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DEPARTMENT OF AGRICULTURE

7 CFR Part 2100

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[Docket No. USDA-2024-0003]

Technical Guidelines for Climate-Smart Agriculture Crops Used as Biofuel Feedstocks

AGENCY: Office of the Chief Economist (OCE), U.S. Department of Agriculture (USDA).

ACTION: Interim rule.

SUMMARY: This interim rule with request for comment establishes technical guidelines for quantifying, reporting, and verifying the greenhouse gas (GHG) emissions associated with agricultural production of biofuel feedstock commodity crops grown in the United States in the context of environmental service markets. Specifically, the rule establishes guidelines for the reporting and verification of practices and technologies used in the production of certain commodity crops that result in lower greenhouse gas emissions or increases in carbon storage. These practices are referred to in the context of this rule as climate-smart agriculture (CSA) practices. The guidelines established through this rule articulate an approach for farm producers to quantify the GHG emissions associated with crops produced using one or more CSA practices. The guidelines also articulate a framework for how information regarding GHG emissions, resulting from the production of biofuel feedstock commodity crops, could be reported and tracked throughout the supply chain.

DATES: *Effective:* January 17, 2025.

Comment Date: We will consider comments that we receive by March 18, 2025.

ADDRESSES: We invite you to submit comments on this rule. You may submit comments through the:

- *Federal eRulemaking Portal*: Go to http://www.regulations.gov and search for Docket ID USDA-2024-0003. Follow the online instructions for submitting comments.

  Comments will be available for viewing online at www.regulations.gov.

FOR FURTHER INFORMATION CONTACT: William Hohenstein, Director of the Office of Energy and Environmental Policy, (202) 720-0450, william.hohenstein@usda.gov. Individuals who require alternative means for communication should contact the USDA TARGET Center at (202) 720-2600 (voice and text telephone (TTY)) or dial 711 for Telecommunications Relay Service (both voice and text telephone users can initiate this call from any telephone).

SUPPLEMENTARY INFORMATION:

Background

This rule establishes new technical guidelines for crop commodities that are used as biofuel feedstocks. USDA is issuing this rule to establish guidelines for the quantification, reporting, and verification of GHG reduction benefits resulting from implementation of CSA practices in the production of commodities that are used as biofuel feedstocks in the context of environmental services markets. CSA practices are agricultural management practices, systems, and technologies that have been demonstrated to generally reduce GHG emissions or increase soil carbon sequestration. Greater adoption of CSA practices could lower overall GHG emissions associated with biofuel production and provide other environmental benefits, such as improved water quality and soil health.

These technical guidelines are intended for the purpose of biofuels production. USDA's authority allows for the establishment of guidelines related to emerging environmental services markets. At this time, the biofuel market represents a clear market opportunity for climate-smart feedstocks. Producing a carbon offset is a different policy context that would require a different set of standards. These guidelines do not constitute a carbon offset protocol.

The net GHG emissions associated with a defined set of CSA practices will be quantified as explained below in the Methodology for Calculating Carbon Intensities used in USDA Feedstock Carbon Intensity Calculator (USDA FD-CIC) section, once USDA FD-CIC is finalized. USDA will shortly publish USDA FD-CIC on its website at https://www.usda.gov/usda-fdcic for peer-review purposes, beta testing, and to obtain public feedback.

Crop production generates GHG emissions, including from soil carbon released during tillage and nitrous oxide emissions resulting from fertilizer use, among other sources. When such crops are used as feedstocks to produce biofuels, the GHG emissions associated with their production contribute a significant percentage of the overall GHG emissions associated with crop-based biofuel production. For instance, feedstock emissions account for approximately 56 percent and 55 percent of the direct emissions from producing corn ethanol and soybean biodiesel, respectively. The GHG emissions associated with feedstock crop production can be reduced through CSA practices, in turn reducing the lifecycle GHG emissions of a biofuel. To date, most existing programs have relied on assumptions about average or typical farming practices to estimate emissions associated with biofuel feedstock production. To improve the empirical basis and verifiability of the effects of CSA practices on net GHG emissions, and to quantify net GHG emissions reductions specifically attributed to those feedstocks grown with climate-smart practices, USDA developed this rule to establish technical

guidelines for CSA crops used as biofuel feedstocks. This interim rule allows for the differentiation and quantification of carbon intensities associated with the production of CSA crops used as biofuel feedstocks, through USDA FD-CIC, upon its finalization.

This interim rule is authorized by the Food, Conservation, and Energy Act of 2008 (2008 Farm Bill (Pub. L. 110-246)), § 2709, (16 U.S.C. 3845), which authorizes the Secretary of Agriculture to establish technical guidelines that outline science-based methods to measure the environmental services benefits from conservation and land management activities in order to facilitate the participation of farm producers, ranchers, and forest landowners in emerging environmental services markets and to give priority to the establishment of guidelines related to farmer, rancher, and forest landowner participation in carbon markets. It further directs the Secretary to establish verification guidelines, including the role of third parties in conducting independent verification of benefits produced for environmental services markets and other functions.

Regulations to implement the programs of Chapter 58 of Title 16 of the U.S. Code, as specified in 16 U.S.C. 3846, and the administration of those programs are to be made as an interim rule effective on publication, with an opportunity for notice and comment. Here, the guidelines relate to the administration of a program for participation in environmental markets. Accordingly, USDA is issuing this interim rule effective on publication with request for comment. This interim rule will facilitate farm producers' ability to participate in environmental service markets associated with biofuel production by establishing guidelines for quantification, reporting, and verification of GHG emissions resulting from the production of agricultural crops grown using CSA practices. It also establishes verification guidelines to increase certainty that the practices claimed are implemented according to the standards established by this rule. While USDA is not creating an environmental service market through this rule, USDA is making these

guidelines available for consideration in international, national, or state clean transportation fuel policies in accordance with 16 U.S.C. 3845, as described above.

Currently, very few U.S.-based clean transportation fuel programs or policies (including private and government programs) have standards or guidelines for climate-smart agricultural practices, such as those described in this rule, to account for the emissions reductions they generate.

Those policies or programs that contain some or all of the elements of the standards in this rule (including CSA practice standards, recordkeeping, quantification, reporting and verification of emissions reductions of such practices) are smaller in scale or were only recently developed and at the pilot stage. For example, the U.S. Department of the Treasury (Treasury) 40B Sustainable Aviation Fuel (SAF) tax credit provides one example of a biofuel policy that incorporated emissions reductions for crops produced using CSA practices. This tax credit provided per gallon credits for the sale or use of SAF defined as achieving a life cycle GHG emissions reduction of at least 50 percent as compared to petroleum-based jet fuel. Treasury and Internal Revenue Service (IRS) guidance for the tax credit included a safe harbor for the USDA CSA Pilot Program, making SAF produced using soybeans or corn employing a bundle of CSA practices eligible for a higher tax credit than SAF produced using crops produced without the bundle of CSA practices. For the purpose of the SAF tax credit, the CSA practice standards, quantification, reporting and verification requirements only pertained to the one bundle of CSA practices eligible under the guidance so are not broadly applicable. As the guidance stated, Treasury and IRS established the CSA safe harbor on a pilot basis to advance the development of CSA verification mechanisms, recognizing the potential emissions reduction benefits of CSA and also the limitations of currently available verification mechanisms, empirical data, and modeling.

California's Low Carbon Fuel Standard (LCFS) and the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) incentivize transportation fuels that have lower GHG emissions, but they do not have standards for the production of biofuel feedstocks or standards that would credit farm producers for the use of CSA practices. The American Coalition for Ethanol through a USDA Regional Conservation Partnership Program grant is working with state partners in several Midwestern states to increase adoption of CSA practices and quantify emissions reductions associated with the use of these practices by paying farmers a premium for adoption of conservation practices that have demonstrated emission benefits including no-till/strip till, cover crops, and nutrient management practices. However, while the program has practice adoption standards it does not provide a whole system for the quantification, recordkeeping, and verification of emissions benefits through the biofuel supply chain.

Given that no comprehensive standards for CSA practice adoption, quantification of emissions benefits, recordkeeping, verification and reporting of emissions benefits currently exist in the U.S. for biofuels markets, USDA is issuing this rule to establish guidelines for the quantification, reporting, and verification of GHG reduction benefits resulting from implementation of CSA practices in the production of commodities that are used as biofuel feedstocks.

This rule specifies technical guidelines to establish a method of calculating the climate benefits of certain agricultural practices. However, other programs, including federal programs such as tax credits, may require additional or different verification or other procedures in order to effectively administer the requirements of their statutes. Accordingly, while these guidelines may inform the subsequent development of requirements for other programs, such requirements will be established through rulemaking or guidance by the relevant agencies or organizations, taking into account

specific statutory requirements, program features, and/or administrative feasibility and constraints.

Should any provision of this rule be deemed invalid, USDA intends that the remaining provisions continue with full effect in order to effectuate the purposes of the statute.

Methodology for Calculating Carbon Intensities used in USDA FD-CIC

This section explains the methodology that was used to calculate values included in USDA FD-CIC. Over the past year, USDA has worked with academic institutions and experts to develop USDA FD-CIC, which, once finalized, would provide users with a crop-specific, per-bushel carbon intensity associated with biofuel feedstock crops using one or more CSA practices. Net emissions are expressed as a carbon intensity (CI), which is a measure of the total carbon dioxide equivalent (CO2-eq) emissions per unit of crop produced (that is, per bushel).

In general, USDA FD-CIC quantifies the CI (in GHG emissions per bushel) of three domestic feedstock crops (field corn, soybeans, and sorghum) produced using one or more specified CSA practices. The USDA FD-CIC model is separate and distinct from models specific to other programs or incentives, for example, 40BSAF-GREET, and the values calculated by USDA FD-CIC may not be representative of values generated by or applicable to other program or incentive-specific models. The USDA FD-CIC feedstock CI estimates reflect the use of specified CSA practices. CSA practices may lead to changes in:

- soil organic carbon (SOC) storage,
- direct and indirect nitrous oxide emissions (N_2O),
- upstream emissions from fertilizer production, and
- carbon dioxide (CO_2) emissions from on-farm energy consumption.

The effectiveness of CSA practices in reducing the CI of feedstocks varies by region. The USDA FD-CIC model contains feedstock CI estimates for each CSA practice and combination of practices for each county.

The underlying models used to generate values in USDA FD-CIC have undergone extensive peer-review. Further, under USDA's authorities in section 2709 of the 2008 Farm Bill, in April 2024, USDA published Quantifying Greenhouse Gas Fluxes in Agriculture and Forestry: Methods for Entity Scale Inventory.[1] The publication of these methods adhered to the U.S. Office of Management and Budget (OMB) guidelines "Final Information Quality bulletin for Peer Review," which was published on January 14, 2005 (70 FR 2664-2677), and this document has been designated by OMB as a highly influential scientific assessment. The method recommended for quantifying changes in soil carbon stocks and nitrous oxide emissions from agricultural soils refers to the DAYCENT ecosystem model, which is used as described in the USDA FD-CIC documentation.

USDA will shortly publish USDA FD-CIC on its website at https://www.usda.gov/usda-fdcic for peer-review purposes, beta testing, and to obtain public feedback. As part of this process of testing and feedback prior to finalization, the public will have the opportunity to examine and download USDA FD-CIC to experience how it would operate. Additional details documenting USDA FD-CIC will be available at https://www.usda.gov/usda-fdcic. USDA will evaluate and respond to the public feedback and peer-review provided on USDA FD-CIC, after which USDA will take final action to establish an operative version. Before such final action is taken, users should consider values from USDA FD-CIC as preliminary and should not rely upon them.

[1] See https://www.usda.gov/about-usda/general-information/staff-offices/office-chief-economist/office-energy-and-environmental-policy/climate-change/greenhouse-gas-inventory-and-assessment-program/quantifying-greenhouse-gas-fluxes-methods-entity-scale-inventory

Definitions

This rule establishes definitions in 7 CFR 2100.002 for terms that are relevant to biofuel feedstock production; agricultural practices; the biofuels supply chain; processing crops in the biofuel supply chain; and recordkeeping and verification.

The rule defines the following terms relevant to biofuel feedstock production: "farm producer," "biofuel," "biomass," "feedstock," "biofuel feedstock crop," "carbon intensity," "conventional crop," "climate-smart agriculture (CSA) crop," and "reduced-carbon intensity (reduced-CI) crop." In the context of this rule, "carbon intensity (CI)," "climate-smart agriculture (CSA) crop," and "reduced carbon intensity (reduced-CI) crop" are relevant to biofuel feedstock production in that the rule contains guidance for on-farm CSA practices that can lead to reduced-CI biofuel feedstocks. The definitions of "agricultural expert," "farm," "farm producer," "biofuel," "biomass," "feedstock," and "biofuel feedstock crop" align with existing USDA definitions. The definition for "carbon intensity" also aligns with language used by California's LCFS.

The rule defines the following terms relevant to agricultural practices: "climate-smart agriculture (CSA) practices," "cover crop," "intensive tillage," "leguminous cover crop," "no-till," "crop interval," "nutrient management," "planting green," "reduced till," and "soil tillage intensity rating (STIR)." This rule defines these terms based on existing USDA definitions, relying heavily on USDA's Natural Resource Conservation Service (NRCS) practice definitions used in existing conservation programs. These definitions provide the necessary context for subpart F of 7 CFR part 2100, which lays out the parameters for CSA practices that farm producers can implement to produce CSA crops.

The rule defines the following terms relevant to the biofuels supply chain: "farm," "first point of aggregation," "intermediary entity," and "biofuel refiner." These terms distinguish the various entities in the biofuels supply chain referred to in this rule. As outlined in subparts D and E of 7 CFR part 2100, recordkeeping and verification

standards differ among farms, first points of aggregation, intermediary entities, and refiners. This approach was informed by the International Sustainability and Carbon Certification (ISCC) standards for verifying entities within the SAF production supply chain for the Carbon Offsetting Reduction Scheme for International Aviation (CORSIA).

The rule defines the following terms relevant to processing crops in the biofuel supply chain: "process," "crushing yield," "input product," "processed product," and "reduced-CI processed product." These terms are defined for the purpose of this rule to clarify how reduced-CI biofuel feedstocks pass through the supply chain and are processed into new material forms, including "reduced-CI processed products." The "crushing yield" is referenced in subpart D of 7 CFR part 2100 as both a recordkeeping requirement and a component of the mass balance equation. Similarly, the terms "process," "input product," and "processed product" are used to describe the activities of various entities in the supply chain and the recordkeeping standards for the inputs and outputs they handle. As noted in subpart D in § 2100.033, there are additional recordkeeping standards for entities that process, sell, or purchase reduced-CI processed products.

