Message

From: David M. (Max) Williamson [maxwilliamson@williamsonlawpolicy.com]
Sent: 2/2/2018 7:55:55 PM
To: Baptist, Erik [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=10fc1b085ee14c6cb61db378356a1eb9-Baptist, Er]; Schwab, Justin [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=eed0f609c0944cc2bbdb05df3a10aadb-Schwab, Jus]; Gunasekara, Mandy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=53d1a3caa8bb4ebab8a2d28ca59b6f45-Gunasekara,]
CC: Motley, Judy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Motley, Judy]; kharris@corn.org
Subject: RE: Ag Biogenic CO2

Hi all, checking whether we can schedule another working session on the biogenic issue. I know folks in the ag community are eager to see this resolved.

We are available over the next week or so at your convenience.

Regards,

David M. (Max) Williamson | Williamson Law + Policy, PLLC
1850 M Street NW, Suite 840 | Washington, D.C. 20036 | (202) 256-6155

WILLIAMSON LAW + POLICY
environmental markets advisory

www.williamsonlawpolicy.com | new carbon future | bio | vCard | map | email

---

From: David M. (Max) Williamson
Sent: Friday, January 12, 2018 9:30 AM
To: 'Baptist, Erik' <baptist.erik@epa.gov>; Schwab, Justin <Schwab.Justin@epa.gov>; Mandy Gunasekara (gunasekara.mandy@epa.gov) <gunasekara.mandy@epa.gov>
Cc: Motley, Judy <motley.judy@epa.gov>; kharris@corn.org
Subject: RE: Ag Biogenic CO2

Erik and Justin, happy new year. Can we jump start discussions on the biogenic issue again now that clear of the holidays?

Regards,

David M. (Max) Williamson | Williamson Law + Policy, PLLC
1850 M Street NW, Suite 840 | Washington, D.C. 20036 | (202) 256-6155

WILLIAMSON LAW + POLICY
environmental markets advisory

www.williamsonlawpolicy.com | new carbon future | bio | vCard | map | email

From: Baptist, Erik [mailto:baptist.erik@epa.gov]
Sent: Tuesday, November 7, 2017 8:25 AM
To: David M. (Max) Williamson <maxwilliamson@williamsonlawpolicy.com>; Schwab, Justin <Schwab.Justin@epa.gov>
Cc: Motley, Judy <motley.judy@epa.gov>; kharris@corn.org
Subject: RE: Ag Biogenic CO2

Max,

We are working on a few pressing deadlines this month. Can we reconnect next month to find a time that works? I still need to digest what you sent a few weeks ago.

Thanks,

Erik Baptist
Senior Deputy General Counsel
Office of General Counsel
U.S. Environmental Protection Agency
1200 Pennsyvlania Ave., NW
Washington, DC 20460
(202) 564-1689
baptist.erik@epa.gov

From: David M. (Max) Williamson [mailto:maxwilliamson@williamsonlawpolicy.com]
Sent: Monday, November 6, 2017 9:42 AM
To: Baptist, Erik <baptist.erik@epa.gov>; Schwab, Justin <Schwab.Justin@epa.gov>
Cc: Motley, Judy <motley.judy@epa.gov>; kharris@corn.org
Subject: RE: Ag Biogenic CO2

All, could we schedule a second work session on the resolution of the biogenic issue this week or next?

We found the first session very productive.

Regards,

David M. (Max) Williamson | Williamson Law + Policy, PLLC
1850 M Street NW, Suite 840 | Washington, D.C. 20036 | (202) 256-6155

WILLIAMSON LAW + POLICY
environmental markets advisory

www.williamsonlawpolicy.com | new carbon future | bio | vCard | map | email

From: David M. (Max) Williamson
Sent: Wednesday, October 25, 2017 10:20 AM
To: 'Baptist, Erik' <baptist.erik@epa.gov>; Schwab, Justin <Schwab.Justin@epa.gov>
Cc: Motley, Judy <motley.judy@epa.gov>; kharris@corn.org
Subject: RE: Ag Biogenic CO2

CONFIDENTIAL

Justin and Eric, thanks again for taking the time last week to work through a legal analysis of the biogenic CO2 issue. As discussed, to facilitate a resolution, we are sharing a legal analysis of the key regulatory actions (in Word format, attached) which forms the basis for our position that biogenic CO2 has never properly been determined to be a pollutant subject to regulation for purposes of the Clean Air Act.

I am also sharing the Biogenic CO2 Coalition's comments on the Significance Rule proposal from the prior administration, as it contains a comprehensive narrative discussion of the coalition's legal and policy positions.

We look forward to having another "work session" to discuss this issue once you have a chance to study the issues in greater depth. Would you be available sometime the week of November 5?

Regards,

David M. (Max) Williamson | Williamson Law + Policy, PLLC
1850 M Street NW, Suite 840 | Washington, D.C. 20036 | (202) 256-6155

WILLIAMSON LAW + POLICY
environmental markets advisory

www.williamsonlawpolicy.com | new carbon future | bio | vCard | map | email

---

From: Baptist, Erik [mailto:baptist.erik@epa.gov]
Sent: Friday, October 13, 2017 12:18 PM
To: David M. (Max) Williamson <maxwilliamson@williamsonlawpolicy.com>; Schwab, Justin <Schwab.Justin@epa.gov>
Cc: Motley, Judy <motley.judy@epa.gov>
Subject: RE: Ag Biogenic CO2

Ok, let's plan for 1:30 p.m. that day.

Erik Baptist
Senior Deputy General Counsel
Office of General Counsel
U.S. Environmental Protection Agency
1200 Pennsyvlania Ave., NW
Washington, DC 20460
(202) 564-1689
baptist.erik@epa.gov

From: David M. (Max) Williamson [mailto:maxwilliamson@williamsonlawpolicy.com]
Sent: Friday, October 13, 2017 12:06 PM
To: Baptist, Erik <baptist.erik@epa.gov>; Schwab, Justin <Schwab.Justin@epa.gov>
Cc: Motley, Judy <motley.judy@epa.gov>
Subject: Re: Ag Biogenic CO2

Erik, that can work - even better if we could start earlier we have a 3pm over at DOE. Thanks

David M. (Max) Williamson
WILLIAMSON LAW + POLICY, PLLC
1800 K Street NW Suite 714 | Washington, D.C. | (202) 256-6155 |

From: Baptist, Erik
Sent: Friday, October 13, 2017 11:39
To: David M. (Max) Williamson; Schwab, Justin
Cc: Motley, Judy
Subject: RE: Ag Biogenic CO2

Let's plan for Friday, October 20, at 2:00-3:00 p.m.

Thanks

Erik Baptist
Senior Deputy General Counsel
Office of General Counsel
U.S. Environmental Protection Agency
1200 Pennsyvlania Ave., NW
Washington, DC 20460
(202) 564-1689
baptist.erik@epa.gov

From: David M. (Max) Williamson [mailto:maxwilliamson@williamsonlawpolicy.com]
Sent: Friday, October 13, 2017 5:45 AM
To: Baptist, Erik <baptist.erik@epa.gov>; Schwab, Justin <Schwab.Justin@epa.gov>
Subject: RE: Ag Biogenic CO2

Thanks, Erik, I look forward to talking.

I could do morning of . . .

- Friday, Oct 20 (outside the proposed range but a Friday)
- Mon Oct 23
- Tues Oct 24 (morning)
- Fri Oct 27 is a possibility but probably by phone only

Best regards,

David M. (Max) Williamson | Williamson Law + Policy, PLLC
1850 M Street NW, Suite 840 | Washington, D.C. 20036 | (202) 256-6155

WILLIAMSON LAW + POLICY
environmental markets advisory

www.williamsonlawpolicy.com | new carbon future | bio | vCard | map | email

From: Baptist, Erik [mailto:baptist.erik@epa.gov]
Sent: Friday, October 13, 2017 12:24 AM
To: David M. (Max) Williamson <maxwilliamson@williamsonlawpolicy.com>; Schwab, Justin <Schwab.Justin@epa.gov>
Subject: RE: Ag Biogenic CO2

Max,

Apologies for the delayed response. Is there a day during the week of October 23-27 that works best for you? Fridays are usually best for us.

Thanks,

Erik Baptist
Senior Deputy General Counsel
Office of General Counsel
U.S. Environmental Protection Agency
1200 Pennsyvlania Ave., NW
Washington, DC 20460
(202) 564-1689
baptist.erik@epa.gov

From: David M. (Max) Williamson [mailto:maxwilliamson@williamsonlawpolicy.com]
Sent: Wednesday, October 4, 2017 8:17 AM
To: Schwab, Justin <Schwab.Justin@epa.gov>; Baptist, Erik <baptist.erik@epa.gov>
Subject: Ag Biogenic CO2

Justin and Erik, following on a telecon with Mandy, I'd like to offer to sit down with you and walk through our legal analysis of the biogenic CO2 policy, which led us to the conclusion that re-interpreting the endangerment finding was the most sensible solution to this issue which has the ag community inflamed.

Could we convene a small working group (no more than 3-4) for an in-person sit down?

Regards,

David M. (Max) Williamson | Williamson Law + Policy, PLLC
1850 M Street NW, Suite 840 | Washington, D.C. 20036 | (202) 256-6155

WILLIAMSON LAW + POLICY
environmental markets advisory

www.williamsonlawpolicy.com | new carbon future | bio | vCard | map | email

Message

From: Chip Murray [cmurray@nafoalliance.org]
Sent: 1/12/2018 4:42:25 PM
To: Schwab, Justin [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=eed0f609c0944cc2bbdb05df3a10aadb-Schwab, Jus]
Subject: Legal assessment
Attachments: FINAL - NAFO Legal Authority White Paper (highlighted studies) - 10.20.14.doc

Justin,

As you know, NAFO is working with the Air Office to advance EPA's policy on the carbon neutrality of biomass. Attached is a legal white paper summarizing why EPA has authority to distinguish biogenetic CO2 from other forms of CO2, including a summary of the scientific studies justifying the carbon neutrality of biomass. The paper was prepared by our outside counsel, Roger Martella, when he worked at Sidley Austin and was provided to the previous Administration. We wanted to make sure you had this in your files.

We welcome a discussion of the theories or authorities in the white paper with you and your staff if you think it might be helpful. Please let us know if you have any questions or comments on the white paper.

Regards, Chip

Chip Murray
Vice President for Policy & General Counsel
National Alliance of Forest Owners
Ex. 6

www.nafoalliance.org

EPA'S CLEAR LEGAL AUTHORITY AND DISCRETION TO DIFFERENTIATE BIOGENIC CO_2 EMISSIONS FROM OTHER GHG EMISSIONS UNDER THE CLEAN AIR ACT.

Table of Contents

Introduction

The Clean Air Act ("CAA") and supporting case law provide EPA clear legal authority to distinguish between carbon dioxide ("CO_2") emissions from biomass combustion ("biogenic CO_2 emissions") and greenhouse gas ("GHG") emissions from other sources, and thus exclude biogenic CO_2 emissions from CAA regulatory and permitting regimes or, at a minimum, establish a differential regulatory scheme for biogenic CO_2 emissions. In particular, EPA has significant authority and discretion to not bring such emissions within the CAA framework at the outset on *de minimis* grounds because CO_2 emissions from biogenic sources do not increase net atmospheric CO_2 concentrations and, therefore, do not cause or contribute to climate change. Thus, EPA need not reach the question of how to treat such emissions under the Prevention of Significant Deterioration ("PSD") permitting program, as there is ample authority for not bringing such emissions within the framework of PSD—if not the CAA—in the first instance, given the lack of any adverse affect of such emissions on the climate.[1] However, even if EPA were to include biogenic CO_2 emissions in the PSD permitting program, there are established grounds for treating biogenic CO_2 emissions differently from fossil fuel CO_2 emissions. This paper is intended to summarize a range of legal theories that offer flexibility to EPA to differentiate biogenic CO_2 emissions from other GHG emissions as it seeks to implement its ultimate policy decision regarding the treatment of biogenic CO_2 emissions under the PSD and Title V permitting programs. In addition, it will provide a summary of the scientific evidence supporting differential treatment for biogenic CO_2 emissions.

As described below, EPA historically has excluded certain air emissions from the PSD and other CAA programs—even when pollutants that comprise such emissions are otherwise regulated in some contexts. In the context of GHG regulations, EPA has relied on a variety of regulatory approaches to distinguish between GHGs, completely excluding some from regulation, while providing differential treatment for others. The case for declining to bring biogenic CO_2 emissions within the PSD program (or at a minimum providing differential treatment for such emissions) is even stronger than this past precedent, given the lack of any net adverse effect on the climate from such emissions. In fact, the Supreme Court confirmed that certain GHG emissions from stationary sources should be excluded from regulation under the Clean Air Act based on *de minimis* principles. *Utility Air Regulatory Group v. EPA*, 134 S. Ct. 2427, 2449 (2014). In making such a decision to exclude biogenic CO_2 emissions, EPA can also properly consider any net GHG benefits that utilizing biomass for power generation or industrial processes provides vis-à-vis other fuels or feedstocks.

This paper is divided into four sections. Section I explains the legal basis for declining to regulate biogenic CO_2 emissions under the CAA at this time because those emissions do not adversely affect the environment. In the alternative, Section II explains that even if EPA were to conclude that it has the authority to consider the regulation of biogenic CO_2 emissions to some extent, it retains significant authority and discretion to exclude or provide different treatment for such emissions. The section provides several legal bases on which EPA could justify treating

[1] This white paper focuses on the PSD permitting program as an example for how EPA has solid legal authority to treat biogenic CO2 emissions differently from other GHG emissions. However, the rationales, justification, and support provided here apply as well to other regulatory programs for addressing GHG emissions under the CAA, and also provide policy and technical support for making such distinctions in other government programs.

biogenic and fossil CO_2 emissions differently. Section III explains that the recent decision in *Center for Biological Diversity*, 722 F.3d 401 (D.C. Cir. 2013) does not foreclose EPA's discretion to provide different and preferential treatment for biogenic CO_2 emissions on a permanent basis. Finally, Section IV provides an expanded summary of the key factual bases for differentiating between biomass emissions and other GHG emissions in CAA permitting as well as a brief description of the scientific literature supporting each point.

I. EPA Has Legal Authority to Conclude that the Clean Air Act Does Not Authorize EPA to Regulate Emissions Which Do Not Adversely Affect the Environment.

A core principle underlying much of EPA's regulatory authority under the CAA is that EPA shall regulate only air pollutants that endanger human health or public welfare. Unlike CO_2 emissions from fossil sources, emissions from the combustion of biomass do not increase net atmospheric levels of CO_2.[2] Domestic forests constitute the nation's leading carbon sink. EPA itself has recognized the lack of any adverse effect from biogenic CO_2 emissions in other contexts. For example, EPA's Mandatory Reporting of Greenhouse Gases Rule distinguishes biogenic CO_2 from other emissions. *See generally* 75 Fed. Reg. 56,260 (Oct. 30, 2009). Likewise, in the Renewable Fuel Standard 2 rulemaking, EPA explained that "[f]or renewable fuels, tailpipe emissions only include non-CO_2 gases, because the carbon emitted as a result of fuel combustion is offset by the uptake of biogenic carbon during feedstock production." 75 Fed. Reg. 14,669, 14,787 (March 26, 2010). In addition, the Department of Energy and virtually every government agency in the world to take up the issue have similarly recognized the lack of any adverse effect from biogenic CO_2 emissions.[3] *See also* NAFO's submission on EPA's Call for Information.

---

[2] As described more fully in Section IV, and in numerous other contexts, net fluxes of biogenic CO_2 to the atmosphere from the combustion of biomass in the United States are, at a minimum, "carbon neutral" in that any CO_2 emissions associated with the combustion of biomass are offset completely by the significant role domestic forests play in sequestering carbon as the nation's leading carbon sink. Thus, when viewed over appropriate time and spatial scales, the combustion of biomass for energy produces significant GHG emissions reductions in comparison to fossil fuel alternatives. As long as domestic forest carbon stocks are stable or increasing, as they are today, the combustion of forest-based biomass for energy will not increase net atmospheric CO_2 concentrations, regardless of the source. In fact, strong demand for forest products—including biomass for energy—has been shown to increase, rather than decrease, forest carbon stocks through increased investments by forest owners. Thus, even under high-demand scenarios, biomass energy demand can be met without significantly affecting markets for high-value timber products. Further, use of certain biomass feedstocks for energy—including harvest residues, mill residuals, and biomass derived from thinning treatments and timber stand management—offer significant GHG reduction benefits because their combustion typically has a *de minimis* impact on overall atmospheric carbon.

[3] DOE, *Technical Guidelines: Voluntary Reporting of Greenhouse Gases (1605(b)) Program* (January 2007) at 77 ("Reporters that operate vehicles using pure biofuels within their entity should not add the carbon dioxide emissions from those fuels to their inventory of mobile source emissions because such emissions are considered biogenic and the recycling of carbon is not credited elsewhere."); *IPCC Guidelines for National Greenhouse Gas Inventories*, Prepared by the National Greenhouse Gas Inventories Programme, Institute for Global Environmental Strategies, Hayama, Kanagawa, Japan: IPCC National Greenhouse Gas Inventories Programme (2006); Commission Regulation (EU) No. 601/2012 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council, Article 38.2 (The emission factor of biomass shall be zero."), *available at* http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:181:0030:0104:EN:PDF.

Because biogenic CO_2 emissions have no adverse effect on the climate and in the absence of specific direction from Congress to regulate such emissions under the CAA, EPA could reasonably conclude that it lacks a basis for regulating them in the first instance. In the Endangerment Finding, EPA specifically concluded that that the combined emissions of GHGs from new motor vehicles and new motor vehicle engines cause and contribute to air pollution that endangers public health and welfare. EPA reached this conclusion after noting that fossil fuel GHG emissions associated with these sources represented 23 percent of total U.S. emissions of well-mixed GHGs. 74 Fed. Reg. 66,496, 66,540 (Dec. 15, 2009).[4] Because they do not increase net atmospheric CO_2 concentrations, *see infra* Section IV, biogenic CO_2 emissions are fundamentally different from GHGs emitted from fossil fuel sources regulated under Section 202(a) of the CAA. Biogenic CO_2 emissions do not contribute to climate change and, therefore, do not cause or contribute to the endangerment of public health or welfare. Thus, EPA could reasonably conclude that biogenic CO_2 emissions should be excluded from the scope of its CAA regulatory authority based on the lack of any adverse effects.[5]

II. EPA Has Substantial Discretion in Applying the Clean Air Act to Biogenic CO_2 Emissions and in Implementing PSD and Title V Permitting Programs.

In its landmark *Massachusetts v. EPA* decision, the Supreme Court recognized from the outset that EPA has significant discretion regarding the scope of climate change regulations. While the Supreme Court held that EPA has the authority to regulate GHG emissions from new motor vehicles based on the Court's finding that GHGs fit within the CAA's definition of "air pollutant," the Court also made clear that EPA's determination as to when and how such regulation should proceed is within the discretion of the Agency. *Massachusetts v. EPA*, 549 U.S. 497, 528-29, 533 (2007). "[A]n agency has broad discretion to choose how best to marshal its limited resources and personnel to carry out its delegated responsibilities." *Id.* at 527 (citing *Chevron U.S.A., Inc. v. Natural Resources Defense Council, Inc.*, 467 U.S. 837, 842-845 (1984)); *see also Am. Coke & Coal Chems. Inst. v. EPA*, 452 F.3d 930, 941-42 (D.C. Cir. 2006) ("The court owes particular deference to EPA when its rulemakings rest upon matters of scientific and statistical judgment within the agency's sphere of special competence and statutory

---

[4] EPA's assessment of motor vehicle GHG emissions as a share of United States GHG emissions specifically excluded biogenic CO_2 emissions because it was based on the United States Greenhouse Gas Inventory. *See* 74 Fed. Reg. at 66,539 n.41 and 66,540; Inventory of U.S. Greenhouse Gas Emissions and Sinks (April 2009) p. 2-5 Table 2-1 n. b and p. 3-1 (excluding biogenic CO_2 emissions based on principles of carbon neutrality). The 2009 Inventory states at page 3-1: "Carbon dioxide emissions from [combustion of biomass and biomass-based fuels] are not included in national emissions totals because biomass fuels are of biogenic origin. It is assumed that the C released during consumption of biomass is recycled as U.S. forest and crops regenerate, causing no net addition of CO_2 to the atmosphere." *See also EPA's Response to Public Comments, Volume 9: The Endangerment Finding* (EPA-HQ-OAR-2009-0171-11676) at 6 (finding that motor vehicle emissions contribute to endangerment does not address biomass burning).

[5] As explained in Section IV, *infra*, this conclusion would be based on the fact that biogenic CO_2 emissions are offset by the sequestration of atmospheric CO_2 by domestic forests. If, at some later date, EPA determined that carbon stocks were no longer stable or increasing, it could revisit the conclusion that biogenic CO_2 emissions from forest stocks do not adversely affect the environment and, if necessary, apply the legal theories described in Section III, *infra*, to determine how biogenic CO_2 emissions should be addressed under the PSD and Title V permitting programs.

jurisdiction.").[6] The Supreme Court confirmed that discretion in *UARG*, distinguishing between the broad definition of "any air pollutant" in 42 U.S.C. §7602(g) which was at issue in *Massachusetts v. EPA* and the narrower definition adopted by EPA in substantive regulatory provisions. *See UARG*, 134 S. Ct. at 2440; *see also id.* at 2449 (directing EPA to establish a *de minimis* threshold below which GHG emissions need not be regulated).

In the Tailoring Rule and related regulations, EPA surgically exercised such discretion to limit the scope and reach of GHG regulation under the CAA. First, EPA specifically defined the precise "greenhouse gases" that are "subject to regulation" as set forth in that rulemaking. *See* 75 Fed. Reg. at 31,606. EPA limited its definition of "greenhouse gases" to "the aggregate group of six" chemicals and excluded other chemicals that may also have climate impacts. *Id.* Second, EPA invoked a series of administrative law doctrines to increase the emissions thresholds for GHGs far beyond those of conventional pollutants regulated under the PSD program. *See, e.g.*, *id.* at 31,533 (asserting authority "to depart[] from a literal interpretation of statutory provisions"). As a result of these regulatory thresholds, EPA excluded a significant number of sources from the PSD and Title V permitting programs. While the Supreme Court concluded "that EPA was mistaken in thinking that the [Clean Air] Act *compelled* a greenhouse-gas-inclusive interpretation of the PSD and Title V triggers," *UARG*, 134 S. Ct. at 2443, it supported the proposition that not all GHG emissions should be regulated . However, the Court indicated thresholds could be justified on *de minimis* grounds rather than the administrative law doctrines on which EPA relied in the Tailoring Rule. *Id.* at 2449 ("We do not hold that 75,000 tons per year CO2 necessary exceeds a true *de minimis* level, only that EPA must justify its selection on proper terms.").

EPA's discretion is further supported by its past practice in other contexts. For example, EPA has long differentiated biogenic CO_2 emissions from fossil fuel CO_2 emissions in its Inventory of U.S. Greenhouse Gas Emissions and Sinks. Likewise, EPA has relied on a variety of administrative law doctrines and other procedures to exclude certain emissions and air pollutants from regulation under the CAA or to distinguish between different types of regulated emissions. The remainder of this section outlines the legal theories and doctrines that EPA could rely upon to exclude biogenic CO_2 emissions from the PSD and Title V permitting programs or, at a minimum, distinguish between biogenic and fossil fuel CO_2 emissions in a manner that recognizes the substantial climate benefits of biomass combustion when compared to fossil fuel alternatives.

[6] Courts specifically have affirmed EPA's discretion regarding the timing and approach to the regulation of GHGs following the Court's decision in *Massachusetts v. EPA*. In rejecting a petition to compel the regulation of GHGs after the *Massachusetts* decision, Judge Tatel observed that "nothing in section 202, the Supreme Court's decision in *Massachusetts v. EPA*, or our remand order imposes a specific deadline by which EPA must determine whether a particular air pollutant poses a threat to public health or welfare." *Commonwealth of Massachusetts v. EPA*, No. 03-1361, separate statement of Tatel, J. concurring in part and dissenting in part from denial of petition, June 26, 2008, at 1. Similarly, the Northern District of California also rejected an argument that EPA is compelled to regulate all GHGs following *Massachusetts*. *S.F. Chapter of A. Philip Randolph Inst. v. EPA*, 2008 U.S. Dist. LEXIS 27794 at *10-11 (N.D. Cal. Mar. 28, 2008). Consistent with the D.C. Circuit's conclusion, the California court recognized that "[t]he Supreme Court was careful not to place a time limit on the EPA, and indeed did not even reach the question whether an endangerment finding had to be made at all."

A. Exclusion of *De Minimis* Emissions

When establishing PSD regulations, EPA has routinely exercised its discretion to avoid bringing certain air pollutants within the reach of the PSD program. In *Alabama Power Co. v. Costle*, 636 F.2d 323, 400 (D.C. Cir. 1979), the D.C. Circuit recognized EPA's discretion, in administering the CAA's provision requiring PSD review for any "modification" of a major emitting facility, "to exempt from PSD review some emission increases on grounds of *de minimis* or administrative necessity." The Court explained that such an exemption was justified when regulation would "yield a gain of trivial or no value." *Id.* at 361.

Invoking similar grounds, EPA has limited PSD permitting to those pollutants that are "subject to regulation" under the CAA, although the statute states that the PSD permitting requirements should apply to "any pollutant." *See Alabama Power*, 636 F.2d at 352 n.57. Likewise, even though the CAA may be read to require PSD permitting for any change to a major source that increases emissions of any air pollutant by any amount, *see* CAA §§ 111(a)(4), 169(2)(C), EPA has limited the permitting requirements to modifications that result in a "significant" net increase in actual emissions. *See* 40 C.F.R. §§ 52.21(b)(2)(i), 52.21(i); *see also United States v. DTE Energy Co.*, 711 F.3d 643, 645 (6th Cir. 2013).[7] For example, carbon monoxide emissions increases of up to 99 tons per year are considered insignificant (or *de minimis*) under EPA's implementing regulations. 40 C.F.R. § 52.21(b)(23)(i); *see also* 45 Fed. Reg. 52,676, 52,705-09 (Aug. 7, 1980) (setting significance levels for PSD permitting programs based on *de minimis* exception). Thus, EPA has a long-standing policy of applying the *de minimis* doctrine to exclude from regulation under the PSD and Title V permitting programs those sources whose emissions increases are deemed insignificant from an air quality perspective, despite the fact that the literal language of the CAA requires permits for *any* emissions increase. *See* 40 C.F.R. § 52.21(b)(23)(i) and (j)(2); 45 Fed. Reg. at 52,722; *Alabama Power*, 636 F.2d at 405.[8]

More recently, the Supreme Court, in *Utility Air Regulatory Group v. EPA*, 134 S. Ct. 2427 (2014), further bolstered EPA's authority to rely on *de minimis* principles to exclude certain air pollutants or sources from regulation under the Clean Air Act. The Court noted that "[i]t is plain as day that the [Clean Air] Act does not envision an elaborate, burdensome permitting process for major emitters of steam, oxygen, or other harmless airborne substances." *Id.* at 2440. The Court then rejected EPA's argument that it was compelled by the plain language of the Clean Air Act to subject stationary sources to PSD and Title V permitting obligations based solely on their emission of GHGs. *Id.* at 2442. However, after affirming EPA's authority to regulate GHG emissions from stationary sources that triggered PSD

[7] Relying on a similar legal theory, EPA has also excluded routine maintenance, repair, and replacement ("RMRR") from triggering New Source Review program requirements. *See Wisconsin Electric Power Co. v. Reilly*, 893 F.2d 901, 905 (7th Cir. 1990) (EPA adopted exclusion for RMRR to avoid regulating "the most trivial activities"); *see also* 40 C.F.R. parts 51-52.

[8] In addition, the *Chevron* decision also addressed EPA's discretion to define the scope of CAA permitting programs, overturning the D.C. Circuit decision that failed to defer to EPA's interpretation of what constitutes a "stationary source" subject to special permitting conditions in nonattainment areas. *Chevron, U.S.A., Inc. v. NRDC*, 467 U.S. 837, 841-42 (1984).

permitting obligations for other pollutants, the Court confirmed that the *de minimis* doctrine applied to EPA's regulation of GHG emissions from stationary sources: "EPA may require an 'anyway' source to comply with greenhouse-gas BACT only if the source emits more than a *de minimis* amount of greenhouse gases. … EPA may establish an appropriate *de minimis* threshold below which BACT is not required for a source's greenhouse gas emissions." *Id.* at 2449. Plainly then, the Court has permitted—if not directed—EPA to exclude certain GHG emissions from regulation under the Clean Air Act if they satisfy *de minimis* principles.

EPA would be justified in applying a *de minimis* exception for biogenic CO_2 emissions. As explained above, CO_2 emissions from the combustion of biomass are part of the natural carbon cycle and, as a result, do not result in any net increase in atmospheric CO_2 concentrations.[9] Thus, as long as forest carbon stocks are stable or increasing and carbon sequestration is sufficient to offset biogenic CO_2 emissions, the emissions associated with biomass energy can be considered insignificant or *de minimis* from a climate perspective.

B. Exclusion of Individual Constituents from Pollutant Categories

In cases where EPA defines and regulates a category of pollutants—as it has done for GHGs—the Agency has repeatedly exercised its discretion by distinguishing between individual constituents and excluding those that have negligible environmental impacts. For example, EPA excludes emissions of certain volatile organic compounds ("VOCs") from otherwise applicable PSD permitting requirements. *See* 40 C.F.R. § 51.100(s); *see also* 40 C.F.R. §§ 52.21(b)(2)(ii) and 52.21(b)(30). Despite the fact that these compounds are both "volatile" and "organic" and, therefore, meet EPA's definition of VOCs, they are excluded from regulation because they do not cause environmental impacts. *See* 40 C.F.R. § 51.100(d); 57 Fed. Reg. 3,941, 3,943-44 (Feb. 3, 1992) (disagreeing with comment that definition exceeded EPA's statutory authority and asserting that "it is an administrative necessity and reasonable to define VOC to include all organic compounds except those EPA has determined to be negligibly reactive"). Notably, EPA has excluded these volatile organics from the PSD permitting program and other CAA regulations, not based on an analysis of their direct effects on human health and welfare, but rather based on their lack of contribution, once emitted and mixed with other gases in the environment, to the formation of ground-level ozone through photooxidation.

Likewise, EPA has distinguished among different categories of particulate matter ("PM") based on differences in environmental and public health impacts. *See Alabama Power*, 636 F.2d at 369 n.131 ("EPA has discretion to define the pollutant termed 'particulate matter' to exclude particulates of a size or composition determined not to present substantial public health or welfare concerns."). Thus, EPA has distinguished between fine and coarse PM and established distinct significance levels for particulate matter smaller than 10 microns in diameter and smaller than 2.5 microns in diameter based on the particle size's impact on public health. 40 C.F.R. § 52.21(b)(23)(i).

---

[9] Likewise, CO_2 emissions from fermentation of biomass or from microbial treatment of wastewater containing bio-materials are part of the natural carbon cycle and, hence, do not result in a net increase in atmospheric CO_2 concentrations.

In addition, EPA has already relied on this regulatory approach to limit the GHGs that are subject to regulation under the CAA. In the Tailoring Rule and other GHG regulations, EPA exercised its discretion to limit the scope and reach of its GHG regulations by specifically defining the pollutants that qualify as "greenhouse gases." EPA chose to limit its definition of "greenhouse gases" to "the aggregate group of six" specified chemicals and excluded other chemicals that also have climate impacts. *See* 75 Fed. Reg. 25,324, 25,397 (May 7, 2010) (identifying the six compounds as "the primary greenhouse gases of concern"); *id.* at 25,398-99 (describing those six compounds as a "single air pollutant"). EPA limited the pollutant GHG to these six compounds despite its findings that they only account for 75% of total anthropogenic heating. 74 Fed. Reg. at 66,517, 66,520 (excluding other gases because they are not thought to be a primary driver of radiative heating, or because their climate impact is unknown). Further, after identifying these six compounds as the single pollutant, GHGs, EPA only elected to regulate emissions of four of the six compounds in the light-duty vehicle rule. *Id.* at 25,396-97. Likewise, in the proposed NSPS rule for power plants, EPA asserts that it is regulating the air pollutant GHGs, but is only establishing emissions limits for a single compound, CO_2. 79 Fed. Reg. 1430, 1455 ("The fact that we are not regulating the other five GHGs does not mean that we are required to identify the air pollution as CO_2 alone rather than the mix of six GHGs.").

This existing precedent under the CAA—and specifically with respect to GHGs—establishes EPA's regulatory authority to differentiate between certain compounds and exclude some from regulation based on different environmental and public health impacts. As a result, EPA could exercise its discretion to amend its existing regulations to differentiate or exclude from regulation biogenic CO_2 emissions. For example, as it did in the light-duty vehicle rule and the proposed NSPS for power plants, EPA could simply exclude biogenic CO_2 emissions, even though they may technically fall within the broad definition of GHGs. EPA could also redefine its regulatory definition of "greenhouse gases," to exclude biogenic CO_2 emissions based on the conclusion that biogenic CO_2 emissions do not increase net atmospheric CO_2 concentrations. EPA could also amend its Endangerment Finding to explicitly exclude biogenic CO_2 emissions based on the conclusion that simultaneous carbon sequestration in working forests mitigates any climate impacts associated with biogenic CO_2 emissions[10] In fact, in his concurring opinion in *CBD v. EPA*, discussed *infra*, Judge Kavanaugh suggested that EPA could presumably exclude biogenic CO_2 emissions by 'tinker[ing] with the Endangerment Finding." *CBD*, 722 F.3d at 413 n.1 (Kavanaugh, J. concurring).

C. Distinguishing Among GHGs Based on Global Warming Potential

In the Tailoring Rule, EPA based PSD applicability for GHG emissions on an artificial, calculated emission rate—carbon dioxide equivalents ("CO_2e")—that takes into account the

[10] Alternatively, EPA's determination that motor vehicle emissions contribute to endangerment of public health and welfare could be interpreted to exclude biogenic CO_2 emissions. The Endangerment Finding was based primarily on the IPCC Fourth Assessment Report of 2007 and EPA's annual *Inventory of U.S. Greenhouse Gas Emissions and Sinks*, both of which exclude biogenic CO_2 emissions from Energy Sector emissions expressly on the basis of their carbon neutrality. 75 Fed. Reg. at 66,510; 66,537; *see also supra* n.3. Thus, EPA never explicitly considered whether biogenic CO_2 emissions contribute to that endangerment in light of their role in the carbon cycle. As a result, EPA could now reasonably conclude that biogenic CO_2 is not among the air pollutants covered by its endangerment determination.

different global warming potential ("GWP") of different components of the regulated pollutant "greenhouse gases." *See* 40 C.F.R. §§ 52.21(b)(49)(ii)-(v); 75 Fed. Reg. at 31,522. Thus, under current PSD regulations a new source could emit 25 times more CO_2 without obtaining a PSD permit than it could methane. *See* 40 C.F.R. §§ 52.21(b)(49)(ii) and 40 C.F.R. pt. 98 subpt. A Table A-1. This deviation from a literal application of the statutory PSD provisions is not based on EPA's GHG regulations for light-duty vehicles, since those rules set separate emission standards for CO_2, methane, and nitrous oxide, and do not involve aggregating emissions of the three compounds or applying weighting factors. *See* 75 Fed. Reg. at 25,421. Rather, EPA implemented the GWP weighting factors specifically for stationary sources in order to determine whether a new or modified source will require a PSD permit in recognition that emissions of the same annual quantity of different "greenhouse gases" can have very different potential impacts on climate change.[11] *See* 75 Fed. Reg. at 31,531 (using CO_2e, which incorporates global warming potential weighting factors, for determining PSD applicability "best addresses the relevant environmental endpoint"); *id.* at 31,531-32 (rejecting comment that EPA has no discretion to depart from actual annual mass emissions in determining PSD applicability).

EPA could employ similar discretion in the PSD permitting program to distinguish between the global warming potential of biogenic and fossil CO_2 emissions, given that biogenic emissions in the United States do not increase net atmospheric CO_2 *and* serve to offset the utilization of fossil fuels for combustion.[12] Thus, by applying a GWP of zero to biogenic CO_2 emissions, EPA could effectively exclude biogenic CO_2 emissions from regulation under the PSD permitting program. EPA has discretion to recognize the readily apparent benefits of substituting a carbon neutral fuel for one that releases carbon which may have been stored, and would otherwise remain stored, for millions of years. Such discretion is further supported by past practice; EPA has long differentiated biogenic emissions from fossil fuel emissions in its Inventory of U.S. Greenhouse Gas Emissions and Sinks and in other regulations. *See* 40 C.F.R. § 98.2(b)(2) (excluding biogenic CO_2 emissions from calculation of thresholds for determining which facilities are required to report GHG emissions).[13] Alternatively, even if EPA concluded that a complete exclusion for biogenic CO_2 emissions was unwarranted, it could apply a smaller GWP to biogenic CO_2 emissions to distinguish between the climate impacts of biogenic and fossil CO_2 emissions in the PSD and Title V permitting programs.[14]

---

[11] EPA's use of CO_2e and GWP is consistent with EPA's practice under the annual *Inventory of U.S. Greenhouse Gas Emissions and Sinks* and with international practice under the Intergovernmental Panel on Climate Change.

[12] EPA has described the "air pollutant" that it is seeking to regulate as the flow of GHGs that changes the total, cumulative stock of greenhouse gases in the atmosphere. 74 Fed. Reg. at 66,536. It would therefore be appropriate for EPA to recognize in the PSD regulations that biogenic CO_2 emissions, which return to the atmosphere CO_2 that was recently removed from the atmosphere in the production of the biomass fuel, and that will be removed again through photosynthesis to replace that biomass, do not add to the total, cumulative stock of GHGs in the atmosphere and therefore represent a net flow of zero.

[13] *See also*, NAFO's submission on EPA's Call for Information at 3-4; EPA, DRAFT Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2012 (Feb. 21, 2014).

[14] Applying a smaller GWP for biogenic CO_2 emissions from forest stocks may also be warranted if, at some future time, carbon stocks are no longer stable or increasing and EPA seeks to account for the incremental effect of the partial, rather than complete, offsetting of biogenic CO_2 emissions through sequestration.

D. Applying Sector-Based Emissions Thresholds Under The Tailoring Rule

In the Tailoring Rule, EPA relied on three administrative law doctrines—absurd results, administrative necessity, and one-step-at-a-time—to adjust the PSD and Title V emissions thresholds for GHGs. EPA reasoned that applying PSD and Title V permitting requirements at the relatively low statutory levels intended for criteria pollutants would, in the context of GHGs, place excessive burdens on small sources and on the state and local permitting authorities that implement these permitting programs. *See, e.g.*, 75 Fed. Reg. at 31,517. Instead, EPA adopted a phased-in approach that would begin by regulating the largest emitting sources and potentially adjust the permitting thresholds downward as state and local permitting authorities gained the experience and capacity to process larger quantities of permits. By focusing the phased-in permitting program on the largest sources, EPA explained that it would "direct limited administrative resources to those new sources with the greatest impact on GHG emissions." *Id.* at 31,529; *see also id.* at 31,531 (addressing "sources and modifications that have the greatest impact on radiative forcing of the GHGs emitted").

Although EPA did not consider making adjustments in the Tailoring Rule based on the source of the emissions, *id.* at 31,591, it suggested that it would consider source-based adjustments in future rulemakings that would occur under the Tailoring Rule's phased-in approach. *See, e.g.*, *id.* at 31,516, 31,524, 31,525, 31,590-91. In a future rulemaking under the Tailoring Rule, EPA could justify source-specific regulations for biomass combustion facilities based on the conclusion that biogenic CO_2 emissions are part of the natural carbon cycle and, therefore, are different than fossil fuel emissions. In fact, EPA specifically addressed this possibility in the Tailoring Rule:

> [T]he decision not to provide this type of an exclusion [for biogenic emissions] at this time does not foreclose EPA's ability to either (1) provide this type of an exclusion at a later time when we have additional information about an overwhelming permitting burdens due to biomass sources, or (2) provide another type of exclusion or other treatment based on some other rationale. Although we do not take a final position here, we believe that some commenters' observations about a different treatment for biomass combustion warrants further exploration as a possible rationale.

Id. at 3,1591. In the event that EPA finds that biogenic CO_2 emissions have a negligible (or even positive) effect on atmospheric CO_2 concentrations, a permanent exclusion may be justified under one or more of the administrative law doctrines that EPA relied upon in issuing the Tailoring Rule. Alternatively, even if EPA determines that a full exclusion is not warranted at this time, it could institute even higher emissions thresholds for biogenic CO_2 emissions in recognition that the combustion of biomass for energy reduces GHG emissions when compared to fossil fuel combustion. Based on such a finding, EPA would be justified in concluding that administrative resources could be better spent by focusing on other sectors where emissions have a greater net effect on radiative forcing. EPA could also conclude that applying the same permitting thresholds to biogenic CO_2 emissions as to emissions of CO_2 from fossil fuels would produce absurd results because it would discourage construction of new sources using biomass fuel or modification of existing sources to burn biomass fuel, despite the fact that burning fossil fuel accumulates more CO_2 to the global atmosphere.[15]

III. The D.C. Circuit Decision in *CBD v. EPA* Does Not Limit EPA's Discretion to Exclude Biogenic CO_2 Emissions from PSD and Title V Permitting Requirements.

In July 2011, in response to the National Alliance of Forest Owners' petition for administrative reconsideration, EPA temporarily deferred the applicability of PSD and Title V permitting requirements to biogenic CO_2 emissions so that the Agency could study the climate impact of biogenic CO_2 emissions and determine how such emissions should be permanently treated under the PSD and Title V permitting programs. 76 Fed. Reg. 43,490 (July 20, 2011). In the so-called "Deferral Rule," EPA invoked the same administrative law doctrines as it did in the Tailoring Rule. *Id.* at 43,496-99. Center for Biological Diversity and other petitioners sought review of the Deferral Rule.

In *CBD*, the D.C. Circuit issued a decision, split three ways, vacating the Deferral Rule. 722 F.3d 401 (D.C. Cir. 2013). The majority's holding was based on the conclusion that the Deferral Rule's invocation of various administrative law doctrines was not adequately supported by the rulemaking record. *Id.* at 410 (EPA "failed to explain" why the one-step-at-a-time doctrine applied); *id.* at 411 (EPA "should have explained why it rejected" a potentially less restrictive alternative under the administrative necessity doctrine); *id* at 412 (finding EPA's reliance on the absurd results doctrine to be "post hoc"). Significantly, however, none of the three opinions suggested that EPA lacked authority to permanently exclude biogenic CO_2 emissions from the PSD and Title V permitting programs. Two of the opinions suggested that EPA retained the broad authority described above to permanently exclude biogenic CO_2 emissions, provided the Agency justified its decision in the rulemaking record. *Id.* ("leav[ing] for another day the question whether the agency has authority under the Clean Air Act to permanently exempt biogenic carbon dioxide sources from the PSD permitting program"); *id.* at 420 (Henderson, J. dissenting) (recognizing the "availability of a *de minimis* exception" to permanently exclude biogenic CO_2 emissions from PSD and Title V). Even the concurring opinion, which asserted that EPA's regulatory discretion was limited by the Agency's prior interpretation of its CAA authority, suggested that EPA retained some limited options to permanently exclude biogenic CO_2 emissions. *Id.* at 413 n.1 (Kavanaugh, J., concurring) (suggesting that EPA could exclude biogenic CO_2 emissions by amending its Endangerment Finding). Thus, while the Deferral Rule litigation highlighted the importance of providing a compelling legal and factual basis for excluding biogenic CO_2 emissions from regulation, nothing in the decision suggested that EPA was foreclosed from seeking permanent exclusion at the conclusion of its reconsideration process.

---

[15] Because fossil fuels typically have higher heat value than biomass fuels, conversion from fossil fuel to biomass usually would result in an increase in the mass of CO_2 emissions, despite the fact that it would reduce the accumulation of CO_2 in the atmosphere. Also, because the equipment to burn biomass fuels often is more costly than for fossil fuels, and the pollution control costs for non-GHG pollutants may be comparable or greater, applying the same permitting requirements to both types of fuels reduces the incentive for sources to choose the biomass fuel route.

IV. Summary of the Factual Bases for Differentiating Biogenic CO_2 Emissions from Other GHG Emissions in CAA Permitting

While EPA has clear legal authority to exclude biogenic CO_2 emissions from the PSD and Title V permitting programs, there is also an extensive technical and factual record supporting a decision to differentiate biogenic CO_2 emissions from fossil fuel GHG emissions. This Section demonstrates that there is ample scientific support in the existing record before the Agency to support a regulation both excluding biogenic CO_2 emissions from the PSD and Title V permitting programs and supporting a distinction between biomass and other fuels. First and foremost, there is scientific consensus that, because it is part of the natural carbon cycle, biogenic carbon is fundamentally different than fossil carbon. Thus, when forests are managed sustainably, biogenic CO_2 emissions are balanced by carbon sequestered during regrowth. Relying on this scientific premise, studies repeatedly show that combusting biomass for energy offers substantial GHG mitigation benefits when compared to fossil fuel alternatives. Second, there is strong evidence that forests are currently being managed sustainably and will be for the foreseeable future. Thus, when forest carbon stocks are evaluated over appropriate time and spatial scales, there is ample support for the proposition that forests are capable of meeting increased demand without reducing overall forest carbon stocks. This section and annotated bibliography will address in turn the key principles needed to support an exclusion for biogenic CO_2 emissions based on the record that is presently before EPA.[16]

A. Because they are part of the forest carbon cycle, CO_2 emissions from the combustion of biomass are offset by carbon sequestration during regrowth.

It is well-established that all wood products—including biomass combusted for energy—are part of the natural forest carbon cycle. CO_2 is sequestered in forests through photosynthesis and emitted through decomposition and combustion. Thus, as long as forests are managed sustainably and forest carbon stocks remain stable (or increase) over time, biomass energy and other parts of the forest products sector do not increase net atmospheric GHG concentrations. In contrast, CO_2 emissions from fossil fuel combustion permanently increase atmospheric GHG concentrations because they release carbon that has been geologically stored for millennia. Active, sustainable management of forested lands provide a number of distinct climate change mitigation benefits which serve to reduce net GHG emissions over time: (1) durable forest products such as lumber used in construction continue to store carbon for decades after harvest, (2) manufacturing forest products is much less carbon intensive than alternative products such as concrete or steel, and (3) biomass used for energy can directly displace fossil fuel emissions over multiple harvest cycles. These scientific principles have been affirmed by the Science Advisory Board and many other qualified experts:

---

[16] The articles and studies cited in this section comprise only a portion of the literature that supports differential treatment of biomass emissions. The vast majority of the material presented here has already been submitted to EPA and/or the EPA Science Advisory Board in prior comments and thus is already part of the administrative record. NAFO has included a few more recent articles that provide further support for differential treatment for biomass emissions. Further, virtually all of these articles and studies are either published in peer-reviewed journals or are publicly available and accessible by EPA. NAFO is willing to provide EPA with copies of any materials cited here that are not readily available to the Agency for review.

- Science Advisory Board, *Review of EPA's Accounting Framework for Biogenic CO2 Emissions from Stationary Sources* at 7, EPA-SAB-12-011 (Sept. 22, 2012) (concluding that "[t]here are circumstances under which biomass is grown, harvested, and combusted in a carbon neutral fashion").

- Lippke, B., *et al.*, Letter from 113 Scientists to Sen. Boxer and Rep. Waxman (July 20, 2010) (explaining that biomass combustion does not increase net atmospheric CO_2 concentrations because "carbon dioxide released from the combustion or decay of woody biomass is part of the global cycle of biogenic carbon").

- Martin, R.M., *Deforestation, land-use change and REDD,* Unasylva 59(230): 3-11 (2008) ("If the land is encouraged or allowed to regenerate a new forest, the ecosystem effect of harvesting is carbon neutral. . . . The atmospheric effect becomes problematic if the cycle is broken and the land is converted to another use.").

- Lippke, B., *et al.*, CORRIM, *Life-cycle Environmental Performance of Renewable Building Materials*, Forest Prod. J., 54: 8 (2004) (highlighting climate benefits of using wood products as substitutes for other materials that have larger carbon footprints).

- Miner, R., NCASI, *Biomass Carbon Neutrality* (Apr. 15, 2010), *available at* http://www.nafoalliance.org/wp-content/uploads/NCASI-Biomass-carbon-neutrality.pdf) (explaining that biomass is carbon neutral due to its role in the carbon cycle and that additional climate benefits occur over each management cycle as additional carbon sequestration occurs through regrowth).

- Lattimore, B. *et al., Environmental Factors in woodfuel production: Opportunities, risks, and criteria and indicators for sustainable practices and utilization*, Biomass and Energy, 33: 1321-42 (2009) (explaining that biomass energy from sustainably managed forests is carbon neutral).

- Cherubini, F., *GHG balances of bioenergy systems – Overview of key steps in the production chain and methodological concerns*, Renewable Energy 35: 1565-73 (2010) ("When biomass is combusted, the resulting CO_2 is not counted for a GHG because C has a biological origin and combustion of biomass releases almost the same amount of CO_2 as was captured by the plant during its growth.").

- Gower, S., *Patterns and mechanisms of the forest carbon cycle,* Annual Review of Environment and Resources 28: 169-204 (2003) ("The CO_2 emitted when wood and paper waste is burned is equivalent to the atmospheric CO_2 that was sequestered by the tree during growth and transformed into organic carbon compounds; hence there is no net contribution to the atmospheric CO_2 concentration; and the material is considered C neutral.").

- Sedjo, R.A., *Biomass: Short-Term Drawbacks, But Long-Term Climate Benefits*, The Energy Daily (Sept. 20, 2010) (concluding that unlike fossil fuel emissions, biogenic CO_2 emissions have no net impact on atmospheric GHG concentrations).

- Bowyer, J., *et al.*, *Life Cycle Impacts of Forest Management and Bioenergy Production* 1-13 (July 2011), *available at* http://www.dovetailinc.org/files/DovetailLCABioenergy0711.pdf (finding that sustainably managed forest are better than carbon neutral when regeneration, displacement of fossil fuels, and long-term carbon storage in durable forest products is considered)

- Sedjo, R, *Carbon Neutrality and Bioenergy: A Zero-Sum Game?*, Resources for the Future Discussion Paper 1-9 (Apr. 2011), *available at* http://www.rff.org/documents/RFF-DP-11-15.pdf (concluding that there are no net CO_2 emissions from biomass energy as long as forest carbon stocks are stable or increasing because CO_2 emissions will be offset entirely by carbon sequestration).

- Lippke, B., *et al.*, *Life cycle impacts of forest management & wood utilization on carbon mitigation: knowns and unknowns*, Carbon Management 2(3): 303-33 (2011) (concluding that combustion of biomass for energy produces no net CO_2 emissions as long as forest carbon stocks are stable or increasing).

- Malmshimer, R.W., *et al.*, *Managing Forests Because Carbon Matters: Integrating Energy, Products, and Land Management Policy*, Journal of Forestry 109(7S) (2011) (concluding that there will be no net CO_2 emissions from biomass energy as long as forest carbon stocks are stable or increasing because emissions will be offset entirely by carbon sequestration).

- Fargione, J., *et al.*, *Land clearing and the biofuel carbon debt*, Science 319: 1235-38 (2008) ("[B]iofuels made from waste biomass or from biomass grown on degraded and abandoned agricultural lands planted with perennials incur little or no carbon debt and can offer immediate and sustained GHG advantages.").

- Lippke, B. and E. Oneil, CORRIM, *Unintended Consequences of the Proposed EPA Tailoring Rule Treatment of Biomass Emissions the Same as Fossil Fuel Emissions* (2010) ("Life cycle research results accumulated over the last decade . . . demonstrate that the emissions from burning biomass for energy are being offset by the sustained growth in forest carbon.").

B. Scientific studies have repeatedly shown that biomass combustion for energy results in significant GHG emissions reductions when compared to fossil fuel alternatives.

Over the past 20 years scientific studies evaluating biomass energy have consistently found significantly lower net GHG emissions when compared to fossil fuel combustion. In particular, a number of recent studies focused directly on the question of carbon neutrality have determined that there are no net CO_2 emissions from woody biomass as long as forests are managed sustainably. Other studies—including a number of life cycle analyses—have attempted to quantify in absolute terms the GHG mitigation benefit of substituting biomass energy for fossil fuels. These studies also identify substantial reductions in GHG emissions, but do not directly answer the question whether biomass combustion for energy results in any net CO_2

emissions. However, these studies consistently conclude that active forest management focused on supplying forests products and biomass energy produces the greatest GHG mitigation benefits from forested lands. While many life cycle analyses show small net GHG emissions from biomass energy, they include certain emissions sources, such as those associated with the harvest and transport of biomass feedstocks, that should be excluded when considering net CO_2 emissions for purposes of PSD and Title V permitting under the Clean Air Act. *See* Science Advisory Board, *Review of EPA's Accounting Framework for Biogenic CO2 Emissions from Stationary Sources* at 7, EPA-SAB-12-011 (Sept. 22, 2012) ("While EPA's primary goal is to account for this offsetting sequestration, its biogenic emission accounting should be consistent with emissions accounting for fossil fuels for other emissions accounting categories—including losses, international leakage, and fossil fuel use during feedstock extraction, production and transport. Including some emissions accounting elements for biomass and not for fossil fuels would be a policy decision without the underling science to support it.").

- Schlamadinger, B., *et al., Towards a standard methodology for greenhouse gas balances of bioenergy systems in comparison with fossil energy systems*, Biomass and Bioenergy 13(6): 359-75 (1997) (finding that biomass-based fuels produce climate benefits when compared to fossil fuels).

- Abbasi, T. and S. Abbasi, *Biomass energy and the environmental impacts associated with its production and utilization*, Renewable and Sustainable Energy Reviews 14: 919-37 (2010) (finding that biomass-based fuels produce climate benefits when compared to fossil fuels).

- Froese, R.E., *et al., An evaluation of greenhouse gas mitigation options for coal-fired power plants in the U.S. Great Lakes States*, Biomass and Bioenergy 34: 251-62 (2010) (finding that, in the Great Lakes region, co-firing 20% forest residuals in coal-fired power plant reduced GHG emissions by 20%).

- DOE, Ethanol Benefits, *available at* http://www.afdc.energy.gov/afdc/ethanol/benefits.html ("Cellulosic ethanol would reduce GHGs by as much as 86%.").

- EPA, Regulation of Fuels and Fuel Additives: Changes to Renewable Fuel Standard Program, Final Rule, 75 Fed. Reg. 14,670 (Mar. 26, 2010) (finding that cellulosic ethanol reduces lifecycle GHG emissions by more than 60% when compared to conventional fuels).

- EPA, *Renewable Fuel Standard Program, Draft Regulatory Impact Analysis* at 191 (Sept. 2006), EPA420-D-06-008 (finding that cellulosic ethanol reduces lifecycle GHG emissions by 92.7% when compared to conventional fuels).

- Mann, M.K. and P.L. Spath, *A life cycle assessment of biomass cofiring in a coal-fired power plant*, Clean Production Processes 3: 81-91 (2001) (finding that cofiring 15% wood residuals in coal-fired power plant reduced GHG emissions by 18.4%).

- Robinson, A.L., *et al.*, *Assessment of potential carbon dioxide reductions due to biomass – Coal cofiring in the United States*, Environmental Science and Technology 37(22): 5081-89 (2003) (concluding that cofiring forestry and agricultural residuals with coal reduce CO2 emissions by as much as 95% when compared to fossil fuel combustion).

- Pehnt, M, *Dynamic life cycle assessment (LCA) of renewable energy technologies*, Renewable Energy 31: 55-71 (2006) (finding that combustion of biomass feedstocks such as forest wood, short rotation forestry wood, and waste wood for energy could reduce life cycle GHG emissions by between 85 and 95% when compared to fossil fuels).

- Cherubini, F., *et al.*, *Energy- and greenhouse gas-based LCA of biofuel and bioenergy systems: Key issues, ranges and recommendations,* Resources, Conservation, and Recycling 53: 434-47 (2009) (finding that combustion of forestry residuals for energy reduce life cycle GHG reductions by between 90 and 95%).

- Zhang, Y., *et al.*, *Life cycle emissions and cost of producing electricity from coal, natural gas, and wood pellets in Ontario Canada*, Environmental Science and Technology 44(1): 538-44 (2010) (finding that combustion of wood harvest specifically for energy production reduced lifecycle GHG emissions by 91% relative to coal and by 78% relative to natural gas).

- Raymer, A.K.P., *A comparison of avoided greenhouse gas emissions when using different kinds of wood energy*, Biomass and Bioenergy 30: 605-17 (2006) (concluding that combustion of biomass feedstocks such as fuel wood, sawdust, wood pellets, demolition wood, briquettes, and bark for energy production reduced lifecycle GHG emissions by between 81 and 98%).

- Heller, M.C., *et al.*, *Life cycle energy and environmental benefits of generating electricity from willow biomass*, Renewable Energy 29: 1023-42 (2004) (finding that cofiring 10% willow, a short rotation woody biomass feedstock, with coal reduced GHG emissions by 9.9%).

- Heller, M.C., *et al.*, *Life cycle assessment of a willow bioenergy cropping system*, Biomass and Bioenergy 25: 147-65 (2003) (finding that cofiring 10% willow, a short rotation woody biomass feedstock, with coal reduced GHG emissions by 9.9%).

- Bowyer, J., *et al.*, Life Cycle Impacts of Forest Management and Bioenergy Production 1-13 (July 2011), *available at* http://www.dovetailinc.org/files/DovetailLCABioenergy0711.pdf (finding that on a life cycle basis, biomass energy reduces GHG emissions by 96% in comparison to coal).

- Gaudreault, C., *et al.*, *Life cycle greenhouse gases and non-renewable energy benefits of kraft black liquor recovery*, Biomass and Bioenergy 46: 683-92 (2012) (finding that combustion of black liquor from Kraft pulping operations for energy reduced lifecycle GHG emissions by 90% relative to coal).

- Hall, D.O., *et al., Alternative roles for biomass in coping with greenhouse gas warming*, Science & Global Security 2: 113-51 (1991) (finding that combustion of woody biomass for energy produces substantial GHG benefits over time when used as a substitute for coal).

- Marland, G. and B. Schlamadinger, *Forests for carbon sequestration or fossil fuel substitution: A sensitivity analysis*, Biomass and Bioenergy 13: 389-97 (1997) (concluding that the use of woody biomass as a substitute for coal in energy production yields substantial GHG emissions reductions over time).

- Schlamadinger, B. and G. Marland, *The role of forest and bioenergy strategies in the global carbon* cycle, Biomass and Bioenergy 13: 275-300 (1996) (concluding that the use of woody biomass as a substitute for coal in energy production yields substantial GHG emissions reductions over time).

- Abt, R.C. *et al.,* Climate Change Policy Partnership, Duke University, *The near-term market and greenhouse gas implications for forest biomass utilization in the Southeastern United States* (2010) (concluding, in a study of forests in the southeastern United States, that the harvest and combustion of biomass for energy "generat[es] net GHG reductions relative to the baseline" when used as a substitute for coal).

- Zanchi, G., *et al.*, *Is woody bioenergy carbon neutral? A comparative assessment of the emissions from consumption of woody bioenergy and fossil fuel*, GCB Bioenergy 4: 761-72 (2012) (finding that combustion of biomass for energy produces long-term reductions in cumulative GHG emissions when compared to combustion of fossil fuels)

- Nabuurs, G.J., *et al.*, *Forestry*, Chapter 9 in Climate change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, (B. Metz, *et al.*, eds.) (2007) ("In the long-term, a sustainable forest management strategy aimed at maintaining or increasing forest carbon stocks, while producing an annual sustained yield of timber, fibre or energy from the forest, will generate the largest sustained mitigation benefit.")

- Ryan, M.G., *et al.*, *A synthesis of the science on forests and carbon for U.S. forests*, Issues in Ecology 13: 1-16 (2010) ("[T]he maximum potential benefit from a project that reestablished forest increases if the stand is periodically harvested and the wood is used for substitution and the biomass used for fuel.")

- Gaudreault, C. and R. Miner, *Greenhouse Gas and Fossil Fuel Reduction Benefits of Using Biomass Manufacturing Residues for Energy Production in Forest Products Manufacturing Facilities*, Technical Bulleting No. 1016, National Council for Air and Stream Improvement (2013) (finding that combustion of mill residuals for energy reduces lifecycle GHG emissions by 86 to 99% when compared to fossil fuels)

- Electric Power Research Institute, *Biopower Generation: Biomass Issues, Fuels, Technologies, and Opportunities for Research, Development, and Deployment* (Feb. 24, 2010), *available at* http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001020784 ("Direct firing of biomass is the only proven carbon-neutral generation technology that is both suitable for baseload operation and available for immediate deployment to support capacity expansion.").

- Interlaboratory Working Group, Oak Ridge, TN and Berkeley, CA: Oak Ridge National Laboratory and Lawrence Berkeley National Laboratory, *Scenarios of U.S. Carbon Reductions: Potential Impacts of Energy-Efficient and Low-Carbon Technologies by 2010 and Beyond*, ORNL-444 and LBNL-40533 (1997) (concluding that cofiring biomass with fossil fuels was the single largest potential contributor to near-term GHG emissions reduction of any renewable energy strategy).

- Matthews, R. and K. Robertson, EIA Bioenergy Task 38, *Answers to Ten Frequently Asked Questions about Bioenergy, Carbon Sinks and Their Role in Global Climate Change* (2nd ed. 2005), *available at* www.ieabioenergy-task38.org/publications/faq/ (finding that between 25 and 50 units of bioenergy are produced for every unit of fossil fuel energy consumed in production) (citing Börjesson (1996), Boman and Turnbull (1997), McLaughlin and Walsh (1998), Matthews (2001). and Elsayed *et al.* (2003)).

- Jones, G., *et al.*, *Forest treatment residues for thermal energy compared with disposal by onsite burning: Emissions and energy return*, Biomass and Bioenergy 34: 737-46 (2010) (finding that, for forest residues in western Montana, an average of 21 units of bioenergy are produced for every unit of fossil fuel energy consumed in production).

- Walker, T., *et al.*, Manomet Center for Conservation Sciences, *Biomass Sustainability and Carbon Policy Study* (2010) ("All bioenergy technologies, even biomass electric power compared to natural gas electricity, look favorable when biomass waste wood is compared to fossil fuel alternatives.").

- Heath, L., *et al.*, *Greenhouse gas and carbon profile of the U.S. forest products industry value chain*, Environmental Science and Technology 44: 3999-4005 (2010) (explaining that active forest management that produces forest products and biomass energy reduces overall atmospheric GHG concentrations).

- Morris, G., Pacific Institute, *Bioenergy and Greenhouse Gases* (May 15, 2008), *available at* http://www.pacinst.org/reports/Bioenergy_and_Greenhouse_Gases/Bioenergy_and_Greenhouse_Gases.pdf (finding that the California biomass energy industry produces significant GHG emission reduction benefits by displacing fossil CO_2 emissions from energy production and by avoiding GHG emissions otherwise associated with alternative disposal options for biomass).

- Werner, F., *et al.*, *National and global greenhouse gas dynamics of different forest management and wood use scenarios: A model based assessment*, Environmental Science and Policy 13: 72-85 (2010) (finding that the contributions of the forestry and timber sector to mitigate climate change can be optimized when sustainable harvests are maximized and harvested wood is processed in accordance with the principles of cascade use including the use of "waste wood" residues to generate energy).

C. Net CO_2 emissions from biomass energy must be evaluated over broad spatial and time scales.

Accounting for net CO_2 emissions from biomass energy is scale-dependent, and much of the controversy surrounding biogenic CO_2 emissions has arisen from studies relying on inappropriate spatial and time scales. This is particularly true for forest-based biomass, which is managed on longer rotation cycles. With respect to spatial scales, studies repeatedly demonstrate that a broad, landscape-based approach is necessary to account for the harvest and regrowth that happen simultaneously in different stands over time. Moreover, such an approach is consistent with the spatial scales over which working forests are managed. Likewise, accounting for net CO_2 emissions from biomass requires a long time scale that captures the longer rotation lengths over which forests are managed. A longer time scale is also consistent with climate science because cumulative net emissions, not near-term annual emissions, will determine peak warming.

- O'Laughlin, J., University of Idaho, College of Natural Resources Policy Analysis Group Report No. 31, *Accounting for Greenhouse Gas Emissions from Wood Bioenergy* (Sept. 13, 2010), *available at* http://www.uidaho.edu/~/media/Files/orgs/CNR/PAG/Reports/PAGReport31 (explaining why a landscape-based approach to carbon accounting is required to reflect that emission and sequestration occur simultaneously, while a stand-based accounting approach misses this point).

- Malmshimer, R.W., *et al.*, *Managing Forests Because Carbon Matters: Integrating Energy, Products, and Land Management Policy*, Journal of Forestry 109(7S) (2011) (explaining that bioenergy offers long-term GHG reduction benefits compared to continued sequestration because forest carbon stocks will eventually reach equilibrium, while bioenergy production continually displaces fossil fuel emissions).

- Lippke, B., *et al.*, *Life cycle impacts of forest management & wood utilization on carbon mitigation: knowns and unknowns*, Carbon Management 2(3): 303-33 (2011) (explaining that bioenergy offers long-term GHG reduction benefits compared to continued sequestration because forest carbon stocks will eventually reach equilibrium, while bioenergy production continually displaces fossil fuel emissions).

- Sedjo, R, *Carbon Neutrality and Bioenergy: A Zero-Sum Game?*, Resources for the Future Discussion Paper 1-9 (Apr. 2011), *available at* http://www.rff.org/documents/RFF-DP-11-15.pdf (explaining that a broad, landscape-based spatial scale for carbon accounting is necessary to appropriately reflect the simultaneous regrowth and harvest that take place on individual stands of forested land).

- Strauss, W., *How Manomet got it backwards: Challenging the "debt-then-dividend" axiom* (May 2011), *available at* http://www.futuremetrics.net/papers/Manomet%20Got%20/it%20Backwards.pdf (explaining that a broad, landscape-based spatial scale for carbon accounting is necessary to appropriately reflect the simultaneous regrowth and harvest that take place on individual stands of forested land).

- Bowyer, J., *et al.*, Dovetail Partners, *Carbon 101: Understanding the Carbon Cycle and the Forest Carbon Debate* (Jan. 2012), *available at* http://www.dovetailinc.org/files/DovetailCarbon101Jan2012.pdf (explaining that a broad landscape-based spatial scale demonstrates that overall forest carbon stocks remain stable when harvests take place at different times on different forest stands).

- Lucier, A., National Council for Air and Stream Improvement, Inc., *NCASI Review of Manomet Biomass Study*, (2010), *available at* http://www.mass.gov/Eoeea/docs/doer/renewables/biomass/study-comments/lucier.pdf (explaining that stand-based carbon accounting approaches fail to reflect the simultaneous harvest and regrowth that occurs across a sustainably-managed forested landscape).

- Galik, C.S. and R.C. Abt, *The Effect of Assessment Scale and Metric Selection on the Greenhouse Gas Benefits of Woody Biomass*, Biomass & Bioenergy, 44: 1-7 (2012) (concluding that "state, procurement area, and landowner assessment scales most closely approximate the actual GHG emission implications" of biomass energy).

- Meinshausen, M., *et al.*, *Greenhouse-gas emission targets for limiting global warming to 2°C*, Nature 248: 1158-62 (2009) (concluding that a long time frame is appropriate to assess climate impacts of alternative GHG emission scenarios because cumulative net emissions, rather than near-term annual emissions, will determine peak warming).

- Allen, M., *et al.*, *Warming caused by cumulative carbon emissions: Toward the trillionth ton*, Nature 458: 1163-66 (2009) (concluding that a long time frame is appropriate to assess climate impacts of alternative GHG emission scenarios because cumulative net emissions, rather than near-term annual emissions, will determine peak warming).

- Helin, T., *et al.*, *Approaches for inclusion of forest carbon cycle in life cycle assessment – a review*, GCB Bioenergy 5: 475-86 (2013) (concluding that the climate effects of biogenic CO_2 emissions are best characterized by analyzing cumulative radiative forcing over 100-year period).

- Ryan, M.G., *et al.*, *A synthesis of the science on forests and carbon for U.S. forests*, Issues in Ecology 13: 1-16 (2010) (explaining that GHGs are global pollutants with centuries-long effective lifespans and, therefore, must be analyzed over long periods of time and large areas).

- Nechodom, M., U.S. Department of Agriculture, U.S. Forest Service, Pacific Southwest Research Station, *Biomass to Energy: Forest Management for Wildlife Reduction, Energy*

Production, And Other Benefits, CEC-500-2009-080 (modeling forest vegetation growth over 40-year period in assessment of biomass energy).

- Miner, R., National Council for Air and Stream Improvement, Inc., *Biomass Carbon Neutrality* (Apr. 15, 2010), *available at* http://www.nafoalliance.org/wp-content/uploads/NCASI-Biomass-carbon-neutrality.pdf) (explaining that a landscape-based approach is necessary for carbon accounting because the emissions from harvesting certain forest stands are offset by the sequestration of carbon through new growth in other stands that will be harvested in the future).

- Lippke, B. & E. Oneil, CORRIM, *Unintended Consequences of the Proposed EPA Tailoring Rule Treatment of Biomass Emissions the Same as Fossil Fuel Emissions* (2010), *available at* http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.189.3736&rep=rep1&type=pdf (explaining that when forests are managed sustainably, carbon neutrality is observed at the stand level over multiple rotations, and at the landscape level at any given point in time).

D. Forest carbon stocks are stable or increasing across the United States.

Stability in forest carbon stocks is an essential prerequisite for establishing that biogenic CO_2 emissions do not increase net atmospheric CO_2 concentrations. If forests are converted to other land uses after harvest, the forest carbon cycle is broken. Thus, while some stand-based changes are inevitable, given urban development and other external pressures, it is essential to ensure that, at a broader landscape level, forest carbon stocks are not depleted as a result of biomass energy. Whether viewed nationally, or on a regional basis, studies consistently find that forest carbon stocks have remained stable—and in many cases increased significantly—over the past 60 years, and this stability has occurred despite significant increases in demand for forest products. Further, projections by the U.S. Forest Service and others suggest that this stability will continue for decades to come.

- Field, C.B., *Primary production for the biosphere: integrating terrestrial and oceanic components*, Science 281: 237-40 (1998) (finding that forests sequester 25-30 billion metric tons of carbon per year).

- Sabine, C.L., *et al.*, *Current status and past trends of the carbon cycle*, *in* The global carbon cycle: integrating humans, climate, and the natural world 17-44 (C.B. Field & M.R. Raupach, eds. 2004) (finding that U.S. forests are a carbon sink).

- Society of American Foresters, *The State of America's Forests* (2007), *available at* http://www.safnet.org/publications/americanforests/StateOfAmericasForests.pdf (noting a 50% increase in forest carbon stocks over second half of the 20^{th} century).

- U.S. Climate Change Science Program and the Subcommittee on Global Change Research, NOAA, *The First State of the Carbon Cycle Report (SOCCR): The North American Carbon Budget and Implications for the Global Carbon Cycle* (King, A.W., *et al.*, eds., 2007) (finding that forests are the largest carbon sink in North America).

- EPA, 2009 US Inventory of Greenhouse Gas Emissions and Sinks: 1990-2007 (stating that U.S. forests capture 10-15% of annual GHG emissions).

- Haynes, R.W., USDA Forest Service, Pacific Northwest Research Station, *The 2005 RPA timber assessment update*, Gen. Tech. Rep. PNW-GTR-699 (2007) (finding that private forests are a net carbon sink and sequester 131 metric tons of CO_2 per year).

- Heath, L.V., *Greenhouse Gas and Carbon Profile of the U.S. Forest Products Industry Value Chain*, Environmental Science and Technology (2010) (projecting that private forests will continue to be a net carbon sink through at least 2040).

- EPA, 2010 US Inventory of Greenhouse Gas Emissions and Sinks: 1990-2008 ("[I]mproved forest management practices, the regeneration of previously cleared lands, and timber harvesting and use have resulted in net uptake (i.e. net sequestration) of [carbon] each year from 1990 through 2008.").

- Smith, W., *et al.*., U.S. Department of Agriculture, U.S. Forest Service, *Forest Resources of the United States 2007 – General Technical Report WO-78* (2007) (concluding, based on data from 1980 to 2007, that forest carbon stocks are stable or increasing in the Rocky Mountain, Pacific Coast, South, and North regions, and for the U.S. as a whole).

- Walker, T., *et al.*, Manomet Center for Conservation Sciences, *Biomass Sustainability and Carbon Policy Study* (2010) (finding that forest carbon stocks in New England are increasing).

- Heath, L.S., *et al.*, *Managed Forest Carbon Estimates for the U.S. Greenhouse Gas Inventory, 1990-2008*, Journal of Forestry 109(3): 167-73 (2011) (finding that overall forest sequestration is increasing and projecting that forest carbon stocks will remain stable for the foreseeable future).

- Pan, Y, *et al.*, *A Large Persistent Carbon Sink in the World's Forests*, Science 333(6054): 988-93 (Aug. 19, 2011) (reporting that United States forest carbon stocks increased by 33% from 1990 to 2007).

- Bowyer, J., *et al.*, Dovetail Partners, *Carbon 101: Understanding the Carbon Cycle and the Forest Carbon Debate* (Jan. 2012), *available at* http://www.dovetailinc.org/files/DovetailCarbon101Jan2012.pdf (noting that between 1950 and 2010 forest carbon stocks increased nationally and across the North, South, Rocky Mountain, and Pacific Northwest regions).

