

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD
COMBUSTION SYSTEM IMPROVEMENT**

(No.)

CODE 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.

Use [Conservation Practice Standard \(CPS\) 533, Pumping Plant](#), for a combustion system associated with a pumping plant (for example, a pumping plant power unit). In addition to CPS 533, this standard (CPS 372, Combustion System Improvement) may be applied 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 the intended task.

Where required, certify that the new, replacement, or retrofitted combustion system and related components or devices meet or exceed currently applicable federal, state, and local standards and guidelines.

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 one or more of the following:

- Obtaining a receipt for the combustion system disposal from a scrap metal recycling operation and keeping this receipt available for inspection.
- 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 engine "tier" technology of the Environmental Protection Agency (EPA).

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.

Retrofitting can include actions or combinations of actions that reduce emissions of oxides of nitrogen and/or fine particulate matter. Examples of individual retrofitting actions include one or more of the following:

- Adding one or more emissions control device(s).
- Altering air/fuel mixtures to achieve more complete combustion and fewer 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.
- 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 retrofitting of an existing combustion system is allowed under this practice standard for the energy efficiency purpose. Installation of new combustion systems where none previously existed is 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.

Retrofitting 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

Specifications for application of this practice shall be prepared for each site or planning unit according to the criteria. Specifications shall be recorded using state-developed 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 any related components or devices and the new or replacement combustion system and any 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 ensuring

permanent disabling and rendering inoperable.

- Documentation requirements to determine combustion system usage and resulting air emissions from the new, replacement, or retrofitted combustion system and related components or devices. Average annual air emissions for the existing combustion system (for replacement and retrofitting) or alternative combustion system (for new installations) shall be calculated prior to the installation of the new, replacement, or retrofitted combustion system to determine the expected air emissions reduction from the application of this practice and to serve as a baseline for later air emissions calculations.

OPERATION AND MAINTENANCE

An operation and maintenance plan shall be developed that is consistent with the purposes of this practice, its intended life, safety requirements, and the criteria used for its design.

The new, replacement, or retrofitted combustion system and related components or devices shall be operated and maintained in

accordance with the manufacturer's recommendations.

NRCS recommends that records be retained and updated for a minimum of 5 years from the beginning of operation of a new, replacement, or retrofitted combustion system. The recommended records to be retained include the following:

- Total actual hours operated.
- Types and amounts of fuel used in the combustion system(s) or electricity used for electric motors that have replaced an existing combustion system.
- Documentation of maintenance conducted on the new, replacement, or retrofitted combustion system and related components or devices.

REFERENCES

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

California Environmental Protection Agency Air Resources Board (CARB) Diesel Programs and Activities Web site.