This rule defines the following terms relevant to recordkeeping and verification: "accreditation," "audit," "biofuel feedstock report," "farm producer attestation," "mass balance system," "operational control," "third party verifier," "field," and "management unit." These terms are used primarily in subpart D of 7 CFR part 2100, which describes the chain of custody standards for 7 CFR part 2100, and Subpart E, which describes the auditing and verification process. The "mass balance system" definition aligns with ISO 22095:2020, which establishes international standards for chain of custody systems used in certification and compliance schemes. The terms "field," "management unit," "operational control," "biofuel feedstock report," and "farm producer attestation" are used in describing the practice and recordkeeping standards for farm producers for 7 CFR

part 2100. These terms reflect definitions used in the implementation of USDA farm-level programs. Broadly, definitions in this section reflect industry standards around auditing and verification within chain of custody systems.

Applicability

Under authorities in section 2709 of the 2008 Farm Bill, this rule establishes 7 CFR 2100.001 through 2100.053 to define and explain technical guidelines for quantifying, reporting, and verifying the GHG emissions associated with production of biofuel feedstock commodity crops using CSA practices and grown in the United States. The primary purpose of this rule is to establish a system for tracking information relevant to environmental service markets, namely the CI of crops grown with CSA practices that are ultimately used as biofuel feedstock.

This rule specifies domestic biofuel feedstock crops, which include field corn, soybeans, and sorghum, as defined in subpart B in § 2100.011 for which a reduced-CI could be quantified using USDA FD-CIC, upon finalization. These domestic crops were included because they account for the majority of biomass feedstock crops used to produce transportation biofuels in the United States. Furthermore, there is modeling and data available to support the quantification of carbon intensity for these feedstock crops. Grain from field corn or sorghum is used to produce ethanol, while vegetable oils, predominately from soybeans, are used for the production of biodiesel, renewable diesel, and SAF. Intermediate oilseeds (for example, camelina, carinata and pennycress) and canola were excluded from this rule given their current limited use in domestic biofuel production and because there is insufficient data on how CSA practices affect the GHG emissions associated with their production.

Crops produced using certain CSA practices are referred to as CSA crops and are defined in § 2100.011. Crops produced without the use of CSA practices are referred to as conventional crops. CSA crops generally have a reduced CI compared to a

conventional crop of the same type and produced in the same location. Depending on the specific crop being produced, CSA crops defined in this rule are grown using one or more of the following practices: no-till, reduced till, cover crops, nitrification inhibitors, split in-season nitrogen application, and no fall nitrogen application. These practices were chosen because they can be used in the production of field corn, soybeans, or sorghum and because scientific evidence demonstrates their effectiveness at reducing GHG emissions or sequestering additional carbon. This rule only includes practices which are used on-field and excludes those practices that occur on field edges or farm borders, in order to associate emissions reductions with the production of commodities on a per acre or per output (for example, bushels) basis.

CSA crops and conventional crops may be physically commingled beginning at the farm if both are being produced. This rule allows for mixing of CSA and conventional crops because segregating crops after harvest and throughout the supply chain is infeasible at farms and entities receiving the crops, especially where farms or other entities lack facilities to physically separate and store crops. Commingling of crops produced using different management techniques is standard practice. Crops that are sold with an associated reduced-CI are referred to as reduced-CI crops and may be composed of solely CSA crops or a combination of CSA crops and conventional crops. If CSA crops and conventional crops are produced at the same farm, the commingled reduced-CI crops must have an associated CI calculated using a weighted average approach, as specified in § 2100.020, Quantification of CI.

This rule can be applied to entities involved in the supply chain for biofuel feedstocks, which spans from the farm to the biofuel refiner. This includes entities that may be producing, storing, processing, or more generally, taking ownership of reduced-CI crops or reduced-CI processed products (that is, a product derived from reduced-CI crops, such as soybean oil) in the supply chain. These entities may include grain

elevators or other intermediary storage facilities, processing facilities, and biofuel refiners. Entities that produce or take ownership of reduced-CI crops or reduced-CI processed products are subject to recordkeeping and verification standards.

The scope of this rule extends to the purchase of reduced-CI crops or reduced-CI processed products up to the point of a biofuel refiner. The production and carbon intensity of biofuels, such as ethanol or biodiesel made with reduced-CI crops or processed products, is not covered under this rule.

Quantification of Farm-level Crop-specific Carbon Intensities

Under USDA's authorities in the 2008 Farm Bill in section 2709, this rule establishes technical guidelines for use in developing a procedure to measure environmental services benefits. Environmental service benefits are estimated as a reduction in net GHG emissions resulting from crop production with CSA practices compared to a national average baseline. Net emissions are expressed as CI, which is a measure of the total CO_2-eq emissions per unit of crop produced (that is, per bushel). Generally, the use of CSA practices lowers the CI per bushel and results in environmental service benefits relative to a national average baseline CI.

In Subpart C, this rule establishes voluntary technical guidelines for the quantification of CI. CIs are quantified for a specific crop at the farm-level (that is, they account for a farm's total volume of production of a specific crop) on an annual basis, derived from field or management unit-level CIs that depend on the CSA practices used on those fields. For example, a farm that produces field corn in 2025 and both field corn and soybeans in 2026 would have a 2025 field corn CI, a 2026 corn CI, and a 2026 soybean CI.

Consider a farm that uses different production practices for soybeans on different fields or management units: a portion of the fields or management units use conventional production methods (typically highest CI), a portion use cover crops (typically lower CI),

and a portion use both cover crops and no-till (typically lowest CI). The farm-level CI for soybeans is a weighted average of the three CI values. The weighted average CI accounts for the relative production of soybeans under conventional, cover crop, and cover crop plus no-till management.

This rule outlines the steps to quantify a farm-level crop-specific CI. CI would be quantified using the USDA FD-CIC, upon its finalization. To quantify CI under this rule, a farm producer would input field-level management information into USDA FD-CIC. Input information would include farm location (county and state), crop type produced, total field or management unit acres, and use of CSA practices, such as no-till or reduced till; use of a cover crop; timing of nitrogen fertilizer application; and nitrification inhibitor usage. USDA FD-CIC output would include a field-level CI for the crop produced using the specified practices at the farm location. This step would be repeated for all fields or management units within a farm on which the crop is grown. In addition to CI for each field or management unit, USDA FD-CIC could also calculate a weighted farm-level average across fields growing the same crop. Farm producers would also need to input information on the fields and management units growing crops without CSA practices. USDA FD-CIC would assign crops on these fields the default national average CI. These calculations would generate a farm-level, crop-specific CI. Further information on USDA FD-CIC, information requirements and how it is used can be found here: https://www.usda.gov/usda-fdcic.

Chain of Custody and Verification

As described in subpart D, every entity in the supply chain producing or taking ownership of reduced-CI crops or reduced-CI processed products covered by this rule must have a system for maintaining records. All first points of aggregation, intermediary entities, and biofuel refiners must also be audited annually by an accredited third-party verifier. Crucially, accredited third-party verifiers ensure the veracity of the underlying

crop production practices and estimated emissions reduction benefits associated with the production of CSA crops by auditing a sample of the farms supplying reduced-CI crops to first points of aggregation, as described in subpart E of this rule. This review is necessary for establishing effective environmental service markets, as described in section 2709 of the 2008 Farm Bill. In the case of markets for transportation biofuel feedstocks, this traceability and verification system could allow for entities such as farm producers, elevators, other intermediary storage facilities, and biorefineries to sell products with environmental attributes such as reduced emissions. In some cases, selling a product with an environmental attribute could enable these entities to earn a premium price for growing, handling, and otherwise helping to move reduced-CI biofuel feedstock through the supply chain.

Recordkeeping and Reporting Standards

As described above, the supply chain for agricultural feedstocks used in biofuel production begins at a farm and ends at a biofuel refiner. The first entity to take ownership of reduced-CI feedstock after the farm is referred to as the first point of aggregation and may include, but is not limited to, elevators; processors (for example, crushers); and biofuel refiners. Intermediary entities take ownership of reduced-CI feedstock or reduced-CI processed product between the first point of aggregation and biofuel refiner. The biofuel refiner is the last entity in the supply chain covered by this rule. If a biofuel refiner sources any reduced-CI crop directly from farms, it is the first point of aggregation for the quantity of crop coming directly from farms and is subject to recordkeeping and audit standards applicable to the first point of aggregation. This rule reflects that biofuel feedstock supply chains can include different numbers and types of entities. A biofuel refiner sourcing feedstocks directly from farms represents a simple supply chain. A more complex supply chain may involve crop that is purchased by an

elevator, subsequently purchased by crusher for processing, and finally purchased as processed product by a biofuel refiner.

USDA's authorities in section 2709 of the 2008 Farm Bill direct the Secretary to establish technical guidelines for use in developing a protocol to report environmental services benefits and a registry to collect, record and maintain the benefits measured. The recordkeeping standards in this rule establish voluntary guidelines for documenting CI information associated with reduced-CI crops and reduced-CI processed products at individual entities. Additionally, this rule establishes voluntary guidelines for reporting CI information between entities in the supply chain. The recordkeeping standards further require entities to use a mass balance accounting system, which constitutes an internal registry system for each entity to record and maintain the CI associated with reduced-CI crops and the volumes of those crops used in reduced-CI processed products.

This rule specifies general recordkeeping standards applicable to all entities as well as specific standards for farms, first points of aggregation, intermediary entities, and biofuel refiners. All records must be maintained for 5 years. Recordkeeping standards enable third-party verification to ensure that entities follow the applicable standards in this rule.

Recordkeeping and Reporting Standards for Farms

The primary purpose of recordkeeping standards at the farm is to provide evidence of CSA practices and sale of reduced-CI crops. Farm producers are required to keep records demonstrating the following:

- implementation of CSA practices in accordance with the standards in this rule (described further in the CSA Practice Standards: Recordkeeping section below);
- evidence of sales of reduced-CI feedstocks; and

- documentation of CI calculations completed in USDA FD-CIC, once finalized.

For reporting purposes, farm producers are required to prepare a Biofuel Feedstock Report for each crop sold as a reduced-CI crop. The Biofuel Feedstock Report includes a Farm Producer Attestation and documentation showing quantification of the farm-level crop-specific CI. The Farm Producer Attestation is a document attesting that the crop was produced in accordance with practice standards specified in this rule and that the farm producer had operational control of fields or management units where CSA practices were used. The Farm Producer Attestation also states the total number of bushels of crop produced and the associated farm-level CI. The Biofuel Feedstock Report also includes the USDA FD-CIC inputs (that is, CSA practices used) and output (that is, CI) for each field or management unit on which the crop was produced, as well as the calculation of the field-level and farm-level crop-specific CI. When reduced-CI crop is sold, the farm producer must provide a copy of the Biofuel Feedstock Report to the first point of aggregation.

Recordkeeping and Reporting Standards for First Points of Aggregation and Intermediary Entities

First points of aggregation and intermediary entities purchase and sell reduced-CI crops. They may also process reduced-CI crops, and purchase or sell reduced-CI processed products. The primary purpose of recordkeeping standards at these entities is to track the amount of reduced-CI crops and reduced-CI processed products that are purchased or sold. Additionally, the rule specifies that first points of aggregation and intermediary entities must report the volume sold, associated CI, and provide evidence of third-party verification to the purchasing entity.

To track the amount of incoming and outgoing reduced-CI crops or reduced-CI processed products, first points of aggregation and intermediary entities must operate a

mass balance system. Mass balance is a method of accounting used to track the weight or volume of products moving through an entity without product segregation. The weight or volume of reduced-CI crops that is sold should not exceed the amount purchased. Similarly, the weight or volume of reduced-CI processed product sold should not exceed the weight or volume purchased or processed on site from reduced-CI crops. This system allows for reduced-CI crops to be physically mixed with conventional crops, and for reduced-CI processed products to be physically mixed with processed products derived from conventional crops.

This rule requires entities to maintain records that demonstrate the amounts of reduced-CI crops and reduced-CI processed products, and associated CIs, moving into and out of the entity. These records constitute mass balance accounting, in that they can be used to demonstrate that the amount of reduced-CI crops or processed products sold from an entity does not exceed the amount that was produced or purchased. These records also enable a third-party verifier to audit an entity's mass balance system.

The mass balance can be represented by an equation, which requires that incoming and outgoing feedstocks must be equivalent over a pre-defined mass balance time period, for which the outgoing reduced-CI crops or processed products, with specific CIs, must be balanced with the incoming crop or processed product with respective CIs. Mass balance time periods are continuous so that no gaps between mass balance periods occur, and each time period may not exceed three months. Each entity should document the mass balance time period, complete mass balance calculations for each mass balance time period, and document results. If reduced-CI crops or processed product is remaining at the end of a mass balance time period, it is accounted for as "ending stored feedstock." This product is included as "beginning stored feedstock" in the calculation for the next mass balance time period. Documentation of the mass balance calculation for each time period must be provided to the entity's third-party verifier during the audit. The third-

party verifier may request additional records to verify mass balance calculations during the audit. The following equation illustrates the mass balance calculation:

$$\text{incoming feedstock}_{i,c,m} + \text{beginning stored feedstock}_{i,c,m} = \text{outgoing feedstock}_{i,c,m} + \text{ending stored feedstock}_{i,c,m}$$

Feedstocks (incoming, stored, and outgoing) for entity *i* are identified by their carbon intensity, *c*, and the pre-defined mass balance time period, *m*. Incoming feedstocks include those purchased by entity *i* in time period *m*. Outgoing feedstocks must include both sold and discarded or wasted feedstocks in time period *m*. Stores of feedstocks are those maintained by the entity during time period *m* and must be accounted for in the mass balance. Entities should record and account for the quantity of stored feedstock at the start and end of time period *m*.

First points of aggregation and intermediary entities that process, sell, or purchase reduced-CI processed product are subject to additional recordkeeping standards. In some instances, reduced-CI crop may be processed before being sold to a biofuel refiner (for example, soybeans processed into soybean oil). Entities that process reduced-CI crop are required to track the amount of reduced-CI crop used in processing, the corresponding amount of reduced-CI processed product, and the crushing yield. These values must align such that reduced-CI processed product amount equals the crushing yield multiplied by the reduced-CI crop amount. These recordkeeping standards provide a mechanism to continue tracking the original reduced-CI crop amount and associated CI throughout the supply chain.

Incoming, stored, or outgoing feedstock can include reduced-CI crops or reduced-CI processed products. To ensure that the mass balance accounting for entity *i* appropriately accounts for different forms of reduced-CI processed products (that is, oils), the entity's crushing yield must be used to convert reduced-CI processed products back to their crop volume or weight equivalents using the following equation:

$$\text{processed feedstock crop equivalent} = (\text{processed feedstock})/(\text{crushing yield})$$

Recordkeeping Standards for Biofuel Refiners

Biofuel refiners are the last entity in the supply chain covered by the recordkeeping standards of this rule. The primary purpose of recordkeeping standards at biofuel refiners is to track the incoming amount of reduced-CI crops or reduced-CI processed products. Biofuel refiners must establish a system to track incoming reduced-CI crops or reduced-CI processed products and associated CIs. If a biofuel refiner purchases any reduced-CI crop directly from farm producers, it is also subject to the recordkeeping standards for a first point of aggregation.