- *More Parkland for Massachusetts*, Northern Woodlands 21 (Summer 2012) (reporting forest carbon stocks in Massachusetts are stable).

- Ince, P.J. and P. Nepal, U.S. Department of Agriculture, U.S. Forest Service, *Effects on U.S. Timber Outlook of Recent Economic Recession, Collapse in Housing, and Wood Energy Trends*, General Technical Report FPL-GTR-219 (Dec. 2012) (projecting that domestic forest carbon stocks will grow through 2060).

- Nepal, P., *et al.*, *Projection of U.S. forest sector carbon sequestration under U.S. and global timber market and wood energy consumption scenarios, 2010-2060*, Biomass and Bioenergy 45: 251-64 (2012) (projecting that U.S. forest carbon stocks will increase annually until at least 2045 and will have net growth from current levels until at least 2060).

- Alavalapati, J.R.R., *et al.*, *Forest Biomass-Based Energy*, *in* The Southern Forest Futures Project: technical report, United States Department of Agriculture (2013) (projecting that increased demand for biomass energy will not reduce forest carbon stocks because increased harvest rates will be offset by increased productivity of fast-growing plantation species).

- Alvarez, M. *The State of America's Forests,* Society of American Foresters (2007) (finding that the amount of forested land in the United States has been essentially constant since 1900).

- Birdsey, *et al.*, *Forest carbon management in the United States: 1600-2100*, Journal of Environmental Quality 35: 1461-69 (2006) (finding that U.S. forests and forest products have been a consistent carbon sink since at least the early 1950s).

- The Heinz Center for Science, Economics, and the Environment, *State of the Nations Ecosystem Report* (2008) ("Since 1953, the amount of carbon stored in live trees—the largest carbon pool in forests reported here—has increased by 43%.").

- Lippke, B., *et al.*, Letter from 113 Scientists to Sen. Boxer and Rep. Waxman (July 20, 2010) (explaining that forested acres have been stable for 100 years, while forest carbon stocks have increased by 50%).

- Forisk Consulting, *Woody Biomass as a Forest Product: Wood Supply and Market Implications* (Oct. 2011) (projecting an adequate supply of woody biomass to meet estimated bioenergy demands through 2022).

- Forisk Consulting, *Three Realities of Wood Bioenergy and Forest Owners* (2010), *available at* http://backup.forisk.com/UserFiles/File/Three%20Realities%20of%20Wood%20Bioenergy%20and%20Forest%20Owners%20final.pdf ("Timber per acre in the US has increased nearly one-third since 1952 and US forest growth has exceeded harvest since the 1940s.").

E. Increased demand for biomass energy feedstocks will not deplete forest carbon stocks.

Despite the stability in forest carbon stocks over time, some have expressed concern that increased demand for biomass energy will reduce the amount of carbon that would otherwise be stored in forests. However, these concerns are inconsistent with the market factors that influence forest management decisions. Studies have repeatedly found that forest owners will respond to increased demand for biomass energy (or any other forest product) by increasing production, and thereby increasing forest carbon stocks. In the case of biomass energy, such responses can take several forms, including (1) increased consumption of existing harvest residuals, (2) increased productivity through investments in forest management practices, and (3) land use changes such as afforestation, reforestation, or avoided deforestation.

- Science Advisory Board, *Review of EPA's Accounting Framework for Biogenic CO2 Emissions from Stationary Sources* at 7, EPA-SAB-12-011 (Sept. 22, 2012) ("Some research has shown that when a future demand signal is strong enough, expectations about biomass demand for energy (and thus revenues) can reasonably be expected to produce anticipatory feedstock production changes with associated changes in land management and land use . . . .").

- Nechodom, M., U.S. Department of Agriculture, U.S. Forest Service, Pacific Southwest Research Station, *Biomass to Energy: Forest Management for Wildlife Reduction, Energy Production, And Other Benefits*, CEC-500-2009-080 (Jan. 2010) (finding that the transition from passive to active management can occur without "carbon debt" due to reduced carbon losses from wild fire).

- Zhang, J., *et al.*, U.S. Department of Agriculture, U.S. Forest Service, Pacific Southwest Research Station, *To Manage or Not to Manage: The Role of Silviculture in Sequestering Carbon in the Specter of Climate Change* RMRS-P-61 /(2010) (showing that active forest management increased carbon sequestration and decreased fire-caused mortality).

- Clutter, M., *et al.*, *A Developing Bioenergy Market and its Implications on Forests and Forest Products Markets in the United States* (prepared for NAFO, 2010) *available at* http://www.nafoalliance.org/wp-content/uploads/NAFO-Executive-Summary-Clutter-Et-Al-Final.pdf (concluding that capacity exists to increase forest productivity by as much as 150% in South and Pacific Coast regions in response to increased market demand).

- James, C., *et al.*, *Carbon Sequestration in Californian Forests; Two Case Studies in Managed Watersheds* (2007) *available at* http://www.spi-ind.com/html/forests_research.cfm (concluding that implementing optimal policy incentives could double the amount of carbon sequestered by forests).

- Wear, D.N. and J.P. Prestemon, *Timber market research, private forests and policy rhetoric*, *in* Southern Forest Science: Past, Present, and Future General Technical Report SRS-75, Southern Research Station, USDA Forest Service, Ashville, NC (H.M. Raucher and K. Johnsen, eds. 2004) (explaining that economic return for forest products creates incentives for private forest stewardship).

- Lubowski, R.N., *et al.*, Economic Research Service, U.S. Department of Agriculture, *Environmental Effects of Agricultural Land-Use Change: The Role of Economics and Policy*, Economics Research Report No. 25, (Aug. 2006) (concluding that in the absence of market incentives, many working forests would be converted to non-forest uses).

- Ince, P.J., *Global Sustainable Timber Supply and Demand, in* Sustainable Development in the Forest Products Industry, Chapter 2, 29-41 (2010) (finding positive correlation between markets for forest products, including bioenergy, and annual increases in forest carbon stocks).

- Sedjo, R, *Carbon Neutrality and Bioenergy: A Zero-Sum Game?*, Resources for the Future Discussion Paper 1-9 (Apr. 2011), *available at* http://www.rff.org/documents/RFF-DP-11-15.pdf (explaining that bioenergy contributes to strong markets for forest products and creates incentives for forest owner to invest in forests rather than alternative land uses).

- Innovative Natural Resources Solutions LLC, *Identifying and Implementing Alternatives to Sustain the Wood-Fired Electricity Generating Industry in New Hampshire* (Jan. 2002), *available at* http://www.inrsllc.com/download/wood_firedelectricityinNH.pdf (explaining that biomass energy markets provide incremental value from low-grade forest products and help ensure that forests remain an economically competitive land use option in New Hampshire).

- Kingsley, E., *Importance of Biomass Energy Markets to Forestry: New England's Two Decades of Biomass Energy Experience* (June 2012), *available at* http://www.usendowment.org/images/Importance_of_Biomass_Energy_Markets_to_Forestry_6.2012.pdf (explaining that biomass energy markets provide incremental value from low-grade forest products and help ensure that forests remain economically competitive with other land uses).

- Maine Forest Service, *Maine Forest Service Assessment of Sustainable Biomass Availability* (July 17, 2008), *available at* http://www.maine.gov/dacf/mfs/about/state_assessment/downloads/maine_assessment_and_strategy_final.pdf (projecting that forest productivity in Maine could be increased by 88-273% through additional investments in site preparation, planting, competition control, and thinning).

- Sedjo, R. and X. Tian, *Does Wood Bioenergy Increase Carbon Stocks in Forests?*, Journal of Forestry 110: 304-11 (2012) (concluding that when "demand [for biomass] is greater than the sustainable harvest of the forest, prices will rise, total forest area will expand to meet the increasing demand, and in the process, will capture and store more carbon").

- Sedjo, R. and B. Sohngen, *Wood as a Major Feedstock for Biofuel Production in the United States: Impacts on Forests and International Trade*, Journal of Sustainable Forestry 23: 195-211 (2003) (explaining that strong market signals supporting future demand for forest products will cause forest owners to make anticipatory changes to ensure that the demand will be met).

- Wear, D.N. and J.G. Greis, *The Southern Forest Futures Project: Summary Report* (May 12, 2011), *available at* http://www.srs.fs.usda.gov/futures/reports/draft/summary_report.pdf (explaining that strong timber markets (1) encourage landowners to retain forests rather than converting them to other land uses and (2) encourage continued investment in forest management).

- MacCleery, D., *American Forests: A History of Resiliency and Recovery* (1996) (concluding that biomass energy can be an important new market that replaces other markets with declining demand and adds economic value to private forest ownership).

- Alavalapati, J.R.R., *et al.*, *Forest Biomass-Based Energy*, *in* The Southern Forest Futures Project: technical report, United States Department of Agriculture (2013) (projecting that under high biomass energy demand scenarios forest owners will increase productivity and expand the number of forested acres to meet demand).

- Daigneault, A., *et al.*, *Economic approach to assess the forest carbon implications of biomass energy*, Environmental Science and Technology 46: 5664-71 (2012) (explaining that strong markets for biomass keep land forested and encourage the planting of new forests).

- Lubowski, R., *et al.*, *What drives land-use change in the United States? A National Analysis of Landowner Decisions*, Land Economics 84: 529-50 (2008) (explaining that demand for wood produces investments by landowners that prevent forest loss through land use change an encourage afforestation).

- Hardie, I., *et al.*, *Responsiveness of rural and urban land uses to land rent determinations in the U.S. South*, Land Economics 76: 659-73 (2000) (explaining that demand for wood produces investments by landowners that prevent forest loss through land use change an encourage afforestation).

- Abt, R.C. *et al.*, Climate Change Policy Partnership, Duke University, *The near-term market and greenhouse gas implications for forest biomass utilization in the Southeastern United States* (2010) ("Forest harvest and planting decisions are affected by an uptick in demand for biomass, which in turn affects net carbon storage over time.").

F. Increased demand for biomass energy will not result in the harvest of high-grade mature trees for energy.

Despite its promise as a renewable energy source that does not increase atmospheric CO_2 concentrations, biomass energy relies on low-cost biomass feedstocks to remain competitive with other types of energy. Thus, biomass energy feedstocks are commonly composed of mill residues, harvest residuals, thinning treatments, and other low-grade feedstocks. In contrast, high-grade trees are reserved for saw timber and other similar products that command higher prices. Given the price differential between low-grade biomass energy feedstocks and saw timber, it is unlikely that high-grade, mature trees would ever be harvested exclusively for biomass energy production. While increased demand for biomass energy could increase prices to some degree, even the most optimistic projections for biomass energy would not raise feedstock prices to the point that landowners would begin managing forests for biomass energy instead of high-value saw timber. Thus, concerns over carbon stock depletion due to the harvest of high-grade, mature trees for biomass energy are misplaced.

- Forisk Consulting, *Woody Biomass as a Forest Product: Wood Supply and Market Implications* (Oct. 2011) (finding that a 435% increase in biomass energy demand by 2016 would be required to make forest management exclusively for biomass energy as profitable as management for saw timber).

- Ince, P.J., *Global Sustainable Timber Supply and Demand, in* Sustainable Development in the Forest Products Industry, Chapter 2 29-41 (2010) (explaining that biomass energy feedstocks are among the lowest value forest products).

- Innovative Natural Resources Solutions LLC, *Identifying and Implementing Alternatives to Sustain the Wood-Fired Electricity Generating Industry in New Hampshire* (Jan. 2002), *available at* http://www.inrsllc.com/download/wood_firedelectricityinNH.pdf (explaining that biomass energy relies on low-cost, low-grade feedstocks, not high-grade grade feedstocks that command higher prices in the market).

- Kingsley, E., *Importance of Biomass Energy Markets to Forestry: New England's Two Decades of Biomass Energy Experience* (June 2012) (explaining that biomass energy relies on low-cost, low-grade feedstocks, not high-grade feedstocks that command higher prices in the market).

- Maine Forest Service, *Maine Forest Service Assessment of Sustainable Biomass Availability* (July 17, 2008) (concluding that Maine has 9.69 million green tons per year of unutilized biomass available for biomass energy).

- U.S. Department of Energy, *Billion-ton update: biomass supply for a bioenegy and bioproducts industry* (2011) (projecting that a goal of replacing 30% of U.S. fossil fuel consumption with biomass resources can be achieved without using current pulpwood or saw timber supplies).

- MacCleery, D., *American Forests: A History of Resiliency and Recovery* (1996) (explaining that biomass energy can be an important new market that can replace other declining markets and add economic value to private forest ownership).

- Forisk Consulting, *Wood Bioenergy Markets and Forestland Owner Decisions: 2010-2013* (2014) (finding that projected demand for bioenegy feedstocks will not alter current forest management practices that are focused on saw timber production)

- U.S. Department of Agriculture, U.S. Forest Service, *Future of America's Forest and Rangelands: Forest Service 2010 Resources Planning Act Assessment*, Gen. Tech. Rep. WO-87 (2012) (projecting that large, mature trees are unlikely to be used for bioenergy due to price competition from higher value forest products).

- Abt, K.L. *et al.*, *Effect of Bioenergy demands and supply response on markets, carbon, and land use*, Forest Science 58: 523-39 (2012) (projecting that price increases associated with biomass energy demand in the southern United States will remain far below prices for saw timber).

- Abt, R.C. and K.L. Abt, *Potential impact of bioenergy demand on the sustainability of the southern forest resource*, Journal of Sustainable Forestry 32: 175-94 (2013) (projecting that price increases associated with biomass energy demand in the southern United States will remain far below prices for saw timber).

- Timber Mart-South, Univ. of Georgia, *Southeastern Timber Market News and Price Reports* (2013) (projecting that price increases associated with biomass energy demand in the southern United States will remain far below prices for saw timber).

- Haq, Z., *Biomass for Electricity Generation*, EIA (July 2002), *available at* http://www.eia.gov/oiaf/analysispaper/biomass/pdf/biomass.pdf (projecting that by 2020, agricultural residues, energy crops, forestry residues, and urban wood waste/mill residues will provide as much as 7.1 quadrillion BTUs of biomass at a price of $5 per BTU or less).

Conclusion

It is clear that EPA has the legal authority, the record support, and the discretion to exclude biogenic CO_2 emissions from the CAA and/or the PSD permitting program or, in the alternative, to differentiate between biogenic CO_2 emissions and other GHG emissions. As EPA reconsiders the treatment of biogenic CO_2 emissions in the Tailoring Rule, it must reconcile the Tailoring Rule with both sound science and policy regarding renewable energy. By regulating CO_2 emissions from biomass combustion identically to fossil fuel GHG emissions, the Tailoring Rule both ignores well-settled principles regarding the balance of biogenic CO_2 emissions and CO_2 sequestration in the United States and removes any regulatory incentive to utilize biomass in place of coal and other fossil fuels.

Message

From: Tim Lust [tim@sorghumgrowers.com]
Sent: 10/16/2017 4:02:52 PM
To: Schwab, Justin [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=eed0f609c0944cc2bbdb05df3a10aadb-Schwab, Jus]
CC: Joe Bischoff [JBischoff@cgagroup.com]
Subject: Sorghum Oil at OGC

Justin,

Thanks for all you are doing as I know life is hectic at EPA. We understand that the sorghum oil pathway has finally gone to OGC. Any help on getting it through that process in a timely manner would be greatly appreciated. Thanks. Tim

Tim Lust
Chief Executive Officer
Ex. 6 office
cell
sorghumgrowers.com
Sorghum: The Smart Choice.

Message

From: David M. (Max) Williamson [maxwilliamson@williamsonlawpolicy.com]
Sent: 12/18/2017 10:28:57 PM
To: Baptist, Erik [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=10fc1b085ee14c6cb61db378356a1eb9-Baptist, Er]; Schwab, Justin [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=eed0f609c0944cc2bbdb05df3a10aadb-Schwab, Jus]
CC: Motley, Judy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Motley, Judy]; kharris@corn.org
Subject: RE: Ag Biogenic CO2

Erik and Justin, if your schedules have opened up a bit (perhaps wishful thinking), could we schedule a follow-up work session on the biogenic issue for the week prior to New Years or in the very early part of January?

If possible, it would be great to resolve this issue for Heartland investment in the first year of the Trump Administration.

Regards,

David M. (Max) Williamson | Williamson Law + Policy, PLLC
1850 M Street NW, Suite 840 | Washington, D.C. 20036 | (202) 256-6155

WILLIAMSON LAW + POLICY
environmental markets advisory

www.williamsonlawpolicy.com | new carbon future | bio | vCard | map | email

From: David M. (Max) Williamson
Sent: Monday, November 6, 2017 9:42 AM
To: 'Baptist, Erik' <baptist.erik@epa.gov>; 'Schwab, Justin' <Schwab.Justin@epa.gov>
Cc: 'Motley, Judy' <motley.judy@epa.gov>; kharris@corn.org
Subject: RE: Ag Biogenic CO2

All, could we schedule a second work session on the resolution of the biogenic issue this week or next?

We found the first session very productive.

Regards,

David M. (Max) Williamson | Williamson Law + Policy, PLLC
1850 M Street NW, Suite 840 | Washington, D.C. 20036 | (202) 256-6155

WILLIAMSON LAW + POLICY
environmental markets advisory

www.williamsonlawpolicy.com | new carbon future | bio | vCard | map | email

From: David M. (Max) Williamson
Sent: Wednesday, October 25, 2017 10:20 AM
To: 'Baptist, Erik' <baptist.erik@epa.gov>; Schwab, Justin <Schwab.Justin@epa.gov>
Cc: Motley, Judy <motley.judy@epa.gov>; kharris@corn.org
Subject: RE: Ag Biogenic CO2

CONFIDENTIAL

Justin and Eric, thanks again for taking the time last week to work through a legal analysis of the biogenic CO2 issue. As discussed, to facilitate a resolution, we are sharing a legal analysis of the key regulatory actions (in Word format, attached) which forms the basis for our position that biogenic CO2 has never properly been determined to be a pollutant subject to regulation for purposes of the Clean Air Act.

I am also sharing the Biogenic CO2 Coalition's comments on the Significance Rule proposal from the prior administration, as it contains a comprehensive narrative discussion of the coalition's legal and policy positions.

We look forward to having another "work session" to discuss this issue once you have a chance to study the issues in greater depth. Would you be available sometime the week of November 5?

Regards,

David M. (Max) Williamson | Williamson Law + Policy, PLLC
1850 M Street NW, Suite 840 | Washington, D.C. 20036 | (202) 256-6155

WILLIAMSON LAW + POLICY
environmental markets advisory

www.williamsonlawpolicy.com | new carbon future | bio | vCard | map | email

From: Baptist, Erik [mailto:baptist.erik@epa.gov]
Sent: Friday, October 13, 2017 12:18 PM
To: David M. (Max) Williamson <maxwilliamson@williamsonlawpolicy.com>; Schwab, Justin <Schwab.Justin@epa.gov>
Cc: Motley, Judy <motley.judy@epa.gov>
Subject: RE: Ag Biogenic CO2

Ok, let's plan for 1:30 p.m. that day.

Erik Baptist
Senior Deputy General Counsel
Office of General Counsel
U.S. Environmental Protection Agency
1200 Pennsyvlania Ave., NW
Washington, DC 20460
(202) 564-1689
baptist.erik@epa.gov

From: David M. (Max) Williamson [mailto:maxwilliamson@williamsonlawpolicy.com]
Sent: Friday, October 13, 2017 12:06 PM
To: Baptist, Erik <baptist.erik@epa.gov>; Schwab, Justin <Schwab.Justin@epa.gov>

Cc: Motley, Judy <motley.judy@epa.gov>
Subject: Re: Ag Biogenic CO2

Erik, that can work - even better if we could start earlier we have a 3pm over at DOE. Thanks

David M. (Max) Williamson
WILLIAMSON LAW + POLICY, PLLC
1800 K Street NW Suite 714 | Washington, D.C. | (202) 256-6155 |

From: Baptist, Erik
Sent: Friday, October 13, 2017 11:39
To: David M. (Max) Williamson; Schwab, Justin
Cc: Motley, Judy
Subject: RE: Ag Biogenic CO2

Let's plan for Friday, October 20, at 2:00-3:00 p.m.

Thanks

Erik Baptist
Senior Deputy General Counsel
Office of General Counsel
U.S. Environmental Protection Agency
1200 Pennsyvlania Ave., NW
Washington, DC 20460
(202) 564-1689
baptist.erik@epa.gov

From: David M. (Max) Williamson [mailto:maxwilliamson@williamsonlawpolicy.com]
Sent: Friday, October 13, 2017 5:45 AM
To: Baptist, Erik <baptist.erik@epa.gov>; Schwab, Justin <Schwab.Justin@epa.gov>
Subject: RE: Ag Biogenic CO2

Thanks, Erik, I look forward to talking.

I could do morning of . . .

- Friday, Oct 20 (outside the proposed range but a Friday)
- Mon Oct 23
- Tues Oct 24 (morning)
- Fri Oct 27 is a possibility but probably by phone only

Best regards,

David M. (Max) Williamson | Williamson Law + Policy, PLLC
1850 M Street NW, Suite 840 | Washington, D.C. 20036 | (202) 256-6155

WILLIAMSON LAW + POLICY
environmental markets advisory

www.williamsonlawpolicy.com | new carbon future | bio | vCard | map | email

From: Baptist, Erik [mailto:baptist.erik@epa.gov]
Sent: Friday, October 13, 2017 12:24 AM
To: David M. (Max) Williamson <maxwilliamson@williamsonlawpolicy.com>; Schwab, Justin <Schwab.Justin@epa.gov>
Subject: RE: Ag Biogenic CO2

Max,

Apologies for the delayed response. Is there a day during the week of October 23-27 that works best for you? Fridays are usually best for us.

Thanks,

Erik Baptist
Senior Deputy General Counsel
Office of General Counsel
U.S. Environmental Protection Agency
1200 Pennsyvlania Ave., NW
Washington, DC 20460
(202) 564-1689
baptist.erik@epa.gov

From: David M. (Max) Williamson [mailto:maxwilliamson@williamsonlawpolicy.com]
Sent: Wednesday, October 4, 2017 8:17 AM
To: Schwab, Justin <Schwab.Justin@epa.gov>; Baptist, Erik <baptist.erik@epa.gov>
Subject: Ag Biogenic CO2

Justin and Erik, following on a telecon with Mandy, I'd like to offer to sit down with you and walk through our legal analysis of the biogenic CO2 policy, which led us to the conclusion that re-interpreting the endangerment finding was the most sensible solution to this issue which has the ag community inflamed.

Could we convene a small working group (no more than 3-4) for an in-person sit down?

Regards,

David M. (Max) Williamson | Williamson Law + Policy, PLLC
1850 M Street NW, Suite 840 | Washington, D.C. 20036 | (202) 256-6155

WILLIAMSON LAW + POLICY
environmental markets advisory

www.williamsonlawpolicy.com | new carbon future | bio | vCard | map | email

Message

From: David M. (Max) Williamson [maxwilliamson@williamsonlawpolicy.com]
Sent: 10/25/2017 2:21:00 PM
To: Baptist, Erik [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=10fc1b085ee14c6cb61db378356a1eb9-Baptist, Er]; Schwab, Justin [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=eed0f609c0944cc2bbdb05df3a10aadb-Schwab, Jus]
CC: Motley, Judy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Motley, Judy]; kharris@corn.org
Subject: RE: Ag Biogenic CO2
Attachments: Biogenic Regulation - Legal Analysis (10-25-17).docx; Biogenic CO2 Coalition Comments EPA Significance Rule (filed) (12-16-16).pdf

CONFIDENTIAL

Justin and Eric, thanks again for taking the time last week to work through a legal analysis of the biogenic CO2 issue. As discussed, to facilitate a resolution, we are sharing a legal analysis of the key regulatory actions (in Word format, attached) which forms the basis for our position that biogenic CO2 has never properly been determined to be a pollutant subject to regulation for purposes of the Clean Air Act.

I am also sharing the Biogenic CO2 Coalition's comments on the Significance Rule proposal from the prior administration, as it contains a comprehensive narrative discussion of the coalition's legal and policy positions.

We look forward to having another "work session" to discuss this issue once you have a chance to study the issues in greater depth. Would you be available sometime the week of November 5?

Regards,

David M. (Max) Williamson | Williamson Law + Policy, PLLC
1850 M Street NW, Suite 840 | Washington, D.C. 20036 | (202) 256-6155

WILLIAMSON LAW + POLICY
environmental markets advisory

www.williamsonlawpolicy.com | new carbon future | bio | vCard | map | email

---

From: Baptist, Erik [mailto:baptist.erik@epa.gov]
Sent: Friday, October 13, 2017 12:18 PM
To: David M. (Max) Williamson <maxwilliamson@williamsonlawpolicy.com>; Schwab, Justin <Schwab.Justin@epa.gov>
Cc: Motley, Judy <motley.judy@epa.gov>
Subject: RE: Ag Biogenic CO2

Ok, let's plan for 1:30 p.m. that day.

Erik Baptist
Senior Deputy General Counsel
Office of General Counsel
U.S. Environmental Protection Agency
1200 Pennsyvlania Ave., NW

Washington, DC 20460
(202) 564-1689
baptist.erik@epa.gov

From: David M. (Max) Williamson [mailto:maxwilliamson@williamsonlawpolicy.com]
Sent: Friday, October 13, 2017 12:06 PM
To: Baptist, Erik <baptist.erik@epa.gov>; Schwab, Justin <Schwab.Justin@epa.gov>
Cc: Motley, Judy <motley.judy@epa.gov>
Subject: Re: Ag Biogenic CO2

Erik, that can work - even better if we could start earlier we have a 3pm over at DOE. Thanks

David M. (Max) Williamson
WILLIAMSON LAW + POLICY, PLLC
1800 K Street NW Suite 714 | Washington, D.C. | (202) 256-6155 |

From: Baptist, Erik
Sent: Friday, October 13, 2017 11:39
To: David M. (Max) Williamson; Schwab, Justin
Cc: Motley, Judy
Subject: RE: Ag Biogenic CO2

Let's plan for Friday, October 20, at 2:00-3:00 p.m.

Thanks

Erik Baptist
Senior Deputy General Counsel
Office of General Counsel
U.S. Environmental Protection Agency
1200 Pennsyvlania Ave., NW
Washington, DC 20460
(202) 564-1689
baptist.erik@epa.gov

From: David M. (Max) Williamson [mailto:maxwilliamson@williamsonlawpolicy.com]
Sent: Friday, October 13, 2017 5:45 AM
To: Baptist, Erik <baptist.erik@epa.gov>; Schwab, Justin <Schwab.Justin@epa.gov>
Subject: RE: Ag Biogenic CO2

Thanks, Erik, I look forward to talking.

I could do morning of . . .

- Friday, Oct 20 (outside the proposed range but a Friday)
- Mon Oct 23
- Tues Oct 24 (morning)
- Fri Oct 27 is a possibility but probably by phone only

Best regards,

David M. (Max) Williamson | Williamson Law + Policy, PLLC
1850 M Street NW, Suite 840 | Washington, D.C. 20036 | (202) 256-6155

WILLIAMSON LAW + POLICY
environmental markets advisory

www.williamsonlawpolicy.com | new carbon future | bio | vCard | map | email

From: Baptist, Erik [mailto:baptist.erik@epa.gov]
Sent: Friday, October 13, 2017 12:24 AM
To: David M. (Max) Williamson <maxwilliamson@williamsonlawpolicy.com>; Schwab, Justin <Schwab.Justin@epa.gov>
Subject: RE: Ag Biogenic CO2

Max,

Apologies for the delayed response. Is there a day during the week of October 23-27 that works best for you? Fridays are usually best for us.

Thanks,

Erik Baptist
Senior Deputy General Counsel
Office of General Counsel
U.S. Environmental Protection Agency
1200 Pennsyvlania Ave., NW
Washington, DC 20460
(202) 564-1689
baptist.erik@epa.gov

From: David M. (Max) Williamson [mailto:maxwilliamson@williamsonlawpolicy.com]
Sent: Wednesday, October 4, 2017 8:17 AM
To: Schwab, Justin <Schwab.Justin@epa.gov>; Baptist, Erik <baptist.erik@epa.gov>
Subject: Ag Biogenic CO2

Justin and Erik, following on a telecon with Mandy, I'd like to offer to sit down with you and walk through our legal analysis of the biogenic CO2 policy, which led us to the conclusion that re-interpreting the endangerment finding was the most sensible solution to this issue which has the ag community inflamed.

Could we convene a small working group (no more than 3-4) for an in-person sit down?

Regards,

David M. (Max) Williamson | Williamson Law + Policy, PLLC
1850 M Street NW, Suite 840 | Washington, D.C. 20036 | (202) 256-6155

WILLIAMSON LAW + POLICY
environmental markets advisory

www.williamsonlawpolicy.com | new carbon future | bio | vCard | map | email

December 16, 2016

VIA ELECTRONIC FILING
Hon. Gina McCarthy, Administrator
U.S. Environmental Protection Agency
c/o E-Docket ID No. EPA–HQ–OAR–2015-0355
William Jefferson Clinton Federal Building
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460

Re: Comments of the Biogenic CO_2 Coalition – EPA Proposed Revisions to the Prevention of Significant Deterioration (PSD) and Title V Greenhouse Gas (GHG) Permitting Regulations and Establishment of a Significant Emissions Rate (SER) for GHG Emissions Under the PSD Program, 81 Fed. Reg. 68110 (Oct. 3, 2016)

Dear Administrator McCarthy:

The Biogenic CO_2 Coalition ("Coalition")[1] appreciates the opportunity to submit these comments on EPA's proposed Revisions to the Prevention of Significant Deterioration (PSD) and Title V Greenhouse Gas (GHG) Permitting Regulations and Establishment of a Significant Emissions Rate (SER) for GHG Emissions Under the PSD Program, which the agency has proposed under the federal Clean Air Act (referred to herein as the "Significance Rule").

The Coalition has previously commented on various EPA proposals to regulate greenhouse gases including, principally, EPA's proposed Standards of Performance for Greenhouse Gas Emissions From Stationary Sources: Electric Utility Generating Units, 79 Fed. Reg. 1430 (Jan. 8, 2014) (EPA-HQ-OAR-2013-0495) ("NSPS Rule"); Carbon Pollution Emission Guidelines for Existing Sources: Electric Utility Generating Units, 79 Fed. Reg. 34830 (June 18, 2014) (EPA-HQ-OAR-2013-0602) ("CPP Rule"); and Proposed Finding That Greenhouse Gas Emissions From Aircraft Cause or Contribute to Air Pollution That May Reasonably Be Anticipated to Endanger Public Health and Welfare and Advance Notice of Proposed Rulemaking, 80 Fed. Reg. 37758 (July 1, 2015) (EPA-HQ-OAR-2014-0828) ("Aircraft Rule"). Our prior comments on all greenhouse gas regulatory policies are incorporated by reference herein. Our comments have concerned primarily the implications of EPA's policy approach to "biogenic CO_2," meaning carbon dioxide emitted from the processing or energy use of agricultural feedstocks.

---

[1] The Coalition consists of the following stakeholders: American Bakers Association, American Farm Bureau Federation, Corn Refiners Association, Enginuity Worldwide, National Corn Growers Association, National Cotton Council of America, National Cottonseed Products Association, National Oilseed Processors Association, and North American Millers' Association.

The stakeholders represented by the Biogenic CO_2 Coalition grow or process various agricultural crops and farm products, typically short-cycle annual herbaceous crops and crop residues. Together with others in the agricultural community, and supported by federal and state agriculture departments, our members are investing billions of dollars in the "bioeconomy," which promotes bioenergy technology and pioneering "green chemistry" approaches to produce food, fiber, consumer products, pharmaceuticals, bioplastics, biofuels, commercial chemicals, and a cornucopia of other bioproducts from crop-derived materials. The bioeconomy provides 21st century solutions to economic growth, domestic energy security, jobs, and environmental benefits in the form of bioenergy, biofuels, and bioproducts made from corn, oilseeds, crop residues, farm wastes and other agricultural feedstocks. America's bioeconomy currently contributes $393 billion in economic activity, provides 4.2 million American jobs, and is the leading source of domestic renewable energy in the United States. Importantly, the bioeconomy is poised to expand exponentially with the right policy environment. *See* USDA, *An Economic Impact Analysis of the U.S. Biobased Products Industry* (Oct. 2016) (the "2016 Biomass Report").[2]

While providing food, fuel and fiber to American families, the bioeconomy also reduces CO_2 by 400 million tons every year through uptake of carbon by growing crops, thus playing a critical role in achieving climate policy goals.[3] The benefits of agriculture as a renewable and sustainable resource are widely recognized, and the life-cycle carbon benefits of biogenic emissions from the use or processing of biomass have been universally acknowledged by policymakers and scientists.[4]

Members of the Biogenic CO_2 Coalition are eager to grow and expand the bioeconomy over the coming decades. Naturally, because bioproducts are made from carbon-based organic materials, some amount of carbon in those materials is cycled back into the atmosphere when agricultural feedstocks are used or processed by energy combustion, fermentation, or microbial wastewater treatment (referred to as "crop-derived CO_2" or "biogenic CO_2"). EPA's current policies and regulations – which in some situations treat biogenic CO_2 the same as fossil fuels and essentially put a carbon tax on farm products – are thwarting investment in the bioeconomy. EPA has failed to put science first by failing to distinguish between fossil-based emissions, which EPA has said contribute to global warming, and crop-derived emissions, which are carbon neutral by nature. Instead of recognizing the natural life cycle of agricultural carbon, EPA instead has inadvisedly labeled biogenic CO_2 as a harmful pollutant under the Clean Air Act.

Farm feedstocks are not the same as fossil fuels or petrochemicals. To the contrary, American farmers growing crop-based feedstocks have already done the hard work of uptaking carbon from the atmosphere during the growth cycle. When agricultural feedstocks are used for energy, turned into bioproducts, or processed for food, fiber and fuel, the "biogenic" emissions from these processes are simply returning carbon to the atmosphere that farmers have already removed from the carbon cycle as part of the natural carbon flow. The science of life-cycle

---

[2] Available at www.biopreferred.gov/BPResources/files/BiobasedProductsEconomicAnalysis2016.pdf.

[3] *See* 2016 Biomass Board Report at 6 (Feb. 2016).

[4] *See* 2016 Biomass Board Report at 7 ("Biobased products . . . recycle carbon (CO_2) from the atmosphere, resulting in air quality improvements when compared to fossil fuel-based products").

emissions shows that emissions of crop-derived CO_2 resulting from energy use or processing of crop-derived feedstocks are harmless from a global warming standpoint and do not contribute to elevated atmospheric concentrations of greenhouse gases. Until this basic science is embraced fully by Administration policy, the bioeconomy will be hobbled from achieving its full promise.

Accordingly, as part of its pending mandate from the Supreme Court to revisit its interpretation of the scope of greenhouse gas regulation under the Clean Air Act (discussed below), EPA should define key terms in its regulations to exclude carbon-neutral biogenic emissions. Similarly, in the context of the proposed Significance Rule, EPA must not deny the scientific reality of life-cycle emissions and should categorize agricultural biogenic emissions as insignificant or *de minimis* for purposes of the PSD and Title V programs, as well as other Clean Air Act programs and policies, including EPA's Clean Power Plan.

I. UNDER SUPREME COURT MANDATE, EPA MUST REVISIT ITS INTERPRETATION OF THE CLEAN AIR ACT AND SET DE MIMINIS LEVELS FOR "POLLUTANTS"

As EPA acknowledges in the preamble of the proposed Significance Rule,[5] its proposal is a response to a series of federal court rulemaking challenges to EPA's greenhouse gas regulations, culminating in the U.S. Supreme Court's seminal decision in *Util. Air Regulatory Group v. EPA*, 134 S. Ct. 2427 (2014) ("*UARG*"), and the D.C. Circuit's amended judgment on remand from *UARG* in *Coalition for Responsible Regulation v. EPA*, No. 09-1322, 606 F. Appx 6, 8 (D.C. Cir. Apr. 4, 2015). These decisions vacated certain aspects of the Obama Administration's regulation of greenhouse gases under the PSD and Title V permitting programs and announced important principles of law, which EPA must now observe.[6] In *UARG*, the Supreme Court explicitly recognized the agency's authority to establish significance (or *de minimis*) levels for regulated pollutants. *See, e.g.*, *UARG*, 134 S. Ct. at 2449 ("EPA may establish an appropriate de minimis threshold . . . for a source's greenhouse-gas emissions"). Importantly, the Supreme Court also ruled that the agency's interpretation of the statutory term "pollutant" under the Clean Air Act is a context-specific definitional exercise and, as a corollary, directed EPA to interpret the statute in such a way as to give meaning to the context in which pollutants are identified or regulated. *See, e.g.*, *UARG*, 134 S. Ct. at 2439 ("where the term 'air pollutant' appears in the Act's operative provisions, EPA has routinely given it a narrower, context-appropriate meaning").

The D.C. Circuit echoed this material aspect of the Supreme Court's opinion by ordering EPA to respect the Supreme Court's mandate and on remand "consider whether any further revisions to its regulations are appropriate in light of *Util. Air Regulatory Group v. EPA*, 134 S. Ct. 2427, 189 L. Ed. 2d 372, and if so, undertake to make such revisions."[7] EPA has acknowledged

---

[5] 81 Fed. Reg. at 68110-11.

[6] The Supreme Court in *UARG* invalidated EPA's greenhouse gas program to the extent it required stationary sources to obtain permits solely because the sources emit or have the potential to emit greenhouse gases above applicable thresholds, thereby limiting the applicability of permitting to "anyway sources" that would be regulated under the permitting programs regardless of greenhouse gas emissions.

[7] *Coal. for Responsible Regulation*, 606 F. Appx 6 at 8.

as much in the proposed rule.[8] Because EPA is under a legal mandate to re-examine its existing policies and regulations affecting greenhouse gas emissions with a context-specific lens – a principle that applies equally to biogenic emissions – the Significance Rule should reflect this watershed directive from the Supreme Court and should establish once and for all an exemption for agricultural biogenic emissions.

Put another way, EPA must consider whether Congress would have intended that biogenic emissions be classified as a subset of the larger set of pollutants within the definition of "any air pollutant." *See UARG*, 134 S. Ct. at 2448. As discussed below, due to the nature of biogenic emissions and their lack of harmful effect, EPA cannot properly interpret the term "air pollutant" to include biogenic emissions within the context of the Clean Air Act regulatory programs and EPA's previous endangerment finding. As a corollary, if biogenic emissions are not properly interpreted as harmful pollutants under the category of "air pollutant," then biogenic emissions would not be considered as "regulated" pollutants and should not be subjected to Clean Air Act programs such as PSD and Title V permitting programs.

A contrary interpretation would result in exactly the "enormous and transformative expansion in EPA's regulatory authority without clear congressional authorization" that the Supreme Court sought to avoid in *UARG* by requiring EPA to re-visit its interpretation of "air pollutant" under the Clean Air Act statutory scheme. *UARG*, 134 S. Ct. at 2444, 2448. The agricultural community is legitimately concerned that EPA is using its current policy with regard to biogenic emissions as a basis for (1) regulating natural CO_2 from biological processes like bread baking, (2) attempting to define "sustainability" on the farm field, and (3) disqualifying agricultural feedstocks as low-carbon fuels under its Clean Power Plan. There is no indication in the Clean Air Act that Congress intended that EPA exercise this type of sweeping authority over agricultural production. *See UARG*, 134 S. Ct. at 2444 (courts should be skeptical "when an agency claims to discover in a long-extant statute an unheralded power to regulate a significant portion of the American economy"). The Supreme Court's ruling in *Michigan v. EPA*, 135 S. Ct. 2699 (2015), is similarly instructive, in that the Court's admonition that EPA cannot presume from Congressional silence an inability to consider economic ramifications would apply by the same logic to EPA's apparent position that it can ignore the life-cycle science of biogenic emissions. As in the case of EPA's overreach in regulating major sources of fossil emissions that was struck down in *UARG*, the concerns repeatedly raised by the agricultural community expressing alarm at the illogical impact of EPA's regulation on farms and food processors "should have alerted EPA that it had taken a wrong interpretive turn" with respect to biogenic emissions. *UARG*, 134 S. Ct. at 2446.

Because EPA is proposing changes to the definition of "greenhouse gases" in the Significance Rule,[9] EPA should take the opportunity to re-evaluate its interpretation of the Clean Air Act and endangerment finding based on an acknowledgment that biogenic emissions are part of the natural carbon flow cycle, and should clarify that its regulatory definitions exclude biogenic

---

[8] 81 Fed. Reg. at 68112:1.

[9] 81 Fed. Reg. at 68112.

emissions from those regulatory programs aimed at "harmful" pollution. Clarifying the limitations of EPA's regulation will avoid an expansive interpretation of the Clean Air Act that would essentially put EPA in the position of regulating the entire agricultural sector, from growing crops on the farm field to baking bread.

Notwithstanding that EPA is under a mandate (issued nearly two years ago) to re-interpret the scope of its greenhouse gas program, the Sigificance Rule proposal does not currently address crop-derived biogenic CO_2 emissions. Nor has EPA proposed any separate significance level applicable specifically to biogenic emissions. EPA's failure to respond to the Supreme Court's mandate puts the agency in contempt of the D.C. Circuit's explicit remand order and in contempt of the Supreme Court's clear instructions. Unless EPA takes the actions described in these comments, including an exemption for agricultural biogenic emissions, EPA will not be able to "fully implement" the Court's mandate as the agency admits that it must do.[10] To the extent that EPA takes a second look at its prior positions concerning biogenic emissions under the *UARG* mandate and revises its flawed interpretive stance by appropriately exempting biogenic emissions, the agency may do so without re-publishing the Significance Rule for a further round of public comment under the Administrative Procedure Act, and therefore could include such an exemption in the final rule.[11]

II. EPA MUST DISTINGUISH SCIENTIFICALLY BETWEEN BIOGENIC AND FOSSIL EMISSIONS

In its various greenhouse gas regulations applicable to stationary sources, EPA failed to recognize the scientific distinction between CO_2 emissions from biogenic sources, such as annual agricultural crop feedstocks, and fossil-based emissions from combustion of fossil fuels. The basic science of carbon life-cycle analysis establishes that crop-based biogenic emissions are part of the natural carbon "flow," which is part of the natural biological stocks of carbon in the world's climate system.[12] In other words, biogenic CO_2 is part of the baseline of roughly 280 parts per million (ppm) of pre-industrial atmospheric CO_2 that is essential for a stable climate and life on Earth.

Under the Clean Air Act, EPA may regulate greenhouse gases from stationary sources only if such sources cause or contribute to "air pollution which may reasonably be anticipated to endanger public health or welfare."[13] In its 2009 Endangerment Finding, EPA identified "elevated" levels of CO_2 in the atmosphere, in other words, excess levels above the natural pre-industrial baseline, as the harmful pollutant endangering the environment.[14] However, as

---

[10] 81 Fed. Reg. at 68112.

[11] *See Perez v. Mortgage Bankers Ass'n*, 135 S. Ct. 1199 (2015) (interpretative rules, even changes to previous definitive positions, are not subject to APA informal rulemaking procedures).

[12] *See, e.g.*, Seungdo Kim, Ph.D and Bruce E. Dale, Ph.D, *The Biogenic Carbon Cycle in Annual Crop-Based Products*, Michigan State University (Nov. 22, 2013) (available at www.biogenicCO2.com).

[13] Clean Air Act § 111(b)(1)A), 42 U.S.C. § 7411(b)(1)(A).

[14] Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Ac, 74 Fed. Reg. 66496, 66516 (Dec. 15, 2009) (the "2009 Endangerment Finding") ("The Administrator finds

discussed below, biogenic CO_2 is part of the baseline of natural flows of carbon dioxide, not excess to the baseline.

Despite this indisputable science, EPA has in a number of settings entirely refused to recognize life-cycle science. For example, in guidance applicable to the PSD and Title V program, Assistant Administrator Janet McCabe stated that "EPA plans to propose revisions to the PSD rules to include an exemption for the [BACT] requirement for GHGs from waste-derived feedstocks and from non-waste biogenic feedstocks derived from sustainable forest or agricultural practices . . . if the applicant can demonstrate that these feedstocks in fact come from sustainably managed lands . . . all other biogenic feedstocks . . . would remain subject to the GHG BACT requirement at this time"[15] This rather backhand phrasing in the McCabe memo means from a legal perspective that biogenic CO_2 emissions are viewed by EPA as harmful pollutants that cause climate change. Similarly, in its controversial Clean Power Plan, EPA again treated biogenic CO_2 from agricultural feedstocks the same as fossil fuels by disqualifying biomass energy feedstocks as low-carbon fuels unless producers meet certain "sustainability" criteria. These phantom criteria, which are nowhere defined in the Clean Power Plan rulemaking and which appear nowhere in the statutory text of the Clean Air Act as authored by Congress, are inscrutible and unworkable, and again assume that biogenic CO_2 is a harmful pollutant.[16] Most recently, EPA stated in its August 2016 final Aircraft Rule in stark categorical terms that "there is no distinction between biogenic and non-biogenic CO_2."[17]

EPA never did propose an exemption for waste-derived or sustainable agricultural feedstocks as it signaled in the 2014 McCabe Memo, nor has it acknowledged the life-cycle carbon neutrality of crop-derived biogenic CO_2 emissions. Rather, the agency has continued to take the position that all biogenic CO_2 from agricultural processes will be regulated as if those emissions were from combustion of fossil fuels. This position has created paralyzing uncertainty in the context of facility permitting in the bioeconomy, as stakeholders have no idea how biogenic CO_2 will be treated in the regulatory context. Many proposed projects, involving millions of investment dollars and hundreds of American jobs, have been unable to proceed in the face of such uncertainty and attendant litigation risk, and the few that have gone forward have bogged down in years of

---

that *elevated* concentrations of greenhouse gases in the atmosphere may reasonably be anticipated to endanger the public health and to endanger the public welfare of current and future generations.") (emphasis added).

[15] *See* Janet McCabe, Assistant Administrator, *Addressing Biogenic Carbon Dioxide Emissions from Stationary Sources*, dated Nov. 19, 2014 ("McCabe Memo"), posted at http://www.epa.gov/climatechange/downloads/Biogenic-CO_2-Emissions-Memo-111914.pdf.

[16] *See Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; Final Rule*, 80 Fed. Reg. 64662, 64886 (Oct. 23, 2015) ("Given the importance of sustainable land management in achieving the carbon goals of the President's Climate Action Plan, sustainably-derived agricultural and forest biomass feedstocks may also be acceptable as qualified biomass in a state plan, if the state-supplied analysis of proposed qualified feedstocks or feedstock categories can adequately demonstrate that such feedstocks or feedstock categories appropriately control increases of CO_2 levels in the atmosphere and can adequately monitor and verify feedstock sources and related sustainability practices.").

[17] *Finding That Greenhouse Gas Emissions From Aircraft Cause or Contribute to Air Pollution That May Reasonably Be Anticipated To Endanger Public Health and Welfare*, 81 Fed. Reg. 54422 (Aug. 15, 2016).

litigation.[18] All of this has a stultifying effect on investment in the bioeconomy and rural development.

EPA's policy toward biogenic CO_2, and the unjustified burden placed on the agricultural sector, is not only misguided policy, it is illegal for several reasons. First, as described at greater length below, EPA has never completed an endangerment finding for biogenic CO_2, which is a prerequisite under the Clean Air Act for regulation as a pollutant. Accordingly, EPA should interpret its previous endangerment findings as having excluded biogenic emissions such that biogenic emissions from agricultural sources are not subject to regulation. Second, even if EPA had included biogenic emissions in its endangerment finding (which it did not), science supports a policy determination that biogenic emissions are insignificant and harmless from a global warming perspective. EPA's failure over the last half decade to acknowledge life-cycle science and its attempt to exert regulatory power over the agricultural system is without precedent and *ultra vires*. Notwithstanding the legal deficiencies in EPA's existing policies, the situation can readily be resolved by providing a *de minimis* determination for crop-derived biogenic CO_2 emissions in the Significance Rule.

III. EPA HAS NOT MADE AN ENDANGERMENT FINDING WITH RESPECT TO BIOGENIC CO_2 EMISSIONS

Prior to regulating emissions as pollution under the Clean Air Act, EPA must determine that the air emission at issue "causes, or contributes significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare."[19] In its 2009 Endangerment Finding for greenhouse gases from motor vehicles, EPA determined that "*elevated* concentrations of greenhouse gases in the atmosphere may reasonably be anticipated to endanger the public health and to endanger the public welfare of current and future generations."[20] However, nowhere in this 2009 rulemaking did EPA study and determine with any acceptable level of scientific detail the effect of biogenic emissions on climate change or whether biogenic emissions properly should be considered a harmful pollutant under the Clean Air Act. As noted, biogenic emissions are part of the baseline levels of CO_2 that are necessary for life on Earth, not part of any "elevated" levels ascribed to emissions from fossil fuels.

A. EPA Must Distinguish Between Biogenic and Fossil Emissions In Terms of Contribution to "Elevated" Concentrations of Greenhouse Gas

The Clean Air Act and supporting case law provide EPA clear legal authority to distinguish between biogenic CO_2 emissions and greenhouse gas emissions from other sources such as fossil

---

[18] *See, e.g.*, *Helping Hand Tools v. United States EPA*, 836 F.3d 999 (9th Cir. 2016) (multi-year litigation over whether facility must burn natural gas instead of biomass for electricity on the basis of opponents' denial of the science of life-cycle emissions).

[19] *See, e.g.*, 42 U.S.C. § 7411(b)(1)(A); *see also National Asphalt Pavement Ass'n v. Train*, 539 F.2d 775, 783 (D.C. Cir. 1976).

[20] Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act; Final Rule, 74 Fed. Reg. 66496, 66516 (Dec. 15, 2009) (emphasis added).

fuel combustion. Congress granted authority to EPA to regulate only those emissions that endanger the environment (*i.e.*, harmful emissions) as stationary source pollutants. Unlike CO_2 emissions from fossil sources, biogenic CO_2 emissions do not increase net atmospheric levels of CO_2.[21] EPA lacks the authority to regulate biogenic CO_2 emissions under the Clean Air Act because biogenic emissions do not adversely affect the environment. But even if EPA had the authority to regulate biogenic CO_2 emissions, it has signficant discretion to exclude or provide different treatment for such emissions.

EPA itself has recognized in other contexts the lack of any adverse effect from agricultural biogenic CO_2 emissions. For example, EPA's Mandatory Reporting of Greenhouse Gases Rule distinguishes biogenic CO_2 from other emissions, and actually exempts reporting of process emissions from the food processing industry.[22] Likewise, in its Renewable Fuel Standard 2 rulemaking, EPA explained that "[f]or renewable fuels, tailpipe emissions only include non-CO_2 gases, because the carbon emitted as a result of fuel combustion is offset by the uptake of biogenic carbon during feedstock production."[23] The Department of Energy and USDA, along with virtually every government agency in the world to take up the issue, similarly have recognized the lack of any adverse effect from biogenic CO_2 emissions.[24] It would be remarkable if EPA, alone in the world, regulated biogenic emissions the same as fossil emissions.

B. <u>EPA Did Not Consider Biogenic Emissions in the 2009 Endangerment Finding</u>

In fact, EPA has never actually determined, one way or the other, that biogenic emissions contribute to climate change. EPA has based its regulation of CO_2 emissions from stationary sources, such as power plants, on the predicate of its 2009 Endangerment Finding for "tailpipe" emissions from motor vehicles.[25] Whatever the merit of EPA's position with respect to fossil-based emisisons, EPA never specifically addressed biogenic emissions in its 2009 Endangerment Finding.

In its 2009 Endangerment Finding addressing fossil fuel combustion in motor vehicles, EPA concluded that elevated concentrations of six well-mixed greenhouse gases (including CO_2) in the atmosphere are harmful to (*i.e.*, endanger) the environment.[26] EPA then determined that this harmful greenhouse gas pollution results directly from emissions of those six greenhouse gases

---

[21] As has been well documented, net fluxes of biomass CO_2 to the atmosphere from agricultural sources are, at a minimum, "carbon neutral" in that any CO_2 emissions associated with the combustion of biomass are offset completely by the significant role domestic forests and agriculture play in sequestering carbon as the nation's leading carbon sink.

[22] *See generally* Mandatory Reporting of Greenhouse Gases, 74 Fed. Reg. 56260 (Oct. 30, 2009).

[23] *Regulation of Fuels and Fuel Additives: Changes to Renewable Fuel Standard Program; Final Rule*, 75 Fed. Reg. 14670, 14,787 (Mar. 26, 2010).

[24] *See* 2016 Biomass Board Report at 7 ("Biobased products . . . recycle carbon (CO_2) from the atmosphere, resulting in air quality improvements when compared to fossil fuel-based products").

[25] 74 Fed. Reg. 66496, 66540 (Dec. 15, 2009).

[26] *See, e.g.,* 74 Fed. Reg. at 66497: 2-3, 66498: 1, 66516: 2-3, 66536: 3.

from stationary sources and motor vehicles.[27] But it is evident from a review of the 2009 Endangerment Finding that EPA did not address the science of biogenic emissions.

One can search the 2009 Endangerment Finding in vain for any mention of biogenic emissions. The word "biogenic" appears nowhere in the endangerment finding and the term "biomass" is used twice, but neither in reference to the significance of biogenic emissions. There is no substantive discussion at all in the endangerment finding of biogenic emissions or the life-cycle aspects of biogenic feedstocks within the atomospheric and terrestrial carbon cycle. Nor did the endangerment finding, which EPA has asserted as the basis for regulation of all carbon dioxide emissions at stationary sources (including agricultural processing facilities and bioenergy plants) ever discuss the scientific distinction between biogenic emissions and fossil emissions from the perspective of elevated concentrations of greenhouse gas. Therefore, there is simply no extant endangerment finding applicable to agricultural biogenic CO_2 emissions that would justify regulation of biogenic CO_2 emissions as a harmful pollutant under the PSD or Title V program, or any other aspect of the Clean Air Act.

To the contrary, the 2009 Endangerment Finding was based on the IPCC Fourth Assessment Report of 2007 and EPA's annual *Inventory of U.S. Greenhouse Gas Emissions and Sinks*, both of which exclude biogenic CO_2 emissions on the basis of their carbon neutrality.[28] For example, one of EPA's principal conclusions in support of the 2009 Endangerment Finding was that fossil-based emissions from combusting petroleum fuel in motor vehicles represented twenty-three percent of total U.S. emissions of greenhouse gases.[29] But EPA's assessment of motor vehicle emissions as a share of United States greenhouse gas emissions specifically excluded biogenic CO_2 emissions because it was based on the United States Greenhouse Gas Inventory for year 2009.[30] The 2009 Inventory itself states at page 3-1: "Carbon dioxide emissions from [combustion of biomass and biomass-based fuels] are not included in national emissions totals because biomass fuels are of biogenic origin. It is assumed that the C [carbon] released during consumption of biomass is recycled as U.S. forest and crops regenerate, causing no net addition of CO_2 to the atmosphere." In the absence of a prerequisite endangerment finding applicable to biogenic CO_2 emissions, biogenic emissions from the processing of agricultural feedstocks or use as bioenergy cannot be considered a pollutant under the Clean Air Act or regulated as dangerous industrial pollutants.

A closer review of the history of EPA's positions with respect to biogenic emissions leading up to the 2009 endangerment finding confirms the interpretation that "harmful" greenhouse gas pollution does not include biogenic emissions. As noted, EPA's 2009 Endangerment Finding quantifies greenhouse gas emissions by reference to its 2009 Emissions

---

[27] *See* 74 Fed. Reg. at 66497-99.

[28] *See, e.g.*, 74 Fed. Reg. at 66510; 66537.

[29] 74 Fed. Reg. at 66540.

[30] *See* 74 Fed. Reg. at 66539 n.41 and 66540; *Inventory of U.S. Greenhouse Gas Emissions and Sinks* (April 2009) p. 2-5 Table 2-1 n. b and p. 3-1 (excluding biogenic CO_2 emissions based on principles of carbon neutrality) ("2009 Emissions Inventory").

Inventory.[31] This is also reflected in the technical support documents accompanying the 2009 Endangerment Finding.[32] EPA has acknowledged that its 2009 Emissions Inventory conforms to the system of emissions accounting established by the Intergovernmental Panel on Climate Change (IPCC) and articulated in the 2006 IPCC Guidelines.[33] Consistent with the 2006 IPCC Guidelines recommendation that each inventory place emissions of CO_2 from combustion of biomass in the section devoted to forestry and land-use changes, as opposed to the section devoted to energy production, EPA's emissions inventories report emissions from combustion of biogenic feedstocks separately as a "Memo item" in the U.S. GHG Inventory and do not include biogenic emissions in the energy sector calculations.[34] Similarly, consistent with the IPCC guidance, any carbon stock changes related to the use of biogenic feedstocks in the energy sector, and the CO_2 emissions associated with those carbon stock changes, are accounted for under the forestry and/or agricultural sectors of the U.S. GHG Inventory.[35]

The *2006 IPCC Guidelines* as they apply to the land-use/forestry sector characterize biogenic emissions as carbon neutral because: "Biomass associated with annual and perennial herbaceous (*i.e.*, non-woody) plants is relatively *ephemeral*, i.e., it decays and regenerates annually or every few years. So emissions from decay are balanced by removals due to re-growth making overall net C [carbon] stocks in biomass rather stable in the long term."[36] Consequently, the *2006 IPCC Guidelines* recommend that: "The change in biomass is only estimated for perennial woody crops. For annual crops, increase in biomass stocks in a single year is assumed equal to biomass losses from harvest and mortality in that same year - thus there is no net accumulation of biomass stocks."[37] As further support for the notion that biomass emissions are carbon neutral, a "Frequently Asked Questions" (FAQ) document on the same IPCC website as the *2006 IPCC Guidelines* addresses the question "Do the IPCC Guidelines consider biomass used for energy to

---

[31] *See, e.g.,* 74 Fed. Reg. at 66510:2-3; 66537:1 ("To date, the focus of UNFCCC actions and discussions has been on the six greenhouse gases that are the same focus of these [endangerment] findings. As a party to the UNFCCC, EPA annually submits the *Inventory of US. Greenhouse Gas Emissions and Sinks to the Convention*, which reports on national emissions of anthropogenic emissions of the well-mixed greenhouse gases."); 66539-40.

[32] EPA, *Technical Support Document for Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act*; Vol. 4 (Dec. 7, 2009) (EPA-HQ-OAR-2009-0171-11645) ("TSD4") at 2-3 ("Primary GHGs that are directly emitted by human activities in general are reported in EPA's annual *Inventory of US. Greenhouse Gas Emissions and Sinks* and include carbon dioxide . . . The primary effect of these gases is their influence on the climate system by trapping heat in the atmosphere that would otherwise escape to space."); TSD4 at 6 (Table 1.1); TSD4 at 11-12.

[33] 5 IPCC, 2006 IPCC Guidelines for National Greenhouse Gas Inventories (*http://www.ipccnggip.iges.or.jp/public/2006gl/index.html*); 2009 Emissions Inventory, at 1-2:1, 7-1.

[34] *See 2006 IPCC Guidelines* Vol. 1, at 1.5-1.6.

[35] *See* 79 Fed. Reg. at 1441 n.46.

[36] *2006 IPCC Guidelines* Vol. 4, at 2.11 (emphasis added).

[37] *Id.* at 5.7 (§ 5.2.1.1) (emphasis added); *see also id.* at 5.26 ("In subsequent years, change in biomass of annual crops is considered zero because carbon gains in biomass from annual growth are offset by losses from harvesting.").

be carbon neutral?"[38] The answer given by the FAQ with respect to annual herbaceous crop-derived biomass is: "For annual crops, the IPCC Guidelines assume that biomass carbon stock lost through harvest and mortality equal biomass carbon stock gained through regrowth in that same year and so there are no net CO_2 emissions or removals from biomass carbon stock changes."[39]

The IPCC indisputably views biogenic CO_2 emissions from annaul crops as carbon neutral because biogenic emissions are inconsequential to the global warming process on a life-cycle basis. Consistent with the *2006 IPCC Guidelines*, EPA's *2009 Emissions Inventory,* which as noted is the foundation of its 2009 Endangerment Findings, accounts for emissions from agricultural lands only to the extent of "changes in organic C stocks in mineral and organic soils due to land use and management, and emissions of CO_2 due to the application of crushed limestone and dolomite to managed land (*i.e.*, soil liming and urea fertilization)."[40] EPA's approach to emissions accounting expressly excludes any quantification of the carbon flux attributable to growth, harvest, and fate of agricultural crop material, because that flux is "relatively small and ephemeral."[41] EPA's use of the term "ephemeral" is a clear reference to the *2006 IPCC Guidelines* and the IPCC's recognition that biogenic emissions are insignificant from the standpoint of increases in atmospheric greenhouse gas concentrations that cause global warming.

The U.S. Department of Agriculture has similarly concluded that biogenic CO_2 emissions are insignificant on a life-cycle basis as their effect is ephemeral. In July 2014, USDA, through its Office of Chief Economist, issued Technical Bulletin 1939,[42] which stated at page 3.43 of that bulletin that: "Both IPCC (2006) and U.S. Environmental Protection Agency (2011) consider herbaceous biomass carbon stocks to be ephemeral, and recognize that there are no net emissions to the atmosphere following crop growth and senescence during one annual crop cycle (West et al., 2011)." Similarly, in May 2014, the World Resources Institute (WRI) and World Business Council on Sustainable Development (WBCSD), which are recognized private-sector leaders in formulating greenhouse gas emissions inventory guidance, issued guidance[43] which at page 62 states: "The biomass associated with annual and perennial herbaceous vegetation is relatively ephemeral – reductions in these biomass stocks from harvesting, the burning of crop residues, or the integration of crop residues into soils, are balanced by stock increases from plant re-growth over a period of only one to a few years. Consequently, companies should also not report any sequestration in herbaceous biomass stocks." The use of the term "ephemeral" in both of the above-quoted passages is no accident. The term was originally used by the IPCC in its 2006 emissions inventory guidance to characterize CO_2 emissions from combustion or microbial treatment of herbaceous crop-derived material and was later repeated in the IPCC's FAQ

---

[38] *See* Q2-10, at 9 (http://www.ipcc-nggip.iges.or.jp/faq/FAQ.pdf).

[39] *Id.*

[40] *2009 Emissions Inventory* at 7-1.

[41] *2009 Emissions Inventory* at 7-27:2, 7-39:1, 7-43:1, 7-47:2.

[42] USDA, *Quantifying Greenhouse Gas Fluxes in Agriculture and Forestry: Methods for Entity-Scale Inventory* (http://www.usda.gov/oce/climate_change/estimation.htm).

[43] WRI/WBCSD, *GHG Protocol Agricultural Guidance* (http://www.ghgprotocol.org/standards/agriculture-guidance).

document, which equated "ephemeral" in this context with carbon neutral – a scientific view being echoed now by USDA and WRI/WBCSD.

In sum, because EPA excluded biogenic emissions from its *2009 Emissions Inventory,* and because EPA's 2009 Endangerment Finding defined "harmful" pollution by reference to those greenhouse gases in the 2009 Emissions Inventory (*i.e.*, those emissions that the global scientific community had identified as elevated concentrations of greenhouse gas), biogenic emissions were never part of EPA's 2009 Endangerment Finding and there is no predicate for regulation of biogenic emissions as harmful pollution under the Clean Air Act. This conclusion is consistent with the scientific consensus that emissions of crop-based biogenic CO_2 are inconsequential to the global warming process – they effect no change in carbon stocks and, therefore, cause no harm.

The position that biogenic CO_2 emissions are insignificant and do not warrant an endangerment finding comports with numerous other EPA pronouncements regarding the carbon-neutral or *de minimis* nature of agricultural feedstock emissions. For example, the final rule for EPA's 2007 Renewable Fuel Standard Program (RPS1) required the exclusion of CO_2 from the combustion by motor vehicles of corn ethanol in comparisons of the lifecycle greenhouse gas emissions of such fuel against the lifecycle emissions of gasoline.[44] As EPA explained in that rule: "[I]n the long run the CO_2 emitted from biomass-based fuels combustion does not increase atmospheric CO_2 concentrations, assuming the biogenic carbon emitted is offset by the uptake of CO_2 resulting from the growth of new biomass. *Thus ethanol's carbon can be thought of as cycling from the environment into the plant material used to make ethanol and, upon combustion of the ethanol, back into the environment from which it came.* As a result, CO_2 emissions from biomass-based fuels combustion are not included in their lifecycle emission results and are not used in the CO_2 displacement index calculations shown above."[45] Similarly, EPA's proposal in May 2009 of the current Renewable Fuel Standard Program (RFS2) took the same position not only with respect to combustion by motor vehicles of corn ethanol, but also with respect to combustion of biomass in boilers to produce the corn ethanol.[46] EPA explained in that rulemaking, which was contemporaneous with its work on the 2009 endangerment finding, that "the CO_2 emitted from biomass-based fuels combustion does not increase atmospheric CO_2 concentrations, assuming the biogenic carbon emitted is offset by the uptake of CO_2 resulting from the growth of new biomass."[47]

Three months after promulgation of the 2009 Endangerment Finding, EPA reiterated in the final RFS2 rule its position that biogenic CO_2 emissions are insignificant.[48] The final RFS2 rule, which EPA was finalizing at the same time that it promulgated the 2009 endangerment finding, relied on emission factors in the Argonne National Laboratory's spreadsheet analysis tool known

---

[44] *See* 72 Fed. Reg. 23900, 23982-83 (May 1, 2007).

[45] *Id.* (emphasis added).

[46] *See* 74 Fed. Reg. 24904, 25039: 3, 25040:1 (May 26, 2009).

[47] *Id.* at 25040:1.

[48] *See* 75 Fed. Reg. 14670, 14787:2 (Mar. 26, 2010).

as "Greenhouse gases, Regulated Emissions, and Energy use in Transportation" (GREET).[49] The GREET model assigns a zero value to all CO_2 emissions from (i) combustion of annual herbaceous crop-derived biomass to generate steam at a fuel ethanol plant; (ii) fermentation of biomass to generate fuel ethanol; and (iii) combustion of the fuel ethanol by motor vehicles.[50] In fact, the EPA study explains (at page 76): "Conversion of corn starch to ethanol produces excess CO_2 emissions. Because the CO_2 generated is from the atmosphere during the photosynthesis process, it should not be classified as CO_2 emissions . . . In this study, we assume that lignin is burned in cellulosic ethanol plants to provide steam needed for ethanol production and electricity. While combustion of lignin undoubtedly produces CO_2 emissions, these emissions come from the atmosphere through the photosynthesis process for biomass growth. Thus, the CO_2 emissions from biomass combustion are treated as zero in the GREET model. For the same reason, the CO_2 emissions from ethanol combustion in ethanol vehicles are treated as zero." Consistent with the GREET model, EPA's Regulatory Impact Analysis for the final RFS2 rule echoes conclusions in the final RFS2 rule, noting that: "The emission factors for the different fuel types are from GREET and were based on assumed carbon contents of the different process fuels . . . The emissions from combustion of biomass fuel source are not assumed to increase net atmospheric CO_2 levels. Therefore, CO_2 emissions from biomass combustion as a process fuel source are not included in the lifecycle GHG inventory of the biofuel production plant."[51] Likewise, in administering the RFS2 program, EPA has continued to exclude biogenic emissions from combustion and fermentation of agricultural feedstocks from its comparisons of the lifecycle emissions of newly-proposed biofuels against the lifecycle emissions of corresponding fossil fuels.[52]

EPA has continued to maintain the position that biogenic emissions are harmless in other contexts subsequent to the 2009 Endangerment Finding, such as its Climate Leaders voluntary greenhouse gas reduction program[53] and its 1605(b) voluntary reporting program which it co-administers with the Department of Energy. The government's position in these programs has been simply that "carbon dioxide emissions of biogenic fuels do not 'count' as anthropogenic emissions."[54] Consistent with this position, EPA has continued using the same language regarding

---

[49] *See* 75 Fed. Reg. at 14769:3, 14782:2.

[50] *See* M.Q. Wang, *GREET 1.5 - Transportation Fuel-Cycle Model, Vol. 1: Methodology, Development, Use, and Results,* at 76 (ANL/ESD-39, Vol. 1) (Aug. 1999) (https://www.anl.gov/energy-systems/publication/greet-15-transportation-fuel-cycle-model-volume-1-methodology-development).

[51] *See* EPA, *Renewable Fuel Standard Program (RFS2) Regulatory Impact Analysis,* at 424 (Feb. 2010) (EPA-420-R-10-006) (https://www.epa.gov/sites/production/files/2015-08/documents/420r10006.pdf) ("*RFS2 RIA*").

[52] *See, e.g.,* Wang *et al.*, *Energy and greenhouse gas emission effects of corn and cellulosic ethanol with technology improvements and land use changes,* Biomass and Bioenergy, Vol. 35, at 1885, 1891:2, 1892:2 (2011) ("A positive energy balance by corn ethanol is possible because only fossil energy used to produce ethanol is taken into account in energy balance calculations. The energy for corn plant growth via photosynthesis is solar energy and is not considered.").

[53] EPA, *Climate Leaders, Greenhouse Gas Inventory Protocol Core Module Guidance, Direct Emissions from Stationary Sources,* § 1.2 (May 2008) (EPA-430-K-08-003) ("[I]t is assumed that combustion of biofuels do not contribute to net addition of CO_2 to the atmosphere.").

[54] U.S. DOE, *Technical Guidelines, Voluntary Reporting of Greenhouse Gases (1605(b)) Program,* at 51 ("By accounting convention, though, carbon dioxide emissions of biogenic fuels do not 'count' as anthropogenic

the harmless nature of biogenic emissions and relying on the same IPCC guidance in its greenhouse gas emission inventories.[55]

EPA's position that biogenic CO_2 emissions are insignificant is securely rooted in fundamental science. As explained by leading experts in life-cycle emissions from Michigan State University, Dr. Seungdo Kim and Bruce E. Dale, in the attached technical report (Attachment A, hereto), each carbon atom released in the form of CO_2 directly from combustion, fermentation or wastewater treatment of agricultural crop-based materials is the same carbon atom that the herbaceous plants incorporated into that matter through photosynthesis. Those processes merely return to the atmosphere carbon atoms that were already there only a short time ago. Thus, biogenic emissions cause no change in carbon stocks, do not contribute to elevated concentrations of greenhouse gases, and cause no harm through the global warming process.[56]

It was in the context of this regulatory history that EPA finalized its 2009 Endangerment Finding, which assumed that biogenic CO_2 emissions were insignificant and not part of the "harmful" greenhouse gas pollution identified as endangering the environment. The context and EPA's contemporaneous positions with regard to biogenic CO_2 also explain the complete lack of any discussion of biogenic emissions in the 2009 Endangerment Finding. In other words, EPA felt no need to discuss biogenic emissions since it was not making an endangerment finding that implicated emissions from agricultural feedstocks. Any other interpretation of the 2009 Endangerment Finding ignores the history of EPA's rulemaking and program administration and the contextual setting in which biogenic emissions have been considered carbon neutral by global consensus.

The only indication that EPA ever considered biogenic emissions in its 2009 Endangerment Finding comes from EPA's response-to-comments document ("2009 RTC"), which was issued by EPA in conjunction with the 2009 endangerment finding. In the 2009 RTC, a stakeholder asked EPA to exclude biogenic CO_2 emissions from the endangerment finding on the grounds that biogenic emissions do not contribute to endangerment of health and welfare. In its response, EPA rejected that request, stating that "all CO_2 emissions, regardless of source, influence radiative forcing equally once it reaches the atmosphere and therefore there is no distinction between biogenic and non-biogenic CO_2 regarding the CO_2 and other well-mixed GHGs within the

---

emissions under the Framework Convention on Climate Change because the carbon embedded in biogenic fuels is presumed to form part of the natural carbon cycle."); 77 ("Reporters that operate vehicles using pure biofuels within their entity should not add the carbon dioxide emissions from those fuels to their inventory of mobile source emissions because such emissions are considered biogenic and the recycling of the carbon is not credited elsewhere.") (Jan. 2007) (http://www.eia.gov/oiaf/1605/January2007/1605bTechnicalGuidelines.pdf).

[55] *See, e.g., Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011,* at 7-1, 7-31, 7-44, 7-49, 7-54 (Apr. 12, 2013) (EPA-430-R-13-001), available at (https://www3.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2013-Main-Text.pdf); *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2012,* at 7-1, 7-35, 7-49, 7-54, 7-60 (Feb. 21, 2014), available at (https://www3.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2014-Main-Text.pdf).

[56] *See* S. Kim, PhD and B. Dale, PhD, *The Biogenic Carbon Cycle in Annual Crop-Based Products* (Nov. 20, 2013) (Attachment A, hereto).

definition of air pollution that is reasonably anticipated to endanger public health and welfare."[57] However, in light of the absence of any such discussion of biogenic emissions in the proposed endangerment finding or the final 2009 Endangerment Finding itself, it is apparent that the EPA staff member who prepared that response was mistaken as to the definitional foundation of the 2009 Endangerment Finding. Moreover, as discussed at length above, EPA had based the endangerment finding on the IPCC and emissions inventory approaches, which acknowledged the scientific principle that biogenic emissions are carbon neutral on a life-cycle basis and are not counted as part of the "elevated" concentration of greenhouse gases which results from society's burning of fossil fuels. Accordingly, EPA's response that molecules of CO_2 are identical was non-responsive to the core question of whether biogenic CO_2 contributes to "elevated" levels of atmospheric CO_2 compared to pre-industrial concentrations. As noted, it is only the elevated concentration that EPA has determined endangers the environment, which is understandable as the non-elevated concentration of CO_2 in the atmosphere keeps the earth at habitable temperatures. In short, a single response to a stakeholder comment, which is inconsistent with and divorced from the record basis for the agency action, cannot form a rational basis to interpret the 2009 Endangerment Finding as concluding that biogenic emissions are harmful and cause global warming. To the contrary, the 2009 Endangerment Finding supports the conclusion that biogenic emissions are harmless.

