	1.80	BAPC Default Value: Baghouse Grain Loading
									PM_{10}	0.02	gr/dscf	0.43	1.80	BAPC Default Value: Baghouse Grain Loading
									$PM_{2.5}$	0.02	gr/dscf	0.43	1.80	BAPC Default Value: Baghouse Grain Loading
System No. & Name:		Included under System 03 - Screen												
S2.002	Three Roll Crusher Including Transfer in from Crusher Feed Conveyor C-3 and Discharge to Crusher Discharge Conveyor C-4	24	8,400	40	336,000	Tons of Aggregate	Baghouse BH-1	2,500 DSCFM	PM	All controlled emissions are combined (see S2.001 Emissions)				
									PM_{10}					
									$PM_{2.5}$					
System No. & Name:		Included under System 03 - Screen												
S2.003	Crusher Discharge Conveyor C-4 and Discharge to Crusher Transfer Conveyor C-5	24	8,400	40	336,000	Tons of Aggregate	Baghouse BH-1	2,500 DSCFM	PM	All controlled emissions are combined (see S2.001 Emissions)				
									PM_{10}					
									$PM_{2.5}$					
System No. & Name:		Included under System 03 - Screen												
S2.004	Crusher Transfer Conveyor C-5 and Discharge to Kiln Hopper Feed Conveyor C-6	24	8,400	40	336,000	Tons of Aggregate	Baghouse BH-1	2,500 DSCFM	PM	All controlled emissions are combined (see S2.001 Emissions)				
									PM_{10}					
									$PM_{2.5}$					

Formulas Used for Calculating Emission Limits

$$EL_{\frac{lb}{hr}} = \left(FR\frac{DSCF}{min} * EF\frac{gr}{DSCF}\right) * 60\frac{min}{hour} * \frac{1\ lb}{7{,}000\ gr}$$

$$EL_{\frac{ton}{year}} = \left(FR\frac{DSCF}{min} * EF\frac{gr}{DSCF}\right) * 60\frac{min}{hour} * \frac{1\ lb}{7{,}000\ gr} * t_{year} * \frac{1\ ton}{2{,}000\ lb}$$

Where:

$EF = The\ listed\ Emission\ Factor\ for\ a\ given\ pollutant\ in\ grains\ per\ dry\ standard\ cubic\ feet.$

$EL_{\frac{lb}{hr}} = The\ requested\ Permit\ Emission\ Limit\ for\ a\ given\ pollutant\ in\ pounds\ per\ hour.$

$EL_{\frac{ton}{year}} = The\ requested\ Permit\ \ Emission\ Limit\ for\ a\ given\ pollutant\ in\ tons\ per\ year.$

$FR_{\frac{DSCF}{min}} = The\ requested\ Baghouse\ Stack\ Exit\ Flow\ Rate\ in\ dry\ standard\ cubic\ feet\ per\ minute.$

$t_{year} = The\ requested\ operating\ hours\ per\ year.$

Example Calculation:

$$EL_{\frac{lb}{hr}} = \left(2,500\frac{DSCF}{min} * 0.02\frac{gr}{DSCF}\right) * 60\frac{min}{hour} * \frac{1\ lb}{7,000\ gr} = 0.429\frac{lb}{hr}$$

$$EL_{\frac{ton}{year}} = \left(2,500\frac{DSCF}{min} * 0.02\frac{gr}{DSCF}\right) * 60\frac{min}{hour} * \frac{1\ lb}{7,000\ gr} * 8,400\frac{hr}{year} * \frac{1\ ton}{2,000\ lb} = 1.80\frac{ton}{year}$$

Notes: The end result emission limits may be intentionally rounded up in the table so that all emissions were included, even when the answer is held to two significant figures.

