

**ENVIRONMENTAL PROTECTION COMMISSION [567]**

**Adopted and Filed**

Pursuant to the authority of Iowa Code section 455B.133, the Environmental Protection Commission hereby adopts an amendment to Chapter 20, “Scope of Title—Definitions—Forms—Rules of Practice,” Iowa Administrative Code.

This amendment to rule 567—20.2(455B) adds new definitions for “biodiesel fuel,” “diesel fuel,” and “number 1 fuel oil” and “number 2 fuel oil.”

Biodiesel fuel is a renewable, biodegradable liquid fuel derived from agricultural plant oils or animal fat. The most common type of biodiesel fuel used in Iowa is made from soybean oil. Number 1 and number 2 fuel oils are two distillate oils that are commonly used in internal combustion engines, and are sometimes used in boilers and combustion turbines. Diesel fuel is a low sulfur fuel oil that is also frequently used in internal combustion engines. Fuel blends of up to 2.0 percent biodiesel, by volume, are widely available and appear to be readily usable in most internal combustion engines.

Based on the available data, blends of diesel fuel, number 1 or number 2 fuel oil, with up to 2.0 percent biodiesel fuel, by volume, are not expected to result in measurable increases in air pollution. The Department therefore defines biodiesel blends at these specifications to be equivalent to unblended diesel fuel, number 1 fuel oil and number 2 fuel oil. Additionally, the Department considers construction or operating permits with restrictions for diesel fuel, number 1 fuel oil or number 2 fuel oil to include this biodiesel/fuel oil blend.

This modification will provide a benefit to facilities that currently combust diesel fuel, number 1 fuel oil or number 2 fuel oil and wish to consider using biodiesel/fuel oil blends because the facilities will no longer be required to apply for modifications of construction permits to make this fuel change. If

facilities wish to burn biodiesel/diesel or biodiesel/fuel oil blends of greater than 2.0 percent biodiesel, by volume, emissions calculations and permits will need to be modified accordingly.

The Iowa Association of Municipal Utilities (IAMU) approached the Department with information that some municipal utilities were interested in burning biodiesel in their internal combustion engines. Because emissions information was limited, the Department worked with IAMU and other interested parties during IAMU's air emissions testing of biodiesel/diesel blends in two diesel generators at a municipal utility.

The testing was conducted at Sumner Municipal Light. The two air pollutants of concern were particulate matter (PM) and nitrogen oxide (NO<sub>x</sub>). The testing results showed that particulate emissions decreased with a 10 percent biodiesel blend (B10) in both engines tested. NO<sub>x</sub> emissions decreased with a 10 percent biodiesel blend in the newer engine tested, but increased in the older engine tested.

Using B10 at Sumner resulted in a 10 percent increase in NO<sub>x</sub> emissions from the older engine. The newer engine showed a 13 percent NO<sub>x</sub> decrease. There is not sufficient information, however, to determine if engine age, or some other unknown factor, accounted for the disparity in NO<sub>x</sub> emissions.

It is known that new engines use electronically controlled fuel injection and intake air control, allowing for optimum fuel timing and air induction at all times, thereby reducing combustion temperatures, and thus NO<sub>x</sub> production. While older engines use mechanical injection and fixed air induction, improved results should be achieved with older engines by adjusting the mechanical timing and optimizing fixed air induction.

Although this technology could allow for some newer engines or retrofitted older engines to achieve reduced NO<sub>x</sub> production, there is not enough emissions data currently available to allow the Department to designate which engine years and models would qualify as "new" engines, or which engine years and models would be considered to be "old" engines.

The Department also reviewed an analysis of biodiesel emissions from mobile, heavy duty engines conducted by the U.S. Environmental Protection Agency (EPA). The EPA study showed that NO<sub>x</sub> emissions increased with increased biodiesel concentration, although to a lesser magnitude than in the results seen in the Sumner test. For example, when burning B10 in the mobile test engines, NO<sub>x</sub>

emissions increased an average of 1 percent. EPA's analysis did not find any correlation between engine model year and the emissions impacts from biodiesel.

It should be noted that the EPA study and the test results at Sumner cannot be directly compared. The mobile engines tested in the EPA study are much smaller than the stationary engines used at Sumner and other municipal utilities and have different equipment and operating parameters. Additionally, the emission testing methods used in the EPA study are not the EPA-approved testing methods for stationary sources of air pollutants.

Based on the limited testing data at Sumner, along with data from the EPA analysis, it is reasonable to assume that NO<sub>x</sub> emissions from stationary, internal combustion engines are linearly related to biodiesel concentration. That is, an increase in biodiesel concentration may cause a similar increase in NO<sub>x</sub> emissions. Therefore, the Department cannot consider the NO<sub>x</sub> emissions from a stationary, internal combustion engine from combustion of biodiesel blends greater than 2.0 percent biodiesel, by volume, to be equivalent to burning unblended diesel fuel, number 1 fuel oil or number 2 fuel oil.