Verification

Third-party verification by accredited verifiers provides assurances that entities follow the standards specified in this rule. All entities from the first point of aggregation to the biofuel refiner must hire a third-party verifier to conduct an audit annually. Evidence of verification is passed throughout the supply chain. Beginning with the first point of aggregation, each entity must provide proof of third-party verification to all subsequent entities to whom they sell reduced-CI feedstock or reduced-CI processed products.

Farms receive audits as suppliers of the first point of aggregation, and a sample of farms supplying reduced-CI crops must be audited by a third-party verifier each year. Per the recordkeeping and reporting standards in this rule, farm producers must provide the first point of aggregation with a copy of the Biofuel Feedstock Report which provides attestation of CSA practices and documents the quantification of farm-level crop-specific CI. This document can be used by the first point of aggregation's third-party verifier to collect farm information and aide in selecting the farm audit sample.

Audits at the first point of aggregation include two parts: an audit of the first point of aggregation's processes, and audits at a sample of farms supplying the first point of aggregation with reduced-CI crop.

In auditing the first point of aggregation's processes, a third-party verifier must verify that the first point of aggregation is operating a mass balance system in accordance with the standards in this rule and has correctly recorded the CI associated with reduced-CI crops delivered from each farm.

The first point of aggregation must provide its third-party verifier with information enabling the third-party verifier to select a random sample of farms to audit. The sample of farms must be selected by the third-party verifier and the sample size must be at least the square root of the total number of farms supplying the first point of aggregation with reduced-CI crop. For example, if a first point of aggregation purchases reduced-CI crop from 51 farms, the farm audit sample must include at least 8 farms (the square root of 51 is 7.14 which is rounded up to 8). Taking a square root of suppliers to determine the minimum sample size aligns with industry accepted standards in current use, such as the ISCC CORSIA certification program for SAF. The sample must be selected in a way that is representative of the supplying farms' characteristics, including types of supplied feedstock, size of farm, geographic location, and risk of non-conformity or fraud. Additionally, third-party verifiers should vary the farms included in a first point of aggregation's audit sample from year to year.

For farms that are selected for an audit by the first point of aggregation, the third-party verifier must verify that the CSA practices and recordkeeping are conducted as specified in this rule. Additionally, the third-party verifier must verify that the weighted average calculation of the farm-level crop-specific CI is done correctly.

If a farm is selected as part of the audit sample for the first point of aggregation, the farm may be considered exempt from an additional audit if a third-party verifier previously audited the farm according to the standards established in this rule for the applicable year. Farm producers can elect to proactively retain a third-party verifier, accredited to ISO 14065, to complete an audit at their farm. This approach allows

flexibility for farm producers who may wish to hire their own third-party verifier, while also maintaining integrity and upholding standards for third-party verifiers established by this rule. Farm producers may choose this option to coordinate with already scheduled audits, or for other reasons. To be considered exempt from an additional audit, the farm producer must provide results of the completed audit to the first point of aggregation's third-party verifier. It is up to the discretion of the third-party verifier to determine whether the farm is exempt from an additional audit, or whether a full or partial audit is necessary.

As defined by this rule, an intermediary entity does not source reduced-CI crops directly from farm producers. The audit standards for intermediary entities include third-party verification of the mass balance system and recordkeeping related to reduced-CI crops or reduced-CI processed product purchased or sold.

The audit standards for biofuel refiners include verification that the biofuel refiner operated a system to correctly record the CI associated with reduced-CI feedstock or reduced-CI processed product. Additionally, biofuel refiners that are acting as a first point of aggregation must also follow the audit standards for first points of aggregation.

Any entity that processes reduced-CI feedstock must comply with additional audit standards to ensure that the amount of reduced-CI processed product is calculated correctly, using the facility-level crushing yield, and that records support mass balance of the product.

All third-party verifiers hired to conduct audits as specified in this rule must be accredited to ISO 14065: General principles and standards for bodies validating and verifying environmental information by a member of the International Accreditation Forum.

CSA Practice Standards: Implementation

This rule establishes implementation standards for specific CSA practices: reduced till, no-till, cover crops, and specified nutrient management practices, such as nitrification inhibitors, no fall application of nitrogen, and split in-season application of nitrogen. These practices are identified by NRCS as CSA and Forestry (CSAF) Mitigation Activities and represent a subset of existing NRCS-approved conservation practices for working lands.[2] Practices included in this rule do not include all NRCS CSAF practices. This rule only includes practices that are relevant to the production of field corn, soybeans, or sorghum and have appropriate data and quantification methodologies needed to estimate the associated net emissions. Additionally, some NRCS CSAF practices were excluded because they only generate net emissions benefits on land that is not growing crops, such as field edges or borders. Emissions benefits from such off-field practices cannot directly be tied to the production of a biofuel feedstock, making it difficult to assign emissions benefits to the biofuel feedstock crop and subsequently produced biofuels.

The practices included in this rule have demonstrated emissions benefits that are directly associated with in-field crop production, as indicated in the NRCS CSAF Mitigation Activity List documentation and based on the latest data and quantification methodologies available to USDA.

Reduced Till

The practice of reduced till manages the amount, orientation, and distribution of crop and other plant residue on the soil surface year-round while reducing the frequency and intensity of soil disturbing activities used to grow and harvest crops in systems where the field surface is tilled prior to planting. The practice of reduced till increases soil

[2] See USDA NRCS, Climate-Smart Agriculture and Forestry (CSAF) Mitigation Activities List for FY2025, August 2024, https://www.nrcs.usda.gov/sites/default/files/2023-10/NRCS-CSAF-Mitigation-Activities-List.pdf.

organic carbon (SOC) as a result of decreased soil disturbance and decreases N_2O emissions due to changes in the soil environment, when compared to intensive till.[3]

To qualify as reduced tillage under this rule, field(s) or management unit(s) are permitted to use tillage methods where the entire soil surface is disturbed by tillage operations such as chisel plowing, field cultivating, tandem disking, vertical tillage, or ridge tillage, provided that the STIR value is no greater than 80. STIR[4] is a numerical value that measures the severity and type of soil disturbance caused by tillage operations. STIR values range from 0 to 200, with higher values indicating more soil disturbance. The STIR rating applies to the entire tillage system used in producing a crop. The components of the rating include tillage type, recommended equipment operating speed, recommended tillage depth, and surface area disturbed. The STIR value must include all field operations that are performed during the crop interval (that is, from the time immediately following harvest or termination of one cash crop through harvest or termination of the next cash crop in the rotation, including fallow periods). Permitted methods are also commonly referred to as mulch tillage, conservation tillage, or ridge till. Primary inversion tillage implements (for example, moldboard plow) must not be used, and residues may not be burned. However, removing residue from the crop planting row area prior to or as part of the planting operation is allowed.

No-Till

The residue and tillage management practice of no-till limits soil disturbance to manage the amount, orientation and distribution of crop and plant residue on the soil

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[3] See USDA NRCS*, Conservation Practice Standard Residue and Tillage Management, Reduced Till,* September 2016, https://www.nrcs.usda.gov/sites/default/files/2022-09/Residue_And_Tillage_Management_Reduced_Till_345_CPS.pdf.

See also: NRCS, *Conservation Practices and Greenhouse Gas Mitigation Information dashboard*, https://publicdashboards.dl.usda.gov/t/FPAC_PUB/views/NRCSConservationPracticesandGreenhouseGasMitigation/MitigationSummaries?%3Aembed=y&%3AisGuestRedirectFromVizportal=y#3

[4] See USDA NRCS, *Soil Intensity Tillage Rating STIR,* 2020, https://www.nrcs.usda.gov/sites/default/files/2023-01/Soil-Tillage-Intensity-Rating-Fact-Sheet3-27-2020.pdf

surface year-round. The practice of no-till increases SOC as a result of decreased soil disturbance and decreases N_2O emissions due to changes in the soil environment when compared to both reduced till and conventional till.[5]

To be considered as no-till under this rule, full-width soil disturbance must not be performed, from the time immediately following harvest or termination of one cash crop through harvest or termination of the next cash crop in the rotation, regardless of the depth of the tillage operation. Strip tillage and fertilizer injection are permitted, provided that the STIR value is no greater than 20. Residues may not be burned. However, removing residue from directly within the seeding, planting, or transplanting area prior to or as part of the planting operation is allowed.

Cover Crops

A cover crop may include one or more species of grasses, legumes, or forbs planted for seasonal protection and soil improvement. Increased above and below-ground biomass from cover crops can increase SOC, while N_2O may, in certain contexts, increase slightly from plant decomposition.[6] Under this rule, if legumes are used alone or within a cover crop mix, the producer should account for nitrogen supplied by the cover crop when determining nitrogen application rates for the following crop in order to minimize the risk of increasing direct and indirect N_2O emissions that may result from excess nitrogen. Cover crops that can be considered under this rule must be seeded in the fall, and interseeding into a commodity crop is allowed. Cover crops should be seeded as

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[5] See USDA NRCS, *Conservation Practice Standard Residue and Tillage Management, No Till,* September 2016, https://www.nrcs.usda.gov/sites/default/files/2022-09/Residue_And_Tillage_Management_No_Till_329_CPS_0.pdf.

See also *NRCS Conservation Practices and Greenhouse Gas Mitigation Information dashboard*. https://publicdashboards.dl.usda.gov/t/FPAC_PUB/views/NRCSConservationPracticesandGreenhouseGasMitigation/MitigationSummaries?%3Aembed=y&%3AisGuestRedirectFromVizportal=y#3.

[6] See NRCS*, Conservation Practices and Greenhouse Gas Mitigation Information dashboard*, https://publicdashboards.dl.usda.gov/t/FPAC_PUB/views/NRCSConservationPracticesandGreenhouseGasMitigation/MitigationSummaries?%3Aembed=y&%3AisGuestRedirectFromVizportal=y#3.

See also Minnesota Pollution Control Agency. *Greenhouse gas reduction potential of agricultural best management practices.* October 2019. https://www.pca.state.mn.us/sites/default/files/p-gen4-19.pdf,

early as possible and terminated as late as practical (late vegetative growth stage or later) with termination timing established to minimize the risk of yield loss and soil moisture depletion.[7] To qualify under this rule, cover crops cannot be fertilized.

Cover crop biomass must not be mechanically harvested or grazed. Residues must remain on the surface following termination and may not be burned. Cover crops may be terminated via winter kill, using herbicide, or by non-soil disturbing mechanical methods (for example, roller crimper, mowing) in the spring. Planting green, where the commodity crop is seeded directly into the standing cover crop in the spring, is allowed.

Nutrient Management

Nutrient management practices included in this rule are:

1) use of nitrification inhibitors;

2) no fall application of nitrogen; and

3) in-season split application of nitrogen.

These practices help to reduce direct and indirect N_2O emissions from biofuel feedstock production, thereby reducing GHG emissions. To implement any of these nutrient management practices, the farm producer must develop and document a planned nutrient budget, yield goal, and applications of, at a minimum, nitrogen, phosphorus, and potassium (N-P-K) in pounds per acre prior to implementation. The nutrient budget must account for all known measurable sources and removals of N-P-K. The farm producer must base the nutrient budget on current soil test results or the professional opinion of an agricultural expert who is employed by the Cooperative Extension System or the agricultural departments of universities, or other persons approved by the Federal Crop Insurance Corporation (FCIC), whose research or occupation is related to the specific crop or practice for which such expertise is sought.

[7] See USDA NRCS, *Conservation Practice Standard, Cover Crop,* 2024, https://www.nrcs.usda.gov/sites/default/files/2024-06/340-nhcp-cps-cover-crop-2024.pdf

Nitrification Inhibitor Practice Standards

A nitrification inhibitor is a chemical compound that slows down the conversion of ammonia to nitrate in soil, a process called nitrification. Nitrification inhibitors are added to fertilizers and can help reduce N_2O emissions.[8] To qualify for the nitrification inhibitor practice under this rule, the producer must apply a nitrification inhibitor with all synthetic nitrogen (synthetic N) applications, including any pre-emergent applications, to the field(s) or management unit(s). Nitrification inhibitors must be defined by the Association of American Plant Food Control Officers (AAPFCO) and be accepted for use by the State fertilizer control official, or similar authority, with responsibility for verification of product guarantees, ingredients (by AAPFCO definition) and label claims.

No Fall Application Practice Standards

Applying fertilizer in the spring at the time of planting results in improved nutrient availability and can reduce overall fertilizer needs compared to fall application, also reducing N_2O losses.[9] To qualify for the no fall application practice under this rule, field(s) or management unit(s) must be managed according to a nutrient budget, the first nitrogen application must occur within 30 days prior to or at the time of planting and no nitrogen fertilizer may be applied in the fall of the previous year.

Split In-Season Application Standards

Split in-season fertilizer application refers to fertilizer that is applied with a minimum of two applications—an initial application at the time of planting with the remainder applied in one or more applications during the growing season. Split in-season

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[8] See Li T, Zhang W et al., *Enhanced-efficiency fertilizers are not a panacea for resolving the nitrogen problem*, Glob Chang Biol, Feb 2018 Feb, 24(2):e511-e521, doi: 10.1111/gcb.13918. Epub 2017 Nov 2. PMID: 28973790. See also: ICF International. *Greenhouse Gas Mitigation Options and Costs for Agricultural Land and Animal Production within the United States.* Prepared for USDA Climate Change Program Office, February 2013. https://www.usda.gov/sites/default/files/documents/GHG_Mitigation_Options.pdf

[9] See ICF International, *Greenhouse Gas Mitigation Options and Costs for Agricultural Land and Animal Production within the United States,* Prepared for USDA Climate Change Program Office, February 2013, https://www.usda.gov/sites/default/files/documents/GHG_Mitigation_Options.pdf

application increases nitrogen use efficiency by applying fertilizer according to plant needs, and can also reduce overall fertilizer needs, which also reduces N_2O losses.[10] To qualify for the split in-season application practice under this rule, field(s) or management unit(s) must be managed according to a nutrient budget. At least 75 percent of total crop nitrogen needs, as defined by the state LGU, must be applied after crop emergence. Post emergent nitrogen may be reduced based on crop scouting, in-season soil sampling or analysis, or plant tissue sampling or analysis. Nutrient availability should be timed to crop uptake.

CSA Practice Standards: Recordkeeping

In addition to specifying the implementation standards for each CSA practice, as described above, this rule also establishes recordkeeping standards for each CSA practice. Required records are necessary to provide evidence that farm producers implemented CSA practices according to the rule. Records must be retained for 5 years and made available to third-party verifiers to conduct audits. The rule does not specify the type or origin of required records; instead, the rule lists examples of record types such as physical documentation (for example, paper forms, invoices, receipts, seed tags), digital files (including from farm management software), data generated by farm equipment (for example, precision agriculture equipment), remote sensing data, georeferenced and timestamped photographs, and data and records used for participation in USDA government programs. The range of allowable record options is designed to increase flexibility and minimize burden for farm producers, who may already maintain various types of records depending on their preferences, participation in government or private programs, or previous CSA practice implementation. However, the records must

[10] See Chan Guo, Xufei Liu, and Xuefei He, *A global meta-analysis of crop yield and agricultural greenhouse gas emissions under nitrogen fertilizer application*, Science of The Total Environment, Volume 831, 2022, 154982, ISSN 0048-9697, https://doi.org/10.1016/j.scitotenv.2022.154982.

be sufficient for the third-party verifier to verify compliance with the relevant practice standard for the specified time period.