In this calculation, the ratio $\frac{1\ lb}{7,000\ gr}$ is a conversion factor of 7,000 grains in one pound of material.

gr = grain

Appendix 7

EXAMPLE OF EMISSION LIMIT CALCULATIONS FOR COOLING TOWERS

Unit No.	Unit Description	Operating Hours		Throughput			Controls		Emissions					References
		Daily	Annual	Hourly	Annual	Units	Type	Efficiency or Dry Volume Flow Rate	Pollutant	Factor	Unit	Hourly Rate (lbs/hr)	Yearly Rate (tons/yr)	
System No. & Name:		System 05 - Cooling Tower												
S2.005	Cooling Tower #2	24	8,760	630,000	5,518,800	Gallons of Water	Drfit Eliminator	75%	PM	0.00459	lb/1000 gal	0.73	3.17	AP-42 Table 13.4-1 Induced Draft (w/ 75% control reduction) *see attached calculation*
		Maximum Throughput Rate (gal/min)	10,500						PM_{10}	0.00459	lb/1000 gal	0.73	3.17	AP-42 Table 13.4-1 Induced Draft (w/ 75% control reduction) *see attached calculation*
		Drift Loss (%)	0.005%						$PM_{2.5}$	0.00459	lb/1000 gal	0.73	3.170	AP-42 Table 13.4-1 Induced Draft (w/ 75% control reduction) *see attached calculation*
		Total Dissolved Solids (ppmv)	2,750											

Data given by Applicant for the Cooling Tower:

Drift Loss $= D_{loss} = 0.005\% = 0.00005$

Maximum Water Throughput Rate (or Maximum Water recirculation Rate) $= WTR = 10{,}500\ \frac{gal}{min} = 630{,}000\ \frac{gal}{hour} = 5{,}518{,}800{,}000\ \frac{gal}{year}$

Total Dissolved Solids $= TDS = 2{,}750$ ppmw

Formulas Used for Calculating Emission Limits

$$\boldsymbol{EF_{PM10}} = \frac{\boldsymbol{TLDL}}{\boldsymbol{100\%}} * \frac{\boldsymbol{lb\ TDS}}{\boldsymbol{10^6\ lb\ drift}} * \frac{\boldsymbol{8.34\ lb\ water}}{\boldsymbol{gallon\ water}}$$

$$\boldsymbol{D_{uncontrolled}} = \frac{\boldsymbol{D_{loss}}}{\boldsymbol{TLDL}}$$

$$\boldsymbol{EL_{PM10\,\frac{lb}{hr}}} = \boldsymbol{EF_{PM10}} * \boldsymbol{WTR} * \frac{\boldsymbol{60\ min}}{\boldsymbol{hour}} * \boldsymbol{D_{uncontrolled}}$$

$$\boldsymbol{EL_{PM10\,\frac{ton}{year}}} = \frac{\boldsymbol{EL_{PM10\,\frac{lb}{hr}}} * \boldsymbol{t_{year}}}{\boldsymbol{2,000\,\frac{lb}{ton}}}$$

$$\boldsymbol{EL_{PM10\,\frac{lb}{year}}} = \boldsymbol{EL_{PM10\,\frac{lb}{hr}}} * \boldsymbol{t_{year}}$$

Where:

$\boldsymbol{D_{uncontrolled}} = Tower\ Uncontrolled\ Drift.$

$\boldsymbol{D_{loss}} = Drift\ Loss\ expressed\ as\ a\ percent, is\ provided\ by\ Permittee.$

$\boldsymbol{EF_{PM10}} = The\ Total\ Uncontrolled\ Emission\ Factor\ for\ PM_{10}\ in\ pounds\ per\ 1{,}000\ gallons\ of\ water\ recirculated.$

$\boldsymbol{EL_{PM10\,\frac{lb}{hr}}} = The\ Requested\ Permit\ Emission\ Limit\ for\ PM_{10}\ in\ pounds\ per\ hour.$

$\boldsymbol{EL_{PM10\,\frac{lb}{year}}} = The\ Requested\ Permit\ Emission\ Limit\ for\ PM_{10}\ in\ pounds\ per\ year.$

