U.S. Department
of Transportation
**Pipeline and Hazardous
Materials Safety
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

December 11, 2025

Ben Barrett
DG Advisor
6 Starry Way
P.O. BOX 248 Dubois,
WY 82513

Reference No. 25-0108

Dear Mr. Barrett:

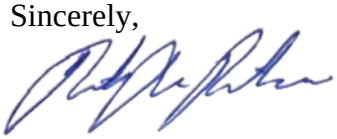
This letter is in response to your August 4, 2025 letter and previous conversations with PHMSA staff requesting clarification of the provisions of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) applicable to the classification of a hazardous material. Your client has developed a new agricultural fertilizer compound consisting of 69.5 percent ammonium nitrate, 30.5 percent ammonium phosphate, and no combustible substances. It is your understanding that this mixture is not regulated as a hazardous material because in accordance with the flowchart in Section 39.5 of the United Nations (UN) Manual of Tests and Criteria—Section 39.5—titled "Classification criteria" (which is incorporated by reference in the HMR), analysis of the fertilizer's properties leads to box 26 which states it is "Not classified." You seek confirmation that the mixture as described is not regulated as a hazardous material.

In accordance with § 173.22 of the HMR, it is the shipper's responsibility to properly classify a hazardous material, as this Office does not generally perform this function. However, based on

the information provided in your letter, it is the opinion of this Office that the agricultural fertilizer you have described is not regulated as a hazardous material. This is based on our understanding that the company classified its material in accordance with § 172.102, special provision 132, and followed the decision logic and required testing in the UN Manual of Tests and Criteria, 7th revised edition, as described in your incoming letter.

I hope this information is helpful. Please contact us if we can be of further assistance.

Sincerely,



Dirk DerKinderen
Chief, Standards Development Branch
Standards and Rulemaking Division

Baker, Y.
25-0108

BENJAMIN Y. BARRETT, PE
MARIE-FRANCE DAGENAIS, LL.L
KYLE D. BARRETT, JD
ADAM BURKS, MBA

6 STARRY WAY
P.O. BOX 248
DUBOIS, WY 82513 USA
PHONE: +1 (307) 455-2517
WWW.DGADVISOR.COM

8/4/25

Standards and Rulemaking Division
Pipeline and Hazardous Materials Safety Administration
U.S. Department of Transportation
1200 New Jersey Avenue, SE, East Building
Washington, DC 20590-0001

To Whom it May Concern:

I'm writing to kindly request a letter of interpretation to answer the question presented below. Defuse Technologies, LLC (Defuse) is a company based in Birmingham, Alabama, that researches and provides solutions for agricultural fertilizers. Defuse recently developed a new ammonium nitrate-based fertilizer (DAN) that eliminates the explosive characteristics of ammonium nitrate (AN) while maintaining the agricultural benefits of AN for crop growth.

We met recently with PHMSA staff to discuss the proper classification of this product, and we would like to confirm our understanding of the regulations. This material contains 69.5% ammonium nitrate and 30.5% ammonium phosphate (a fire retardant used to extinguish forest fires). It is our understanding that this mixture is not regulated as a dangerous good, as it takes the following path through the classification criteria of Section 39.5 of the UN Manual of Tests & Criteria, incorporated by reference into the CFR.

The path that was tentatively chosen with PHMSA in our meeting is as follows:

1. Figure 39.1(a) Classification criteria for solid ammonium nitrate based fertilizers.
    a. Box 1 – Defuse's product, DAN, is a fertilizer. Proceed to Box 2.
    b. Box 2 – DAN contains 69.5% ammonium nitrate. Proceed to Box 10.
    c. Box 10 – "Go to figure 39.1(b)". Proceed to Box 11.

2. Figure 39.1(b) Classification criteria for solid ammonium nitrate based fertilizers (*continued*)
    a. Box 11 – "(arrive) from figure 39.1(a)". Proceed to Box 12.
    b. Box 12 – DAN is an ammonium nitrate-based compound fertilizer. It contains nitrogen and phosphorus. Proceed to Box 13.
    c. Box 13 – DAN contains 69.5% ammonium nitrate, less than 70%. Proceed to Box 21.

d. Box 21 – DAN contains 69.5% ammonium nitrate, greater than 45%. Proceed to Box 22.
e. Box 22 – DAN contains no combustible substances, i.e., less than 0.4%. It consists of ammonium nitrate and ammonium phosphate, which combine into a homogenous mixture of ammonium phosphate nitrate compounds. Proceed to Box 24.
f. Box 24 – DAN passed the UN S.1 Trough Test and is not capable of self-sustaining decomposition. Proceed to Box 26.
g. Box 26 – "Not Classified."
h. Thus, DAN is Not Regulated in Class 1.