Across all CSA practices, farm producers must maintain records demonstrating the location and acreage of any field or management unit where the CSA practice was implemented, as well as the total bushels of crop harvested from those fields or management units. These are basic parameters required for calculating the carbon intensity of the resulting crop. Farm producers with multiple fields or management units must keep their records separately for each of these fields or management units to ensure accurate accounting.

For farm producers implementing no-till or reduced till, the following practice-specific records must be maintained:

- a list of all field operations that may cause surface disturbance, including tillage, fertilizing, planting, controlling pests, seeding, and harvesting;
- data on these operations, including the depth and width of disturbance and average speed of operation;
- equipment used; and
- dates that each operation occurred.

These records are necessary for calculating and verifying the STIR value, a quantitative measure of soil disturbance. Calculation of the STIR value on each field or unit provides a consistent way for farm producers and third-party verifiers to evaluate whether a soil management system qualifies as no-till or reduced till.

For farm producers implementing cover crops, the following practice-specific records must be maintained:

- documentation that cover crop seeds were purchased and received in sufficient quantities for the designated field(s) or unit(s);
- the date, method, and rate of seeding;

- the total acreage seeded across each field or unit; and
- time-stamped and georeferenced photographic evidence of establishment.

Records of cover crop purchase and seeding alone is not sufficient to verify that a GHG benefit occurred, because the GHG benefits of cover crops result from biomass accumulation due to plant growth. Time-stamped and georeferenced photographic evidence of establishment is also necessary to ensure that the CSA practice, and associated GHG benefits, can be verified.

For farm producers implementing nutrient management practices, the following practice-specific records must be maintained:

- details on the source and type of nutrients applied;
- date, method, and location of nutrient applications;
- planting-seeding date for the field or unit where the practice was implemented; and
- the total acreage within each field or unit where the nutrient management practice was applied.

Additionally, the producer must provide a nutrient budget that demonstrates all crop nutrient needs for N-P-K, as well as a soil test dated within 2 years of the development of the nutrient budget. Because nutrient needs vary greatly across crops, fields, and management units, a tailored nutrient budget is necessary to assess the nutrient needs of each crop. Evaluation of the nutrient budget can inform the crop-specific and geography-specific rates and types of nutrient management that may result in a GHG benefit.

USDA Request for Information and Public Consultation Sessions

On June 27, 2024, USDA published a Request for Information (RFI) requesting public input on Procedures for Quantification, Reporting, and Verification of Greenhouse Gas Emissions Associated with the Production of Domestic Agricultural Commodities

Used as Biofuel Feedstocks (89 FR 53585-53587). The RFI indicated that USDA was considering a rule to establish voluntary standards for quantifying, reporting, and verifying GHG outcomes for domestic agricultural commodities used as biofuel feedstocks and grown with practices that mitigate GHG emissions or sequester soil carbon. USDA requested public input on several topics that are addressed in this rule. Specifically, the RFI asked for input on qualifying practices, quantification approaches for CSA practices, soil carbon, verification and recordkeeping, and verifier qualifications and accreditation requirements. A total of 256 unique comments were posted to regulations.gov in response to the RFI. The top sources of comments were from individuals (45 comments), industry trade groups (33), biofuel groups (29), agriculture industry and technology groups (28), and crop commodity groups (26). Other groups submitting comments included environmental advocacy groups, organizations involved in carbon markets, farm groups, state and local government agencies, and farm bureaus.

Approximately 52 comments were supportive of USDA's efforts to facilitate quantifying, reporting, and verifying emissions benefits associated with CSA practices for biofuel feedstocks. Broadly, these commenters recognized the potential benefits and opportunities associated with using CSA practices in biofuel feedstock production, including market opportunities and the enhanced sustainability of agricultural systems. These commenters agreed with the need for more accurate accounting of emissions benefits associated with using CSA practices and supported the establishment of guidance in this area. In addition, supportive comments from farm producers, agricultural groups, and industry representatives emphasized the opportunity to establish a simple and inclusive program which facilitates the participation of many different types of farm producers in CSA markets.

Approximately 11 comments were generally opposed to the production of biofuels as a means to reduce GHG emissions and were therefore opposed to any

potential USDA rule efforts on this topic. Some opposing comments argued that expanding crop-based biofuel production will lead to greater GHG emissions and additional environmental harms such as air and water pollution. Commenters argued that alternatives such as electrification would be more effective for reducing GHG emissions from the transportation sector. Some opposing comments also expressed concerns with the validity of GHG reductions from CSA practices, pointing out that there is a risk of double-counting benefits from these practices and that incentives for CSA practices may fail to meet "additionality" requirements.

Approximately 193 comments maintained neutral or mixed positions on a rule. Comments spanned many perspectives on the purpose, scope, and ideal execution of a rule. Flexibility and inclusivity were widely shared themes, with commenters asking for inclusion of a wide range of crops, a wide range of CSA practices, and the inclusion of early CSA practice adopters. However, commenters differed on a number of issues, including verification requirements, chain of custody models, and specific crops and practices that should be considered. Commenter perspectives on these topics are described in the sections below.

In addition to publishing the June 2024 RFI, in October 2024, USDA hosted three stakeholder consultation sessions over Zoom in accordance with requirements in 16 U.S.C. § 3845, which directs the Secretary of Agriculture to consult with the public when establishing technical guidelines for measuring environmental services benefits from conservation and land management activities. Specifically, section 3845 requires consultation with the following groups:

1) Federal and State government agencies;
2) Nongovernmental interests, including:
    A) farm, ranch, and forestry producers,
    B) financial institutions involved in environmental services trading,

C) institutions of higher education with relevant expertise or experience,

D) nongovernmental organizations with relevant expertise or experience, and

E) private sector representatives with relevant expertise or experience; and

3) Other interested persons, as determined by the Secretary.

USDA invited groups from each of these specified categories and posted public information and registration links for the consultation sessions to the Office of Energy and Environmental Policy website. A total of 203 individuals registered for the Zoom calls, with 201 individuals joining at least one of the three consultation sessions. Attendees included private citizens such as farmers, industry representatives, and representatives from farm and environmental groups. A total of 74 individuals elected to speak during the calls to offer their perspectives.

Insights shared in the public consultation sessions echoed comments received in response to the RFI. Some speakers directly echoed portions of their RFI comments, while others shared personal experiences with CSA and biofuels production. Multiple speakers asked for the inclusion of intermediate cover crops and oilseed crops. Parallel to a request for more flexibility was an opposition to "bundling," rules that would require farm producers to simultaneously implement a specified group of CSA practices. Many speakers emphasized that a bundling approach limits farmer participation; instead, they favored the use of a more flexible approach to CSA practices, as well as a quantification system that reflects the impact of individual CSA practices.

Speakers also frequently highlighted their perspectives on traceability systems throughout the consultation calls. Many speakers expressed support for either book and claim or mass balance systems. Supporters of book and claim underscored the benefits of decoupling carbon intensities from bushels of feedstock, giving farmers greater market

flexibility and increasing farmer participation and eligibility across a broader geography. Others were in favor of a mass balance system which would align with ISCC traceability programs, simplify the chain of custody, and maintain the participation of grain elevators.

USDA completed an analysis of comments submitted through the RFI and documented viewpoints shared during the public consultation sessions. Both the RFI and the consultation sessions provided valuable insights into the preferences, perspectives, and concerns of groups potentially impacted by the USDA rule. Insights gained from these public engagements were informative to the drafting of the rule.

RFI Comments Regarding Biofuel Crops

In response to which crops should be considered for inclusion in a USDA policy on biofuel feedstock crop production, RFI commenters primarily and widely supported the inclusion of traditional row crops. Field corn was the most frequently mentioned, as it currently represents 98 percent of U.S. ethanol industry feedstock production. Soybeans, sorghum, and spring canola were also frequently endorsed as major biofuel feedstocks, reflecting their established role in current U.S. biofuel production. These mainstream feedstocks were often recommended due to their existing infrastructure, and well-understood production practices. Many commenters emphasized the importance of maintaining these established feedstocks while gradually expanding options to ensure market stability and reliable supply chains.

Many commenters also recommended including winter oilseed crops, with particular emphasis on brassica carinata, camelina, pennycress, and winter canola. These crops were highlighted for their potential to provide soil health benefits, offer crop diversification advantages, and generate additional farm income through double-cropping systems. Notably, commenters pointed out that winter canola has 20 to 30 percent greater yield potential than spring canola, and several organizations detailed their

ongoing research and development efforts with these winter oilseed varieties, particularly in regions like the Northern Great Plains.

Commenters also recommended a diverse array of alternative feedstocks for consideration, ranging from perennial grasses like switchgrass and miscanthus to woody crops such as hybrid poplar and shrub willow. Agricultural residues and byproducts, including corn stover, wheat straw, and sugar beet processing remnants, were frequently mentioned as potential feedstock sources. Several commenters advocated for the inclusion of emerging options like Kernza (an intermediate wheatgrass), various biowaste streams, and crop residues, emphasizing the importance of maintaining flexibility to incorporate new feedstock sources as technology and research advance. Many stressed the value of a diverse feedstock portfolio to mitigate risks associated with market fluctuations, crop failures, and regional variations.

RFI Comments Regarding CSA Practices

RFI commenters overwhelmingly emphasized the importance of soil management practices, particularly conservation tillage and no-till operations, as foundational CSA practices. These practices received strong support due to their well-documented benefits in reducing soil disturbance and enhancing carbon sequestration, though several commenters noted the need for regional flexibility in implementation. To support the argument for including these practices, some commenters referenced extensive research demonstrating their effectiveness, though some stakeholders raised important considerations about the permanence of carbon sequestration benefits and suggested the need for monitoring practice duration and potential reversals. Many recommended using existing NRCS standards to define specific parameters for these practices, ensuring consistent implementation and reliable GHG emissions quantification.

Many commenters advocated for the inclusion of nitrogen management practices and presented evidence for including a range of approaches from enhanced efficiency

fertilizers to precise application timing and placement. Arguments for these practices emphasized their direct impact on reducing N_2O emissions, a potent GHG. Many commenters emphasized the importance of the "4R" approach (right source, right rate, right time, and right place) and provided specific examples of how technologies like variable rate application and nitrogen stabilizers can significantly reduce emissions while maintaining crop yields. The recommended inclusion of these practices was further supported by their potential to reduce both direct field emissions and indirect emissions associated with fertilizer production and transport.

Integrated systems practices, including cover cropping, buffer strips, and crop rotations, were strongly recommended based on their multiple environmental benefits and GHG reduction potential. Stakeholders presented evidence that these practices could sequester carbon and also improve soil health, reduce erosion, enhance biodiversity, and create more resilient agricultural systems. However, commenters emphasized the need for flexible implementation frameworks that allow farmers to adapt practices to their specific contexts while maintaining measurable GHG benefits. Many suggested using established NRCS conservation practice standards as a foundation while incorporating new technologies and emerging practices as they are validated.

Some commenters also recommended the inclusion of water conservation practices, based on evidence of both direct and indirect GHG reduction benefits. Stakeholders detailed how improved irrigation efficiency, precision irrigation systems, and soil moisture monitoring can significantly reduce energy usage associated with water transportation and irrigation operations. Several commenters provided specific examples of technologies, such as subsurface drip irrigation-effluent systems, that demonstrate measurable GHG reductions while delivering co-benefits like improved nutrient management and water quality. Proponents of including water conservation practices

also pointed to regional variations in water availability and the increasing importance of water efficiency in agricultural sustainability**.**

RFI Comments Regarding Quantification Approaches: Data and Modeling

RFI commenters strongly emphasized the critical importance of utilizing robust scientific data and empirical evidence to accurately quantify GHG emissions and carbon sequestration from agricultural practices. Many commenters advocated for a multi-model ensemble approach that would combine outputs from different models and compare them with empirical data, suggesting the use of the lower bound of the 95 percent confidence interval for crediting purposes. A fundamental tension emerged between the scientific rigor of complex biogeochemical modeling and the practical needs of implementation, with some stakeholders favoring a more straightforward practice-based approach using lookup tables and simple regressions. Many commenters supported regional and county-level modeling as a means to account for variations in soil types, weather conditions, and management practices. Several commenters highlighted specific models and tools for consideration, including DAYCENT, COMET, and Field to Market's Sustainability Metrics, while emphasizing the importance of regular updates to incorporate new data and technologies.

RFI commenters identified an extensive array of existing data sources and tools that could be leveraged for quantifying GHG emissions from agricultural practices. Frameworks including the R&D GREET model, CORSIA protocol, and Intergovernmental Panel on Climate Change guidelines were frequently cited as established frameworks that could inform a policy approach. Federal programs and databases, including the Agricultural Resource Management Survey, the USDA the Agricultural Resource Management Survey, and the USDA Greenhouse gas Reduction through Agricultural Carbon Enhancement network, were highlighted as valuable resources that already contain relevant data for emissions quantification. Private sector

contributions, including data from carbon markets and third-party verification entities, were identified as important complementary sources to public datasets. The integration of academic research, particularly from LGUs and research institutions, was consistently emphasized as crucial for building a comprehensive understanding of agricultural GHG emissions and mitigation potential.

RFI commenters proposed a range of quantification approaches, reflecting the complexity of measuring agricultural GHG emissions. Process-based models like the Soil and Water Assessment Tool+ model, DAYCENT, and DeNitrification-DeComposition model were suggested alongside empirical approaches using emission factors and direct measurements. A key debate emerged between supporters of regional-scale quantification using standardized factors and advocates for more granular field-level measurements. Stakeholders emphasized the importance of standardized protocols and verification processes to ensure consistency and comparability across different approaches. The need to consider full life cycle impacts, including upstream emissions and indirect land-use changes, was highlighted as crucial for comprehensive emissions accounting. Many commenters recommended aligning with established international standards while maintaining flexibility to accommodate regional variations in agricultural practices.

Data gaps in current empirical research emerged as a significant concern among some commenters, particularly regarding the quantification of GHG emissions from various agricultural practices. Commenters expressed concerns about limitations in data availability for specific practices such as cover crops, nutrient management, and residue management, with commenters noting that most agricultural research has only recently begun focusing on climate mitigation potential. Geographic and regional data limitations were highlighted, with stakeholders cautioning against over-reliance on broad-scale data

that might miss important local variations. The lack of consistent historical baseline data was identified as a key challenge, especially for early adopters of climate-smart practices.

RFI Comments Regarding Quantification Approaches: Geographic Scale

RFI commenters emphasized that geographic variability significantly influences the effectiveness and outcomes of CSA practices, necessitating careful consideration in any quantification framework. Many commenters advocated for a regional approach that could effectively balance accuracy with scalability, with several specifically recommending USDA's Farm Resource Regions as an appropriate foundation for regional quantification. The complexity of geographic considerations was highlighted by concerns about potentially creating "winners and losers" based on regional differences, which could inadvertently shift production patterns and impact farm incomes in certain areas. Some stakeholders suggested that while geographic variability must be acknowledged, the quantification system should strive to maintain relative parity in potential benefits across regions to ensure equitable program implementation.