$\boldsymbol{EL_{PM10\,\frac{ton}{year}}} = The\ Requested\ Permit\ Emission\ Limit\ for\ PM_{10}\ in\ tons\ per\ year.$

$\boldsymbol{t_{year}} = The\ requested\ operating\ hours\ in\ hours\ per\ year.$

$\boldsymbol{TDS} = Total\ Disolved\ Solids\ in\ parts\ per\ million\ by\ weight.$

$\boldsymbol{TLDL} = The\ Total\ Liquid\ Drift\ Loss\ expressed\ as\ a\ percent\ (from\ AP\ 42\ Ch.\ 13.4\ Wet\ Cooling\ Towers, Table\ 13.4-1).$

$\boldsymbol{WTR} = The\ Maximum\ Water\ Throughput\ Rate\ in\ gallon\ per\ minute, gallon\ per\ hour, or\ gallon\ per\ year.$

Example Calculation:

$$EF_{PM10} = 0.00020 * \frac{2,750\ lb\ TDS}{10^6\ lb\ drift} * \frac{8.34\ lb\ water}{gal\ water} = 0.00459 \frac{lb\ TDS}{1000\ gal} = 0.00459 \frac{lb\ PM_{10}}{1000\ gal}$$

$$D_{uncontrolled} = \frac{0.005\%}{0.020\%} = 0.25$$

$$EL_{PM10\ \frac{lb}{hr}} = 0.00459 \frac{lb\ PM_{10}}{1000\ gal} * 10,500 \frac{gal}{min} * \frac{60\ min}{hour} * 0.25 = 0.723 \frac{lb}{hour}$$

$$EL_{PM10\ \frac{ton}{year}} = \frac{0.723 \frac{lb}{hour} * 8,760 \frac{hour}{year}}{2,000 \frac{lb}{ton}} = 3.167 \frac{ton}{year}$$

$$EL_{PM10\ \frac{ton}{year}} = 0.724\ \frac{lb}{hour} * 8,760 \frac{hours}{year} = 6,340\ \frac{lb}{year}$$

Notes: The end result emission limits may be intentionally rounded up in the table so that all emissions were included, even when the answer is held to two significant figures.

In this calculation TLDL = 0.020% = 0.00020.

With cooling towers, all particulate matter is assumed to be equal to PM_{10}, thus PM = PM_{10} = $PM_{2.5}$.
If the Applicant does not provide the Drift Loss percentage (D_{loss}), then D_{loss} defaults to an assumed value of 0.020% and $D_{uncontrolled} = \frac{0.020\%}{0.020\%} = 1$.
If $EL_{PM10\ \frac{lb}{year}}$ is less than4,000 $\frac{lb}{year}$, then the Applicant may request a determination by the BAPC that the unit be considered an Insignificant Activity.
If $EL_{PM10\ \frac{lb}{year}}$ is greater than4,000 $\frac{lb}{year}$, then the cooling tower may not be considered an Insignificant Activity and must be a permitted system.