Despite EPA's recent assertions in the McCabe memo, Clean Power Plan and elsewhere that there is no distinction between biogenic CO_2 and fossil CO_2, EPA has nonetheless recognized in other contexts that there is indeed a scientific distinction. As a striking example, EPA's ill-fated "Deferral Rule" itself evidences that EPA never actually determined in the 2009 Endangerment Finding whether biogenic CO_2 emissions are "dangerous" pollutants, such that the agency is free to decide whether and how biogenic CO_2 emissions should be regulated going forward. Two years following its 2009 Endangerment Finding for fossil fuel emissions from motor vehicles, and in response to a stakeholders petition for administrative reconsideration, EPA attempted to defer application of its greenhouse gas regulations to biogenic CO_2 emissions from stationary sources under the PSD and Title V rules until it could complete a scientific review of the climate effects of biogenic emissions.[58] At the same time, EPA began developing an accounting process for evaluating the life-cycle of biogenic feedstocks know as the Biogenic Accounting Factor framework, and charged its Science Advisory Board with supporting its study of biogenic emissions.[59] That review process has now taken more than six years and appears nowhere close to completion. But the fact that EPA constituted the scientific review process in the first place

---

[57] *See* EPA, *Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act: EPA's Response to Public Comments, Vol. 9: The Endangerment Finding,* at 5 (2009) (EPA-HQ-AR-2009-0171-11676) ("*2009 RTC Vol. 9*").

[58] *Deferral for CO_2 Emissions From Bioenergy and Other Biogenic Sources Under the Prevention of Significant Deterioration (PSD) and Title V Programs*, 76 Fed. Reg. 43490 (July 20, 2011).

[59] EPA Office of Air and Radiation, Office of Atmospheric Programs, Climate Change Division, *Framework for Assessing Biogenic CO_2 Emissions from Stationary Sources* (2d Draft) (Nov. 2014) ("BAF Framework"); *see also* Office of Atmospheric Programs, Accounting Framework for Biogenic CO_2 Emissions from Stationary Sources (Sept. 2011) (https://www3.epa.gov/climatechange/Downloads/ghgemissions/Biogenic-CO_2-Accounting-Framework-Report-Sept-2011.pdf) ("Biogenic Accounting Framework").

illustrates that EPA never reached a definitive conclusion in the 2009 Endangerment Finding as to the nature of biogenic CO_2 as a harmful pollutant.

The Deferral Rule was originally intended for a period of three years; however, at about the time the rule expired of its own terms, the D.C. Circuit vacated the rule by rejecting the administrative law doctrines that EPA had invoked to defend the rule.[60] Importantly, however, EPA had (somewhat mystifyingly) expressly declined to rely on any scientific basis for its authority to exempt insignificant or *de minimis* emissions from regulation in defending the Deferral Rule.[61] In light of this procedural history, the D.C. Circuit's invalidation of the Deferral Rule presents no precedential impediment for EPA either to properly interpret the 2009 Endangerment Finding as having not addressed biogenic emissions or to exempt biogenic emissions under its general authority to exempt insignificant emissions on the basis of sound science.[62] Put simply, it seems obvious that EPA would not have needed a deferral rule, nor embarked on a multi-year scientific study of biogenic emissions, if it had already studied the issue sufficiently in its 2009 Endangerment Finding.

In short, EPA's 2009 Endangerment Finding did not actually address the science of biogenic CO_2 in determining whether biogenic CO_2 from agricultural sources was "harmful" such that it should be regulated as a "pollutant." Accordingly, under the Supreme Court's precedent, any regulation of biogenic CO_2 under the Clean Air Act would be *ultra vires*, arbitrary, and capricious until EPA completes a thorough, meaningful and scientifically informed endangerment finding specific to biogenic CO_2 sources, considering the context of Congress's use of the term "pollutant" in the Clean Air Act. EPA should acknowledge this fact in the Significance Rule rulemaking and either determine that biogenic CO_2 emissions are not currently subject to a predicate endangerment finding or include an exemption for biogenic CO_2 emissions from short-cycle agricultural biomass feedstocks.

IV. EPA MUST DEFINE KEY TERMS TO CLARIFY THE EXCLUSION OF BIOGENIC EMISSIONS

In order to fully implement the Supreme Court's mandate, EPA must define key regulatory terms such as "any pollutant", "greenhouse gases", and "subject to regulation" in the proper context, considering the scientific nature of biogenic emissions. This context necessarily includes

---

[60] *Ctr. for Biological Diversity v. EPA*, 722 F. 3d 401 (D.C. Cir. 2013).

[61] 722 F.3d at 409.

[62] Indeed each of the panel judges in the Deferral Rule litigation suggested that EPA retained the broad authority described above to permanently exclude biogenic CO_2 emissions, provided the Agency justified its decision in the rulemaking record. 722 F.3d at 412 ("leav[ing] for another day the question whether the agency has authority under the Clean Air Act to permanently exempt biogenic carbon dioxide sources from the PSD permitting program"); 722 F.3d at 420 (Henderson, J. dissenting) (recognizing the "availability of a *de minimis* exception" to permanently exclude biogenic CO_2 emissions). Even Judge Kavanaugh's concurring opinion, which asserted that EPA's regulatory discretion was limited by the agency's prior interpretation of its Clean Air Act authority suggested that EPA retained at some limited options to permanently exclude biogenic CO_2 emissions. 722 F.3d at 413 n.1 (Kavanaugh, J. dissenting) (suggesting that EPA could exempt biogenic CO_2 emissions by amending or reinterpreting its Endangerment Finding).

acknowledgement that EPA has not thoroughly considered the *de minimis* nature of biogenic emissions and has not made an endangerment finding specific to biogenic emissions, which is a predicate to regulation under the Clean Air Act. Accordingly, EPA must revisit the definitions in its PSD program (and elsewhere in the Clean Air Act) with these limitations in mind, and must craft regulatory definitions in a manner so as to effectively exclude biogenic emissions from regulation under all portions of the Clean Air Act.

A. Definition of "Any Pollutant"

First, EPA must interpret the phrase "any air pollutant" as it appears in the Clean Air Act to exclude biogenic emissions, in light of the fact that EPA has not made an endangerment finding specific to biogenic emissions. There is no indication in the Clean Air Act that Congress would have intended that phrase to encompass emissions that are not actually harmful on a life-cycle basis. Nor would Congress have allowed EPA to simply ignore life-cycle science. As EPA acknowledges in the proposal, greenhouse gases are "unique."[63] Accordingly, any attempt to regulate these unique emissions should be based on careful consideration by the agency of the biological carbon cycle of CO_2 emissions and the necessity to human life and welfare of a baseline concentration of CO_2 in the atmosphere, both of which are core aspects of the unique nature of greenhouse gases.

B. Definition of "Greenhouse Gases"

Similarly, the definition of "greenhouse gases" or "GHGs" should be phrased in EPA's regulations in each instance of use to exclude biogenic CO_2. For example, the proposed definition under 40 C.F.R. § 51.166(b)(31) in the Significance Rule should read as follows, with the addition of the italized phrasing: "Greenhouse gases (GHGs) means the air pollutant definted in § 86.1818-12(a) of this chapter as the aggregate group of six greenhouse gases: Carbon dioxide, nitrous oxide, methane, hydrofluorcarbons, perfluorocarbons and sulfur hexafluoride, *excluding biogenic emissions from agricultural feedstocks.*" 81 Fed. Reg. at 68142:2.

C. Definition of "Subject to regulation"

The definition of "subject to regulation" should also be phrased in EPA's regulations in each instance of use to exclude biogenic CO_2. For example, the proposed definition under 40 C.F.R. § 51.166(b)(48) should read as follows with the addition of the italized phrasing: "Subject to regulation means, for any air pollutant, that the pollutant is subject to either a provision in the Clean Air Act, or a nationally-applicable regulation codified by the Administrator in subchapter C of this chapter, that requires actual control of the quantity of emissions of that pollutant, and that such a control requirement has taken effect and is operative to control, limit or restrict the quantity of emissions of that pollutant released from the regulated activity. Pollutants subject to regulation include, but are not limited to, greenhouse gases as defined in paragraph (b)(31) of this section, *but excluding biogenic emissions from agricultural feedstocks.*" 81 Fed. Reg. at 68142:3.

[63] 81 Fed. Reg. at 68122:2 ("The EPA's judgment at this time is that the approaches we have previously used to establish SERs are not workable for the establishment of a GHG SER due the unique nature of GHG emissions").

V. IF BIOGENIC EMISSIONS ARE CURRENTLY SUBJECT TO REGULATION, EPA SHOULD DETERMINE THAT CROP-BASED BIOGENIC EMISSIONS ARE INSIGNIFICANT

A. EPA Has Authority to Exempt Crop-Based Biogenic Emissions as Insignificant

As EPA recognizes in its proposed Significance Rule, it has discretion to determine that certain emissions are *de minimis* and to exempt such emissions from Clean Air Act regulatory programs.[64] In its landmark decision addressing greenhouse gases in *Massachusetts v. EPA*, the Supreme Court, although holding that EPA has the authority to regulate greenhouse gas emissions as "air pollution" generally, also recognized that "an agency has broad discretion to choose how best to marshal its limited resources and personnel to carry out its delegated responsibilities."[65] Similarly, in *Alabama Power Co. v. Costle*, 636 F.2d 323, 360-61, 400 (D.C. Cir. 1979), the D.C. Circuit recognized EPA's discretion "to exempt from PSD review some emission increases on grounds of *de minimis* or administrative necessity" where regulation would "yield a gain of trivial or no value." The Supreme Court's flagship *Chevron* decision also addressed EPA's discretion to define the scope of Clean Air Act permitting programs, overturning a D.C. Circuit decision that failed to defer to EPA's interpretation of what constitutes a "stationary source" subject to special permitting conditions in nonattainment areas.[66] And as discussed above, the Supreme Court has reminded EPA more recently in *UARG* that the agency must interpret statutory provisions in practical context.

In reliance on this broad discretion, EPA has previously intepreted the Clean Air Act with a contextual lens in analogous situations. Notably, EPA has limited PSD permitting to those pollutants that are "subject to regulation" under the Clean Air Act, notwithstanding that the statute itself refers to "any pollutant."[67] Likewise, even though the Clean Air Act may be read to require

---

[64] 81 Fed. Reg. at 68120.

[65] *Massachusetts v. EPA*, 549 U.S. 497, 527-29, 533 (2007) (citing *Chevron U.S.A. Inc. v. Natural Resources Defense Council, Inc.*, 467 U.S. 837, 842-845 (1984)); *see also Am. Coke & Coal Chems. Inst. v. EPA*, 452 F.3d 930, 941-42 (D.C. Cir. 2006) ("The court owes particular deference to EPA when its rulemakings rest upon matters of scientific and statistical judgment within the agency's sphere of special competence and statutory jurisdiction."). Courts have noted EPA's discretion regarding the timing and approach to the regulation of pollutants following the Court's decision in *Massachusetts v. EPA*. For example, in the remand from the Supreme Court's decision, Judge Tatel observed that "nothing in section 202, the Supreme Court's decision in *Massachusetts v. EPA*, or our remand order imposes a specific deadline by which EPA must determine whether a particular air pollutant poses a threat to public health or welfare." *Massachusetts v. EPA*, No. 03-1361, separate statement of Tatel, J. concurring in part and dissenting in part from denial of petition, June 26, 2008, at 1. Similarly, the Northern District of California also rejected an argument that EPA is compelled to regulate all forms of greenhouse gases following *Massachusetts*. *See S.F. Chapter of A. Philip Randolph Inst. v. EPA*, 2008 U.S. Dist. LEXIS 27794 at 10-11 (N.D. Cal. Mar. 28, 2008). Consistent with the D.C. Circuit's conclusion, the California district court recognized that "[t]he Supreme Court was careful not to place a time limit on the EPA, and indeed did not even reach the question whether an endangerment finding had to be made at all."

[66] *Chevron, U.S.A., Inc. v. NRDC*, 467 U.S. 837, 841-42 (1984).

[67] *See Coalition for Responsible Regulation, Inc. v. EPA*, 684 F.3d 102, 134-35 (D.C. Cir. 2012) (*per curiam*) (finding that the Clean Air Act does not require EPA to regulate "a 'physical, chemical, [or] biological' substance

PSD permitting for any change to a major source that increases emissions of any air pollutant by any amount, *see* Clean Air Act §§ 111(a)(4), 169(2)(C), EPA has limited the permitting requirements to modifications that result in a "significant" net increase in actual emissions.[68] For example, carbon monoxide emissions increases of up to 99 tons per year are considered insignificant (*de minimis*) under EPA's implementing regulations.[69] Thus, EPA has a long-standing policy of applying the *de minimis* doctrine to exclude from regulation under the PSD and Title V permitting programs those sources whose emissions increases are deemed insignificant from an air quality perspective, despite the fact that the literal language of the Clean Air Act requires permits for *any* emissions increase.[70]

EPA has also exercised its discretion to distinuish among various families of chemical compounds to exclude regulation of those emissions that have negligible environmental impacts. For example, EPA excludes emissions of certain volatile organic compounds (VOCs) as smog precursors because they don't react in the atmosphere like other compounds and do not cause environmental impacts regardless of the fact that these compounds are both "volatile" and "organic" and therefore meet EPA's definition of VOCs.[71] Likewise, EPA has distinguished among different categories of particulate matter (PM) based on differences in environmental and public health impacts.[72] Thus, EPA has distinguished between fine and coarse PM and established distinct significance levels for particulate matter smaller than 10 microns in diameter and smaller than 2.5 microns in diameter based on the particle size's impact on public health.

In the greenhouse gas context, EPA exercised its discretion to limit the scope and reach of its greenhouse gas regulations by choosing to limit the pollutants that qualify as "greenhouse gases" to "the aggregate group of six" specified chemicals and excluded other chemicals that also have climate impacts.[73] In fact, EPA limited the "pollutant" greenhouse gas to these six

---

EPA had determined was harmless"), *reversed in part by UARG v. EPA*; *see also Alabama Power*, 636 F.2d at 352 n.57.

[68] *See* 40 C.F.R. §§ 52.21(b)(2)(i), 52.21(i); *see also United States v. DTE Energy Co.*, 711 F.3d 643, 645 (6th Cir. 2013).

[69] 40 C.F.R. § 52.21(b)(23)(i); *see also* 45 Fed. Reg. 52676, 52705-09 (Aug. 7, 1980) (setting significance levels for PSD permitting programs based on *de minimis* exception).

[70] *See* 40 C.F.R. § 52.21(b)(23)(i) and (j)(2); 45 Fed. Reg. at 52722; *Alabama Power*, 636 F.2d at 405.

[71] *See* 40 C.F.R. § 51.100(s); 40 C.F.R. §§ 52.21(b)(2)(ii) and 52.21(b)(30); 40 C.F.R. § 51.100(d); 57 Fed. Reg. 3941, 3943-44 (Feb. 3, 1992) (disagreeing with comment that definition exceeded EPA's statutory authority, asserting that "it is an administrative necessity and reasonable to define VOC to include all organic compounds except those EPA has determined to be negligibly reactive.").

[72] 40 C.F.R. § 52.21(b)(23)(i); *Alabama Power*, 636 F.2d at 369 n.134 ("EPA has discretion to define the pollutant termed "particulate matter" to exclude particulates of a size or composition determined not to present substantial public health or welfare concerns.").

[73] *See* 75 Fed. Reg. 25324, 25397 (May 7, 2010) (identifying the six compounds as "[t]he primary greenhouse gases of concern"); *id.* at 25398-99 (describing light-duty vehicle emissions standards as regulating "the single air pollutant" constituting the aggregate of the six identified gases).

compounds despite its findings that they only account for 75% of total anthropogenic heating.[74] Similarly, in its rulemaking restricting emissions of carbon dioxide from new electric power plants, EPA acknowledged that it has broad discretion to exclude from regulation not only subcategories of a particular source categories, but also particular emissions. Thus, EPA excluded from that rule all emissions of non-CO_2 greenhouse gases, including methane and other powerful greenhouse gases, and to justify its position, EPA explained that such emissions "represent less than 1 percent of total estimated GHG emissions" from electric power plants.[75]

In its proposed Significance Rule, EPA identifies various factors that would support a *de minimis* finding for greenhouse gases: (1) the regulatory context, including the nature of the pollutant and the dangers caused by increases in that pollutant; (2) the nature and purposes of the regulatory program; and (3) the administrative and implementation burdens of, and the gain achieved from, regulating the activities at or below a certain level. 81 Fed. Reg. at 68121:1. Because the science dictates that biogenic CO_2 emissions are part of the natural annual carbon cycle and do not increase atmospheric CO_2 concentrations, each of these factors commands that EPA exclude biogenic emissions as *de minimis* for all Clean Air Act purposes.

B. Science Supports a De Minimis Determination Because Biogenic Emissions Are Not Harmful

As discussed above, biogenic emissions from agricultural feedstocks are not harmful to the environment because they do not contribute to elevated levels of greenhouse gas concentrations. For the same scientific reasons, biogenic CO_2 emissions are clearly insignificant, whether from the perspective of net life-cycle effect on atmospheric greenhouse gas concentrations or as a fraction of nationwide greenhouse gas emissions, which are dominated by fossil fuel combustion. For illustration, looking only at the electricity sector, direct stack emissions of CO_2 from bioenergy sources are at most 0.04 percent of the direct emissions of CO_2 from combustion of fossil fuels, based on conservative calculations using statistics published by the U.S. Energy Information Administration.[76] Specifically, the amount of CO_2 emitted in 2012 by the electric power sector through combustion of coal, natural gas, petroleum liquids and petroleum coke was nearly 1,982,000 million kilograms, whereas the amount of CO_2 emitted in that year by that sector through combustion of "other waste biomass" *(i.e.,* agricultural crop byproducts, straw, sludge waste and other biomass, excluding wood and wood-derived fuels) was 817 million kilograms, or approximately 0.04 percent of the fossil CO_2 emissions. There are no comprehensive statistics on biogenic emissions from all sources, but the volume of emissions from bioenergy is vastly smaller in volume than the 1 percent threshold that EPA used to justify the exclusion of five greenhouse

---

[74] 74 Fed. Reg. at 66517, 66520 (excluding other gases because they are not thought to be a primary driver of radiative heating, or because their climate impact is unknown).

[75] 79 Fed. Reg. 1430 at 1446:1-2 (Jan. 8, 2014).

[76] Calculations based on EIA, *Electric Power Annual 2012,* tables 5.1.D, 5.2.D, 5.3.D, 5.4.D, 5.8.E (Dec. 2013) (http://www.eia.gov/electricity/annual/epa.pdf) (statistics on fuel consumption by btu) and EPA's Climate Leaders Program, *Emission Factors for Greenhouse Gas Inventories,* at 1 (Nov. 7, 2011) (https://www.epa.gov/sites/production/files/2015-11/documents/emission-factors_2011.pdf) (emission factor for GHG emissions per btu).

gases, other than carbon dioxide, from the reach of its new source performance standards (NSPS) rulemaking for new or modified electric power plants.[77]

EPA's own Biogenic Accounting Framework, which the agency issued in revised form on November 19, 2014, strongly corroborates the Coalition's position as it relates to CO_2 emissions.[78] The *2014 BAF* repeatedly treats as a scientifically sound working assumption the proposition that the CO_2 emissions resulting *directly* from the combustion of such biomass are carbon neutral.[79] In fact, in the *2014 BAF*, EPA provided hypothetical examples to illustrate how the *BAF* would operate in the case of corn stover combustion, concluding that any factor combustion of corn stover would be zero or tiny.[80] Similarly, emissions of biogenic CO_2 associated with processing agricultural crops, assuming they should legally be considered (which is not the case), are also harmless from a global warming standpoint.

Although EPA has identified some questions regarding life cycle analysis of long-rotation biomass from forest products, EPA does not need to study emissions from the agricultural sector further. In fact, the Biogenic CO_2 Coalition has on numerous occasions inquired of EPA whether it needs additional information regarding the life-cycle emissions profile of short-rotation agricultural biomass, and the agency has not indicated that more data is needed. Indeed, as reviewed in the report by Professors Kim and Dale, which has been presented to EPA in comments submitted by the Biogenic CO_2 Coalition in various rulemakings,[81] the data currently before the agency is more than adequate to support a finding that biogenic CO_2 emissions from agricultural crops are insignificant on a life-cycle basis. The Kim-Dale Report examined the biogenic carbon cycle for combustion of crop residues using corn stover as an example of agricultural feedstocks under three different scientifically accepted methodologies: (i) life cycle biogenic carbon balance; (ii) mass balance; and (iii) EPA's proposed *Biogenic Accounting Framework*. *See* Kim-Dale Report pp. 30-35). The report studied the release and sequestration of biogenic carbon during agricultural production of corn and corn stover, the transportation and storage of corn and corn stover, and the ultimate combustion of the corn stover for bioenergy. The report found under all

---

[77] *See* 79 Fed. Reg. at 1446:1-2 (excluding all emissions of non-CO_2 greenhouse gases on the basis that such emissions "represent less than 1 percent of total estimated GHG emissions" from EGUs).

[78] *See* EPA Office of Atmospheric Programs, *Framework for Assessing Biogenic CO_2 Emissions from Stationary Sources,* (Nov. 2014) (*"2014 BAF"*)(http://www.epa.gov/climatechange/ghgemissions/biogenicemissions.html).

[79] *See, e.g., 2014 BAF, Appendix D: Feedstock Categorization and Definitions,* at D-10 ("[T]he net atmospheric biogenic contribution from the growth and harvest of the feedstock itself *[i.e.,* "conventional crops"] is in balance"); *Appendix 1: Illustrative Forestry and Agriculture Case Studies Using a Retrospective Reference Point Baseline,* at 1-14 ("GROW is set to 0 because the ratio of net growth to removals is 0."); *Appendix L: Illustrative Forestry and Agriculture Case Studies Using a Future Anticipated Baseline,* at L-17 ("The GROW term defaults to 0 for agricultural biomass sources in this methodology. The assumption is that, with annual crops, biogenic CO_2 'growth' in this context equals what is harvested (removed) from the system for energy generation."); *2014 BAF,* at 6 n.18, 16 (§2.4.1.), 43 (§4.4).

[80] *See* 2014 BAF *Appx 1,* at 1-14 to 1-15; *Appx M,* at M-10 (Table M-5 and §6.1); *Appx M,* at M-11 (Table M-6, last row).

[81] *See, e.g.*, Seungdo Kim, Ph.D and Bruce E. Dale, Ph.D, *The Biogenic Carbon Cycle in Annual Crop-Based Products*, Michigan State University (Nov. 22, 2013) (available at www.biogenicCO2.com).

three methods that the indirect biogenic carbon emissions were net negative – *i.e.*, that the biogenic carbon cycle yields a net sequestration of carbon (and a net benefit to the environment). As discussed above, both IPCC and EPA, as well as private sector organizations, consider herbaceous biomass carbon stocks to be ephemeral in the inventory context, and recognize that there are no net emissions to the atmosphere during the annual crop cycle.

Interestingly, EPA admits in the Significance Rule that it actually has no way to determine the impact of greenhouse gases on the global environment,[82] and thus EPA has no way to determine the danger posed by any level of emissions, whether biogenic or fossil. In light of that admission, it is difficult to understand how EPA made the 2009 endangerment finding with respect to fossil fuels, but certainly EPA now concedes that it could not have made any endangerment findings with respect to harm from biogenic emissions. Regardless, for the reasons discussed herein, biogenic emissions can be found to present no danger due to their net carbon-neutral nature. Therefore EPA can properly determine biogenic emissions to be insignificant or de minimis, regardless of the amount of emissions, provided that the biogenic emissions are from short-rotation agricultural feestocks.

C. The PSD Program Is Not Suited for Regulation of Biogenic Emissions

The PSD program, at its core, was designed by Congress to prevent air quality from eroding in areas that were relatively clean where the more stringent requirements applicable to nonattainment areas were not triggered. Because biogenic emissions are not harmful and do not adversely affect either ambient air or global greenhouse gas concentrations, it serves no regulatory purpose to consider them in the PSD context. As the Supreme Court has chastened EPA, "the Act does not envision an elaborate, burdensome permitting process for . . . harmless airborne substances." *UARG*, 134 S. Ct. at 2440.

D. Regulation of Biogenic Emissions Is Burdensome With No Gain

Because biogenic emissions are scientifically harmless, there would be no gain achieved by regulating biogenic emissions as greenhouse gas pollution under the Clean Air Act. Any emissions reduction that could be achieved at the end of the day through application of BACT under the PSD program, could not actually be required under the balancing factors in the Clean Air Act, as any cost of control technology would be uneconomic compared to the lack of any benefit from reducing biogenic emissions since biogenic emissions do not cause harm. EPA cannot use the PSD program to force stationary sources to provide environmental benefits, as opposed to reducing environmental harms associated with emissions from that facility.

For the same reasons, any administrative or implementation burden would outweigh the non-existent gain from such regulation. However, it is worth noting that EPA seems to severely underestimate the regulatory burden caused by applying the PSD permitting program and Clean Power Plan rules to biogenic feedstocks. As discussed further in Parts VI and VII, below, the

[82] 81 Fed. Reg. at 68123:1 ("current climate modeling tools are not capable of isolating the precise correlations between singular, incremental facility-specific GHG emissions changes, ambient CO_2 concentrations, and climate impacts").

uncertainty associated with permitting fermentation units and other sources of biogenic emissions from feedstock processing has deterred investment in the bioeconomy and thrown up unnecessary barriers to construction or expansion projects. Similarly, the Obama Administration's current approach to biogenic emissions in its Clean Power Plan effectively disqualifies renewable bioenergy as a solution to reducing fossil fuel greenhouse gas emissions. As noted above, EPA has taken the position that other aspects of the PSD program such as ambient impacts analysis would not apply to greenhouse gases, but as noted that conclusion is subject to question following the *UARG* decision and may lead to litigation.

Accordingly, new source review for biogenic CO_2 emissions under the PSD program, and BACT review in particular, would be a pointless exercise since the outcome would be predetermined – there is simply no appropriate BACT for biogenic emissions. Making the PSD applicable to biogenic emissions would simply compound the administrative burden for facilities going through new source review for other emissions and would expose the facility to (unfortunately) real litigation risks such as have been documented in recent years.

VI. EPA HAS NOT SATISFIED THE REGULATORY FLEXIBILITY ACT

EPA's proposed rule includes a certification of no effect on small business. 81 Fed. Reg. at 68140. EPA also concluded that the proposed significant emissions rate of 75,000 tpy would relieve regulatory burdens. However, EPA did not undertake a sufficient analysis of economic impacts in the context of biogenic emissions.

EPA's failure to distinguish between fossil emissions and biogenic emissions effectively disqualifies bioenergy as a low carbon energy source and imposes burdens on all biogenic sources, including small businesses that are engaged in entrepreneural development of biomass technologies, such as low carbon and renewable fuels. Similarly, if EPA fails to amend its current policies as required by the Supreme Court mandate, its PSD regulations would continue to impose unnecessary permitting burdens on small businesses that may have emissions of biogenic CO_2 in excess of the proposed (or final) significant emissions rate.

It is obvious from the proposed Significance Rule that EPA has not studied the regulatory impact on biogenic source categories at all. The proposed rule summarizes EPA's review of fossil-fuel combustion sources and certain non-combustion facilities such as landfills, cement production and petroleum refineries. However, EPA neglected to assess emissions from fermentation units such as those that process agricultural feedstocks used to produce bioproducts. 81 Fed. Reg. at 68132. EPA did not request information relating to such plants from stakeholders nor apparently did EPA make any effort to characterize this sector. Emissions from large fermentation units, while carbon neutral, can nominally be well in excess of EPA's proposed significant emissions rate of 75,000 tons pr year.

Similarly, in evaluating regulatory burdens, EPA only looked at PSD permits that were applied for and advanced through the regulatory process. 81 Fed. Reg. at 68128. This approach suffers from a critical flaw in overlooking projects that have been deterred by EPA's hostile policies with regard to biogenic emissions, and therefore never entered the PSD system. Accordingly, EPA's conclusion in the Significance Rule proposal that "PSD has not imposed unreasonable administrative and enforcement burdens," 81 Fed. Reg. at 68137:2, is patently arbitrary and capricious because EPA never examined those still-born projects that never advanced to the permitting stage precisely because of the weight of those anticipated burdens.

EPA also apparently failed to recognize that the national GHG inventory and greenhouse gas reporting rules exempt biogenic emissions or distinguish such emissions from fossil-based greenhouse gases, particularly as applied to the food processing sector. 81 Fed. Reg. at 68132. EPA's assessment of biomass energy focused on forest-derived biomass in the pulp and paper sector and appears to have overlooked biomass opportunities from agricultural biomass and residues. 81 Fed. Reg. at 68129:3.

Finally, EPA oddly acknowledges that it did not actually determine a *de minimis* level for greenhouse gas emissions; rather it has merely proposed a finding that smaller projects (with non-GHG emissions near the lower most applicability thresholds) would have *de minimis* associated greenhouse gas emissions.[83] In other words, EPA did not study whether a higher significance level would be appropriate pursuant to the Supreme Court's *UARG* mandate, nor did EPA consider whether a higher signficance level should be established for biogenic emissions (the Coalition posits that such a level should, in effect, be set at infinity).

Because EPA has not studied sources of biogenic emissions at all, it cannot determine whether the assumed regulatory costs in the proposed rule would be applicable to such sources. For example, EPA's assertion that the average cost to undergo BACT review for greenhouse gases is only $24,000 is implausible based on the experience of Coalition members. 81 Fed. Reg. at 68136. This is particularly concerning given the lack of clarity as to how BACT review must be conducted, lack of data on available control technologies or techniques in the context of the carbon neutral life cycle of biogenic emissions, and potential costs of litigation (which unfortunately is quite likely based on past experience).[84]

In sum, unless EPA recognizes the de minimis nature of any level of biogenic emissions, it must conduct a more thorough regulatory impacts review under applicable law.

VII. EPA HAS NOT SATISFIED E.O. 13211 ENERGY SUPPLY REVIEW

Because EPA has not considered the effect of its current regulations on bioenergy sources, EPA has not complied with Executive Order 13211 with respect to agency actions affecting energy supply. 81 Fed. Reg. at 68141. EPA's failure to distinguish between fossil emissions and biogenic

---

[83] 81 Fed. Reg. at 68122:2 ("The proposed SER is not a level of GHGs below which the EPA has concluded there is a *de minimis* impact on the gloval climate. Rather, the *de minimis* level proposed in this rule relfects only a level of GHG emissions from an 'anyway source' below which the EPA is prposing to find that there would be trivial or no value in applyint the BACT requirement").

[84] For example, the Supreme Court's decision in UARG strongly suggested that an impacts analysis would be required for all sources triggering PSD review, which EPA incorrectly assumes is not applicable but would add signficant additional costs if stationary sources were forced into new source review for biogenic emissions. *See UARG*, 134 S. Ct. at 2457 (Alito, J., concurring in part and dissenting in part) (noting that EPA may not ignore the statutory text of section § 165 of the Clean Air Act requires "an analysis of the ambient air quality . . . at the site of the proposed major emitting facility and in the area potentially affected by the emissions from such facility for each pollutant regulated under [the Clean Air Act])."

emissions effectively disqualifies bioenergy as a low carbon energy source and imposes burdens on bioenergy stationary sources, which in turn significantly limits the quantity and diversity of American energy supply, distribution and use. Unless EPA exempts biogenic emissions, as requested in these comments, EPA must undertake the evaluation required by E.O. 13211.

* * * * *

For the legal and scientific reasons detailed above, the Coalition views any regulation of emissions of crop-derived CO_2 as unlawful and unjustifiably burdensome. Accordingly, the Coalition respectfully requests that EPA: (1) categorically exclude from the Clean Air Act, including the definition of "pollutant" and Clean Air Act regulations generally, those CO_2 emissions resulting from the combustion or processing of agricultural feedstocks derived from short-rotation herbaceous crops; (2) determine that such biogenic CO_2 emissions are insignificant and *de minimis*, regardless of amount, in recognition of the established science on life-cycle carbon flow; and (3) expressly confirm that such exclusion and significance determination excludes biogenic CO_2 from treatment as "a pollutant subject to regulation" for purposes of the PSD and Title V permitting programs under the Clean Air Act.

The undersigned associations appreciate the opportunity to comment on this proposal. If you have any questions, please contact John Bode, Chair of the Biogenic CO_2 Coalition, at (202) 534-3498 or JBode@corn.org.

Respectfully submitted,

____

John Bode, Chair

Biogenic CO_2 Coalition

American Bakers Association

American Farm Bureau Federation

Corn Refiners Association

Enginuity Worldwide

National Corn Growers Association

National Cotton Council of America

National Cottonseed Products Association

National Oilseed Processors Association

North American Millers' Association

Biogenic CO_2 Coalition Members

American Bakers Association (ABA) is a national association that represents the interests of bakers before the U.S. Congress, federal agencies, and international regulatory authorities. ABA advocates on behalf of more than 700 baking facilities and baking company suppliers.

American Farm Bureau Federation (AFBF) is an independent, non-governmental, voluntary organization governed by and representing farm and ranch families united for the purpose of analyzing their problems and formulating action to achieve educational improvement, economic opportunity and social advancement and, thereby, to promote the national well-being.

Corn Refiners Association (CRA) is the national trade association representing the corn refining (wet milling) industry of the United States. CRA and its predecessors have served this important segment of American agribusiness since 1913. Corn refiners manufacture starches, sweeteners, corn oil, bioproducts (including ethanol), and animal feed ingredients.

Enginuity Worldwide makes an engineered solid biomass fuel, using agricultural residues and woody wastes as the feedstocks, that can be used to co-fire with coal in power plants to produce base load energy. Using carbon neutral farm-based biomass provides an immediate carbon benefit that can help power companies comply with their GHG reduction targets.

National Cotton Council of America (NCC) aims to ensure the ability of all U.S. cotton industry segments to compete effectively and profitably in the raw cotton, oilseed and U.S.- manufactured product markets at home and abroad. NCC serves as the central forum for consensus-building among producers, ginners, warehousers, merchants, cottonseed processors/dealers, cooperatives and textile manufacturers. The organization is the unifying force in working with the government to ensure that cotton's interests are considered.

National Corn Growers Association (NCGA) represents more than 40,000 dues-paying corn farmers nationwide and the interests of more than 300,000 growers who contribute through corn checkoff programs in their states. NCGA and its 48 affiliated state organizations work together to create and increase opportunities for corn growers.

National Cottonseed Products Association (NCPA) is an organization of firms and individuals engaged in the processing of cottonseed and the marketing of cottonseed products, as well as cottonseed. These include oil mills, refiners, product dealers and product brokers.

National Oilseed Processors Association (NOPA) is a national trade association that represents 13 companies engaged in the production of food, feed, and renewable fuels from oilseeds, including soybeans, sunflower seed, canola, flaxseed and safflower seed. NOPA's member companies process more than 1.6 billion bushels of oilseeds annually at 63 plants located in 19 states throughout the country, including 57 plants that process soybeans.

North American Millers' Association (NAMA) represents millers of wheat, corn, oats and rye in the US and Canada. NAMA members take the raw grain and, through grinding and crushing, create flour and other products that are used to make such favorite foods as bread, pasta, cookies, cakes, and snack foods.

Attachment A

Michigan State University Technical Report

David M. (Max) Williamson

From:	Kyle Harris <kharris@corn.org>
Sent:	Friday, December 16, 2016 6:16 PM
To:	David M. (Max) Williamson
Subject:	FW: Your Comment Submitted on Regulations.gov (ID: EPA-HQ-OAR-2015-0355-0001)

From: Regulations.gov [mailto:no-reply@regulations.gov]
Sent: Friday, December 16, 2016 6:05 PM
To: Kyle Harris <kharris@corn.org>
Subject: Your Comment Submitted on Regulations.gov (ID: EPA-HQ-OAR-2015-0355-0001)

regulations.gov

Your Voice in Federal Decision-Making

Please do not reply to this message. This email is from a notification only address that cannot accept incoming email.

Your comment was submitted successfully!

Comment Tracking Number: 1k0-8tmn-jax9

Your comment may be viewable on Regulations.gov once the agency has reviewed it. This process is dependent on agency public submission policies/procedures and processing times. Use your tracking number to find out the status of your comment.

Agency: Environmental Protection Agency (EPA)
Document Type: Rulemaking
Title: Prevention of Significant Deterioration and Title V Greenhouse Gas Permitting Regulations: Establishment of a Significant Emissions Rate for Greenhouse Gas Emissions under the Prevention of Significant Deterioration Program; Revisions
Document ID: EPA-HQ-OAR-2015-0355-0001

Comment:
Comment submitted by John Bode, Chair, Biogenic CO2 Coalition

Uploaded File(s):

- Biogenic CO2 Coalition - EPA Significance Rule Comments (12-16-16).pdf
- MSU Biogenic Carbon Study (final) (11-23-13).pdf

For further information about the Regulations.gov commenting process, please visit https://www.regulations.gov/faqs.

EPA Statutory Authority Biogenic Rulemakings – Biogenic CO2 Coalition

Issue: Will re-interpretation of 2009 Endangerment Finding or Tailpipe Rule Solve Clean Air Act Applicability to Biogenic Emissions?

	Rule	Citation	Authority	Analysis
	Summary of Argument			***<u>Summary of Argument</u>*** EPA has ample basis, considering the administrative record, to take the position with respect to the 2009 Endangerment Finding that: (1) the 2009 Endangerment Finding was not intended to encompass biogenic emissions within the **scope of elevated concentrations** of greenhouse gas in the atmosphere, which are the air emissions that EPA determined to be the 'endangering' pollution, notwithstanding a response to comments document prepared by EPA staff that purported to express EPA's position that there is no distinction between biogenic and fossil CO2; (2) even if EPA intended to include biogenic emissions within the determination of harmful pollution, **EPA did not in fact study** the science underlying biogenic emissions and elevated concentrations of greenhouse gases (as evidenced by the lack of any scientific discussion in the administrative record and consistent with EPA's subsequent decision to develop an accounting framework), and therefore the 2009 Endangerment Finding is fatally flawed with respect to biogenic emissions and must be interpreted to exclude biogenic emissions; (3) even if the 2009 Endangerment Finding included biogenic emissions, the 2010 **Tailpipe Rule did not impose actual control** on biogenic emissions (in that

				tailpipe emissions from biofuels are either not counted or otherwise credited), which is a prerequisite for regulation as a pollutant subject to regulation for purposes of the PSD automatic trigger provisions as a result of the Tailpipe Rule. (4) after recognizing that biogenic CO2 emissions are not currently regulated, EPA may continue its ongoing **study of biogenic CO2** to decide on the basis of a responsible scientific record whether to regulate, or alternatively recognize the *de minimis* nature of, biogenic emissions. EPA may revisit its interpretation of its prior interpretations or policy provisions on these bases. See Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; Proposed Rule, 82 Fed. Reg. 48035,48039 (Oct. 16, 2017) (EPA has inherent authority to reconsider, repeal, or revise past decisions to the extent permitted by law so long as the Agency provides a reasoned explanation). Any or all of the above form a proper basis for EPA to take the position that biogenic CO2 emissions are not currently regulated and not pollutants subject to regulation, and to resolve pending litigation on that basis.
1	2009 Endangerment Finding	74 Fed. Reg. 66496 (Dec. 15, 2009)	The Administrator shall by regulation prescribe . . . standards applicable to [vehicle emissions] which in his judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare. CAA 202(a), 42 USC 7521(a).	Argument: The 2009 EPA Endangerment Finding is imprecisely worded but defines either the endangering pollution or the endangering situation as elevated concentrations of GHG in the atmosphere, which necessarily implies that there is a baseline concentration that is not pollution or is not endangering (i.e., not harmful). Thus, even if biogenic emissions are pollutants because they are included in the suite of greenhouse gases, they are part of the baseline concentration but not part of the harmful elevated concentration. The 2009

			IV. The Administrator's Finding That Greenhouse Gases Endanger Public Health and Welfare The Administrator finds that *elevated* concentrations of greenhouse gases in the atmosphere may reasonably be anticipated to endanger the public health and to endanger the public welfare of current and future generations. The Administrator is making this finding specifically with regard to six key directly-emitted, long lived and well-mixed greenhouse gases 74 Fed. Reg. at 66516:2 (emphasis added). Administrator finds that the air pollution is the combined mix of six key directly-emitted, long-lived and well-mixed greenhouse gases (henceforth ''well-mixed greenhouse gases''), which together, constitute the root cause of human-induced climate change and the resulting impacts on public health and welfare. 74 Fed. Reg. at 66516:3. the Administrator is defining the air pollution for purposes of the endangerment finding to be the *elevated* concentration of well-mixed greenhouse gases in the atmosphere . . . Administrator's finding that emissions of well-mixed greenhouse gases from	Endangerment Finding simply never considered whether biogenic emissions should be regulated as elevated dangerous pollution. Background: The 2009 EF does not expressly address biogenic emissions, except for the RTC passage; the Federal Register does not mention the term biogenic even once, and biomass is mentioned only twice and neither in relation to the biogenic issue. Similarly, the term life cycle is mentioned only twice in the EF and neither in relation to the biogenic issue. To the extent that EPA takes the position that the 2009 EF included biogenic emissions, EPA's EF with respect to biogenic emissions is arbitrary and capricious in that the agency failed to reconcile its finding that elevated concentrations are the endangering condition with the fact that biogenic emissions do not scientifically contribute to increased stocks (i.e., concentrations) of greenhouse gas in the atmosphere, and the agency entirely failed to consider a material factor in the endangerment analysis by ignoring the life-cycle science, literature and other government policies (including Congress' renewable energy policies enacted only 2 years earlier) all of which recognize biogenic emissions from agricultural feedstocks as carbon neutral and negligible in terms of contribution to atmospheric concentrations. Similarly, EPA entirely failed to consider as a critical factor how the life cycle of biogenic emissions (in which the CO2 emitted from processing of crops was only months before captured out of the atmosphere and stored in the crop biomass) might inform and affect the Administrator's endangerment finding. Similarly, the Administrator entirely neglected to consider in her cause-and-

			new motor vehicles contribute to the air pollution which is reasonably anticipated to endanger public health and welfare. 74 Fed. Reg. at 66536:3 (emphasis added). EPA, *Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act: EPA's Response to Public Comments*, Vol. 9: The Endangerment Finding, at 5 (2009) (EPA-HQ-AR-2009-0171-11676) (2009 RTC Vol. 9) (all CO2 emissions, regardless of source, influence radiative forcing equally once it reaches the atmosphere and therefore there is no distinction between biogenic and non-biogenic CO2 regarding the CO2 and other well-mixed GHGs within the definition of air pollution that is reasonably anticipated to endanger public health and welfare).	contribute finding that biogenic emissions from crop-based fuels were generally considered under other EPA policies (including the statutory renewable fuels program) as not contributing to elevated greenhouse gas concentrations. EPA, in subsequent greenhouse gas rules, has acknowledged the critical distinction between the baseline concentration of greenhouse gases and the elevated concentration that the agency found to be harmful in the 2009 Endangerment Finding: Greenhouse gases trap the Earth's heat that would otherwise escape from the atmosphere into space, and form the greenhouse effect that helps keep the Earth warm enough for life. Tailoring Rule, 75 Fed. Reg. at 31518:3 EPA has also acknowledged that a baseline concentration of greenhouse gas is essential, and only the excess emissions cause harm through global warming: Greenhouse gases trap the Earth's heat that would otherwise escape from the atmosphere into space, and form the greenhouse effect that helps keep the Earth warm enough for life . . . When they are emitted more quickly than natural processes can remove them from the atmosphere, their concentrations increase, thus increasing the greenhouse effect. Tailoring Rule, 75 Fed. Reg. at 31518-19. The fact that EPA subsequently embarked on a study focused on the appropriate accounting of biogenic emissions in its 2001 Accounting Framework for Biogenic CO2 Emissions from Stationary Sources is consistent with a reading of the 2009 Endangerment Finding did not contemplate biogenic emissions as the harmful pollution

				or endangering condition. See Deferral Rule, 76 Fed. Reg. 43490 (July 20, 2011) [cite SAB charge, BAF document/website]. EPA acknowledged in the EF that the concept of life-cycle uptake and recycling of carbon was a material factor in the endangerment analysis, yet failed to consider how biogenic emissions should be assessed under this framework: As discussed in the Proposed Findings, to help appreciate the distinction between air pollution and air pollutant, the *air pollution* can be thought of as the total, cumulative stock in the atmosphere, while the *air pollutant can be thought of as the [carbon] flow that changes the size of the total [carbon] stock*. Endangerment Finding, 74 Fed. Reg. at 66536:3 (emphasis added). The discussion of flow and stocks is consistent with the scientific literature that recognizes that biogenic emissions are carbon neutral on a life cycle basis and should be disregarded in emissions regulation. See, *e.g.*, Seungdo Kim, Ph.D and Bruce E. Dale, Ph.D, The Biogenic Carbon Cycle in Annual Crop-Based Products, Michigan State University (Nov. 22, 2013) (available at www.biogenicCO2.com). The D.C. Circuit has ruled that nothing in the CAA requires regulation of a substance simply because it qualifies as an 'air pollutant' under this broad definition. Coalition Resp. Reg., Inc. v. EPA, 864 F.3d 102, 135 (D.C. Cir. 2012).
2	Tailpipe Rule	75 Fed. Reg. 25324 (May 7, 2010)		Argument: The Tailpipe Rule does not regulate biogenic emissions because the 2009 Endangerment Finding addressed emissions of a harmful air pollutant that did not encompass biogenic emissions. In addition, because biogenic emissions are not subject to actual control in the Tailpipe Rule, they are not a pollutant subject to

				regulation for purposes of Clean Air Act permitting programs. The endangerment and contribution findings described previously require EPA to issue standards under section 202(a) 'applicable to emission' of the air pollutant [i.e., carbon flows that change carbon stocks] that EPA found causes or contributes to the air pollution that endangers public health and welfare. Tailoring Rule, 75 Fed. Reg. at 31519:3 (describing scope of Tailpipe Rule). The Tailpipe Rule regulates the same air pollutant referenced in EPA's 2009 Endangerment Finding. See Tailpipe Rule, 75 Fed. Reg. at 25686; 40 CFR § 86.1818–12 (Greenhouse gas emission standards for light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles. (a) Applicability. This section contains standards and other regulations applicable to the emission of the air pollutant defined as the aggregate group of six greenhouse gases: Carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.). As argued above, the EF could not have found that biogenic emissions create an endangering situation or contribute to greenhouse gas pollution because biogenic emissions do not contribute to elevated concentrations of greenhouse gas compared to baseline levels that are necessary for global climate stability. Similarly, biogenic emissions are not carbon flows that change carbon stocks, as pollution was defined in the 2009 Endangerment Finding. The Tailpipe Rule does not impose actual control on biogenic CO2 from vehicle tailpipe emissions, therefore biogenic CO2 is not a 'pollutant subject to regulation' for

				PSD purposes by virtue of the Tailpipe Rule's requirements for control of fossil CO2 from vehicles. Rather than imposing actual control of biogenic CO2 from vehicle tailpipes, for model years 2012-2015 the Tailpipe Rule counts biogenic CO2 emissions as carbon neutral through the mechanism of a credit for E85 using a 0.15 volumetric conversion factor. Tailpipe Rule, 75 Fed. Reg. at 25432 (the measured CO2 emissions on the alternative fuel will be multiplied by a 0.15 volumetric conversion factor which is included in the CAFE calculation as provided by EPCA. Through this mechanism a gallon of alternative fuel is deemed to contain 0.15 gallons of fuel . . . the CO2 emissions value for the vehicle is calculated to be significantly lower than it actually would be otherwise, even if the vehicle were assumed to operate on the alternative fuel at all times. This represents a 'credit' being provided to FFVs.). For model years 2016 and subsequent, the Tailpipe Rule greenhouse standard is based on actual tested tailpipe CO2, without the conversion factor and not differentiating biogenic CO2 and fossil CO2. See Tailpipe Rule, 75 Fed. Reg. at 25433 (Starting with model year 2016, as proposed, EPA will no longer allow manufacturers to base FFV emissions on the use of the 0.15 factor credit described above, and on the use of an assumed 50% usage of alternative fuel. Instead, EPA believes the appropriate approach is to ensure that FFV emissions are based on demonstrated emissions performance . . . Therefore, EPA is basing the FFV program for MYs 2016 and thereafter on real-world reductions: i.e., actual vehicle CO2 emissions levels based on actual use of the two fuels, without the 0.15 conversion factor specified under EISA.). However, EPA recognized that the carbon neutrality of biogenic CO2 is

				credited in the RFS2 program such that no additional crediting under the Tailpipe Rule was needed. Tailpipe Rule, 75 Fed. Reg. at 25434 (EPA is not including lifecycle emissions in the calculation of vehicle credits. EPA continues to believe that it is appropriate to base credits for MY 2012–2015 on the EPCA/ CAFE credits and to base compliance values for MY 2016 on the demonstrated tailpipe emissions performance on gasoline and E85, and is finalizing this approach as proposed. EPA recently finalized its RFS2 rulemaking which addresses *lifecycle emissions from ethanol and the upstream GHG benefits of E85 use are already captured by this program*.) (emphasis added). EPA recognized in the Tailpipe Rule that it has the authority to consider lifecycle emissions and emissions upstream of the emissions source. Tailpipe Rule, 75 Fed. Reg. at 25437 (EPA disagrees with Nissan that excluding upstream GHGs is legally required under section 202(a)(1). In this rulemaking, EPA is adopting standards under section 202(a)(1), which provides EPA with broad discretion in setting emissions standards. This includes authority to structure the emissions standards in a way that provides an incentive to promote advances in emissions control technology. This discretion includes the adjustments to compliance values adopted in the final rule, the multipliers we proposed, and other kinds of incentives. EPA recognizes that we have not previously made adjustments to a compliance value to account for upstream emissions in a section 202(a) vehicle emissions standard, but that does not mean we do not have authority to do so in this case) (discussing decision to exclude upstream GHG emissions from electricity used in electric vehicles).

3	Timing Rule	75 Fed. Reg. 17004 (June 3, 2010)		Reaffirmed EPA's actual control interpretation of PSD/Title V trigger. See Tailoring Rule, 75 Fed. Reg. at 31521 (describing Timing Rule interpretation and context).
4	Tailoring Rule	75 Fed. Reg. 31514 (June 3, 2010)	CAA 202(a), 42 USC 7521(a). The endangerment and contribution findings described previously require EPA to issue standards under section 202(a) 'applicable to emission' of the air pollutant that EPA found causes or contributes to the air pollution that endangers public health and welfare. 75 Fed. Reg. 31519:3. Under EPA's longstanding interpretation, a pollutant, such as a GHG, is ''subject to regulation'' when it is subject to a CAA requirement establishing actual control of emissions. 75 Fed. Reg. 31521:1.	Note: AFPA/NAFO petition (10-1209) in abeyance Argument: Biogenic CO2 emissions are not now regulated because the Timing Rule and/or Tailoring Rule are vacated and EPA has not yet issued replacement rules. EPA states that under CAA 202(a) the tailpipe standards are applicable to emission of only the pollutant subject to the 2009 Endangerment Finding, see 75 Fed. Reg. 31519:3; accordingly, it is logical that if biogenic emissions were not part of the endangerment finding, then they are not legally part of the Tailpipe Rule nor pollutants subject to regulation for PSD purposes. Tailoring Rule tacitly assumes biogenic is a regulated pollutant and rejects commenter request for an exemption, but notes that the rule does not foreclose EPA's ability to exempt biogenic and EPA do not take a final position with respect to an applicability exclusion for biogenic emissions in the PSD/Title V context in the Tailoring Rule, Tailoring Rule, 75 Fed. Reg. at 31591:1, although EPA did not address the question of the proper interpretation of the Endangerment Finding or Tailpipe Rule with respect to biogenic emissions. Tailoring Rule did not address biogenic issues, and thus is at best irrelevant to PSD applicability to biogenic emissions. Deferral Rule 76 Fed. Reg. at 43492 (in the final Tailoring Rule, EPA decided not to provide exemptions from applicability determinations . . .under PSD and Title V for . . . biogenic emissions).

5	PSD Preconstruction Permitting		CAA 169 ("The term *best available control technology* means an emission limitation based on the maximum degree of reduction of each pollutant *subject to regulation* under this chapter emitted from or which results from any major emitting facility"). Greenhouse gases are regulated under PSD and Title V pursuant to automatic operation of the CAA Coalition Resp. Reg., Inc. v. EPA, 864 F.3d 102, 144 (D.C. Cir. 2012).	Pursuant to long-standing EPA policy, the PSD and Title V are applicable to emissions of pollutants that are subject to regulation under the Clean Air Act. Tailoring Rule, 75 Fed. Reg. at 31520:2 (PSD applies to major sources and the major source definition incorporates the phrase 'subject to regulation'), 31521:1 (Title V applies when greenhouse gas emissions are 'subject to regulation' when it is subject to a CAA requirement establishing actual control of emissions). The pollutant at issue with respect to the PSD and Title V programs is the same suite of greenhouse gases (including fossil CO2 emissions) for which EPA made the 2009 Endangerment Finding. See Tailoring Rule, 75 Fed. Reg. at 31522:1 (We are identifying the air pollutant for purposes of PSD and title V applicability to be the pollutant subject to regulation, which is the air pollutant for GHGs identified in EPA's [Tailpipe Rule], as well as EPA's endangerment and contribution findings.). EPA considers a pollutant covered by the PSD and Title V programs only when the pollutant is previously subject to actual control of emissions by an antecedent requirement of the Clean Air Act. See Tailoring Rule, 75 Fed. Reg. at 31521:2 (a pollutant is 'subject to regulation' only if it is subject to either a provision in the CAA or regulation adopted by EPA under the CAA that requires actual control of emissions of that pollutant). Because under a proper interpretation of the Endangerment Finding, the Tailpipe Rule did not address biogenic emissions and therefore does not require actual control of biogenic emissions from vehicle tailpipes, nor does any other Clean Air Act provision set actual controls for biogenic CO2 (other than the NSPS and CPP rules,

				which are both under challenge), the PSD and Title V programs do not apply to emissions of biogenic CO2. Because biogenic emissions were not included in the 2009 Endangerment Finding, they cannot be 'subject to regulation' in terms of triggering PSD permitting requirements. In addition, because the 2010 Tailpipe Rule credits biogenic emissions as carbon neutral, biogenic emissions have never (prior to the 2015 CPP) been subject to any actual control and therefore are not 'subject to regulation' in terms of triggering PSD permitting requirements. Alternatively, even if the Endangerment Finding intended to include biogenic emissions as part of the greenhouse gas air pollution, the Tailpipe Rule does not actually impose any actual controls on emissions of biogenic CO2 from vehicle tailpipes because all biogenic emissions are credited as carbon neutral. [see discussion of Tailpipe Rule]
6	Deferral Rule	76 Fed. Reg. 43490 (July 20, 2011)	Deferred application to PSD permitting for 3 years; overturned by D.C. Circuit for lack of administrative authority in *CBD v. EPA* (No. 11-1101)	The Deferral Rule is not itself legally relevant to regulation of biogenic emissions under the Clean Air Act because it expired by its own terms, it was invalidated by the D.C. Circuit on non-substantive grounds, and did not itself purport to be the basis for Clean Air Act regulation of biogenic emissions. The existing of the Deferral Rule, and EPA's request for information on biogenic emissions, shows that the 2009 EF did not constitute a final EPA action on endangerment from biogenic emissions. 76 Fed. Reg. at 43492 (purpose of EPA's July 15, 2015 Call for Information was to assess

				underlying science that should inform any such accounting approach for biogenic emissions). In the 2011 Deferral Rule, EPA stated that [d]uring the three-year deferral period, EPA will conduct a detailed examination of the science associated with biogenic CO2 emissions from stationary sources, 76 Fed. Reg. 43492:2, indicating that it had not undertaken a detailed scientific examination of biogenic emissions in the 2009 EF and therefore had no basis to determine that biogenic emissions are climate change pollutants like fossil fuel emissions. EPA also acknowledged that feedstocks with negligible net atmospheric impact not be subject to unnecessary regulation. 76 Fed. Reg. at 43492:3. In the Deferral Rule, EPA took the position that biogenic emissions were regulated as a 'pollutant subject to regulation' alluding to (but not specifying) the tailpipe rule as the genesis of such regulation. 76 Fed. Reg. at 43493:2 (EPA's long-standing regulations limit the PSD applicability provision that refers to ''any air pollutant'' to refer to any ''regulated NSR pollutant,'' which in turn includes any air pollutant ''subject to regulation'' under the CAA. Similarly, under sections 165(a)(4) and 169(3) of the CAA, the BACT requirement applies to ''each pollutant subject to regulation'' under the CAA. As noted in other recent EPA actions, GHGs are currently ''subject to regulation'' under the CAA; . . . Thus, emissions of GHGs (including CO2) must be considered in determining whether a source is a major emitting facility subject to PSD, as a result of construction or modification, and whether the BACT requirement applies to GHGs (including CO2 as a component of GHGs). In light of the way these regulations are currently written, EPA is unable

				to exclude biogenic CO2 emissions from PSD review without amending the regulations. 76 Fed. Reg. at 43493:2. According to EPA, biogenic emissions became subject to regulation for PSD purposes when GHGs were regulated in the Tailpipe Rule, 76 Fed. Reg. at 43493:3 ("as of January 2, 2011, the date by which EPA determined that GHGs become subject to regulation under the CAA as a result of the motor vehicle rule"); the Tailpipe Rule in turn rests on the 2009 EF finding that certain greenhouse gas emissions contribute to elevated levels of greenhouse gas in the atmosphere. EPA recognized that biogenic CO2 emissions impacts are unique. 76 Fed. Reg. at 43496:1 ("In contrast to other sources of GHG emissions, these uncertainties and complexities are exacerbated because of the unique role and impact biogenic sources of CO2 have in the carbon cycle"). EPA failed to evaluate the "unique" situation of biogenic emissions. EPA took the position in the Deferral Rule that there is no currently available methodology to measure the impact of biogenic emissions; therefore, how could EPA have completed an endangerment finding concluding that biogenic CO2 causes global warming? 76 Fed. Reg. at 43496:1 (Further, methodologies are not sufficiently developed to assure that various permitting authorities would be able to perform the necessary calculations reasonably and consistently to determine the net atmospheric impact).

				In fact, EPA admitted that biogenic feedstocks may actually be carbon neutral or even carbon beneficial such that regulating facilities under the Clean Air Act for biogenic emissions would result in over-regulation. 76 Fed. Reg. at 43496:2-3 (EPA may ultimately determine that the utilization of some or all biomass feedstocks for bioenergy has a negligible (or de minimis), negative, or positive net impact on the carbon cycle.); 76 Fed. Reg. at 43499:1 (EPA believes based on information currently before the Agency that at least some biomass feedstocks that may be utilized to produce energy or other products have a negligible impact on the net carbon cycle, or possibly even a positive net effect.).
7	NSPS (111(a) new power plants)			See below ESPS/CPP 111(d).
8	Clean Power Plan (111 existing power plants)		McCabe Memo: Janet McCabe, Assistant Administrator, *Addressing Biogenic Carbon Dioxide Emissions from Stationary Sources*, dated Nov. 19, 2014 ("McCabe Memo"), "EPA plans to propose revisions to the PSD rules to include an exemption for the [BACT] requirement for GHGs from waste-derived feedstocks and from non-waste biogenic feedstocks derived from sustainable forest or agricultural practices . . . if the applicant can demonstrate that these feedstocks in fact come from sustainably managed lands . . . all other biogenic feedstocks . . . would remain subject to the GHG BACT requirement at this time");	Argument: The CPP is predicated on the 2009 Endangerment Finding: In 2009, based on a large body of robust and compelling scientific evidence, the EPA Administrator issued the Endangerment Finding under CAA section 202(a)(1). In the Endangerment Finding, the Administrator found that the current, elevated concentrations of GHGs in the atmosphere—already at levels unprecedented in human history—may reasonably be anticipated to endanger public health and welfare of current and future generations in the U.S. 80 Fed. Reg. at 64682. Under CAA section 111(b), the EPA lists source categories which 'contribute significantly to air pollution which causes or contributes to the endangerment of public health or welfare,' and then establishes 'standards of

			Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; Final Rule, 80 Fed. Reg. 64662, 64886 (Oct. 23, 2015) ("Given the importance of sustainable land management in achieving the carbon goals of the President's Climate Action Plan, sustainably-derived agricultural and forest biomass feedstocks may also be acceptable as qualified biomass in a state plan, if the state-supplied analysis of proposed qualified feedstocks or feedstock categories can adequately demonstrate that such feedstocks or feedstock categories appropriately control increases of CO2 levels in the atmosphere and can adequately monitor and verify feedstock sources and related sustainability practices.").	performance' for the new sources in the listed category. 80 Fed. Reg. at 64700. Under CAA section 111(d), there is no requirement that the EPA make a finding that the emissions from existing sources that are the subject of regulation cause or contribute significantly to air pollution which may reasonably be anticipated to endanger public health or welfare. As predicates to promulgating regulations under CAA section 111(d) for existing sources, the EPA must make endangerment and cause-or-contribute-significantly findings for emissions from the source category, and the EPA must promulgate regulations for new sources in the source category. In the CAA section 111(b) rule for CO2 emissions for new affected EGUs that the EPA is promulgating concurrently with this rule, the EPA discusses the endangerment and cause-or-contribute-significantly findings and explains why the EPA has already made them for the affected EGU source categories so that the EPA is not required to make them for CO2 emissions from affected EGUs, and, in the alternative, why, if the EPA were required to make those findings, it was making them in that rulemaking. 80 Fed. Reg. 64709 n.284. In the CPP, EPA also improperly attempted to regulate sustainability on the farm field, or to condition recognition of biogenic emissions on whether crops were grown sustainability on the farm field.
9	Aircraft Engine Standards – 2016 Endangerment Finding		EPA, *Finding that Greenhouse Gas Emissions from Aircraft Cause or Contribute to Air Pollution that May Reasonably Be Anticipated to Endanger Public Health and Welfare*; Final Rule, 81 Fed. Reg. 54422 (Aug 15, 2016)	Argument: Because the 2016 Aircraft EF relies on the 2009 Vehicle EF, the same legal analysis applies. EPA simply has never undertaken a scientific review of biogenic emissions sufficient to justify regulating biogenic emissions as "elevated concentrations" of greenhouse gas in the atmosphere. EPA fails to acknowledge in the

			("The EPA reiterates that the Administrator defines the relevant air pollution considered in the endangerment finding as the aggregate group of the six well-mixed GHGs based on shared physical characteristics and common attributes relevant to climate change science and policy, which is not affected by consideration of the sources of the emissions contributing to the air pollution. In the record for the 2009 Endangerment Finding [i.e., EPA's response to comments, not in the rule itself], the Agency stated that "all CO2 emissions, regardless of source, influence radiative forcing equally once it reaches the atmosphere and therefore there is no distinction between biogenic and non-biogenic CO2 regarding the CO2 and the other well-mixed GHGs within the definition of air pollution that is reasonably anticipated to endanger public health and welfare." [FN2] The EPA continues to hold that position in these findings, which is supported by the evidence before it. First, the fact that these CO2 emissions originate from combustion of carbon-based fuels created through different processes is not relevant to defining the air pollution that is reasonably anticipated to endanger public health and welfare. The origin and constitution of a fuel prior to its	Aircraft EF that carbon from biogenic feedstocks is part of the baseline of existing carbon stocks, and not a contributor to flows of fossil carbon that is added to the atmosphere and creates "elevated" levels of greenhouse gas. EPA also incorrectly describes the scientific literature as supporting its position, when in fact every greenhouse gas program in the world other than EPA's Clean Air Act policy recognizes that biogenic emissions are different than fossil emissions and are lifecycle neutral. In addition, because the ICAO international agreement for aircraft GHG emissions, to which the US is a party, ultimately depends on the use of biofuels and recognizing the low-carbon nature of biogenic emissions, EPA's statements in the Aircraft EF cannot be reconciled with the scientific record or the agency's goals with regard to regulating greenhouse gas emissions. As its justification for refusing to distinguish in the Aircraft Rule between biogenic emissions and fossil fuel emissions, EPA asserts that it lacks authority to consider emissions outside of the emissions source itself, but cites to no legal authority for this proposition. In any event, this is inconsistent with previous EPA positions; for example, EPA recognized in the Tailpipe Rule that it does have inherent authority to consider lifecycle emissions and emissions upstream of the emissions source. See Tailpipe Rule, 75 Fed. Reg. at 25437 ("EPA disagrees with Nissan that excluding upstream GHGs is legally required under section 202(a)(1). In this rulemaking, EPA is adopting standards under section 202(a)(1), which provides EPA with broad discretion in setting emissions standards. This includes authority to structure the emissions standards in a way that provides an incentive

			combustion and subsequent emission into the atmosphere has no bearing on the fact that CO2 and the other well-mixed GHGs are all sufficiently long lived to become well mixed in the atmosphere, directly emitted, of well-known radiative forcing, and generally grouped and considered together in climate change scientific and policy forums as the primary driver of climate change. Moreover, as explained in section IV.C of this notice, the endangerment arises from the elevated concentrations of the six well-mixed GHGs in the atmosphere. A molecule of biogenic CO2 has the same radiative forcing effect as a molecule of fossil-fuel derived CO2. In other words, no matter the original source of the CO2, the behavior of the CO2 molecules in the atmosphere in terms of radiative forcing, chemical reactivity, and atmospheric lifetime is effectively the same. Any differential treatment of biogenic CO2 in the context of the endangerment finding would be inconsistent with the primary scientific basis for the grouping of the six well-mixed GHGs as a single class for purposes of identifying the air pollution (and air pollutant, as explained below). A more detailed response to the issues raised in this comment can be found in	to promote advances in emissions control technology. This discretion includes the adjustments to compliance values adopted in the final rule, the multipliers we proposed, and other kinds of incentives. EPA recognizes that we have not previously made adjustments to a compliance value to account for upstream emissions in a section 202(a) vehicle emissions standard, but that does not mean we do not have authority to do so in this case") (discussing decision to exclude upstream GHG emissions from electricity used in electric vehicles).

			the Response to Comments document in the docket. FN2: EPA, 2009. Response to Comments document, Volume 9: The Endangerment Finding, EPA–HQ–OAR–2009–0171–11676. Available at www.regulations.gov (last accessed April 11, 2016).	
10	Renewable Fuel Standard	2005 EPA/2007 EISA, CAA 211a	Tailpipe CO 2emissions from corn ethanol assumed offset by carbon uptake. See 2010 EPA RIA / USDA 2016 LCA.	Statutory Renewable fuel quota; biogenic emissions assumed carbon neutral; production LCA emissions comparison biofuel to fossil fuel; tailpipe emissions < 1%.

Message

From: Tim Lust [tim@sorghumgrowers.com]
Sent: 11/13/2017 10:12:11 PM
To: Schwab, Justin [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=eed0f609c0944cc2bbdb05df3a10aadb-Schwab, Jus]
Subject: Fwd: Sorghum Oil Pathway

Justin, just copying you into the loop on an e-mail that I sent Mandy. This is still critical to our industry and any help or information would be appreciated. Thanks. Tim

Tim Lust
Chief Executive Officer
Ex. 6 office
cell
sorghumgrowers.com
Sorghum: The Smart Choice.

---------- Forwarded message ----------
From: **Tim Lust** <tim@sorghumgrowers.com>
Date: Mon, Nov 13, 2017 at 3:58 PM
Subject: Sorghum Oil Pathway
To: "Gunasekara, Mandy" <Gunasekara.Mandy@epa.gov>

Mandy,

I have board meetings the next two days and I was just following up to see if there was anything that could be reported to my board in terms of progress on a sorghum oil pathway. Specifically, we are hopeful that a sorghum oil pathway is finally going into the federal register very soon. Anything you can share would be appreciated. Thanks. Tim

Tim Lust
Chief Executive Officer
Ex. 6 office
cell
sorghumgrowers.com
Sorghum: The Smart Choice.

Message

From: David M. (Max) Williamson [maxwilliamson@williamsonlawpolicy.com]
Sent: 11/8/2017 2:11:02 PM
To: Baptist, Erik [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=10fc1b085ee14c6cb61db378356a1eb9-Baptist, Er]; Schwab, Justin [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=eed0f609c0944cc2bbdb05df3a10aadb-Schwab, Jus]
CC: kharris@corn.org
Subject: RE: Ag Biogenic CO2

Erik, we certainly understand the bandwidth considerations. However, it's only the first week of November and if we push off to December with the holiday season we lose another two months, are not likely to see substantial progress until well into 2018.

As you know the agricultural community has been eager for a solution to inappropriate regulation of biogenic emissions since day one of the Trump Administration. We have three litigation matters in abeyance, which we have continued in abeyance at Mandy's request so everyone could work together in good faith without litigation pressure. We heard from Administrator Pruitt very early on that he was committed to a solution, but it's now month 10, and we are starting to see political dissatisfaction with the pace of addressing this issue from farm interests and Mid-West governors, which we had hoped to avoid through a prompt resolution. This is an easy fix and a would be a clear win for the Administrator, and once done it will clear EPA's docket for the more complicated issues and bigger challenges.

In this light, can we find a way to advance the biogenic resolution, in the midst of your many other competing demands on your time. I've not copied Mandy but perhaps you can talk it over with her and the Administrator.

Regards,

David M. (Max) Williamson | Williamson Law + Policy, PLLC
1850 M Street NW, Suite 840 | Washington, D.C. 20036 | (202) 256-6155

WILLIAMSON LAW + POLICY
environmental markets advisory

www.williamsonlawpolicy.com | new carbon future | bio | vCard | map | email

---

From: Baptist, Erik [mailto:baptist.erik@epa.gov]
Sent: Tuesday, November 7, 2017 8:25 AM
To: David M. (Max) Williamson <maxwilliamson@williamsonlawpolicy.com>; Schwab, Justin <Schwab.Justin@epa.gov>
Cc: Motley, Judy <motley.judy@epa.gov>; kharris@corn.org
Subject: RE: Ag Biogenic CO2

Max,

We are working on a few pressing deadlines this month. Can we reconnect next month to find a time that works? I still need to digest what you sent a few weeks ago.

Thanks,

Erik Baptist

Senior Deputy General Counsel
Office of General Counsel
U.S. Environmental Protection Agency
1200 Pennsyvlania Ave., NW
Washington, DC 20460
(202) 564-1689
baptist.erik@epa.gov

From: David M. (Max) Williamson [mailto:maxwilliamson@williamsonlawpolicy.com]
Sent: Monday, November 6, 2017 9:42 AM
To: Baptist, Erik <baptist.erik@epa.gov>; Schwab, Justin <Schwab.Justin@epa.gov>
Cc: Motley, Judy <motley.judy@epa.gov>; kharris@corn.org
Subject: RE: Ag Biogenic CO2

All, could we schedule a second work session on the resolution of the biogenic issue this week or next?

We found the first session very productive.

Regards,

David M. (Max) Williamson | Williamson Law + Policy, PLLC
1850 M Street NW, Suite 840 | Washington, D.C. 20036 | (202) 256-6155

WILLIAMSON LAW + POLICY
environmental markets advisory

www.williamsonlawpolicy.com | new carbon future | bio | vCard | map | email

---

From: David M. (Max) Williamson
Sent: Wednesday, October 25, 2017 10:20 AM
To: 'Baptist, Erik' <baptist.erik@epa.gov>; Schwab, Justin <Schwab.Justin@epa.gov>
Cc: Motley, Judy <motley.judy@epa.gov>; kharris@corn.org
Subject: RE: Ag Biogenic CO2

CONFIDENTIAL

Justin and Eric, thanks again for taking the time last week to work through a legal analysis of the biogenic CO2 issue. As discussed, to facilitate a resolution, we are sharing a legal analysis of the key regulatory actions (in Word format, attached) which forms the basis for our position that biogenic CO2 has never properly been determined to be a pollutant subject to regulation for purposes of the Clean Air Act.

I am also sharing the Biogenic CO2 Coalition's comments on the Significance Rule proposal from the prior administration, as it contains a comprehensive narrative discussion of the coalition's legal and policy positions.

We look forward to having another "work session" to discuss this issue once you have a chance to study the issues in greater depth. Would you be available sometime the week of November 5?

Regards,

David M. (Max) Williamson | Williamson Law + Policy, PLLC

1850 M Street NW, Suite 840 | Washington, D.C. 20036 | (202) 256-6155

WILLIAMSON LAW + POLICY
environmental markets advisory

www.williamsonlawpolicy.com | new carbon future | bio | vCard | map | email

From: Baptist, Erik [mailto:baptist.erik@epa.gov]
Sent: Friday, October 13, 2017 12:18 PM
To: David M. (Max) Williamson <maxwilliamson@williamsonlawpolicy.com>; Schwab, Justin <Schwab.Justin@epa.gov>
Cc: Motley, Judy <motley.judy@epa.gov>
Subject: RE: Ag Biogenic CO2

Ok, let's plan for 1:30 p.m. that day.