The debate over appropriate geographic scale for GHG emissions quantification revealed a tension between precision and practicality. While many commenters supported farm or field-level quantification for its accuracy and ability to capture site-specific variations, others advocated for district, county, or state-level approaches that could better balance precision with administrative feasibility. Several commenters argued that county-level quantification aligns well with existing USDA survey capabilities and the R&D GREET Feedstock Calculator methodology. A notable suggestion emerged for a hybrid approach that would use field-level data where available while maintaining broader-scale defaults as a "safety valve" to ensure program inclusivity and account for unique circumstances.

The importance of addressing local and regional conditions in GHG emissions quantification was consistently emphasized across stakeholder comments. Variations in

soil types, climate, topography, precipitation, and growing season length were identified as critical factors affecting practice effectiveness and GHG benefits. Several commenters recommended leveraging existing resources such as LGUs and extension services to better understand and account for local variations. Some stakeholders specifically suggested using established regional classifications like NRCS MLRAs or crop reporting districts to group areas with similar conditions, while others advocated for investment in enhanced monitoring technologies like Eddy flux towers to better quantify regional differences in GHG emissions and sequestration potential.

RFI Comments Regarding Verification and Recordkeeping

RFI commenters emphasized the importance of balancing robust verification standards with the need to minimize administrative burdens on farm producers. Many suggested that existing USDA conservation program data and third-party tools could effectively streamline documentation processes. Some commenters were concerned about the potential for CSA opportunities to become a vehicle for collecting excessive farm data, with several commenters noting that only 3 percent of eligible producers currently participate in carbon markets due to high transaction costs and administrative burdens. While accurate documentation was broadly acknowledged as crucial for transparency and long-term impact assessment, stakeholders emphasized that standards should remain practical and cost-effective.

RFI commenters provided extensive recommendations for specific recordkeeping approaches, emphasizing the need for practical documentation that builds upon existing farm management practices. Key recommended records included field boundary maps, crop types, planting and harvest dates, fertilizer and chemical application records, waste-management practices, tillage documentation, cover crop information, yield data, and equipment usage metrics, with many commenters noting these records are typically already maintained for USDA programs. Integration with established frameworks like

USDA organic certification processes, the USDA CSA pilot program referenced in Treasury and IRS's guidance on the Section 40B SAF credit, and USDA's Conservation Evaluation and Monitoring Activity was recommended to avoid creating entirely new documentation systems. The importance of allowing flexibility in record formats was emphasized to accommodate diverse farming operations and technological capabilities, with particular consideration for smaller farms and operations with limited resources. Commenters also stressed the value of accepting attestations from farmers and third-party service providers like agricultural retailers, cooperatives, and independent crop consultants, particularly during the initial implementation phase.

Remote sensing and emerging technologies received significant attention from commenters as potential tools for streamlining verification processes while maintaining program integrity. Many commenters highlighted how satellite imagery, drone technology, and precision agriculture data could effectively verify practices like cover crops, tillage patterns, and buffer strip implementation, with some noting that technologies like Sentinel-2 imagery can identify buffer strips with over 80 percent accuracy. However, several stakeholders cautioned that remote sensing technologies have limitations, particularly in measuring three-dimensional stored carbon or verifying practices not visible from above, suggesting these tools should complement rather than replace traditional verification methods. The integration of these technologies with farm management software, Internet of Things devices, and blockchain was recommended to enhance data collection and verification efficiency, though commenters emphasized the need for standardized processes and algorithms to ensure consistency and reliability across different regions and farming operations.

Most RFI commenters advocated for limited on-site audits to maintain cost-effectiveness and practicality. They recommended following established verification frameworks like those used by the California LCFS and the ISCC Program, which

typically require annual verification through a combination of on-site visits and remote monitoring. Commenters suggested giving farmers a presumption of compliance, with auditing practices kept to a reasonable minimum while still deterring non-compliance. Recommendations for audit frequency ranged from annual reviews for high-risk operations to every 2 to 3 years for compliant operations.

RFI commenters recommended sampling methodologies as a means to balance verification rigor with practical implementation. Commenters recommended approaches like stratified random sampling based on geography, crop type, and farm size, following protocols like the square root method used by ISCC CORSIA. Risk-based sampling was a preferred approach, prioritizing farms with higher non-compliance risk based on factors like operation size, practice complexity, and past audit performance. Commenters consistently highlighted the need for sampling approaches tailored to regional and operational differences while maintaining statistical validity and cost-effectiveness.

RFI Comments Regarding a Chain of Custody Approach

Commenters expressed diverse views on the use of mass balance and book-and-claim systems for tracing CSA feedstocks through supply chains. Many commenters supported the use of a book-and-claim system, arguing that it provides flexibility, reduces compliance costs, and aligns better with the intended outcomes compared to mass balance or identity preservation systems. These commenters emphasized the need for minimal and flexible data collection requirements for farmers, suggesting the use of digital solutions, farm equipment data, satellite imagery, and remote sensing to reduce administrative burdens and align with existing programs like NRCS and ISCC.

On the other hand, some commenters supported the current traceability definition used in the USDA CSA Pilot Program in the Treasury and IRS guidance on the section 40B SAF tax credit which relies on a mass balance approach. They argued that mass balance is an indispensable tool for incentivizing the development of renewable natural

gas (RNG) production and that programs should be modified to allow RNG to be used as a feedstock for SAF and renewable diesel without limitations like region or first use criteria. One commenter noted that a mass balance approach would make it more difficult to track actual bushels leaving the field where the CI-lowering practices were completed; however, another stated that mass balance could reduce the risk of fraudulent claims regarding production practices and chain of custody claims.

A few commenters proposed the use of blockchain technology, token-based systems, or digital ledger platforms for tracing and verifying CSA attributes and feedstock movements, providing transparency, auditability, and reduced risk of double-counting or over-allocating attributes. One commenter described a pilot program using blockchain for tracking sustainable soybean oil attributes.

In summary, commenters were split between supporting mass balance and book-and-claim systems for tracing CSA feedstocks. While book and claim was recommended for its flexibility and reduced compliance costs, mass balance was seen as the best approach for aligning with existing traceability systems.

USDA Response and Request for Additional Public Comment

USDA considered public comments when preparing this interim rule. USDA considered multiple crops for inclusion in this rule, including canola and intermediate oilseeds. The crops included in this rule were selected based on their prevalence of use as a biofuel feedstock, as well as the availability of data to quantify the impact of CSA practices on their production. When assessing different chain of custody approaches, USDA considered both mass balance and book and claim. While USDA recognizes the potential merits of a book and claim system, as outlined by commenters, the infrastructure needed to support a book and claim system does not exist at scale at this time. As detailed by other commenters, mass balance systems are already in use for

tracking commodity crops and associated environmental attributes throughout supply chains.

USDA is requesting public comment on this interim rule and welcomes feedback on any aspect of this rule. In particular, USDA is considering the inclusion of additional crops and CSA practices in the final rule and is seeking input on the following questions.

1. USDA is considering the inclusion of spring canola in the final rule. What data and research exist on the current adoption rates and GHG impacts of CSA practices, defined in this rule, on spring canola production?
2. USDA is considering the inclusion of winter canola in the final rule. What CSA practice(s) are applicable to winter canola? What data and research exist on the GHG impacts of the practices used in winter canola production?
3. What records or information could be used to verify that a crop is winter canola or spring canola?
4. USDA is considering the inclusion of intermediate oilseed crops in the final rule. What CSA practices are applicable to intermediate oilseeds? What data and research exist on the GHG impacts of these CSA practices used in intermediate oilseed production?
5. USDA is considering including "conservation crop rotation" as a CSA practice in the final rule. Conservation crop rotation is the practice of growing a planned sequence of crops on the same ground over a period of time. Conservation crop rotation is similar to the cover crop practice in that living crops provide cover year-round; however, unlike cover crops, all crops in a conservation crop rotation may be harvested.
    a. What data and research exist on the GHG impacts of conservation crop rotation?

b. If conservation crop rotation is included as a CSA practice, how should USDA proportion the GHG impacts when multiple biofuel feedstock crops are grown in the rotation? For example, if an intermediate oilseed crop and corn are grown in the rotation, which crop should receive a GHG reduction for the conservation crop rotation practice?

6. USDA is considering the inclusion of additional Enhanced Efficiency Fertilizer (EEF) products, such as controlled release fertilizers, in the final rule. What data and research exist on the GHG impacts of EEF products when used on the crops defined in this rule?

7. USDA is considering the inclusion of plant biostimulant products in the final rule. There is no universally accepted definition of plant biostimulants in the United States. However, the 2018 Farm Bill directed USDA to submit a report on plant biostimulants to the President and Congress.[11] For the purposes of the report, the 2018 Farm Bill considered a plant biostimulant to be "a substance or micro-organism that, when applied to seeds, plants, or the rhizosphere, stimulates natural processes to enhance or benefit nutrient uptake, nutrient efficiency, tolerance to abiotic stress, or crop quality and yield" and allowed USDA to modify the definition, as appropriate.

   a. What definition(s) of plant biostimulant products should USDA consider for the purpose of this rule?

   b. Which biostimulant product categories should be considered for inclusion in the final rule?

[11] See USDA, *Report to the President of the United States and United States Congress on Plant Biostimulants Submitted by the United States Department of Agriculture (USDA) in Consultation with the Environmental Protection Agency (EPA) on December 20, 2019,* December 2019, https://agriculture.house.gov/uploadedfiles/usda_report_on_plant_biostimulants_12.20.2019.pdf.

c. What data and research exist on the GHG impacts of biostimulant products?

d. What implementation standards would be necessary to ensure a net GHG reduction from plant biostimulant products?

e. How can the appropriate use of plant biostimulant products be verified?

8. USDA is considering including "reduced nitrogen application rate" as a CSA practice in the final rule.

a. What implementation standards would be necessary to ensure a net GHG reduction from a "reduced nitrogen application rate" practice?

b. What records and information would be necessary to verify a "reduced nitrogen application rate" practice?

9. USDA recognizes that the practice implementation standards in this interim rule are different than requirements for some USDA programs (for example, the cover crop termination methods and timing in this rule are more specific than practices allowed under crop insurance). How might the guidelines included in this interim rule impact farmers' ability to participate in USDA policies and programs (for example, crop insurance)?

10. What refinements to the USDA FD-CIC tool should USDA consider?

11. Should USDA consider transitioning to a book-and-claim traceability approach? If so, how could USDA facilitate that transition?

12. USDA is requesting comment on potential improvements to the verification, recordkeeping, and reporting standards and whether the standards appropriately balance verification rigor with burden of implementation.

13. The Regulatory Impact Analysis (RIA) for this rule estimates the expected costs associated with this rule which are primarily attributable to costs to conform with recordkeeping and verification standards necessary to trace

reduced-CI biofuel feedstock through the biofuel supply chain. These costs are estimated on a per entity basis (farm producer, first point aggregator, other intermediary entities, and biofuel refiner). The rule's primary benefits, which are described qualitatively in the RIA, are due to the efficiencies achieved through more standardized guidelines for quantification, recordkeeping, and verification of reduced-CI biofuel feedstocks through the supply chain this rule provides. USDA requests public comment, including any data or information, that will lead to a better understanding of this rule's costs and benefits.

Notice and Comment, Effective Date, and Exemptions

The promulgation of regulations to implement the programs of Chapter 58 of Title 16 of the U.S. Code, as specified in 16 U.S.C. 3846, and the administration of those programs, are:

- To be made as an interim rule effective on publication, with an opportunity for notice and comment,
- Exempt from the Paperwork Reduction Act (44 U.S.C. chapter 35), and
- To use the authority in 5 U.S.C. 808 related to Congressional review and any potential delay in the effective date.

Per Subtitle E of the Small Business Regulatory Enforcement Fairness Act of 1996, also known as the Congressional Review Act (5 U.S.C. 801 - 808), the Office of Information and Regulatory Affairs has determined that this rule does not meet the criteria specified in 5 U.S.C. 804(2), so the Congressional Review Act's 60-day effective date delay requirement for rules does not apply. Even if this rule did meet the criteria specified in 5 U.S.C. 804(2), the 2018 Farm Bill directs the Secretary to use the authority in 5 U.S.C. 808 to specify this rule's effective date. Therefore, this rule is effective on the date of publication in the *Federal Register*.

In addition, this rule is exempt from the regulatory analysis requirements of the Regulatory Flexibility Act (5 U.S.C. 601-612), as amended by the Small Business Regulatory Enforcement Fairness Act of 1996. The Regulatory Flexibility Act generally requires an agency to prepare a regulatory analysis of any rule whenever an agency is required by the Administrative Procedure Act or any other law to publish a proposed rule, unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. This rule is not subject to the Regulatory Flexibility Act because OCE is not required by the Administrative Procedure Act or any law to publish a proposed rule for this rule.

Executive Orders 12866, 13563, and 14904

Executive Order 12866 (as amended by Executive Order 14904), "Regulatory Planning and Review," and Executive Order 13563, "Improving Regulation and Regulatory Review," direct agencies to assess all costs and benefits of available regulatory alternatives and, if regulation is necessary, to select regulatory approaches that maximize net benefits (including potential economic, environmental, public health and safety effects, distributive impacts, and equity). Executive Order 13563 emphasized the importance of quantifying both costs and benefits, of reducing costs, of harmonizing rules, and of promoting flexibility.

The Office of Management and Budget (OMB) designated this rule as significant under Executive Order 12866, "Regulatory Planning and Review," and therefore, OMB has reviewed this rule. The analysis of costs and benefits of this rule is summarized below.

Regulatory Impact Analysis Summary

Section 2709 of the 2008 Farm Bill (16 U.S.C. § 3845) directs the Secretary to establish technical guidelines that outline science-based methods to measure the environmental services benefits from conservation and land management activities to

facilitate the participation of farmers, ranchers, and forest landowners in emerging environmental services markets. It also directs the Secretary to give priority to the establishment of guidelines related to farmer, rancher, and forest landowner participation in carbon markets. It further directs the Secretary to establish verification guidelines, including the role of third parties in conducting independent verification of benefits produced for environmental services markets and other functions.

Under these authorities, this rule facilitates recognition of crops grown with CSA practices in biofuel markets and provides farm producers with opportunities to market biofuel crops based on their lower net GHG emissions. It also provides standardized guidelines for entities in the biofuel supply chain (including first point aggregators, intermediary entities, and biofuel refiners) to quantify, verify, and trace reduced-CI feedstocks (that is, those crops grown with CSA practices) through the biofuel supply chain, from farm to biofuel refiner. The rule achieves these outcomes by providing quantification, recordkeeping, chain of custody, and verification standards that:

(1) decrease information asymmetries between biofuel supply chain entities with respect to the carbon intensity of biofuel feedstocks, and

(2) reduce transaction costs and increase efficiencies in existing systems that quantify, trace, and verify emissions benefits associated with biofuel feedstocks produced with CSA practices.