Appendix 8

EXAMPLE OF EMISSION LIMIT CALCULATIONS FOR DRYING OVEN COMBINED EMISSIONS

Unit No.	Unit Description	Operating Hours		Heat Input (MMBtu)		Material Throughput or Fuel Usage			Power Output		Controls		Emissions					References
		Daily	Annual	Hourly	Annual	Hourly	Annual	Units	Amount	Units	Type	Efficiency or Dry Volume Flow Rate	Pollutant	Factor	Unit	Hourly Rate (lbs/hr)	Yearly Rate (tons/yr)	
	System No. & Name:	System 06 - Industrial Dyring Oven																
S2.006a	1.5 MMBtu/hr Drying Oven and Discharge to Supersacks (Throughput of Metallic Ore)	24	6,000	N/A	N/A	5	30,000	Tons of Metallic Ore	N/A	N/A	N/A	N/A	PM	0.12	lb/ton	0.6	1.8	AP-42 Ch. 11.24, Table 11.24-2 (Uncontrolled)
													PM_{10}	0.06	lb/ton	0.3	0.9	AP-42 Ch. 11.24, Table 11.24-2 (Uncontrolled)
													$PM_{2.5}$	0.009	lb/ton	0.045	0.135	AP-42 Ch. 11.24, Table 11.24-2 (Uncontrolled)
	System No. & Name:	System 06 - Industrial Dyring Oven																
S2.006b	1.5 MMBtu/hr Drying Oven and Dsicharge to Supersacs (Combustion)	24	6,000	1.5	8,996	1,470	8,820,000	Cubic Feet of Natural Gas	N/A	N/A	N/A	N/A	PM	7.6	lb/10^6 scf	0.011	0.034	AP-42 Ch. 1.4 Table 1.4-2 (Uncontrolled)
													PM_{10}	7.6	lb/10^6 scf	0.011	0.034	Assume PM=PM10
													$PM_{2.5}$	7.6	lb/10^6 scf	0.011	0.034	Assume PM=PM2.5
													SO_2	0.6	lb/10^6 scf	0.0009	0.0026	AP-42 Ch. 1.4 Table 1.4-2 (Uncontrolled)
													NO_X	10	lb/10^6 scf	0.015	0.044	AP-42 Ch. 1.4 Table 1.4-1 (Uncontrolled)
													CO	84	lb/10^6 scf	0.12	0.37	AP-42 Ch. 1.4 Table 1.4-1 (Uncontrolled)
													VOC	5.5	lb/10^6 scf	0.0081	0.024	AP-42 Ch. 1.4 Table 1.4-2 (Uncontrolled)

Unit No.	Unit Description	Operating Hours		Heat Input (MMBtu)		Fuel Usage			Controls		Emissions						References
		Daily	Annual	Hourly	Annual	Hourly	Annual	Units	Type	Efficiency or Dry Volume Flow Rate	Pollutant	Factor	Unit	GWP Multiplier	Hourly Rate (lbs/hr)	Yearly Rate (tons/yr)	
	System No. & Name:	System 06 - Industrial Drying Oven															
S2.006	1.5 MMBtu/hr Drying Oven and Discharge to Supersacks	24	6,000	1.50	8,996	1,470	8,820,000	Cubic Feet of Natural Gas	N/A	N/A	CO_2	120,000	lb/10^6 scf	1	176.4	529.2	AP-42 Ch. 1.4, Table 1.4-2
											CH_4	2.30	lb/10^6 scf	25	0.085	0.25	AP-42 Ch. 1.4, Table 1.4-2
											N_2O	2.20	lb/10^6 scf	298	0.96	2.89	AP-42 Ch. 1.4, Table 1.4-2
											Total CO2e				177.4	532.3	AP-42 Ch. 1.4, Table 1.4-2