Based on the foregoing information, please clarify whether Defuse Ammonium Nitrate is regulated by the Department of Transportation Pipeline and Hazardous Materials Safety Administration).

Thank you for your consideration,

Ben Barrett

Attachments: 1. MTC Figure 39.1 Charts

SECTION 39

CLASSIFICATION PROCEDURE AND CRITERIA RELATING TO SOLID AMMONIUM NITRATE BASED FERTILIZERS

39.1 Purpose

This section presents the United Nations scheme for the classification of solid ammonium nitrate based fertilizers as referred to in the *Model Regulations*, chapter 3.3, special provisions 307 and 193.

39.2 Scope

Any new solid fertilizer composition containing ammonium nitrate shall be subjected to the classification procedure as set out in 39.4.

39.3 Definitions

39.3.1 An ammonium nitrate based fertilizer is a uniform mixture containing ammonium (NH_4^+) and nitrate (NO_3^-) ions. See also 39.3.3.

39.3.2 A compound fertilizer is a uniform mixture that contains at least two of the three primary nutrients nitrogen (N), phosphorus (P) and potassium (K).

39.3.3 In determining the ammonium nitrate content, all nitrate ions for which a molecular equivalent of ammonium ions is present in the fertilizer shall be calculated as ammonium nitrate.

39.3.4 Combustible substances as referred to in paragraph 39.4 include also inorganic substances that can be oxidized, e.g. elemental sulphur. For organic substances the content of combustibles is calculated as carbon.

39.3.5 Materials that may be incompatible with ammonium nitrate include urea, acids, superphosphates with free acid, elemental sulphur, sulphides and most transition metals, including heavy metals (e.g. copper), and chlorides. Note however that this listing is not exhaustive.

39.4 Classification procedure

39.4.1 Solid ammonium nitrate based fertilizers are classified on the basis of their composition and experience and knowledge of their hazardous behaviour. Occasionally, the classification is complemented by testing for the ability to undergo self-sustaining decomposition or for explosive properties. These principles are condensed in the flowchart in 39.5.

39.4.2 UN 2067 may only be used for ammonium nitrate based fertilizers that do not show explosive properties when tested in accordance with test series 2 of this *Manual*.

39.4.3 Ammonium nitrate based fertilizers that do not fulfil the requirements for classification as UN 2067, can be assigned another suitable UN number in Class 1 or Class 5, Division 5.1, provided that the suitability for transport is demonstrated and this is approved by the competent authority. This may for instance be when contamination has occurred in e.g. an accident, so that the fertilizer can be transported under a suitable UN number e.g. in Class 1 as approved by the competent authority.

39.4.4 Ammonium nitrate based fertilizers that meet composition limits relevant for inclusion in the class of Explosives as set out in 39.5 shall be classified in that class regardless of the results when tested in accordance with test series 2 of this *Manual*.

39.4.5 Ammonium nitrate based fertilizers that meet composition limits relevant for classification as oxidizing solids as set out in 39.5, or are otherwise classified as oxidizing solids, shall not be exempted from that classification on the basis of the results from tests O.1 and/or O.3 in section 34 of this *Manual*. See also paragraph 34.3.1 in section 34 of this *Manual*.

39.4.6 Fertilizers that contain 70 % or more ammonium nitrate shall not contain ammonium sulphate as nutrient, unless they are compound fertilizers with less than 90 % ammonium nitrate and with at least 10 % inorganic materials excluding ammonium nitrate and ammonium sulphate.

39.4.7 Compound fertilizers that meet the composition limits relevant for potential inclusion for transport in Class 9 shall be tested for their capability to undergo self-sustaining decomposition according to the method given in paragraph 38.2.4 of this *Manual* (test S.1, trough test) and classified according to criteria given there and in 39.5.