Erik Baptist
Senior Deputy General Counsel
Office of General Counsel
U.S. Environmental Protection Agency
1200 Pennsyvlania Ave., NW
Washington, DC 20460
(202) 564-1689
baptist.erik@epa.gov

From: David M. (Max) Williamson [mailto:maxwilliamson@williamsonlawpolicy.com]
Sent: Friday, October 13, 2017 12:06 PM
To: Baptist, Erik <baptist.erik@epa.gov>; Schwab, Justin <Schwab.Justin@epa.gov>
Cc: Motley, Judy <motley.judy@epa.gov>
Subject: Re: Ag Biogenic CO2

Erik, that can work - even better if we could start earlier we have a 3pm over at DOE. Thanks

David M. (Max) Williamson
WILLIAMSON LAW + POLICY, PLLC
1800 K Street NW Suite 714 | Washington, D.C. | (202) 256-6155 |

From: Baptist, Erik
Sent: Friday, October 13, 2017 11:39
To: David M. (Max) Williamson; Schwab, Justin
Cc: Motley, Judy
Subject: RE: Ag Biogenic CO2

Let's plan for Friday, October 20, at 2:00-3:00 p.m.

Thanks

Erik Baptist
Senior Deputy General Counsel
Office of General Counsel
U.S. Environmental Protection Agency

1200 Pennsyvlania Ave., NW
Washington, DC 20460
(202) 564-1689
baptist.erik@epa.gov

From: David M. (Max) Williamson [mailto:maxwilliamson@williamsonlawpolicy.com]
Sent: Friday, October 13, 2017 5:45 AM
To: Baptist, Erik <baptist.erik@epa.gov>; Schwab, Justin <Schwab.Justin@epa.gov>
Subject: RE: Ag Biogenic CO2

Thanks, Erik, I look forward to talking.

I could do morning of . . .

- Friday, Oct 20 (outside the proposed range but a Friday)
- Mon Oct 23
- Tues Oct 24 (morning)
- Fri Oct 27 is a possibility but probably by phone only

Best regards,

David M. (Max) Williamson | Williamson Law + Policy, PLLC
1850 M Street NW, Suite 840 | Washington, D.C. 20036 | (202) 256-6155

WILLIAMSON LAW + POLICY
environmental markets advisory

www.williamsonlawpolicy.com | new carbon future | bio | vCard | map | email

---

From: Baptist, Erik [mailto:baptist.erik@epa.gov]
Sent: Friday, October 13, 2017 12:24 AM
To: David M. (Max) Williamson <maxwilliamson@williamsonlawpolicy.com>; Schwab, Justin <Schwab.Justin@epa.gov>
Subject: RE: Ag Biogenic CO2

Max,

Apologies for the delayed response. Is there a day during the week of October 23-27 that works best for you? Fridays are usually best for us.

Thanks,

Erik Baptist
Senior Deputy General Counsel
Office of General Counsel
U.S. Environmental Protection Agency
1200 Pennsyvlania Ave., NW
Washington, DC 20460
(202) 564-1689
baptist.erik@epa.gov

From: David M. (Max) Williamson [mailto:maxwilliamson@williamsonlawpolicy.com]
Sent: Wednesday, October 4, 2017 8:17 AM
To: Schwab, Justin <Schwab.Justin@epa.gov>; Baptist, Erik <baptist.erik@epa.gov>
Subject: Ag Biogenic CO2

Justin and Erik, following on a telecon with Mandy, I'd like to offer to sit down with you and walk through our legal analysis of the biogenic CO2 policy, which led us to the conclusion that re-interpreting the endangerment finding was the most sensible solution to this issue which has the ag community inflamed.

Could we convene a small working group (no more than 3-4) for an in-person sit down?

Regards,

David M. (Max) Williamson | Williamson Law + Policy, PLLC
1850 M Street NW, Suite 840 | Washington, D.C. 20036 | (202) 256-6155

WILLIAMSON LAW + POLICY
environmental markets advisory

www.williamsonlawpolicy.com | new carbon future | bio | vCard | map | email

From: Cory, Preston (Katherine) [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BFD80B15F6D04A3BA11FC8CA3C85BC50-CORY, KATHE]
Sent: 10/27/2017 1:41:52 PM
To: Baptist, Erik [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=10fc1b085ee14c6cb61db378356a1eb9-Baptist, Er]; Schwab, Justin [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=eed0f609c0944cc2bbdb05df3a10aadb-Schwab, Jus]; Stephanie Groen [Stephanie.Groen@iowa.gov]; LeeAnn Veatch [leeann.veatch@ky.gov]; ryan@nevadadc.org; Katie Beck [katie.beck@governor.arkansas.gov]
Subject: RE: Sue and Settle Call w/ EPA General Counsel

Ex. 6 s the code, so sorry!

-----Original Appointment-----
From: Cory, Preston (Katherine)
Sent: Friday, October 27, 2017 9:39 AM
To: Baptist, Erik; Schwab, Justin; Stephanie Groen; LeeAnn Veatch; ryan@nevadadc.org; Katie Beck
Subject: Sue and Settle Call w/ EPA General Counsel
When: Friday, October 27, 2017 9:30 AM-10:00 AM (UTC-05:00) Eastern Time (US & Canada).
Where:

Ex. 6 (passcode: Ex. 6

Message

From: Tim Lust [tim@sorghumgrowers.com]
Sent: 6/20/2017 7:58:51 PM
To: Gunasekara, Mandy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=53d1a3caa8bb4ebab8a2d28ca59b6f45-Gunasekara,]
CC: Schwab, Justin [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=eed0f609c0944cc2bbdb05df3a10aadb-Schwab, Jus]; Dominguez, Alexander [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5ced433b4ef54171864ed98a36cb7a5f-Dominguez,]
Subject: Re: Sorghum Oil Update

Mandy and Alex, We look forward to the meeting please let us know what schedules allow for next week.
Regards, Tim

Tim Lust
Chief Executive Director
Ex. 6 office
cell
sorghumgrowers.com
Sorghum: The Smart Choice.

On Mon, Jun 19, 2017 at 8:18 PM, Gunasekara, Mandy <Gunasekara.Mandy@epa.gov> wrote:

HI Tim,

Justin forwarded me your message. I handle the Administrator's air portfolio and given the sorghum oil issue is under review at the Office of air and radiation (ie OTAQ) it would be good for us to meet. I've cc'd Alex Dominguez who can help set the meeting up.

Best,

Mandy

Begin forwarded message:

From: Tim Lust <tim@sorghumgrowers.com>
Date: June 19, 2017 at 6:35:28 PM EDT
To: "Schwab, Justin" <schwab.justin@epa.gov>
Subject: Sorghum Oil Update

Justin,

I wanted to check with you and see if you had any information on sorghum oil? We have a tentative call with OTAQ staff this Friday at 1:00 pm eastern on sorghum oil but I don't have a good feel on what information will be discussed. I will be in DC next Tuesday- Friday, do you have any time for us to catch up at any time early or late next week? Regards, Tim

Tim Lust
Chief Executive Director
Ex. 6 office
cell
sorghumgrowers.com
Sorghum: The Smart Choice.

Message

From: Joe Bischoff [JBischoff@cgagroup.com]
Sent: 5/26/2017 7:18:39 PM
To: Schwab, Justin [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=eed0f609c0944cc2bbdb05df3a10aadb-Schwab, Jus]
CC: Tim Lust [tim@sorghumgrowers.com]
Subject: Impact of recent changes to risk assessment
Attachments: ATZ EPA Review Memo_5.16.2017[2].docx; Atz summary - 11may17[2].docx; neonicotinoid-new-use.pdf; 2016_06_17_Sulfoxaflor_EPA-HQ-OPP-2010-0889-Final.docx

Justin,

My apologies for taking so long to get back to you with examples of how things have significantly changed in the registration and re-registration of pesticides in recent years. I am still gathering examples, as they are a more difficult to tease out than I initially anticipated but they remain very much real and impactful to growers.

We know that there have been significant changes to risk assessment, not through stakeholder engagement or notice and comment but through fiat. These changes were first signaled by Dr. Thomas Burke (Former Dep. Assistant Administrator at EPA) in 2009 when he presented, "New Directions for Risk Assessmentin the Incoming Administration and Beyond" to the Wharton School of Business. While the changes were done through policy and model shifts within the agency the impacts have been profound.

<u>HERBICIDE</u>
The first example is in regards to Atrazine, which is the second most widely used herbicide in the United States, primarily on corn, sorghum, soybean and sugarcane production. Atrazine has been around for more than 50 years and few chemicals have been studied more closely. Atrazine is currently going through re-registration at EPA, as it did in 2003, but this time through significant policy changes appear to have been made and the goalposts moved. Below I have provided a list of some of the major concerns. Attached, you'll find two documents that provide additional details about these concerns. One document (ATZ summary) was produced by folks at Syngenta. The other document (ATZ EPA Review Memo) was produced through the Triazine Network which is a coalition of grower organizations, including the National Sorghum Producers).

- EPA ignored the recommendations of their own Science Advisory Panels (2007, 2009, 2012) in setting aquatic level of concern (LOCs).
- Preliminary assessment focuses on models that clearly overestimate potential environmental concentrations of atrazine in water and ignores real-world and robust data taken over a 10 year period that completely contradicts the imaginative models used by EPA.
- <u>Different outcomes despite the same information</u>
    - In 2003 EPA concluded "atrazine is practically non-toxic to slightly toxic to birds and mammals". But in 20016, despite the thresholds remaining unchanged EPA concluded that atrazine posted a chronic risk to mammals.
    - In 2003 EPA concluded "atrazine is practically non-toxic to slightly toxic to birds." But in 2016 EPA concluded that there was acute risk for plant-eating, insect-eating and omnivorous birds for nearly all use patterns.

<u>PESTICIDES AND POLLINATORS: Decisions based on hazards and not on risk assessment</u>
I have attached the National Sorghum Producers' comments on the registration of sulfoxaflor (EPA-HQ-OPP-2010-0889) and a 2015 letter from EPA to the registrants instructing them not to pursue further neonicotinoid uses. I provided these two documents to help illustrate how OPP has made registration decisions that were influenced by the NGO outcry about honeybees and other pollinators without documenting risk (e.g., exposure). These are hazard-based decisions that have been repeated over and over and are not in keeping with a risk-benefit evaluation as required under FIFRA. Below I have highlighted some of the specific concerns captured and further explained in the attached documents.

- EPA identified the hazard and assumed a harmful exposure without data to support their assumptions.
    - Crops like sorghum, soybean and citrus were prevented from being registered uses, keeping a useful tool out of producers hands.
- EPA's letter prohibiting new neonic registrations has kept cost effective tools out of growers hands do to their "no risk" approach to bees.
    - Sorghum faces a new and devastating pest (sugarcane aphid). Studies have shown that an imidacloprid in-furrow treatment would be effective and inexpensive for this low-input cost crop. Unfortunately, EPA has told the registrants not to apply for the use due to their presumed concerns about bees.
    - The letter circumvents the risk/benefit evaluation process required under FIFRA and blocks registrations without evidence.
    - A letter from OPP instructing registrants that the moratorium no-longer applies would be a strong message and encourage innovation and new uses.
- Honeybees are non-native livestock in the United States. Beekeeping is a form of agriculture. However, EPA has chosen that form of agriculture over all others.
- While beekeepers do have significant pest and pathogen challenges, we have more honeybee colonies in the U.S. than we have had in 20 years.
- The abundance of caution and concern that EPA is exhibiting to bees, and honeybees in particular, is keeping important crop protection tools out of the hands of producers and ignoring their needs to control pests.

I am working to gather specific examples of how the models have changed and the resulting impacts on registrations. Hope to have that to you in the next week or two.

On a different topic, can you tell us if there has been any progress on the sorghum oil pathway? We are still waiting to hear from EPA regarding next steps, which we hope is a letter providing the approval.

Thank you for your continued attention to our issues and please let me know if you have any questions. Hope you enjoy the holiday weekend.

— Joe

Joe Bischoff, PhD | Senior Vice President
Cornerstone Government Affairs

Annapolis | Atlanta | Austin | Baton Rouge | Chicago | Des Moines
Houston | Jackson | Richmond | Springfield| **Washington**

Ex. 6 mobile | Ex. 6 direct
www.cgagroup.com
@CGAgroup

June 17, 2016

Ms. Susan Lewis
Director, Registration Division
Office of Pesticide Programs
Regulatory Public Docket (7502P)
U.S. Environmental Protection Agency
One Potomac Yard (South Building)
2777 South Crystal Drive
Arlington, VA 22202

RE: Proposed Registration Decision for Sulfoxaflor (Docket No. EPA-HQ-OPP-2010-0889)

Dear Ms. Lewis,

The National Sorghum Producers (NSP), representing 40,000 sorghum farmers in 21 states with over 7 million planted acres, appreciates the opportunity to comment on EPA's proposed registration decision for sulfoxaflor (EPA-HQ-OPP-2010-0889). While sorghum is not being considered for inclusion in this proposed registration, we are hopeful that it will be considered for a Section 3 registration in the near future. We want to take this opportunity to address the issues of tank mixing and buffers as well as address what we believe to be an overly conservative approach to bee protection and a misinterpretation of the USDA's bee attractiveness report.

Bee Attractiveness
NSP believes the EPA is misinterpreting the USDA's Bee Attractiveness report. The agency is ignoring the distinctions made in the report, specifically a single-plus (+) and a double-plus (++). A double-plus is meant to signify a plant that a bee is highly attracted to while a single-plus indicates that the crop is utilized by a bee under certain circumstances. Yet EPA appears to treat any crop with even a single-plus as equally attractive as a double-plus, ignoring the distinction made by the USDA. Again, EPA is choosing the most conservative approach to its evaluation, ignoring distinguishing information, and misrepresenting the very report developed to guide the agency with these decisions.

Buffers
NSP strongly recommends EPA not include a 12-foot on-field buffer requirement on the sulfoxaflor label. Buffers cause crop losses both in the buffer zone and further on-field by creating a refugia where crop pests maintain their populations, and it reduces farmer revenue. In addition, the continued presence of the pests in significant numbers allows them to rebuild populations quickly, which often leads to

increased application frequency and thereby increasing a grower's input costs. Furthermore, more applications mean more active ingredient and increased risk of negatively impacting non-targets and beneficial insects.

The agency admits that the assumptions used to estimate risk of off-site exposure are not realistic.

> *"... several assumptions that collectively are to likely over estimate off-site exposure (and risk) to bees. These include assuming that: 1) plants in the spray drift zone are blooming at the time of application, 2) 100% of the bee's diet comes from the blooming plants inhabiting the spray drift zone, and 3) residues in pollen and nectar of plants in the spray drift zone equate to maximum residues observed in submitted studies."*

Yet, the agency decides to embrace their impractical estimations. Why? Certainly some steps could be taken to lessen the level of overestimation.

Tank Mixes

Unless significant concerns regarding synergistic effects of sulfoxaflor with other potential tank mixed chemicals is identified, NSP would urge EPA to avoid restriction on tank mixes. The practice of tank mixing, as the EPA highlights in the proposal, is an economic necessity for the viability of farming in the U.S. In the Mid-South each application can cost $5-$8 per acre or $5,000 - $8,000 for a 1000 acre farm. Prohibiting the ability to use tank mixing could easily quadruple the costs associated with applications. Some tank mixes help with drift. Furthermore, tank mixing results in significant fossil fuel savings, which should not be underestimated.

Tank mixing also allows for growers to carefully plan when applications are made while also providing the flexibility for timely applications in responding to pest pressure. With significant breaks in applications, growers can work with applicators and pest scouts to make informed decisions on the timing of treatments. Shifting to a single chemistry per application approach would stretch the availability of applicators beyond their current capacity and require applications to be scheduled well in advance. This would cause the end of integrated pest management programs and require farmers to "calendar" pesticide treatments rather than making informed decisions based on observed circumstances in the field.

Precautionary Approach of EPA to Risk to Bees

According to the proposal, the agency has made the decision to adopt a "no risk," and "no exposure" approach for bees to crop protection tools. While the focus of this proposal is sulfoxaflor, there is no reason to believe the approach would be limited to sulfoxaflor and creates a decision matrix that places bees above all else, including feeding and clothing our population. The agency has chosen this path without calculating the risks to bees and no evaluation of the lost benefits to crops like cotton, citrus, cucurbits, soybeans and strawberries. To call this anything other than an adoption of the "precautionary principle" is to either misunderstand the phrase or ignore the realities.

Why would the agency decide to go deny the registration for crops that are clearly in need of this important crop protection tool (e.g., cotton for tarnished plant bug, citrus for Asian citrus psyllid) when other steps to mitigate the risk are available? In the case of sulfoxaflor, with its brief residual activity, EPA could have instructed that applications be made any time after dusk or pre-dawn if managed hives are known to be in close proximity to the field. For products with longer residual activity and managed beehives in close proximity to the field, applications could be timed so that the risk was sufficiently reduced by the time bees would again be foraging or if applications were made to parts of the plant that are not blooming, shedding pollen or producing nectar.

Synergistic Effects of Overestimated Risks and Conclusion
EPA's proposed registration for sulfoxaflor is a good example of the negative impacts on regulatory decision-making when each individual risk area is overestimated and then evaluated in combination. It causes decisions to be made that are not at all reflective of reality. It is doubtful the worst-case scenario imagined by EPA could be recreated in nature, even if we tried.

A product like sulfoxaflor has great utility in many crops for a wide range of pests, yet due to EPA's myopic view on risk it may only be approved for a narrow subset of crops (zero evidence of bee visits), under limited circumstances (without blooms) and with the potential of significant restrictions (no tank mixing and on-field buffers). The synergistic effect of all of these limitations results in the neutering of an advanced crop protection tool with a significantly improved environmental profile and a novel mode of action. It seems that we should be encouraging chemical products like this one rather than inhibiting their adoption.

Regards,

James Born

James Born
Chairman of the Board
National Sorghum Producers

4201 North Interstate 27 • Lubbock, Texas 79403 • phone: (806) 749-3478 • fax: (806) 749-9002
www.sorghumgrowers.com

TITLE

The Conservatism of EPA's Preliminary Ecological Risk Assessment for Atrazine

TEST GUIDELINE

N/A

AUTHORS

Dwayne R.J. Moore
Colleen D. Priest
Adric D. Olson

COMPLETION DATE

05/17/2017

PERFORMING LABORATORY

Intrinsik Environmental Sciences (US), Inc.
41 Campus Drive, Suite 202
New Gloucester, ME 04260

SUBMITTER/SPONSOR

The Triazine Network
P.O. Box 446
Garnett, KS 66032

PROJECT ID

80135

SCIENCE INTEGRITY KNOWLEDGE

intrinsik

The Conservatism of EPA's Preliminary Ecological Risk Assessment for Atrazine

FINAL REPORT

Prepared by: Dwayne R.J. Moore, Colleen D. Priest, Adric D. Olson

Intrinsik Environmental Sciences (US), Inc.
41 Campus Dr., Suite 202,
New Gloucester, ME 04260

Prepared for: The Triazine Network

Date: May 17, 2017

www.intrinsik.com

STATEMENT OF CONFIDENTIALITY CLAIMS

No claim of confidentiality, on any basis whatsoever, is made for any information contained in this document. I acknowledge that information not designated as within the scope of FIFRA sec. 10(d)(1)(A), (B) or (C) and which pertains to a registered or previously registered pesticide is not entitled to confidential treatment and may be released to the public, subject to the provisions regarding disclosure to multinational entities under FIFRA sec. 10(g).

Gary Marshall
Chair
Triazine Network

May 17, 2017

This document is the property of the Triazine Network and, as such, is considered to be confidential for all purposes other than compliance with FIFRA sec. 10. Submission of these data in compliance with FIFRA does not constitute a waiver of any right to confidentiality, which may exist under any other statute or in any other country.

Statement of Good Laboratory Practice Compliance

This report is a Review of EPA's Ecological Risk Assessment for Atrazine and is consistent with the requirements of FIFRA. As such, it is not required to comply with 40CFR Part 160.

Author and Title	Signature	Date
Dr. Dwayne R.J. Moore Senior Scientist	[signature]	05/17/2017
Colleen D. Priest Environmental Risk Analyst III	[signature]	05/17/2017
Adric D. Olson Environmental Risk Analyst II	[signature]	05/17/2017

Sponsor/Submitter and Title	Signature	Date
Gary Marshall Chair Triazine Network	[signature]	05/17/2017

DISCLAIMER

Intrinsik Environmental Sciences (US), Inc. (Intrinsik) developed this report for the Triazine Network solely for the purpose stated in the report.

Intrinsik does not accept any responsibility or liability related to the improper use of this report or incorrect data or information provided by others.

TABLE OF CONTENTS

APPENDICES

INTRODUCTION

The US Environmental Protection Agency (EPA) recently released a preliminary version of the ecological risk assessment (ERA) for atrazine. Our previous review of this document indicated many shortcomings including use of poor quality data, hyperconservative assumptions and inputs, and model calculation errors. These shortcomings occurred in spite of atrazine having a very rich database for fate parameters, monitoring data, and toxicity studies. Past assessments of atrazine by EPA came to very different risk conclusions for at least some of the receptors, e.g., birds. The different conclusions in past assessments were at least partly due to use of fewer hyperconservative assumptions and more scientifically defensible methods and data. Because atrazine is a critical tool for farmers, particularly those with corn, soybean and sugarcane farms, the Triazine Network requested that Intrinsik prepare comments for submission to the EPA Administrator regarding the erosion of sound science as the basis for regulating this compound. Our comments are aimed at ensuring that EPA uses the best available science in future assessments for atrazine.

This document is organized by receptor group and focuses on the taxa that were identified as being at risk in EPA's preliminary assessment for atrazine. The text in the main body of the report is brief with the details being provided in the attached appendices.

AQUATIC RECEPTORS

EPA's aquatic risk assessments for atrazine have become more conservative since its previous assessment in 2003. In 2003, EPA determined that adverse effects to aquatic plants and fish could occur at atrazine concentrations greater than 10 to 20 µg/L. In 2016, EPA lowered the effects thresholds to 5 µg/L for fish and 3.4 µg/L for aquatic plants. The sensitivity of aquatic communities to atrazine has not changed over time. However, EPA's procedures for deriving effects metrics, as well as exposure estimates, have become increasingly conservative without any supporting scientific rationale (see Appendix A for details). Some examples:

- Although the acute effects threshold for fish did not change in the preliminary risk assessment (EPA, 2016), the chronic effects threshold was reduced 13-fold. EPA (2003) selected a chronic no observed effect concentration (NOEC) of 65 µg/L from a brook trout study (Macek et al., 1976) to be the chronic effects threshold for freshwater fish. However, in the preliminary assessment, EPA (2016) selected a chronic NOEC of 5 µg a.i./L derived from a Japanese medaka study (Papoulias et al., 2014). According to EPA's own Data Evaluation Record (Bryan et al., 2014), the Papoulias et al. (2014) study was seriously flawed. A high-quality study (Schneider et al., 2015) with the same species that followed Good Laboratory Practice (unlike the Papoulias et al., 2014 study) produced a chronic NOEC of >53 µg a.i./L. The superior study by Schneider et al. should have been used to assess chronic risks to freshwater fish rather than the flawed study used in the preliminary assessment. To compound the problem further, EPA used the flawed study to also assess risks to saltwater species, even though the flawed study was conducted with a freshwater species and acceptable toxicity studies were available for saltwater species.

- Because aquatic plants are the most sensitive receptor to atrazine, a level of concern (LOC) was derived by EPA below which no effects to aquatic plant communities would be expected. In the last several years, EPA has made multiple attempts to define the LOC for aquatic plants. Except for the most recent LOC of 3.4 µg/L in the preliminary EPA (2016) assessment, the proposed LOCs have been thoroughly reviewed by EPA's own Scientific Advisory Panels (SAP, 2007, 2009, 2012). Notably, none of EPA's previously proposed LOCs have been formally accepted or endorsed. In fact, the latest SAP (2012) review strongly recommended increasing the proposed LOC of 4-7 µg/L (EPA, 2007) because many of the community-level studies were either of unacceptable quality or did not actually cause effects of ecological significance. EPA (2016) ignored the advice of the SAP (2012) and the recommendations of other reviewers (e.g., Giddings, 2012; Moore et al., 2015, 2016) by continuing to use poor quality study results to derive the lowest LOC proposed to date. A recent evaluation that was published in a peer-reviewed scientific journal resulted in an LOC of 23.6 µg/L (Moore et al., 2016).
- Despite the availability of a comprehensive water monitoring dataset for atrazine, EPA (2003, 2016) has primarily relied on models to predict atrazine concentrations. The environmental concentrations predicted by EPA's models, however, significantly overpredict measured environmental concentrations by as much as 260-fold when compared to all available monitoring data. In their earlier assessment, EPA (2003) did incorporate monitoring data into the refined exposure estimates for streams, lakes, reservoirs, and estuarine/marine environments. Why EPA (2016) reverted to a more conservative approach and primarily relied on modeling data for their preliminary assessment is perplexing. The targeted monitoring dataset available for atrazine is extensive, robust and of the highest quality and should have been the basis for the aquatic exposure assessment.

Predictably, the hyperconservatism in EPA's fish and plant assessments led to increased risk estimates in the 2016 preliminary assessment. For example, the calculated risk quotients for fish by EPA (2016) were over an order of magnitude higher than those calculated previously even though application rates for atrazine have decreased or remained constant since the earlier assessment. Similarly, aquatic plant risk estimates increased significantly, at least partly because of the LOC of 3.4 µg/L, which is 3 to 10-fold below any other LOC for aquatic plants that has been developed by EPA or recommended by various SAPs, Giddings (2012) and Moore et al. (2016).

TERRESTRIAL PLANTS

EPA's estimated risks for atrazine to terrestrial plants increased from their 2003 assessment, despite no changes to the effects threshold and decreases or no changes in assessed application rates. The increased risk estimates were due to a change in the exposure estimation methodology. In 2003, exposure was estimated as a simple fraction of applied pesticide. The preliminary ERA used a model (i.e., TerrPlant) to estimate spray drift and runoff to non-target plants. However, as with many of the Agency's models, TerrPlant includes a number of overly conservative assumptions, including assuming maximum wind speed permitted on the label, minimum droplet size, and others (see Appendix B for details). Furthermore, the Agency continued to rely on an effects threshold from a flawed study even though new studies that followed Good Laboratory Practice were conducted recently (i.e., Martin, 2015a,b). The effects threshold used by EPA in 2003 and 2016 was from studies by Chetram (1989a,b). However, these studies followed an outdated methodology and used nearly pure atrazine rather than the end use product that is actually applied in the field. The new studies used currently available products and updated the methodology to include evaluating plant recovery. It appears that EPA was insistent on using the study that provided the lowest threshold and therefore highest possible risk rather than rely on best available data. The increased conservativism in the terrestrial plants assessment produced higher risk estimates and larger than necessary no-spray buffers to mitigate risk to non-target terrestrial plants.

MAMMALS

In their 2003 assessment, EPA concluded that "atrazine is practically non-toxic to slightly toxic to birds and mammals". Even though the effects thresholds remained the same in the 2016 preliminary assessment, EPA concluded that atrazine posed a chronic risk to mammals. This chronic risk conclusion is solely due to a change in the method by which EPA estimates exposure. In the preliminary ERA, EPA (2016) used a modeling tool, T-REX. However, T-REX is overly conservative and assumes, for example, that: 100% of an organism's daily diet over a long duration is from a crop recently treated with atrazine, concentrations on all food items consumed by mammals are upper bound values, and atrazine has an unrealistically high persistence following application (see Appendix C for additional details). Given the relative non-toxicity of atrazine to mammals, it is doubtful that any pesticide would pass EPA's current assessment protocol for mammals.

BIRDS

When EPA conducted its risk assessment for birds in 2003, they concluded that "atrazine is practically non-toxic to slightly toxic to birds" and that "there is negligible potential for acute risk to birds". Although some chronic risks were identified, they were fairly minor. These conclusions were reached despite using a highly conservative screening-level risk model for birds (i.e., the Terrestrial Fate Residue Model) that was purposefully designed to overestimate acute and chronic risks. Conversely, in the 2016 preliminary assessment, EPA concluded that there was acute risk for plant-eating, insect-eating and omnivorous birds for nearly all use patterns. Chronic risks were also higher than predicted in the 2003 assessment. The screening-level risk model used in 2016 was the Terrestrial Residue Exposure model (T-REX, version 1.5.2). The 2003 and 2016 screening-level risk models for birds are conceptually similar. Unlike in 2003, EPA went further with their 2016 avian assessment, and used two probabilistic models, TIM and MCnest, to better characterize acute and chronic risks of atrazine to birds. The models estimated significant mortality for many species and near total reproductive failure for small and medium omnivorous and insectivorous bird species (e.g., American robin, chipping sparrow, common yellowthroat, killdeer, and vesper sparrow) that forage in corn fields treated with atrazine. Even with application rates well below current typical rates or the rates assessed in 2003, near total reproductive failure was predicted.

So how is it that EPA reached such radically different conclusions with regard to acute and chronic risk of atrazine to birds in 2003 and 2016? The answer is not because of new studies showing increased toxicity of atrazine to birds or new fate studies indicating higher levels of atrazine on bird foods than had been predicted previously. The answer is due to EPA's use of increasingly conservative assumptions in the 2016 assessment compared to the 2003 assessment (see Appendix C for further details). These conservative assumptions were not based on sound science. Some examples:

- In its 2016 assessment, EPA used a default 35-day foliar dissipation half-life, despite acknowledging the availability of field studies showing that the half-life ranges from a few to 17 days. Longer half-lives lead to higher estimates of chronic exposure and risk.
- The highest acute and chronic exposures predicted by EPA in 2016 were for very small birds (20 grams) that only consume short grass in areas recently treated with atrazine. No such bird exists, however, because such a small bird cannot digest grass sufficiently and rapidly enough to provide the energy required to sustain itself.
- Using the same mallard reproduction test as in the 2003 assessment, EPA reduced the chronic effects threshold >3-fold. The rationale for the reduction, however, was based on a flawed statistical analysis.
- The 2016 probabilistic assessment considered dermal exposure. This route of exposure was estimated to contribute 80% of the overall dose for birds. However, dermal exposure dominating over oral exposure does not make logical sense. Birds have feathers that intercept and significantly decrease dermal exposure. Also, birds typically evacuate the area during application and therefore are unlikely to come into direct contact with spray. Following application, atrazine becomes rainfast within 1-2 hours and thus is far less available for dermal exposure via contact with the foliage. To further compound the issue, EPA vastly overestimated dermal toxicity of atrazine by extrapolating from data for insecticides that are far more toxic than atrazine.
- In the 2016 assessment, EPA used a lower acute effects metric. The change was based on a re-analysis of the data, a change supported by the Triazine Network's own re-analysis of the data. However, EPA mistakenly retained the slope of the dose-response curve from the old analysis rather than use the slope from the re-analysis. This error led to a significant overestimate of acute risk to birds.
- The basis for EPA's estimate of the rate at which birds metabolize and detoxify atrazine was not adequately described in the 2016 assessment. Our review of the available data, however, indicated a much more rapid rate of metabolism. As expected, using the more scientifically justified rate of metabolism led to a considerable reduction in the predicted effects of atrazine on birds.
- The cumulative error of many incorrect inputs results in highly conservative and inaccurate risk estimates for birds. Selection of correct model inputs results in negligible risk estimates for birds, as would be expected for birds exposed to an herbicide that has no record of having caused bird kills in over 50 years of use.

When real-world data are considered, it is obvious that the 2016 risk estimates were grossly overstated. Despite atrazine having been one of the most widely used herbicides in the United States since being registered in 1959, the EPA's own incident databases indicate a complete lack of bird incidents in the last 10 years. Further, according to the US Geological Survey's Breeding Bird Survey, many of the bird species predicted to be at significant risk from atrazine exposure have experienced strong and sustained population increases in areas where atrazine has been most intensively used over the last 50 years, while experiencing decreases in areas where atrazine use has been lower.

CONCLUSIONS

The preliminary risk assessment recently released by EPA (2016) for atrazine was overly conservative, relied on poor quality data, and had a number of errors. A number of issues are highlighted in this report and include the following:

- EPA's aquatic and terrestrial exposure modeling relied on highly conservative assumptions that are not representative of atrazine use areas and the organisms that live there.
- The best available effects data were not employed for fish, aquatic and terrestrial plants, and wildlife. Instead, EPA often relied on poorer quality data simply because they produced more conservative effects thresholds.
- Numerous issues were identified in EPA's refined avian assessment. When best available data are used as inputs to the exposure model, avian risks are negligible.
- The calculation of a level of concern for aquatic plants relied on poor quality data that have previously been rejected by multiple sources (SAP, 2009; 2012; Giddings, 2012; Moore et al., 2015; 2016).

Atrazine has an incredibly rich database of information with regard to exposure and effects to aquatic and terrestrial organisms. Numerous Scientific Advisory Panels have also given thoughtful recommendations and advice to the EPA that, if accepted, would have led to a far less conservatively biased and more scientifically defensible assessment. EPA, however, ignored this advice and the availability of much high quality scientific information in favor of making decisions that significantly overestimated ecological risk.

There are several obvious consequences to overestimating risks, particularly in a high profile case such as atrazine:

Loss of regulatory credibility

Atrazine has been widely used for decades in the United States and undergone assessment and reregistration by the EPA on several occasions. What must the public think about an agency charged with protecting the environment suddenly finding that their assessment and registration process failed, on a grand scale, to protect, for example, bird communities in the Midwest? Even though the atrazine assessment is in preliminary form and may ultimately be revised, the damage to the EPA's credibility with the public will be difficult to reverse.

Loss of important tools for agriculture

According to the National Corn Growers Association, farming without atrazine would cost corn farmers US$30 to US $59 per acre. Thus, its continued use saves US farmers up to US$3.3 billion per year and consumers up to US$4.8 billion per year. Atrazine is also an important tool for weed resistance management.

There are, of course, many other consequences associated with overestimating the risks of atrazine. Clearly, time, effort, and resources must be invested in developing a more scientifically defensible ecological risk assessment for atrazine.

REFERENCES

Baxter, L.R, P.K. Sibley, K.R. Solomon and M.L. Hanson. 2013. Interactions between atrazine and phosphorus in aquatic systems: Effects on phytoplankton and periphyton. Chemosphere 90(3):1069-1076.

Brain, R.A. 2012. Atrazine: An Overview of the Recovery of Aquatic Plants from Exposure to the Herbicide Atrazine. Syngenta Crop Protection, LLC., Greensboro, NC. Report No.: TK0123265. 30 pp.

Brain, R.A., A.J. Hosmer, D. Desjardins, T.Z. Kendall, H.O. Krueger and S.B. Wall. 2012a. Recovery of duckweed from time-varying exposure to atrazine. Environmental Toxicology and Chemistry 31(5):1121-1128.

Brain, R.A., J.R. Arnie, J.R. Porch and A.J. Hosmer. 2012b. Recovery of photosynthesis and growth rate in green, blue-green, and diatom algae after exposure to atrazine. Environmental Toxicology and Chemistry 31(11):2572-2581.

Brain, R.A., J. Perine, C. Cooke, C.B. Ellis, P. Harrington, A. Lane, C. Sullivan and M. Ledson. 2017. Evaluating the effects of herbicide drift on non-target terrestrial plants: A case study with mesotrione. Environmental Toxicology and Chemistry, in press. DO: 10.1002/etc.3786.

Brockway, D.L., P.D. Smith and F.E. Stancil. 1984. Fate and effects of atrazine on small aquatic microcosms. Bulletin of Environmental Contamination and Toxicology 32:345-353.

Bryan, R.L., K. Luck and J.D. Early. 2014. Data Evaluation Record: Papoulias, D.M., D.E. Tillitt, M.G. Talykina, J.J. Whyte and C.A. Richter. 2014. Atrazine reduces reproduction in Japanese medaka (*Oryzias latipes*). Aquatic Toxicology 154:230-239. Prepared by Dynamac Corporation, Durham, NC for Health Effects Division, Office of Pesticide Programs, US Environmental Protection Agency, Arlington, VA.

Cafarella, M.A. 2005. Atrazine (G-30027) – Early Life-Stage Toxicity Test with Sheepshead Minnow (*Cyprinodon variegatus*). Unpublished study performed by Springborn Smithers Laboratories, Wareham, MA. Project No.: 1781.6642. Prepared for Syngenta Crop Protection, Inc., Greensboro, NC. Syngenta Study No.: T000067-02. MRID 46648203.

Chetram, R.S. 1989a. Tier 2 Seedling Emergence Nontarget Phytotoxicity Test. Unpublished study performed by Pan-Agricultural Laboratories, Inc., Madera, CA. Report No.: LR89-07C. Prepared for Ciba-Geigy Corporation, Greensboro, NC.

Chetram, R.S. 1989b. Tier 2 Vegetative Vigor Nontarget Phytotoxicity Test. Unpublished study performed by Pan-Agricultural Laboratories, Inc., Madera, CA. Report No.: LR89-07A. Prepared for Ciba-Geigy Corporation, Greensboro, NC.

Choung, C.B., R.V. Hyne, M.M. Stevens and G.C. Hose. 2013. The ecological effects of a herbicide-insecticide mixture on an experimental freshwater ecosystem. Environmental Pollution 172:264-274.

Dalton, R.L. and C. Boutin. 2010. Comparison of the effects of glyphosate and atrazine herbicides on nontarget plants grown singly and in microcosms. Environmental Toxicology and Chemistry 29(10): 2304-2315.

Denslow, J.S. 1985. Disturbance-mediated Coexistence of Species. In: The Ecology of Natural Disturbance and Patch Dynamics. Academic Press, San Diego, CA.

EFSA (European Food Safety Authority). 2012. Scientific Opinion on the Temporal and Spatial Ecological Recovery of Non-Target Organisms for Environmental Risk Assessments. European Food Safety Authority, Parma, Italy. https://www.efsa.europa.eu/sites/default/files/assets/150622c.pdf.

EPA (Environmental Protection Agency). 2003. Interim Reregistration Eligibility Decision for Atrazine. US Environmental Protection Agency, Washington DC. Case No. 0062. October 31, 2003.

EPA (Environmental Protection Agency). 2007. The Potential for Atrazine to Affect Amphibian Gonadal Development. US Environmental Protection Agency, Washington DC.

EPA (Environmental Protection Agency). 2012. User's Guide T-REX Version 1.5.2 (Terrestrial Residue EXposure model). Accessed August 2013 from http://www.epa.gov/oppefed1/models/terrestrial/trex/t_rex_user_guide.htm, 2012.

EPA (Environmental Protection Agency). 2016. Refined Ecological Risk Assessment for Atrazine. Environmental Risk Branch III, Environmental Fate and Effects Division, Office of Pesticide Programs, US Environmental Protection Agency, Washington, DC. April 12, 2016.

Fink, R. 1976. Final report: Acute oral LD50 – Bobwhite quail. Project No. 108-123. Prepared by Wildlife International, Ltd., Easton, MD; submitted by Ciba-Geigy Corp., Greensboro, NC. [MRID 00024721].

Giddings, J.M. 2012. Atrazine: Review of mesocosm and microcosm studies. Compliance Services International (CSI). May 2012. Sponsor: Syngenta Crop Protection. Unpublished. Available in the atrazine public docket, EPA-HQ-OPP-2012-0230.

Halstead, N.T., T.A. McMahon, S.A. Johnson, T.R. Raffel, J.M. Romansic, P.W. Crumrine and J.R. Rohr. 2014. Community ecology theory predicts the effects of agrochemical mixtures on aquatic biodiversity and ecosystem properties. Ecological Letters DOI: 10.1111/ele.12295.

Hughes, J.S., M.M. Alexander and K. Balu. 1988. Evaluation of Appropriate Expressions of Toxicity in Aquatic Plant Bioassays as Demonstrated by the Effects of Atrazine on Algae and Duckweed Aquatic Toxicology and Hazard Assessment: 10^{th} Volume. American Society for Testing Materials, Philadelphia, PA. p. 531-547.

Jenson, K.I.N., G.R. Stephenson and L.A. Hunt. 1977. Detoxification of atrazine in three graminae subfamilies. Weed Science 25:212-220.

Jones, T.W., W.M. Kemp, P.S. Estes and J.C. Stevenson. 1986. Atrazine uptake, photosynthetic inhibition, and short-term recovery for the submersed vascular plant, *Potamogeton perfoliatus* L. Environmental Contamination and Toxicology 15:277-283.

Juttner, I., A. Peither, J.P. Lay, A. Kettrup and S.J. Ormerod. 1995. An outdoor mesocosm study to assess ecotoxicological effects of atrazine on a natural plankton community. Archives of Environmental Contamination and Toxicology 29:435-441.

Klaine, S.J., K.R. Dixon, R.B. Benjamin and J.D. Florian. 1996. Characterization of *Selenastrum capricornutum* response to episodic atrazine exposure. The Institute of Wildlife and Environmental Toxicology, Department of Environmental Toxicology, Clemson University, Pendleton, SC. Report No.: TIWET 09542. 92 p.

Knauer, K. and U. Hommen. 2012. Sensitivity, variability, and recovery of functional and structural endpoints of an aquatic community exposed to herbicides. Ecotoxicology and Environmental Safety. 78:178-183.

Macek, K.J., K.S. Buxton, S. Sauter, S. Gnilka and J.W. Dean. 1976. Chronic Toxicity of Atrazine to Selected Aquatic Invertebrates and Fishes. Unpublished study performed by EG&G Bionomics, Inc., Duluth, MN. Prepared for Shell Chemical Co., Washington, DC. MRID 00024377.

Mainiero, J., M. Youreneff, M. Giknis and E.T. Yau. 1987. Atrazine Technical: Two-Generation Reproduction Study in Rats. Ciba-Geigy Corporation, Greensboro, NC. Laboratory study number 852063. [MRID 40431303].

Martin, J.A. 2015a. Atrazine SC (A8566A) – Seedling Emergence Test with Extended Exposure to View Potential Recovery. Unpublished study performed by Smithers Viscient, Wareham, MA. Study No.: 1781.7000. Prepared for Syngenta Crop Protection, LLC, Greensboro, NC. MRID 49639102.

Martin, J.A. 2015b. Atrazine SC (A8566A) – Vegetative Vigor Test with Extended Exposure to View Potential Recovery. Unpublished study performed by Smithers Viscient, Wareham, MA.

Study No.: 1781.7001. Prepared for Syngenta Crop Protection, LLC, Greensboro, NC. MRID 49639101.

Marton, J., T.S. Myers, F.T. Farruggia and C. Rossmeisl. 2015. Data Evaluation Record on the Fish Short-Term Reproduction Assay with Atrazine, EPA MRID Number 49694001.

Mohammad, M., K. Itoh, and K. Suyama. 2008. Comparative effects of different families of herbicides on recovery potentials in *Lemna* sp. Journal of Pesticide Sciences 33:171-174.

Mohammad, M., K. Itoh, and K. Suyama. 2010. Effects of herbicides on *Lemna gibba* and recovery from damage after prolonged exposure. Archives of Environmental Contamination and Toxicology 58:605-612.

Moore, D., G. Manning, K. Wooding and K. Beckett. 2015. Review of Mesocosm Studies and Other Lines of Evidence for Deriving a Community-Level Level of Concern for Atrazine. Report prepared by Intrinsik Environmental Sciences (US), Inc., New Gloucester, ME. Prepared for Triazine Network, Garnett, KS.

Moore, D.R.J. 1998. The ecological component of ecological risk assessment: Lessons from a field experiment. Human and Ecological Risk Assessment 3:1-21.

Moore, D.R.J., C.D. Greer, G. Manning, K. Wooding, K.J. Beckett, R.A. Brain and G. Marshall. 2016. A weight of evidence approach for deriving a level of concern for atrazine that is protective of aquatic plants. Integrated Environmental Assessment and Management, *Early View.*

Moorhead, D.L. and R.J. Kosinski. 1986. Effect of atrazine on the productivity of artificial stream algal communities. Bulletin of Environmental Contamination and Toxicology 37:330-336.

Murdock, J.N. and D.L. Wetzel. 2012. Macromolecular response of individual algal cells to nutrient and atrazine mixtures within biofilms. Microbial Ecology 63:761-772.

Nagy, K. A. 1987. Field metabolic rate and food requirement scaling in mammals and birds. Ecological Monographs 57: 111-128.

Nagy, K.A., I.A. Girard and T.K. Brown. 1999. Energetics of free-ranging mammals, reptiles and birds. Annual Reviews in Nutrition 19:247-277.

Olson, A., S. Rodney, M. Feken, J. Maul, D. Moore and C. Greer. 2016. Response to EPA's Preliminary Ecological Risk Assessment of Atrazine for Wildlife. Performed by Intrinsik Environmental Sciences (US), Inc., New Gloucester, ME. Project No.: 60-60700. Prepared for Syngenta Crop Protection, LLC, Greensboro, NC.

Papoulias, D.M., D.E. Tillitt, M.G. Talykina, J.J. Whyte and C.A. Richter. 2014. Atrazine reduces reproduction in Japanese medaka (*Oryzias latipes*). Aquatic Toxicology 154:230-239.

Pedersen, C.A. and D.R. DuCharme. 1992. Atrazine Technical: Toxicity and Reproduction Study in Mallard Ducks. Bio-Life Associates, Ltd., Neillsville, WI. Project BLAL number 102-013-08. MRID 42547101.

Piegorsch, W. and A.J. Bailer. 1997. Statistics for Environmental Biology and Toxicology. Chapman and Hall, London, UK. 584 pp.

Rapport, D.J., H.A. Regier and T.C. Hutchinson. 1985. Ecosystem behavior under stress. American Naturalist 125:617-640.

SAP (Scientific Advisory Panel). 2007. Transmittal of the Meeting Minutes of the FIFRA SAP Meeting Held on December 4-7, 2007 to Review the Interpretation of the Ecological Significance of Atrazine Stream-Water Concentrations Using a Statistically-Designed Monitoring Program. March 5, 2008, 2007 FIFRA Scientific Advisory Panel Meeting Held at One Potomac Yard, Arlington, VA.

SAP (Scientific Advisory Panel). 2009. Transmittal of the Meeting Minutes of the FIFRA SAP Meeting Held May 12-14, 2009 on the Scientific Issues Associated with "The Ecological Significance of Atrazine Effects on Primary Producers in Surface Water Streams in the Corn and Sorghum Growing Region of the United States (Part II)". August 11, 2009, 2009 FIFRA Scientific Advisory Panel Meeting Held at One Potomac Yard, Arlington, VA.

SAP (Scientific Advisory Panel). 2012. A Set of Scientific Issues Being Considered by the Environmental Protection Agency Regarding: Problem Formulation for the Reassessment of Ecological Risks from the Use of Atrazine. SAP Minute No. 2012-05. June 12-14, 2012 FIFRA Scientific Advisory Panel Meeting Held at One Potomac Yard, Arlington, Virginia.

Schneider, S.C., L. Zhang, K.H. Martin and S.P. Gallagher. 2015. Atrazine – Fish Short-term Reproduction Assay with the Japanese Medaka (*Oryzias latipes*). Unpublished study performed by Wildlife International, Easton, MD. Laboratory Report No.: 528A-275. Study sponsored by Syngenta Crop Protection, LLC, Greensboro, NC. MRID 49694001.

Selman, F.B. 1995. Atrazine and Metolachlor – Magnitude of Residues in Soil and Grain Sorghum Following Applications of AATREX 4L® and Dual 8E® With and Without the Addition of Acrysol G-110. Unpublished report produced by and for Ciba Crop Protection, Greensboro, North Carolina.

Shimabukuro, R.J., H.R. Swanson and W.C. Walsh. 1970. Glutathione conjugation: Atrazine detoxification mechanism in corn. Plant Physiology 46:103-107.

Stay, F.S., D.P. Larsen, A. Katko, and C.M. Rohm (Eds.). 1985. Effects of Atrazine on Community Level Responses in Taub Microcosms. ASTM STP 865, Philadelphia, PA. American Society for Testing and Materials, p. 75-90.

Stay, F.S., A. Katko, C.M. Rohm, M.A. Fix and D.P. Larsen. 1989. The effects of atrazine on microcosms developed from four natural plankton communities. Archives of Environmental Contamination and Toxicology 18:866-875.

Trask, J.R., W.M. Williams and A.M. Ritter. 2010a. Overview of USEPA-OPP's terrestrial risk assessment models. Prepared by Waterborne Environmental, Inc., Leesburg, VA for CropLife America, Washington, DC.

Trask, J.R., W.M. Williams and A.M. Ritter. 2010b. Options for refining the exposure component of USEPA-OPP's terrestrial risk assessment models. Prepared by Waterborne Environmental, Inc., Leesburg, VA for Croplife America, Washington, DC.

Vallotton, N., R.I.L. Eggen, B.I. Escher, J. Krayenbühl and N. Chèvre. 2008. Effect of pulse herbicidal exposure on *Scenedesmus vacuolatus*: A comparison of two photosystem II inhibitors. Environmental Toxicology and Chemistry 27:1399-1407.

Volz, D.C. 2006. Atrazine: Response to EFED Concerning Acceptability of Fish Early Life-Stage Toxicity Test with Sheepshead Minnow (MRID No. 46648203). Unpublished report submitted by Syngenta Crop Protection, Inc., Greensboro, NC. MRID 46952604.

Zar, J.H. 2010. Biostatistical Analysis, 5th Edition. Prentice-Hall, Englewood Cliffs, NJ.

Appendix A
Risk Assessment for Aquatic Receptors

A.1 Chronic Effects Threshold for Freshwater Fish

EPA (2016) selected a chronic exposure study using Japanese medaka (*Oryzias latipes*) (Papoulias et al., 2014) as the basis of their chronic effects metrics for both freshwater and estuarine/marine fish. Papoulias et al. (2014) exposed breeding groups of one male and four females to atrazine in a static renewal system for up to 38 days. Nominal test concentrations were 0.5, 5.0, and 50 µg/L. The authors found reduced egg production at all treatment levels.

The study (Papoulias et al., 2014) was flawed, as EPA noted in its own Data Evaluation Record (DER) (Bryan et al., 2014). The study did not follow a standard guideline, had high intra-treatment variability, particularly in the solvent control treatment, and did not demonstrate a clear concentration-response relationship (Bryan et al., 2014). EPA further highlighted other limitations of the study, including lack of a true negative control treatment, a high female to male ratio (4:1 versus 1:1), no results reported for time zero sampling, low fecundity in the control treatment (9.7 eggs/female/day), and high mortality in the solvent control. The study authors found significant effects to egg production and reproduction at all treatment levels (NOEC <0.5 µg/L), but EPA (2016; Bryan et al., 2014) re-evaluated the study data and determined a NOEC of 5 µg/L and a LOEC of 50 µg/L. In fact, all differences in egg production were within the variability of the dataset, high variability was noted throughout the test, and only weak statistical evidence of an atrazine effect was observed at 50 µg/L (Bryan et al., 2014).

Because of the many flaws in the Papoulias et al. (2014) study, Syngenta sponsored a Good Laboratory Practice (GLP) study on Japanese medaka that followed standard testing protocols (GLP; OCSPP Guideline 890.1350; OECD 229) to provide a higher quality study for use in future risk assessments (Schneider et al., 2015 [MRID 49694001]).

Schneider et al. (2015) exposed Japanese medaka to atrazine under flow-through conditions for 21 days. Nominal exposure concentrations were 0, 0.49, 4.9, and 49 µg a.i./L, which corresponded to mean measured concentrations of <0.125, 0.59, 5.4, and 53 µg a.i./L, respectively. Schneider et al. (2015) found no significant effects on fecundity or fertility at any treatment level. Control fecundity was 40.9 eggs/female/day, compared to 9.7 eggs/female/day in Papoulias et al. (2014). Mean control fertility in Papoulias et al. (2014) was 62%, while mean control fertility in Schneider et al. (2015) was 91.7%. Only the Schneider et al. (2015) study meets the OECD guidelines, which require ≥80% fertility.

Schneider et al. (2015) made several improvements to the study design used by Papoulias et al. (2014) including use of a flow-through exposure system, achieving much higher fecundity in controls, no reliance on solvent, and alignment with recommended guidelines. Therefore, Schneider et al. (2015) offers significantly higher data quality than the Papoulias et al. (2014) study used upon by EPA (2016) in their ERA for atrazine. Schneider et al. (2015) were not able to reproduce the results of Papoulias et al. (2014). In fact, the higher quality study found no treatment-related effects at the test concentrations previously used by Papoulias et al. (2014), further decreasing the scientific credibility of the effects threshold used in the ERA.

EPA also evaluated Schneider et al. (2015) in a DER (Marton et al., 2015). The reviewers determined that the study was scientifically sound and the methods used were generally consistent with OCSPP guideline 890.1350. Marton et al. (2015) agreed with the study authors that no significant treatment-related effects were observed at any test concentration. Therefore, we recommend that EPA re-consider the effects threshold used in their preliminary ERA with the goal of relying on best available data, rather than lower quality data simply because the latter produces a lower threshold.

A.2 Chronic Effects Threshold for Estuarine/Marine Fish

EPA (2016) used the flawed Japanese medaka study summarized above (Papoulias et al., 2014) as a surrogate effects metric for chronic effects to estuarine/marine fish. However, EPA (2016) provided no support or rationale for their choice nor did they provide evidence indicating that freshwater and estuarine/marine fish have similar sensitivities to atrazine. Further, EPA (2016) ignored a chronic marine fish study that is available for sheepshead minnow (Cafarella, 2005 [MRID 46648203]), an estuarine fish species. In their previous 2003 assessment, toxicity data for estuarine/marine fish were used.

Under GLP conditions, Cafarella (2005) exposed fertilized sheepshead minnow eggs from 26-hours post-fertilization to 28 days after hatch to concentrations of atrazine (FL-881692; 97.1% purity) ranging from 200 to 3200 µg /L. Mean measured concentrations were 150, 300, 570, 1100, and 2200 µg /L. Larval length and wet weight were the most sensitive endpoints, resulting in a no observed effects concentration or NOEC of 1100 a.i./L. This effects threshold is over 200 times higher than the freshwater effects threshold from the flawed Japanese medaka study (Papoulias et al., 2014) used by EPA in their preliminary assessment.

EPA previously scored the Cafarella (2005) study as supplemental because it did not fulfill guideline requirements (Volz, 2006 [MRID 46952604]). The flaws highlighted by EPA included: the study only maintained two replicate aquaria, did not assess time to hatch, and the study duration was 28 days post-hatch instead of the recommended 32 days. Syngenta subsequently amended the reported and provided support for re-scoring of the study (Volz, 2006). The issues are addressed below:

- Description of test substance: Provided to EPA in amended report.
- Replication: Current OPPTS Guidelines (850.1400) recommend at least two replicates, with 60 eggs total. Cafarella (2005) had 40 eggs per replicate, and thus 80 eggs per treatment. The guideline requirements were met.
- Duration: OPPTS Guideline 850.1400 clearly states that the study should last 28 days post-hatch for sheepshead minnow. This duration was used in the original study (Cafarella, 2005).
- Reporting of dilution water analysis: Provided to EPA in amended report.
- pH range: According to OPPTS Guideline 850.1400, a pH range of >7.5 to <8.5 is appropriate for marine testing. This is consistent with the pH range of 7.8 to 8.2 measured by Cafarella (2005).
- Time to hatch: Although treatment effects on time to hatch were not directly evaluated to avoid injuring newly hatched fry, percent hatch was determined on Day 5. On Day 5, percent hatch among treatments and controls was not significantly different, indicating that atrazine did not affect hatch.

Based on data provided in the amended report and consistencies between the original study methods and OPPTS guideline 850.1400, this study is appropriate for use in a risk assessment and should have been used by EPA in their atrazine assessment for estuarine and marine fish. For the reasons described above, EPA (2016) had no scientific justification for relying on a poorly conducted freshwater fish study as the basis for the chronic effects threshold for estuarine and marine fish, particularly given the availability of a well-conducted chronic study on sheepshead minnow, an estuarine species.

A.3 Effects Threshold for Aquatic Plants

As an herbicide, plants are expected to be more sensitive to atrazine than other receptors. Therefore, to ensure that atrazine concentrations in watersheds will not cause ecologically-significant effects to aquatic plant communities, EPA developed a community-level level of concern (LOC). The LOC was compared to exposure data to determine which watersheds have atrazine concentrations that could cause adverse effects to aquatic plants.

Over the last several years, EPA has made multiple attempts to define the LOC for community-level effects of atrazine to aquatic plants. These LOCs have become increasingly conservative over time. Except for the most recent LOC of 3.4 µg/L in the preliminary EPA (2016) assessment, the proposed LOCs have been thoroughly reviewed by EPA's own Scientific Advisory Panels (SAP, 2007, 2009, 2012). Notably, none of EPA's proposed LOCs have been formally accepted or endorsed. In fact, the latest SAP (2012) review strongly recommended increasing the proposed LOC of 4-7 µg/L (EPA, 2007) because many of the higher tier mesocosm studies purportedly showing effects at low concentrations were either of unacceptable quality or did not actually cause effects of ecological significance. However, EPA (2016) ignored the advice of the SAP (2012) and the recommendations of other reviewers (e.g., Giddings, 2012; Moore et al., 2015, 2016) by continuing to use poor quality mesocosm study results to derive the lowest LOC that has been proposed to date.

The SAP (2012) recommended evaluating mesocosm studies using a standard set of scoring criteria. The SAP (2009, 2012) also recommended that EPA re-evaluate and re-score all cosm studies where effects were observed at concentrations less than 30 µg/L because of weaknesses in study design and data interpretation (see also Giddings, 2012). The SAP (2012) identified a number of studies that were incorrectly scored by EPA as having effects when in fact, no effects were observed during the studies or the studies were clearly of poor quality. Further, the SAP (2012) requested that the LOC be recalculated once the studies were re-scored.

The results of Giddings (2012), two SAPs (2009, 2012) and Moore et al. (2015, 2016) demonstrate that no statistically and ecologically significant effects have occurred at atrazine concentrations below 30 µg/L. Moore et al. (2015, 2016) also evaluated new mesocosm studies published since the SAP (2012) review (Baxter et al., 2013; Choung et al., 2013; Halstead et al., 2014; Knauer and Hommen, 2012; Murdock and Wetzel, 2012). In these studies, no effects were observed at concentrations less than 30 µg/L. Therefore, EPA's 60-day LOC of 3.4 µg/L is almost an order of magnitude lower than the lowest reliable effects concentrations observed in mesocosm studies, and is overly conservative.

The mode of action of atrazine is reversible upon removal of atrazine exposure at the target site of both terrestrial and aquatic plants (Brain et al., 2012a,b; Brockway et al., 1984; Hughes et al., 1988; Jensen et al., 1977; Jones et al., 1986; Juttner et al., 1995; Klaine et al., 1996; Mohammad et al., 2008, 2010; Moorhead and Kosinski, 1986; Shimabukuro et al., 1970; Stay et al., 1985, 1989; Vallotton et al., 2008). Monitoring data from the Atrazine Ecological Exposure Monitoring Program (AEEMP) have shown that the median duration of concentration peaks greater than 15 µg/L is 2 days (Brain, 2012). Atrazine is likely to enter natural systems as pulses during runoff events. Independent of degradation, water dynamics, flow and dilution would disperse the atrazine away from the point of input and decrease the concentration quite rapidly, particularly in larger flowing water bodies. Decreasing concentration levels would immediately allow for recovery of aquatic communities (Brain, 2012). Therefore, the increasingly conservative LOCs proposed by EPA have been overly protective of aquatic communities and unnecessarily low.

A.4 Aquatic Exposure Assessment

Despite the availability of the comprehensive and scientifically robust AEEMP dataset for atrazine (i.e., 288 site-years of daily or nearly daily data from 70 most vulnerable watersheds between 2004 and 2015), EPA (2016) primarily relied on a highly conservative model, the Surface Water Concentration Calculator (SWCC) to predict atrazine concentrations for a variety of regions and use patterns. The model scenarios were intended to be conservative and represent the 90th percentile most vulnerable sites for first-order streams and static water bodies adjacent to atrazine use areas.

Compared to available monitoring data, SWCC over-predicted peak daily and 60-day average concentrations by as much as 260-fold.

EPA's SWCC and other screening-level models should not be used to make regulatory decisions for atrazine. Unlike most pesticides, a scientifically robust targeted monitoring dataset exists that can be used to estimate atrazine exposure to aquatic organisms. To evaluate specific use patterns, EPA should consider using more refined watershed models such as the Soil Water Assessment Tool (SWAT).

EPA's standard screening-level models are not designed to identify the specific geographical locations where atrazine might truly pose a risk to aquatic organisms, a seemingly more useful approach for decision making. Refined watershed level modeling is a superior approach for such assessments because it provides exposure predictions at a fine geographical resolution with the ability to simultaneously simulate varying site-specific weather, soil, environmental, and cropping conditions within a watershed. Watershed modeling also simulates variation in pesticide application timing, and proximity of treated fields to surface water bodies and riparian areas. Moreover, watershed level modeling simulates flowing and non-flowing water bodies as well as site-specific hydrologic conditions, water body depths and water body geometries. Examples of available watershed models that could have been used in the atrazine risk assessment include the SWAT, the Agricultural Policy EXtension (APEX) model, the Hydrologic Simulation Program-Fortran (HSPF) model and the Pesticide Root Zone Model – RIVerine

Water Quality (PRZM-RIVWQ) model. All of these models, particularly the SWAT model, have undergone validation testing and have been shown to perform well.

Appendix B
Risk Assessment for Terrestrial Plants

For terrestrial plants, EPA (2016) chose effects endpoints from Chetram (1989a,b). Both the seedling emergence and vegetative vigor studies were performed according to GLP and evaluated the effects of atrazine on ten crops: soybean, lettuce, carrot, tomato, cucumber, cabbage, oat, ryegrass, corn, and onion. The Chetram (1989a,b) studies are outdated and did not evaluate recovery. A recovery phase is an important study design component for herbicides such as atrazine that have a reversible mode of action following cessation of exposure. In fact, European Food Safety Authority (EFSA, 2012) guidance recommends that the potential for ecological recovery be integrated into risk assessments for terrestrial plants.

Recently, new seedling emergence (Martin, 2015a [MRID 49639102]) and vegetative vigor (Martin, 2015b [MRID 49639101]) studies were performed using a current product (Atrazine SC; 43.0% a.i.). The new studies followed GLP, OCSPP Guideline 850.4100 and OECD 208. The Martin (2015a,b) studies applied a typical end-use product, which is required for OCSPP 850.4100 guidelines. Conversely, the Chetram (1989a,b) studies applied technical atrazine, which is not what terrestrial plants would be exposed to from spray drift in the field.

The Martin (2015a,b) studies included a recovery phase to determine the long-term effects of atrazine application on terrestrial plants. In the seedling emergence study, Martin (2015a) observed recovery in cabbage and tomato shoot lengths and dry weights. Other species either exhibited no recovery or recovery was not statistically significant.

In the vegetative vigor study, Martin (2015b) applied Atrazine SC to crops. Observations were made at 21 and 42 days after application to determine effects and the potential for recovery. Recovery was observed for all species, except for corn (which experienced no adverse effects) and shoot dry weight for oat.

When evaluating the effects of an herbicide on the terrestrial environment, the potential for recovery must be considered. Agro-ecosystems in dynamic environments are likely to recover from disturbances (e.g., pesticide applications), especially disturbances that mimic historical events (e.g., previous pesticide applications; Denslow, 1985; Rapport et al., 1985; Moore, 1998).

Recent studies with terrestrial plants suggest that tested species generally recover following single and repeated exposures to atrazine at environmentally relevant application rates. Dalton and Boutin (2010) applied atrazine to microcosms and single species to determine the potential for effects and recovery. Nine terrestrial and seven wetland plant species (1 monocot and 15 dicots) found in Eastern Ontario and Western Quebec were evaluated. Short-term experiments were 28 days and long-term experiments spanned 60 and 70 days for terrestrial and wetland microcosms, respectively. AAtrex® 480 (Syngenta Crop Protection; 470.4 g a.i./L) was applied at doses selected to achieve 20 to 80% effect in target species. Some recovery was observed in the long-term microcosms, and effects levels were higher for total microcosm biomass in longer-term microcosms than in the 28-day greenhouse microcosms.

There is no scientific justification for EPA (2016) excluding two high quality terrestrial plant studies that follow standard guidelines and use a current product (i.e., Martin et al., 2015a,b). In addition, it is critical that recovery be considered for herbicides such as atrazine. Herbicides are developed to eradicate unwanted plants. Therefore, it is understandable that spray drift and runoff to non-target areas could cause negative effects to non-target plants. However, if recovery is possible, it could mitigate the initial effects of atrazine and show that non-target plants are able to tolerate higher exposures than assumed by EPA using shorter toxicity tests.

For terrestrial plants, TerrPlant was used to model both ground spray and aerial applications of atrazine. The limitations, assumptions and sources of uncertainty in the TerrPlant model are highlighted below (see Trask et al., 2010a,b for more details).

- *The spray drift component of TerrPlant only considers the application method and does not include additional factors such as wind speed, droplet size and height of pesticide release that may affect the quantity of pesticide moving off the field as spray drift. The no spray buffer distance is based on the application rate observed to cause no effect to the most sensitive non-target terrestrial plant species.*

- *TerrPlant conservatively assumes that runoff occurs at the time of application, an unlikely event given that farmers generally avoid applying pesticides on rainy days or when rain is in the immediate forecast.*

- *Both runoff and spray drift are assumed to be distributed uniformly throughout the non-target area. In reality, there is typically a decrease in the quantities of runoff and spray drift reaching areas of increasing distance from the application area.*

- *TerrPlant assumes that runoff and spray drift reach the non-target area at the same time and that non-target plants exposed to the pesticide residues are in the sensitive, early emergent life stages. Both of these assumptions are conservative.*

- *The fraction of pesticide in runoff is based upon estimates of pesticide solubility. Other environmental fate parameters that would likely affect the fraction of pesticide in runoff, such as K_d of the pesticide, are not considered.*

- *TerrPlant assumes that the method of exposure in standard plant toxicity tests (i.e., an overhead spray that provides even coverage of the foliage or soil surface) is analogous to what off-field non-target plants experience in the field. In reality, off-field plants experience spray drift as a fraction of the applied rate moving primarily laterally away from the application area. When surrounding vegetation is present, there may be considerable interception of drift very close to the treated field such that much reduced drift amounts reach plants downwind of the treated area. A recent field study conducted by Brain et al. (2017) with the herbicide mesotrione demonstrated that simulations of real-world exposure lead to much reduced estimates of the distance to no effects from treated fields. This and other similar studies indicate the conservativeness of EPA's assessment approach for terrestrial plants.*

Appendix C
Risk Assessments for Birds and Mammals

C.1 Effects Thresholds for Birds and Mammals

EPA (2016) selected an acute LD50 of 783 mg a.i./kg bw and a slope of 2.263 to estimate acute risks to birds. Although the original study reported an oral LD50 of 940 mg a.i./kg bw with a corresponding slope of 2.263 (Fink, 1976 [MRID 00024721]), the LD50 used by EPA (2016) was recalculated from raw data provided in the original study. EPA (2016) re-analyzed the raw data using probit analysis, resulting in an LD50 of 783 mg a.i./kg bw and a probit slope of 3.836. However, when generating effects metrics for the preliminary ERA, EPA (2016) paired the recalculated LD50 with the probit slope reported in the original study. This is incorrect. The correct LD50 and slope should be 783 mg a.i./kg bw and 3.836, respectively.

To estimate chronic risks to birds, EPA (2016) selected a NOEC of <75 mg a.i./kg diet for hatchling weight and LOEC of 225 mg a.i./kg diet for egg production and food consumption (Pedersen and DuCharme, 1992 [MRID 42547101]). A number of issues have been identified with the use of these endpoints, and include the following:

- When analyzing the raw data, the dead female in the 225 mg a.i./kg diet group should have been excluded from analyses for reproduction, so as not to skew the results.
- Data for egg production were analyzed using the William's Multiple Comparison Test, which is only acceptable for continuous data (Piegorsch and Bailer, 1997). It would have been more appropriate to use the Dunnett's test (Zar, 2010). Use of the Dunnett's test would have resulted in a NOEC of 225 mg a.i./kg diet and LOEC of 625 mg a.i./kg diet. When calculated with the appropriate statistical analyses, the endpoints are at least three-fold higher.
- The NOEC selected by EPA (2016) for hatchling weight is likely the result of inherent variability in hatchling weights and not ecologically significant. In fact, the original study authors (Pedersen and DuCharme, 1992 [MRID 42547101]) noted that the lower hatchling weight values observed on day 1 were likely attributable to normal biological variation not atrazine exposure. Statistical analyses showed large variations among birds within treatments, including within controls. Therefore, the statistical significance identified by EPA (2016) is likely trivial from an ecological standpoint and a more appropriate endpoint showing clear a concentration-response relationship should be selected.
- Estimates of food consumption were calculated incorrectly by EPA (2016). Food consumption depends on a number of factors, particularly body weight. Therefore, food consumption is generally normalized to body weight. However, not only did EPA (2016) fail to normalize the data, but they also included data points for dead birds and capped the food limit at 4600 g per cage per week for reasons unstated. This led to inaccurate food consumption calculations and artificial censoring of the data. If the raw data are recalculated to normalize for body weight and exclude dead individuals, the NOEL is ≥675 mg a.i./kg diet.

For mammals, EPA (2016) selected a chronic NOEL of 3.7 mg a.i./kg bw/d to estimate long-term effects. EPA (2016) stated that their endpoint was calculated from a NOEC of 50 mg a.i./kg diet reported by Mainiero et al. (1987 [MRID 40431303]). However, the selection of the chronic

NOEL was not discussed anywhere in the assessment and we could not replicate the calculations, despite access to the raw data. Therefore, the accuracy of the NOEL is unknown.

C.2 Exposure and Risk Assessments for Birds and Mammals

EPA (2016) used T-REX version 1.5.2 in their screening-level assessment to estimate risks to birds and mammals potentially exposed to atrazine. However, T-REX relies on a number of highly conservative assumptions to estimate risk, including the following:

- One concentration normalized to application rate (i.e., residue unit dose) is used for all arthropods, despite varying residues based on location and behavior of the arthropods. For example, flying insects are likely to have much lower residues than crop-dwelling insects. For realistic dietary exposure estimates, residues should be quantified for different invertebrate groups using available pesticide data.
- The model assumes upper bound or maximum concentrations in food items for the entire duration of exposure immediately after application.
- The model assumes that wildlife obtain 100% of their daily diet from treated locations immediately after application, whereas in reality most species forage on and off the field and will vacate the area during application, only returning after the disturbance has ceased.
- The model does not allow for analysis of mixed diets and instead considers only homogeneous diets, several of which are implausible (e.g., small birds only consuming small or long grass or broadleaf foliage).
- Food ingestion rate is estimated in T-REX with allometric equations derived from Nagy (1987). However, more up-to-date equations are currently available (e.g., Nagy et al., 1999). Further, the calculations should be based on field metabolic rates, gross energies of dietary items, and assimilation efficiencies of the dietary items consumed. The latter approach accounts for the differing amounts of energy available from different food items.

In its assessment, EPA (2016) used a default 35-day foliar dissipation half-life for atrazine, despite acknowledging appropriate dissipation studies for atrazine. These studies reported a maximum observed half-life of 17 days. EPA (2012) guidance directs risk assessors to estimate a 90% upper confidence limit on a mean half-life when three or more half-lives are available. EPA (2016) failed to follow their own guidance, citing degradates of atrazine as the primary reason. However, no data were presented by EPA (2016) that support a longer half-life for atrazine or that describe the nature of residues on foliage. Further, a field study investigating atrazine residues on grain sorghum supports foliar dissipation half-lives between four and five days for “equivalently toxic” residues (Selman, 1995).

A refined risk assessment for birds was conducted using EPA’s TIM and MCnest models for atrazine. However, there are numerous issues with their use in the preliminary assessment. Many of the input values chosen by EPA (2016) did not follow their own guidance or were not appropriately determined from studies and the models incorporated a number of overly conservative assumptions that are inappropriate for a refined assessment. Some of the issues are described below and further reviewed by Olson et al. (2016):

The Assumptions in the ERA were Not Supported by Best Available Data

- EPA used a dermal effects ratio for birds that relied on data for organophosphates and carbamates, the applicability of which to atrazine are unknown. As a result of the effects ratio, 80% of the predicted exposure was contributed by dermal contact. However, birds have feathers that will intercept and significantly decrease exposure, most birds will leave a treated area during application, and atrazine becomes rainfast within one to two hours. Therefore, contact exposure is likely to be much lower.
- A dermal effects ratio for atrazine and related chemicals (i.e., triazines) is much more applicable. For example, an effects ratio produced from data for triazine compounds reduces the estimated mortality of vesper sparrows by two thirds.
- EPA did not incorporate the vast amount of field data showing the fraction of time birds spend on treated fields. Fitting distributions to the available data, rather than using worst case scenarios, is a more applicable approach for estimating the potential for exposure.
- EPA assumed a default foliar half-life of 35 days, despite a number of field studies demonstrating a half-life of 17 days or less for atrazine. Use of the default half-life was not supported and did not follow EPA's own guidance.