Unit No.	Unit Description	Emissions					References
		Pollutant	Factor	Unit	Hourly Rate (lbs/hr)	Yearly Rate (tons/yr)	
System No. & Name:		System 06 - Industrial Drying Oven					
S2.006b	1.5 MMBtu/hr Drying Oven and Discharge to Supersacs (Combustion)	2-Methylnaphthalene	2.35E-08	lb/MMBtu	3.53E-08	1.06E-07	AP42 Table 1.4-3
		3-Methylchloranthrene	1.76E-09	lb/MMBtu	2.65E-09	7.94E-09	AP42 Table 1.4-3
		7,12-Dimethylbenz(a)anthracene	1.57E-08	lb/MMBtu	2.35E-08	7.06E-08	AP42 Table 1.4-3
		Acenaphthene	1.76E-09	lb/MMBtu	2.65E-09	7.94E-09	AP42 Table 1.4-3
		Acenaphthylene	1.76E-09	lb/MMBtu	2.65E-09	7.94E-09	AP42 Table 1.4-3
		Anthracene	2.35E-09	lb/MMBtu	3.53E-09	1.06E-08	AP42 Table 1.4-3
		Benz(a)anthracene	1.76E-09	lb/MMBtu	2.65E-09	7.94E-09	AP42 Table 1.4-3
		Benzene	2.06E-06	lb/MMBtu	3.09E-06	9.26E-06	AP42 Table 1.4-3
		Benzo(a)pyrene	1.18E-09	lb/MMBtu	1.76E-09	5.29E-09	AP42 Table 1.4-3
		Benzo(b)fluoranthene	1.76E-09	lb/MMBtu	2.65E-09	7.94E-09	AP42 Table 1.4-3
		Benzo(g,h,i)perylene	1.76E-09	lb/MMBtu	2.65E-09	7.94E-09	AP42 Table 1.4-3
		Benzo(k)fluoranthene	2.06E-06	lb/MMBtu	3.09E-06	9.26E-06	AP42 Table 1.4-3
		Chrysene	1.76E-09	lb/MMBtu	2.65E-09	7.94E-09	AP42 Table 1.4-3
		Dibenzo(a,h)anthracene	1.18E-09	lb/MMBtu	1.76E-09	5.29E-09	AP42 Table 1.4-3
		Dichlorobenzene	1.18E-06	lb/MMBtu	1.76E-06	5.29E-06	AP42 Table 1.4-3
		Fluoranthene	2.94E-09	lb/MMBtu	4.41E-09	1.32E-08	AP42 Table 1.4-3
		Fluorene	2.75E-09	lb/MMBtu	4.12E-09	1.23E-08	AP42 Table 1.4-3
		Formaldehyde	7.35E-05	lb/MMBtu	1.10E-04	3.31E-04	AP42 Table 1.4-3
		Hexane	1.76E-03	lb/MMBtu	2.65E-03	7.94E-03	AP42 Table 1.4-3
		Indeno(1,2,3-cd)pyrene	1.76E-09	lb/MMBtu	2.65E-09	7.94E-09	AP42 Table 1.4-3
		Napthalene	5.98E-07	lb/MMBtu	8.97E-07	2.69E-06	AP42 Table 1.4-3
		Phenanathrene	1.67E-08	lb/MMBtu	2.50E-08	7.50E-08	AP42 Table 1.4-3
		Pyrene	4.90E-09	lb/MMBtu	7.35E-09	2.21E-08	AP42 Table 1.4-3
		Toluene	3.33E-06	lb/MMBtu	5.00E-06	1.50E-05	AP42 Table 1.4-3
		Arsenic	1.96E-07	lb/MMBtu	2.94E-07	8.82E-07	AP42 Table 1.4-4
		Beryllium	1.18E-08	lb/MMBtu	1.76E-08	5.29E-08	AP42 Table 1.4-4
		Cadmium	1.08E-06	lb/MMBtu	1.62E-06	4.85E-06	AP42 Table 1.4-4
		Chromium	1.37E-06	lb/MMBtu	2.06E-06	6.17E-06	AP42 Table 1.4-4
		Cobalt	8.24E-08	lb/MMBtu	1.23E-07	3.70E-07	AP42 Table 1.4-4
		Manganese	3.73E-07	lb/MMBtu	5.59E-07	1.68E-06	AP42 Table 1.4-4
		Mercury	2.55E-07	lb/MMBtu	3.82E-07	1.15E-06	AP42 Table 1.4-4
		Nickel	2.06E-06	lb/MMBtu	3.09E-06	9.26E-06	AP42 Table 1.4-4
		Selenium	2.35E-08	lb/MMBtu	3.53E-08	1.06E-07	AP42 Table 1.4-4
Hazardous Air Pollutants (HAPs) Totals:					2.78E-03	8.34E-03	AP42 Table 1.4-3