39.5 Classification criteria

39.5.1 Ammonium nitrate based fertilizers shall be classified in accordance with the flowchart below.

Figure 39.1 (a): Classification criteria for solid ammonium nitrate based fertilizers

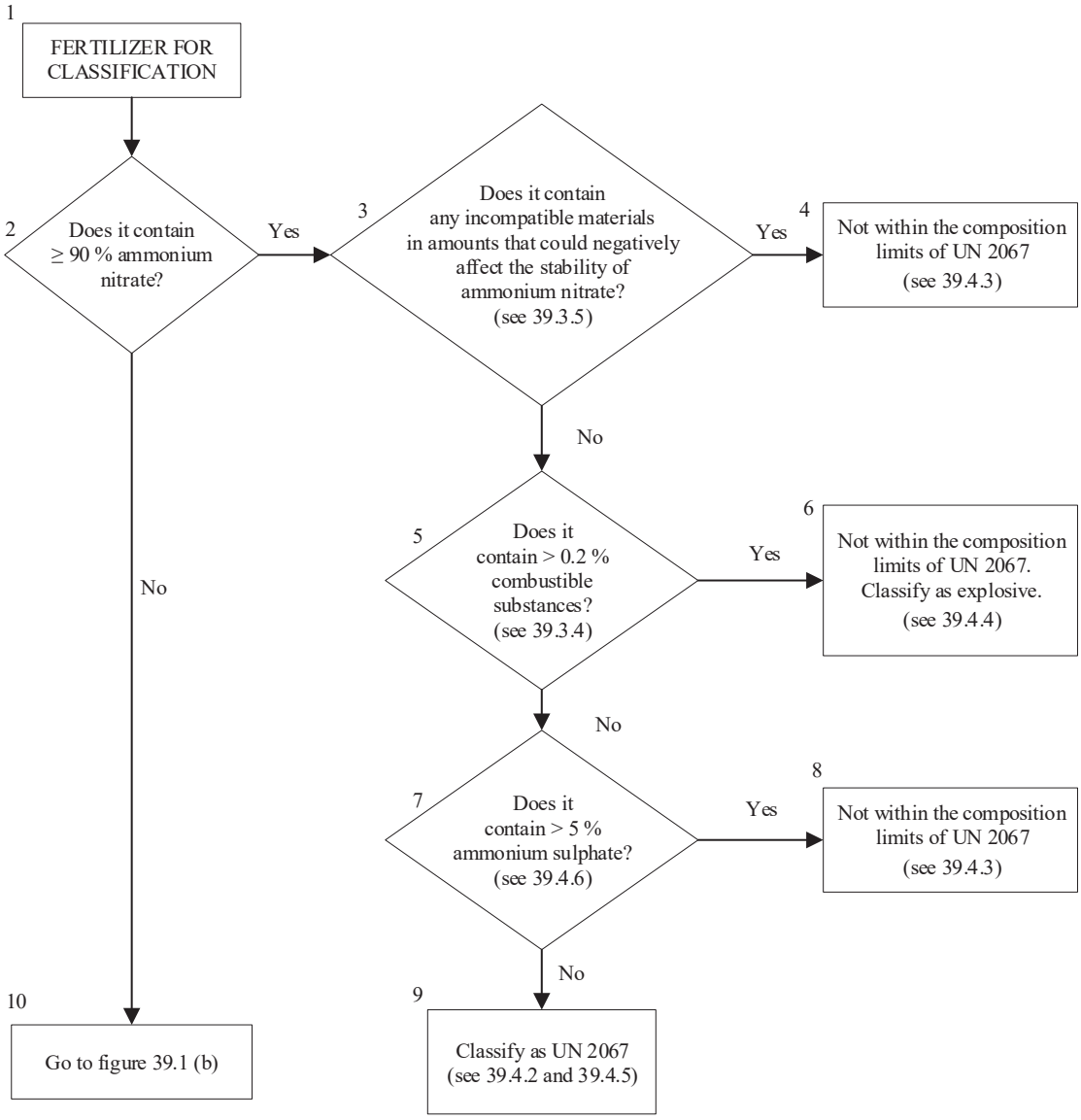


Figure 39.1 (b): Classification criteria for solid ammonium nitrate based fertilizers *(continued)*