The ERA Contained Significant Errors that Impacted Risk Estimates

- To estimate acute risks to birds, EPA used an LD50 and slope that were calculated using different methods. When the LD50 was paired with the appropriate slope, mortality estimates were reduced by almost 50%.
- To estimate chronic risks to birds, EPA made several errors in the selection and use of statistical analyzes. When the correct statistics are used, the NOEC increases from <75 mg a.i./kg-diet to 225 mg a.i./kg-diet. This has a significant impact on chronic risk estimates.

The ERA was Hyper-Conservative

- EPA selected an arbitrary hourly fraction of pesticide retained rather than calculating one from available data. The calculated value is lower, which decreases the potential for toxicity over long-term or multiple exposures.
- Instead of using average exposure values over the duration required to elicit reproductive effects in birds, EPA used one-day peak exposure values. This greatly increased the exposure estimates.
- EPA assumed complete nest failure when exposure exceeded the no observed effect concentration (NOEC), despite studies showing only a 24% reduction in clutch size at the LOEC and modeling showing no impacts on reproductive success when the clutch size is lowered by 22%.

The issues summarized above led to significant overestimates of acute and chronic risks for birds and mammals potentially exposed to atrazine. Using the vesper sparrow as an example, EPA's conservative assumptions predicted 21.8% mortality in treated corn fields. However, this is not supported by 50 years of incident data or field studies. When best available data are applied, negligible risks are predicted for birds and mammals as described in Olson et al. (2016).

Finally, no other lines of evidence were discussed by EPA (2016) to validate their conclusions. Some additional information should have included:

- The lack of incident reports for birds and mammals associated with atrazine exposure despite many decades of widespread use.
- The results of breeding bird surveys that indicate that many bird species that forage in corn have increased in abundance in areas where atrazine is intensively used.
- Potential avoidance, as is often observed with other pesticides at high doses.
- The implications of their assessment being based on sprayed vegetation rather than sprayed soil, which is the predominant timing of application for atrazine in corn.

Examples of overestimation of risk by EPA models and assessments:
EPA Atrazine Ecological Risk Assessment for Atrazine

- Atrazine is currently undergoing Registration Review by EPA, the normal 15-year re-registration process required for all pesticides.
- A draft ecological risk assessment was posted by EPA for public comment in June of 2016 (note that this document was initially posted and removed by EPA in April 2016 without explanation or public comment).

- The preliminary assessment contains a number of determinations based on unsound science that, if uncorrected, could have a significant impact on the ultimate registration review decision and atrazine's use and availability for growers. Moreover, if the same approach were adopted for ecological risk assessments for other herbicides, this would impact the availability of all or virtually all major herbicides.

- This assessment proposes an aquatic level of concern (LOC) that uses poor quality studies that drives the number far below biological impacts. This preliminary assessment disregarded recommendations made by multiple Science Advisory Panels (SAPs; 2007, 2009 and 2012) concerning the setting of an aquatic level of concern. The aquatic level of concern (LOC) proposed in the preliminary assessment is based on a dataset containing numerous fundamentally flawed, inconsistent and misinterpreted micro/mesocosm (cosm) studies, contrary to the recommendations of multiple SAPs to correct these errors.
    - The assessment acknowledges the methodology utilized to derived the LOC is highly sensitive to scoring effects in the cosm dataset
    - The assessment disregarded consistent recommendations of multiple SAPs and retained data points from studies with obvious errors and weaknesses
    - Retaining these data points results in a LOC that is artificially low and not biologically relevant
    - If the recommendations of the 2012 SAP are followed, the LOC is >20 ppb as a 60-day rolling average, at least 6-fold higher than the value referenced in EFED's document

- The 2012 SAP overwhelmingly and strongly recommended that additional focused cosm studies are needed to specifically address the durations of exposure expected at environmentally relevant concentrations. A definitive state-of-the art cosm study based on the Panel's design suggestions (including natural conditions, size, design reflecting water body type , duration, spectrum of plant diversity, source of algal re-colonization and replicated treatments) was conducted at the Baylor University aquatic stream facility by a team led by Professor Ryan King. This cosm study indicated no significant effects on primary producer community structure and only slight transient (recoverable) effects on most other functional endpoints. The preliminary assessment mischaracterized, misinterpreted and inappropriately dismissed this benchmark study. This is the same research facility and a similar protocol that was used by Dr. King to resolve a long standing dispute between Arkansas and Oklahoma over defining a phosphorus standard through a high quality study commissioned by Oklahoma Attorney General Scott Pruitt, current Administrator of the U.S. EPA.

- <u>The preliminary assessment uses models that overestimate the estimated environmental concentrations of atrazine in water.</u> Robust and comprehensive monitoring data are available, for example from the Atrazine Ecological Monitoring Program (AEMP; 2004-2015) which has generated 239 site-years of daily or near-daily monitored data from 70 watersheds, representing the upper 20th centile most vulnerable agricultural watersheds in the Midwestern and Southern U.S. in terms of susceptibility to potential runoff and agrichemical losses. This dataset represents the high-end scenarios for potential exposure to atrazine and is therefore highly protective with minimal uncertainty and negates the need for conventional regulatory modelling that relies on theoretical conservative assumptions.
    - The AEMP provided a 90th centile 60-day rolling average is ~14 ppb.
        - Considering all available monitoring data from multiple state, university and government programs, the 90th centile 60-day rolling average is ~8 ppb.
    - Instead of relying on these real world monitoring data, EPA relied on modeling to estimate atrazine the 90th centile 60-day rolling exposures of up to 111 ppb for corn use.
    - Previous comprehensive EPA assessment from 2003 reregistration modeled an estimated environmental concentration range from 26 – 36 ppb for the 90th centile 60-day rolling average.
    - Even as recent as this month, the principle EPA modelers showed modeled individual values of greater than 7000 ppb, as shown in attachment 1.
    - Average atrazine use rates over this time have remained flat or decreased, as shown in attachment 2. The changes in values result from over-estimation of EPA models.

- <u>This assessment inappropriately lowers the endpoints for assessment of fish toxicity.</u> The chronic fish No Effect Concentration (NOEC) identified in the assessment (5.0 μg/L) was derived from a non-Good Laboratory Practices (non-GLP) published Japanese medaka study that is clearly an outlier when all fish studies, including EPA-conducted fish studies, are considered; a quantitative weight of evidence approach should be used to evaluate the quality and relevance of all chronic fish studies.
    - This non-GLP study followed a non-validated design predating standardization of EPA and OECD guidelines and exhibited numerous weakness and significant deviations from the standard guideline, including a non-recommended male/female ratio which has been shown to reduce egg production.
    - A more recent guideline compliant, GLP study found no effects on medaka egg production, and no statistically significant or dose-response related effects on reproduction at treatment levels up to 10X higher than the NOEC identified in the preliminary assessment.

- <u>The preliminary assessment's stated position on potential effects on amphibians represents a reversal of its positions of the last 10+ years and overall conclusions of SAPs held in 2003, 2007 and 2012.</u> The preliminary assessment relies on studies previously deemed by the EPA to be of low quality, studies that deviate from the EPA requirements for standardized protocols and under GLP, and published literature for which study methods and data transparency are insufficient. In some cases the EPA is relying on studies which they previously stated could not be evaluated due to uncertainties and lack of data transparency.

- The preliminary assessment inexplicably lowered the chronic avian (mallard reproduction) No Observed Adverse Effects Concentration (NOAEC) (from 225 to 75 mg/kg-diet). The 225 mg/kg NOAEC was historically supported by the Agency in previous risk assessments and identified in the study Data Evaluation Record (DER); this change in conjunction with highly conservative and unrealistic assumptions used to parameterize higher-tier models such as TIM and MCnest resulted in uncorroborated and severely exaggerated effect predictions for bird species.

- The preliminary document incorrectly characterizes potential impacts on mammals: The assessment utilized unrealistic, unrefined and hyper-conservative screening-level exposure estimates (including continuous consumption of a singular food item containing maximum residues) to reach a conclusion of risk for mammalian species chronically exposed to atrazine even though the assumptions are implausible and completely improbable.

- The preliminary assessment misinterpreted and mischaracterized guideline-specific terrestrial plant studies (vegetative vigor and seedling emergence). These studies were recently conducted with the current formulation to evaluate recovery and update studies conducted over a decade earlier. These updated studies clearly demonstrated reduced seedling emergence effects and recovery for most species affected for vegetative vigor.

Attachment 1 –

REREGISTRATION ELIGIBILITY SCIENCE CHAPTER FOR ATRAZINE ENVIRONMENTAL FATE AND EFFECTS CHAPTER, January 28, 2003, page 35

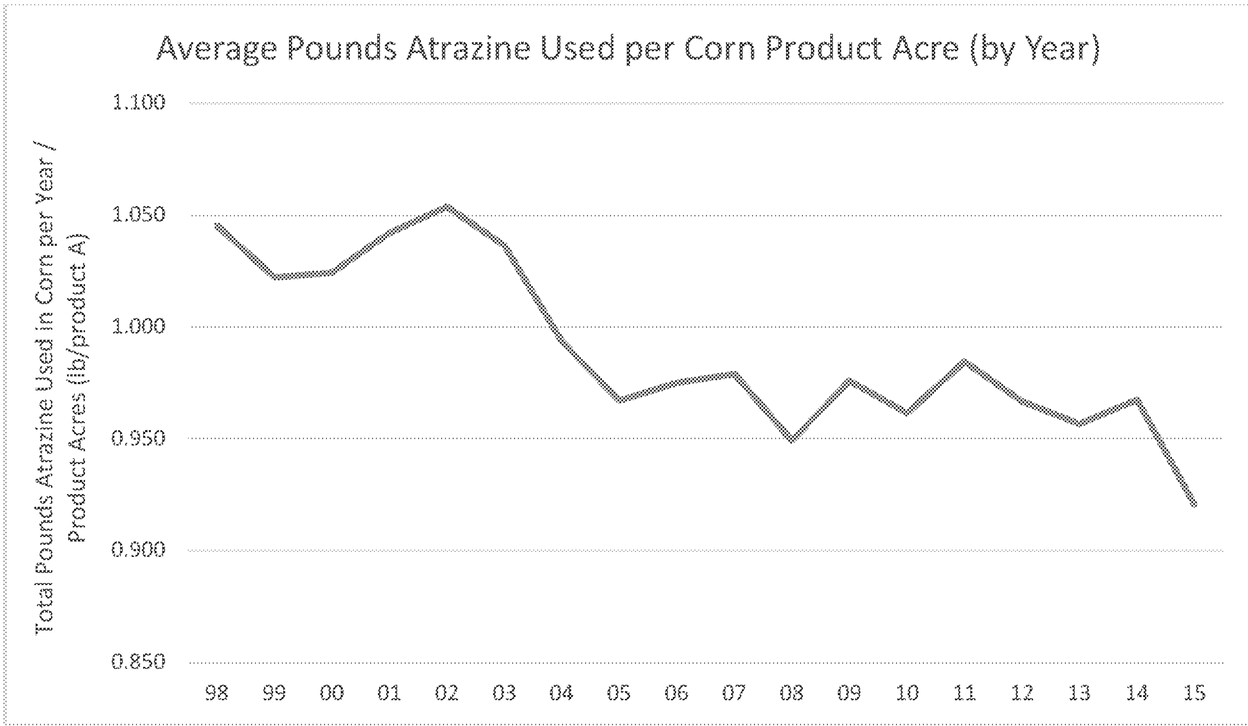
Treated Crop	Scenario	Atrazine EEC Values ppb (µg/L)				
		Peak Conc.	96-hour Average	21-day Average	60-day Average	90-day Average
Sugarcane (4.0 lb ai/a)	1[1]	205	204	202	198	194
	2[2]	167.6	166.7	163.8	157.8	152.9
	3[3]	207	206	203	195	189
	4[4]	200.6	199.6	196.7	189.8	183.8
Corn (2.0 lb ai/a)	1	38.2	38.0	37.2	35.5	34.2
	2	29.7	29.4	28.4	26.6	25.1
	3	35.3	35.0	33.8	31.6	30.0
Sorghum (2.0 lb ai/a)	1	72.7	72.3	70.6	67.7	65.9
	2	47.9	47.4	46.0	42.7	40.4
	3	58.4	57.8	56.0	52.0	49.2

[1] Orignial environmental fate inputs found in Agency's Science Chapter;
[2] Based on Syngenta's suggested environmental fate inputs;
[3] Based on Syngenta's suggested environmental fate inputs;
[4] Ground application of 99% efficiency and 1% off-target spray drift for sugarcane use with Syngenta's suggested input values.

Jim Hetrick slides, April 2017:

Monitoring Program	Monitoring Program Design	Site Percentile				
		50th	75th	90th	95th	99th
		µg/L				
NWIS	Non-Targeted Low Sample Frequency	3.4	30.8	227	750.3	7059.7
STORET		12.0	51.1	188.7	412.4	1787.7
AEEMP	Targeted High Sample Frequency	52.7	105.1	195.46	283.4	568.8
PWC Model	Corn Split App 2.5 lbs/A	67.5	91.5	120.3	141.7	192.7

Attachment 2 –



APR 0 2 2015

To: Registrants of Nitroguanidine Neonicotinoid Products

Subject: New and Pending Submissions for Outdoor Uses of Products Containing the Nitroguanidine Neonicotinoids Imidacloprid, Dinotefuran, Clothianidin or Thiamethoxam

Dear Registrant:

You are receiving this letter because your company has submitted an application for a new outdoor use and/or holds registrations for products containing imidacloprid, dinotefuran, clothianidin or thiamethoxam that have use directions for outdoor application.

I. Background

EPA is committed to developing a robust and science-based understanding of the implications of the use of nitroguanidine neonicotinoid pesticides. To that end, as you know, EPA has required that the registrants of these pesticides submit data (pollinator hazard and exposure) to inform this issue. EPA will specifically receive data on potential impacts of a pesticide on developing bees (larvae, pupae), oral exposures and data which examine potential adverse effects on honey bee colonies. These data are being generated now under the Registration Review program for this class of pesticides. The Registration Review schedule for these chemicals has been accelerated.

Separately, the Agency is also in receipt of a number of new use registration applications for these same pesticides. In the absence of the new studies, the Agency does not believe it has sufficient information to support a determination that new outdoor uses will meet the FIFRA registration standard for the pesticides imidacloprid, clothianidin, thiamethoxam and dinotefuran. EPA believes that until the data on pollinator health have been received and appropriate risk assessments completed, it is unlikely to be in a position to determine that such uses would avoid "unreasonable adverse effects on the environment" as required under FIFRA to support further regulatory expansion of these pesticides in outdoor settings. Affected actions include:

- New or Modified Uses (including crop group expansion requests)
- Changes to Existing Use Patterns (ex. adding aerial or soil application or significant formulation changes)
- Experimental Use Permits
- New Special Local Needs Registrations

Accordingly, until EPA receives and assesses the outstanding pollinator health data, EPA is unlikely to be in a position to grant any submitted registration action that involves a request with one of these pesticides for a new outdoor use or use expansion. However, EPA acknowledges that the merits of individual actions may differ and that, for example, a pest management need could arise during this interim period that would support the issuance of an emergency exemption request under FIFRA section 18. EPA will assess such requests by relying on currently available information and risk mitigation strategies. This announcement does not preclude the approval of products that are identical or substantially similar to existing uses (i.e., "me-too" products).

II. Products affected

This letter applies to any future submissions or submissions that are currently under review in the Agency for outdoor use(s) (excluding "me-too applications/products and FIFRA section 18 submissions that are consistent with EPA regulations) for pending and existing products containing the active ingredients imidacloprid, thiamethoxam, clothianidin, or dinotefuran.

III. What you need to do

For your registered nitroguanidine neonicotinoid products with a pending new outdoor use/expansion and/or any pending nitroguanidine neonicotinoid registrations with a new outdoor use, EPA requests that registrants withdraw or modify those impacted actions (where applicable by deleting the outdoor new use) by April 30, 2015. If your company does not have any pending outdoor use applications (excluding "me-too applications/products or FIFRA section 18 submissions) then no action is needed.

A. Address

For impacted actions that can be modified by deleting the pending outdoor use, you may send the revised cover letter and CD/DVD containing the revised label(s) by courier service to the Document Processing Desk address listed below by April 30, 2015.

Personal/Courier Service Deliveries (e.g., FedEx)

The following address should be used for resubmissions that are hand-carried or sent by courier service Monday through Friday, from 8:00 AM to 4:30 PM, excluding Federal holidays.

Document Processing Desk
Office of Pesticide Programs (7505P)
U.S. Environmental Protection Agency
Room S-4900, One Potomac Yard
2777 South Crystal Drive
Arlington, VA 22202-4501
ATTENTION: Resubmission/Revision to a Nitroguanidine Neonicotinoid

B. Email withdrawal request to Product Manger

For pending affected actions with the EPA, it is requested that the registrants email the withdrawal request directly to the product's Product Manager (PM) by April 30, 2015.

For imidacloprid, clothianidin and thiamethoxam -- please direct your email to Venus Eagle, PM01: eagle.venus@epa.gov. For dinotefuran -- please direct your email resubmission to Mark Suarez, PM07: suarez.mark@epa.gov.

EPA considers the completion of the new pollinator risk assessments for these chemicals to be an agency priority. Following that review, the agency expects to be in a position to make determinations under FIFRA Section 3 for new outdoor use applications for products containing imidacloprid, dinotefuran, clothianidin and thiamethoxam. Updates to this position, and EPA's assessments will be added to the Registration Review docket for each chemical. If you have any questions about this letter, please feel free to call Susan Lewis at (703) 305-8009 or Meredith Laws at (703) 308-7038.

Sincerely,

By [signature], Acting

Jack Housenger, Director
Office of Pesticide Programs

Message

From: Tim Lust [tim@sorghumgrowers.com]
Sent: 5/5/2017 11:10:19 AM
To: Schwab, Justin [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=eed0f609c0944cc2bbdb05df3a10aadb-Schwab, Jus]
CC: Bernadette Bern Rappold, Esq. [rappoldb@gtlaw.com]; Joe Bischoff [JBischoff@cgagroup.com]
Subject: Re: Sorghum Oil Update

Thanks. We will do so on both items. Tim

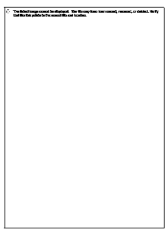
On May 5, 2017, at 5:50 AM, Schwab, Justin <schwab.justin@epa.gov> wrote:

> Tim,
>
> Thank you for this message. We will take the appropriate steps to make sure the process works properly here and that all avenues are considered in line with our authority and prior practice.
>
> And to the extent that you have not already, please send in electronic form both the original briefing materials you brought and any additional citations to authority and case studies of how you feel the process can and has worked in previous cases, to better highlight the options that you consider as available but not being satisfactorily explored in your case.
>
> On chemicals, when you do reach out on that, please copy Nancy Beck (beck.nancy@epa.gov), a new arrival to our team who has joined OCSPP.
>
> Best,
>
> Justin
>
> Sent from my iPhone
>
> On May 5, 2017, at 12:37 AM, Tim Lust <tim@sorghumgrowers.com> wrote:
>
>> Justin,
>>
>> Thank you again for your time last week. I need to update you on the sorghum oil pathway. We had a discussion with EPA staffers Sharyn Lie and Aaron Levy (both are OTAQ staff) on Thursday on yet one last technical question on the value of DDG without oil that we answered for the 4th time. I actually got Aaron Levy to admit that oil increased the score on corn so it is not an issue with sorghum as sorghum already had a better score than corn and that our email should be the last technical item needed. When we ask about the approval process Sharyn went political and said first it was a new feedstock so it had to go through rule making. Then she said that executive order 13771 said no new rules unless two are removed...so who knows how long. Our attorney does not believe that executive order 13771 applies to this as it doesn't cost anything when it is approved. Sharyn didn't mention the executive order on energy independence which should help get this approved even faster.

The other option mention by EPA staff was a facility specific approach that would still require a federal register notice and a comment period as was required by the RFS. If there were not negative comments then it could move forward more quickly but under either approach we were looking at 1.5 to 2 years for approval. I ask about approval by letter and she said no because it's a new feedstock. This goes again what EPA staff have told us in the past that this could be approved by letter and it did not have to be considered a new feedstock. This goes totally against what was done on fiber in the legal example that we provided you where all grain fibers were approved as part of the July 2014 RFS pathways II rule (I have included this below). The rule identified corn kernel fiber as a crop residue feedstock and acknowledged the similarity between corn kernel fiber and other grain kernel fibers.

"The impacts of fiber on the digestion of ruminants, swine, and poultry are extremely similar, regardless of what grain that fiber came from, because all grain fiber is virtually 100 percent cellulosic. Therefore, we are confident that diverting that fiber to a fuel production stream would have similarly insignificant market and other GHG impacts to those of corn kernel fiber . . . ." Environmental Protection Agency; Regulation of Fuels and Fuel Additives: RFS Pathways II, and Technical Amendments to the RFS Standards and E15 Misfueling Mitigation Requirements, 79 Fed. Reg. 42,150 (July 18, 2014).

Eighteen months to two years is totally unacceptable to our industry and we need to find a way to approve this in a more simple manner. Perhaps you can reach out to Chris Grundler, Director of OTAQ and find another way to approve this quicker. Thanks for your leadership and help. I will provide you examples on the chemical side in a separate email next week. Regards, Tim



Tim Lust
Chief Executive Director
Ex. 6 office
cell
sorghumgrowers.com
Sorghum: The Smart Choice.

Message

From: rappoldb@gtlaw.com [rappoldb@gtlaw.com]
Sent: 4/29/2017 2:19:06 PM
To: Schwab, Justin [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=eed0f609c0944cc2bbdb05df3a10aadb-Schwab, Jus]
CC: tim@sorghumgrowers.com; john@sorghumgrowers.com; chris@sorghumgrowers.com; JBischoff@cgagroup.com; dohales@gtlaw.com
Subject: Re: [SPAM] Sorghum Oil Contacts - Thank you

Justin -

It's nice to hear your cybervoice.

I saw that you had joined the agency. Congratulations! I hope you are enjoying it. The scope of the work there is breathtaking at times.

Thank you for the well wishes Ex. 6
Ex. 6

You've met the folks from NSP so you know how incredibly knowledgeable they are. But if you need us to track down any legal issues quickly (and before I am discharged from hospital), I invite you to reach out to my colleague, Sonali Dohale, copied above.

Sonali knows the RFS -- and is a delightful human to boot. She can be reached by phone at Ex. 6

Thanks in advance.

- Bernadette

PS -Say hi to Phil for me if you see him.

Sent from my iPhone

> On Apr 29, 2017, at 5:49 AM, Schwab, Justin <schwab.justin@epa.gov> wrote:
>
> Tim,
>
> It was a pleasure to meet you and the others. I have met Bernadette once before and am sorry to hear of
Ex. 6
>
> I will look into this internally and follow up quickly with any more questions I may have. At some point soon we should have a call with the right people on your team and at EPA. We want to make sure this process works properly for all applicants and for the correct administration of the program.
>
> Best,
>
> Justin
>
> Sent from my iPhone
>
>> On Apr 28, 2017, at 10:39 PM, "tim@sorghumgrowers.com" <tim@sorghumgrowers.com> wrote:
>>
>> Justin,
>>
>> Thank you for meeting with us today and we look forward to working with you to get final approval of the sorghum oil pathway.
>> I have copied our legal and technical team on this document.
>> Bernadette Rappold is our legal lead and she spent 2001-2013 as an attorney at EPA. Unfortunately,
knows a lot about the legal aspects and can coordinate with Bernadette's colleges at Greenberg Traurig next week if needed. Many times these issues seem to cross over so if we need to have a conference call to get you more information we certainly will anytime at your convenience. This is priority for us so you pick a time and we will make it work.
>>
>> You can reach any of us by email above or John Duff on his cell at Ex. 6.
>> You can reach me on my cell at Ex. 6
>> Our office is Ex. 6 Joe Bischoff and I will follow up with you separately on the chemical issues we discussed. Thank you again for your service.
>> Regards, Tim
>>

Message

From: John Duff [john@sorghumgrowers.com]
Sent: 5/9/2017 7:36:49 PM
To: Schwab, Justin [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=eed0f609c0944cc2bbdb05df3a10aadb-Schwab, Jus]
CC: Tim Lust [tim@sorghumgrowers.com]; Chris Cogburn [chris@sorghumgrowers.com]; Bernadette Bern Rappold, Esq. [rappoldb@gtlaw.com]; dohales@gtlaw.com
Subject: Re: Sorghum Oil Update
Attachments: Grain Sorghum Oil Pathway Petition (2).pdf; NSP Responses to EPA Questions on Sorghum Oil Petition (1).pdf; NSP Responses to EPA Questions April 24 (4).pdf; 373478145_v 1_RFS approvals Fed Reg July 2014 (1).PDF

Justin,

This email includes all the information relevant to the sorghum oil pathway process. The email includes a large amount of information, so I have grouped similar pieces of information and included **bold headings** and brief *italicized summaries* of each group for ease of reference.

Applicable Executive Orders

The provisions of Executive Order 13771 requiring two regulations be eliminated for every one issued do not apply given approving sorghum oil is a permitting action that imposes no compliance cost. Furthermore, this Order as well as EO 13783 demonstrate intent by the Administration to streamline the regulatory process and remove regulatory obstacles for businesses.

On our May 4 phone call with EPA staff, Sharyn Lie stated Executive Order 13771 would preclude a straightforward rulemaking (or similar approval) given it would require two regulations to be eliminated as well. This requirement is not applicable in this case given approving sorghum oil as a biodiesel feedstock does not increase compliance costs but rather functions as a permit for the petitioners to engage in a business activity. Subjecting our petition for approval to EO 13771 would undermine the intent of the EO, which was to reduce unnecessary costs of regulatory compliance.

The Order states in section 1: "It is the policy of the executive branch to be prudent and financially responsible in the expenditure of funds, from both public and private sources." This demonstrates an intent for the process of approving new regulations to be streamlined. An expeditious approval of sorghum oil as a biodiesel feedstock would save significant taxpayer resources and assist U.S. companies subject to a renewable volume obligation with compliance. In addition, we believe our proposed pathway is so similar to existing pathways that approval by letter, rather than rulemaking (as EPA has done in the past), is appropriate.

Similarly, section 1(c) of Executive Order 13783 states:

> "Accordingly, it is the policy of the United States that executive departments and agencies (agencies) immediately review existing regulations that potentially burden the development or use of domestically produced energy resources and appropriately suspend, revise, or rescind those that unduly burden the development of domestic energy resources beyond the degree necessary to protect the public interest or otherwise comply with the law."

In section 2, the Order further directs:

> “The heads of agencies shall review all existing regulations, orders, guidance documents, policies, and any other similar agency actions (collectively, agency actions) that potentially burden the development or use of domestically produced energy resources, with particular attention to oil, natural gas, coal, and nuclear energy resources.”

It continues by defining "burden" in section 2(b):

> "For purposes of this order, 'burden' means to unnecessarily obstruct, delay, curtail, or otherwise impose significant costs on the siting, permitting, production, utilization, transmission, or delivery of energy resources."

Taken together, these sections demonstrate a desire by the Administration to remove regulatory obstacles to greater energy production. When conducting its review under EO 13783, we suggest the EPA examine ways to reduce the burden on renewable fuels producers. As described below, our lengthy journey to obtain a permit for a much-needed domestic energy source is a perfect example of the kind of burden the Administration seeks to eliminate.

Pathway petition and related documents sent to EPA staff

We have submitted three documents to EPA staff totaling 325 pages. The original petition was submitted in July 2016, and follow-up submissions answering staff questions were sent in January 2017 and April 2017. We also sent a follow-up answer to Aaron Levy on May 4. He assured us the question we answered with this email would be the last in this process.

The first three attachments constitute our submissions to EPA staff. The first is the original petition submitted in July 2016. The second includes our answers to their first round of questions submitted in January 2017. The third includes our answers to their second round of questions submitted in April 2017.

We answered their third round of questions on May 4 with the following email to Aaron Levy, who assured us via phone this would be all staff needs to finish the pathway. On the questions of a) why we are unable to provide separate market data for sorghum DDGS with oil and sorghum DDGS without oil and b) why nutritionist Ryan Mass stated cattle feeders pay less for de-oiled DDGS:

> "Per our discussion, these two statements are not contradictory. First, on the question of marketing sorghum DDGS with and without oil, the two products are not physically separated and sold as such by the ethanol producer. An ethanol producer deploying oil extraction for the first time will not change anything with regard to storing or selling the DDGS.

Second, on the question about Dr. Mass's statement, he is correct in that cattle feeders do pay less for DDGS without oil. However, he also emphasizes the dynamic nature of feed markets. This applies to all feed ingredients as these are commodity markets and thus change on a minute-by-minute basis. Therefore, feed buyers do pay different prices for DDGS depending on market conditions for a multitude of ingredients.

For example, local supply and demand of soybean oil often has a significantly larger impact on the price and needed quantity of oil in DDGS than the oil content in DDGS itself. Other key prices in this calculation are the domestic and international supply and demand factors affecting energy as well as local availability of other energy sources. Prices of other ingredients, such as protein and starch, also exert influence. This holds for both corn and sorghum DDGS as the change in composition from sorghum DDGS with oil to sorghum DDGS without oil is the same as the change in composition from corn DDGS with oil to corn DDGS without oil.

As Dr. Mass noted, species other than beef cattle (e.g., poultry, swine and dairy cattle) in many cases perform better on de-oiled DDGS. And, in the case of beef cattle, there is still a large amount of oil left to meet the animals' needs. Furthermore, as stated above, feed markets are dynamic and complex, and feed buyers continuously change the price they are willing to pay based on a number of factors. This is the same whether the ingredient in question is sorghum DDGS or corn DDGS."

Modeling

No new modeling is required as extensive modeling has already taken place for related feedstocks and processes. Adding oil extraction means sorghum ethanol producers should achieve a footprint reduction of approximately 35-40%. This is because a) adding oil extraction improves the environmental footprint and b) sorghum ethanol has a better footprint than corn ethanol.

As Aaron Levy verified via phone, adding oil extraction to an ethanol production facility actually improves the environmental footprint of the ethanol produced from the de-oiled grain (keep in mind a smaller footprint means a higher "score"). This is important as EPA staff is particularly interested in ensuring nothing related to the oil extraction process will adversely impact the footprint of the ethanol produced from the de-oiled grain.

Per section V.C. of the RFS2 final rule:

"Based on the above, corn ethanol facilities using natural gas or biomass as the process energy source will meet the applicable 20% GHG performance threshold if it either also uses at least two of the technologies Table V.C–6 or one of the technologies in Table V.C–6 but marketing at least 35% of its DGS as wet. Alternatively, a facility using none of the advanced technologies listed in Table V.C–6 will qualify as producing ethanol meeting the 20% performance threshold if it sells at least 50% of its DGS prior to drying."

Here is the table to which the passage refers:

TABLE V.C–6—MODELED ADVANCED TECHNOLOGIES
Corn oil fractionation
Corn oil extraction
Membrane separation
Raw starch hydrolysis
Combined heat and power

This reference to corn oil extraction as an advanced technology indicates it improves the footprint. Furthermore, per the following passage from section 1.4.1.3 of the RFS2 regulatory impact analysis:

> "The oil recovered using the corn oil extraction process is distressed oil and cannot be sold as a food grade product. Markets for this product do exist, however, as an additive to cattle feed or as a biodiesel feedstock. In addition to generating an additional revenue stream, extracting the corn oil has several other benefits for the ethanol producer. Because the oil is an insulator, removing it improves the heating efficiency of the DGS dryers and reduces the energy demand of the ethanol plant. Reducing the oil content of the DGS also improves its flowability and concentrates its protein content."

This passage details the reasons why corn oil extraction improves the footprint, and the following table provides a quantification. This table is included in the RFS2 notice of proposed rulemaking:

TABLE VI.C.1–2—LIFECYCLE GHG EMISSIONS CHANGES FOR VARIOUS CORN ETHANOL PATHWAYS IN 2022 RELATIVE TO THE 2005 PETROLEUM BASELINE

Corn ethanol production plant type	Percent change from 2005 petroleum baseline (100 yr 2%)	Percent change from 2005 baseline (30 yr 0%)
Natural Gas Dry Mill with dry DGs	−16	+5
Natural Gas Dry Mill with dry DGs and CHP	−19	+2
Natural Gas Dry Mill with dry DGs, CHP, and Corn Oil Fractionation	−27	−6
Natural Gas Dry Mill with dry DGs, CHP, Corn Oil Fractionation, and Membrane Separation	−30	−10
Natural Gas Dry Mill with dry DGs, CHP, Corn Oil Fractionation, Membrane Separation, and Raw Starch Hydrolysis	−35	−14
Natural Gas Dry Mill with wet DGs	−27	−6
Natural Gas Dry Mill with wet DGs and CHP	−30	−9
Natural Gas Dry Mill with wet DGs, CHP, and Corn Oil Fractionation	−33	−12
Natural Gas Dry Mill with wet DGs, CHP, Corn Oil Fractionation, and Membrane Separation	−36	−15
Natural Gas Dry Mill with wet DGs, CHP, Corn Oil Fractionation, Membrane Separation, and Raw Starch Hydrolysis	−39	−18
Coal Fired Dry Mill with dry DGs	+13	+34
Coal Fired Dry Mill with dry DGs and CHP	+10	+31
Coal Fired Dry Mill with dry DGs, CHP, and Corn Oil Fractionation	−5	+15
Coal Fired Dry Mill with dry DGs, CHP, Corn Oil Fractionation, and Membrane Separation	−19	+8
Coal Fired Dry Mill with dry DGs, CHP, Corn Oil Fractionation, Membrane Separation, and Raw Starch Hydrolysis	−21	−1
Coal Fired Dry Mill with wet DGs	−9	+12
Coal Fired Dry Mill with wet DGs and CHP	−11	+10
Coal Fired Dry Mill with wet DGs, CHP, and Corn Oil Fractionation	−17	+3
Coal Fired Dry Mill with wet DGs, CHP, Corn Oil Fractionation, and Membrane Separation	−25	−4
Coal Fired Dry Mill with wet DGs, CHP, Corn Oil Fractionation, Membrane Separation, and Raw Starch Hydrolysis	−30	−9
Biomass Fired Dry Mill with dry DGs	−39	−18
Biomass Fired Dry Mill with wet DGs	−40	−19
Natural Gas Fired Wet Mill	−7	+14

212 The treatment of emissions over time is not critical if international land use change emissions are excluded because the results without land use change are consistent over time. Therefore the overall lifecycle GHG results do not vary with time or discount rate assumptions.

Notice adding corn oil fractionation (which in the notice of proposed rulemaking primarily means oil separated via centrifuge, or the process sorghum ethanol producers use) to a facility producing DDGS improves the footprint by 8%. For a facility producing WDGS, adding oil extraction improves the footprint by 3%. The coproduct credit is included in both cases.

According to the grain sorghum notice of data availability (EPA–HQ–OAR–2011–0542; FRL–9680–8), grain sorghum ethanol achieves a 32% footprint reduction, easily meeting the 20% reduction threshold necessary for qualification as a conventional biofuel eligible to generate RINs under RFS2. Accordingly, adding oil extraction means sorghum ethanol producers should achieve a footprint reduction of approximately 35-40%.

As noted above, EPA staff is particularly interested in ensuring nothing related to the oil extraction process will adversely impact the footprint of the ethanol produced from the de-oiled grain. Any adverse impacts would relate to the coproduct credit, which improves the footprint by offsetting the amount of grain needed to replace the grain diverted away from the feed supply to produce ethanol.

It is important to note the modeling summarized in table VI.C.1–2 above includes the coproduct credit. Given the similarities between corn and sorghum DDGS we have demonstrated in our submissions and sorghum's smaller footprint, sorghum ethanol with oil extraction has already been effectively modeled with the result being an approximate 35-40% footprint reduction. Therefore, per EPA's own models, sorghum ethanol produced with de-oiled grain easily qualifies as a conventional biofuel eligible to generate RINs under RFS2. For this reason, sorghum oil qualifies as a biodiesel feedstock.

Between the wealth of data we have provided and the similarities between sorghum oil and other grain oils, the EPA has ample information that would allow it to quickly approve our pathway. In fact, the EPA's prior actions in approving renewable fuel pathways suggest there is already legal precedent for more streamlined action. Well-researched, proven sources of energy like our proposed pathway have usually qualified for expedited approval without the need for a lengthy rulemaking.

Legal precedents

At least three precedents for expeditious approval exist. The first two were approvals of biodiesel pathways (in 2013 and 2014) using assumptions and models already approved. Neither approval included a protracted process, and one required no new modeling at all. The third was an approval of all grain kernel fibers (in 2014) based on similarities to corn kernel fiber. No modeling was performed for this approval at all.

Here is an excerpt Bernadette Rappold prepared for us detailing what EPA has done in the past:

> "Every element of our proposed pathway has been evaluated during prior pathway approvals, which should provide the EPA with most of the models and data needed to complete a quick analysis. In particular, the EPA's approval of renewable fuel pathways with non-food grade corn oil (NFGCO) and grain sorghum feedstock should provide the necessary background and a blueprint for your analysis of our proposed grain sorghum oil pathway.
>
> Since 2013, several proposed pathways for biodiesel produced from corn oil and other crop residue oils have been approved with minimal additional analysis because of their similarity to previously approved pathways. For example, in October 2013, the EPA approved a pathway petition from Diamond Green Diesel, LLC, after comparing DGD's proposal to existing modeling for three previously approved pathways that had the same components as DGD's proposal. Although DGD's proposal included several feedstock options in addition to NFGCO (soybean oil, canola oil, and biogenic waste oils/fats/greases), much of the EPA's straightforward analysis utilized the assumptions and models applicable to the already approved hydrotreating process, NFGCO, and *Camelina satvia* oil feedstock, which had all been carefully evaluated. Similarly, in March 2014, the EPA determined that Duonix Beatrice's proposal to produce biodiesel from NFGCO, beef tallow, and/or yellow grease through transesterification did not even require a new fuel pathway petition because of its similarity to existing approved pathways.
>
> Just like the DGD and Duonix Beatrice pathways, almost all aspects of our proposed pathway have been analyzed during the approval process for NFGCO pathways. Given the current industry practices of blending corn-based and sorghum-based distillers' grains, we would expect any analysis concerning the impact of sorghum grain oil feedstock to be virtually identical to the analysis already conducted for corn oil. Further, in the EPA's July 2014 RFS Pathways II rule identifying corn kernel fiber as a crop residue feedstock, it acknowledged the similarity between corn kernel fiber and other grain kernel fibers: 'The impacts of fiber on the digestion of ruminants, swine, and poultry are extremely similar, regardless of what grain that fiber came from, because all grain fiber is virtually 100 percent cellulosic. Therefore, we are confident that diverting that fiber to a fuel production stream would have similarly insignificant market and other GHG impacts to those of corn kernel fiber...' Environmental Protection Agency; Regulation of Fuels and Fuel Additives: RFS Pathways II, and Technical Amendments to the RFS Standards and E15 Misfueling Mitigation Requirements, 79 Fed. Reg. 42,150 (July 18, 2014)."

We believe the last reference, in particular, is key. I have attached this rule. As noted in the reference the key passage can be found on page 150, which is page 24 of the attachment. You will notice all grain fibers were approved with little to no analysis based on similarity to corn fiber.

Based on these precedents, we believe that the EPA could approve our sorghum oil pathway by letter, just as it did with the DGD and Duonix Beatrice pathways described above. If it still believes rulemaking is necessary, the 2014 RFS rule approving several grain kernel fibers provides an ideal blueprint for an efficient rule that approves sorghum oil based on its similarities to corn oil, soybean oil as well as other approved crop residue oils and includes the approval in a related rulemaking (i.e., renewable volume obligations). The EPA already has the information it needs for an efficient approval, and we ask that it acts on our petition in the same manner that it did in its past approvals.

Please do not hesitate to let me know if you have questions.

Thanks,

John

John Duff
Strategic Business Director
Ex. 6 office
cell
sorghumgrowers.com
Sorghum: The Smart Choice

FEDERAL REGISTER

Vol. 79 Friday,
No. 138 July 18, 2014

Part III

Environmental Protection Agency

40 CFR Part 80
Regulation of Fuels and Fuel Additives: RFS Pathways II, and Technical Amendments to the RFS Standards and E15 Misfueling Mitigation Requirements; Final Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 80

[EPA–HQ–OAR–2012–0401; FRL–9910–40–OAR]

RIN 2060–AR21

Regulation of Fuels and Fuel Additives: RFS Pathways II, and Technical Amendments to the RFS Standards and E15 Misfueling Mitigation Requirements

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: In this final rulemaking, the Environmental Protection Agency (EPA) is amending three separate sets of regulations relating to fuels. In amendments to the renewable fuels standard (RFS) program regulations, EPA is clarifying the number of cellulosic biofuel renewable identification numbers that may be generated for fuel made with feedstocks of varying cellulosic content, is specifying new and amended pathways for the production of renewable fuels made from biogas, and is clarifying or amending a number of RFS program regulations that define terms or address registration, recordkeeping, and reporting requirements. EPA is also making various changes to the misfueling mitigation regulations for gasoline that contains greater than 10 volume percent ethanol and no more than 15 volume percent ethanol (E15) and to the survey requirements associated with the ultra-low sulfur diesel program.

DATES: This rule is effective August 18, 2014.

FOR FURTHER INFORMATION CONTACT: Jon Monger, Office of Transportation and Air Quality, Mail Code: 1101A, U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue NW., 20460; telephone number: (202) 564–0628; fax number: (202) 564–1686; email address: *monger.jon@epa.gov*.

SUPPLEMENTARY INFORMATION:

I. Executive Summary

In this rule, EPA is amending three sets of regulations. First, as described in section IV of this preamble, EPA is amending certain parts of the RFS program regulations at 40 CFR part 80, subpart M. Some of the changes in this rule are of a substantive nature; others are more in the nature of technical corrections, including corrections of obvious omissions and errors in citation. In this final rule, EPA establishes requirements for determining the number of cellulosic biofuel Renewable Identification Numbers (RINs) that will be generated for fuel made from a range of cellulosic feedstocks. We also modify regulatory provisions related to renewable fuel made from biogas, including a new compressed natural gas (CNG)/liquefied natural gas (LNG) cellulosic biofuel pathway, and add a new cellulosic biofuel pathway for renewable electricity (used in electric vehicles) produced from biogas. These pathways have the potential to provide notable volumes of cellulosic biofuel for use in complying with the RFS program, since significant volumes of advanced biofuels are already being generated for fuel made from biogas, and in many cases this same fuel will qualify for cellulosic RINs when this rule becomes effective. The approval of these new cellulosic pathways could have an impact on EPA's projection of 2014 cellulosic biofuel volumes in the final 2014 RFS standards rulemaking. EPA noted the possibility of such an impact in its proposed rule.[1] Many of the changes in today's rule will facilitate the introduction of new renewable fuels under the RFS program. By qualifying these new fuel pathways, this rule provides opportunities to increase the volume of advanced, low-GHG renewable fuels—such as cellulosic biofuels—under the RFS program. EPA's analyses show significant lifecycle GHG emission reductions from these fuel types, as compared to the baseline gasoline or diesel fuel that they replace. In this rulemaking, EPA also clarifies or amends a number of RFS program regulations that define terms or address registration, recordkeeping, or reporting requirements. These include amendments related to: (1) Use of crop residue and corn kernel fiber as renewable fuel feedstock; (2) definition of "small refinery"; (3) provisions for small blenders of renewable fuels; (4) when EPA may deactivate a company registration; (5) the use for registration purposes of "nameplate capacity" for certain production facilities that do not claim exemption from the 20% greenhouse gas (GHG) reduction threshold; and (6) clarifying what penalties apply under the RFS program.

EPA is also making various changes to the E15 misfueling mitigation regulations (E15 MMR) at 40 CFR part 80, subpart N. Among the E15 changes are technical corrections and amendments to sections dealing with labeling, E15 surveys, product transfer documents, and prohibited acts. We also amend the definitions of E10 and E15 in subpart N to address a concern about the rounding of ethanol content test results, in response to a question raised by some industry stakeholders.

In response to questions received from regulated parties, we amend the ultra-low sulfur diesel (ULSD) survey provisions in a manner that reduces the number of samples required. This will reduce costs and burdens associated with compliance for regulated parties, with no expected degradation in the highly successful environmental performance of the program. We received helpful comments from the public on these three issues, and provide response to them in this preamble.

We are not finalizing at this time all of the proposed changes in the Notice of Proposed Rulemaking.[2] Due to comments received and time constraints, we are not taking final action at this time on the proposed advanced butanol pathway, the proposed pathways for the production of renewable diesel, naphtha and renewable gasoline from biogas, or the proposed additional compliance requirements for non-RIN-generating foreign renewable fuel producers. We are also not taking final action at this time on the definition of "producer" for renewable CNG/LNG and renewable electricity from biogas sources, the definition of responsible corporate officer, or the proposed amendments to compliance related provisions for the alternative reporting method in § 80.1452. The Agency is deferring the final decision on these matters until a later time.

This preamble follows the following outline:

[1] 78 FR 71732, November 29, 2013.

[2] 78 FR 36042, June 14, 2014.

II. Why is EPA taking this action?

EPA is taking this action to amend various provisions in its regulations pertaining to the Renewable Fuels Standard (RFS) program (40 CFR part 80, subpart M) and misfueling mitigation for 15 volume percent (%) ethanol blends (E15) (40 CFR part 80, subpart N) to assist regulated parties in complying with RFS and E15 requirements. EPA is also amending the ultra low sulfur diesel (ULSD) survey provisions (40 CFR part 80, subpart I) to decrease regulatory burdens and costs.

III. Does this action apply to me?

Entities potentially affected by this action include those involved with the production, distribution and sale of transportation fuels, including gasoline and diesel fuel, or renewable fuels such as ethanol and biodiesel. Regulated categories and entities affected by this action include:

Category	NAICS Codes [a]	SIC Codes [b]	Examples of potentially regulated parties
Industry	324110	2911	Petroleum refiners, importers.
Industry	325193	2869	Ethyl alcohol manufacturers.
Industry	325199	2869	Other basic organic chemical manufacturers.
Industry	424690	5169	Chemical and allied products merchant wholesalers.
Industry	424710	5171	Petroleum bulk stations and terminals.
Industry	424720	5172	Petroleum and petroleum products merchant wholesalers.
Industry	454310	5989	Fuel dealers.
Industry	486210	4922	Pipeline Transportation of Natural Gas.
Industry	221117	4911	Biomass Electric Power Generation.
Industry	562212	4953	Solid Waste Landfill.
Industry	562219	4953	Other Nonhazardous Waste Treatment and Disposal.
Industry	221320	4952	Sewage Treatment Facilities.

[a] North American Industry Classification System (NAICS).
[b] Standard Industrial Classification (SIC) system code.

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. This table lists the types of entities that EPA is now aware could be potentially regulated by this action. Other types of entities not listed in the table could also be regulated. To determine whether your entity is regulated by this action, you should carefully examine the applicability criteria of part 80, subparts I, M and N of Title 40 of the Code of Federal Regulations. If you have any question regarding applicability of this action to a particular entity, consult the person in the preceding **FOR FURTHER INFORMATION CONTACT** section above.

IV. Renewable Fuel Standard (RFS) Program Amendments

In this rule, we are clarifying requirements related to existing cellulosic biofuel pathways under the RFS program, and adopting new cellulosic biofuel pathways. This rule also modifies a number of RFS program regulations.

A. Renewable Identification Number (RIN) Generation for Fuels Made From Feedstocks Containing Cellulosic Biomass

1. Background

The Clean Air Act (CAA) defines "cellulosic biofuel" as "renewable fuel derived from any cellulose, hemicellulose, or lignin that is derived from renewable biomass and has lifecycle greenhouse gas emissions, as determined by the Administrator, that are at least 60 percent less than the baseline lifecycle greenhouse gas emissions." However, plants do not contain only cellulose, hemicellulose, and lignin; depending on the plant species and other variables (such as variety within a generic feedstock type and storage time) they can also contain varying amounts of other compounds. Using cellulosic biofuel production technologies, some of these other compounds may be converted, along with the cellulosic compounds of plant feedstocks, into renewable fuel. When this occurs, biofuel producers must ascertain what type of RIN or RINs to assign to the resulting renewable fuel. Prior to the proposal, EPA had not provided detailed information on how other compounds should be treated, which led to uncertainty amongst renewable fuel producers about whether their entire volume of fuel produced from a cellulosic feedstock would be eligible to generate cellulosic RINs.

In the proposed rule, EPA noted that existing RFS regulations specify that the fuel made from certain types of feedstocks that are predominantly of cellulosic content[3] (e.g., fuel made from the biogenic portion of separated municipal solid waste) are considered entirely made from cellulosic material.[4] EPA noted that these regulations have been based on the view that the statutory requirement that cellulosic biofuel be "derived from cellulose, hemicellulose or lignin" does not mandate that in all cases the renewable fuel must be produced only from the cellulosic material in the renewable biomass. Rather, EPA considers the statutory definition of cellulosic biofuel to be ambiguous on this point, providing EPA the discretion to reasonably determine under what circumstances a fuel appropriately should be considered cellulosic biofuel when the fuel is produced from a feedstock that contains a mixture of cellulosic and non-cellulosic materials.[5] Consistent with this view and the previously established statutory interpretation permitting assignment of a single RIN value to fuel produced predominantly from one source, EPA proposed that fuels made from feedstocks that are "predominantly" cellulosic should be considered cellulosic biofuel and that all of the volume of fuels from such feedstocks could generate cellulosic biofuel RINs. Accordingly, EPA proposed that the entire volume of fuel made pursuant to the cellulosic biofuel pathways in Table 1 to § 80.1426 be for cellulosic biofuel RINs (D code of 3 or 7), based on EPA's proposed determination that the feedstocks associated with those pathways are composed predominantly of cellulosic materials.[6]

EPA solicited comment in the Notice of Proposed Rulemaking (NPRM) on several alternative approaches, including a "cellulosic content threshold approach." Under the cellulosic content threshold approach, EPA would set a minimum threshold of cellulosic content, and only fuels made from feedstocks meeting this minimum threshold would be eligible to generate cellulosic RINs for their entire fuel volume. EPA suggested possible thresholds in the range of 70% to 99.9%.

After evaluating the comments received, EPA has decided to finalize a cellulosic content approach, with a minimum cellulosic content threshold of 75%. In section IV.A.2. below, we discuss the merits of the approach generally, and how we intend to implement it for feedstocks used in cellulosic biofuel pathways listed in Table 1 to § 80.1426. This includes special provisions for energy cane and annual cover crops. In sections IV.A.3 and IV.A.4 we discuss how RINs should be allocated for fuel made from feedstocks containing less than 75% cellulosic content, and the registration, recordkeeping and reporting requirements associated with the rule. In section IV.A.5 we discuss application of the cellulosic content threshold approach to feedstocks evaluated in the future, and in section IV.A.6 we discuss in more detail the comments received and our responses to them.

2. The Cellulosic Content Threshold Approach and Its Application to Cellulosic Feedstocks Currently Listed in Table 1 to 40 CFR 80.1426

EPA has decided to finalize the cellulosic content threshold approach and to set the minimum threshold as an average adjusted cellulosic content of 75%, measured on a dry mass basis. Since inorganic materials are not likely to end up in the final fuel product and would not contribute to the fuel heating content in the event that they remained in the final fuel, the "adjusted cellulosic content" is the percent of organic (non-ash) material that is cellulose, hemicellulose, or lignin.[7] Consistent with previous precedents permitting assignment of a single RIN value to fuel produced predominantly from one source, fuels made from feedstocks that EPA determines meet this minimum threshold will, therefore, be eligible for cellulosic biofuel RINs for the entire fuel volume produced. As a result of this rule, all of the cellulosic biofuel made from the following feedstocks is eligible to generate cellulosic RINs for

[3] For purposes of this preamble, "cellulosic content" means cellulose, hemicellulose, and lignin.

[4] 75 FR 14670, 14706. In the March 2010 RFS rulemaking, EPA determined, in certain circumstances, it is appropriate for producers to base RIN assignment on the predominant component.

[5] 78 FR 36042, 36047.

[6] EPA included in the docket for the Notice of Proposed Rulemaking a Memorandum to the Docket, entitled "Cellulosic Content of Various Feedstocks—2014 Update," available in docket EPA–HQ–OAR–2012–0401. This memorandum discusses the cellulosic content of various feedstocks, including most of the cellulosic feedstocks listed in cellulosic biofuel pathways in Table 1 to 40 CFR 80.1426. The memorandum notes that the average adjusted cellulosic content of these feedstocks is at least 75%. Because of the high degree of natural variability in biomass, average adjusted cellulosic contents are likely more meaningful than any single value reported, because no single value can reflect the compositional range and variability present.

[7] Further details about this determination can be found in the Memorandum to the Docket, "Cellulosic Content of Various Feedstocks—2014 Update," available in docket EPA–HQ–OAR–2012–0401.

the entire volume of fuel produced: Crop residue, slash, pre-commercial thinnings and tree residue, switchgrass, miscanthus, Arundo donax, Pennisetum purpureum, and biogas from landfills, municipal wastewater treatment facility digesters, agricultural digesters, and separated MSW digesters (collectively "predominantly cellulosic feedstocks"). In addition, EPA is not modifying existing rules that allow generation of cellulosic biofuel RINs for the entire volume of fuel made from separated yard waste, see 40 CFR 80.1426(f)(5)(i)(A), and for the biogenic portion of fuel made from separated MSW, see 75 FR 14706 and 40 CFR 80.1426(f)(5)(v), other than to clarify that the testing requirement to determine biogenic content of finished fuel made from separated MSW does not apply to biogas-derived fuels. For such fuels, the anaerobic process limits digestion and associated biogas generation to the biogenic components of separated MSW, so all resulting fuel is appropriately considered biogenic. Fuels made from feedstocks which do not meet the minimum 75% threshold, but which contain some level of cellulosic material, will be eligible to generate both cellulosic and non-cellulosic RINs using the apportionment methods described below.

However, EPA is taking a different approach with respect to the Table 1 cellulosic feedstocks energy cane and cover crops. Because considerable variability in cellulosic content may exist in plants that may be considered sugarcane or energy cane, we have amended the definition of energy cane to specify that it refers only to cultivars that have been demonstrated to contain an average adjusted cellulosic content of at least 75%. Fuel made through cellulosic biofuel pathways from feedstocks meeting the new definition of energy cane are eligible for cellulosic biofuel RINs for the entire fuel volume.

Annual cover crops will also be treated differently than other cellulosic feedstocks in Table 1. We do not have enough data about annual cover crops to be confident that they will always meet the 75% threshold. Therefore, in Table 1 annual cover crops will still be listed as "cellulosic components of annual cover crops." However, we are also adding a new pathway for "non-cellulosic components of annual cover crops," which will be eligible for advanced RINs. In the future, as more information becomes available, we may revisit this determination.

EPA believes that a 75% content threshold is consistent with the statutory definition of cellulosic biofuel, as EPA indicated in the NPRM, and satisfies the objective identified in the proposed rule of allowing fuels made from feedstocks that are "predominantly" cellulosic to generate cellulosic biofuel RINs for their entire fuel volume. A threshold of 75% also allows fuel made from all predominantly cellulosic feedstocks to generate RINs for their entire fuel volume, consistent with EPA's principal proposal. As compared to alternative approaches discussed in the NPRM, the approach will also greatly simplify compliance by cellulosic biofuel producers and reduce regulatory burden, since for qualifying cellulosic feedstocks the approach to RIN generation is straightforward and will not require testing or apportionment of RINs. These benefits, in turn, should help to promote cellulosic biofuel production, consistent with Congressional objectives. This final rule will help to ensure that cellulosic RINs are in fact only generated for fuels derived predominantly from cellulosic materials.

Because all of the fuel produced from predominantly cellulosic feedstocks will qualify for cellulosic biofuel RINs, EPA is making related modifications to the text in Table 1 to § 80.1426. Specifically we are deleting the references to "cellulosic biomass from" in rows K, L, M, and N to reflect that fuel made pursuant to the listed pathways from the feedstocks listed without this modifier are eligible to generate cellulosic biofuel RINs even though the feedstocks contain some non-cellulosic compounds. However, because certain production processes that can be used to produce cellulosic biofuel may be employed so as to only derive fuel from the non-cellulosic components of feedstock, EPA is also modifying the production process description in these lines in the table to specify that the production process must convert the cellulosic components of feedstock into biofuel. The effect is that cellulosic RINs may only be generated when a production process is employed that in fact produces biofuel that is derived from the cellulosic content of feedstocks.

Many commenters agreed that the cellulosic feedstocks currently listed in Table 1 are predominantly composed of cellulosic components and that allowing all of the fuel derived from these feedstocks to qualify for cellulosic biofuel RINs is consistent with the statutory definition of cellulosic biofuels. Some commenters asserted that allowing all the fuel produced from the cellulosic feedstocks in Table 1 was an overly expansive interpretation of the statutory definition of cellulosic biofuels.[8] EPA considers the statutory definition to be ambiguous on the point of whether cellulosic biofuel RINs may be generated for fuel produced from predominantly cellulosic material, allowing EPA discretion to reasonably interpret this definition. As established in previous rulemakings,[9] EPA believes the statutory definition does not mandate that in all cases cellulosic biofuel must be produced exclusively from cellulosic material in the renewable biomass, and today's rule adopts a common-sense approach to the matter that allows fuel made from predominantly cellulosic feedstocks to qualify as cellulosic biofuel.

In the NPRM, EPA invited comment on an appropriate threshold value for use with a cellulosic threshold approach. EPA received comments on a wide range of suggested threshold values, with many commenters supporting 70% and 80%, some suggesting multiple thresholds, and some commenters requesting much higher (95%) thresholds. Some commenters opposed setting a cellulosic content threshold because there is not a consensus on a value for a threshold, and one commenter asserted that setting a minimum threshold content may stifle development of new feedstocks. In response, EPA has decided that a cellulosic content threshold of 75% is a reasonable value that appropriately implements the statutory requirements.[10] Feedstocks which do not meet or exceed a 75% minimum cellulosic content threshold have a more significant non-cellulosic portion of the feedstock which could contribute to the volume of fuel produced. These feedstocks start to resemble traditional crops that have been developed for purposes other than energy generation, such as crops that are grown for their sugar content (e.g., sugarcane, sweet sorghum). EPA believes that a threshold significantly below 75% might inadvertently encourage use of multipurpose feedstocks for the production of fuels that are qualified for cellulosic RINs, in lieu of the feedstocks

[8] Comments provided by AFPM/API (EPA–HQ–OAR–2012–0401–0128) and Chevron (EPA–HQ–OAR–2012–0401–0171).

[9] EPA has previously considered instances where fuel would generate cellulosic biofuel RINs even if produced from feedstocks containing both cellulosic and non-cellulosic materials. In the March 2010 RFS rulemaking, EPA determined that biofuel from separated yard waste qualified as cellulosic and would generate cellulosic RINs because separated yard waste was "largely cellulosic." 75 FR 14794, March 26, 2010.

[10] All fuel that qualifies for cellulosic biofuel RINs must achieve a minimum 60% lifecycle greenhouse gas emissions reduction as compared to baseline fuels, even if some portion of the fuel is derived from non-cellulosic materials.

with a higher cellulosic content that Congress envisioned would be used to produce this category of biofuel. On the other hand, a threshold higher than 75% would result in regulatory and administrative burdens on the use of predominantly cellulosic feedstocks.[11] EPA believes that the 75% threshold strikes a reasonable balance among these considerations, while remaining consistent with the statutory definition of cellulosic biofuels and past regulatory approaches that EPA has taken for specified feedstocks. While arguments could be made for other numeric values, EPA believes that a rational basis exists for settling on 75%, as explained in this rule, and is within EPA's exercise of discretion to reasonably interpret the CAA. EPA believes that the 75% threshold, which is well over a 50% or "majority" value, is consistent with the concept that cellulosic content should be predominant in feedstocks for which all resulting fuel is qualified for cellulosic biofuel RINs. The 75% threshold also eliminates the current regulatory uncertainty for cellulosic biofuel producers, minimizes regulatory burden, and as a consequence should help promote the production of the category of renewable fuels that provides the most lifecycle GHG emissions benefits.

3. Compliance Requirements for Producers of Cellulosic Biofuel Made From Feedstocks That Are Not Predominantly Cellulosic

In the proposal, EPA invited comment on how to determine the appropriate type of RIN or RINs for fuel that is produced from feedstocks that contain cellulosic material, but where the feedstocks are not predominantly cellulosic in content. Based on the comments received, EPA believes that the existing regulations at § 80.1426(f)(3)(vi) provide an appropriate mechanism for allocation of RINs, both for processes that convert two or more feedstocks simultaneously where not all feedstocks are predominantly cellulosic, and for processes using a single feedstock that has an average cellulosic content below 75%. However, EPA is amending the regulations, by adding new registration, recordkeeping, and reporting requirements ("RRR requirements") to allow EPA to verify that the formula in § 80.1426(f)(3)(vi) is being applied appropriately for cellulosic biofuel RIN generation. EPA believes that, to relieve regulatory burden and streamline program implementation, it makes sense to establish a 75% minimum cellulosic content threshold above which testing and reporting of cellulosic content and RIN apportionment is not necessary. However, when fuel is made from feedstocks below the 75% cellulosic content threshold, EPA believes that testing of the feedstock's cellulosic content is appropriate, and that RINs should be apportioned according to the test results.

EPA recognizes that one result of today's rule is that fuel made from a feedstock meeting the 75% minimum cellulosic content threshold will qualify completely for cellulosic RINs, whereas fuel made from a feedstock containing 74% cellulosic content would, through the apportionment formula, only qualify for at most 74% cellulosic RINs. EPA believes it is appropriate to have simplified procedures for fuel made from feedstocks that are predominantly cellulosic, and has selected a 75% threshold to identify these feedstocks. At some level of content, EPA believes there is less benefit to requiring that manufacturers account for the increasingly small non-cellulosic content of the feedstock. EPA has determined that 75% cellulosic content is a large enough percentage that it is appropriate to allow full qualification. This results in a simplified implementation approach for the large majority of feedstocks typically considered "cellulosic" in nature. While this obviously allows significantly greater benefits to producers using feedstocks above 75% cellulosic content, compared with fuel derived from feedstocks containing just below 75% cellulosic content, the difference is the inevitable result of having any sort of threshold level. Wherever EPA set the threshold, fuels made from feedstocks that just fail to satisfy the threshold will be treated differently. For the reasons provided, EPA believes that the approach is reasonable and appropriate.

As one possible approach to addressing the disparity between fuels made from feedstocks that meet the 75% minimum cellulosic content threshold and those that do not, EPA considered the option of allowing up to an additional 25% of fuel made from feedstock not meeting the threshold to qualify for cellulosic biofuel RINs, beyond levels that are determined to reflect the cellulosic converted fraction. While this approach could be seen as providing more equitable treatment of fuels made from feedstocks that satisfy the 75% cellulosic content threshold and those that do not, EPA determined that it would be inappropriate. The principal objective of the cellulosic content approach adopted today is to minimize burdens and streamline program implementation for both EPA and producers of cellulosic biofuel and provide incentives for production of fuels that are 75% or greater cellulosic content. However, for fuels made from feedstocks that do not meet the minimum cellulosic content threshold, testing (either of cellulosic content of feedstock or of the proportion of fuel derived from cellulosic content) will be required. In cases where the expense and burden of testing is undertaken, EPA believes it is most consistent with the objectives of the Act for RIN apportionment to accurately reflect the test results.

4. Testing, Registration, Reporting and Recordkeeping Requirements for Cellulosic Biofuel

The agency requested comment on test methods available to determine what percentage of a finished biofuel volume was derived from cellulosic or non-cellulosic components. At the time of the proposal, we were not aware of any ready test that could be used to identify the amount of a finished fuel that was derived from cellulosic versus non-cellulosic components. However, we received several comments that suggested there are methods available for this purpose.[12] Given this new information, we believe it is reasonable to require the use of these existing methods under certain circumstances when fuel is produced from feedstocks that are not predominantly cellulosic to verify that the values used in the formula at § 80.1426(f)(3)(vi) are as accurate as possible. Therefore, as part of this final rule, we are requiring the use of these available test methods under certain circumstances described below to help ensure that an appropriate number of cellulosic RINs are generated when applying the formula at § 80.1426(f)(3)(vi).

As described in more detail below, different feedstocks and processes require more information to ensure a

[11] Requirements for determining the number of cellulosic biofuel RINs that may be generated for fuel derived from feedstocks that do not satisfy the minimum cellulosic content threshold adopted in today's rule are described in section IV.A.3 of this preamble.

[12] Comments suggested various methods to determine the converted fraction, including approaches for performing a mass-balance accounting of feedstock components converted to fuel products. As described in the memo to the docket, "Additional Detail on the Calculation of the Cellulosic Converted Fraction, and Attribution of Batch RINs for D-code Dependent Feedstocks," available in docket EPA–HQ–OAR–2012–0401, a mass balance approach which meets the requirements discussed below is an appropriate method for calculating the converted fraction. Converted fraction refers to the portion of the feedstock converted into renewable fuel by the producer and is used in calculating cellulosic RIN volumes generated.

high degree of confidence that cellulosic biofuel RINs are appropriately generated. These registration, recordkeeping, and reporting requirements, including changes to the production process requirements of Table 1 to § 80.1426, are described in the following sections. These requirements apply to all relevant registrations and registration updates, including cellulosic biofuel pathways approved pursuant to a § 80.1416 petition process which take place after the effective date of this rule.

a. Additional Registration Requirements for Certain Producers Seeking To Generate Cellulosic Biofuel RINs

At registration or during registration updates under § 80.1450(d)(3), all producers seeking to use a cellulosic biofuel pathway that converts cellulosic biomass to fuel (currently rows K, L, M, and N of Table 1 to § 80.1426, or as otherwise approved by EPA), must demonstrate that their production process has the ability to convert cellulosic components to fuel by including (1) a process diagram with all relevant unit processes labeled and a designation of which unit process is capable of performing cellulosic treatment; (2) a description of the cellulosic biomass treatment process; and (3) a description of the mechanical, chemical, and biochemical mechanisms by which cellulosic materials can be converted to fermentable sugars or biofuel products. In addition, an independent professional engineer must verify that the equipment to perform each of the relevant unit processes required to convert cellulosic biomass to biofuel is in place as part of registration, in order to demonstrate that the conversion process will derive the finished fuel from cellulosic components.

b. Additional Registration Requirements for Renewable Fuel Produced From Energy Cane

Energy cane is derived from sugarcane, which can be and is bred for a variety of uses and a wide range of fiber and sugar contents.[13] Prior to this rule, energy cane was defined in 40 CFR 80.1401 as "a complex hybrid in the Saccharum genus that has been bred to maximize cellulosic rather than sugar content." This definition did not include any specific requirements regarding cellulosic content. However, some cultivars[14] of cane are bred to have a high sugar content and therefore have a lower percent cellulosic content. For example, two cultivars released by USDA, which are commonly referred to as energy cane,[15] have cellulosic contents of approximately 50% on a dry matter basis.[16] Fuel produced from these cultivars would not be derived predominantly from cellulose, hemicellulose, and lignin; instead, the fuel would largely be derived from sugar. Therefore, in this rule EPA is amending the definition of energy cane to specify that it means cultivars that have, on average, at least 75% adjusted cellulosic content on a dry matter basis. Cultivars that do not meet the 75% adjusted cellulosic content threshold will be considered sugarcane. With this clarification, only cultivars that have predominantly cellulosic content are included in the definition of energy cane and are qualified to generate cellulosic RINs for the entire volume of finished fuel produced. When cultivars containing less than 75% adjusted cellulosic content are used to make fuel, we consider those cultivars to be sugarcane and eligible to generate advanced biofuel RINs for the portion of fuel that is derived from sugar. If the bagasse is converted to renewable fuel, cellulosic RINs could be generated for the amount of fuel derived from the bagasse (under the existing crop residue pathway).

Upon registration, fuel producers seeking to produce cellulosic biofuel using energy cane feedstocks will need to submit data showing that the average adjusted cellulosic content of each energy cane cultivar they intend to use is at least 75%, based on the average of at least three representative samples of each cultivar.[17] Cultivars must be grown under normal growing conditions and consistent with accepted farming practices. Samples must come from a feedstock supplier that the fuel producer intends to use when operating their production process and must represent the feedstock supplier's range of growing conditions and locations. Producers that decide after initial registration to use energy cane or a new energy cane cultivar will need to update their registration and provide data to EPA demonstrating the average adjusted cellulosic content for each cultivar they intend to use. Cellulosic content data must come from an analytical method certified by a voluntary consensus standards body (VCSB) or a non-VCSB method that would produce reasonably accurate results.[18] Producers using a non-VCSB approved method will need to show that the method used is an adequate means of providing reasonably accurate results by providing peer reviewed references to the third party engineer performing the engineering review at registration. Because cane can be bred for a variety of uses, and different cultivars of cane can have different amounts of cellulosic material, these registration requirements will help ensure that fuel producers know whether or not the cultivars they intend to use meet the 75% adjusted cellulosic content threshold and are qualified to generate RINs for the entire volume of finished fuel. EPA expects to require similar registration requirements for producers seeking to produce cellulosic biofuel using feedstocks that will be evaluated in the future that could similarly be bred for a wide range of uses and fiber content.

[13] Tew, Thomas L. and Robert M. Cobill. 2008. Genetic improvement of sugarcane (*Saccharum* spp.) as an energy crop. p. 249–272. In: W. Vermerris (ed.) Genetic Improvement of Bioenergy Crops. Springer.

[14] A cultivar is a subset of a species. USDA has provided a list of sugarcane cultivars (including energy cane). This list, "USDA ARS Sugarcane Release Notices 1999 to 2012," is included in the docket.

[15] Ho 00–961 and HoCP 91–552; Tew, Thomas L. and Robert M. Cobill. 2008. Genetic improvement of sugarcane (*Saccharum* spp.) as an energy crop. p. 249–272. In: W. Vermerris (ed.) Genetic Improvement of Bioenergy Crops. Springer.

[16] Tew, T. L. et al., 2007. "Notice of release of high-fiber sugarcane variety Ho 00–961." Sugar Bulletin, 85(10) 23–24. Tew, T. L. et al, 2007. "Notice of release of high-fiber sugarcane variety HoCP 91–552." Sugar Bulletin, 85(10) 25–26. Ho 00–961 has a Brix value of 17–19% cane, and HoCP 91–552 has a Brix value of 15–18% cane, where Brix is a measure of the total soluble solids, including sugar. These Brix values are similar to the Brix value of a traditional sugarcane cultivar presented in these papers. Ho 00–961 has a percent cellulosic content of 47%, and HoCP 91–552 has a percent cellulosic content of 48%. The percent cellulosic content is calculated using the fiber content (as a measure of the cellulosic content) presented in the papers, divided by the total solids content (Brix + fiber). By contrast, energy cane cultivar L 79–1002, which has a higher fiber content, has a Brix value of 8–12% cane, as reported by Bischoff, K.P. et al., 2008. "Registration of 'L 79–1002' sugarcane." Journal of Plant Registrations, 2(3) 211–217, and Hale, A.L. 2010. "Notice of release of a high fiber sugarcane variety Ho 02–113." Sugar Bulletin, 88(10) 28–29.

[17] As described above and in the Memorandum to the Docket, "Cellulosic Content of Various Feedstocks—2014 Update," available in docket EPA–HQ–OAR–2012–0401, adjusted cellulosic content is the percent of organic (non-ash) material that is cellulose, hemicellulose, and lignin. Therefore, a calculation of the adjusted cellulosic content requires a measurement of the cellulosic content, as well as a measurement of the ash content of a feedstock.

[18] For example, AOAC 2002.04 "Amylase-Treated Neutral Detergent Fiber in Feeds" or ASTM E1758 "Determination of Carbohydrates in Biomass by High Performance Liquid Chromatography." Voluntary consensus standards bodies are defined as "domestic or international organizations which plan, develop, establish, or coordinate voluntary standards using agreed-upon procedures." See "Federal Use of Standards," Office of Management and Budget, *http://www.whitehouse.gov/omb/fedreg_a119rev.*

c. Additional Registration, Recordkeeping, and Reporting Requirements for Producers of Cellulosic Fuels Derived From the Simultaneous Conversion of Feedstocks That Are Predominantly Cellulosic and Feedstocks That Are Not Predominantly Cellulosic

Under § 80.1426(f)(3)(vi), if a renewable fuel producer produces a single type of renewable fuel (e.g., ethanol) using two or more different feedstocks which are processed simultaneously, and at least one of the feedstocks does not have a minimum 75% average adjusted cellulosic content, the producer would have to determine how much of the finished fuel is derived from the cellulosic versus non-cellulosic components of the feedstocks and assign RINs to the finished fuel based on the relative "converted fractions."[19] Given variations in individual conversion processes, enzymes used, and other differences, the amount of finished fuel that is derived from the cellulosic content can vary. For example, the process and enzymes used may do a better job of converting the sugars and starches in a feedstock than the cellulose or hemicellulose. In such a case the cellulosic content of the feedstock may not be a good indicator of the amount of finished biofuel that is derived from cellulosic materials. Furthermore, depending on the conversion process used, the amount of information needed to determine how much of the finished fuel is derived from the cellulosic content will also vary.