Formulas Used for Calculating Emission Limits

$$ER_{Th\frac{lb}{hr}} = (Th_{hour} * EF_{Th}) * (1 - C_{eff}) \qquad ER_{Th\frac{ton}{year}} = \frac{(Th_{year} * EF_{Th}) * (1 - C_{eff})}{2{,}000\frac{lb}{ton}}$$

$$ER_{C\frac{lb}{hr}} = (FC_{Hour} * EF_{C}) * (1 - C_{eff}) \qquad ER_{C\frac{ton}{year}} = \frac{(FC_{year} * EF_{C}) * (1 - C_{eff})}{2{,}000\frac{lb}{ton}}$$

$$EL_{\frac{lb}{hr}} = ER_{Th\frac{lb}{hr}} + ER_{C\frac{lb}{hr}} \qquad EL_{\frac{ton}{year}} = ER_{Th\frac{ton}{year}} + ER_{C\frac{ton}{year}}$$

Where:

$C_{eff} = The\ listed\ Control\ Efficiency\ for\ a\ given\ control\ and\ pollutant.$

$EL_{\frac{lb}{hr}} = The\ requested\ Permit\ Emission\ Limit\ for\ a\ given\ pollutant\ in\ pounds\ per\ hour.$

$EL_{\frac{ton}{year}} = The\ requested\ Permit\ \ Emission\ Limit\ for\ a\ given\ pollutant\ in\ tons\ per\ year.$

$EF_{Th} = The\ listed\ Uncontrolled\ Emission\ Factor\ for\ a\ given\ pollutant\ for\ the\ throughput\ of\ material\ through\ the\ Drying\ Oven.$

$EF_{C} = The\ listed\ Uncontrolled\ Emission\ Factor\ for\ a\ given\ pollutant\ for\ the\ combustion\ within\ Drying\ Oven.$

$ER_{Th\frac{lb}{hr}} = The\ calculated\ Emission\ Rate\ for\ a\ given\ pollutant\ from\ the\ throughput\ of\ material\ through\ the\ Drying\ Oven, in\ pounds\ per\ hour.$

$ER_{Th\frac{ton}{year}}$

$= The\ calculated\ Permit\ \ Emission\ Rate\ for\ a\ given\ pollutant\ from\ the\ throughput\ of\ material\ through\ the\ Drying\ Oven, in\ tons\ per\ year.$

$ER_{C\frac{lb}{hr}} = The\ calculated\ Emission\ Rate\ for\ a\ given\ pollutant\ from\ combustion\ within\ Drying\ Oven, in\ pounds\ per\ hour.$

$ER_{C\frac{ton}{year}} = The\ calculated\ Emission\ Rate\ for\ a\ given\ pollutant\ from\ combustion\ within\ Drying\ Oven, in\ tons\ per\ year.$

$FC_{hour} = The\ Fuel\ Combustion\ rate\ in\ units\ of\ volume\ per\ hour. The\ units\ for\ FC\ will\ vary\ depending\ on\ the\ type\ of\ fuel\ being\ combusted.$

$FC_{year} = The\ Fuel\ Combustion\ rate\ in\ units\ of\ volume\ per\ year.$

$Th_{hour} = The\ throughput\ of\ ore\ through\ the\ drying\ oven\ in\ tons\ per\ hour.$

$Th_{year} = The\ throughput\ of\ ore\ through\ the\ drying\ oven\ in\ tons\ per\ year.$

Multipliers Used for Calculating Greenhouse Gas (CO_2e) Emissions

When calculating Greenhouse Gas (otherwise known as CO_2e) emissions, the chemical-specific global warming potentials (GWP) of Carbon Dioxide (CO2), Methane (CH4), and Nitrous Oxide (N2O) are multiplied by their respective GWP factors (1, 25, and 298, respectively), as specified under Table A-1 to Subpart 98 Global Warming Potentials, and added together.

Note: For default Heat Content Values see Chapter 5.1.3 For Reciprocating Internal Combustion Engines (RICE) Only.

