Frequently Asked Questions for Stationary Internal Combustion Engines

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Disclaimer: The BAPC reserves the right to modify this guidance at any time. This document supersedes any previous documents that relate to stationary engines issued by the BAPC.

1) I have a generator that I need to add to my permit. What information should I provide?
   - *The BAPC permits the engine that is powering the generator. The facility should provide the horsepower, specification sheet, and any other information about the engine. If the facility has the unit already onsite this information would be shown on the engine plate of the generator.*

2) What do I need to provide in my application if I have an engine at my facility?
   - *Manufacturer's specification that includes maximum fuel flow, rated power (in hp/kW), and EPA certified emissions (e.g. for 40 CFR Part 60 Subparts IIII, JJJJ).*

3) What if my engine's manufacturer specifications do not include the maximum fuel flow rate?
   - *Option 1: Provide a photograph of the engine's name plate displaying the horsepower or kilowatt rating.*

     Example calculation to obtain the fuel flow of diesel fuel can be found below:

$$\boldsymbol{Fuel\ Rate_{max}} = \mathbf{7,000}\ \frac{\boldsymbol{Btu}}{(\boldsymbol{HP})(\boldsymbol{hr})} * \frac{\boldsymbol{gal_{diesel}}}{\mathbf{140,000_{Btu}}} * \boldsymbol{HP} = \boldsymbol{X}\ \frac{\boldsymbol{gal_{diesel}}}{\boldsymbol{hr}}$$

   - *Option 2: install a fuel flow meter (additional monitoring requirements will be written in the permit).*

4) What if my engine's manufacturer specifications do not include EPA certified emissions?
   - *Use the appropriate AP-42, CARB, CFR, or other approved emission factors. Note that requested emission limits cannot exceed any applicable federal emission standards.*

5) What is the maximum amount of hours per year I can operate my emergency engine?
   - *Emergency engines are limited to 100 hours per year of non-emergency use. Operating hours are not limited during emergency situations.*

6) What emission factors should I use for a propane engine?
   - *Use CARB or other approved emission factors attached to this guidance.*

7) Which SO_2 emission factors should I use?

- *A mass balance calculation is acceptable, and must provide step-by-step calculations showing how the emissions were derived. Please refer to the example below.*

$$EL_{\frac{lb}{hr}} = FR * \rho_{diesel} * S_{diesel} * \frac{2\ lbs\ SO_2}{1\ lb\ S} \qquad EL_{\frac{ton}{yr}} = \frac{FR * \rho_{diesel} * S_{diesel} * \frac{2\ lbs\ SO_2}{1\ lb\ S} * \frac{hrs}{yr}}{2{,}000\frac{lbs}{ton}}$$

Where:

FR = *The requested combustion NG fuel rate in standard cubic feet (scf)per hour.*
ρ_{diesel} = *Density of diesel in pounds per gallon. The BAPC default value is* ***6.943*** *lbs/gal*
S_{diesel} = *Sulfur content of diesel fuel in parts per million by weight (ppmw).*
EL = *Emission Limit*
Note: Modern diesel cannot exceed 15 ppm S pursuant to 40 CFR 80.510(b). The SO_2 emission limit of an engine is dependent on the sulfur content of the fuel. The fuel supplier should provide the sulfur content of the fuel.

- *AP-42 Chapter 3.4 SO_2 emission factors may be utilized for small and large diesel engines.*

8) AP-42 provides emission factors in units of lb/hp-hr and lb/MMBtu. Which one should I use?

- *The BAPC prefers emission factors in lb/MMBtu; however, both are acceptable.*

9) What if I have a NMHC+NO_X emission factor?

- *This emission factor may only be used to calculate NO_X emission limits.*

10) What federal subpart(s) is my engine subject to?

- Use the table below:

Federal Subparts Which May be Applicable			
Engine Type	**Year Engine Manufactured**	**You may be subject to…**	**Reference**
Compression Ignition (CI) (I.e. Diesel)	2005 and Older	40 CFR Part 63, Subpart ZZZZ	40 CFR 63.6580
	2005 to Present	40 CFR Part 60, Subpart IIII and 40 CFR Part 63, Subpart ZZZZ	40 CFR 60.4200 40 CFR 63.6580
Spark Ignition (SI) (I.e. Gasoline, Natural Gas, or Propane)	2006 and Older	40 CFR Part 63, Subpart ZZZZ	40 CFR 63.6580
	2006 to Present	40 CFR Part 60, Subpart JJJJ and 40 CFR Part 63, Subpart ZZZZ	40 CFR 60.4230 40 CFR 63.6580

E08 - ENGINE, PROPANE FIRED, UNCONTROLLED

CALCULATION METHODS

Ea = Ua x EF (lbs/1000 gallons)

Eh = Uh (gal/hr) x (1/1000) x EF (lbs/1000 gallons)

NOTES:

- Control efficiencies must be included in emission factors since the calculation procedure will not refer to this data.

- There are no current emission factors specified in AP-42 for propane fired engines. Previous factors were identified in the ARB Instructions for the Emission Data System (8/91), Appendix III, Page III-7.

- Trace metal emission factors are assumed to be negligible for propane fuel.

- Trace organic compounds are assumed 100% propane. ARB VOC Speciation Profile 719 (8/91) is for natural gas not propane.

POLLUTANT	District Emission Factor	REFERENCE	ARB	(UNITS)	COMMENTS
	(lbs/1000 gal fuel burned)	DOCUMENT	FACTOR		
NOX	139.00	See Comments	139	(lbs/1000 gal)	ARB "Instructions for the Emission Data System Review & Update Report 8/91".
CO	129.00		129		
SOX	0.35		0.35		
TOG	83.00		83		Assume all TOG and ROG is propane (i.e.; negligible methane, formaldehyde, etc.)
ROG	83.00		83		
TSP	5.00		5		
PM10	5.00		5		
BENZENE					
1,3-BUTADIENE					
CHLORINE					
ETHYL BENZENE					
FORMALDEHYDE					
HEXANE					
HYDROGEN CHLORIDE					
HYDROGEN SULFIDE					
PROPANE	83.00	Not a listed substance			Assume all ROG and TOG is propane.
TOLUENE					
XYLENES					

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