Therefore, EPA believes it is prudent to include specific requirements related to calculating the cellulosic converted fraction and to specify appropriate registration, recordkeeping, and reporting requirements for producers seeking to generate cellulosic RINs using two or more feedstocks[20] which are processed simultaneously. EPA has attempted to minimize additional requirements, so has limited certain provisions to circumstances where a producer seeks to generate cellulosic RINs for fuel produced by *"in situ"* biochemical hydrolysis treatment where cellulosic and non-cellulosic components of feedstocks (at least one of which is not predominantly cellulosic) are simultaneously hydrolyzed to fermentable sugars (e.g., corn starch and a crop residue). These additional registration, recordkeeping, and reporting requirements will also apply to producers that combine cellulosic- and non-cellulosic-derived sugars from separate hydrolysis units prior to fermentation. In the latter case, the cellulosic conversion factor can be obtained by analyzing feedstock conversion in the cellulosic hydrolysis unit.

A fundamental distinction relevant to verifying conversion of cellulosic content is whether or not a process converts the entire organic fraction into fuel. Thermochemical conversion is an example of a process that converts the entire organic fraction. Thermochemical processes mainly consist of (1) pyrolysis: a process in which cellulosic biomass is decomposed with temperature to bio-oils that can be further processed to produce a finished fuel or (2) gasification: a process in which cellulosic biomass is decomposed to synthesis gas ("syngas") that with further catalytic processing can produce a finished fuel product. Thermochemical processes typically convert all of the organic components of the feedstock into finished fuel, thus the finished fuel produced from the thermochemical process is proportional to the cellulosic content of the organic fraction of the feedstock material.

Alternatively, biochemical conversion is an example of a non-thermochemical type of process that does not convert the entire organic fraction into fuel. Biochemical processes convert different fractions of the cellulosic and non-cellulosic carbohydrates to finished fuel. During this process, enzymatic hydrolysis releases sugars from feedstock carbohydrates and employs microorganisms to convert those sugars into fuels.

Since thermochemical processes typically convert all of the organic components of the feedstock into finished fuel, fewer recordkeeping and reporting requirements are necessary to verify appropriate cellulosic biofuel RIN generation for producers using thermochemical conversion processes. In addition, since the finished fuel produced from the thermochemical process is proportional to the cellulosic content of the organic fraction of the feedstock material, demonstration of the cellulosic content of the feedstock is the only additional registration requirement that is necessary for thermochemical processes. In contrast, biochemical conversion does not convert the entire organic fraction into fuel and the converted fraction is variable and not proportional to the cellulosic content of the organic fraction of the feedstock material. Therefore, we believe it is prudent to require additional registration, reporting, and recordkeeping requirements for *in situ* biochemical conversion processes to ensure that cellulosic RINs are appropriately generated for the finished fuel.

In the proposal, EPA requested comment on conversion technologies, and we also requested comment on whether to allow 100% of the fuel produced via biochemical processes to generate cellulosic RINs. EPA received comments supporting our proposal to allow biochemical processes to generate 100% cellulosic RINs but, as discussed above, biochemical processes will also typically convert portions of the sugar and starch components of the feedstock. If feedstocks containing significant amounts of starches and sugars are used in a biochemical process, the resulting fuel may not be predominantly of cellulosic origin. Therefore, EPA is not finalizing this aspect of its proposal. Instead, EPA has finalized the cellulosic threshold approach which will generally allow cellulosic biofuel RIN generation for all fuel produced by cellulosic conversion processes using feedstocks determined to have an average adjusted cellulosic content of at least 75%.

i. Registration Requirements

As explained in section IV.A.4.a, at registration, producers seeking to use a cellulosic biofuel pathway that converts cellulosic biomass to fuel (currently listed in rows K, L, M, and N of Table 1 to § 80.1426), or as otherwise approved by EPA, must demonstrate the ability to convert cellulosic components of their feedstock to fuel. In addition, producers seeking to generate cellulosic RINs (D code of 3 or 7) using two or more different feedstocks (at least one of which does not have at least 75% average adjusted cellulosic content) which are processed simultaneously using a thermochemical conversion process will be able to allocate cellulosic RINs using the formula in § 80.1426(f)(3)(vi) where the cellulosic fraction is proportional to the cellulosic content of the feedstock. The average adjusted cellulosic content of the feedstock will have to be reported at registration, based on the average of at least three representative samples, and cellulosic content data must come from an analytical method certified by a voluntary consensus standards body (VCSB) or a non-VCSB method that would produce reasonably accurate

[19] See § 80.1426(f)(3)(vi). Converted fraction refers to the portion of the feedstock converted into renewable fuel by the producer and is used in calculating cellulosic RIN volumes generated.

[20] As described in section IV.A.5, if a future feedstock does not meet the 75% threshold, we consider it as comprised of two separate feedstocks: one cellulosic and one non-cellulosic.

results.[21] Producers using a non-VCSB approved method will need to show that the method used is an adequate means of providing reasonably accurate results by providing peer reviewed references to the third party engineer performing the engineering review at registration. Producers that later want to change their feedstock will need to update their registration. Parties that initially registered prior to the effective date of this rule must comply with the new requirements at their next required registration update.

Producers generating RINs with a D code of 3 or a D code of 7 using two or more different feedstocks (at least one of which does not have at least 75% average adjusted cellulosic content) which are processed simultaneously through an *in situ* biochemical hydrolysis treatment will similarly have additional registration requirements to help ensure that cellulosic RINs are being generated accurately. At the time of registration, such a producer must submit (1) the overall fuel yield[22] including supporting data demonstrating this yield and a discussion of the possible variability in overall fuel yield that could be expected between reporting periods; (2) the cellulosic converted fraction that will be used for generating RINs under § 80.1426(f)(3)(vi), including chemical analysis data (described in more detail below) supporting the calculated cellulosic converted fraction and a discussion of the possible variability that could be expected between reporting periods; and (3) a description of how the cellulosic converted fraction is determined and calculations showing how the data were used to determine the cellulosic converted fraction.

Data used to calculate the cellulosic converted fraction by producers using *in situ* biochemical hydrolysis treatment who seek to generate cellulosic RINs must be representative and obtained using an analytical method certified by a voluntary consensus standards body (VCSB) or using a non-VCSB method that would produce reasonably accurate results. If using a non-VCSB approved method to generate the data required to calculate the cellulosic converted fraction for a given fuel, then the producer will need to show that the method used is an adequate means of providing reasonably accurate results by providing peer reviewed references to the third party engineer performing the engineering review at registration. A full description of the formulas in § 80.1426(f)(3) used to calculate RINs for renewable fuel described by two or more pathways, including methods used to calculate the converted fraction, can be found in the associated memo to the docket.[23]

ii. Additional Cellulosic Converted Fraction Reporting and Recordkeeping Requirements

Producers generating cellulosic RINs using two or more different feedstocks (at least one of which does not have at least 75% average adjusted cellulosic content) which are processed simultaneously using an *in situ* biochemical hydrolysis treatment will also have additional recordkeeping and reporting requirements to provide ongoing verification that the cellulosic RINs are being accurately allocated.

The converted fraction provides a comprehensive accounting of the portion of a feedstock that is converted into cellulosic fuel. The formula in § 80.1426(f)(3)(vi) requires producers to calculate a converted fraction for each category of RINs generated. That converted fraction is then used to determine the appropriate number and type of RINs to assign to a batch of renewable fuel.

Comments suggested calculating the amount of the finished fuel derived from the cellulosic and non-cellulosic components could create an administrative burden if required on a batch-by-batch basis. EPA is structuring applicable registration, recordkeeping, and reporting requirements in a manner intended to result in accurate accounting while also avoiding overly burdensome requirements. Therefore the final rule provides that the cellulosic converted fraction will initially be based on the data submitted at registration.

This upfront converted fraction determination will apply to RINs produced until a new converted fraction allocation is available and reported. The interval at which a new converted fraction must be reported is similarly intended to avoid unnecessary burden on producers. EPA is requiring that low volume producers calculate the cellulosic converted fraction annually. However, for higher volume producers, we believe more frequent calculating and reporting is prudent and are requiring that the cellulosic converted fraction be recalculated within 10 business days of every 500,000 gallons of cellulosic RINs generated. This information will be reported in the quarterly report. Low-volume producers may report the current converted fraction value used to generate RINs on their quarterly reports if they have not produced 500,000 cellulosic gallons in the calendar year. Periodic cellulosic converted fraction determinations will be made by collecting new process data and performing the same chemical analysis approved at registration, using representative data. If at any point new data show that the converted fraction is different from that reported in the previous period, the formula used to generate RINs at § 80.1426(f)(3)(vi) must be updated as soon as practical but no later than 5 business days after the producer receives the new data. If new testing data results in a change to the cellulosic converted fraction, only RINs generated after the new testing data were received would be affected. In addition if a renewable fuel producer changes their process (for example, stops using enzymes in their cellulosic hydrolysis or changes the enzymes used), the producer must calculate a new converted fraction and update their registration consistent with § 80.1450(d).

Given the natural variation in cellulosic content and conversion efficiencies, EPA recognizes some variation will exist in the amount of cellulosic fuel that is derived from the cellulosic components of a feedstock. However, certain circumstances raise significant concerns with respect to cellulosic RIN generation. While we believe that variation within 10% of the previously calculated numbers may result under normal operating conditions, larger variations raise concerns that the process or feedstock has significantly changed from what was approved at registration. If the cellulosic converted fraction deviates from the previously calculated cellulosic converted fraction by 10% or more, it is appropriate for the producer to alert EPA to this change and update the formula used to calculate RIN allocations as soon as possible. The producer must (1) notify EPA within 5 business days and (2) adjust the formula used to generate RINs at § 80.1426(f)(3)(vi) for all fuel generated as soon as practical but no later than 5 business days after the producer receives the new data. As explained above, if new testing data results in a change to the cellulosic converted

[21] For example, AOAC 2002.04 "Amylase-Treated Neutral Detergent Fiber in Feeds" or ASTM E1758 "Determination of Carbohydrates in Biomass by High Performance Liquid Chromatography."

[22] The overall fuel yield is determined to be the total volume of fuel produced (e.g., cellulosic plus non-cellulosic fuel volume) divided by the total feedstock mass (sum of all feedstock masses) on a dry mass basis.

[23] "Additional Detail on the Calculation of the Cellulosic Converted Fraction, and Attribution of Batch RINs for D-code Dependent Feedstocks," which is available in docket EPA–HQ–OAR–2012–0401.

fraction, only RINs generated after the new testing data were received would be affected.

5. Determining the Average Adjusted Cellulosic Content of Feedstocks Going Forward

EPA will apply the minimum average adjusted cellulosic content threshold framework described above for feedstocks evaluated in the future. If these feedstocks meet the 75% average adjusted cellulosic content threshold, we will allow the fuel producer using them in approved cellulosic biofuel pathways to generate cellulosic RINs for all of the finished fuel volume. If the feedstock does not meet the 75% threshold, we would expect to create two separate regulatory pathways—one involving "cellulosic components of [feedstock X]" and another involving "non-cellulosic components of [feedstock X]"). A producer using both of these feedstocks which are processed simultaneously, would allocate cellulosic and non-cellulosic RINs using the formula in § 80.1426(f)(3)(vi). Fuel producers using feedstocks evaluated in the future would also be subject to the appropriate registration, reporting, and recordkeeping requirements described in section IV.A.4.

EPA anticipates that it will determine the cellulosic content of newly evaluated feedstocks that might be used to produce cellulosic biofuel up front when it conducts a lifecycle analysis of a pathway involving the new feedstock. For example, EPA will calculate the average adjusted cellulosic content of feedstocks such as energy sorghum and energy beets at the same time that we evaluate the lifecycle GHG emissions associated with these feedstocks. As with lifecycle analyses, EPA may undertake the evaluation of the cellulosic content of feedstocks either in the context of a rulemaking to amend Table 1 to § 80.1426, or in response to an individual petition submitted pursuant to § 80.1416. In either case, EPA will clarify whether the feedstock meets the 75% cellulosic content threshold allowing cellulosic RINs to be generated for the entire fuel volume produced, or if the producer should use the apportionment method in § 80.1426(f)(3)(vi). Future petitioners pursuant to the process in § 80.1416 should submit peer-reviewed data on the average cellulosic content of their feedstock as well as their own estimate of cellulosic content based on these data.

In the proposal, EPA sought comment on whether individual producers should be responsible for submitting data on the cellulosic content of their feedstock, or whether EPA should determine whether feedstocks meet the threshold based on existing published data. We received comments that EPA should determine whether feedstocks meet the threshold and should use existing published data. In addition, we received a range of opinions on whether the producer should also be required to provide data. Some comments suggested that EPA should use both existing published data and data from the producer, because academic publications may not be up to date with industry. Some comments said fuel producers should be allowed to present data if their feedstocks have higher cellulosic content than published data. One comment said that if no peer-reviewed data exist, the producers should provide data. Some comments suggested that producers should be required to maintain documentation of cellulosic content, as well as evidence that the cellulosic content was the primary source of biofuels production. Others commented that producers should not be required to measure, submit and certify feedstock composition. In the future, producers should submit data regarding cellulosic content in order to ensure a determination is made on the most up to date data. EPA will evaluate this information, together with other available information, on a case by case basis to determine whether feedstocks meet the cellulosic content threshold.

6. Other Comments Received

EPA considered a range of alternative approaches for determining appropriate cellulosic RIN generation with different types of feedstocks. These approaches were discussed in the NPRM and also evaluated in public comments. This section discusses these alternative approaches and comments.

a. Treatment of Cellulosic Feedstocks Currently Listed in Table 1 to 40 CFR 80.1426

In the NPRM, EPA sought comment on multiple approaches for determining the volume of cellulosic RINs from currently approved cellulosic feedstocks listed in Table 1 to § 80.1426. Many commenters preferred allowing feedstock sources listed in Table 1 to § 80.1426 to generate cellulosic RINs without applying a threshold, although some commenters asserted a minimum content threshold could be used in conjunction with the proposed approach. In addition, one commenter suggested adding "planted trees from a tree plantation" to Table 1 to § 80.1426.[24] However, this addition would require further analysis of the lifecycle greenhouse gas emissions of this feedstock, and is beyond the scope of this rule. As discussed above, EPA is finalizing the cellulosic content threshold approach that generally qualifies all fuel produced from predominantly cellulosic feedstocks pursuant to existing cellulosic biofuel pathways listed in Table 1 for cellulosic RINs. In addition, the approach will guide EPA evaluation of future feedstocks not currently included in Table 1 to § 80.1426.

Some commenters asserted EPA should adopt a plurality approach to determining whether cellulosic RINs could be generated when using particular feedstocks.[25] Instead of requiring that the cellulosic content make up a predominant percentage of the organic material from which the fuel is derived, under this approach, feedstocks would be deemed cellulosic if a plurality of the contained material is cellulosic. EPA acknowledges that such an approach would likely lead to larger production volumes of cellulosic biofuels. However, as discussed above, the statutory definition of cellulosic biofuel provides that they are "derived from cellulose, hemicellulose, or lignin." EPA believes that to effectuate Congressional intent in promoting fuels derived from these sources, it is appropriate to require that qualifying fuels be predominantly cellulosic in content. Therefore the 75% cellulosic content threshold approach adopted today is preferable in this regard to the commenter's suggestion.

Other commenters contended EPA should establish a minimum cellulosic content for individual feedstocks and assign RINs based only on this content, instead of allowing feedstocks currently listed in Table 1 to § 80.1426 to generate cellulosic RINs for their entire fuel volume.[26] EPA believes this approach would create unnecessary administrative and regulatory burden. Instead of setting a minimum content for each individual feedstock, EPA is finalizing a single cellulosic content threshold. EPA has determined that most of the feedstocks listed in Table 1 to § 80.1426 for cellulosic biofuel pathways satisfy the 75% cellulosic content threshold adopted today. In

[24] Comment provided by Blue Source (EPA–HQ–OAR–2012–0401–0137).

[25] Comments provided by Smithfield Foods (EPA–HQ–OAR–2012–0401–0103) and the National Association of Clean Water Agencies (EPA–HQ–OAR–2012–0401–0178).

[26] Comments provided by AFPM/API (EPA–HQ–OAR–2012–0401–0128) and Chevron (EPA–HQ–OAR–2012–0401–0171).

addition, as described in section IV.A.5, EPA will assess the cellulosic content of future individual feedstocks as part of the lifecycle analysis process and determine whether the feedstock exceeds this threshold. Therefore, individual feedstocks will be analyzed to determine if they meet the minimum cellulosic content threshold, and different regulatory provisions apply depending on the result.

Several commenters stated that the emphasis should be placed on whether a feedstock meets the 60 percent reduction in greenhouse gas emissions relative to the baseline petroleum fuel they replace,[27] particularly where a feedstock is predominantly cellulosic.[28] One commenter also noted the agency should emphasize whether the feedstock has similar overall environmental qualities as a feedstock that is entirely cellulosic, such as the potential to avoid competition with food, the potential to require less fertilizer, pesticides, and irrigation, and the potential for a lower fossil fuel energy input requirement.[29] In response, EPA notes that it is required to implement the statutory requirements, and that the CAA is clear that a cellulosic biofuel must be both derived from cellulosic materials and meet the 60 percent GHG emission reduction threshold. Therefore, EPA is not free to establish regulations focusing exclusively on attainment of the 60% GHG reduction threshold, while ignoring the cellulosic content of the feedstock used to produce the fuel. In addition, EPA notes that in determining whether or not the fuel produced pursuant to a particular pathway satisfies the minimum 60 percent GHG reduction threshold for cellulosic biofuel, EPA does take into consideration a number of factors of concern to the commenter, including use of fertilizer and amount of fuels consumed in the production process. The Agency will continue to evaluate lifecycle emissions for feedstocks and require this reduction in greenhouse gas emissions for cellulosic pathways.

EPA also sought comment on a specified percentage approach, under which fuels produced from feedstocks listed in Table 1 to § 80.1426 would be eligible to generate cellulosic RINs for 85% of their volume, and the remaining 15% would be eligible to generate advanced RINs. This percentage was based on data that suggested that the average adjusted cellulosic content of the predominantly cellulosic feedstocks currently listed in Table 1 for cellulosic biofuel pathways was approximately 85%. Commenters generally opposed the specified percentage approach, asserting that it would create administrative burden to track two classes of RINs, that a partial loss of cellulosic RINs could hurt the financial viability of producers, and that there is the possibility of RIN generation errors.[30]

EPA has concluded that this approach would significantly increase the complexity of the program without providing additional environmental benefits. EPA believes the additional precision the method would provide is not justified in light of the administrative and regulatory burden associated with it, and that overall the cellulosic content threshold approach we are adopting today provides an appropriate balance of the competing considerations of precision and adopting a workable approach. Therefore, for the reasons described above, EPA is finalizing the content threshold approach.

b. Feedstocks With Lower Average Cellulosic Content Than Feedstocks Currently Listed in Table 1 to § 80.1426

In the proposal, EPA also invited comment on how to treat feedstocks that had lower average cellulosic content than the feedstocks currently listed in Table 1 to § 80.1426. Some commenters suggested using an approach with multiple thresholds, where fuel made from feedstocks that meet the highest cellulosic content threshold would receive 100% cellulosic RINs, and fuel made from feedstocks meeting lower thresholds would receive a fixed percentage of cellulosic RINs, with the remaining fuel receiving advanced RINs. Some comments suggested cellulosic RINs should not be generated for fuels with low cellulosic content.[31] Other commenters stated that the existing regulations in § 80.1426(f)(3) were sufficient to handle the allocation of RINs for the cellulosic and non-cellulosic portions of the finished fuel.[32] They noted that these regulations already provide a way to assign RINs for a mixture of fuel types with different D-codes. After evaluating these comments, EPA has concluded that the approach provided by the existing regulations in § 80.1426(f)(3) to allocating cellulosic and non-cellulosic RINs is preferable. This system is already established, and is designed to accurately apportion the finished fuel to account for cellulosic biofuel conversion, potentially allowing for a greater proportion of cellulosic RIN generation than would be allowed in establishing a series of thresholds with fixed percentages of cellulosic RIN generation.

B. Lifecycle Greenhouse Gas Emissions Analysis and Cellulosic Determinations for Pathways Using Biogas as a Feedstock

In the March 2010 RFS final rule, EPA established biogas as an advanced fuel type (D code of 5) when derived from landfills, sewage waste treatment plants, and manure digesters. Based on questions from companies, EPA proposed to: (1) Modify the existing biogas pathway to specify that compressed natural gas (CNG) or liquefied natural gas (LNG) is the fuel and biogas from landfills, waste treatment plants, and waste digesters is the feedstock; (2) allow fuels derived from landfill biogas to qualify for cellulosic RINs rather than just advanced RINs; (3) add a landfill biogas to renewable electricity pathway; and (4) add a Fischer-Tropsch landfill biogas pathway.

Based on comments and new data received, in this rule we are: (1) Finalizing the proposed change to make CNG and LNG the fuel and biogas from specified sources the feedstock; (2) expanding the cellulosic pathways to include biogas from landfills, municipal wastewater treatment facility digesters, agricultural digesters, and separated MSW digesters; (3) finalizing the proposed change to add an advanced pathway for fuels from waste digester biogas; and (4) expanding the renewable

[27] Comments provided by BP (EPA–HQ–OAR–2012–0401–0130), Iowa Corn Growers Association (EPA–HQ–OAR–2012–0401–0131), and NRDC (EPA–HQ–OAR–2012–0401–0136).

[28] Comments provided by BP (EPA–HQ–OAR–2012–0401–0130) and NRDC (EPA–HQ–OAR–2012–0401–0136).

[29] Comment provided by NRDC (EPA–HQ–OAR–2012–0401–0136).

[30] Comments provided by National Sorghum Producers (EPA–HQ–OAR–2012–0401–0065), the Renewable Fuels Association (EPA–HQ–OAR–2012–0401–0123), Weyerhaeuser (EPA–HQ–OAR–2012–0401–0140), NexSteppe (EPA–HQ–OAR–2012–0401–0153), the Independent Fuel Terminal Operators Association (EPA–HQ–OAR–2012–0401–0165) and Global Renewable Strategies and Consulting, LLC (EPA–HQ–OAR–2012–0401–0184). Some commenters expressed support for the specified percentage approach. See comments provided by the AFPM/API (EPA–HQ–OAR–2012–0401–0128), Phillips 66 (EPA–HQ–OAR–2012–0401–0102), Chevron (EPA–HQ–OAR–2012–0401–0171), and Camco (EPA–HQ–OAR–2012–0401–0183).

[31] Comments provided by NRDC (EPA–HQ–OAR–2012–0401–0136).

[32] Comments provided by the National Corn Growers Association (EPA–HQ–OAR–2012–0401–0071), Novozymes North America, Inc. (EPA–HQ–OAR–2012–0401–0088), and the Renewable Fuels Association (EPA–HQ–OAR–2012–0401–0123), the Iowa Corn Growers Association (EPA–HQ–OAR–2012–0401–0131), and Edeniq (EPA–HQ–OAR–2012–0401–0159).

electricity pathway to include biogas from landfills, wastewater treatment facility digesters, agricultural digesters, separated MSW digesters, and waste digesters. Due to time constraints, we are not finalizing a Fischer-Tropsch landfill biogas pathway at this time. However, we expect to address this pathway in a future action.

Our determinations regarding biogas derived renewable CNG, LNG and electricity are discussed more fully in the following sections. This section discusses:

- Changes Applicable to the Revised CNG/LNG Pathway from Biogas
- Determination of the Cellulosic Content of Biogenic Waste Derived Biogas
  - Landfill gas and MSW waste digester biogas as cellulosic
  - Municipal wastewater treatment facility digester biogas as cellulosic
  - Agricultural digester biogas as cellulosic
  - Biogas from Waste Digesters
- Consideration of Lifecycle GHG Emissions Associated With Biogas Pathways
  - Upstream GHG Analysis of Biogas as a Renewable Fuel Feedstock
  - Flaring Baseline Justification
  - Lifecycle GHG Analysis for Electricity From Biogas
- Alternative Biogas Options and Comments

The following section, "Regulatory Amendments Related to Biogas" will discuss additional clarifications and changes to the regulations associated with the biogas pathways.

1. Changes Applicable to the Revised CNG/LNG Pathway From Biogas

Prior to this rulemaking, an approved fuel pathway in Table 1 to § 80.1426(f)(1) allowed biogas from landfills, manure digesters or sewage treatment plants to qualify as an advanced biofuel. We received many requests about what fuel qualifies under this pathway, including what renewable fuel types qualify under the term "biogas," and what are the eligible sources of biogas. In response, EPA proposed to make several changes to the regulations related to biogas.

EPA is now characterizing biogas as a transportation fuel feedstock and is amending the existing biogas pathway in Table 1 to § 80.1426 by changing the renewable fuel type in the pathway from "biogas" to "renewable compressed natural gas (renewable CNG) and renewable liquefied natural gas (renewable LNG)." EPA is also changing the feedstock type of "landfills, manure digesters or sewage waste treatment plants" to "biogas from landfills, municipal wastewater treatment facility digesters, agricultural digesters, and separated MSW digesters" for a pathway producing cellulosic biofuels. Finally, EPA is adding a new advanced biofuel pathway for fuels produced using "biogas from waste digesters" as the feedstock type.

In this final rule, we are changing the term "sewage waste treatment plants" to "municipal wastewater treatment facility digesters" since "sewage waste treatment plants" is not a commonly used term and to clarify that the digester is the source of the biogas. We are also defining an "agricultural digester" as an anaerobic digester that processes predominantly cellulosic materials including animal manure, crop residues, and/or separated yard waste.

The existing biogas pathway in Table 1 to § 80.1426 refers to "biogas" as the renewable fuel type and "landfills, manure digesters and sewage waste treatment plants" as the feedstock. Several companies raised questions about whether the term "biogas" in this pathway could refer to the unprocessed or raw gas from the landfills, manure digesters or sewage treatment plants, or processed "biogas" that has been upgraded and could be used directly for transportation fuel. Companies also asked about use of biogas as an ingredient in the production of transportation fuel, as an energy source used in the production of transportation fuel, and other fuel types that can be produced from the raw biogas either through a physical or chemical process (such as CNG, LNG, renewable electricity, renewable diesel, dimethyl ether or naphtha). These companies further inquired whether the various forms of biogas discussed above could qualify under this pathway and therefore be eligible for RIN generation under the RFS program.

The term "biogas" in this pathway is used broadly in the industry to refer to various raw and processed forms of the biogas from various sources. However, under the existing requirements in § 80.1426(f)(10) and (11), only biogas that is used for transportation fuel can qualify as renewable fuel for RIN generation under the RFS program. EPA recognizes that raw biogas cannot be used directly in the transportation sector and must be physically or chemically treated to generate a finished transportation fuel eligible for RIN generation. Raw biogas can be put through a physical process in which it is compressed or liquefied to produce CNG or LNG. Because these fuels can be used directly for transportation purposes, it seems appropriate to identify these products as "fuels" that are produced using biogas.

We are finalizing revisions to the definition of biogas and adding new definitions for renewable CNG, renewable LNG, and agricultural digester to § 80.1401. This rulemaking clarifies that biogas means a mixture of hydrocarbons that is a gas at 60 degrees Fahrenheit and 1 atmosphere of pressure that is produced through the anaerobic digestion of organic matter. We are also finalizing revisions to clarify renewable compressed natural gas ("renewable CNG") means biogas or biogas-derived pipeline quality gas that is compressed for use as transportation fuel and that renewable liquefied natural gas ("renewable LNG") means biogas or biogas-derived pipeline quality gas that goes through the process of liquefaction in which it is cooled below its boiling point. Finally, this rulemaking clarifies that agricultural digester means an anaerobic digester that processes predominantly cellulosic materials, including animal manure, crop residues, and/or separated yard waste.

These finalized definitions reflect comments we received that supported our changes to the "biogas" pathway as discussed above, namely changing fuel to CNG/LNG and adding a description of the applicable biogas feedstocks. The finalized definitions for CNG/LNG also reflect comments we received suggesting that we clarify whether CNG/LNG that is produced on-site and not sent through a pipeline would fall within the pathway. In order to clarify that CNG/LNG produced on-site and not sent through a pipeline would also qualify, the proposed definitions of renewable CNG and LNG were modified to indicate that either biogas or pipeline-quality gas can be compressed to make renewable CNG and LNG.

2. Determination of the Cellulosic Content of Biogenic Waste-Derived Biogas

In order for fuels produced from biogas as a feedstock to qualify for cellulosic RINs (D code of 3 or D code of 7), the renewable fuel must be derived predominantly from cellulosic materials and must meet a 60% GHG emissions reduction threshold, as described in the following sections.

EPA proposed to allow renewable fuel derived from landfill biogas to qualify as cellulosic biofuel and solicited comment on whether biogas from other sources should also be qualified as cellulosic biofuel. Based on new data and comments received during our public review process, EPA has determined that biogas generated by landfills, municipal wastewater treatment facility digesters, agricultural digesters, and separated MSW digesters are predominantly cellulosic in origin, and that biogas derived from waste digesters processing non-cellulosic renewable biomass therefore qualifies as an advanced biofuel feedstock. Data supporting these determinations are discussed in more detail in an associated memo to the docket,[33] and the main findings are provided forthwith.

a. Landfill Biogas and MSW Digester Biogas as Cellulosic in Origin

In the June 2013 NPRM, EPA proposed to classify renewable fuels produced from landfill biogas as derived from cellulose, hemicellulose or lignin, and therefore eligible to generate cellulosic RINs (D code of 3 and D code of 7). EPA cited a 1989 study that concluded that not only was the average cellulosic content of the organic fraction of municipal solid waste (OFMSW)[34] approximately 90%, but that roughly 90% of the methane generated in landfills was derived from the cellulose and hemicellulose[35] portions of the OFMSW as the basis for this proposal.

Some commenters argued that MSW landfill gas was not cellulosic because a large portion of the waste disposed is food waste which contains some non-cellulosic components. We do not believe this affects our determination for several reasons. Our cellulosic content determination is based on an average mixture of MSW components that includes food waste. Since the average cellulosic content of the organic fraction of MSW is approximately 90%, EPA believes that organic matter in MSW landfills is predominantly cellulosic in origin. Furthermore, many of the non-cellulosic components of food waste are oxidized in the early stages of waste decomposition during the collection, handling and transportation and released as CO_2 instead of CH_4. Therefore, a greater proportion of the biogas produced from anaerobic digestion (and subsequently used as a transportation fuel) comes from the remaining cellulosic components.

Some commenters stated that only about 27% of MSW landfill gas can be considered to be derived from renewable biomass, and thus, any transportation fuel derived from the biogas cannot even be considered to be eligible for RIN generation. However, EPA determined in the March 2010 RFS rule that biogas from MSW landfills is derived from renewable biomass, namely separated yard and food wastes, and EPA did not propose to change that finding. Thus, this comment is not relevant to the current rulemaking.

EPA invited comment and data on the proposed approach to treat landfill biogas as being derived from cellulose, hemicellulose and lignin. Some commenters argued that landfill biogas should not be considered as cellulosic,[36] others supported considering landfill biogas as cellulosic,[37] and still others requested that EPA expand the proposed determination to include biogas derived from additional sources processing biogenic wastes as cellulosic.[38] Commenters that opposed considering landfill gas as cellulosic pointed to the EPA proposal that relied on a single study to justify this approach. This was not, in fact, the case, and EPA had reviewed, discussed and cited numerous studies to support this determination.[39] Moreover, subsequent to the June 2013 proposal, EPA updated its literature review and found additional peer reviewed studies that support our proposed assessment that biogas from landfills is predominantly derived from cellulosic components. The studies considered a broad spectrum of landfills, including studies comparing differences among landfill design, operating practices, regional influence, and typical waste loadings throughout the United States over more than two decades. Therefore, our determination that the biogas generated in landfills is predominantly derived from cellulose and hemicellulose is well supported.[40]

Since separated MSW digesters would use the same biogenic materials that are present in landfills, and generate biogas by the same anaerobic processes, a logical extension of the reasoning and data described above justifies treating the biogas generated by digesters processing separated MSW as cellulosic as well. Therefore, we have included biogas from separated MSW digesters as a feedstock in cellulosic biofuel pathway Q in Table 1 to § 80.1426.

b. Municipal Wastewater Treatment Facility Digester Biogas as Cellulosic

For purposes of this rule, the term "municipal wastewater treatment facility digester" means an anaerobic digester that processes the sludge, undissolved solids, and biosolids derived from municipal wastewater whether or not the facility is owned by a municipality. While there are substantial data characterizing the solids content of municipal wastewater, there are somewhat less data characterizing the composition of materials entering the digesters specifically. The average adjusted cellulosic content of the unprocessed wastewater solids—including primary sludge, activated sludge, and biosolids[41]—is greater than 75%.[42] For the purposes of calculating the average adjusted cellulosic content of materials entering the wastewater treatment facility digesters, we believe it is appropriate to use the subset of peer-

[33] "Support for Classification of Biofuel Produced from Waste Derived Biogas as Cellulosic Biofuel and Summary of Lifecycle Analysis Assumptions and Calculations for Electricity Biofuel Produced from Waste Derived Biogas," which is available in docket EPA–HQ–OAR–2012–0401.

[34] The study specifies the "volatile solids" of the MSW to be 90% cellulosic. Volatile solids refer to organic compounds of plant or animal origin that have caloric value and are susceptible to bioconversion during anaerobic digestion.

[35] Barlaz, M.A., R.K. Ham, and D.M. Schaefer. 1989. Mass-balance analysis of anaerobically decomposed refuse. Journal of Environmental Engineering, 15(6) 1088–1102.

[36] See "Comment submitted by Friends of the Earth, Sierra Club, Center for a Competitive Waste Industry", docket number EPA–HQ–OAR–2012–0401–0164.

[37] See for example, "Comment submitted by Kerry Kelly, Director, Federal Public & Regulatory Affairs, Waste Management (WM)", docket number EPA–HQ–OAR–2012–0401–0112 and "Comment submitted by Stewart T. Leeth, Assistant Vice President, Environmental and Corporate Affairs and Senior Counsel, Smithfield Foods, Inc." docket number EPA–HQ–OAR–2012–0401–0103.

[38] See "Comment submitted by Stewart T. Leeth, Assistant Vice President, Environmental and Corporate Affairs and Senior Counsel, and Dennis Treacy, Executive Vice President and Chief Sustainability Officer, Smithfield Foods, Inc.", docket number EPA–HQ–OAR–2012–0401–0111, and "Comment submitted by Cynthia A. Finley, Director, Regulatory Affairs, National Association of Clean Water Agencies (NACWA)", docket number EPA–HQ–OAR–2012–0401–0178.

[39] "Support for Cellulosic Determination for Landfill Biogas and Summary of Lifecycle Analysis Assumptions and Calculations for Biofuels Produced from Landfill Biogas," which has been placed in docket EPA–HQ–OAR–2012–0401.

[40] Barlaz, M.A., R.K. Ham, and D.M. Schaefer. 1989. Mass-balance analysis of anaerobically decomposed refuse. Journal of Environmental Engineering, 15(6) 1088–1102. Mehta, R., Barlaz, M.A., Yazdani, R., Augenstein, D. Bryars, M. and Sinderson, L. 2002, "Refuse Decomposition in the Presence and Absence of Leachate Recirculation," J. Environ. Eng., 128, 3, 228–236 Staley, B. F. and M. A. Barlaz, 2009, *Composition of Municipal Solid Waste in the U.S. and Implications for Carbon Sequestration and Methane Yield,"* J. Environ. Eng. 135, 10, 901–909.

Additional citations were offered in comments from *Waste Management*.

[41] Activated sludge and biosolids typically refer to aerobically treated residuals from the processing of municipal wastewater solids.

[42] Wang, Xue. 2008. Feasibility of Glucose Recovery from Municipal Sewage Sludges as Feedstocks Using Acid Hydrolysis. Masters Thesis Queen's University, Ontario, Canada. Champagne, P. & Li, C. 2009 "Enzymatic hydrolysis of cellulosic municipal wastewater treatment process residuals as feedstocks for the recovery of simple sugars. Bioresource Technology. Vol 100 pp 5700—5706. See memo to the docket: "Support for Classification of Biofuel Produced from Waste Derived Biogas as Cellulosic Biofuel and Summary of Lifecycle Analysis Assumptions and Calculations for Biofuels Produced from Waste Derived Biogas," available in docket EPA–HQ–OAR–2012–0401.

reviewed data that analyzes the activated sludge and biosolids.

The material that enters the digester typically includes the undissolved solids that are recovered from the primary clarification tank and the solids that are allowed to settle out in a secondary clarification tank following aerobic treatment. Therefore, the data for activated sludge and biosolids resembles the material that actually enters the digesters at wastewater treatment facilities. In addition, the data related to activated sludge and biosolids is more consistent and comparable, and therefore provides a more robust estimate of the cellulosic content. The average adjusted cellulosic content was obtained by dividing the reported cellulosic fraction by the convertible organic fraction (minus the percent organic nitrogen, which does not convert to methane). Based on these data, the activated sludge and biosolids are on average composed of 22% cellulose, 36% hemicellulose, and 21% lignin.[43] Therefore, we estimate that the material used to generate the biogas through anaerobic digestion from wastewater treatment facilities is, on average, greater than 75% cellulosic. These data and analyses are described in more detail in a memo to the docket.[44]

c. Agricultural Digester Gas as Cellulosic

In this rule we are defining "agricultural digesters" to be "anaerobic digesters that process predominantly cellulosic materials, including animal manure, crop residues, and/or separated yard waste," and have identified biogas from such digesters as a feedstock for the production of cellulosic biofuel. Based on EPA's AgSTAR data, we have estimated that animal manure, crop residues and yard wastes represent over 90% of the materials being processed in agricultural digesters. As discussed in section IV.A, EPA has determined that crop residues and yard wastes are predominantly cellulosic. As to animal manure, we received in response to our proposal data indicating that animal manure is predominantly cellulosic.[45] Based on these data, animal manure is on average composed of 25% cellulose, 21% hemicellulose, and 17% lignin. When divided by the organic fraction (minus the percent organic nitrogen, which does not convert to methane), we estimate that the material used to generate the biogas through anaerobic digestion from agricultural digesters is, on average, greater than 75% cellulosic.[46] Therefore, in this rule we are including biogas from agricultural digesters in the cellulosic biofuel pathway in row Q of Table 1 to § 80.1426. Note that digesters that primarily process food wastes that cannot be demonstrated to be cellulosic in origin would fall in the general waste digester category discussed in the following section, and could be eligible to produce advanced biofuel instead of cellulosic biofuel.

d. Biogas From Waste Digesters

The current regulations identify biogas from manure digesters as an advanced biofuel. As described above, we have determined that animal manure is predominantly cellulosic, and therefore have determined that fuel made from biogas derived from agricultural digesters processing predominantly cellulosic feedstocks (such as animal manure, crop residues, and yard wastes) qualifies for cellulosic biofuel RINs. However, additional types of renewable biomass may be processed in anaerobic waste digesters. For example, non-manure animal wastes and separated food wastes containing predominantly starches and sugars may be processed in waste digesters that produce biogas. Based on our analyses of biogas from other sources of anaerobic decomposition, described in section IV.B.3, below, we are confident that fuel made from biogas from waste digesters will satisfy the 50% greenhouse gas reduction threshold for advanced biofuels. Therefore, we are including in Row T of Table 1 to § 80.1426, an advanced biofuel pathway for fuel made from biogas derived from waste digesters.

3. Consideration of Lifecycle GHG Emissions Associated With Biogas Pathways

Biogas, consisting primarily of methane and carbon dioxide (with trace amounts of other gases), is produced during the microbial mediated decomposition of organic wastes. In anaerobic environments with available organic material such as landfills, organic conversion to biogas proceeds slowly over decades producing large amounts of methane. While methane is a potent greenhouse gas, it is also a combustible gas and valuable feedstock for the production of other fuels. Biogas collection systems are currently used at landfills to recover and destroy methane by flaring or to recover methane for energy generation or fuel production. Further, the natural anaerobic decomposition of organic wastes occurring in landfills can be exploited and optimized in controlled systems (such as waste digesters) to convert organic wastes to biogas for energy generation or fuel production. In this section we will discuss our GHG analysis of fuels made from waste derived biogas.

a. Upstream GHG Analysis of Biogas as a Renewable Fuel or Fuel Feedstock

The March 2010 RFS final rule concluded that municipal solid waste has no agricultural or land use change GHG emissions associated with its production. In the NPRM, we proposed to add a new pathway to Table 1 to § 80.1426 that used biogas from landfills to produce renewable electricity, CNG or LNG as transportation fuels. In the NPRM, we proposed that no new renewable feedstock production modeling was required, and that no GHG emissions would be attributed to feedstock production, which was consistent with the analysis we had done for the landfill biogas pathway included in the March 2010 RFS final rule. In addition, as described in more detail below, EPA believes that the GHG emissions assumptions for biogas generated at MSW landfills applies to biogas from municipal wastewater treatment facility digesters, agricultural digesters, separated MSW digesters, and waste digesters.

We received several comments supporting this approach for landfills, and it is consistent with other Agency analysis conducted for the annual Inventory of US GHG Emissions and Sinks, which assumes that MSW poses no land use or carbon stock changes.[47]

[43] Wang, Xue. 2008. Feasibility of Glucose Recovery from Municipal Sewage Sludges as Feedstocks Using Acid Hydrolysis. Masters Thesis Queen's University, Ontario, Canada. Sun & Cheng. 2002. "Hydrolysis of lignocellulosic materials for ethanol production: a review. Bioresource Technology. Vol 83 pp 1–11.

[44] Data available for pre-digested biosolids and methods for estimating the aggregate adjusted cellulosic content is presented in the memo to the docket: "Support for Classification of Biofuel Produced from Waste Derived Biogas as Cellulosic Biofuel and Summary of Lifecycle Analysis Assumptions and Calculations for Biofuels Produced from Waste Derived Biogas," available in docket EPA–HQ–OAR–2012–0401.

[45] Chen, S., et. al., 2003, *Value Added Chemicals from Animal Manure.* Pacific Northwest Laboratory, PNNL—14495. December 2003.

[46] See memo to the docket: "Support for Classification of Biofuel Produced from Waste Derived Biogas as Cellulosic Biofuel and Summary of Lifecycle Analysis Assumptions and Calculations for Biofuels Produced from Waste Derived Biogas," available in docket EPA–HQ–OAR–2012–0401.

[47] "*Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks*". Prepared by ICF for the U.S. Environmental

However, we also received comment opposing this approach on the grounds that it would incentivize landfilling over other more GHG-beneficial waste disposal methods.

Commenters did not provide new data or analysis that supported the assertion that allowing biogas-derived fuels from landfills to generate cellulosic rather than advanced RINs or adding new biogas-to-biofuel pathways would significantly reduce recycling and reuse rates. If waste management methods were impacted by use of biogas for transportation fuel, there could be indirect GHG emissions impacts. However, waste management policies are typically controlled by state and local governments, and there are many unique factors that influence these decisions. We have not seen any evidence or data to suggest that the RFS in general has had or will have a substantial impact on existing waste disposal practices across the U.S., and therefore we believe that there will not be significant GHG impacts associated with the biogas-based pathways adopted in this rule. In fact, MSW landfilling rates over the past 50 years have continuously decreased even as both recycling rates and biogas collection have increased significantly. Over the past 10 years as both the per capita and overall MSW generation rates have decreased slightly, the percentage of total trash diverted for recycling has increased.[48] Moreover, energy from waste technologies, such as fuels derived from landfill biogas, can be viewed as a form of waste reuse itself. Incentivizing the use of biogas for fuel production establishes biogas recovery as an operating parameter to be actively optimized—promoting technology that reduces fugitive emissions from landfills.

Other commenters argued that we should begin our lifecycle GHG analysis at the point of waste generation, in which case our comparison would be to an alternative disposal method like recycling of waste paper, composting, or anaerobic digestion. This approach is not being employed because, as mentioned previously, we do not believe that the biogas pathways adopted today will have a substantial impact on existing waste disposal methods, and therefore no significant GHG impacts from waste disposal changes are anticipated as a result of this rule.

EPA does not believe that allowing landfill biogas to generate cellulosic rather than advanced RINs will incentivize landfilling, and we are therefore not changing our assumptions regarding the upstream analysis of feedstocks as part of this final rule. However, we will reevaluate our lifecycle GHG baseline assumptions in subsequent rulemakings if new evidence and supporting data suggest that changes in the waste management system are occurring as a result of these policies.

b. Flaring Baseline Justification

Landfills currently treat their landfill gas, which is comprised of approximately 50% methane, in one of several ways. Municipal solid waste (MSW) landfills are required by EPA regulations to capture and control their biogas if they are designed to collect at least 2.5 million megagrams (Mg) and 2.5 million cubic meters of waste and emitting at least 50 Mg of non-methane organic compounds per year.[49] These large, regulated landfills represent a small percentage of all landfills by number but are responsible for the majority of biogas emissions from landfills. To comply with regulations, these landfills must at a minimum combust their biogas in a flare, converting the methane to carbon dioxide, a less potent GHG. They may also use it for other purposes, including to generate electricity, in which case the electricity produced may displace electricity from other, higher GHG-emitting sources (such as gas-fired power plants) once it enters the grid.[50] Many smaller, unregulated landfills do not collect their biogas, and this methane is "vented" to the atmosphere. Larger regulated landfills do collect the biogas and are assumed to have an average biogas collection efficiency of 75%.[51] In 2012, 14,089 Gg of methane was generated at all landfills (regulated and unregulated), of which 4,608 Gg (33%) was collected and combusted in gas-to-energy projects, 4,040 Gg (29%) was collected and flared, and the rest was either uncollected or collected and vented.[52]

For the landfill gas-to-electricity pathway, we proposed to use landfills that flare their biogas as providing the baseline GHG emissions for use in comparison to scenarios involving production of electricity from the landfill biogas. We chose this baseline because these landfills are the ones most likely to convert to gas-to-energy projects, since they already have gas collection systems in place and are relatively larger landfills producing higher quantities of biogas. Small unregulated landfills might be unable to generate enough biogas to justify the expense of collecting it for conversion to renewable fuels. However, if such small landfills were to capture and use their biogas in transportation fuels, there would be a significantly greater reduction in GHG emissions than would be occasioned by the shift from a flaring landfill to a gas-to-energy project, since a flaring system represents a significant improvement in GHG emissions over a landfill that simply vents its methane. Therefore, if the shift from a flaring landfill to a gas-to-energy project results in a 50% reduction in GHG emissions, the shift of a venting landfill to a gas-to-energy project would result in GHG reductions substantially larger than 50%. Since landfills that currently have gas-to-energy projects in place at one point either replaced flaring with a gas-to-energy project or installed a gas-to-energy project as an alternative to the minimal compliance route of flaring, we proposed to treat the emissions from these landfills compared to the same flaring baseline. We show lifecycle results calculated using alternative baselines and discuss our choice of baseline in more depth in a memo to the docket.[53] We received comments in support of our flaring baseline approach. We did not receive any comments that justified revising this baseline for the pathway in Table 1,

Protection Agency (EPA) Office of Solid Waste, EPA530–R–06–004, September 2006.

48 "*Municipal Solid Waste (MSW) in the United States: Fact and Figures*". EPA's Annual Waste Trends Report. 2012 Facts and Figures Facts Sheet; *http://www.epa.gov/osw/nonhaz/municipal/pubs/2012_msw_fs.pdf*.

49 Standards of Performance for New Stationary Sources and Guidelines for Control of Existing Sources: Municipal Solid Waste Landfills, 61 FR 9905, **Federal Register** Volume 61, Issue 49 (March 12, 1996).

50 Some facilities also use the biogas directly in boilers and other applications or purify the biogas to create CNG or LNG or inject it directly into natural gas pipelines.

51 Environmental Protection Agency. 2012. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2010, Annex 3: Methodological Descriptions for Additional Source or Sink Categories. *http://epa.gov/climatechange/emissions/usinventoryreport.html*. As of December 2012, landfills produced 1913 MW of electricity based on figures from LMOP. This electricity would be almost entirely sold for use on the grid. From *http://www.epa.gov/lmop/projects-candidates/index.html*. Environmental Protection Agency, Landfill Methane Outreach Program. 2010. LFG Energy Project Development Handbook: Chapter 2. Landfill Gas Modeling. *http://epa.gov/lmop/publications-tools/handbook.html*.

52 National Greenhouse Gas Emissions Data. 2011. Chapter 8: Waste. *http://epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2013-Chapter-8-Waste.pdf*.

53 "Support for Classification of Biofuel Produced from Waste Derived Biogas as Cellulosic Biofuel and Summary of Lifecycle Analysis Assumptions and Calculations for Electricity Biofuel Produced from Waste Derived Biogas." Available in docket EPA–HQ–OAR–2012–0401.

therefore EPA is finalizing flaring as our baseline as proposed. We received comment on the use of alternative baselines for specific projects that we discuss below.

Other commenters addressed the case of a landfill that is already generating renewable electricity from landfill gas. The commenters stated that with the increasing availability of plug-in hybrid electric vehicles (PHEVs) and electric vehicles (EVs), it is likely that at least some of the electricity that is currently being generated by these landfills is going to charge these vehicles. The commenter argued that if the landfill now signs contracts with these users, there will be no change in GHG emissions, and fuel from this landfill biogas will not achieve a 60% GHG reduction as required for cellulosic biofuels. Although EPA considered the possibility of differentiating between existing and new biogas projects,[54] we believe that such an approach would inappropriately punish "early actors" that have previously made the decision to install gas-to-energy equipment, either to replace flaring or as an alternative to installing flares. The fact that these facilities made the upgrade to gas-to-energy production prior to the availability of an RFS incentive to do so should not disqualify them. These facilities are already leading performers, and their fuel should be credited with the GHG reductions occasioned by the move away from the flaring alternative even if that move happened in the past. This approach is consistent with how we have treated the early implementation of advanced technologies for all biofuels producers in the past.

We also believe that it is appropriate to use a flaring baseline when considering emissions related to biogas production from municipal wastewater treatment facility digesters, agricultural digesters, separated MSW digesters, and waste digesters. Similar to landfills, biogas from these sources could be vented, flared or used for beneficial purposes. According to the American Biogas Council Web site, of the 1,500 municipal wastewater treatment facility digesters that produce biogas, about 250 use the biogas; for the other 1,250, the biogas is flared. For agricultural digesters the alternative to beneficial use of the biogas is typically that the methane would have been emitted. We believe a similar situation exists with respect to separated MSW, and therefore we use that same flaring baseline for both of these systems. In fact for most waste digesters, the alternative is that the waste would have gone to a landfill resulting in the same baseline. Furthermore, wastewater treatment facilities that don't use digester biogas for process energy, fuel production, or electrical generation typically flare the unused biogas. Assuming that the biogas is flared generally provides a conservative baseline. If sources that are using flaring will achieve a 60% GHG reduction when converting to electricity production, sources that are venting their methane will certainly do so as well.

c. Lifecycle GHG Analysis for Electricity From Biogas

The previous section discussed the baseline EPA has selected for use in comparison to the biogas pathways under consideration.[55] This section discusses the lifecycle GHG emissions analyses of the pathways adopted today, which are then compared to the baseline to determine if the requisite GHG reductions are achieved.

As part of the proposed rule, EPA prepared a proposed assessment of the lifecycle GHG emissions of renewable electricity produced from landfill biogas. In doing so, we examined two main factors. The first involved determining by how much emissions at a landfill employing flaring would change upon installation of a gas-to-energy project. For this calculation, we used emission factors from the GREET model.[56] The second involved calculation of the decrease in GHG emissions caused by powering the gas blowers already in use with biogas-derived electricity produced on-site rather than grid electricity upon installation of a gas-to-energy project at the landfill. This calculation used data from the EPA Landfill Methane Outreach Project (LMOP).[57] For this analysis, we calculated how much electricity could be generated and how much could be delivered off-site to the consumer including consideration of on-site parasitic losses and on-site use. We used values from LMOP to provide estimates of the relative shares of different types of engines or turbines, the electricity generation efficiency, parasitic losses, energy use in collecting and preparing the biogas, and a value from the U.S. Energy Information Agency to estimate distribution losses. Values used are discussed in more detail in a memo to the docket.[58]

We calculated GHG emissions in two ways, per mmBtu electricity and per mmBtu fuel equivalent which accounted for the drivetrain efficiency of electric vehicles. In both cases we found that renewable electricity produced from landfill gas meets the 60% GHG emission reduction threshold required by the CAA, and thus qualifies as a cellulosic biofuel. Compared with the gasoline that it would replace, these projects would be accompanied by an 87% reduction in GHG emissions when normalized per mmBtu electricity. Accounting for the improved efficiency of EV drivetrains increases the GHG emissions reductions to 96%.

We did not receive any comment on our lifecycle calculations and are therefore finalizing our determination that renewable electricity produced onsite from landfill gas meets the 60% reduction in GHG emissions required by the CAA. This determination also applies to a pathway where the electricity is generated off-site. The main differences are removal of the credit associated with using biogas electricity in on-site blowers, and adding emissions associated with scrubbing the gas to pipeline quality, shipping it via pipeline, and removing it from the pipeline to make electricity. Removing the credit associated with use of biogas-derived electricity for onsite blowers still results in a 75% reduction in GHG emissions when normalized per mmBtu electricity, and the emissions associated with other aspects of a pathway involving off-site electricity generation (e.g., scrubbing the gas to pipeline quality, shipping it via pipeline, removing it to make electricity) are not expected to change the result significantly.

We believe that GHG emissions related to electricity produced with biogas from municipal wastewater treatment facility digesters, agricultural

[54] "Support for Classification of Biofuel Produced from Waste Derived Biogas as Cellulosic Biofuel and Summary of Lifecycle Analysis Assumptions and Calculations for Electricity Biofuel Produced from Waste Derived Biogas," which is available in docket EPA–HQ–OAR–2012–0401.

[55] The discussion here is limited to the new biogas to electricity pathway adopted today. Lifecycle greenhouse gas emission reductions required for the new cellulosic CNG and LNG pathways are 60% as compared to a 2005 fossil fuel baseline (50% reductions were previously required for CNG and LNG for the advanced pathway). The CNG and LNG lifecycle assessment for the 60% reduction requirement is discussed in the memo placed in the docket: "Support for Classification of Biofuel Produced from Waste Derived Biogas as Cellulosic Biofuel and Summary of Lifecycle Analysis Assumptions and Calculations for Biofuels Produced from Waste Derived Biogas," available in docket EPA–HQ–OAR–2012–0401.

[56] Argonne National Laboratory (2011) Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation Model (GREET), Version 1 2011. *http://greet.es.anl.gov/*.

[57] EPA LMOP Data.

[58] "Support for Classification of Biofuel Produced from Waste Derived Biogas as Cellulosic Biofuel and Summary of Lifecycle Analysis Assumptions and Calculations for Electricity Biofuel Produced from Waste Derived Biogas." Available in docket EPA–HQ–OAR–2012–0401.

digesters, separated MSW digesters, and waste digesters would be similar to those for landfill biogas production. The analysis for landfill biogas to electricity considered two main components: An increase in emissions due to converting from flaring to electricity generation and a credit associated with reduced grid electricity purchased to run blowers. The change in emissions due to converting from flaring to electricity generation that we assumed for landfill biogas can be considered the same for other sources of biogas. In all cases the emissions are based on the properties of the biogas itself, and its combustion products, which are independent of the biogas source. For other biogas sources there may be less need for purchased grid electricity to run blowers since other biogas sources are generally less distributed than gas collection at landfills. However, even if the credit associated with the reduction in purchased grid electricity for blowers is not considered for municipal wastewater treatment facility digesters, agricultural digesters, separated MSW digesters and waste digesters, compared with the gasoline baseline GHG emissions of 98 kg CO_2-eq/mmBtu, these projects would still be accompanied by a 75% reduction in GHG emissions when normalized per mmBtu electricity. The calculated reduction would be even greater if we accounted for the improved efficiency of EV drivetrains. Therefore, we have determined that pathways involving electricity production from biogas derived from these other sources also meet the 60% lifecycle GHG reduction threshold and can be qualified as cellulosic biofuel (assuming all other definitional and regulatory requirements are satisfied). It is important to note that RINs may only be generated for electricity from biogas that can be tracked to use in the transportation sector, such as by an electric vehicle.

4. Alternative Biogas Options and Comments

a. Alternative Baseline Approaches

We received comments in support of our flaring baseline approach. However, we also received several comments arguing for alternative approaches. Several commenters wanted EPA to allow parties to use a non-flaring baseline where it can be shown that the landfill providing biogas is not required to have a flare or other methane controls. For the basis of our biogas pathways in Table 1, EPA is not changing the baseline comparison of flaring for the reasons stated above, that on average it is the baseline landfill condition that would be replaced. In addition, EPA had determined that the biogas to energy pathways evaluated are all calculated to achieve at least a 60% reduction in GHG emissions required by the CAA when a change from landfill flaring is assumed. Assuming venting instead of flaring as a baseline landfill condition would improve the calculated benefits of the projects, but would not change the applicable RFS GHG threshold determination. Accordingly, there is no purpose served by these comments for purposes of today's rule.

b. Additional Comments on Lifecycle Analysis for Renewable Electricity

In addition to the comments discussed above, we also received comment suggesting that we include electricity from biomass sources such as woody biomass as a pathway in Table 1 to § 80.1426. However, evaluation of the lifecycle GHG emissions associated with generating electricity from woody biomass or other biomass sources would involve substantially different considerations from our analysis of electricity production from biogas sources, and is beyond the scope of this rule. Therefore EPA is not finalizing an electricity pathway from other types of biomass at this time. We also received comments on adding pathways for biogas to transportation fuels other than CNG/LNG and electricity. These other fuel types included dimethyl ether (DME) and hydrogen (H). However, assessing emissions associated with these production processes is also beyond the scope of this rule.

We received comment seeking clarification of whether electricity from landfill biogas or other approved biogas sources that was used in trains would qualify for RIN generation. EPA has determined that electricity used in trains is not a "transportation fuel" as defined in the Clean Air Act. Electricity from RFS-approved biogas sources that is used in trains does not "replace or reduce the use of fossil fuel present in transportation fuel", and therefore does not meet the statutory definition of a "renewable fuel" eligible for RIN generation in the RFS program.

Commenters also asked whether electricity from landfill biogas or other approved biogas sources that was used to compress natural gas would be eligible for RIN generation, if the natural gas was used for transportation purposes. EPA has determined that electricity used to compress natural gas does not qualify for RIN generation, since the electricity will not reduce the amount of fossil fuel present in the natural gas, which is the transportation fuel in this situation.

C. Regulatory Amendments Related to Biogas

Prior to this rulemaking, an approved fuel pathway in Table 1 to § 80.1426 allowed biogas from landfills, manure digesters or sewage waste treatment plants to qualify as an advanced biofuel. We have received questions related to some of the details of this pathway that are also relevant to the biogas-related pathways approved today. The questions include the following: (1) What company along the production chain of biogas from generation to end user is considered the producer that qualifies to register under this pathway and generate RINs, and (2) what are the contract requirements to track the biogas from generation to end use.

We proposed revising and adding new documentation, registration, reporting and recordkeeping requirements at locations along the production chain from biogas generation to finished transportation fuel use. We also proposed to specify which company along the production chain is considered the "producer" and eligible to generate RINs under the RFS program. In the following sections, we will detail the changes being finalized.

1. Changes Applicable to Renewable Electricity From Biogas Sources

In the NPRM, EPA requested comment on a number of potential changes intended to clarify the process for generating RINs for renewable electricity. We received a number of comments on these proposed changes, but have decided that in general the existing regulations are sufficient for present purposes and only minor clarifications are warranted at this time. To the extent that these modifications do not resolve all questions, EPA's intent is to address them through a combination of guidance documents and future rulemaking.

a. Registration and RIN Generation Requirements

Section 80.1426 paragraphs (f)(10) and (11) describe the requirements for generating RINs for renewable electricity and biogas which are either introduced into a dedicated renewable distribution system (§ 80.1426(f)(10)) or introduced into a commercial distribution system (§ 80.1426(f)(11)). EPA requested comment on the provisions and suggestions for alternative requirements. Several commenters provided background information related to actual renewable electricity generation and transportation use to aid in the development of more detailed provisions. This information included specific detail on how individual companies are currently using biogas to generate electricity for transportation purposes, and what these companies are doing to comply with state regulatory programs. These comments illustrated a number of significant challenges faced by parties wishing to generate biogas electricity RINs under the RFS program.

Most commenters agreed that the electricity distribution system is complex, and that detailed and clear regulatory requirements specific to renewable electricity are needed. EPA agrees that the electricity generation system is complex, and EPA intends to take more time to evaluate the options and their implications. We believe that the regulatory changes made in this final rulemaking to § 80.1426 paragraphs (f)(10) and (f)(11) should help address some of those challenges. EPA and stakeholders will benefit from additional experience in implementing the current provisions before adopting significant modifications.

b. Distribution and Tracking Requirements

Tracking and verifying the production and use of the renewable electricity are of particular concern. Each state regulates electricity individually and so there is a wide variety of systems and requirements that must be accounted for in establishing a robust system for electricity accounting. In addition, several states have renewable portfolio standards and "renewable electricity[59] credit" (REC) programs. Further, most states do not allow private electricity generators to sell electricity directly to consumers. Therefore we cannot rely solely on written contracts for tracking of renewable electricity to transportation use. An alternative tracking and verification system must be established. The alternative adopted in this final rule is described in the next section.

It was suggested by commenters that EPA leverage existing state renewable electricity portfolio programs to track and validate RINs generated for RFS-qualified renewable electricity. These programs rely on defined environmental attributes which can be owned and transferred independently of the actual electricity. Ownership of these environmental attributes allows regulated parties to demonstrate compliance with the renewable electricity portfolio programs. Given the variety of renewable electricity programs managed by a multitude of states, this does not seem workable for the RFS program. In addition, EPA does not intend for the RFS to interfere with existing state programs. Therefore we have made the decision to match generation to use, and not require the purchase or definition of related environmental attributes. This does not preclude RIN generators from participating in state renewable electricity programs or from using that information to support their RFS registration and reporting documentation.

2. Regulatory Changes Applicable to All Biogas Related Pathways

As discussed above, we have had many inquiries related to the "biogas" pathway, specifically regarding contract requirements for tracking the biogas through the distribution system to end use, and regarding what company along the production chain is considered the "producer" and eligible to generate RINs under the RFS program. In this rulemaking, we have revised the documentation requirements slightly, to better track the biogas as it moves into and out of the distribution system and to document the final use as a transportation fuel. Provisions related to registration, reporting and recordkeeping were revised as well. These provisions allow for the use of signed affidavits, when written contracts are not available, to prove the use or sale of renewable electricity and renewable CNG/LNG for transportation purposes. It is assumed that these affidavits would be signed by fleet managers or vehicle operators, verifying the use of the renewable transportation fuel. These affidavits would then be matched, by the registered fuel producer, to the delivery or sale of an equivalent amount of qualifying renewable electricity or renewable CNG/LNG. While it is impossible to track the specific molecules or electrons, it must be theoretically feasible that the fuel produced can reach the vehicle using it. Examples of connected grid systems include, but are not limited to, commercial natural gas distribution systems, dedicated private fuel distribution systems, or transmission grids as defined by the North American Electrical Reliability Corporation (NERC) regions. These amended requirements are applicable to all pathways related to biogas.

We proposed that the "producer" of renewable CNG/LNG be the company that compresses or liquefies the gas and distributes the CNG/LNG for transportation fuel, and for renewable electricity, we proposed that the "producer" would be the company that distributes the electricity for use as transportation fuel. Numerous commenters indicated that limiting RIN generation to the CNG/LNG or electricity distributor would revoke current RIN generation ability from those who have invested significant resources in developing biogas projects. Some commenters also stated that the company first injecting the pipeline quality biogas into the grid would be intimately familiar with the responsibilities in tracking distribution, and should be eligible to act as the RIN generator. Given the complexities of the situation involving the production, transportation and use of biogas-derived fuels, we are not finalizing the definition of "producer" for renewable CNG/LNG and renewable electricity. EPA believes a more appropriate approach at this time is to examine registrations on a case by case basis in the short term, and to learn from this experience prior to issuing any final rule addressing the subject.

The processing and distribution train from raw biogas to final transportation fuel use can be complex, and may include many companies and processing steps from the point when the raw biogas is withdrawn from its source (such as landfills, waste digesters, wastewater treatment plants), to where it is processed, converted into biofuel and distributed to consumers. In some cases the fuel may be cleaned at a biogas scrubbing facility to pipeline quality specifications for distribution, and then withdrawn from the commercial pipeline to be processed further at another production facility into renewable CNG/LNG or renewable electricity. The company registering to generate RINs is responsible for providing all the required information and supporting documentation in their registration, and for satisfying reporting and recordkeeping requirements to track and verify the movement of gas from point of extraction of the raw biogas from its original source, through all the processing steps and distribution steps in between, to the last step where the actual fuel is used for transportation purposes. In the engineering review report required for registration, the producer must include documentation that the professional engineer performed site visits at each biogas production facility covered by the producer's registration that is located prior to the point of injection into a common carrier pipeline, or in the case of on-site distribution, prior to the point of

[59] When referring to various state "renewable electricity" programs in this preamble, we are using that term as defined in the state programs, and do not intend to suggest that the electricity in question necessarily satisfies the RFS regulatory definition of "renewable electricity."

distribution for transportation usage. The third-party engineer must also review and verify all related supporting documents such as design documents, calculations, regulatory permits, contracts and affidavits between facilities that track the raw biogas from the point of withdrawal from its source, the various injection/withdraw points into the distribution pipeline, the various production facilities, and the final step for use as transportation fuel. For purposes of biogas-related pathways, EPA does not interpret its regulations as specifying where the producer must lie on the value chain. EPA will evaluate the situation on a case by case basis through the registration process; any company that is registered to generate RINs must be in a position to oversee the entire process and provide all necessary documentation. These requirements will help ensure that the company registering to generate RINs will only generate RINs for fuel that is fully compliant with all regulatory requirements.

The registration, reporting and recordkeeping requirements are in §§ 80.1426(f), 80.1450, and 80.1454 in this rulemaking. The structure of § 80.1426(f) paragraphs (10) and (11) was changed to more clearly address RIN generation requirements for electricity and CNG/LNG derived from biogas. Paragraph (10) lists requirements for fuels that are not introduced into a commercial distribution system; subparagraph (i) addresses electricity requirements and subparagraph (ii) addresses CNG/LNG requirements. Subparagraph (iii) is an additional requirement for producers co-firing a combination of fuels to generate electricity. Similarly, paragraph (11) lists requirements for fuels that are introduced into a commercial distribution system, with the same organization as paragraph (10).

Comments to the NPRM raised the concern that contracts are not always feasible between the parties producing and using the fuel. In some cases, smart metering is available to provide very detailed documentation of fuel distribution and use. Therefore EPA has added signed affidavits and an option for other EPA-approved documentation to demonstrate the transfer of qualifying fuel used for transportation. EPA will provide guidance on other documentation that may be considered acceptable. The changes regarding the documentation requirements for distribution and use of the biogas, electricity, and CNG/LNG is located in § 80.1426 and § 80.1454.

D. Clarification of the Definition of "Crop Residue" and Clarification of Feedstocks That EPA Considers Crop Residues

1. Clarification of the Definition of "Crop Residue"

In today's FRM, EPA is amending "crop residue" in the RFS regulations to more clearly describe the characteristics of products that should fall within the definition.[60] The final amendments are identical to those proposed. EPA proposed in the NPRM to include this amendment to provide more detailed guidance regarding the types of feedstocks that EPA considers crop residues. In our preexisting regulations, "crop residue" "is the biomass left over from the harvesting or processing of planted crops from existing agricultural land and any biomass removed from existing agricultural land that facilitates crop management (including biomass removed from such lands in relation to invasive species control or fire management), whether or not the biomass includes any portion of a crop or crop plant." [61]

In the NPRM, we proposed to amend the definition to specify that biomass is considered crop residue only if the use of that biomass for the production of renewable fuel has no significant impact on demand for the feedstock crop, products produced from that feedstock crop, and all substitutes for the crop and its products including the residue, nor any other impact that would result in a significant increase in direct or indirect GHG emissions. We also noted that crop residue must come from crop production or processing for some other primary purpose (e.g., refined sugar, corn starch ethanol) or be removed to facilitate crop management, such that the crop residue is not the reason the crop was planted. The residue must also come from existing agricultural land, the exact definition of which is laid out in our current regulations that define "renewable biomass." [62] We stated further that the residue should generally not have a significant market in its own right, to the extent that removing it from that market to produce biofuels instead will result in increased GHG emissions.

We sought comment on this revision to the crop residue definition, specifically inviting comments regarding what ought to constitute a "significant" increase or decrease in GHG emissions in the context of this definition.

We received significant comment supporting and opposing this change. At least one commenter who supported the change also stated that EPA should amend the definition of crop residues to more explicitly exclude non-cellulosic components of crop residues.[63] We address the question of the cellulosic content of feedstocks in section IV.A. of this rulemaking. Information available to EPA indicates that crop residue as a class more than satisfies the 75% cellulosic content threshold we have adopted today to identify feedstocks which are eligible to generate cellulosic biofuel RINs for the entire produced volume.[64] For this reason, we are not modifying the definition as suggested by the commenter.

Those opposed to the proposed change were uniformly clear that they supported the crop residue pathway in general.[65] Opposition stemmed from concerns that our proposed clarification would be overly limiting and would exclude feedstocks that rightfully ought to be considered crop residues under the RFS. Several commenters stated that very few products have no market value and that most will find some sort of beneficial use. These commenters expressed concern over our statement in the preamble of the NPRM that, in order to meet the definition of crop residue, a crop product must generally not have a significant market in its own right. In their estimation, the fact that most crop products have a non-zero market value might cause them to be disqualified from the crop residue pathway.[66] EPA acknowledges that many crop residues have some non-zero market value. We also acknowledge that most could find some sort of beneficial use, albeit a low value use in many cases. This in turn may have some non-zero impact on the total revenue a farmer receives for a crop. However, we do not believe that a crop product must necessarily be completely useless in order to qualify under the crop residue pathway. Rather, as indicated in our amendment to the definition of crop residue and our statements in the NPRM preamble, the use of the crop product to produce renewable fuel should not significantly

[60] *See* § 80.1401.

[61] Ibid.

[62] Ibid.

[63] Comments submitted by AFPM/API (EPA–HQ–OAR–2012–0401–0128).

[64] See Memorandum to the Docket, "Cellulosic Content of Various Feedstocks—2014 Update." Available in docket EPA–HQ–OAR–2012–0401.

[65] See, for example, comments submitted by the Renewable Fuels Association, (EPA–HQ–OAR–2012–0401–0123), the National Corn Growers Association (EPA–HQ–OAR–2012–0401–0065), and Growth Energy (EPA–HQ–OAR–2012–0401–0173).

[66] Here as well, several commenters expressed similar opinions. See, for example, comments submitted by the Renewable Fuels Association, (EPA–HQ–OAR–2012–0401–0123).

impact demand for the feedstock crop and associated products and should not lead to a significant increase in GHG emissions. It is our judgment that a crop product need not be completely devoid of value to meet these criteria, though there should be a notable difference in the value of the primary product and the value of the residue.

Other commenters stated that the use of a crop residue as biofuel feedstock gives it value and that this use itself may increase the total value of the primary crop.[67] Several commenters expressed concern that this approach may create a chilling effect on investment in crop residue-based fuels.[68] EPA acknowledges the possibility that, if used as biofuel feedstock in large enough quantities, demand for a crop product may begin to affect the value of the primary crop. EPA noted in the NPRM that, if significant facts change over time, it is possible that EPA would modify its assessment regarding whether particular crop products meet the definition of crop residue. However, if EPA were to revise our assumptions or analysis concerning the qualification of certain crop products as crop residue, this change would be done after public notice and an opportunity for comment. Therefore, industry would have adequate opportunity to provide data to EPA prior to any potential changes to our interpretation regarding any of the feedstocks listed in Table IV.D.3–1. It is important to note that even if a particular feedstock evolved to the point where it had a significant market as a commodity and EPA were required to revisit the lifecycle GHG emissions analysis, this feedstock would most likely still meet the definition of renewable biomass. EPA would therefore be able to establish a new pathway for the feedstock upon completion of a lifecycle GHG analysis, even if the feedstock no longer fit under the crop residue pathway. In sum, we do not believe that the possibility of EPA reconsidering past LCA determinations, including those for crop residue pathways, should create any undue uncertainty for the private sector, nor that the possibility of reconsideration will materially affect production of cellulosic renewable fuels under pathways allowing for the use of crop residue as a feedstock.

Most commenters who opposed the change also argued that the key consideration ought to be whether the residue meets the 60 percent GHG reduction threshold for establishing a pathway to generate RINs with a D code of 3 and/or a D code of 7 and that, as long as a crop product meets this threshold, it ought to be considered a crop residue.[69] EPA believes that the term crop residue should be defined in a manner that ensures that materials within the definition satisfy the 60 percent GHG reduction threshold. This is one of the reasons why EPA is finalizing the proposed amended definition. Materials that do not meet the definition of crop residue, and do not qualify as other feedstocks listed in Table 1, may be independently evaluated to determine if they satisfy the 60 percent GHG reduction threshold, or other thresholds applicable to other types of biofuels. Parties questioning whether an agricultural product meets the current definition of crop residue must determine if the product is "left over." Our proposed and final definitional change is intended to clarify what this means.

However, the current regulations do not provide stakeholders with much guidance regarding what EPA considers to be the meaning of "left over." The current definition has created significant confusion and uncertainty among stakeholders. Our goal in clarifying the definition of crop residue is to more transparently define the criteria that must be met for a feedstock to qualify under the existing crop residue pathway. Stakeholders who are considering whether or not to use a given feedstock will be able to consider these criteria, rather than relying on the current regulatory text that does not specify the meaning of "left over."