Example Calculation:

$$ER_{Th\frac{lb}{hr}}\ for\ PM = \left(5\frac{ton}{hour} * 0.12\frac{lb}{ton}\right) * (1-0) = 0.600\frac{lb}{hour}$$

$$ER_{Th\frac{ton}{year}}\ for\ PM = \frac{(30{,}000\frac{ton}{year} * 0.12\frac{lb}{ton}) * (1-0)}{2{,}000\ \frac{lb}{ton}} = 1.800\frac{ton}{year}$$

$$ER_{C\frac{lb}{hr}}\ for\ PM = (1{,}470\frac{cubic\ feet}{hour} * \frac{7.6\ lb}{10^6\ cubic\ feet}) * (1-0) = 0.011\frac{lb}{hour}$$

$$ER_{C\frac{ton}{year}}\ for\ PM = \frac{(8{,}820{,}000\frac{cubic\ feet}{year} * \frac{7.6\ lb}{10^6\ cubic\ feet}) * (1-0)}{2{,}000\ \frac{lb}{ton}} = 0.034\frac{ton}{year}$$

$$EL_{\frac{lb}{hr}}\ for\ PM = 0.011\frac{lb}{hour} + 0.60\frac{lb}{hour} = 0.611\frac{lb}{hour}$$

$$EL_{\frac{ton}{year}}\ for\ PM = 1.800\frac{ton}{year} + 0.034\frac{ton}{year} = 1.834\frac{ton}{year}$$

Notes: The end result emission limits may be intentionally rounded up in the table so that all emissions were included, even when the answer is held to two significant figures.

In this example the system is uncontrolled so $C_{eff} = 0$.

Appendix 9

EXAMPLE OF EMISSION LIMIT CALCULATIONS FOR RECIPROCATING INTERNAL COMBUSTION ENGINES (RICE)

Unit No.	Unit Description	Operating Hours		Heat Input (MMBtu)		Material Throughput or Fuel Usage			Power Output		Controls		Emissions					References
		Daily	Annual	Hourly	Annual	Hourly	Annual	Units	Amount	Units	Type	Efficiency or Dry Volume Flow Rate	Pollutant	Factor	Unit	Hourly Rate (lbs/hr)	Yearly Rate (tons/yr)	
System No. & Name:		System 07 - Diesel Generator																
S2.007	2,944 HP Caterpillar Diesel Generator, Model #35516C, Mfd. In 2014	24	8,760	19.53	171,083	139.5	1,222,020	Gallons of Diesel	2,944	HP	N/A	N/A	PM	0.000027	lb/hp-hr	0.08	0.35	Manufacturer's Guarantee
													PM_{10}	0.000027	lb/hp-hr	0.08	0.35	Manufacturer's Guarantee
													$PM_{2.5}$	0.000027	lb/hp-hr	0.08	0.35	Assume PM10=PM2.5
													SO_2	0.000012	lb/hp-hr	0.036	0.16	AP-42 Table 3.4-1. Sulfur content 0.0015%
													NO_X	0.00086	lb/hp-hr	2.54	11.13	Manufacturer's Guarantee
													CO	0.000054	lb/hp-hr	0.16	0.07	Manufacturer's Guarantee
													VOC	0.000017	lb/hp-hr	0.05	0.22	Manufacturer's Guarantee

Unit No.	Unit Description	Operating Hours		Heat Input (MMBtu)		Fuel Usage			Controls		Emissions						References
		Daily	Annual	Hourly	Annual	Hourly	Annual	Units	Type	Efficiency or Dry Volume Flow Rate	Pollutant	Factor	Unit	GWP Multiplier	Hourly Rate (lbs/hr)	Yearly Rate (tons/yr)	
System No. & Name:		System 07 - Diesel Generator															
S2.007	2,944 HP Caterpillar Diesel Generator, Model #35516C, Mfd. In 2014	24	8,760	19.53	171,083	139.5	1,222,020	Gallons of Diesel	N/A	N/A	CO_2	163.05	lb/MMBtu	1	3,184.4	13,947.5	AP-42 Table 3.3-1
											CH_4	0.0066	lb/MMBtu	25	3.2	14.1	40 CFR Part 98 Table C-1
											N_2O	0.0013	lb/MMBtu	298	7.57	33.14	40 CFR Part 98 Table C-1
											Total CO2e				3,195.2	13,994.8	AP-42 Table 3.3-1

