

Combustion System Improvement (No.) (372)

DEFINITION

Installing, replacing, or retrofitting agricultural combustion systems and/or related components or devices for air quality and energy efficiency improvement.

PURPOSE

- To improve air quality by addressing the air quality resource concerns for particulate matter and ozone precursors by mitigating actual or potential emissions of oxides of nitrogen and/or fine particulate matter
- To improve the energy efficiency of agricultural combustion systems

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to any agricultural operation that operates an agricultural combustion system, including stationary, portable, mobile, and self-propelled equipment. The combustion system must be used primarily for agricultural and/or forestry activities.

For a combustion system associated with a pumping plant (i.e., pumping plant power unit), use Conservation Practice Standard, Pumping Plant, Code 533. This standard (Combustion System Improvement for Air and Energy, Code 372) may be applied in addition to the Pumping Plant standard for addressing air quality resource concerns associated with a pumping plant power unit, if applicable.

CRITERIA

General Criteria Applicable to All Purposes

Size the new or replacement combustion system and related components or devices appropriately to accomplish its intended task.

Combustion system improvement (including new, replacement, or retrofit combustion system and related components or devices) shall be planned, designed, and installed in accordance with all federal, state, local, and tribal laws and regulations.

All replaced combustion systems shall be rendered inoperable or used to replace higher-emitting or lower-efficiency combustion systems. Certification of use as a replacement system can be accomplished by providing certification of inoperability of one or more higher-emitting or lower-efficiency combustion system(s).

Certification of inoperability can be accomplished by:

- Obtaining a receipt for the combustion system disposal from a scrap metal recycling operation and keeping this receipt available for inspection; or
- Creating a permanent hole in the engine block or combustion chamber of the combustion system (minimum size to be determined by federal, state, or local guidelines). The disabled engine must be kept on-farm for inspection, or a written and signed certification that a permanent hole has been created and the engine is disabled must be prepared and kept available on-farm for inspection.

Additional Criteria Applicable to Improving Air Quality

A new or replacement combustion system and related components or devices shall utilize a non-combustion power source or a combustion power source that utilizes cleaner-burning technologies, techniques, and/or fuels.

When installing a new combustion system that is not a replacement system, the new combustion system shall emit fewer oxides of nitrogen and/or less fine particulate matter than the most commonly-installed alternative system. When installing a new or replacement diesel-powered engine, use the newest-available EPA engine TIER technology.

When installing a replacement combustion system and related components or devices, the replacement system shall emit fewer oxides of nitrogen and/or fine particulate matter than the replaced combustion system and related components or devices.

Retrofit can include actions or combinations of actions that reduce emissions of oxides of nitrogen and/or fine particulate matter. Examples of individual retrofit actions include:

- Adding one or more emissions control device(s),
- Altering air/fuel mixtures to achieve more complete combustion and less emissions,
- Adding a device that allows for reduced combustion of fuel to accomplish the same intended task,
- Accommodating the use of a cleaner-burning fuel, and/or
- Other physical modifications or changes in combustion techniques that reduce emissions formation or release.

Additional Criteria Applicable to Improving Energy Efficiency

Only the replacement or retrofit of an existing combustion system is allowed under this practice standard for the energy efficiency purpose.

Installation of new combustion systems where none existed prior are not allowed if energy efficiency is the sole purpose.

Replacement combustion systems shall be certified to be at least 20% more energy efficient than the systems they replace.

Retrofit to improve energy efficiency may involve adding a device that allows for reduced operation of an existing combustion system, such as a variable frequency drive or automated sensors and controls.

CONSIDERATIONS

Installation of new or replacement combustion systems with non-combustion renewable energy sources, such as solar, wind, and water, are preferred means of reducing air emissions associated with agricultural combustion systems. Non-combustion renewable energy sources do not release air emissions directly and do not increase air emissions from off-site electricity generation. The impacts of non-combustion renewable energy sources on other resources should also be considered to analyze their overall conservation benefit.

PLANS AND SPECIFICATIONS

Plans and specifications shall be prepared in accordance with the criteria of this standard and shall describe the requirements for applying the practice to achieve its intended use. Specifications shall be recorded using specification sheets, job sheets, practice requirement sheets, narrative statements in conservation plans, or other acceptable documents.

As a minimum, the plans and specifications shall provide the following:

- Identification and description of the existing combustion system and related components or devices, if applicable, and the new or replacement combustion system and related components or devices. If the combustion system is being retrofitted, identification and description of the type of modifications being made to the existing system.
- Requirements on disposal of replaced combustion system and related components or devices, including assuring permanent disabling and rendering inoperable.
- Documentation requirements to determine combustion system usage and resulting air

emissions from the new, replacement, or retrofit combustion system and related components or devices. Average annual air emissions for the existing combustion system (for replacements and retrofits) or alternative combustion system (for new installations) shall be calculated prior to the installation of the new combustion system or replacement or retrofit of the existing combustion system to determine the expected air emissions reductions from the application of this practice and to serve as a baseline for later air emissions calculations.

Additional support data documentation requirements are as follows, where applicable:

- Inventory and evaluation records
 - Assistance notes or special report
- Survey notes, where applicable
 - Design survey
 - Construction layout survey
 - Construction check survey
- Design records
 - Physical data, functional requirements, and site constraints, where applicable
 - Soils/subsurface investigation report, where applicable
- Design and quantity calculations
- Construction drawings/specifications with:
 - Location map
 - “Designed by” and “Checked by” names or initials
 - Approval signature
 - Job class designation
 - Initials from preconstruction conference
 - As-built notes
- Construction inspection records
 - Assistance notes or separate inspection records
 - Construction approval signature
- Record of any variances approved, where applicable
- Record of approvals of in-field changes affecting function and/or job class, where applicable.

OPERATION AND MAINTENANCE

An Operation and Maintenance (O&M) plan shall be developed for this practice. The O&M plan shall be consistent with the purposes of the practice, its intended life, safety requirements, and the criteria for the design.

REFERENCES

United States Environmental Protection Agency (U.S. EPA) National Clean Diesel Campaign for Agriculture (Clean Agriculture USA) website.

California Environmental Protection Agency Air Resources Board (CARB) Diesel Programs and Activities website