Those opposed to the amendment to the definition of crop residue also generally argued that the word "significant" was used vaguely in our proposed clarification, and that this might create undue hurdles for producers seeking to use low-GHG crop products under the crop residue pathway.[70] As stated previously, EPA sought comment on the proposed change and specifically regarding what ought to constitute a "significant" change in GHG emissions. Commenters who opposed the proposed clarification declined to offer alternative interpretations of the terms "left over" and "significant." However, several of these commenters did state that EPA's proposal did not sufficiently describe what might constitute a "significant increase," a "significant market," or a "significant impact."[71]

It is true that EPA did not provide specific criteria for meeting these significance thresholds. However, in our NPRM discussion concerning corn kernel fiber, we discussed this question contextually. In that discussion, we described why we believe that corn kernel fiber would not cause a significant increase in demand for corn, why we believe that corn kernel fiber does not have a significant market in its own right, and why its removal from distillers' grains to produce biofuel will not have a significant impact on direct or indirect GHG emissions. Stakeholders who wish to better understand how to evaluate whether other feedstocks meet the definition of crop residue should consult that discussion and the comparable discussion in section IV.D.2 of this preamble.

Few commenters offered opinions regarding what might constitute a "significant market" for a crop product. However, comments submitted by the Iogen Corporation did provide one potential framework for understanding when a crop product might be considered to have a significant market. In their comments, Iogen stated that "EPA should not consider potential for significant crop shifting unless the farmer revenue per acre for raw unprocessed crop residue (i.e., before fees for collection, baling, stacking, transport, etc.) is more than 15 percent of the grain crop revenue per acre. We believe the volatility of the grain crop revenues is much larger than 15 percent of the grain price, and that the incremental revenue will not affect crop planting decisions."[72]

EPA has not utilized this methodology to identify which crop products we consider crop residues for the purposes of this final rulemaking. We acknowledge that this type of methodology could potentially be useful for evaluating whether future feedstocks meet our definition of crop residue, including non-grain crops. While we have not performed sufficient analysis to determine whether it is appropriate to adopt such an approach today, we may

[67] See comments submitted by the National Corn Growers Association (EPA–HQ–OAR–2012–0401–0065) and the Iowa Corn Growers Association (EPA–HQ–OAR–2012–0401–0124), among others.

[68] See, for example, comments submitted by the American Coalition for Ethanol (EPA–HQ–OAR–2012–0401–0147).

[69] See, for example, comments submitted by Novozymes North America, Inc. (EPA–HQ–OAR–2012–0401–0088) and Growth Energy (EPA–HQ–OAR–2012–0401–0173).

[70] See, for example, comments submitted by the National Biodiesel Board (EPA–HQ–OAR–2012–0401–0166) and Novozymes North America Inc. (EPA–HQ–OAR–2012–0401–0088).

[71] See, for example, comments submitted by the National Biodiesel Board (EPA–HQ–OAR–2012–0401–0166) and Novozymes North America Inc. (EPA–HQ–OAR–2012–0401–0088).

[72] Comments submitted by Iogen Corporation (EPA–HQ–OAR–2012–0401–0135).

reconsider it in the future. Regardless, we do believe that it provides a useful consideration for stakeholders.

In Table IV.D.3–1 of this preamble, EPA identifies several crop products that we consider crop residues. In addition, we have provided greater transparency to stakeholders regarding the criteria for qualifying as a crop residue under the RFS in this preamble and in the clarified definition of crop residue. As a general principle, if a product meets the regulatory definition of crop residue as described above and is similar to a feedstock that we identify as a crop residue in Table IV.D.3–1, then it is likely that EPA would consider it as qualifying as a crop residue. Conversely, if it is not clear that a product meets the regulatory definition of crop residue as described above, or if the feedstock is not similar to any of the feedstocks identified in Table IV.D.3–1, then there is greater uncertainty that it will qualify.[73]

EPA acknowledges that it may not always be straightforward for a stakeholder to determine for themselves whether a crop product is likely to qualify under the crop residue pathway, even with the guidance provided in this preamble and in the revised definition. In light of this, and to promote accurate identification of feedstocks that do and do not qualify as crop residues, EPA is implementing additional registration, recordkeeping, and reporting requirements for producers intending to use crop residue as a feedstock. These additional requirements will help to ensure that producers of renewable fuel do not inadvertently attempt to generate RINs under a crop residue pathway utilizing a feedstock that EPA does not consider to be a crop residue. See section IV.D.4 of this final rulemaking for more details on these requirements.

2. Consideration of Corn Kernel Fiber as a Crop Residue

We also proposed in the NPRM that corn kernel fiber be considered a crop residue. Corn kernel fiber has not been specifically mentioned as a type of crop residue in any previous RFS rulemaking. However, EPA has received several requests to consider corn kernel fiber to be a crop residue. Because it had not been considered a crop residue previously, EPA conducted an evaluation that assessed whether corn kernel fiber should be considered a crop residue. This analysis focuses on whether corn kernel fiber can be considered ‘‘left over from the harvesting or processing of planted crops’’, whether it has ‘‘no significant impacts on demand for the feedstock crop, products produced from that crop, or any substitutes for the crop and its products’’ nor ‘‘any other impact that would result in a significant increase in direct or indirect GHG emissions.’’

We requested comment on our proposed analysis. We received significant comment supporting our analysis and our proposal that corn kernel fiber should be considered a crop residue.[74] We did not receive any comments opposing our analysis or our conclusions. Accordingly, we have decided based on the assumptions, facts and analysis described below that corn kernel fiber should be considered crop residue as proposed. Should relevant facts described in our analysis change, a re-evaluation of the issue may be warranted. Our analysis of corn kernel fiber can serve as one of many possible illustrative examples of how crop products can be evaluated for qualification as crop residues, in addition to our previous considerations of other feedstocks that we consider to be crop residue, such as corn stover.[75]

a. Analysis of Corn Kernel Fiber as a Crop Residue

The amended definition of crop residue requires us to consider any potential ‘‘significant impact on demand for the feedstock crop, products produced from that feedstock crop, and all substitutes for the crop and its products, and any other impact that would result in a significant increase in direct or indirect GHG emissions.’’ To determine whether the use of corn kernel fiber to produce renewable fuel would lead to increased direct or indirect GHG emissions stemming from any of these sources, EPA conducted a detailed assessment of the two major potential sources of emissions from this feedstock, namely effects on feed markets and effects on demand for corn. In our analytical judgment, any impacts on corn, corn products, or substitutes for corn or corn products would come from impacts on the feed market for dried distillers grains (DDG) or from some other impact on overall demand for corn. We did not identify any other potential sources of significant increased GHG emissions in our proposed analysis, and no commenter suggested that any such source might exist. Therefore, we are confident that the analysis we have conducted below adequately addresses all aspects of the definition of crop residue, excepting questions regarding the source of the biomass, which will be evaluated in the context of each individual producer registration pursuant to 40 CFR 80.1450.

Producers acquire corn kernel fiber for ethanol feedstock as a part of the whole corn feedstock stream entering into a corn starch ethanol plant. This fiber stream may then be accessed for ethanol production in one of two general ways. One option is for producers to extract it from matter that would otherwise be converted to DDG during the dry mill corn ethanol production process. This step can be performed either before or after that matter has been separated from the corn starch ethanol. In either case, the corn fiber is processed into ethanol via a separate stream from corn starch ethanol production. A second option is for producers to access and convert the fiber in situ along with the corn starch that is converted to ethanol. In order to meet the definition of a crop residue, the source of corn kernel fiber must be incidental to some other primary purpose. An ethanol producer utilizing corn kernel fiber as a feedstock cannot purchase whole corn for the primary purpose of generating corn fiber ethanol and still qualify their feedstock as crop residue.

Consequently, this analysis relied significantly on the assessment of corn starch ethanol-derived DDG that was conducted for the March 2010 RFS final rule, adjusting the analysis to account for the extraction of fiber from this product.[76] The analysis also drew substantially on the available scientific literature on low fiber DDG (LF–DDG), as well as the expertise of the U.S. Department of Agriculture. Potential producers also submitted important data that helped EPA evaluate the lifecycle GHG emissions of corn kernel fiber.

It is important to note that all animal feed products must be approved by the U.S. Food and Drug Administration (FDA) before they can be sold in the United States. EPA's analysis makes observations and draws conclusions about the characteristics and likely uses of LF–DDG based on the available literature regarding LF–DDG that has

[73] It is important to keep in mind that not qualifying under the crop residue pathway does not in any way exclude fuel produced from a given feedstock from qualifying to generate RINs with a D code of 3 or a D code of 7 more generally. It only means that a new pathway would need to be established, were EPA to find that the fuel produced from that feedstock meets the 60 percent threshold.

[74] Several commenters expressed extremely similar opinions on this point. But see, for example, comments submitted by the Renewable Fuels Association, (EPA–HQ–OAR–2012–0401–0123), the National Corn Growers Association (EPA–HQ–OAR–2012–0401–0065), and Growth Energy (EPA–HQ–OAR–2012–0401–0173).

[75] For our analysis of corn stover in the context of the crop residue pathway, see 75 FR 14670, March 26, 2010.

[76] See 75 FR 14670, March 26, 2010.

been fed to livestock in research settings. However, at this time the FDA has not approved LF–DDG for use in commercial animal feed. Nothing in EPA's analysis should be construed as an official federal government position regarding the approval or disapproval of LF–DDG as an animal feed. Only FDA is authorized to make that determination. Our analysis proceeds from the assumption that producers of LF–DDG will be able to gain FDA approval for these feed products and that they will do so before commencing production and sale of this feed product. If however FDA does not approve LF–DDG as an animal feed, there will be implications for the LCA of corn kernel fiber, and EPA will revisit its determination.

EPA found that extracting the fiber from corn matter used to produce standard DDG would not have a significant effect on feed markets. Processors who extract the fiber from corn produce a feed product known as LF–DDG, as opposed to standard DDG, which retains the fiber. The scientific literature on LF–DDG animal nutrition has found that this product has at least equal, and perhaps even slightly superior, nutritional value for swine and poultry compared to standard DDG.[77] This means that, even though the physical volume of the LF–DDG produced by ethanol plants using corn kernel fiber extraction technology will be somewhat smaller than the volume of DDG produced by plants not extracting corn kernel fiber, the nutritional content of LF–DDG for swine and poultry will be equivalent to or greater than DDG.

Conversely, LF–DDG is an inferior feed for cattle compared to standard DDG, since ruminants benefit from ingesting corn fiber in DDG.[78] Therefore, EPA expects swine and poultry producers to absorb the supply of LF–DDG, while the cattle and dairy industry will continue to consume standard DDG. With this dynamic in place, fiber extraction from DDG should not significantly affect feed markets, since there will be no reduction in the overall supply of DDG in terms of nutritional content nor will there be any impact on aggregate demand for other animal feed sources.

If enough corn ethanol producers adopt fiber extraction technology, LF–DDG could saturate swine and poultry demand and spill over into dairy and cattle feed markets. If a situation arises where LF–DDG begin to replace standard DDG in dairy and/or cattle markets, this could lead to an increase in aggregate feed demand, most likely in the form of increased demand for fiber supplements in dairy and cattle feed. This theoretically could cause an increase in GHG emissions. However, we do not expect this to occur. If swine and poultry demand for LF–DDG becomes saturated, demand for standard DDG in the cattle and dairy industries should create sufficient market incentives for the remaining corn starch ethanol producers to decide against adopting corn fiber ethanol production. EPA believes this will prevent a situation where there is insufficient supply of standard DDG in the cattle and dairy industries. However, as noted above, if significant facts change, it may be appropriate for EPA to reexamine corn kernel fiber as a crop residue in the future.

EPA's analysis indicates that producing ethanol from corn kernel fiber is unlikely to increase overall demand for corn, in addition to having no significant impact on feed markets. It is our judgment, based on the analysis above, that the primary purpose of procuring whole corn for processing in a corn starch ethanol plant is to produce corn starch ethanol, since more than 90 percent of the ethanol produced will be from the starch. The plant would most likely procure that same quantity of whole corn regardless of whether they were converting the fiber into ethanol or sending it to some other end use. The diversion of corn kernel fiber from the DDG stream to an ethanol production stream will not materially affect the value of the feed products produced by a corn starch ethanol plant per bushel of corn processed. Because of this, there will be no significant incentive for the plant that is producing ethanol from corn kernel fiber to procure more or less corn than they would if they were selling the fiber as part of their DDG product. We can find no evidence to support a claim that production of ethanol from corn kernel fiber has any significant impact on demand for corn, products produced from corn, or the substitutes for corn and its products. Further, we find that if corn kernel fiber is not used to produce ethanol, it will be left over from the corn starch ethanol production process, because its presence or absence in DDG products does not materially impact the value of those DDGs or the overall market for DDGs and feed products. Finally, we were unable to identify any other potentially significant impacts associated with utilizing corn kernel fiber to produce renewable fuel that might lead to significant GHG emissions, nor were any such impacts identified during public notice and comment. Based on these factors, we find that utilizing corn kernel fiber to produce renewable fuel would have no significant impacts on GHG emissions. These findings support a determination that corn kernel fiber meets the definition of a crop residue. Therefore, corn kernel fiber may be used as a feedstock in those pathways in Table 1 to § 80.1426 that specify crop residue as a feedstock.

b. Treatment of Corn Starch That Adheres to Corn Kernel Fiber After Separation From DDG

EPA sought comment on whether the definition of crop residue should be amended to explicitly exclude the corn starch component, since some corn starch may still adhere to the corn kernel after separation. Additionally, EPA invited comment on how RINs should be allocated for fuel derived from corn fiber, including comment on the sufficiency of current RFS regulations with regards to the assignment of RINs to batches of corn starch ethanol and corn kernel fiber ethanol produced via consolidated bioprocessing and whether producers have the technological capability to adequately demonstrate the volume of fuel produced under each pathway.

Commenters confirmed that some starch may adhere to the unconverted fiber, even after most of the starch has been processed into ethanol.[79] However, many of those same commenters also supported considering this starch as "de minimis" under our current regulations.[80] Those current regulations state that "producers and importers may disregard any incidental, de minimis feedstock contaminants that are impractical to remove and are related to customary feedstock production and transport." [81] We received several comments noting that corn kernels undergo a rigorous mechanical process designed to separate the starch from the

[77] *See, e.g.*, Kim, E.J., C.M. Parsons, R. Srinivasan, and V. Singh. 2010. *Nutritional composition, nitrogen-corrected true metabolizable energy, and amino acid digestibilities of new corn distillers dried grains with solubles produced by new fractionation processes. Poultry Science* 89, p. 44, available on the docket for this rulemaking as EPA–HQ–OAR–2012–0401–0002. *See also* additional studies cited within Kim et al 2010.

[78] *See* Shurson, G.C. 2006. *The Value of High-Protein Distillers Coproducts in Swine Feeds. Distillers Grains Quarterly*, First Quarter, p. 22, available on the docket for this rulemaking as EPA–HQ–OAR–2012–0401–0003.

[79] See, for example, comments submitted by Edeniq, Inc. (EPA–HQ–OAR–2012–0401–0159).

[80] Numerous commenters supported this position. See, for example, comments submitted by Edeniq, Inc. (EPA–HQ–OAR–2012–0401–0159), the American Coalition for Ethanol (EPA–HQ–OAR–2012–0401–0147), and Growth Energy (EPA–HQ–OAR–2012–0401–0173).

[81] *See* specifically § 80.1426(f)(1).

rest of the corn kernel before processing that starch into ethanol. Despite this process, some starch adheres to the fibrous portions of the kernel and, in a standard corn starch ethanol plant, ends up in the DDG.[82]

Commenters argued that this adhering starch is indeed impractical to remove and is present only in small quantities.[83] In the preamble of the NPRM for this rulemaking, EPA stated that starch might compose up to 20 percent of the separated mass used to produce corn kernel fiber ethanol via a separate stream, based on data from 1998. Through the public comment process, we received more recent and fine-grained data that better represents current methods of starch-fiber separation. Based on this newer data, we believe the actual amount of starch that adheres to the fiber after separation from the rest of the corn kernel is typically less than 5 percent of the total mass of the separated corn kernel fiber feedstock.[84]

In light of the small quantity of starch involved, typically less than 5 percent of the mass, and the impracticability of separating the starch which adheres to the fiber, we believe that this starch component can appropriately be considered a de minimis contaminant. Like all plant fibers, the fibrous portion of corn kernel fiber is composed of nearly 100 percent cellulose, hemicellulose, and lignin. Taken together with the small quantity of adhering corn starch, corn kernel fiber is clearly above the 75 percent threshold we have established in today's rulemaking for determining when a feedstock is predominantly cellulosic, and this is also consistent with our finding, discussed in section IV.A. of the preamble, that crop residue as a class has at least 75 percent cellulosic content. To be clear, this de minimis determination only applies to starch adhering to corn kernel fiber that is being processed into ethanol separately from corn starch ethanol. Processes that convert corn starch and corn kernel fiber to ethanol in situ (as is described in detail in the next section) may not consider any portion of the corn starch to be de minimis. Furthermore, if any producer processing corn kernel fiber separately from corn starch fails to use best practices[85] to separate adhering corn starch, in an attempt to boost production of cellulosic biofuel from processing corn kernel fiber or for any other reason, the adhering starch will not be considered a de minimis contaminant, and the entire batch of resulting fuel will not be considered derived from crop residue and will not qualify as cellulosic biofuel. Since processing of the corn kernel would be incomplete, the feedstock would not be considered left over from processing and would not meet the definition of crop residue in § 80.1401. While the batch of resulting fuel might be eligible to generate renewable biofuel RINs (D code of 6) for the starch-derived component of the fuel, RINs could only be generated for the fuel derived from non-starch components of such feedstock to the extent that such volumes were grandfathered under § 80.1403(c) or (d).Based on the existing reporting requirements listed in § 80.1451(b)(1)(ii),[86] EPA is already requiring the data necessary to identify whether the cellulosic RINs that a fuel producer is generating is disproportionate to the amount of corn kernel fiber processed at a facility. EPA collects feedstock volumes, fuel volumes, and other data reported to determine that RINs and volumes are generated in accordance with the regulations.

c. Processing Corn Kernel Fiber

Corn kernel fiber may be used for biofuel production in multiple ways. As detailed above in section IV.A.4, renewable fuel can be produced pursuant to biochemical conversion processes that simultaneously hydrolyze and/or ferment cellulosic and non-cellulosic material into fermentable sugars and/or fuel. Corn kernel fiber as a crop residue may be converted into qualifying renewable fuel via biochemical methods in one of two ways.[87] First, it may be converted via a consolidated bioprocessing method that converts cellulosic and non-cellulosic corn material into sugars and/or fuel products simultaneously. Second, corn kernel fiber may be converted to sugar and/or fuel via a separate stream from the corn starch sugar and fuel conversion streams.

The first method may include simultaneous hydrolysis of the starch and cellulosic components of the corn kernel into sugars, followed by simultaneous conversion of those sugars into fuel products. In other cases, the cellulosic and non-cellulosic portions of the corn kernel may be hydrolyzed separately but fermented together in a single vessel. In either case, EPA considers this process technology to be a method of simultaneous conversion. We discuss the requirements for using a simultaneous conversion process in section IV.A.4 of this preamble.

Alternatively, producers may hydrolyze and ferment the cellulosic and non-cellulosic portions of the corn kernel via separate streams. This may be accomplished in at least one of two ways. A producer might separate the starch from the corn kernel fiber before the hydrolysis step, sending each set of material through separate hydrolysis, fermentation, and distillation streams. A producer might also perform a conventional corn starch ethanol fermentation process, yielding corn starch ethanol, and then hydrolyze and ferment the residual solids (which typically become DDG at the end of the process) a second time, using enzymes designed to convert cellulosic material to sugars. If a producer uses a process that hydrolyzes and ferments the corn kernel fiber separately from the corn starch, either in a parallel but separate process or in a sequential process that extracts the fiber from the residual solids after corn starch ethanol fermentation, then the producer is not considered to be performing simultaneous conversion, and all of the resulting corn kernel fiber-derived fuel may appropriately be considered derived from predominantly cellulosic biomass. As discussed above, some starch may adhere to the fiber after the separation step or may remain in the residual solids output of a conventional corn starch ethanol fermentation process. However, we believe this small amount of corn starch contaminant fits under EPA's de minimis feedstock contaminant provision in the existing regulations, and should be disregarded.[88] This is the case even if a producer were to add enzymes which might convert starch adhering to the corn kernel fiber to ethanol.

[82] See comments submitted by Quad County Corn Processors (EPA–HQ–OAR–2012–0401–0063), by Edeniq, Inc. (EPA–HQ–OAR–2012–0401–0159), and the American Coalition for Ethanol (EPA–HQ–OAR–2012–0401–0147).

[83] See, for example, comments submitted by Edeniq, Inc. (EPA–HQ–OAR–2012–0401–0159).

[84] Ibid.

[85] Data submitted by commenters indicate that the rigorous mechanical process employed to separate corn kernel fiber and corn starch will typically allow less than 5% of residual starch to adhere to the fiber after separation. See comments submitted by Quad County Corn Processors (EPA–HQ–OAR–2012–0401–0063), by Edeniq, Inc. (EPA–HQ–OAR–2012–0401–0159), and the American Coalition for Ethanol (EPA–HQ–OAR–2012–0401–0147).

[86] Required information includes: Quantity of RINs generated, volume of fuel produced, feedstock type, and exact feedstock quantity.

[87] Corn kernel fiber may also be converted to fuel via thermochemical methods. See section IV.A.4 for details on the requirements for renewable fuel production via thermochemical pathways.

[88] *See* specifically § 80.1426 (f) (1).

3. Identification of Feedstocks EPA Considers Crop Residues

To provide additional guidance on the definition of crop residue, EPA is identifying several feedstocks that we consider to be crop residues. In the NPRM, we provided a table that included feedstocks which we have previously identified as crop residues in public documents and which we believed fit the definition of crop residue.[89] That table included corn stover, corn kernel fiber (see section IV.D.2 above for further discussion), citrus residue, rice straw, sugarcane bagasse, and wheat straw. All of these feedstocks were identified as crop residues in the preamble of the March 2010 RFS final rulemaking, with the exception of corn kernel fiber. For example, EPA analyzed the agricultural sector GHG emissions of using corn stover for biofuels in the final March 2010 RFS final rulemaking and found that fuel produced from this feedstock met the 60% GHG reduction threshold for cellulosic biofuels.[90] Since the direct and indirect impacts of several other crop products, including citrus residue, rice straw, and wheat straw, were expected to be similar to those of corn stover, EPA also applied the land use change impacts associated with corn stover to those products as well. Based on that analysis, EPA found that fuels produced from these products also met the 60% reduction threshold. EPA further determined that fuels produced from materials left over after the processing of a crop into a useable resource had land use impacts sufficiently similar to agricultural residues to also meet the 60% threshold. EPA specifically cited bagasse left over from sugarcane processing as an example of this type of crop residue.

EPA sought comment on whether these feedstocks should be considered crop residues, whether these feedstocks would have direct and indirect GHG impacts similar to corn stover, and whether additional feedstocks should also be considered crop residues. We received numerous comments that supported considering all of these feedstocks as crop residues.[91] We did not receive any comments that opposed considering any of the feedstocks identified in the NPRM as crop residues, nor did we receive any comments that disputed our reasons for considering them crop residues.

In addition, several commenters identified other crop products which are extremely similar to those that we proposed to consider crop residues. Commenters noted that we have identified sugarcane bagasse as a crop residue in multiple rulemakings, including the March 2010 RFS final rule and the NPRM of this rule, but have not previously considered sweet sorghum bagasse.[92] The processes for separating bagasse from simple sugars is very similar between sugarcane and sweet sorghum and the market and other potential GHG impacts of utilizing that bagasse to produce renewable fuel are also considered to be similar. Therefore we are today identifying both as feedstocks which we consider crop residues.

Commenters noted that we identified corn stover as a crop residue in the NPRM, but have not previously considered grain sorghum stover.[93] Since the composition, methods of production, methods of collection, market potential, and implications for other relevant markets for these two types of stover are nearly identical, these two stovers would reasonably seem to have similar GHG impact profiles.

Commenters also noted that, in the NPRM, we did not list grain fibers other than corn kernel fiber. To the extent that other grain kernel fibers are extracted and used for biofuel feedstock in the same manner as we lay out for corn kernel fiber in section IV.D.2 above (i.e., during the processing of grain feedstock into ethanol), these products would reasonably seem to have similar GHG impact profiles to corn kernel fiber.[94] To the extent that these grain fibers are obtained in the same manner that we have laid out for corn kernel fiber, their alternative fate would also be distillers grains. The impacts of fiber on the digestion of ruminants, swine, and poultry are extremely similar, regardless of what grain that fiber came from, because all grain fiber is virtually 100 percent cellulosic. Therefore, we are confident that diverting that fiber to a fuel production stream would have similarly insignificant market and other GHG impacts to those of corn kernel fiber, and we similarly consider them to be crop residues under those circumstances.

Commenters also pointed out that we identified wheat straw and rice straw as crop residues in the NPRM but did not identify other grain straws (e.g., oat straw, barley straw) as residues, even though these products would reasonably seem to have similar GHG impact profiles to wheat straw and rice straw.[95] EPA has determined that these straws do indeed have similar GHG impacts to those of wheat straw and rice straw. All of them have similarly insignificant markets, insignificant effects on demand for the crop from which they are derived, and insignificant impacts on other crop products and substitutes. Further they are processed into renewable fuel in nearly identical ways. Therefore, we consider all of the grain straws listed in Table IV.D.3–1 below to be crop residues.

Finally, while we proposed to identify "citrus residue" as a crop residue in the NPRM, several stakeholders have suggested that this label is rather vague. There are several different types of byproducts or residues from citrus processing (e.g., peels, pulp, seeds), each with a unique chemical composition and degree of alternative usefulness. EPA does not currently have sufficient information to determine that all byproducts of citrus processing meet the requirements of the crop residue pathway. Producers wishing to utilize citrus processing byproducts as a feedstock under the crop residue pathway will need to provide EPA with further information about the materials they are utilizing, per the registration requirements detailed in section IV.D.4.a of this FRM.

In Table IV.D.3–1 we are identifying several crop products that EPA considers to be crop residues.[96] This table is meant to be illustrative, not exhaustive, of the types of crop products that EPA considers to be crop residues. It is included here to provide guidance and greater clarity to stakeholders; it should not be considered a definitive list. It will not appear in our regulations, though EPA may publish a table similar

[89] See Table IV.D.3–1—Feedstocks That May Qualify as Crop Residue, 78 FR, 36056–36057, June 14, 2013.

[90] See EPA–HQ–OAR–2005–0161–3173.2, EPA–HQ–OAR–2005–0161–3173.3, and EPA–HQ–OAR–2005–0161–3173.4, under the Lifecycle Results Docket for the March 2010 RFS Final Rulemaking.

[91] Several commenters expressed extremely similar opinions on this point. But see, for example, comments submitted by the Renewable Fuels Association, (EPA–HQ–OAR–2012–0401–0123), the National Corn Growers Association (EPA–HQ–OAR–2012–0401–0065), and Growth Energy (EPA–HQ–OAR–2012–0401–0173).

[92] See comments submitted by NexSteppe Inc. (EPA–HQ–OAR–2012–0401–0153). See also 75 FR 14692, March 26, 2010 and 78 FR 36042, June 14, 2013.

[93] See comments submitted by the National Sorghum Producers (EPA–HQ–OAR–2012–0401–0065), Iogen Corporation (EPA–HQ–OAR–2012–0401–0135), NexSteppe Inc. (EPA–HQ–OAR–2012–0401–0153).

[94] See comments submitted by Novozymes North America Inc. (EPA–HQ–OAR–2012–0401–0088), ICM (EPA–HQ–OAR–2012–0401–0114), NexSteppe Inc. (EPA–HQ–OAR–2012–0401–0153), Growth Energy (EPA–HQ–OAR–2012–0401–0173).

[95] See comments submitted by Iogen Corporation (EPA–HQ–OAR–2012–0401–0135).

[96] Our analysis of corn kernel fiber as a crop residue is discussed in section IV.D.2 of this preamble.

to Table IV.D.3–1 on our Web site for the convenience and education of stakeholders. We acknowledge that there may be other crop products which were not brought to our attention during this rulemaking process and which are not included in Table IV.D.3–1, but which may meet the definition of crop residue as we are clarifying it in today's final rulemaking. Further details regarding how EPA may evaluate these crop products can be found in section IV.D.1 and section IV.D.2 of this final rulemaking. Additionally, stakeholders may also want to consult section IV.D.4 of this final rulemaking, which describes new RRR requirements for producers who wish to use crop residue as a feedstock for renewable fuel production.

TABLE IV.D.3–1—FEEDSTOCKS THAT EPA CONSIDERS CROP RESIDUES

Sugarcane and Sweet Sorghum Bagasse.
Kernel Fiber from Barley, Corn, Oats, Rice, Rye, Grain Sorghum, and Wheat.
Stover from Corn and Grain Sorghum.
Straw from Barley, Oats, Rice, Rye, Soybeans, and Wheat.

4. Registration, Recordkeeping, and Reporting Requirements Associated With Using Crop Residue as a Feedstock

Under current regulations, producers registering to generate RINs using the crop residue pathway are not required to specify exactly which crop products they intend to use. This could potentially lead to a situation where a producer inadvertently generates invalid RINs by producing a batch of fuel from a crop product that does not meet the crop residue definition. In order to ensure that producers only utilize crop products which EPA considers to be crop residues and thereby generate valid RINs when using a crop residue pathway, we are implementing additional RRR requirements for producers using crop residue as feedstock under any approved pathway.

a. Registration Requirements for Producers Utilizing Crop Residue as a Feedstock

EPA acknowledges that the regulatory definition adopted today may be difficult to interpret in some respects. On the other hand, EPA believes that the proposed revised definition appropriately describes crop products that should qualify as crop residues. In order to reduce uncertainty and confusion in the application of the revised definition, we are implementing a new registration requirement for those seeking to use crop residues as a feedstock. Any entity registering to use crop residue as a feedstock must, as a part of their registration package submitted pursuant to 40 CFR 80.1450, include a list of all crop materials they intend to use that they consider to be crop residue, and a justification for their belief that the listed crop materials meet the regulatory definition of crop residue. These regulatory amendments appear in 40 CFR 80.1450.

If the crop product is one that EPA has previously identified as meeting the regulatory definition of crop residue, then referencing the relevant EPA document will likely be sufficient justification. However, if a crop product is not one that EPA has previously identified as a crop residue, then EPA intends to evaluate whether that feedstock meets the regulatory definition prior to accepting the facility's registration. If the feedstock is very similar to one that EPA has already evaluated, this may be a relatively brief process. See the discussion in section IV.D.3 above for some examples of how this comparison could be performed by EPA. However, if the feedstock markedly differs from those we have evaluated previously, as corn kernel fiber did before this final rulemaking, then a more extensive analysis, even including lifecycle GHG analysis, may be required. Each feedstock presents its own sets of questions. Stakeholders may wish to consult our analysis of corn kernel fiber in section IV.D.2 of this rulemaking for an example of such an analysis.

If EPA decides that further analysis of a particular feedstock is needed, the registrant will have the option of removing the crop product from its registration package, in order to allow the remainder of the package to be processed more quickly and to allow the producer to be registered and begin production using other feedstocks pending EPA's analysis. If EPA later determines that the crop product in question meets the regulatory definition of crop residue, then the registrant could update their registration to include that feedstock. However, in order to avoid delay, stakeholders may wish to consult EPA's Web site and rulemakings regarding the definition of crop residue before submitting their registration. Should a stakeholder discover that a feedstock they are planning to utilize has not been previously identified by EPA as a crop residue, it may be beneficial and expedient for them to consult EPA before submitting their registration. We are not finalizing any requirement that stakeholders take this affirmative step before submitting their registration. However, we believe that taking this step may lead to a more streamlined process for entities who wish to utilize a new crop product as feedstock in pathways providing for use of crop residue.

Entities who are already registered to generate renewable fuel using crop residue as a feedstock will not be required to immediately update their registration to conform to these new requirements. However, when these entities perform periodic updates to their registration pursuant to 40 CFR 80.1450(d)(3), they will be required to include the information described in these new requirements at that time.

b. Recordkeeping and Reporting Requirements for Producers Utilizing Crop Residue as a Feedstock

In addition to the registration requirements outlined above, EPA is also requiring that any entity registered to generate RINs using crop residue as a feedstock keep records of the quantities of each specific crop product they utilize, and that they report the quantities used to generate qualifying renewable fuel over the past three months in each quarterly report to EPA.[97] This requirement is somewhat different from the feedstock reporting requirement associated with reporting RIN generation in EMTS. In EMTS, the RIN generator is only required to report the total quantity of crop residue used to produce the batch of fuel for which RINs are generated. These new recordkeeping and quarterly reporting requirements go a step further by requiring specific accounting of the exact quantities of individual crop products used by the producer over a three-month period. The exact regulatory requirements of this new provision are detailed in the amendments to 40 CFR 80.1451 and 80.1454 below.

E. Amendments to Various RFS Compliance Related Provisions

We are finalizing a number of changes to the RFS regulations related to compliance, except for the definition of "Responsible Corporate Officer" (RCO), which was proposed but is not being finalized.

1. Changes to Definitions

"Responsible Corporate Officer":

EPA is not finalizing the definition of "responsible corporate officer" at this time. The existing RFS regulations at §§ 80.1416, 80.1451 and 80.1454, and

[97] At the time of this rulemaking, RIN generators would report this information via quarterly report number RFS0801. See *http://www.epa.gov/otaq/fuels/reporting/rfs.htm* for further details.

EPA guidance and instructions regarding registration and reporting, frequently refer to the responsibilities of the "owner or a responsible corporate officer." However, the term "responsible corporate officer" had not been defined in the RFS regulations.

Several commenters requested that EPA review its existing policy on acceptable position titles and what registration updates have to be approved by an RCO. These comments were directed at EPA's administrative procedures and registration system, rather than the regulatory responsibilities of the RCO with regard to compliance with RFS standards. EPA needs to evaluate the registration process, which may include potential modifications to the registration system, for opportunities to minimize burden on RCOs and to better differentiate an RCO's roles with respect to program compliance versus administrative roles in our registration system. Based on these comments and the potential for registration system modifications, EPA is not finalizing the RCO definition at this time. Regulated parties should continue to follow existing regulations and registration procedures.

"Small Refinery":

Section 211(o)(9)(A) of the Clean Air Act provides an exemption from RFS requirements through 2010 for "small refineries," defined as refineries having an average aggregate daily crude oil throughput "for a calendar year" that does not exceed 75,000 barrels. It also provides for possible extensions of this exemption, through individual petitions to EPA under CAA section 211(o)(9)(B). In EPA's March 26, 2010 regulations implementing the EISA amendments to the RFS program we specified in the regulatory definition of "small refinery" that the 75,000 bpd threshold determination should be calculated based on information from calendar year 2006. At the beginning of the program, having a single year in which to make this determination simplified the calculations and helped to ensure that all refineries were treated similarly. However, we no longer believe that it is appropriate that refineries satisfying the 75,000 bpd threshold in 2006 should be eligible for extensions to their small refinery RFS exemption if they no longer meet the 75,000 bpd threshold. Allowing such facilities to qualify for an exemption extension, while not allowing similarly sized facilities that have not grown since 2006 to qualify for an exemption, does not appear fair, nor does it further the objectives of the statute to target relief to only truly small facilities. Therefore, we proposed modifying the definition of small refinery so that the crude throughput threshold of 75,000 bpd must apply in 2006 and in all subsequent years. We also proposed specifying in § 80.1441(e)(2)(iii) that in order to qualify for an extension of its small refinery exemption, a refinery must meet the definition of "small refinery" in § 80.1401 for all full calendar years between 2006 and the date of submission of the petition for an extension of the exemption.

We proposed that that these changes would not affect any existing exemption extensions under CAA section 211(o)(9)(B); rather, they would apply at such time as any approved exemption extension expires and the refinery at issue seeks a further exemption extension. No further extension would be permitted unless the revised crude oil throughput specifications were satisfied.

We received two comments on our proposed small refinery revisions, both supporting EPA's proposed change. After further consideration of this matter, we believe that the proposal could unfairly disqualify a refinery from eligibility for small refinery relief based only on a single year's production since 2006. We do not believe it would be appropriate to treat two refineries whose recent operating conditions were equivalent differently if one refinery exceeded 75,000 bpd in a single year as much as 8 years ago. Considering this concern and the intent in our proposal to treat similarly sized facilities the same, we are modifying the final rule to require that throughput be no greater than 75,000 barrels in the most recent full calendar year prior to an application for hardship. We will also clarify that a qualifying small refinery can't be projected to exceed the threshold in the year or years for which it is seeking an exemption. Production that exceeds the average aggregate 75,000 barrel per date limitation during an approved exemption period would invalidate the exemption. With these modifications, we believe we will better address our primary concern from proposal of treating refineries with similar performance the same. We believe that these changes reasonably implement the statutory definition of "small refinery," which indicates that the 75,000 barrel aggregate daily crude oil throughput is for "a calendar year," but does not specify which calendar year should be the focus of inquiry. The final rule places the focus on the time period immediately prior to and during the desired exemption period, which we believe is most appropriate given the objectives of the provision.

2. Provisions for Small Blenders of Renewable Fuels

The RFS regulations at § 80.1440 allow renewable fuel blenders who handle and blend less than 125,000 gallons of renewable fuel per year, and who are not obligated parties or exporters, to delegate their RIN-related responsibilities to the party directly upstream from them who supplied the renewable fuel for blending. EPA has received feedback from several parties to the effect that the 125,000 threshold is too low and is a lower threshold than what industry considers "small." EPA requested input on what a more appropriate gallon threshold should be.

EPA received two comments supporting an increase in the threshold and one comment suggesting it remain at the current amount of 125,000 gallons. Of the two commenters suggesting the amount should be increased, one suggested an increased amount of 250,000 gallons, and the other suggested an increased amount of 3 to 4 million gallons. Based on comments received from stakeholders previously and based on comments received on the proposed rule, EPA believes it is reasonable to increase the threshold for small blenders of renewable fuels (those that are not obligated parties or exporters) to help relieve burden from managing RINs. However, EPA is cautious not to increase the threshold beyond what is reasonable and beyond an amount that would be considered "small." EPA generally agrees with one of the commenter's suggested amount of 250,000 gallons. Doubling the threshold from 125,000 gallons to 250,000 gallons will provide additional relief to the smallest renewable fuel blenders. Therefore, EPA is adjusting the gallon threshold for small blenders of renewable fuels (and who are not obligated parties or exporters) that want to delegate their RIN-related responsibilities to the party directly upstream from them who supplied the renewable fuel for blending. The threshold is being changed from 125,000 gallons to 250,000 gallons in today's final rule.

3. Changes to § 80.1450—Registration Requirements

EPA is adding a new paragraph (h) to § 80.1450 that describes the circumstances under which EPA may deactivate a company registration and an administrative process to initiate a deactivation that provides any company the opportunity to respond to and/or timely submit the required information.

EPA originally proposed deactivating a company registration where there had been no activity in EMTS for one calendar year (January 1 through December 31). Commenters noted that there may be valid reasons for a break in use of EMTS within a calendar year. To avoid this scenario, EPA is modifying this provision to specify that if a company has reported no activity in EMTS under § 80.1452 for twenty-four calendar months, then EPA will initiate this administrative process. In addition, for this particular circumstance, if a party responds within 14 days of EPA notification of an intent to deactivate registration with a letter stating that they wish to remain as a current registered party, EPA will not deactivate their registration. If there is no response received, or the response does not indicate a desire to for the entity to remain actively registered, then EPA may deactivate the registration.

EPA may also deactivate a company registration if a party fails to comply with any registration requirement of § 80.1450, if the party fails to submit any required compliance report under § 80.1451, if the party fails to meet the requirements related to EMTS under § 80.1452, or if the party fails to meet the requirements related to attest engagements under § 80.1454. EPA will provide written notice to the owner or responsible corporate officer (RCO) that it intends to deactivate the company's registration and would allow the company fourteen (14) days from the date of the letter's issuance to correct the deficiencies noted or explain why there is no need for corrective action. If there is no satisfactory response received, then EPA may deactivate the registration. Reactivation will be possible following the submission or updating of all required information and reports.

4. Changes to § 80.1452—EPA Moderated Transaction System (EMTS) Requirements—Alternative Reporting Method for Sell and Buy Transactions for Assigned RINs

EPA proposed an alternative method for recording in EMTS the date of title transfer between the buyer and seller. Specifically, the parties involved in a trade of renewable fuel with assigned RINs would agree beforehand on using either the current methodology for determining the date of transfer or the parties would utilize a unique identifier and only the buyer would enter into EMTS the title transfer date.

EPA is not finalizing this proposal at this time due to impacts on other systems functionality and processes. EPA may choose to pursue this proposal in a later rulemaking when we have sufficient resources to modify impacted systems.

5. Changes to Facility's Baseline Volume To Allow "Nameplate Capacity" for Facilities Not Claiming Exemption From the 20% GHG Reduction Threshold

As a requirement of registration under the RFS program, each renewable fuel producer and foreign ethanol producer must establish and provide documents to support its facility's baseline volume as defined in § 80.1401. This is either the permitted capacity or, if permitted capacity cannot be determined, the actual peak capacity of a specific renewable fuel production facility on a calendar year basis. After the promulgation of the March 26, 2010 RFS rule, we have received many requests from companies asking EPA to allow them to use their nameplate or "design" capacity to establish their facility's baseline volume due to either the facility being exempt from obtaining a permit, and thus not able to determine their permitted capacity, or the facility not starting operations, or not being operational for a full calendar year to produce actual production records to establish actual peak capacities. Because the regulations currently only allow a facility's baseline volume to be established by a limit stated in a permit or actual production records for at least one calendar year, facilities that had neither a permit or sufficient production records had difficultly registering under the RFS program. EPA proposed allowing use of nameplate capacity for registration, where permitted capacity or actual peak capacity could not be determined. There were no adverse comments regarding this proposal. Therefore, in this rulemaking we are finalizing our proposal to allow a facility to use its "nameplate capacity" to establish its facility's baseline volume for the purposes of registration. The "nameplate capacity" may be used only if the facility (1) does not have a permit or there is no limit stated in the permit to establish their permitted capacity; (2) has not started operations or does not have at least one calendar year of production records; and (3) does not claim exemption from the 20 percent GHG threshold under § 80.1403. Due to the complexity of the exemption provision provided under § 80.1403 and the added flexibility that facilities claiming this exemption are allotted under the program, we are finalizing our decision that the extension of this option not be available to facilities claiming an exemption under § 80.1403. Additionally, by this stage in the RFS program, the facilities that would qualify for registration under § 80.1403 would be very few, if any. We are also finalizing the revision of the definition of baseline volume to include "nameplate capacity," add a new definition for "nameplate capacity" to § 80.1401, and include conforming amendments to the registration requirements of § 80.1450. The amendments today will allow the initial registration of certain facilities using nameplate capacity, but EPA interprets the requirements for registration updates under 80.1450(d)(3)(i) and (ii) to require the calculation and submission of actual peak capacity as part of the registration updates required in those sections where the facility has operated for a sufficient time period to allow that calculation.

6. Changes to § 80.1463—What penalties apply under the RFS program?

Preventing the generation and use of invalid RINs and encouraging rapid retirement and replacement of invalid RINs is crucial to the integrity of the RFS program. The RFS regulations include various provisions related to prohibited acts, liability for violations, and penalties for those violations.

Section 80.1460 sets forth the prohibited acts for the renewable fuels program. Section 80.1461(a) states that any person who violates a prohibition in § 80.1460(a) through (d) is liable for the violation of that prohibition, and § 80.1461(b) provides the liability provisions for failure to meet other provisions of the regulations. The penalty provisions of the regulations at § 80.1463(a) state that any person who is liable for a violation under § 80.1461 is subject to a civil penalty as specified in sections 205 and 211(d) of the Clean Air Act (CAA), for every day of each such violation and the amount of economic benefit or savings resulting from each violation. Section 80.1463(c) provides that "any person . . . is liable for a separate day of violation for each day such a requirement remains unfulfilled."

As described in the proposal, EPA interprets these statutory and regulatory penalty provisions to give the Agency the authority to seek penalties against parties generating, transferring or causing another person to generate or transfer invalid RINs for the day of the party's action and each day subsequent to the party's action that an invalid RIN is available for sale or use by a party subject to an obligation under the RFS program to acquire and retire RINs. For example, for a RIN generator, this time period typically runs from the date of invalid RIN generation until either effective corrective action is taken by the RIN generator to remove the invalid RIN from the marketplace or a party uses the RIN to satisfy an RVO or other requirement to retire RINs. This is consistent with the CAA approach of assessing penalties for every day of a violation, consistent with EPA's historic approach under the fuels regulations (*see* § 80.615), and will encourage renewable fuel producers that generate invalid RINs to promptly take corrective action.

EPA received comments from two parties in opposition of the proposed regulation in § 80.1463. Both commenters stated that RIN may be kept in another party's inventory outside of the generator's or transferor's control. Therefore, if that RIN is later identified as invalid the generator and transferor could be held to substantial penalties based on actions by other parties beyond their control. One of the commenters stated they believe that finalizing this regulation will "cause confusion and may create disincentives for producers to self-report and take corrective actions, rather than promote compliance." While EPA acknowledges that the RIN generator or subsequent transferor cannot force another party to retire invalid RINs, the regulations at § 80.1431(b)(1) state that "Upon determination by any party that RINs owned are invalid, the party must . . . retire the invalid RINs in the applicable RIN transaction reports . . . for the quarter in which the RINs were determined to be invalid." Therefore, EPA believes that finalizing EPA's existing interpretation of per day violations for the generation or transfer of invalid RINs will minimize potential penalties and incentivize parties who committed a prohibited act at § 80.1460 (b)(1)–(4) and (b)(6) to identify invalid RINs to those owning parties so they can retire RINs as required in § 80.1431(b)(1) prior to an obligated party or renewable fuel exporter using those RINs for compliance purposes.

One commenter stated that EPA should continue to use its enforcement discretion to assign appropriate penalties instead of finalizing this regulation. In the proposal, EPA explained that this regulation would simply codify our existing practice and interpretation and that we would continue to evaluate the appropriate penalties for each violation on a case by case basis. Although EPA is finalizing this regulation to make it clear to the regulated industry that EPA has the authority to seek the maximum statutory penalty for each day of violation, the Agency will continue to evaluate appropriate penalties on a case by case basis.

As described above, EPA is finalizing the addition of the new paragraph (d) to § 80.1463 which more explicitly incorporates EPA's interpretation of these penalty provisions into the regulations. The language has been modified from the proposal to follow the existing format and language in § 80.1463. The amendments state that any person liable under § 80.1461(a) for a violation of § 80.1460(b)(1)–(4) and (b)(6) for RIN generation or transfer violations is subject to a separate day of violation for each day that the invalid RIN remains available for use for compliance purposes, and EPA has the authority to seek the maximum statutory penalty for each day of violation.

F. Minor Corrections to RFS Provisions

We are finalizing a number of corrections to address minor definitional issues that have been identified in implementing the RFS program.

Renewable Biomass:

We did not receive any significant comment on our proposed clarification to the definition "renewable biomass" in § 80.1401 and thus are finalizing proposed changes to make clear that biomass obtained in the vicinity of buildings means biomass obtained within 200 feet of the buildings. The preamble for the March 26, 2010 RFS final rule cites the distance of 200 feet (*see* 75 FR 14696), but EPA did not include a reference to this value in the regulations. We believe doing so provides additional clarity to the regulations.

"Naphtha":

We did not receive any significant comment on our proposed clarification to the definition "naphtha" in § 80.1401 and thus are finalizing the proposed changes to make clear that we consider naphtha a blending component of gasoline.

English Language Translations:

We received no significant comments on our proposed changes related to English language translations. Therefore, we are finalizing the addition of a new paragraph (i) to § 80.1450 stating that any registration materials submitted to EPA must be in English or accompanied by an English language translation. Similarly, we are finalizing the addition of a new paragraph (h) to § 80.1451, which states that any reports submitted to EPA must be in English or accompanied by an English language translation. We are also finalizing the addition of a new paragraph (q) to § 80.1454, which states that any records submitted to EPA must be in English or accompanied by an English language translation. The translation and all other associated documents must be maintained by the submitting company for a period of five (5) years, which is already the established time period for keeping records under the existing RFS program.

Correction of Typographical Errors:

No comments were received on our proposed corrections to typographical errors, thus we are finalizing typographical and grammatical corrections in § 80.1466 as proposed. Specifically, we are amending paragraph (o) to correct a typographical error in the last sentence of the affirmation statement, by changing the citation from § 80.1465 to § 80.1466. We are also amending paragraph (d)(3)(ii) to correct a typographical error. The current regulation cites § 80.65(e)(2)(iii), which does not exist. The correct citation is § 80.65(f)(2)(iii).

V. Amendments to the E15 Misfueling Mitigation Rule

In the NPRM, we proposed several minor corrections and other changes to the E15 misfueling mitigation rule (E15 MMR) found at 40 CFR part 80, subpart N.

A. Changes to § 80.1501—Label

We proposed to correct several minor errors in the description of the E15 label required by the E15 MMR at § 80.1501, including corrections in the dimensions of the label and ensuring that the word "ATTENTION" is capitalized. The Agency intended the label required by the regulations to look identical to that pictured in the **Federal Register** notice for the final E15 MMR (*see* 76 FR 44406, 44418, July 25, 2011), but there were some minor typographical errors in the regulations.

We received a number of comments on the E15 label changes, and most were supportive of the corrections to the regulations to make the label consistent with the picture of the E15 label in the E15 MMR. However, some comments expressed concerns about the potential costs to retail stations already lawfully selling E15 with labels produced under the current regulations. We recognize this concern; however, we do not believe that this is an issue since EPA has worked closely with the limited number of retail stations that have lawfully offered E15 to date to ensure that their labels met the intent of the E15 MMR (i.e., were consistent with the label pictured in the E15 MMR).

We also received several comments requesting that EPA make substantive changes to the E15 label (e.g., change the word "ATTENTION" to "WARNING"). The Agency thoroughly explained its rationale for its label design in the E15 MMR and was not intending to make substantive changes to the E15 label in this rulemaking. We also received comments suggesting additional labeling requirements for blender pumps. We believe that these comments are outside of the scope of this rulemaking.

Therefore, we are finalizing the changes to the E15 labeling regulations at § 80.1501 as proposed.

B. Changes to § 80.1502—E15 Survey

We proposed two changes to the survey requirements found at § 80.1502. First, we proposed to clarify that E15 surveys need to sample for Reid vapor pressure (RVP) only during the high ozone season as defined in § 80.27(a)(2)(ii) or during any time RVP standards apply in any state implementation plan approved or promulgated under the Clean Air Act. EPA did not intend to require RVP sampling and testing during the rest of the year, when RVP standards do not apply.

Second, we proposed to change when the results of surveys that detect potential noncompliance must be reported to the Agency. As originally drafted, the regulations require the independent survey association conducting a survey to notify EPA of potentially noncompliant samples within 24 hours of the laboratory receiving this sample (*see* 76 FR at 44423, July 25, 2011). EPA has since learned that more time may be needed for reporting of noncompliant samples since it may take several days for analysis of the sample to be completed. We are therefore requiring that noncompliant samples be reported to EPA within 24 hours of being analyzed.

Comments received on these two changes to the E15 survey requirements were overwhelmingly supportive. Therefore, EPA is finalizing the changes to the E15 survey requirements in § 80.1502 as proposed.

C. Changes to § 80.1503—Product Transfer Documents

In the NPRM, we proposed certain minor changes to the product transfer document (PTD) requirements found in § 80.1503. Specifically, we proposed to allow the use of product codes for conventional blendstock/gasoline upstream of an ethanol blending facility, since historically, the codes have been allowed to be used for conventional blendstock/gasoline upstream of an ethanol blending facility in other fuels programs. We noted that this was an unintentional omission from the original regulation.

Commenters unanimously supported including language that allowed the use of product codes for conventional blendstock/gasoline upstream of an ethanol blending facility. Some commenters pointed out that maintaining the current language allowing the use of product codes downstream of an ethanol blending facility did not make sense since product codes have not typically been used in that part of the gasoline distribution chain. Therefore, we are finalizing the flexibility for parties upstream of an ethanol blending facility to use product codes and removing the extraneous language for product code use downstream of an ethanol blending facility.

We also received comment on whether this proposed change was in response to a petition for reconsideration from the American Fuel and Petrochemical Manufacturers (AFPM) (formerly the National Petroleum Refiners Association, or NPRA), which raised a number of questions regarding the E15 MMR PTD requirements.[98] Today's regulatory change only addresses one of the questions that AFPM raised regarding the E15 MMR PTD requirements in its petition. Today's action was not meant to address all of the questions raised by AFPM regarding the E15 MMR PTD requirements. It should be noted that most of the questions raised in AFPM's petition did not require changes to the regulations and were simply questions on the implementation and applicability of the E15 MMR requirements. For example, AFPM was unclear on what the wintertime PTD requirements for gasoline/blendstocks upstream of an ethanol blending facility are under the E15 MMR. These types of questions are typically addressed through guidance provided to affected parties (either directly or via guidance letters or the Fuels Program Frequent Questions Web page) and do not necessitate a change to our regulations. However, we may consider further changes to the E15 MMR PTD requirements in a future rulemaking that address some or all of the remaining questions raised in AFPM's petition for reconsideration.

We also sought comment on potential ways of streamlining the PTD language required at § 80.1503. We received one comment that suggested substantial changes to the PTD language requirements. For example, the commenter suggested removing most of the downstream RVP language requirements that were intended to inform retail stations of their summertime RVP requirements. The commenter pointed out that such a streamlining of the PTD requirements in the E15 MMR would significantly reduce compliance costs for industry. We feel that these suggested changes would significantly alter the PTD language in such a way that may no longer carry out our intent, which is to inform parties throughout the gasoline distribution chain all the way down to the retail station of their applicable regulatory requirements. Such changes are outside the scope of today's rulemaking, which includes only a minor technical change to the E15 MMR PTD requirements. Therefore, we are not finalizing such changes at this time. Although we are not engaging in a substantial streamlining of the PTD language required at § 80.1503 in today's action, we may revisit the streamlining of E15 MMR PTD language in a future rulemaking.

D. Changes to § 80.1504—Prohibited Acts

In the NPRM, we proposed a slight rewording of § 80.1504(g) to state that blending E10 that has taken advantage of the statutory 1.0 psi RVP waiver during the summertime RVP control period with a gasoline-ethanol fuel that cannot take advantage of the 1.0 psi RVP waiver (i.e., a fuel that contains more than 10.0 volume percent ethanol (e.g., E15) or less than 9 volume percent ethanol) would be a violation of the E15 MMR. As originally written, the language does not clearly describe the prohibited activity (*see* 76 FR 44435, 44436, July 25, 2011).

We received no direct comments on this specific proposed change. We did, however, receive comments suggesting that we expand the prohibited activities language in § 80.1504 to allow for the better enforcement of ethanol content requirements at blender pumps. The addition of new prohibited activities to § 80.1504 is outside the intended scope of today's action. Therefore we are finalizing the slight rewording of the prohibited activities language of § 80.1504(g) as proposed.

E. Changes to § 80.1500—Definitions

In response to the August 17, 2011 petition for reconsideration submitted by NPRA, now AFPM, which requested the Agency, under CAA section 307(d)(7)(B), reconsider certain portions of the E15 MMR, we granted AFPM's petition for reconsideration on the issue of the definitions of E10 and E15 in the E15 MMR. AFPM expressed concern

[98] See September 15, 2011 letter from AFPM entitled, "Request for Partial Reconsideration of EPA's "Misfueling Rule" 76 FR 44406 (July 25, 2011)," Docket EPA–HQ–OAR–2012–0401–0041.

that the Agency had defined E10 and E15 in the E15 MMR in a way that would change how ethanol concentrations are determined for regulatory purposes. While EPA did not intend the definitions of E10 and E15 in the E15 MMR to have this effect, we proposed changes to the regulations to avoid this perceived impact. Specifically, we proposed to add a new section, § 80.1509, containing language that clearly states that when ethanol concentrations are measured for compliance testing purposes for 40 CFR part 80, subpart N, the applicable ethanol concentration value will be rounded using the rounding procedures at § 80.9. We also proposed modifications to language throughout 40 CFR part 80, subpart N, to better reflect our intentions in defining E10 and E15 in the E15 MMR, including a small revision to § 80.1508.

Comments received on this issue generally supported EPA's approach to continue to allow the rounding of test results to determine whether fuel samples had adhered to applicable ethanol content samples under § 80.9. One commenter suggested that EPA remove the remaining decimal points to make the point more clearly that rounding applied to the testing of fuels samples for ethanol content. Another commenter argued that making such a change would allow parties to manufacture gasoline-ethanol blended fuels containing more than 10 volume percent ethanol without taking appropriate measures to ensure that vehicles and engines not covered by the E15 partial waiver decisions were not misfueled by gasoline-ethanol blended fuels containing more than 10 volume percent ethanol.

We continue to believe that it is necessary to make our intent clear that parties that blend gasoline-ethanol blended fuels with more than 10 volume percent ethanol and up to 15 volume percent ethanol must adhere to the requirements for such fuels under the E15 MMR. Our approach will continue to enforce ethanol content standards as we have in the past, through the appropriate use of rounding procedures specified in the regulations under § 80.9. We do not believe we need to remove the decimal points from the proposed regulatory text since we were careful to ensure that such language only appeared in places where the blending of gasoline-ethanol blended fuels containing greater than 10 volume percent ethanol would necessitate further action by the party manufacturing such fuel. Therefore, we are finalizing the changes to the definitions of the E15 MMR and the new language under § 80.1509 as proposed. Additionally, in order to remain consistent with requirements for evidence used to determine compliance with requirements in other fuels programs, we are not finalizing the proposed changes to § 80.1508, which covers the evidence responsible parties and the Agency can use to demonstrate compliance with E15 MMR requirements.

VI. Amendments to the Ultra Low Sulfur Diesel (ULSD) Survey

In the NPRM, EPA proposed a reduction in the minimum sample size for the ULSD survey program from 5,250 annual samples to 1,800 samples.[99] We argued that compliance with the ULSD sulfur content standard has been extremely high; less than 1% of the samples have been in violation in recent years, and the use of the statistical formula in the regulations would result in a sampling rate of several hundred samples per quarter for each of the past several years, instead of 5,250 samples required annually. The cost difference between taking several hundred samples a quarter versus taking over 5,000 samples annually is significant. For these reasons we believed that the high compliance rate and the substantial discrepancy between the sampling rate calculated by the formula in the regulations and the minimum sampling size justified our proposal of a minimum annual sampling rate of 1,800 samples.

Public comments received on the proposed reduction in sampling rate were overwhelming supportive. Most comments suggested that EPA reduce the minimum sampling rate for the ULSD program to the proposed rate of 1,800. However, some commenters suggested that we reduce the sample size even further. Consistent with most comments, we are finalizing the proposed rate of 1,800 samples per year. Since the program is based on conducting four quarterly surveys, only about 450 samples are collected to represent all retail stations offering diesel fuel, over 60,000 stations, nationwide each quarter. A further reduction in the sample size may compromise the robustness of the survey program's ability to detect non-compliance, even taking into account today's high compliance rates. Although we acknowledge that a further reduction in the sample size could reduce costs even further, there is a point where the number of samples per year would be so few that the survey would be meaningless relative to robust sampling and testing programs conducted by each refiner individually. We feel that a rate of 1,800 samples strikes the correct balance of ensuring compliance with ULSD standards downstream while controlling costs for branded refiners that choose to utilize the ULSD survey program as an alternative affirmative defense.

Additionally, one commenter, citing high costs, suggested that we remove the alternative affirmative defense altogether. It is important to note that participation in the consortium that conducts the ULSD survey is completely voluntary and the program provides each branded refiner an alternative to conducting individual downstream sampling and testing programs. We believe that as long as there is continued interested by some branded refiners to take advantage of the ULSD survey program alternative affirmative defense, we should maintain the flexibility to allow those parties the ability to conduct such a survey in lieu of individual downstream sampling and testing programs to establish an affirmative defense to potential downstream violations.

Therefore, today we are reducing the minimum annual sampling size for the ULSD survey program from 5,250 samples to 1,800 samples. However, we will continue to closely monitor national ULSD compliance rates and branded refiner interest in maintaining the ULSD survey program to determine whether further reduction in sample sizes is necessary.

VII. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

Under Executive Order 12866 (58 FR 51735, October 4, 1993), this action is a

[99] The ULSD rule includes a provision that deems branded refiners liable for violations of the ULSD sulfur standard that are found at retail outlets displaying the refiner's brand (40 CFR 80.612). The regulations include defense provisions. One element of a branded refiner's defense to such violations is that it must have a periodic sampling and testing program at the retail level (40 CFR 80.613(b) and (d)). The regulations also set forth an alternative sampling and testing defense element provision for branded refiners. This alternative defense element provision (40 CFR 80.613(e)) allows a branded refiner to meet the company-specific downstream periodic sampling and testing element of its defense by participating in a survey consortium that pays an independent surveyor to sample diesel fuel at retail outlets nationwide. The number of samples that are taken each year is determined by a statistical formula that is based in part on the previous year's compliance rate. In addition, the regulations set a floor of 5,250 samples that must be taken in an annual survey cycle regardless of the sample number that would be calculated using the regulatory formula.

"significant regulatory action" because it raises novel legal or policy issues. Accordingly, EPA submitted this action to the Office of Management and Budget (OMB) for review under Executive Orders 12866 and 13563 (76 FR 3821, January 21, 2011) and any changes made in response to OMB recommendations have been documented in the docket for this action.

B. Paperwork Reduction Act

The information collection requirements in this rule have been submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* The Information Collection Request (ICR) document prepared by EPA has been assigned EPA ICR number 2469.01. A supporting statement for the ICR has been placed in the docket. The information collection is described in the following paragraphs. The following existing ICRs are being amended: OMB numbers 2060–0639, 2060–0637, 2060–0640, and 2060–0675).

This action contains recordkeeping and reporting that may affect the following parties under the RFS regulation: RIN generators (producers, importers), obligated parties (refiners), exporters, and parties who own or transact RINs. We estimate that 670 parties may be subject to the information collection. We estimate an annual recordkeeping and reporting burden of 3.1 hours per respondent. This action contains recordkeeping and reporting that may affect the following parties under the E15 regulation: Gasoline refiners, gasoline and ethanol importers, gasoline and ethanol blenders (including terminals and carriers). We estimate that 2,000 respondents may be subject to the information collection. We estimate an annual recordkeeping and reporting burden of 1.3 hours per respondent. Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review the instructions; develop, acquire, install, and utilize technology and systems for the purpose of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transit or otherwise disclose the information. Burden is as defined at 5 CFR 1320.3(b).

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations in 40 CFR are listed in 40 CFR Part 9. When this ICR is approved by OMB, the Agency will publish a technical amendment to 40 CFR part 9 in the **Federal Register** to display the OMB control number for the approved information collection requirements contained in this final rule.

C. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of today's rule on small entities, small entity is defined as: (1) A small business as defined by the Small Business Administration's (SBA) regulations at 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of this action on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. The amendments to the RFS provisions in this final rule allow for additional opportunities for parties to participate in the RFS program by producing qualifying fuel if they choose to, clarify existing provisions, remove the possibility of exemptions for entities that are no longer small entities due to growth in their business, or make relatively minor corrections and modifications to these regulations. The various changes to the E15 misfueling mitigation regulations are relatively minor corrections and should not place any additional burden on small entities. The reduction in the required sample size for the voluntary ULSD survey program should reduce the burden of any small entity that elects to participate in the ULSD survey program.

D. Unfunded Mandates Reform Act

This rule does not contain a Federal mandate that may result in expenditures of $100 million or more for State, local, and tribal governments, in the aggregate, or the private sector in any one year. We have determined that this action will not result in expenditures of $100 million or more for the above parties and thus, this rule is not subject to the requirements of sections 202 or 205 of UMRA.

This rule is also not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments. It only applies to gasoline, diesel fuel, and renewable fuel producers, importers, distributors and marketers and makes relatively minor corrections and modifications to the RFS and diesel regulations.

E. Executive Order 13132 (Federalism)

This action does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. This action only applies to gasoline, diesel, and renewable fuel producers, importers, distributors and marketers. Thus, Executive Order 13132 does not apply to this action. In the spirit of Executive Order 13132, and consistent with EPA policy to promote communications between EPA and State and local governments, EPA specifically solicited comment on the proposed action from State and local officials.

F. Executive Order 13175 (Consultation and Coordination With Indian Tribal Governments)

This action does not have tribal implications, as specified in Executive Order 13175 (65 FR 67249, November 9, 2000). It applies to gasoline, diesel fuel, and renewable fuel producers, importers, distributors and marketers. This action does not impose any enforceable duties on communities of Indian tribal governments. Tribal governments would be affected only to the extent they purchase and use regulated fuels. Although Executive Order 13175 does not apply to this action, EPA specifically solicited comment from tribal officials in developing this action.

G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

EPA interprets EO 13045 (62 FR 19885, April 23, 1997) as applying only to those regulatory actions that concern health or safety risks, such that the analysis required under section 5–501 of the EO has the potential to influence the regulation. This action is not subject to EO 13045 because it does not establish an environmental standard intended to mitigate health or safety risks.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

This action is not a "significant energy action" as defined in Executive Order 13211 (66 FR 28355 (May 22, 2001)), because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. This action amends existing regulations related to renewable fuel, E15, and ultra-low sulfur diesel. We have concluded that this rule is not likely to have any adverse energy effects. In fact, we expect this rule may result in positive effects, because many of the changes we are finalizing will facilitate the introduction of new renewable fuels under the RFS program and have come at the suggestion of industry stakeholders.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 ("NTTAA"), Public Law 104–113, 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

The regulations permit the use of an analytical method certified by a voluntary consensus standard body in order for certain producers to comply with applicable registration requirements. Producers of renewable fuel made from energy cane and producers of renewable fuel made using two or more feedstocks converted simultaneously, when at least one of the feedstocks does not have a minimum 75% average adjusted cellulosic content, and at least one of which is a pathway producing RINs with a D code of 3 or a D code of 7 using a process described in § 80.1426(f)(15)(i)(A) or § 80.1426(f)(15)(i)(B), must obtain data used to calculate the cellulosic converted fraction using an analytical method certified by a voluntary consensus standards body or using a method that would produce reasonably accurate results as demonstrated through peer reviewed references provided to the third party engineer performing the engineering review at registration. The Agency therefore believes this rulemaking is consistent with the requirements of the NTTAA.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order (EO) 12898 (59 FR 7629, February 16, 1994) establishes federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

EPA has determined that this rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it does not affect the level of protection provided to human health or the environment. These technical amendments do not relax the control measures on sources regulated by the RFS regulations and therefore will not cause emissions increases from these sources.

K. Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 et seq., as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the **Federal Register**. A Major rule cannot take effect until 60 days after it is published in the **Federal Register**. This action is not a "major rule" as defined by 5 U.S.C. 804(2). This rule will be effective August 18, 2014.

L. Clean Air Act Section 307(d)

This rule is subject to section 307(d) of the CAA. Section 307(d)(7)(B) provides that "[o]nly an objection to a rule or procedure which was raised with reasonable specificity during the period for public comment (including any public hearing) may be raised during judicial review." This section also provides a mechanism for the EPA to convene a proceeding for reconsideration, "[i]f the person raising an objection can demonstrate to the EPA that it was impracticable to raise such objection within [the period for public comment] or if the grounds for such objection arose after the period for public comment (but within the time specified for judicial review) and if such objection is of central relevance to the outcome of the rule." Any person seeking to make such a demonstration to the EPA should submit a Petition for Reconsideration to the Office of the Administrator, U.S. EPA, Room 3000, William Jefferson Clinton Building, 1200 Pennsylvania Ave., NW., Washington, DC 20460, with a copy to both the person(s) listed in the preceding FOR FURTHER INFORMATION CONTACT section, and the Director of the Air and Radiation Law Office, Office of General Counsel (Mail Code 2344A), U.S. EPA, 1200 Pennsylvania Ave. NW., Washington, DC 20460.

VIII. Statutory Provisions and Legal Authority

Statutory authority for this action comes from section 211 of the Clean Air Act, 42 U.S.C. 7545. Additional support for the procedural and compliance related aspects of this rule, including the recordkeeping requirements, comes from sections 114, 208, and 301(a) of the Clean Air Act, 42 U.S.C. 7414, 7542, and 7601(a).

List of Subjects in 40 CFR Part 80

Environmental protection, Administrative practice and procedure, Agriculture, Air pollution control, Confidential business information, Energy, Forest and forest products, Fuel additives, Gasoline, Imports, Motor vehicle pollution, Penalties, Petroleum, Reporting and recordkeeping requirements.

Dated: July 2, 2014.

Gina McCarthy,

Administrator.

For the reasons set forth in the preamble, title 40, chapter I of the Code of Federal Regulations is amended as follows:

PART 80—REGULATION OF FUELS AND FUEL ADDITIVES

■ 1. The authority citation for part 80 continues to read as follows:

Authority: 42 U.S.C. 7414, 7521, 7542, 7545 and 7601(a).

Subpart I—[Amended]

■ 2. Section 80.613 is amended by revising the "Where" statement defining the value of "n" in paragraph (e)(4)(v)(A) to read as follows:

§ 80.613 What defenses apply to persons deemed liable for a violation of a prohibited act under this subpart?

* * * * *

(e) * * *

(4) * * *

(v) * * *

(A) * * *

Where:

n = minimum number of samples in a year-long survey series. However, in no case shall n be larger than 9,600 or smaller than 1,800.

* * * * *

Subpart M—[Amended]

■ 3. Section 80.1401 is amended as follows:

■ a. By adding the definitions of "Adjusted cellulosic content", "Agricultural digester," "Nameplate capacity", "Renewable compressed natural gas", and"Renewable liquefied natural gas" in alphabetical order.

■ b. By revising the definitions of "Biogas", "Crop residue", "Energy cane", "Naphtha", "Renewable biomass", and "Small refinery".

§ 80.1401 Definitions.

* * * * *

Adjusted cellulosic content means the percent of organic material that is cellulose, hemicellulose, and lignin.

* * * * *

Agricultural digester means an anaerobic digester that processes predominantly cellulosic materials, including animal manure, crop residues, and/or separated yard waste.

* * * * *

Biogas means a mixture of hydrocarbons that is a gas at 60 degrees Fahrenheit and 1 atmosphere of pressure that is produced through the anaerobic digestion of organic matter.

* * * * *

Crop residue means biomass left over from the harvesting or processing of planted crops from existing agricultural land and any biomass removed from existing agricultural land that facilitates crop management (including biomass removed from such lands in relation to invasive species control or fire management), whether or not the biomass includes any portion of a crop or crop plant. Biomass is considered crop residue only if the use of that biomass for the production of renewable fuel has no significant impact on demand for the feedstock crop, products produced from that feedstock crop, and all substitutes for the crop and its products, nor any other impact that would result in a significant increase in direct or indirect GHG emissions.

* * * * *

Energy cane means a complex hybrid in the Saccharum genus that has been bred to maximize cellulosic rather than sugar content. For the purposes of this subpart:

(1) Energy cane excludes the species *Saccharum spontaneum,* but may include hybrids derived from *S. spontaneum* that have been developed and publicly released by USDA; and

(2) Energy cane only includes cultivars that have, on average, at least 75% adjusted cellulosic content on a dry mass basis.

* * * * *

Nameplate capacity means the peak design capacity of a facility for the purposes of registration of a facility under § 80.1450(b)(1)(v)(C).

Naphtha means a blendstock or fuel blending component falling within the boiling range of gasoline which is composed of only hydrocarbons, is commonly or commercially known as naphtha and is used to produce gasoline through blending.

* * * * *

Renewable biomass means each of the following (including any incidental, de minimis contaminants that are impractical to remove and are related to customary feedstock production and transport):

(1) Planted crops and crop residue harvested from existing agricultural land cleared or cultivated prior to December 19, 2007 and that was nonforested and either actively managed or fallow on December 19, 2007.

(2) Planted trees and tree residue from a tree plantation located on non-federal land (including land belonging to an Indian tribe or an Indian individual that is held in trust by the U.S. or subject to a restriction against alienation imposed by the U.S.) that was cleared at any time prior to December 19, 2007 and actively managed on December 19, 2007.

(3) Animal waste material and animal byproducts.

(4) Slash and pre-commercial thinnings from non-federal forestland (including forestland belonging to an Indian tribe or an Indian individual, that are held in trust by the United States or subject to a restriction against alienation imposed by the United States) that is not ecologically sensitive forestland.

(5) Biomass (organic matter that is available on a renewable or recurring basis) obtained from within 200 feet of buildings and other areas regularly occupied by people, or of public infrastructure, in an area at risk of wildfire.

(6) Algae.

(7) Separated yard waste or food waste, including recycled cooking and trap grease, and materials described in § 80.1426(f)(5)(i).

Renewable compressed natural gas (CNG) means biogas or biogas-derived pipeline quality gas that is compressed for use as transportation fuel and meets the definition of renewable fuel.

* * * * *

Renewable liquefied natural gas (LNG) means biogas or biogas-derived pipeline quality gas that goes through the process of liquefaction in which it is cooled below its boiling point, and which meets the definition of renewable fuel.