Notice of Intended Action was published in the Iowa Administrative Bulletin on May 11, 2005, as **ARC 4159B**. A public hearing was held on June 14, 2005. No comments were received at the public hearing. One written comment was received prior to the close of the public comment period. The public comment period closed on June 20, 2005.

The submitted comment and the Department's response to the comment are summarized in a responsiveness summary available from the Department. In response to public comment, this amendment includes one minor administrative change from the amendment published under Notice of Intended Action. This change is noted below.

The National Biodiesel Board (NBB) submitted written comments in response to the Notice of Intended Action, urging the Department to reconsider the EPA mobile source testing data, as well as other emissions data, to potentially increase the proposed volume of biodiesel allowed in a blend without requiring a construction permit modification. As noted above, the EPA study of small mobile engines cannot be directly extrapolated to the large stationary engines used at Sumner Municipal Utilities and other facilities. NBB has not provided any additional, acceptable emissions testing data on these types

of engines. The Department is also not aware of any additional emissions testing data. The testing data from Sumner is currently the Department's only acceptable emissions test data on large stationary internal combustion engines.

With limited data, the Department must make a conservative emissions estimate to ensure that air quality is not adversely impacted. Therefore, the Department has proceeded with the amendment allowing up to a 2.0 percent biodiesel blend to be considered equivalent to diesel fuel and number 1 and number 2 fuel oils for air permitting and air emissions purposes. The Department is receptive to proposing an amendment to allow a higher percentage biodiesel blend at such time as the higher percentage can be supported by emissions testing data. The Department will continue to work closely with facilities in calculating their emissions and expeditiously obtaining any needed permit amendments.

The NBB also requested that the definition of "biodiesel fuel" be clarified to change the term "Act" to "Clean Air Act." The Department has modified this term to be consistent with references to the Clean Air Act elsewhere in the air quality rules.

This amendment is intended to implement Iowa Code section 455B.133.

This amendment shall become effective September 21, 2005.

The following amendment is adopted.

Amend rule **567—20.2(455B)** by adopting the following **new** definitions in alphabetical order:

"Biodiesel fuel" means a renewable, biodegradable, mono alkyl ester combustible liquid fuel derived from agricultural plant oils or animal fat such as, but not limited to, soybean oil. For purposes of this definition, "biodiesel fuel" must also meet the specifications of American Society for Testing and Material Specifications (ASTM) D 6751-02, "Standard Specification for Biodiesel Fuel (B100) Blend Stock for Distillate Fuels," and be registered with the U.S. Environmental Protection Agency as a fuel and a fuel additive under Section 211(b) of the Clean Air Act, 42 U.S.C. Sections 7401, et seq. as amended through November 15, 1990.

"Diesel fuel" means a low sulfur fuel oil that complies with the specifications for grade 1-D or 2-D, as defined by the American Society of Testing and Materials (ASTM) D 975-02, "Standard

Specification for Diesel Fuel Oils,” grade 1–GT or 2–GT, as defined by ASTM D 2880–00, “Standard Specification for Gas Turbine Fuel Oils,” or grade 1 or 2, as defined by ASTM D 396–02, “Standard Specification for Fuel Oils.”

1. For purposes of the air quality rules contained in Title II, and unless otherwise specified, diesel fuel may contain a blend of up to 2.0 percent biodiesel fuel, by volume, as “biodiesel fuel” is defined in this rule.

2. The department shall consider air pollutant emissions calculations for the biodiesel fuel blends specified in numbered paragraph “1” to be equivalent to the air pollutant emissions calculations for unblended diesel fuel.

3. Construction permits or operating permits issued under 567—Chapter 22 which restrict equipment fuel use to diesel fuel shall be considered by the department to include the biodiesel fuel blends specified in numbered paragraph “1,” unless otherwise specified in 567—Chapter 22 or in a permit issued under 567—Chapter 22.

“Number 1 fuel oil” and “number 2 fuel oil,” also known as “distillate oil,” mean fuel oil that complies with the specifications for fuel oil number 1 or fuel oil number 2, as defined by the American Society of Testing and Materials (ASTM) D 396–02, “Standard Specification for Fuel Oils.”

1. For purposes of the air quality rules contained in Title II, and unless otherwise specified, number 1 fuel oil or number 2 fuel oil may contain a blend of up to 2.0 percent biodiesel fuel, by volume, as “biodiesel fuel” is defined in this rule.

2. The department shall consider air pollutant emissions calculations for the biodiesel fuel blends specified in numbered paragraph “1” to be equivalent to the air pollutant emissions calculations for unblended number 1 fuel oil or unblended number 2 fuel oil.

3. Construction permits or operating permits issued under 567—Chapter 22 which restrict equipment fuel use to number 1 fuel oil or number 2 fuel oil shall be considered by the department to include the biodiesel fuel blends specified in numbered paragraph “1,” unless otherwise specified in 567—Chapter 22 or in a permit issued under 567—Chapter 22.

[Filed 7/28/05, effective 9/21/05]

[Published 8/17/05]

EDITOR'S NOTE: For replacement pages for IAC, see IAC Supplement 8/17/05.