The Regulatory Impact Analysis estimates the expected costs of this rule quantitatively and discusses the expected benefits qualitatively.

To estimate the expected costs of the rule, USDA created a model that quantifies the total per entity annual costs (in hours and dollars) of quantification, recordkeeping, and verification processes conforming to the rule standards for each entity type in the biofuel supply chain including farm producers, first point aggregators, intermediary

entities, and biofuel refiners. Model inputs were derived from multiple sources, including:

- USDA program office data on the hours required of producers to record and verify information about the adoption of conservation practices (including CSA practices in this rule) for existing USDA programs, such as the Environmental Quality Incentives Program;
- internal USDA data on the time costs (hours) associated with third party verification of reduced-CI feedstocks;
- Bureau of Labor Statistics wage rates applicable to labor used by each entity type to conduct quantification, recordkeeping or verification;
- latest USDA data on estimated acres and bushels of biofuel feedstock production with CSA practices; and
- annual volume throughput of biofuel feedstocks for each entity type in the biofuel supply chain calculated using internal USDA data and data from the U.S. Energy Information Agency.

Aggregate costs of the rule for all entities in the biofuel supply chain are not estimated in the RIA because they depend on the level of participation among biofuel supply entities in policies or programs that adopt the rule's standards. Additional details about the RIA assumptions, model inputs, methodology, and limitations are described in the RIA.

Summary of Costs and Benefits

Costs

The costs of this rule include costs associated with collection of information, the maintenance of such information in records, and the exchange of these records between entities in the biofuel supply chain. Under this rule's standards, information collection and the maintenance and exchange of records occurs between private entities. The

federal government does not collect, maintain, or exchange any information or records as part of the rule standards. The regulatory impact analysis calculates the costs of this rule in burden hours and dollars on a per entity basis (for each entity type including farm producers, first point aggregators, intermediary entities, and biofuel refiners) and on a per bushel basis for each entity type.

USDA estimates of the per entity level of effort (LOE) per entity type (farm producers, first point aggregators, intermediary entities, and biofuel refiners) are summarized in Tables 1 and 2 below.

LOEs for farm producers are estimated to be between 5 to 7 hours per year and were scaled based on the number of CSA practices adopted which assumes that additional practices require additional recordkeeping time. The LOE estimates for producers are inclusive of quantification of carbon intensity of the crop and recordkeeping time costs. LOE for farm producer audits is estimated separately because not all farm producers in a given year will be selected for auditing by a third-party verifier.

LOE for first point aggregators are estimated to be between 48 and 286 hours per entity per year, depending on the size (measured in throughout of biofuel feedstock) of the entity. The LOE estimates for First Point Aggregator verification does not include verification fees; these fees however are included in the per entity costs estimated, as summarized in Table 2.

LOE for intermediary entities is estimated to be 143 hours per entity per year. These LOE estimates also do not include any verification fees (see Table 2).

LOE for biofuel refiners is estimated to be 673 hours per entity per year. These LOE estimates also do not include any verification fees (those are included in Table 2).

Table 1. Estimated Level of Effort (LOE) Per Entity Per Year

Category	LOE (hours per year)
Producers (1 CSA practice).....	5

Producers (2 CSA practices)	6
Producers (3 CSA practices)	7
Producers (Audits only, if selected)*	8
First Point Aggregators (small)**	48
First Point Aggregators (medium)**	143
First Point Aggregators (large)**	286
Intermediary Entities**	143
Biofuel Refiners**	673

Notes:
**Farms selected for audits will have 8 extra hours of LOE. Not all farms are selected for audits in a given year.*
***LOE hours do not include verification fees.*

Table 2 summarizes the annual per entity costs (in 2023 dollars) per entity type. For farm producers, depending on the number of CSA practices adopted, the annual costs range from $380 to $490, which include costs associated with quantification of the carbon intensity of the crop and recordkeeping time costs and a lawyer fee for completing the farm attestation, with an addition $470 annually per entity in the event that a farm producer is audited. The verification and recordkeeping costs for First Point Aggregators is estimated to be between $3,400 to $19,400 per year per entity, depending on the size of the aggregator. These costs include any verification fees incurred for their audits and the audits of the farm producers. The verification and recordkeeping cost for intermediary entities are estimated to be $9,400 per entity per year. Finally, recordkeeping and verification costs for biofuel refiners are estimated to be $72,500 per entity per year.

Table 2. Estimated Cost Per Entity Type Per Year (in 2023 dollars)

Category	Cost
Producer (1 practice)	$380
Producer (2 practices).....	$440
Producer (3 practices).....	$490
Producer Audits	$470
First Point Aggregators (small).....	$3,400
First Point Aggregators (medium).....	$9,900
First Point Aggregators (large)	$19,400
Intermediary Entities	$9,400
Biofuel Refiners	$72,500

Additional details about these estimates are described in the RIA.

While this RIA quantifies the paperwork burden associated with the rule, this rule's information collection requirements and associated burden hours (that is, level of effort estimates) are exempt from Paperwork Reduction Act of 1995 review and approval by the Office of Information Affairs within the Office of Management and Budget, as indicated by 16 U.S.C. 3846, as noted above.

Benefits

The benefits of this rule include the reduction in transaction costs and efficiency gains associated with the rule's framework for the quantification, reporting, and verification of reduced-CI biofuel feedstocks grown with CSA practices. USDA believes the framework specified in this rule provides a more standardized set of guidelines for the quantification, reporting, and verification of reduced-CI biofuel feedstocks grown with CSA practices. With this more standardized framework, USDA expects that the transaction costs incurred by entities for the quantification, reporting, and verification of reduced-CI feedstocks will be reduced. This standardization is expected to improve the efficiency of quantifying, reporting, tracing, and verifying reduced-CI feedstocks. USDA expects these improvements could facilitate participation in clean fuels policies and programs, should these policies and programs incorporate a reduced-CI for crops produced using CSA practices. Increased adoption of CSA practices in the production of biofuel feedstock crops will also generate environmental co-benefits such as improved water and air quality. Because insufficient data is available to quantify these benefits, the cost benefit analysis only qualitatively discusses them.

Clarity of the Regulation

Executive Order 12866, as supplemented by Executive Order 13563, requires each agency to write all rules in plain language. Executive Order 14094 requires Federal agencies to increase and improve public participation in the regulatory process. The

Executive Order's objective is to improve public trust in the regulatory process by reducing the risk or appearance of unequal or unfair influence in regulatory development. Under Executive Order 14904, agencies must, to the extent they can under law, seek out, assist with, and include public input in the regulatory process. We welcome comments from public (State, local, Tribal, and territorial) and private sector regulated entities; members of underserved communities; consumers; workers and labor organizations; businesses; and program beneficiaries, among others. In addition to substantive comments on this rule, we invite comments on how to make the rule easier to understand. For example:

- Are the standards in the rule clearly stated? Are the scope and intent of the rule clear?
- Does the rule contain technical language or jargon that is not clear?
- Is the material logically organized?
- Would changing the grouping or order of sections or adding headings make the rule easier to understand?
- Could we improve clarity by adding tables, lists, or diagrams?
- Would more, but shorter, sections be better? Are there specific sections that are too long or confusing?
- What else could we do to make the rule easier to understand?

Environmental Review

This rule qualifies as an activity under USDA categorical exclusion 7 CFR 1b.3(a)(6): "Activities which are advisory and consultative to other agencies and public and private entities, such as legal counselling and representation." As such, it is excluded from the requirements of an environmental assessment or environmental impact statement under the National Environmental Policy Act (42 U.S.C. 4321-4347) and its implementing procedures. The rule contains voluntary technical guidance in the form of

quantification, reporting, and verification standards that may or may not be adopted in future policies at various levels of government to incentivize the adoption of CSA practices for biofuel feedstock production, or may or may not be adopted by proponents of potential future actions that require measurement of GHG emissions. Making voluntary technical guidance available to a variety of users is advisory and consultative in nature. The rule also qualifies as "Educational and informational programs and activities" under 7 CFR 1b.3(a)(4) because technical guidance is educational and informative in nature. The rule does not authorize or fund any policy or action. If the standard is used in any future federal actions, a project specific analysis may be warranted at that time.

The Office of Energy and Environmental Policy has found that there are no extraordinary circumstances indicating that further NEPA analysis would be necessary or informative in promulgating this technical assistance; nor has it found any extraordinary circumstances indicating that providing this voluntary technical guidance may have significant effects on the quality of the human environment, individually or cumulatively. The Office of Energy and Environmental Policy has determined, therefore, that the rule does not constitute a major Federal action that would significantly affect the quality of the human environment. This notice serves as the documentation of this determination.

Executive Order 12372

Executive Order 12372, "Intergovernmental Review of Federal Programs," requires consultation with State and local officials that would be directly affected by proposed Federal financial assistance. The objectives of the Executive Order are to foster an intergovernmental partnership and a strengthened Federalism, by relying on State and local processes for State and local government coordination and review of proposed Federal Financial assistance and direct Federal development. This rule does not provide

Federal financial assistance to State and local governments. Therefore, consultation is not required.

Executive Order 12988

This rule has been reviewed in accordance with Executive Order 12988, "Civil Justice Reform." This rule will not preempt State or local laws, regulations, or policies unless they represent an irreconcilable conflict with this rule. Before any judicial actions may be brought regarding the provisions of this rule the administrative appeal provisions of 7 CFR part 11 and 2100 are to be exhausted.

Executive Order 13132

This rule has been reviewed under Executive Order 13132, "Federalism." The policies contained in this rule do not have any substantial direct effect on States, on the relationship between the Federal government and the States, or the distribution of power and responsibilities among the various levels of government, except as required by law. Nor does this rule impose substantial direct compliance costs on State and local governments. Therefore, consultation with the States is not required.

Executive Order 13175

The agency has determined that the rule may have Tribal implications. Tribal consultation will occur simultaneously with the public comment period. Notice for Tribal consultation will be sent on January 17, 2025. Consultation will be held virtually and written comments will be received until 60 days from the publication of this interim rule.

The Unfunded Mandates Reform Act of 1995

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Pub. L. 104-4, requires Federal agencies to assess the effects of their regulatory actions on State, local, and Tribal governments or the private sector. Agencies generally must prepare a written statement, including a cost benefit analysis, for proposed and final rules with Federal

mandates that may result in expenditures of $100 million or more in any 1 year for State, local, or Tribal governments, in the aggregate, or to the private sector. UMRA generally requires agencies to consider alternatives and adopt the more cost effective or least burdensome alternative that achieves the objectives of the rule. This rule contains no Federal mandates, as defined in Title II of UMRA for State, local, or Tribal governments, or the private sector. Therefore, this rule is not subject to the requirements of sections 202 and 205 of UMRA.

USDA Non-Discrimination Policy

In accordance with Federal civil rights law and USDA civil rights regulations and policies, USDA, its Agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family or parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.

Individuals who require alternative means of communication for program information (for example, braille, large print, audiotape, American Sign Language, etc.) should contact the responsible Agency or the USDA TARGET Center at (202) 720-2600 (voice and text telephone (TTY)) or dial 711 for Telecommunications Relay Service (both voice and text telephone users can initiate this call from any telephone). Additionally, program information may be made available in languages other than English.

To file a program discrimination complaint, complete the USDA Program Discrimination Complaint Form, AD–3027, found online at https://www.usda.gov/oascr/how-to-file-a-program-discrimination-complaint and at any

USDA office or write a letter addressed to USDA and provide in the letter all the information requested in the form. To request a copy of the complaint form, call (866) 632-9992. Submit your completed form or letter to USDA by: (1) mail to: U.S. Department of Agriculture, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue SW, Washington, DC 20250–9410; (2) fax: (202) 690–7442; or (3) email: program.intake@usda.gov.

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List of Subjects in 7 CFR Part 2100

Alternative fuels, Agriculture, Environmental protection, Fuel economy, Greenhouse gases, Natural resources, Reporting and recordkeeping requirements.

For the reasons discussed above, and under the authority of the Food, Conservation, and Energy Act of 2008 (2008 Farm Bill (Pub. L. 110-246)), section 2709, (16 U.S.C. 3845), OCE amends title 7 of the CFR by adding Chapter XXI consisting of part 2100 to read as follows:

Chapter XXI -- OFFICE OF ENERGY AND ENVIRONMENTAL POLICY, DEPARTMENT OF AGRICULTURE

PART 2100 — Technical Guidelines for Climate-Smart Agriculture Crops Used as Biofuel Feedstocks

Subpart A-General Provisions

Sec.

Subpart B-Applicability

Subpart C-Quantification of Farm-level Crop-specific Carbon Intensity

Subpart D-Chain of Custody Standards

Subpart E-Audits and Verification

Subpart F-Climate-Smart Agriculture (CSA) Practice Standards

Authority: 16 U.S.C. 3845-3846.

Subpart A-General Provisions

§ **2100.001 Purpose.**

The purpose of this rule is to establish technical guidelines for quantifying, reporting, and verifying the greenhouse gas (GHG) emissions associated with agricultural production of biofuel feedstock commodity crops grown in the United States.

§ 2100.002 Definitions.

Accreditation means a formal recognition by an authorized body that a third-party verifier operates according to a set of standards.

Agricultural expert means persons who are employed by the Cooperative Extension System or the agricultural departments of universities, or other persons approved by Federal Crop Insurance Corporation, whose research or occupation is related to the specific crop or practice for which such expertise is sought.

Audit means a process for obtaining relevant information about an entity's practices or processes, recordkeeping, and management and evaluating it objectively.

Biofuel means a liquid or gaseous fuels and fuel blending components produced from biomass feedstock.

Biofuel feedstock crop means a crop that can be used as raw material for biofuel production.

Biofuel Feedstock Report means a report generated by a farm producer that includes documentation of carbon intensity calculations and the Farm Producer Attestation.

Biofuel refiner means an entity that refines biomass feedstocks into a biofuel.

Biomass means any organic material other than oil and natural gas (or any product thereof), and coal (including lignite) or any product thereof.

Carbon intensity (CI) means a measure of GHG performance reflecting the estimated quantity of GHG emissions associated with one unit of production. For biofuel feedstock crops, carbon intensity is expressed as grams of carbon dioxide equivalent (CO_2-eq) per bushel of produced crop (g CO_2-eq/bushel).

Climate-smart agriculture (CSA) crop means a crop that is produced with CSA practices according to subparts A through F of this part.

Climate-smart agriculture (CSA) practices means agricultural management, practices, systems, and technologies that have been demonstrated to generally reduce GHG emissions or increase soil carbon sequestration.

Conventional crop means a crop that is produced without the use of CSA practices according to this part.

Cover crop means grasses, legumes, and forbs planted for seasonal vegetative cover, and not intended for harvest, between harvested production crops in rotation.

Crop interval means the time immediately following harvest or termination of one cash crop through harvest or termination of the next cash crop in the rotation, including fallow periods.

Crushing yield means a number representing the amount of oilseed produced from crushing one bushel of seed oil crop. Crushing yield is usually expressed in pounds per bushel (lbs/bu).