Unit No.	Unit Description	Emissions					References
		Pollutant	Factor	Unit	Hourly Rate (lbs/hr)	Yearly Rate (tons/yr)	
System No. & Name:		System 07 - Diesel Generator					
S2.007	2,944 Caterpillar Diesel Generator, Model #35516C, Mfd. in 2014	Benzene	9.33E-04	lb/MMBtu	1.82E-02	7.98E-02	AP 42 Table 3.3-2
		Toluene	4.09E-04	lb/MMBtu	7.99E-03	3.50E-02	AP 42 Table 3.3-2
		Xylenes	2.85E-04	lb/MMBtu	5.57E-03	2.44E-02	AP 42 Table 3.3-2
		1,3-Butadiene	3.91E-05	lb/MMBtu	7.64E-04	3.34E-03	AP 42 Table 3.3-2
		Formaldehyde	1.18E-03	lb/MMBtu	2.30E-02	1.01E-01	AP 42 Table 3.3-2
		Acetaldehyde	7.67E-04	lb/MMBtu	1.50E-02	6.56E-02	AP 42 Table 3.3-2
		Acrolein	9.25E-05	lb/MMBtu	1.81E-03	7.91E-03	AP 42 Table 3.3-2
		Naphthalene	8.48E-05	lb/MMBtu	1.66E-03	7.25E-03	AP 42 Table 3.3-2
Hazardous Air Pollutants (HAPs) Totals:					7.40E-02	3.24E-01	AP 42 Table 3.3-2

Any referenced manufacturer's guarantee must be included in application

Formulas Used for Calculating Emission Limits

$$EL_{\frac{lb}{hr}} = (HP * EF) * (1 - C_{eff}) \qquad EL_{\frac{ton}{year}} = \frac{(HP*EF)*(1-C_{eff})*t_{year}}{2{,}000\,\frac{lb}{ton}}$$

Where:

$C_{eff} = The\ listed\ Control\ Efficiency\ for\ a\ given\ control\ and\ pollutant\ .$

$EF = The\ listed\ Uncontrolled\ Emission\ Factor\ for\ a\ given\ pollutant\ in\ pounds\ per\ horsepower\ hour.$

$EL_{\frac{lb}{hr}} = The\ requested\ Permit\ Emission\ Limit\ for\ a\ given\ pollutant\ in\ pounds\ per\ hour.$

$EL_{\frac{ton}{year}} = The\ requested\ Permit\ \ Emission\ limit\ for\ a\ given\ pollutant\ in\ tons\ per\ year.$

$HP = The\ power\ output\ for\ the\ system\ in\ horsepower.$

$t_{year} = The\ requested\ operating\ hours\ in\ hours\ per\ year.$

Example Calculation:

$$EL_{\frac{lb}{hr}} = \left(2{,}944\ hp * 0.0000272\,\frac{lb}{hp-hr}\right) * (1-0) = 0.080\ \frac{lb}{hr}$$

$$EL_{\frac{ton}{year}} = \frac{\left(2{,}944\ hp * 0.0000272\,\frac{lb}{hp-hr}\right) * (1-0) * 8{,}760\ \frac{hr}{year}}{2{,}000\ \frac{lb}{ton}} = 0.350\ \frac{ton}{year}$$

Notes: The end result emission limits may be intentionally rounded up in the table so that all emissions were included, even when the answer is held to two significant figures.

In this example the system is uncontrolled so $C_{eff} = 0$.