Farm means a business entity that produces (that is, grows and harvests) biofuel feedstock crops.

Farm producer means a person who is involved in making decisions for the farm operation. These decisions may include planting, harvesting, management, and marketing. The farm producer may be the owner, a member of the owner's household, a hired manager, a tenant, a renter, or a sharecropper. If a person rents land to others or has land worked on shares, they are considered the farm producer only for the land retained for their own operation.

Farm Producer Attestation means a document generated by the farm producer, who has operational control, that provides assurance that the farm producer followed standards in this part. The Farm Producer Attestation is included in the Biofuel Feedstock Report.

Feedstock means raw material that is converted into fuels and coproducts during the fuel production process.

Field means a part of a farm that is separated from the balance of the farm by permanent boundaries, such as fences, permanent waterways, woodlands, roads, croplines, or other similar features. In addition to a permanent, contiguous boundary, a field has common land cover and management.

First point of aggregation means the entity that purchases crops directly from the farm. Entities serving as the first point of aggregation distribute, trade, or further process these feedstocks.

Intensive tillage means a tillage operation that involves full width soil disturbance and multiple operations with implements such as moldboard, disk, or chisel plow. Intensive tillage does not meet the standards of reduced till or no-till in this part.

Intermediary entity means any entity in the biofuel supply chain that falls between the first point of aggregation and the biofuel refiner. Intermediary entities may include crushers, processors, storage facilities, or other entities.

Leguminous cover crop means a cover crop that fixes atmospheric nitrogen and are planted for seasonal vegetative cover, and not intended for harvest, between harvested production crops in rotation.

Management unit means field, group of fields, or other land units of the same land use and having similar treatment needs and planned management.

Mass balance system means a system in which materials or products with specified characteristics are mixed with materials or products without some or all of these characteristics, resulting in a claim on a part of the output, proportional to the input.

No-till means a practice that limits soil disturbance to manage the amount, orientation, and distribution of crop and plant residue on the soil surface year-round.

Nutrient management means the practice of managing the rate, source, placement, and timing of plant nutrients and soil amendments to optimize their economic benefits while minimizing environmental impacts.

Operational control means authority possessed by the person who runs the farm, making day-to-day management decisions. A person with operational control could be an owner, hired manager, cash tenant, share tenant, or a partner. If land is rented or worked on shares, the tenant or renter has operational control.

Planting green means a system where a cover crop is left in place and a production crop is planted into the cover crop without prior termination.

Process means any mechanical operation that transforms the physical properties of a product. Processing includes extracting oil from seed oil crops (for example, soybeans).

Reduced-carbon intensity (reduced-CI) crop means a crop that is produced by a farm that employs CSA practices on some or all of the fields or management units used for that crop's production. A farm that does not employ any CSA practices does not have crop that is considered reduced-CI crop.

Reduced-carbon intensity processed product (Reduced-CI processed product means a product derived from reduced-CI crops.

Reduced till means the practice of managing the amount, orientation, and distribution of crop and other plant residue on the soil surface year-round while limiting soil-disturbing activities used to grow and harvest crops in systems where the field surface is tilled prior to planting.

Soil Tillage Intensity Rating (STIR) means a numerical value that measures the severity and type of soil disturbance caused by tillage operations. STIR values range from 0 to 200, with higher values indicating more soil disturbance. The STIR rating applies to the entire tillage system used in producing a crop. The components of the rating include tillage type, recommended equipment operating speed, recommended tillage depth, and surface area disturbed.

Third-party verifier means an accredited person or organization independent of the verified entity that performs a verification activity or audit.

Subpart B-Applicability

§ 2100.010 Entities in the biofuel supply chain.

The supply chain for feedstock crops used in biofuel production begins at a farm and ends at a biofuel refiner. Any entity within this supply chain that produces, processes, or takes ownership of reduced-CI crop or reduced-CI processed product must

meet all applicable standards of this part. These entities include farms, first points of aggregation, intermediary entities, and biofuel refiners. If a biofuel refiner sources directly from a farm, the biofuel refiner is the first point of aggregation.

§ 2100.011 Biofuel feedstock crops.

Crops produced using one or more CSA practices, in accordance with subpart F of this part, are referred to as CSA crops. Crops produced without the use of CSA practices are referred to as conventional crops. A farm producer may produce both CSA crops and conventional crops. CSA crops and conventional crops can be physically mixed. Crops that are sold with an associated reduced-CI, as compared to the national average CI, are referred to as reduced-CI crops. Reduced-CI crops may be composed of solely CSA crops or a combination of CSA crops and conventional crops. If CSA crops and conventional crops are produced at the same farm, the commingled crop must have an associated CI that reflects the proportion of CSA crops, quantified in accordance with subpart C of this part. Crops for which a reduced-CI may be quantified include:

(a) Field corn;

(b) Soybeans; and

(c) Sorghum.

§ 2100.012 CSA practices to produce CSA crops.

CSA crops must be produced using one or more CSA practices:

(a) Field corn produced using no-till, reduced till, cover crops, nitrification inhibitors, split in-season nitrogen application, or no fall nitrogen application;

(b) Soybeans produced using no-till, reduced till, cover crops, or nitrification inhibitors; or

(c) Sorghum produced using no-till, reduced till, cover crops, nitrificiation inhibitors, or split in-season nitrogen application.

Subpart C-Quantification of Farm-level Crop-specific Carbon Intensity

§ 2100.020 Quantification of CI.

Any farm producing and selling reduced-CI crops must calculate a farm-level CI for each crop type (field corn, soybeans, or sorghum). The farm-level crop-specific CI represents the carbon emissions resulting from production of one bushel of that crop. The farm-level crop-specific CI applies to the year in which the crop was harvested, and the total amount of a crop harvested in a given year must be included in the calculation. Once a farm-level CI is calculated for a specific crop, the total amount of that crop is assigned the farm-level crop-specific CI and may be sold as reduced-CI crop. To calculate the farm-level CI for each crop:

(a) Farm producers must calculate the CI for each field or management unit on which CSA practice(s) were implemented, in accordance with subpart F of this part, using the U.S. Department of Agriculture (USDA) Feedstock Carbon Intensity Calculator (FD-CIC). This step must be repeated for every field or management unit producing CSA crops. To calculate a field or management unit-level CI in USDA FD-CIC, farm producers must input data on:

(1) farm location (county and state);

(2) crop type produced;

(3) crop yield;

(4) field or management unit acres;

(5) use of no-till or reduced till;

(6) use of a cover crop;

(7) timing of nitrogen fertilizer application; and

(8) nitrification inhibitor usage.

(b) For any conventional crop, farm producers must input crop and yield (excluding yield of crop produced using CSA practices) into USDA FD-CIC. USDA FD-CIC will assign these crops the default national value CI.

(c) USDA FD-CIC will use the farm producer inputs from paragraphs (a) and (b) of this section to calculate a weighted average, which is the farm-level crop-specific CI.

(d) Farm producers must repeat paragraphs (a) through (c) of this section for each crop type that is sold as reduced-CI.

Subpart D-Chain of Custody standards

§ 2100.030 General recordkeeping and reporting standards.

(a) The total amount of reduced-CI crop and associated CI must be maintained and tracked from the farm to the biofuel refiner using records and mass balance accounting.

(b) Crops with different CIs can be physically mixed at any entity along the supply-chain.

(c) Processed products derived from crops (for example, seed oils) can be produced using crops with different CIs.

(d) All entities specified in § 2100.010 must maintain required documentation for 5 years from when reduced-CI crops or processed products are sold, including documentation of previous verification activities and audits conducted as required by this part. Documentation must be readily available to accredited third-party verifiers and provided upon request during an audit.

§ 2100.031 Farm recordkeeping and reporting standards.

(a) Farm producers must keep records demonstrating implementation of the CSA practices used in calculation of a CI.

(1) For reduced till or no-till, see § 2100.051(c), titled Tillage management recordkeeping standards.

(2) For cover crops, see § 2100.052(b), titled Cover crop recordkeeping standards.

(3) For nutrient management, see § 2100.053(g), titled Nutrient management recordkeeping standards.

(b) Farm producers must keep records demonstrating all sales of crop as a reduced-CI crop. These records must indicate the total amount sold, the purchasing entity, and the date of the transaction.

(c) For each crop that is sold as a reduced-CI crop, farm producers must prepare and maintain a Biofuel Feedstock Report. Farm producers must provide the Biofuel Feedstock Report to any entity purchasing reduced-CI crop. The Biofuel Feedstock Report must:

(1) State the farm name, farm producer name, and farm location (county and state);

(2) Demonstrate the quantification of the farm-level crop-specific CI, including:

(i) Documentation of USDA FD-CIC calculation for each field or management unit (for example, screenshots or printouts from the USDA FD-CIC excel tool, or similar documentation showing USDA FD-CIC inputs and outputs including CI for each field or management unit) including a unique identifier for each field or management unit; and

(ii) Calculation of the farm-level crop-specific CI for each crop; and

(3) Include a Farm Producer Attestation declaring that the farm producer:

(i) Has operational control over all fields using CSA practices and has decision-making authority to manage fields as specified for practice standards in subpart F of this part;

(ii) Implemented CSA practice(s) that were used in calculation of the CI according to the implementation standards in subpart F of this part;

(iii) Calculated the farm-level CI as specified in subpart C of this part;

(iv) Will retain required records for 5 years and make records available upon request to accredited third-party verifier;

(v) Will not double sell greenhouse gas benefits resulting from CSA practice(s) that are used in calculation of the CI (that is, will not sell the CI information, attributes, or greenhouse gas benefits associated with CSA crops in more than one market);

(vi) When implementing no-till, will continue no-till for a minimum of four out of every five years; and

(vii) Did not convert the land used to produce CSA biofuel feedstock crops into crop production after the date that this rule was published.

§ 2100.032 First point of aggregation and intermediary entity recordkeeping and reporting standards.

(a) The first point of aggregation and intermediary entities must establish and maintain a reporting system to ensure a clear link between reduced-CI crops and documentation at all times. The first point of aggregation and intermediary entities must have a documented system in place to prevent the double sale of crops associated with a CI. At minimum, the entity must keep:

(1) Records of incoming and outgoing reduced-CI crop, including:

(i) the total amount of reduced-CI crop purchased, sold, or both;

(ii) the entity from and to which the crop was purchased, sold, or both;

(iii) the associated CI; and

(iv) the date of the transaction;

(2) List of and contracts with all suppliers and recipients of reduced-CI crop; and

(3) List of and contracts with subcontractors and service providers who have a direct role in data management, accounting, processing, or other activities that involve the receipt, storage, sale, or tracking of reduced-CI crop.

(b) In addition to the standards in paragraph (a) of this chapter, the first point of aggregation and intermediary entities must maintain some documentation from the previous entity in the supply chain:

(1) The first point of aggregation must maintain the Biofuel Feedstock Report from each farm supplying reduced-CI crops; and

(2) Intermediary entities must maintain documentation showing that entities supplying reduced-CI crops or reduced-CI processed products received accredited third-party verification under this part.

(c) When a first point of aggregation or intermediary entity sells reduced-CI crops or reduced-CI processed products, the entity must provide the following documentation to the purchasing entity:

(1) documentation that the selling entity received third-party verification in accordance with this part;

(2) total amount of reduced-CI crop or reduced-CI processed product sold; and

(3) CI(s) associated with the amount of reduced-CI crop or reduced-CI processed product sold.

§ 2100.033 Additional recordkeeping standards for entities that process reduced-CI crops, or sell or purchase reduced-CI processed product.

(a) Any entity that processes product using reduced-CI crops is subject to additional recordkeeping standards. Processing includes extracting oil from seed oil crops (for example, soybeans). Entities that process reduced-CI crops must:

(1) Keep records on processing of reduced-CI crops, including the entity's crushing yield, the amount of reduced-CI crop used in processing, and the corresponding amount of reduced-CI processed product; and

(2) Demonstrate calculation of the amount of reduced-CI processed product corresponding to the amount of reduced-CI crop, using the entity specific crushing yield and the following equation:

reduced CI processed product = crushing yield x reduced CI crop

(b) Any entity that sells or purchases reduced-CI processed product must keep records demonstrating:

(1) The amount of reduced-CI crop used as an input for reduced-CI processed product sold or purchased;

(2) The CI associated with reduced-CI crop used as an input for reduced-CI processed product sold or purchased; and

(3) The amount of reduced-CI processed product sold or purchased.

§ 2100.034 Mass balance recordkeeping standards.

(a) First points of aggregation and intermediary entities must calculate and record the mass balance of incoming and outgoing reduced-CI crops, such that the incoming and outcoming amounts of reduced-CI crops with a specific CI are equal over a defined period of time. If an entity processes, purchases, or sells reduced-CI processed product, the mass balance accounting must document the amount of reduced-CI crop that was used in the reduced-CI processed product.

(b) To complete mass balance calculations, entities must define mass balance time periods such that mass balance time periods are continuous (that is, no gaps between mass balance periods occur). Each mass balance time period may not exceed three months. Entities must document the mass balance time period used for the mass balance calculation.

(c) Entities must provide documentation of the mass balance calculation for each time period to the third-party verifier during audits.

(d) For any given CI, records must indicate that incoming and outgoing crops and processed products are balanced according to the equation:

$$\text{incoming feedstock}_{i,c,m} + \text{beginning stored feedstock}_{i,c,m} = \text{outgoing feedstock}_{i,c,m} + \text{ending stored feedstock}_{i,c,m}$$

(1) Where feedstocks (incoming, stored, and outgoing) for entity *i* are identified by their carbon intensity, *c*, and the pre-defined mass balance accounting time period, *m*.

(i) Incoming feedstocks include those purchased by entity *i* in time period *m*.

(ii) Outgoing feedstocks must include both sold and discarded or wasted feedstocks in time period *m*.

(iii) Stored feedstocks are those maintained by the entity during time period *m* and must be accounted for in the mass balance accounting.

(iv) If reduced-CI crops or processed product is remaining at the end of a mass balance time period *m*, it is accounted for as ending stored feedstock for that time period and as beginning stored feedstock for the subsequent time period.

(2) To ensure that the mass balance accounting for entity *i* appropriately accounts for different forms of reduced-CI processed products (that is, oils), the entity's crushing yield must be used to convert reduced-CI processed products back to their crop volume or weight equivalents using the following equation:

processed feedstock crop equivalent = (processed feedstock)/(crushing yield)

§ 2100.035 Biofuel refiner recordkeeping standards.

(a) For reduced-CI crop that a biofuel refiner sources directly from a farm, the biofuel refiner is acting as a first point of aggregation and must follow the standards in § 2100.032.

(b) For reduced-CI crops and reduced-CI processed products that are sourced from a first point of aggregation or intermediary entity, a biofuel refiner must keep:

(1) Records of incoming reduced-CI crops or reduced-CI processed products, which, at a minimum this includes records of incoming reduced-CI crop or reduced-CI processed products, including the total amount of reduced-CI crop or reduced-CI processed product purchased, the entity from which the crop or processed product was purchased, the associated CI, and the date of the transaction; and

(2) Documentation that the entity supplying reduced-CI crop or reduced-CI processed product has undergone third-party verification by an accredited third-party verifier and met the standards of this part.

(c) For all reduced-CI crops, a biofuel refiner must establish a system to track all incoming reduced-CI crops and the associated CI.

Subpart E-Audits and Verification

§ 2100.040 Third-party audits.

(a) *Audit standards for first point of aggregation.* Each audit for a first point of aggregation must meet the following standards.

(1) First points of aggregation must hire a third-party verifier to conduct an audit annually;

(2) An audit, conducted by a third-party verifier, must verify that the first point of aggregation:

(i) Operates a mass balance system as specified in § 2100.034; and

(ii) Correctly recorded the CI associated with reduced-CI crops delivered from each farm; and

(3) The first point of aggregation must include supplying farms in its audit scope. The first point of aggregation and third-party verifier must adhere to the following standards when selecting the audit sample.

(i) The first point of aggregation must provide farm producer information to enable the third-party verifier to select a sample of supplying farms for verification. Farm producer information must include the total number of farms supplying reduced-CI crops, geographic location of each farm, type and amount of crop supplied by each farm, and CI associated with the crop from each farm;

(ii) The third-party verifier will determine the total number of farms to be included in the audit sample. The third-party verifier must determine the minimum size

of the farm audit sample by taking the square root, rounded up to the nearest whole number, of the total number of farms supplying the first aggregation point with reduced-CI crops; and

(iii) The third-party verifier must select the individual farms to be included in the sample for verification. The third-party verifier should select the sample in a way that is representative of supplying farms' characteristics including types of supplied reduced-CI crop, size of farm, geographic location, and risk of non-conformity or fraud. If an audit occurs at the same first aggregation point in subsequent years, the sample of farms should avoid selecting those audited in prior years.

(b) *Audit standards for farms*. Each audit for a farm must meet the following standards.

(1) Farms that supply reduced-CI crops to a first point of aggregation may be selected for an audit by the first point of aggregation's third-party verifier;

(2) If the farm is selected as part of the audit sample as the first point of aggregation, the farm may be considered for exemption from an additional audit when an audit was previously completed for the applicable year. Farm producers can elect to proactively retain an accredited third-party verifier to complete an audit at their farm per the standards of paragraph (b)(3) of this section. To be considered for exemption from an additional audit, the farm producer must provide results of the completed audit. It is up to the discretion of the third-party verifier to determine whether the farm is exempt from an additional audit or if a full or partial audit is necessary; and

(3) For farms that are audited individually or included in an audit sample:

(i) The third-party verifier must verify that CSA practices and practice recordkeeping is in accordance with the standards in subpart F of this part;

(ii) The third-party verifier must verify that the weighted average CI for each crop is calculated correctly in accordance with subpart C; and

(iii) Records from relevant sub-contractors or service providers must be made available during the farm audit at the request of the third-party verifier if necessary to audit practice standards.

(c) *Audit standards for intermediary entities.* Each audit for an intermediary entity must meet the following standards.

(1) Intermediary entities must hire a third-party verifier to conduct an audit annually; and

(2) An audit, conducted by a third-party verifier, must verify that the intermediary entity:

(i) Operates a mass balance system as specified in § 2100.034; and

(ii) Correctly recorded the CI associated with reduced-CI crops or reduced-CI processed product delivered to the intermediary entity.

(d) *Additional audit standards for entities that process, sell, or purchase reduced-CI processed product.* Each audit for a first point of aggregation or intermediary entity that processes, sells, or purchases reduced-CI processed products must meet the following standards.

(1) For entities that process, sell, or purchase reduced-CI processed products, an audit, conducted by a third-party verifier, must verify that the entity implemented recordkeeping standards specified in § 2100.033.

(2) [Reserved]

(e) *Additional audit standards for entities that process reduced-CI crop.* Each audit for a first point of aggregation or intermediary entity that processes reduced-CI processed products must meet the following standards.

(1) For entities that process reduced-CI crop, the third-party verifier must verify that internal records support the calculation and application of the entity's crushing yield used to:

(i) Determine the amount of reduced-CI processed product derived from the amount of inputs; and

(ii) Perform the mass balance calculation.

(2) [Reserved]

(f) *Audit standards for biofuel refiners.* Each audit for a biofuel refiner must meet the following standards.

(1) Biofuel refiners must hire a third-party verifier to conduct an audit annually; and

(2) An audit, conducted by a third-party verifier, must verify that the biofuel refiner:

(i) Operates a system to correctly record the CI associated with reduced-CI crop or reduced-CI processed product as specified in § 2100.035(c); and

(ii) Followed the standards in paragraph (a) of this section, if the biofuel refiner acted as a first point of aggregation for any reduced-CI crop.

§ 2100.041 Accreditation of third-party verifiers.

Third-party verifiers that conduct audits in accordance with this part must be accredited to ISO 14065: General principles and requirements for bodies validating and verifying environmental information by a member of the International Accreditation Forum.

Subpart F-Climate-Smart Agriculture (CSA) Practice Standards

§ 2100.050 General.

CSA practices may be implemented individually or in combination on a field or management unit.

§ 2100.051 Tillage management.

(a) *Reduced till standards.* To qualify as reduced till under this part, field(s) or management unit(s) must be managed according to the following standards:

(1) Tillage methods where the entire soil surface is disturbed by tillage operations such as chisel plowing, field cultivating, tandem disking, vertical tillage, or ridge tillage are permitted, provided that the STIR value is no greater than 80. The STIR value must include all field operations that are performed during the crop interval (that is, from the time immediately following harvest or termination of one cash crop through harvest or termination of the next cash crop in the rotation, including fallow periods). Permitted methods are also commonly referred to as mulch tillage, conservation tillage, or ridge till;

(2) Primary inversion tillage implements (for example, moldboard plow) must not be used;

(3) Residue must not be burned; and

(4) Removing residue from the crop planting row area prior to or as part of the planting operation is allowed.

(b) *No-till standards.* To qualify as no-till under this part, field(s) or management unit(s) must be managed according to the following standards:

(1) Full-width soil disturbance must not be performed, from the time immediately following harvest or termination of one cash crop through harvest or termination of the next cash crop in the rotation, regardless of the depth of the tillage operation. Strip tillage and fertilizer injection are permitted, provided that the STIR value is no greater than 20. The STIR value must include all field operations that are performed during the crop interval (that is, from the time immediately following harvest or termination of one cash crop through harvest or termination of the next cash crop in the rotation, including fallow periods);

(2) Residue must not be burned; and

(3) Removing residue from directly within the seeding, planting, or transplanting area prior to or as part of the planting operation is allowed.

(c) *Tillage management recordkeeping standards.* Farm producers must maintain records for 5 years demonstrating required implementation of the reduced till or no-till practice. Records must contain sufficient detail to be readily understood and auditable. Records may be of varying types and origins including, but not limited to, physical documentation (for example, paper forms, invoices, receipts, seed tags), digital files (including from farm management software), data generated by farm equipment (for example, precision agriculture equipment), remotely sensed data, georeferenced and timestamped photographs, or data and records used for participation in USDA programs. Records must demonstrate:

(1) Field(s) or management unit(s) where the practice is implemented, including location and acreage;

(2) All field operations including tillage and all other operations (including fertilizing, planting, controlling pests, seeding, harvesting) that may cause surface disturbance;

(3) Type of field operation including depth and width of disturbance and average speed of operation;

(4) Equipment used;

(5) Date(s) that each operation occurred; and

(6) Total bushels of the harvested production crop harvested from field(s) or management unit(s) where the practice was implemented. If the farm producer uses both reduced till and no-till on different fields, records must indicate the total bushels produced using each CSA practice.

(d) *Tillage management verification.* When auditing the reduced till or no-till practice, third-party verifiers must review documentation demonstrating all field operations including the type of operation, equipment used, and timing of operation. Using these records, third-party verifiers must verify the correct calculation (or perform

the calculation) of a crop interval STIR value and verify that the value meets the standards of the reduced till or no-till practice.

§ 2100.052 Cover crop management.

(a) *Cover crop standards.* To qualify for the cover crop practice under this part, field(s) or management unit(s) must be managed according to the following standards:

(1) Cover crop species selection, seedbed preparation, seeding rate(s), seeding date, seeding depth, and seeding method must be consistent with applicable soil and site conditions;

(2) When a leguminous cover crop is used individually or as part of a mix, the farm producer must develop a nutrient budget which demonstrates:

(i) The available nitrogen resulting from the cover crop; and

(ii) An adjustment in total planned nitrogen application to the harvested production crop following the cover crop;

(3) Cover crops must be seeded in the fall. Cover crop may be interseeded into an existing or established crop. Cover crop species and seeding dates should not adversely affect crop yield or interfere with the maintenance and harvest process;

(4) Cover crops should be seeded as early as possible and terminated as late as practical (late vegetative stage or later), with termination timing established to minimize the risk of yield loss and soil moisture depletion;

(5) Cover crops must be terminated via winter kill or using herbicide or non-soil disturbing mechanical methods (that is, roller crimper, mowing) in the spring;

(6) Planting green is permitted;

(7) Cover crop biomass must not be mechanically harvested or grazed. Residues must remain on the surface following termination and may not be burned; and

(8) Cover crops may not be fertilized.

(b) *Cover crop recordkeeping standards.* Farm producers must maintain records for 5 years demonstrating required implementation of the cover crop practice. Records must contain sufficient detail to be readily understood and auditable. Records may be of varying types and origins including, but not limited to, physical documentation (for example, paper forms, invoices, receipts, seed tags), digital files (including from farm management software), data generated by farm equipment (for example, precision agriculture equipment), remotely sensed data, georeferenced and timestamped photographs, or data and records used for participation in USDA programs. Records must demonstrate:

(1) Purchase and receipt of cover crop seed in sufficient quantities to cover the area seeded;

(2) Field(s) or management unit(s) where cover crop practice is implemented, including location and acreage;

(3) Cover crop seeding date, method, and seeding rate;

(4) Total acreage seeded in cover crop across the operation;

(5) Photographic evidence of cover crop establishment;

(6) Cover crop termination date and method; and

(7) Total bushels of the crop harvested from field(s) or management unit(s) where the cover crop practice was implemented immediately prior to seeding or planting the harvested production crop.

(c) *Cover crop verification.* When auditing the cover crop practice, third-party verifiers must review documentation demonstrating cover crop species selection, seeding date, seeding method, seeding rate, total seeded acreage, termination date, and termination method. Through an on-site visit, remote video conferencing, remote sensing data, or georeferenced and timestamped photographs, third-party verifiers must verify the establishment of cover crops.

§ 2100.053 Nutrient management.

(a) *Nutrient management standards.* To qualify for any nutrient management practice (nitrification inhibitors, controlled release fertilizers, no fall application, split in-season application) under this part, field(s) or management unit(s) must be managed according to the following standards:

(1) Prior to implementation, the farm producer must develop and document a planned nutrient budget, yield goal, and applications of at a minimum, nitrogen, phosphorous, and potassium (N-P-K) in pounds per acre. The nutrient budget must account for all known measurable nutrient sources and removals. Sources of nitrogen may include, but are not limited to, commercial fertilizers (including starter and in-furrow starter or pop-up fertilizer), animal manures, legume crops, green manures, plant or crop residues, compost, organic by-products, municipal and industrial biosolids, wastewater, organic materials, estimated plant available soil nutrients, and irrigation water; and

(2) The farm producer must base the nutrient budget on current soil test results or the professional opinion of an agricultural expert who is employed by the Cooperative Extension System or the agricultural departments of universities, or other persons approved by the Federal Crop Insurance Corporation (FCIC), whose research or occupation is related to the specific crop or practice for which such expertise is sought. Soil test must be no older than 2 years. Tissue testing may be used for monitoring or adjusting the nutrient management plan in accordance with the state LGU guidance, or industry practice recognized by the state LGU.

(b) *Nitrification inhibitor standards.* To qualify for the practice under this part, field(s) or management unit(s) must be managed in accordance with paragraph (a) of this section and with the following standards:

(1) The farm producer must apply an inhibitor with all synthetic nitrogen (synthetic N) applications, including any pre-emergent applications. Inhibitors must be

defined by the Association of American Plant Food Control Officers (AAPFCO) and be accepted for use by the State fertilizer control official, or similar authority, with responsibility for verification of product guarantees, ingredients (by AAPFCO definition), and label claims.

(2) [Reserved]

(c) *No fall application standards.* To qualify for the no fall application practice under this part, field(s) or management unit(s) must be managed as specified in paragraph (a) of this section and with the following standards:

(1) The first synthetic N application must occur within 30 days prior to or at the time of planting; and

(2) The farm producer must not apply synthetic N in the fall on fallow fields or fields in cover crop. This includes any synthetic N included in phosphorus fertilizers.

(d) *Split in-season application standards.* To qualify for the split in-season application practice under this part, field(s) or management unit(s) must be managed accordingly in accordance with paragraph (a) of this section and with the following standards:

(1) Farm Producer must apply at least 75 percent of total crop synthetic N needs after crop emergence. Post emergent synthetic N may be reduced based on crop scouting, in-season soil sampling or analysis, or plant tissue sampling or analysis. Nutrient availability should be timed to crop uptake.

(2) [Reserved]

(e) *Nutrient management recordkeeping standards.* Farm producers must maintain records demonstrating correct implementation of the nutrient management practice(s) for 5 years. Records must contain sufficient detail to be readily understood and auditable. Records may be of varying types and origins, including, but not limited to, physical documentation (for example, paper forms, invoices, receipts, seed tags), digital

files (including from farm management software), data generated by farm equipment (for example, precision agriculture equipment), remotely sensed data, georeferenced and timestamped photographs, or data and records used for participation in USDA programs. Records must demonstrate:

(1) Development of a nutrient budget that accounts for realistic yield goal and all known and measurable sources of N-P-K;

(2) Soil test results, soil test methods, laboratory where soil test was conducted, and date of the soil test within 2 years of the development of the nutrient budget. In-season soil samples or tissue samples results for N analysis should be provided along with methods, laboratory, and date sampled;

(3) Date(s), method(s), location(s) of all nutrient applications in pounds per acre for N-P-K;

(4) The source and type of nutrients supplied, including nutrient content;

(5) Field(s) or management unit(s) where nutrient management practice(s) is implemented, including location and acreage;

(6) Planting or seeding date for field(s) and management unit(s) where nutrient management practice(s) is implemented;

(7) Total acreage using each nutrient management practice across the operation; and

(8) Total bushels of the crop harvested from field(s) or management unit(s) where each nutrient management practice was implemented.

(f) *Nutrient management verification.* When auditing nutrient management practice(s), the third-party verifier must verify development of a nutrient management budget that accounts for all known and measurable sources of nutrients (that is, N-P-K). For nitrification inhibitors, the third-party verifier must verify that inhibitors were used with 100 percent of synthetic N application on all field(s) or management unit(s) where

the practice was implemented. For timing practices (no fall application or split in-season application), the third-party verifier must verify application timing through management records.

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