* * * * *

Small refinery means a refinery for which the average aggregate daily crude oil throughput (as determined by dividing the aggregate throughput for the calendar year by the number of days in the calendar year) does not exceed 75,000 barrels.

* * * * *

■ 4. Section 80.1415 is amended by revising paragraphs (b)(5) and (c)(1) to read as follows:

§ 80.1415 How are equivalence values assigned to renewable fuel?

* * * * *

(b) * * *

(5) 77,000 Btu (lower heating value) of compressed natural gas (CNG) or liquefied natural gas (LNG) shall represent one gallon of renewable fuel with an equivalence value of 1.0.

* * * * *

(c) * * *

(1) The equivalence value for renewable fuels described in paragraph (b)(7) of this section shall be calculated using the following formula:

EV = (R/0.972) * (EC/77,000)

Where:

EV = Equivalence Value for the renewable fuel, rounded to the nearest tenth.

R = Renewable content of the renewable fuel. This is a measure of the portion of a renewable fuel that came from renewable biomass, expressed as a fraction, on an energy basis.

EC = Energy content of the renewable fuel, in Btu per gallon (lower heating value).

* * * * *

■ 5. Section 80.1416 is amended by revising paragraph (d) to read as follows:

§ 80.1416 Petition process for evaluation of new renewable fuels pathways.

* * * * *

(d) A D code must be approved prior to the generation of RINs for the fuel in question. During petition review EPA will evaluate whether a feedstock meets the 75% cellulosic content threshold allowing cellulosic RINs to be generated for the entire fuel volume produced. The Administrator may ask for additional information to complete this evaluation.

* * * * *

■ 6. Section 80.1426 is amended as follows:

■ a. By revising rows K, L, M, N, P, and Q of Table 1 to § 80.1426.

■ b. By adding a new row T to Table 1 to § 80.1426.

■ c. By revising paragraphs (f)(3)(vi), (f)(4)(i)(A)(*2*), (f)(5)(v), (f)(10), and (f)(11).

■ d. By adding new paragraphs (f)(15) and (f)(16).

§ 80.1426 How are RINs generated and assigned to batches of renewable fuel by renewable fuel producers or importers?

* * * * *

(f) * * *

(1) * * *

TABLE 1 TO § 80.1426—APPLICABLE D CODES FOR EACH FUEL PATHWAY FOR USE IN GENERATING RINS

	Fuel type	Feedstock	Production process requirements	D-Code
*	*	*	*	*
K	Ethanol	Crop residue, slash, pre-commercial thinnings and tree residue, switchgrass, miscanthus, energy cane, Arundo donax, Pennisetum purpureum, and separated yard waste; biogenic components of separated MSW; cellulosic components of separated food waste; and cellulosic components of annual cover crops.	Any process that converts cellulosic biomass to fuel.	3
L	Cellulosic diesel, jet fuel and heating oil.	Crop residue, slash, pre-commercial thinnings and tree residue, switchgrass, miscanthus, energy cane, Arundo donax, Pennisetum purpureum, and separated yard waste; biogenic components of separated MSW; cellulosic components of separated food waste; and cellulosic components of annual cover crops.	Any process that converts cellulosic biomass to fuel.	7
M	Renewable gasoline and renewable gasoline blendstock.	Crop residue, slash, pre-commercial thinnings, tree residue, and separated yard waste; biogenic components of separated MSW; cellulosic components of separated food waste; and cellulosic components of annual cover crops.	Catalytic Pyrolysis and Upgrading, Gasification and Upgrading, Thermo-Catalytic Hydrodeoxygenation and Upgrading, Direct Biological Conversion, Biological Conversion and Upgrading utilizing natural gas, biogas, and/or biomass as the only process energy sources providing that process used converts cellulosic biomass to fuel; any process utilizing biogas and/or biomass as the only process energy sources which converts cellulosic biomass to fuel.	3
N	Naphtha	Switchgrass, miscanthus, energy cane, Arundo donax, and Pennisetum purpureum.	Gasification and upgrading processes that converts cellulosic biomass to fuel.	3
*	*	*	*	*
P	Ethanol, renewable diesel, jet fuel, heating oil, and naphtha.	The non-cellulosic portions of separated food waste and non-cellulosic components of annual cover crops.	Any	5
Q	Renewable Compressed Natural Gas, Renewable Liquefied Natural Gas, Renewable Electricity.	Biogas from landfills, municipal wastewater treatment facility digesters, agricultural digesters, and separated MSW digesters; and biogas from the cellulosic components of biomass processed in other waste digesters.	Any	3
*	*	*	*	*
T	Renewable Compressed Natural Gas, Renewable Liquefied Natural Gas, and Renewable Electricity.	Biogas from waste digesters	Any	5

* * * * *

(3) * * *

(vi) If a producer produces a single type of renewable fuel using two or more different feedstocks which are processed simultaneously, and each batch is comprised of a single type of fuel, then the number of gallon-RINs that shall be generated for a batch of renewable fuel and assigned a particular D code shall be determined according to the formulas in Table 4 to this section.

Table 4 to §80.1426

Number of gallon-RINs to assign to batch-RINs with D codes dependent on feedstock

D code to use in batch-RIN	Number of gallon-RINs
D = 3	$V_{RIN,CB} = EV * V_s * \frac{FE_3}{FE_3 + FE_4 + FE_5 + FE_6 + FE_7}$
D = 4	$V_{RIN,BBD} = EV * V_s * \frac{FE_4}{FE_3 + FE_4 + FE_5 + FE_6 + FE_7}$
D = 5	$V_{RIN,AB} = EV * V_s * \frac{FE_5}{FE_3 + FE_4 + FE_5 + FE_6 + FE_7}$
D = 6	$V_{RIN,RF} = EV * V_s * \frac{FE_6}{FE_3 + FE_4 + FE_5 + FE_6 + FE_7}$
D = 7	$V_{RIN,CD} = EV * V_s * \frac{FE_7}{FE_3 + FE_4 + FE_5 + FE_6 + FE_7}$

Where:

$V_{RIN,CB}$ = RIN volume, in gallons, for use in determining the number of gallon-RINs that shall be generated for a batch of cellulosic biofuel with a D code of 3.

$V_{RIN,BBD}$ = RIN volume, in gallons, for use in determining the number of gallon-RINs that shall be generated for a batch of biomass-based diesel with a D code of 4.

$V_{RIN,AB}$ = RIN volume, in gallons, for use in determining the number of gallon-RINs that shall be generated for a batch of advanced biofuel with a D code of 5.

$V_{RIN,RF}$ = RIN volume, in gallons, for use in determining the number of gallon-RINs that shall be generated for a batch of renewable fuel with a D code of 6.

$V_{RIN,CD}$ = RIN volume, in gallons, for use in determining the number of gallon-RINs that shall be generated for a batch of cellulosic diesel with a D code of 7.

EV = Equivalence value for the renewable fuel per § 80.1415.

V_S = Standardized volume of the batch of renewable fuel at 60 °F, in gallons, calculated in accordance with paragraph (f)(8) of this section.

FE_3 = Feedstock energy from all feedstocks whose pathways have been assigned a D code of 3 under Table 1 to this section, or a D code of 3 as approved by the Administrator, in Btu.

FE_4 = Feedstock energy from all feedstocks whose pathways have been assigned a D code of 4 under Table 1 to this section, or a D code of 4 as approved by the Administrator, in Btu.

FE_5 = Feedstock energy from all feedstocks whose pathways have been assigned a D code of 5 under Table 1 to this section, or a D code of 5 as approved by the Administrator, in Btu.

FE_6 = Feedstock energy from all feedstocks whose pathways have been assigned a D code of 6 under Table 1 to this section, or a D code of 6 as approved by the Administrator, in Btu.

FE_7 = Feedstock energy from all feedstocks whose pathways have been assigned a D code of 7 under Table 1 to this section, or a D code of 7 as approved by the Administrator, in Btu.

Feedstock energy values, FE, shall be calculated according to the following formula:

$$FE = M * (1 - m) * CF * E$$

Where:

FE = Feedstock energy, in Btu.

M = Mass of feedstock, in pounds, measured on a daily or per-batch basis.

m = Average moisture content of the feedstock, in mass percent.

CF = Converted Fraction in annual average mass percent, except as otherwise provided by § 80.1451(b)(1)(ii)(U), representing that portion of the feedstock that is converted into renewable fuel by the producer.

E = Energy content of the components of the feedstock that are converted to renewable fuel, in annual average Btu/lb, determined according to paragraph (f)(7) of this section.

(4) * * *

(i) * * *

(A) * * *

(*2*) The value of FE for use in paragraph (f)(4)(i)(A)(*1*) of this section shall be calculated from the following formula:

$$FE = M * (1 - m) * CF * E$$

Where:

FE = Feedstock energy, in Btu.

M = Mass of feedstock, in pounds, measured on a daily or per-batch basis.

m = Average moisture content of the feedstock, in mass percent.

CF = Converted Fraction in annual average mass percent, except as otherwise provided by § 80.1451(b)(1)(ii)(U), representing that portion of the feedstock that is converted into transportation fuel, heating oil, or jet fuel by the producer.

E = Energy content of the components of the feedstock that are converted to fuel, in annual average Btu/lb, determined according to paragraph (f)(7) of this section.

* * * * *

(5) * * *

(v) The number of cellulosic biofuel gallon-RINs that shall be generated for the cellulosic portion of a batch of renewable fuel derived from separated MSW as defined in paragraph (f)(5)(i)(C) of this section shall be determined according to the following formula:

$$V_{RIN} = EV * V_S * R$$

Where:

V_{RIN} = RIN volume, in gallons, for use in determining the number of cellulosic biofuel gallon-RINs that shall be generated for the batch.

EV = Equivalence value for the batch of renewable fuel per § 80.1415.

V_S = Standardized volume of the batch of renewable fuel at 60 °F, in gallons, calculated in accordance with paragraph (f)(8) of this section.

R = The calculated non-fossil fraction of the fuel as measured by a carbon-14 dating test method as provided in paragraph (f)(9) of this section, except that for biogas-derived fuels made from separated MSW, no testing is required and R = 1.

* * * * *

(10)(i) For purposes of this section, electricity that is only distributed via a closed, private, non-commercial system is considered renewable fuel and RINs may be generated if all of the following apply:

(A) The electricity is produced from renewable biomass and qualifies for a D code in Table 1 to this section or has received approval for use of a D code by the Administrator.

(B) The RIN generator has documentation for the sale, if applicable, and use of a specific quantity of renewable electricity as transportation fuel, or has obtained affidavits from all parties selling or using the electricity as transportation fuel.

(C) The electricity is used as a transportation fuel and for no other purposes.

(ii) For purposes of this section, CNG or LNG produced from biogas that is only distributed via a closed, private, non-commercial system is considered renewable fuel for which RINs may be generated if all of the following apply:

(A) The CNG/LNG is produced from renewable biomass and qualifies for a D code in Table 1 to this section or has received approval for use of a D code by the Administrator.

(B) The RIN generator has entered into a written contract for the sale or use of a specific quantity of CNG/LNG to be used as transportation fuel, or obtained affidavits from all parties selling or using the CNG/LNG as transportation fuel.

(C) The CNG/LNG is used as a transportation fuel and for no other purposes.

(iii) A producer of electricity that is generated by co-firing a combination of renewable biomass and fossil fuel may generate RINs only for the portion attributable to the renewable biomass, using the procedure described in paragraph (f)(4) of this section.

(11)(i) For purposes of this section, electricity that is introduced into a commercial distribution system (transmission grid) is considered renewable fuel for which RINs may be generated if all of the following apply:

(A) The electricity is produced from renewable biomass and qualifies for a D code in Table 1 of this section or has received approval for use of a D code by the Administrator.

(B) The RIN generator has documentation for the sale and use of a specific quantity of renewable electricity as transportation fuel, or has obtained affidavits from all parties selling or using the electricity as transportation fuel.

(C) The quantity of electricity for which RINs were generated was sold for use as transportation fuel and for no other purpose.

(D) The renewable electricity was loaded onto and withdrawn from a physically connected transmission grid.

(E) The amount of electricity sold for use as transportation fuel corresponds to the amount of electricity derived from biogas that was placed into the commercial distribution system.

(F) No other party relied upon the renewable electricity for the creation of RINs.

(ii) For purposes of this section, CNG or LNG produced from biogas that is introduced into a commercial distribution system is considered renewable fuel for which RINs may be generated if all the following apply:

(A) The fuel is produced from renewable biomass and qualifies for a D code in Table 1 to this section or has received approval for use of a D code by the Administrator.

(B) The RIN generator has entered into a written contract for the sale or use of a specific quantity of renewable CNG/LNG, taken from a commercial distribution system (e.g., physically connected pipeline, barge, truck, rail), for use as a transportation fuel, or has obtained affidavits from all parties selling or using the CNG/LNG taken from a commercial distribution system as a transportation fuel.

(C) The quantity of CNG/LNG for which RINs were generated was sold for use as transportation fuel and for no other purposes.

(D) The biogas/CNG/LNG was injected into and withdrawn from the same commercial distribution system.

(E) The biogas/CNG/LNG that is ultimately withdrawn from the commercial distribution system for use as transportation fuel is withdrawn in a manner and at a time consistent with the transport of the biogas/CNG/LNG between the injection and withdrawal points.

(F) The volume and heat content of biogas/CNG/LNG injected into a pipeline and the volume of biogas/CNG/LNG withdrawn to make a transportation fuel are measured by continuous metering.

(G) The amount of fuel sold for use as transportation fuel corresponds to the amount of fuel derived from biogas that was placed into the commercial distribution system.

(H) No other party relied upon the volume of biogas/CNG/LNG for the creation of RINs.

(iii) For renewable electricity that is generated by co-firing a combination of renewable biomass and fossil fuel, the producer may generate RINs only for the portion attributable to the renewable biomass, using the procedure described in paragraph (f)(4) of this section.

* * * * *

(15) *Application of formulas in paragraph (f)(3)(vi) of this section to certain producers generating D3 or D7 RINs.*

(i) If a producer seeking to generate D code 3 or D code 7 RINs produces a single type of renewable fuel using two or more feedstocks converted simultaneously, and at least one of the feedstocks does not have a minimum 75% average adjusted cellulosic content, one of the following additional requirements apply:

(A) If the producer is using a thermochemical process to convert cellulosic biomass into cellulosic biofuel, the producer is subject to additional registration requirements under § 80.1450(b)(1)(xiii)(A).

(B) If the producer is using any process other than a thermochemical process, or is using a combination of processes, the producer is subject to additional registration requirements under § 80.1450(b)(1)(xiii)(B) and reporting requirements under § 80.1451(b)(1)(ii)(U).

(ii) [Reserved]

(16) *Renewable fuel produced from crop residue.* Producers generating RINs for qualifying renewable fuel utilizing crop residue as feedstock under Pathway K or Pathway L must meet all of the following conditions (in addition to any other applicable requirements):

(i) Registration requirements under § 80.1450(b)(1)(xv).

(ii) Reporting requirements under § 80.1451(b)(1)(ii)(V).

(iii) Recordkeeping requirements under § 80.1454(s).

* * * * *

■ 7. Section 80.1440 is amended as follows:

■ a. By revising the section heading.

■ b. By revising paragraph (a).

■ c. By revising paragraph (d).

■ d. By revising paragraph (e).

§ 80.1440 What are the provisions for blenders who handle and blend less than 250,000 gallons of renewable fuel per year?

(a) Renewable fuel blenders who handle and blend less than 250,000 gallons of renewable fuel per year, and who do not have one or more reported or unreported Renewable Volume

Obligations, are permitted to delegate their RIN-related responsibilities to the party directly upstream of them who supplied the renewable fuel for blending.

* * * * *

(d) Renewable fuel blenders who handle and blend less than 250,000 gallons of renewable fuel per year and delegate their RIN-related responsibilities under paragraph (b) of this section must register pursuant to § 80.1450(e), and may not own RINs.

(e) Renewable fuel blenders who handle and blend less than 250,000 gallons of renewable fuel per year and who do not opt to delegate their RIN-related responsibilities, or own RINs, will be subject to all requirements stated in paragraph (b) of this section, and all other applicable requirements of this subpart M.

* * * * *

■ 8. Section 80.1441 is amended by adding paragraph (e)(2)(iii) to read as follows:

§ 80.1441 Small refinery exemption.

* * * * *

(e) * * *

(2) * * *

(iii) In order to qualify for an extension of its small refinery exemption, a refinery must meet the definition of "small refinery" in § 80.1401 for the most recent full calendar year prior to seeking an extension and must be projected to meet the definition of "small refinery" in § 80.1401 for the year or years for which an exemption is sought. Failure to meet the definition of small refinery for any calendar year for which an exemption was granted would invalidate the exemption for that calendar year.

* * * * *

■ 9. Section 80.1450 is amended as follows:

■ a. By revising paragraph (b)(1)(ii).

■ b. By revising paragraphs (b)(1)(v)(C) and (b)(1)(v)(D), and by adding paragraph (b)(1)(v)(E).

■ c. By adding and reserving paragraph (b)(1)(xii).

■ d. By adding paragraphs (b)(1)(xiii) through (xv).

■ e. By adding paragraph (h).

■ f. By adding paragraph (i).

§ 80.1450 What are the registration requirements under the RFS program?

* * * * *

(b) * * *

(1) * * *

(ii) A description of the facility's renewable fuel or ethanol production processes.

(A) For registrations indicating production of cellulosic biofuel (D codes 3 or 7) from feedstocks other than biogas (including through pathways in rows K, L, M, and N of Table 1 to § 80.1426), the producer must demonstrate the ability to convert cellulosic components of feedstock into fuel by providing all of the following:

(*1*) A process diagram with all relevant unit processes labeled and a designation of which unit process is capable of performing cellulosic treatment, including required inputs and outputs at each step.

(*2*) A description of the cellulosic biomass treatment process, including required inputs and outputs used at each step.

(*3*) A description of the mechanical, chemical and biochemical mechanisms by which cellulosic materials can be converted to biofuel products.

(B) [Reserved]

* * * * *

(v) * * *

(C)(*1*) For all facilities, copies of documents demonstrating each facility's actual peak capacity as defined in § 80.1401 if the maximum rated annual volume output of renewable fuel is not specified in the air permits specified in paragraphs (b)(1)(v)(A) and (b)(1)(v)(B) of this section, as appropriate.

(*2*) For facilities not claiming the exemption described in § 80.1403(c) or (d) which are exempt from air permit requirements and for which insufficient production records exist to establish actual peak capacity, copies of documents demonstrating the facility's nameplate capacity, as defined in § 80.1401.

(D) For all facilities producing renewable electricity or other renewable fuel from biogas, submit all relevant information in § 80.1426(f)(10) or (11), including:

(*1*) Copies of all contracts or affidavits, as applicable, that follow the track of the biogas/CNG/LNG or renewable electricity from its original source, to the producer that processes it into renewable fuel, and finally to the end user that will actually use the renewable electricity or the renewable CNG/LNG for transportation purposes.

(*2*) Specific quantity, heat content, and percent efficiency of transfer, as applicable, and any conversion factors, for the renewable fuel derived from biogas.

(E) Any other records as requested by the Administrator.

* * * * *

(xiii) (A) A producer of renewable fuel seeking to generate D code 3 or D code 7 RINs, or a foreign ethanol producer seeking to have its product sold as cellulosic biofuel after it is denatured, who intends to produce a single type of fuel using two or more feedstocks converted simultaneously, where at least one of the feedstocks does not have a minimum 75% average adjusted cellulosic content, and who uses only a thermochemical process to convert feedstock into renewable fuel, must provide all the following:

(*1*) Data showing the average adjusted cellulosic content of the feedstock(s) to be used to produce fuel, based on the average of at least three representative samples. Cellulosic content data must come from an analytical method certified by a voluntary consensus standards body or using a method that would produce reasonably accurate results as demonstrated through peer reviewed references provided to the third party engineer performing the engineering review at registration. Samples must be of representative feedstock from the primary feedstock supplier that will provide the fuel producer with feedstock subsequent to registration.

(*2*) For producers who want to use a new feedstock(s) after initial registration, updates to their registration under paragraph (d) of this section indicating the average adjusted cellulosic content of the new feedstock.

(*3*) For producers already registered as of August 18, 2014, to produce a single type of fuel that qualifies for D code 3 or D code 7 RINs (or would do so after denaturing) using two or more feedstocks converted simultaneously using only a thermochemical process, the information specified in this paragraph (b)(1)(xiii)(A) shall be provided at the next required registration update under paragraph (d) of this section.

(B) A producer of renewable fuel seeking to generate D code 3 or D code 7 RINs, or a foreign ethanol producer seeking to have its product sold as cellulosic biofuel after it is denatured, who intends to produce a single type of fuel using two or more feedstocks converted simultaneously, where at least one of the feedstocks does not have a minimum 75% adjusted cellulosic content, and who uses a process other than a thermochemical process or a combination of processes to convert feedstock into renewable fuel, must provide all the following:

(*1*) The expected overall fuel yield, calculated as the total volume of fuel produced per batch (e.g., cellulosic biofuel plus all other fuel) divided by the total feedstock mass per batch on a dry weight basis (e.g., cellulosic feedstock plus all other feedstocks).

(*2*) The cellulosic Converted Fraction (CF) that will be used for generating RINs under § 80.1426(f)(3)(vi).

(*3*) Chemical analysis data supporting the calculated cellulosic Converted Fraction and a discussion of the possible variability that could be expected between reporting periods per § 80.1451(b)(1)(ii)(U)(*1*). Data used to calculate the cellulosic CF must be representative and obtained using an analytical method certified by a voluntary consensus standards body, or using a method that would produce reasonably accurate results as demonstrated through peer reviewed references provided to the third party engineer performing the engineering review at registration.

(*4*) A description and calculations showing how the data were used to determine the cellulosic Converted Fraction.

(*5*) For producers already registered as of August 18, 2014, to produce a single type of fuel that qualifies for D code 3 or D code 7 RINs (or would do so after denaturing) using two or more feedstocks converted simultaneously using a combination of processes or a process other than a thermochemical process, the information specified in this paragraph (b)(1)(xiii)(B) shall be provided at the next required registration update under paragraph (d) of this section.

(xiv) For a producer of cellulosic biofuel made from energy cane, or a foreign renewable fuel producer making ethanol from energy cane and seeking to have it sold after denaturing as cellulosic biofuel, provide all of the following:

(A) Data showing that the average adjusted cellulosic content of each cane cultivar they intend to use is at least 75%, based on the average of at least three representative samples of each cultivar. Cultivars must be grown under normal growing conditions and consistent with acceptable farming practices. Samples must be of feedstock from a feedstock supplier that the fuel producer intends to use to supply feedstock for their production process and must represent the feedstock supplier's range of growing conditions and locations. Cellulosic content data must come from an analytical method certified by a voluntary consensus standards body or using a method that would produce reasonably accurate results as demonstrated through peer reviewed references provided to the third party engineer performing the engineering review at registration.

(B) Producers that want to change or add new cultivar(s) after initial registration must update their registration and provide EPA with data in accordance with paragraph (d) of this section demonstrating that the average adjusted cellulosic content for any new cultivar is at least 75%. Cultivars that do not meet this requirement are considered sugarcane for purposes of Table 1 to § 80.1426.

(xv) For a producer of cellulosic biofuel made from crop residue or a foreign renewable fuel producer making ethanol from crop residue and seeking to have it sold after denaturing as cellulosic biofuel, provide all the following information:

(A) A list of all feedstocks the producer intends to utilize as crop residue.

(B) A written justification which explains why each feedstock a producer lists according to paragraph (b)(1)(xv)(A) of this section meets the definition of "crop residue" per § 80.1401.

(C) For producers already registered as of August 18, 2014 to produce a renewable fuel using crop residue, the information specified in this paragraph (b)(1)(xv) shall be provided at the next required registration update under paragraph (d) of this section.

* * * * *

(h) *Deactivation of company registration.* (1) EPA may deactivate a company's registration, using the process in paragraph (h)(2) of this section, if any of the following criteria are met:

(i) The company has reported no activity in EMTS for twenty-four consecutive months.

(ii) The company has failed to comply with the registration requirements of this section.

(iii) The company has failed to submit any required report within thirty days of the required submission date under § 80.1451.

(iv) The attest engagement required under § 80.1454 has not been received within thirty days of the required submission date.

(2) EPA will use the following process whenever it decides to deactivate the registration of a company:

(i) EPA will provide written notification to the responsible corporate officer identifying the reasons or deficiencies of why EPA intends to deactivate the company's registration. The company will have fourteen calendar days from the date of the notification to correct the deficiencies identified or explain why there is no need for corrective action.

(ii) If the basis for EPA's notice of intent to deactivate registration is the absence of EMTS activity, a stated intent to engage in activity reported through EMTS will be sufficient to avoid deactivation of registration.

(iii) If the company does not respond, does not correct identified deficiencies, or does not provide an adequate explanation regarding why such correction is not necessary within the time allotted for response, EPA may deactivate the company's registration without further notice to the party.

(3) Impact of registration deactivation:

(i) A company whose registration is deactivated shall still be liable for violation of any requirements of this subpart.

(ii) A company whose registration is deactivated will not be listed on any public list of actively registered companies that is maintained by EPA.

(iii) A company whose registration is deactivated will not have access to any of the electronic reporting systems associated with the renewable fuel standard program, including the EPA Moderated Transaction System (EMTS).

(iv) A company whose registration is deactivated must submit any corrections of deficiencies to EPA on forms, and following policies, established by EPA.

(v) If a company whose registration has been deactivated wishes to re-register, they may initiate that process by submitting a new registration, consistent with paragraphs (a) through (c) of this section.

(i) *Registration procedures.* (1) Registration shall be on forms, and following policies, established by the Administrator.

(2) English language registrations—Any document submitted to EPA under this section must be submitted in English, or shall include an English translation.

10. Section 80.1451 is amended as follows:

■ a. By redesignating paragraph (b)(1)(ii)(U) as paragraph (b)(1)(ii)(W).
■ b. By adding a new paragraph (b)(1)(ii)(U).
■ c. By adding paragraph (b)(1)(ii)(V).
■ d. By adding and reserving paragraph (i).
■ e. By adding paragraph (j).

§ 80.1451 What are the reporting requirements under the RFS program?

* * * * *

(b) * * *

(1) * * *

(ii) * * *

(U) Producers generating D code 3 or D code 7 RINs for fuel derived from feedstocks other than biogas (including through pathways listed in rows K, L, M, and N of Table 1 to § 80.1426), and that was produced from two or more feedstocks converted simultaneously, at least one of which has less than 75% average adjusted cellulosic content, and using a combination of processes or a process other than a thermochemical process or a combination of processes shall report all of the following:

(*1*) The cellulosic converted fraction as determined by collecting new representative process data and performing the same chemical analysis method accepted at registration. Producers shall calculate this information on an annual basis or within 10 business days of generating every 500,000 gallons of cellulosic biofuel, whichever is more frequent, and report quarterly. Reports shall include all values used to calculate feedstock energy according to § 80.1426(f)(3)(vi). If new data shows that the cellulosic Converted Fraction is different than previously calculated, the formula used to generate RINs under § 80.1426(f)(3) must be updated as soon as practical but no later than 5 business days after the producer receives the updated data. If new testing data results in a change to the cellulosic Converted Fraction, only RINs generated after the new testing data were received, subject to the 5-day allowance, would be affected.

(*2*) If the cellulosic Converted Fraction deviates from the previously calculated cellulosic Converted Fraction by 10% or more then the producer must notify EPA within 5 business days of receiving the new data and must adjust the formula used to generate RINs under § 80.1426(f)(3) for all fuel generated as soon as practical but no later than 5 business days after the producer receives the new data. If new testing data results in a change to the cellulosic Converted Fraction, only RINs generated after the new testing data were received, subject to the 5-day allowance, would be affected.

(V) Producers of renewable fuel using crop residue as a feedstock shall report all of the following according to the schedule specified in paragraph (f)(2) of this section:

(*1*) The specific feedstock(s) utilized to produce renewable fuel under a pathway allowing the use of crop residue as feedstock.

(*2*) The total quantity of each specific feedstock used to produce renewable fuel.

(*3*) The total amount of qualifying renewable fuel produced under the crop residue pathway(s) in that quarter.

* * * * *

(j) *English language reports.* Any document submitted to EPA under this section must be submitted in English, or shall include an English translation.

■ 11. Section 80.1454 is amended as follows:

■ a. By revising paragraph (b)(4)(i).

■ b. By adding and reserving paragraph (b)(9).

■ c. By adding paragraph (b)(10).

■ d. By revising paragraph (f)(3)(i).

■ e. By revising paragraph (k)(1).

■ f. By adding and reserving paragraphs (q) and (r).

■ g. By adding a new paragraph (s).

■ h. By adding a new paragraph (t).

§ 80.1454 What are the recordkeeping requirements under the RFS program?

* * * * *

(b) * * *

(4) * * *

(i) A list of the RINs owned, purchased, sold, separated, retired, or reinstated.

* * * * *

(10) Records related to any volume of renewable fuel where RINs were not generated by the renewable fuel producer or importer pursuant to § 80.1426(c).

* * * * *

(f) * * *

(3) * * *

(i) A list of the RINs owned, purchased, sold, separated, retired, or reinstated.

* * * * *

(k)(1) Biogas/CNG/LNG and electricity in pathways involving feedstocks other than grain sorghum. A renewable fuel producer that generates RINs for renewable CNG, renewable LNG or renewable electricity pursuant to § 80.1426(f)(10) or (11), or that uses process heat from biogas to produce renewable fuel pursuant to § 80.1426(f)(12) shall keep all of the following additional records:

(i) Documentation recording the sale of renewable CNG, renewable LNG or renewable electricity for use as transportation fuel relied upon in § 80.1426(f)(10), § 80.1426(f)(11), or for use of biogas for process heat to make renewable fuel as relied upon in § 80.1426(f)(12) and the transfer of title of the biogas/CNG/LNG or renewable electricity from the point of biogas production to the facility which sells or uses the fuel for transportation purposes.

(ii) Documents demonstrating the volume and energy content of biogas/CNG/LNG, or kilowatts of renewable electricity, relied upon under § 80.1426(f)(10) that was delivered to the facility which sells or uses the fuel for transportation purposes.

(iii) Documents demonstrating the volume and energy content of biogas/CNG/LNG, or kilowatts of renewable electricity, relied upon under § 80.1426(f)(11), or biogas relied upon under § 80.1426(f)(12) that was placed into the commercial distribution.

(iv) Documents demonstrating the volume and energy content of biogas relied upon under § 80.1426(f)(12) at the point of distribution.

(v) Affidavits, EPA-approved documentation, or data from a real-time electronic monitoring system, confirming that the amount of the biogas/CNG/LNG or renewable electricity relied upon under § 80.1426(f)(10) and (11) was used for transportation purposes only, and for no other purpose. The RIN generator shall obtain affidavits, or monitoring system data under this paragraph (k), at least once per calendar quarter.

(vi) The biogas or renewable electricity producer's Compliance Certification required under Title V of the Clean Air Act.

(vii) Any other records as requested by the Administrator.

* * * * *

(s) Producers of renewable fuel using crop residue shall keep records of all of the following:

(1) The specific crop residue feedstock(s) utilized to produce renewable fuel for each batch of renewable fuel produced.

(2) The total quantity of each specific crop residue feedstock used for each batch.

(3) Total amount of fuel produced under the crop residue pathway for each batch.

(t) *English language records.* Any document requested by the Administrator under this section must be submitted in English, or shall include an English translation.

■ 12. Section 80.1463 is amended by adding paragraph (d) to read as follows:

§ 80.1463 What penalties apply under the RFS program?

* * * * *

(d) Any person liable under § 80.1461(a) for a violation of § 80.1460(b)(1) through (4) or (b)(6) is subject to a separate day of violation for each day that an invalid RIN remains available for an obligated party or renewable fuel exporter to demonstrate compliance with the RFS program.

Subpart N—[Amended]

■ 13. Section 80.1500 is amended by revising the definitions of "E10", "E15", and "EX" to read as follows:

§ 80.1500 Definitions.

* * * * *

E10 means a gasoline-ethanol blend that contains at least 9 and no more than 10 volume percent ethanol.

E15 means a gasoline-ethanol blend that contains greater than 10 volume percent ethanol and not more than 15 volume percent ethanol.

EX means a gasoline–ethanol blend that contains less than 9 volume percent ethanol where X equals the maximum volume percent ethanol in the gasoline-ethanol blend.

* * * * *

■ 14. Section 80.1501 is amended as follows:

■ a. By revising the section heading.

■ b. By revising paragraph (a) introductory text.

■ c. By revising paragraphs (b)(3)(i), (b)(3)(iv), and (b)(4)(ii).

§ 80.1501 What are the labeling requirements that apply to retailers and wholesale purchaser-consumers of gasoline-ethanol blends that contain greater than 10 volume percent ethanol and not more than 15 volume percent ethanol?

(a) Any retailer or wholesale purchaser-consumer who sells, dispenses, or offers for sale or dispensing E15 shall affix the following conspicuous and legible label to the fuel dispenser:

* * * * *

(b) * * *

(3) * * *

(i) The word "ATTENTION" shall be capitalized in 20-point, orange, Helvetica Neue LT 77 Bold Condensed font, and shall be placed in the top 1.25 inches of the label as further described in paragraph (b)(4)(iii) of this section.

* * * * *

(iv) The words "Use only in" shall be in 20-point, left-justified, black, Helvetica Bold font in the bottom 1.875 inches of the label.

* * * * *

(4) * * *

(ii) The background of the bottom 1.875 inches of the label shall be orange.

* * * * *

■ 15. Section 80.1502 is amended as follows:

■ a. By revising paragraph (b)(1).

■ b. By revising paragraphs (b)(3)(iii)(A) and (b)(3)(iv) introductory text.

■ c. By revising paragraphs (b)(4)(iv)(B) and (b)(4)(v)(A).

■ d. By revising paragraphs (c)(4), (c)(6), and (c)(7).

■ e. By revising paragraphs (d)(3) and (d)(4).

§ 80.1502 What are the survey requirements related to gasoline-ethanol blends?

* * * * *

(b) * * *

(1) To comply with the requirements under this paragraph (b), any gasoline refiner, gasoline importer, ethanol blender, ethanol producer, or ethanol importer who manufactures, introduces into commerce, sells or offers for sale E15, gasoline, blendstock for oxygenate blending, ethanol, or gasoline-ethanol blend intended for use in or as E15 must participate in a consortium which arranges to have an independent survey association conduct a statistically valid program of compliance surveys pursuant to a survey program plan which has been approved by EPA, in accordance with the requirements of paragraphs (b)(2) through (b)(5) of this section.

* * * * *

(3) * * *

(iii) * * *

(A) Samples collected at retail outlets shall be shipped the same day the samples are collected via ground service to the laboratory and analyzed for oxygenate content. Samples collected at a dispenser labeled E15 in any manner, or at a tank serving such a dispenser, shall also be analyzed for RVP during the high ozone season defined in § 80.27(a)(2)(ii) or any SIP approved or promulgated under sections 110 or 172 of the Clean Air Act. Such analysis shall be completed within 10 days after receipt of the sample in the laboratory. Nothing in this section shall be interpreted to require RVP testing of a sample from any dispenser or tank serving it unless the dispenser is labeled E15 in any manner.

* * * * *

(iv) In the case of any test that yields a result that does not match the label affixed to the product (e.g., a sample greater than 15 volume percent ethanol dispensed from a fuel dispenser labeled as "E15" or a sample containing greater than 10 volume percent ethanol and not more than 15 volume percent ethanol dispensed from a fuel dispenser not labeled as "E15"), or the RVP standard of § 80.27(a)(2) or any SIP approved or promulgated under sections 110 or 172 of the Clean Air Act, the independent survey association shall, within 24 hours after the laboratory has completed analysis of the sample, send notification of the test result as follows:

* * * * *

(4) * * *

(iv) * * *

(B) In the case of any retail outlet from which a sample of gasoline was collected during a survey and determined to have an ethanol content that does not match the fuel dispenser label (e.g., a sample greater than 15 volume percent ethanol dispensed from a fuel dispenser labeled as "E15" or a sample with greater than 10 volume percent ethanol and not more than 15 volume percent ethanol dispensed from a fuel dispenser not labeled as "E15") or determined to have a dispenser containing fuel whose RVP does not comply with § 80.27(a)(2) or any SIP approved or promulgated under sections 110 or 172 of the Clean Air Act, that retail outlet shall be included in the subsequent survey.

* * * * *

(v) * * *

(A) The minimum number of samples to be included in the survey plan for each calendar year shall be calculated as follows:

$$n = \{[(Z_\alpha + Z_\beta)]^2 / (4*[arc\sin(\sqrt{\phi_1}) - arc\sin(\sqrt{\phi_0})]^2)\} * St_n * F_a * F_b * Su_n$$

Where:

n = Minimum number of samples in a year-long survey series.

However, in no case shall n be smaller than 7,500.

Z_α = Upper percentile point from the normal distribution to achieve a one-tailed 95% confidence level (5% α-level). Thus, Z_α equals 1.645.

Z_β = Upper percentile point to achieve 95% power. Thus, Z_β equals 1.645.

φ_1 = The maximum proportion of non-compliant stations for a region to be deemed compliant. In this test, the parameter needs to be 5% or greater, i.e., 5% or more of the stations, within a stratum such that the region is considered non-compliant. For this survey, φ_1 will be 5%.

φ_o = The underlying proportion of non-compliant stations in a sample. For the first survey plan, φ_o will be 2.3%. For subsequent survey plans, φ_o will be the average of the proportion of stations found to be non-compliant over the previous four surveys.

St_n = Number of sampling strata. For purposes of this survey program, St_n equals 3.

F_a = Adjustment factor for the number of extra samples required to compensate for collected samples that cannot be included in the survey, based on the number of additional samples required during the previous four surveys. However, in no case shall the value of F_a be smaller than 1.1.

F_b = Adjustment factor for the number of samples required to resample each retail outlet with test results exceeding the labeled amount (e.g., a sample greater than 15 volume percent ethanol dispensed from a fuel dispenser labeled as "E15", a sample with greater than 10 volume percent ethanol and not more than 15 volume percent ethanol dispensed from a fuel dispenser not labeled as "E15"), or a sample dispensed from a fuel dispenser labeled as "E15" with greater than the applicable seasonal and geographic RVP pursuant to § 80.27, based on the rate of resampling required during the previous four surveys. However, in no case shall the value of F_b be smaller than 1.1.

Su_n = Number of surveys per year. For purposes of this survey program, Su_n equals 4.

* * * * *

(c) * * *

(4) The survey program plan must be sent to the following address: Director, Compliance Division, U.S. Environmental Protection Agency, 1200 Pennsylvania Ave. NW. Mail Code 6506J, Washington, DC 20460.

* * * * *

(6) The approving official for a survey plan under this section is the Director of the Compliance Division, Office of Transportation and Air Quality.

(7) Any notifications or reports required to be submitted to EPA under this section must be directed to the official designated in paragraph (c)(4) of this section.

(d) * * *

(3) For the first year in which a survey program will be conducted, no later than 15 days preceding the start of the survey EPA must receive a copy of the contract with the independent surveyor and proof that the money necessary to carry out the survey plan has either been paid to the independent surveyor or placed into an escrow account; if the money has been placed into an escrow account, a copy of the escrow agreement must to be sent to the official designated in paragraph (c)(4) of this section.

(4) For subsequent years in which a survey program will be conducted, no later than December 15 of the year preceding the year in which the survey will be conducted, EPA must receive a copy of the contract with the independent surveyor and proof that the money necessary to carry out the survey plan has either been paid to the independent surveyor or placed into an escrow account; if placed into an escrow account, a copy of the escrow agreement must be sent to the official designated in paragraph (c)(4) of this section.

* * * * *

■ 16. Section 80.1503 is amended as follows:

■ a. By revising paragraphs (a)(1)(vi)(B) and (a)(1)(vi)(C).

■ b. By revising paragraph (a)(2).

■ c. By adding paragraph (a)(3).

■ d. By revising paragraphs (b)(1)(vi)(B) through (D).

§ 80.1503 What are the product transfer document requirements for gasoline-ethanol blends, gasolines, and conventional blendstocks for oxygenate blending subject to this subpart?

(a) * * *

(1) * * *

(vi) * * *

(B) For gasoline designed for the special provisions for gasoline-ethanol blends in § 80.27(d)(2), information about the ethanol content and RVP in paragraphs (a)(1) through (a)(3) of this section, with insertions as indicated:

(*1*) "Suitable for the special RVP provisions for ethanol blends that contain between 9 and 10 vol % ethanol.".

(*2*) "The RVP of this blendstock/gasoline for oxygenate blending does not exceed [Fill in appropriate value] psi.".

(*3*) "The use of this blendstock/gasoline to manufacture a gasoline-ethanol blend containing anything other than between 9 and 10 volume percent ethanol may cause a summertime RVP violation.".

(C) For gasoline not described in paragraph (a)(1)(vi)(B) of this section, information regarding the suitable ethanol content, stated in the following format: "Suitable for blending with ethanol at a concentration of no more than 15 vol % ethanol.".

(2) The requirements in paragraph (a)(1) of this section do not apply to reformulated gasoline blendstock for oxygenate blending, as defined in § 80.2(kk), which is subject to the product transfer document requirements of §§ 80.69 and 80.77.

(3) Except for transfers to truck carriers, retailers, or wholesale purchaser-consumers, product codes may be used to convey the information required under paragraph (a)(1) of this section if such codes are clearly understood by each transferee.

(b) * * *

(1) * * *

(vi) * * *

(B) For gasoline containing less than 9 volume percent ethanol, the following statement: "EX—Contains up to X% ethanol. The RVP does not exceed [fill in appropriate value] psi." The term X refers to the maximum volume percent ethanol present in the gasoline.

(C) For gasoline containing between 9 and 10 volume percent ethanol (E10), the following statement: "E10: Contains between 9 and 10 vol % ethanol. The RVP does not exceed [fill in appropriate value] psi. The 1 psi RVP waiver applies to this gasoline. Do not mix with gasoline containing anything other than between 9 and 10 vol % ethanol.".

(D) For gasoline containing greater than 10 volume percent and not more than 15 volume percent ethanol (E15), the following statement: "E15: Contains up to 15 vol % ethanol. The RVP does not exceed [fill in appropriate value] psi.".

* * * * *

■ 17. Section 80.1504 is amended by revising paragraphs (a)(1), (a)(3), (b) through (e), and (g) to read as follows:

§ 80.1504 What acts are prohibited under this subpart?

* * * * *

(a)(1) Sell, introduce, cause or permit the sale or introduction of gasoline containing greater than 10 volume percent ethanol (i.e., greater than E10) into any model year 2000 or older light-duty gasoline motor vehicle, any heavy-duty gasoline motor vehicle or engine, any highway or off-highway motorcycle, or any gasoline-powered nonroad engines, vehicles or equipment.

* * * * *

(3) Be prohibited from manufacturing, selling, introducing, or causing or allowing the sale or introduction of gasoline containing greater than 10 volume percent ethanol into any flex-fuel vehicle, notwithstanding paragraphs (a)(1) and (a)(2) of this section.

(b) Sell, offer for sale, dispense, or otherwise make available at a retail or wholesale purchaser-consumer facility E15 that is not correctly labeled in accordance with § 80.1501.

(c) Fail to fully or timely implement, or cause a failure to fully or timely implement, an approved survey required under § 80.1502.

(d) Fail to generate, use, transfer and maintain product transfer documents that accurately reflect the type of product, ethanol content, maximum RVP, and other information required under § 80.1503.

(e)(1) Improperly blend, or cause the improper blending of, ethanol into conventional blendstock for oxygenate blending, gasoline or gasoline already containing ethanol, in a manner inconsistent with the information on the product transfer document under § 80.1503(a)(1)(vi) or (b)(1)(vi).

(2) No person shall produce a fuel designated as E10 by blending ethanol and gasoline in a manner designed to produce a fuel that contains less than 9.0 or more than 10.0 volume percent ethanol.

(3) No person shall produce a fuel designated as E15 by blending ethanol and gasoline in a manner designed to produce a fuel that contains less than 10.0 volume percent ethanol or more than 15.0 volume percent ethanol.

* * * * *

(g) For gasoline during the regulatory control periods, combine any gasoline-ethanol blend that qualifies for the 1 psi allowance under the special regulatory treatment as provided by § 80.27(d) applicable to 9–10 volume percent gasoline-ethanol blends with any gasoline containing less than 9 volume percent ethanol or more than 10 volume percent ethanol up to a maximum of 15 volume percent ethanol.

* * * * *

■ 18. A new § 80.1509 is added to subpart N to read as follows:

§ 80.1509 Rounding a test result for purposes of this subpart N.

The provisions of § 80.9 apply for purposes of determining the ethanol content of a gasoline-ethanol blend under this subpart.

[FR Doc. 2014–16413 Filed 7–17–14; 8:45 am]

BILLING CODE 6560–50–P

April 24, 2017

Ms. Diana Galperin
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Diana,

National Sorghum Producers is providing the supplemental information you requested via email dated March 15, 2017, on our renewable fuel pathway petition for sorghum oil, which we submitted on July 29, 2016, and the supplemental information we submitted on January 18, 2017. Please note this includes the additional technical information provided by ICM after our initial April 6 submission.

For ease of reference, we have again reproduced your email in its entirety below in black type with our original answers in red type. Our new answers are provided in purple type. As you will see, portions of this supplemental submission also contain confidential business information (CBI). We have marked the CBI-containing sections with red headers and footers and yellow highlighting.

We appreciate your work on the petition and hope this submission will allow you to move toward expeditious approval of the pathway. We believe this can be accomplished quickly via letter and with little additional modeling as the Agency has several precedents for doing so.

These precedents include Diamond Green Diesel's straightforward 2013 pathway approval utilizing the assumptions and models applicable to the already approved hydrotreating process and corn as well as *Camelina sativa* oil feedstocks; Duonix Beatrice's 2014 approval that did not even require a new fuel pathway petition because of its similarity to existing approved pathways; and EPA's 2014 approval of corn kernel fiber along with other grain fibers, including sorghum.

Although electricity use when adding oil extraction increases per the RFS2 regulatory impact analysis, based on table VI.C.1–2 of the RFS2 proposed rule, adding oil extraction nets a 3-8 percent reduction in emissions depending on the percentage of DGS dried. Given this prior modeling work and the information provided in our petition and supplemental submissions showing no material differences in de-oiled coproduct composition (and thus no changes to the coproduct credit), we believe sorghum oil qualifies as a biodiesel and renewable diesel feedstock eligible for D4 and D5 RIN generation.

Please do not hesitate to call me at (806) 638-5334 or contact me via email at john@sorghumgrowers.com if you have questions.

Thanks,

John Duff
National Sorghum Producers
(806) 749-3478

Dear Mr. Duff,

Thank you for replying to our request for additional information. We went through your provided documents and had several further questions to clarify.

1) On page 4 of your response, in your reply to our prompt "Please provide the following information on the market value of SDGS with and without oil extraction" you note:

a. Monthly historical prices (in nominal terms) for past 5 years of SDGS with and without oil extraction $/lb See this information attached on pages 13-14. Please note data for the three White Energy plants are only available beginning in 2014. This is due to an ownership change that has made gathering accurate accounting information difficult. Also note these data are marked as CONFIDENTIAL BUSINESS INFORMATION.

b. Please also provide values for corn DDGS oiled and de-oiled. Prices for corn and sorghum distillers grains are not separated in public datasets as prices received do not differ based on the feedstock. See the attached letter to this effect from the USDA Agricultural Marketing Service on page 15.

We have three follow-up questions on this information:

a) On pages 13-14 you provide SDG pricing for WDGS and DDGS. Can you clarify which columns and prices are for oiled DGS and which ones are for de-oiled DGS? WDGS and DDGS with and without oil are not marketed as separate products. Refer to pages 22-24 of the response for the dates each facility began extracting oil. This information is also attached on pages 6-8 of this document. Note these data are marked as CONFIDENTIAL BUSINESS INFORMATION.

b) In your response b) you note that no public datasets reflect prices for separate sorghum DGs from corn DGs. Can you provide this information from private sector data? Similar to WDGS and DDGS with and without oil, corn-based distillers grains and sorghum-based distillers grain are not marketed separately, so private data do not exist. Refer to figure 1 of the grain sorghum oil pathway petition which shows no significant price shift occurred as a result of initiating oil extraction. This figure is also attached on page 9 of this document. Note it is marked as CONFIDENTIAL BUSINESS INFORMATION.

c) Can you provide prices for de-oiled corn and sorghum DGS blends and, for comparison, the corresponding prices of de-oiled corn DGS? Because corn-based distillers grains with and without oil and sorghum-based distillers grains with and without oil are not marketed separately, no pricing data on these blends or comparisons exists in public or private datasets.

2) We asked for clarification on whether it was necessary to add sources of additional fat to Sorghum DGS in order to sell this feed product to the livestock market. In your response to question 2b, you note:

Dr. Mass outlines these minor additional requirements on page 8. Also attached on pages 11-12 are two rations (one for sorghum and one for corn) balanced by Dr. Mass using de-oiled distiller's grains.

We would like to clarify this statement in regards to the net energy implications on livestock:

a) For the ration charts you cite on page 11 and 12 of your response (copied below), can you clarify which ration is for corn and which is for sorghum? See pages 10-11 for Dr. Mass's clarifications.

b) In that same chart, can you explain what the shadow price represents? See pages 10-11 for Dr. Mass's clarifications.

c) In these two charts, we see that the chart on page 11 has Sorghum DGS composed of 9.75% fat, while the chart on page 12 includes Sorghum DGS composed of 3.91% fat. However, the price for the higher fat DGS is $174/ton compared to $151. Since the chart on page 8 showing SDG displacement rates indicates that the displacement rate is the same for all livestock save beef, why is there a price differential shown in the rations chart? See pages 10-11 for Dr. Mass's clarifications.

d)

11

Ration Analysis DALEX CONNECT **Ryan Mass**

Bluebird Feeders

Prepared on:December 05, 2016

Pricing Sorghum DDGS - Ingredient Detail

Ingredient Name	AF lb	% of AF	% of DM	Ingredient AF $/ton	AF Shadow Price (ton)
Corn Grain - Flaked - 24 lb	1,325.21	66.26	63.81	142.86	
Sorghum DDGS- 9.75% fat	461.65	23.08	25.01	174.00	
Alfalfa Hay 17 - 46 NDF	108.75	5.44	5.89	100.00	
Molasses - Cane	60.00	3.00	2.64	200.00	
Limestone - Ground	22.00	1.10	1.32	52.00	
Distillers' Corn Oil	14.61	0.73	0.87	588.00	
Salt - White	4.15	0.21	0.25	56.00	
Vitamin ADE Premix 1	3.07	0.15	0.18	5,555.00	
Trace Mineral Premix	0.57	0.03	0.03	4,444.00	
Sorghum DDGS- 3.91% fat				1,000.00	165.07
Total	2,000.00	100.00	100.00		

Costs($/Formula)

Ingredient Cost	161.03

12

Ration Analysis DALEX CONNECT Ryan Mass

Bluebird Feeders

Prepared on:December 05, 2016

Pricing Sorghum DDGS - Ingredient Detail

Ingredient Name	AF lb	% of AF	% of DM	Ingredient AF $/ton	AF Shadow Price (ton)
Corn Grain - Flaked - 24 lb	1,300.30	65.02	62.44	142.86	
Sorghum DDGS- 3.91% fat	462.85	23.14	25.00	151.00	
Alfalfa Hay 17 - 46 NDF	108.75	5.44	5.87	100.00	
Molasses - Cane	60.00	3.00	2.63	200.00	
Distillers' Corn Oil	38.31	1.92	2.28	588.00	
Limestone - Ground	22.00	1.10	1.31	52.00	
Salt - White	4.15	0.21	0.25	56.00	
Vitamin ADE Premix 1	3.07	0.15	0.18	5,555.00	
Trace Mineral Premix	0.57	0.03	0.03	4,444.00	
Total	2,000.00	100.00	100.00		

Costs($/Formula)

Ingredient Cost	161.02

3) We also require additional clarification for the charts on page 6 and page 8 (copied below). On page 6, you indicate that there are differences in net energy for swine and dairy cattle when they are fed Full-Oil SDDGS versus when they are fed Reduced-Oil Sorghum DDGS. However, on page 8, the chart on displacement ratio indicates that de-oiled and oiled Sorghum Distillers' Grains show no differences in displacement ratios for swine and dairy cattle. Why are the differences in net energy not reflected in the grain displacement ratios? See pages 10-11 for Dr. Mass's clarifications.

a) Secondly, the chart on page 6 has an entry for poultry, while the chart on page 8 does not. Can you clarify whether sorghum DGS is suitable for poultry feeding and, if so, what displacement ratio is suggested by the available literature (corresponding to the data in the chart on page 8 for cattle and swine)? See pages 10-11 for Dr. Mass's clarifications.

Pg. 6 chart:

Nutrient	Full-Oil Sorghum DDGS*	Reduced-Oil Sorghum DDGS**
Dry Matter, %	89.84	89.94
Crude Protein, %	30.80	31.36
Crude Fat, % (a.k.a. Ether Extract)	9.75	3.91
Net Energy- beef growing, kcal/kg^	2144	1924
Net Energy- beef finishing, kcal/kg^	2011	1830
Net Energy- dairy, kcal/kg^^	1855	1873
Net Energy- swine, kcal/kg	2394	2053
Net Energy- poultry, kcal/kg^^^	2283	2135
Neutral Detergent Fiber (NDF), %	33.60	37.23
Acid Detergent Fiber (ADF), %	22.68	31.91
Ash, %	6.62	7.60
Calcium, %	0.12	0.08
Phosphorus, %	0.76	0.96
Lysine, %	0.82	0.62
Methionine, %	0.54	0.47
Cystine, %	0.53	0.61
Tryptophan, %	0.25	0.23

Page 8 chart:

	Sorghum Distillers' Grains Displacement Ratio (lb of ingredient / lb of SDGS, dry matter basis)							
	Beef Cattle		Dairy Cattle		Swine		Poultry	
Ingredient	Full-Oil	Reduced Oil	Full-Oil	Reduced Oil	Full-Oil	Reduced Oil	Full-Oil	Reduced Oil
Corn	1.196	1.173	0.731	0.731	0.890	0.890	-	-
Soybean Meal	-	-	0.633	0.633	0.095	0.095	-	-
Urea	0.056	0.056	-	-	-	-	-	-

Thank you for your help in clarifying these questions.

Sincerely,
Diana Galperin

Month	Kansas Ethanol Oil Production (pounds)	Kansas Ethanol Grain Sorghum Use (percent of total bushels used)	White Energy Hereford Oil Production (pounds)	White Energy Hereford Grain Sorghum Use (percent of total bushels used)	White Energy Plainview Oil Production (pounds)	White Energy Plainview Grain Sorghum Use (percent of total bushels used)	Western Plains Energy Oil Production (pounds)	Western Plains Energy Grain Sorghum Use (percent of total bushels used)	Conestoga Energy Partners Bonanza Oil Production (pounds)	Conestoga Energy Partners Bonanza Grain Sorghum Use (percent of total bushels used)	Conestoga Energy Partners Arkalon Oil Production (pounds)	Conestoga Energy Partners Arkalon Grain Sorghum Use (percent of total bushels used)
May 2016												
April 2016												
March 2016												
February 2016												
January 2016												
December 2015												
November 2015												
October 2015												
September 2015												
August 2015												

CBI / Ex. 4

July 2015	
June 2015	
May 2015	
April 2015	
March 2015	
February 2015	
January 2015	CBI / Ex. 4
December 2014	
November 2014	
October 2014	
September 2014	
August 2014	
July 2014	
June 2014	
May 2014	

April 2014	CBI / Ex. 4
March 2014	
February 2014	
January 2014	
December 2013	
November 2013	
October 2013	

CBI / Ex. 4

the energy of innovation™

April 23, 2017

Answers to questions from the EPA
Submitted by Ryan A. Mass, PhD
ICM Feed Business Manager

Thank you for your questions. I will answer them in turn:

Questions 2a, 2b, 2c (related to rations on pages 11 and 12):
"Which ration is for corn and which is for sorghum?"
"What does a shadow price represent?"
"Why the price discrepancy between the two types of distillers' grains?"

Both of these cattle rations are intentionally identical in nutrient composition (as designed by Opheim et al, 2016). They both use sorghum distillers grains as a main ingredient for cattle. The intention is to demonstrate that the partial removal of oil from sorghum distillers grains impacts the net energy of that ingredient for cattle in a small way. The computer is programmed to keep fat and net energy the same and to calculate the least cost ration. The shadow price indicates 1) that ingredient option was not selected because of price; and 2) that if the ingredient is priced below the shadow price in alternative scenarios, it would be selected. However, that does not mean that simply lowering the shadow priced ingredient by $1 (for example) would result in a total replacement of one sorghum distillers grains option for the other; rather, the computer would choose to use both sources to maintain least cost. Because it is not practical to inventory both options, the second ration was calculated to show that, at a certain price, a total replacement of one for another is made. In this case, the fair market value for the full oil distillers grains is $174 per ton and the fair market price for the reduced oil distillers grains is $151 per ton. The difference in oil content between the two ration options is made up by the distillers corn oil option. It is important to note that "ingredient displacement" and the aforementioned "fair market value" have little to do with each other. Ingredient displacement simply means that one ingredient (sorghum distillers grains) replaces another (corn) in the ration because it is a better alternative nutritionally; this is independent of how much oil is in it. On the other hand, cattle producers want to keep their ration costs as low as possible and utilize consulting nutritionists to tell them (using the example method) a fair price to pay for the ingredient. This price arbitrage occurs daily nationwide and the example price differential is a real phenomenon; in other words, cattle producers do pay less for reduced oil distillers grains whether from sorghum or corn.

Question 3:
"Why are calculated net energy values for dairy cattle and swine and actual displacement values of grain in the rations of these species unrelated?"
Please recall the methodology used to calculate net energy (as described). There are no data in any scientific publication for net energy of reduced oil sorghum distillers grains; however, there are data for reduced oil corn distillers grains. Using ratios, I calculated these missing values as requested.
In a real world sense, swine and dairy producers do not use less reduced oil distillers grains (independent of whether it comes from corn or sorghum) when compared to full oil distillers grains. There are two reasons for this:

1. Animal performance in these species is not diminished (see the citation of Kerr et al., 2016 and Ramirez et al., 2016). This is in stark contrast to the slightly diminished performance of beef cattle (see above discussion of how this managed in the real world).

310 N. First Street | P.O. Box 397 | Colwich, Kansas 67030 USA | Phone: +1.316.796.0900 | Fax: +1.316.796.0570

www.icminc.com

2. Other animal parameters may actually be enhanced (better bacon from swine, better butter fat from dairy cows)

Question 3a:
"Are sorghum distillers grains suitable for feeding to poultry? Suggested displacement ratio?"
Sorghum distillers grains are most certainly suitable for feeding to poultry (or any species of animal for that matter) *at the proper level*. In his classic text entitled, Feeds and Feeding (copyright 1915), Morrison describes "the excellent composition of grains from ethanol distilleries as a protein source for all animal species". When sorghum distillers grains are fed to poultry, they are fed in combination with other protein sources such as soybean meal. Based on empirical data from the Ag Marketing Resource Center of Iowa State University, the suggested rate of corn by sorghum distillers grains (all types) is 0.292 lbs of corn displaced per lbs of distillers grains. There are no data available for feeding reduced oil sorghum distillers grains to poultry but it is expected to have the same effect in poultry as it does in swine (which is zero).

January 18, 2017

Ms. Diana Galperin
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Diana,

National Sorghum Producers (NSP) is pleased to provide the supplemental information you requested via email dated October 28, 2016, on our renewable fuel pathway petition for sorghum oil, which we submitted on July 29, 2016.

For ease of reference, we have reproduced your email in its entirety below in black type and provided our answers in red type. As you will see, portions of this supplemental submission contain confidential business information (CBI). We have marked the CBI-containing sections with red headers and footers and yellow highlighting.

We thank you for your attention to and review of this petition. We stand ready to provide any additional information you may require. Please do not hesitate to call me at (806) 638-5334 or contact me via email at john@sorghumgrowers.com.

Thanks,

John Duff
National Sorghum Producers
(806) 749-3478

Dear Mr. Duff,

We have reviewed your petition and are requesting the following additional information before we can accept your petition as being complete. We understand that some, but not all, of the data requested below is included in the petition you submitted, and we are requesting that the data be provided in the tables/formats specified below to help us complete our evaluation as expeditiously as possible. We ask that all data provided be documented with peer reviewed literature, data from USDA or from other credible sources to the extent possible. If such data are not available, please explain why and include the best information available. Please let us know if you have any questions.

1) In our May 2016 reply to the pathway screening tool (PST) from NSP, we cited section 5.1.2.3 of the RIA to the March 2010 RFS final rule as an example of the type of information needed. For the composition and nutritional value of oiled and de-oiled DGS, the RIA cites Shurson (2006).[1] Please fill in the following data table, based on Table 1 in Shurson (2006). See the attached table completed by Dr. Ryan Mass, feed business manager for ICM, on page 6. Dr. Mass's resume is attached on page 7. Please note Dr. Mass's inclusion of net energy in place of metabolizable energy. According to Dr. Mass, this substitution was made because net energy is the primary parameter used by professional nutritionists to formulate rations. Conversely, metabolizable energy is an intermediate calculation used primarily for research purposes. Net energy also allows for more accurate comparisons between species.

	Common nutrient specifications for oiled and de-oiled SDGS	
Composition/Nutrient	Oiled SDGS	De-Oiled SDGS
Yield (lb DGS/bu grain sorghum) [2]		
Dry matter, %[3]		
Mass As Percent of 100% SDGS on Dry Matter Basis:[4]		
Crude protein, %		
Crude fat, %		
ME[5] (beef cows, kcal/kg)		
ME (dairy cows, kcal/kg)		
ME (swine, kcal/kg)		
ME (poultry, kcal/kg)		
Acid Detergent Fiber (ADF), %		
Neutral Detergent Fiber (NDF), %		
Ash, %		
Calcium, %		
Phosphorous, %		
Lysine, %		
Tryptophan, %		
Methionine, %		
Cystine, %		

[1] http://www.biofuelscoproducts.umn.edu/sites/biodieselfeeds.cfans.umn.edu/files/cfans_asset_416494.pdf
[2] Yield on wet matter basis
[3] Dry mass percent of SDGS = mass of SDGS on dry matter basis / mass of SDGS on wet matter basis
[4] % = dry mass of nutrient listed in first column / mass of SDGS on dry matter basis
[5] ME = Metabolizable energy

Threonine, %		

2) Section 5.1.2.3 of the RIA to the March 2010 RFS final rule cited Arora et al. (2008)[6] as the basis for DGS displacement rates. Please fill in the following data table based on the bottom of Table 14 in Arora et al. (2008). (Only displacement data is needed, as nutritional value will be covered by the data table above.) See the attached table completed by Dr. Mass on page 8. Please note some of the table entries are left blank (for example, soybean meal in beef cattle rations). This is because sorghum DGS does not replace soybean meal in beef cattle rations regardless of the oil content.

	SDGS Displacement rates by animal type (lb/lb SDGS, 100% dry matter basis)							
	Beef cows		Dairy cows		Swine		Poultry	
	Oiled	De-oiled	Oiled	De-oiled	Oiled	De-oiled	Oiled	De-oiled
Corn displacement								
Soybean meal displacement								
Urea displacement								

a) On page 11 of the ICM Consulting report submitted in the petition, it states "Plant A reported that the plant intentionally reduced the BTS oil recovery in order to maintain the fat value in the DDGS for the marketing feed tag requirements." Please provide information on the nutrient requirements to attain marketing feed tags (% lb of dry matter basis oiled and de-oiled SDGS) for beef cows, dairy cows, swine and poultry. This issue relates solely to the feed tag requirements for a specific customer of Plant A. There are no universally-accepted requirements for feed tags. Instead, each facility guarantees a certain nutritional composition based on its own capabilities and the needs of its customers. See the attached letter to this effect from ICM on page 9.

   a. Please also provide background information on how de-oiled SDGS are treated in order to be sold on the livestock market. No additional non-mechanical treatments are used in the production and marketing of in de-oiled SDGS. See the attached letter to this effect from Conestoga Energy Partners on page 10.

   b. On page 3 of the appendix with Dr. Kimberly C. McCuistion's analysis of the nutritional value of sorghum DDGS with and without oil extraction, she notes, "With the removal of the oil, additional sources of fat may be included in the diet through other ingredients to insure adequate energy availability; however, any additional fat sources needed when feeding de-oiled sorghum DDGS should be similar in quantity to those needed when feeding de-oiled corn DDGS." Please provide quantities in lbs of additional fat that need to be added to the de-oiled sorghum DDGS and the most common sources of this fat. Please also provide similar information for corn DDGS. Dr. Mass outlines these minor

[6] http://www.anl.gov/energy-systems/publication/update-distillers-grains-displacement-ratios-corn-ethanol-life-cycle-0

additional requirements on page 8. Also attached on pages 11-12 are two rations (one for sorghum and one for corn) balanced by Dr. Mass using de-oiled distillers grains.

c. Please provide the following information on the market value of SDGS with and without oil extraction:
    a. Monthly historical prices (in nominal terms) for past 5 years of SDGS with and without oil extraction $/lb See this information attached on pages 13-14. Please note data for the three White Energy plants are only available beginning in 2014. This is due to an ownership change that has made gathering accurate accounting information difficult. Also note these data are marked as CONFIDENTIAL BUSINESS INFORMATION.
    b. Please also provide values for corn DDGS oiled and de-oiled. Prices for corn and sorghum distillers grains are not separated in public datasets as prices received do not differ based on the feedstock. See the attached letter to this effect from the USDA Agricultural Marketing Service on page 15.

4) Please fill out "Tab 2. Process" on the spreadsheet titled *Data Submission Template for New Pathway Petitions Version 2.0* and located at https://www.epa.gov/sites/production/files/2015-08/420b14071.xlsx.
    a. In this spreadsheet please provide the mass and energy balance of a representative dry mill grain sorghum ethanol facility with both sorghum oil and no sorghum oil extraction. If you wish to provide data for multiple dry mill facility configurations, please fill out separate spreadsheets for each one and submit all of them with clear labelling explaining the differences. See the attached spreadsheets completed by ICM detailing mass and energy balances for dry mill ethanol production facilities using grain sorghum as a feedstock. One includes oil extraction, and one does not. These sheets are attached as PDFs on pages 16-17 along with a letter from ICM on the process of completing the sheets on page 18. Please note they are marked as CONFIDENTIAL BUSINESS INFORMATION.
    b. Please also fill provide separate spreadsheets with the mass and energy balance of representative fuel production processes for the conversion of extracted grain sorghum oil to finished fuel. This should include the following fuel production processes:
        i. Biodiesel produced via transesterification See the attached spreadsheet completed by engineering consulting firm Saola Energy LLC on page 19. We have also attached at page 20 a letter from Saola on the process of completing the sheet. Please note the sheets are marked as CONFIDENTIAL BUSINESS INFORMATION.
        ii. Renewable diesel, jet fuel, naphtha and LPG produced via hydrotreating (with and without co-processing). (Note that on the cover sheet of your petition you listed the production process as "hydroheating" but we assume you meant "hydrotreating" as currently listed in Table 1 to 40 CFR 80.1426, if that is incorrect please clarify.) You are correct. We indeed mean "hydrotreating." Thank you for catching this typo. The separate spreadsheets you requested were completed by Saola Energy and attached on page 21. Please note it details the mass and energy balance of renewable

diesel only. Also note these are marked as CONFIDENTIAL BUSINESS INFORMATION.

iii. Heating oil produced via transesterification and/or hydrotreating. At this time, NSP cannot provide the requested supplemental information for jet fuel, naphtha, LPG and heating oil. As of this writing, there is no market for sorghum oil-derived jet fuel, naphtha, LPG or heating oil, and to our knowledge, no facilities are considering producing these fuels. We respectfully reserve the right to supplement this pathway petition in the future with jet fuel, naphtha, LPG and heating oil data, should they become relevant. In the meantime, we respectfully request EPA proceed with processing our pathway petition on the sorghum oil to renewable diesel and biodiesel pathways.

5) Please explain all of the units for the data in the table found on page 52, in the PDF version of your petition which lists production and sorghum use figures. The applicable units have been added and the updated table is attached on pages 22-24. Please note it is marked as CONFIDENTIAL BUSINESS INFORMATION.

6) On page 6 of your petition, you write "Moreover, the EPA's approval of these fuel pathways will result in near-immediate introduction of a monthly volume of 310,725 gallons (466,088 million ethanol-equivalent gallons[1]) of grain sorghum oil biomass-based diesel and advanced biofuels into the stream of commerce. " Please clarify how this figure was calculated. This was calculated by multiplying the cumulative monthly volume of sorghum oil produced by the six dry mill ethanol production facilities discussed in this petition multiplied by the biofuel yield per pound of oil divided by the number gallons of biofuel per pound. This note of clarification has been added. See attached for a copy of the applicable page and highlighted note on page 25.

the energy of innovation™

December 2, 2016

Nutrient Profile of Reduced-Oil Sorghum Distillers' Grains

Submitted by Ryan A. Mass, PhD
ICM Feed Business Manager

There exists in the scientific literature no information about the feeding value and nutrient profile of reduced-oil sorghum distillers' grains for livestock. However, data exist about the effect of reducing the oil in corn distillers' grains. It is the professional opinion of ICM, Inc that sorghum and corn behave similarly in terms of the way nutrients flow through an ethanol plant and deposit in the distillers' grains. Therefore, it is logical to apply the ratios taken from the corn distillers' grains data to the sorghum distillers' grains data. Please find below. Only refereed sources of data are used in this analysis.

Nutrient	Full-Oil Sorghum DDGS*	Reduced-Oil Sorghum DDGS**
Dry Matter, %	89.84	89.94
Crude Protein, %	30.80	31.36
Crude Fat, % (a.k.a. Ether Extract)	9.75	3.91
Net Energy- beef growing, kcal/kg^	2144	1924
Net Energy- beef finishing, kcal/kg^	2011	1830
Net Energy- dairy, kcal/kg^^	1855	1873
Net Energy- swine, kcal/kg	2394	2053
Net Energy- poultry, kcal/kg^^^	2283	2135
Neutral Detergent Fiber (NDF), %	33.60	37.23
Acid Detergent Fiber (ADF), %	22.68	31.91
Ash, %	6.62	7.60
Calcium, %	0.12	0.08
Phosphorus, %	0.76	0.96
Lysine, %	0.82	0.62
Methionine, %	0.54	0.47
Cystine, %	0.53	0.61
Tryptophan, %	0.25	0.23

*Data (unless noted) taken from Nutrient Requirements of Swine, 2012 National Academies Press, Washington DC, pg 329

**Data calculated using the ratio of 1) corn DDGS, >6 and <9% Oil; and 2) corn DDGS, <4% Oil from Nutrient Requirements of Swine, 2012 National Academies Press, Washington DC, pp. 266 and 267

^Nutrient Requirements of Beef Cattle, 2016 National Academies Press, Washington DC, pg 295

^^ Mjoun et al., 2010 Journal of Dairy Science 93:288-303. Lactation performance and amino acid utilization of cows fed increasing amounts of reduced-fat dried distillers grains with solubles.

^^^Barekatain et al., 2014 Poultry Science 93:2793-2801. Effect of sorghum distillers' dried grains and microbial enzymes on net energy values of broiler diets.

the energy of innovation™

Ryan A. Mass

EDUCATION – ANIMAL SCIENCE

2002	**Doctor of Philosophy**	**University of Nebraska**
1998	**Master of Science**	**University of Nebraska**
1995	**Bachelor of Science**	**Iowa State University**

PROFESSIONAL EXPERIENCE

Oct, 2016 – Present **ICM Ventures, Incorporated** **Colwich KS**

Recruited to lead their new feed business, I evaluate the commercial viability of new ingredients through the design and supervision of research and development. I will lead the launch of ingredients deemed to be commercially viable into the marketplace. I also support the sales and marketing team of this ethanol equipment manufacturing firm as it continues to be the market-leading provider of new technologies.

Jan, 2010 – Sep, 2016 **XF Enterprises** **Pratt KS**

Recruited to lead the consulting division of Nutrition Service Associates in Pratt Kansas, I supervised one nutritionist and all custom formulas. I also served as the consulting nutritionist for the Anipro / Xtraformance Feeds division of the company.

In addition, I served as the sales and technical representative of Westway Feed Products for Kansas and adjoining areas from July 2012 to July 2015. I set gross margins on liquids and pellets, quoted prices, and delivered customer service.

Major Accomplishments

-9% annualized sales growth during my tenure
-Sold over 2,000 tons of rock pellets (Westway's new technology)
-Added 22 consulting clients

Sep, 2006 – Dec, 2009 **Lallemand Animal Nutrition** **Milwaukee WI**

Recruited to lead all beef technical consultation globally for their yeast and bacterial DFM products, my time was split equally among applied research projects, technical support, and sales.

Major Accomplishment- Impact of a new direct-fed microbial on intake and ruminal pH. Nebraska Beef Report MP92, pp. 99-101.

Apr, 2003 – Aug, 2006 **XF Enterprises** **Pratt KS**

Marketed and provided technical services to a diverse clientele as an associate member of Nutrition Service Associates. Clients included feed ingredient companies, beef and dairy producers, an independent feed store, and an analytical laboratory. I also developed new cattle nutrition products.

Major Accomplishments

-Invented the technology used for QualiTech Precision Micronutrients
-Co-invented U.S. Patent #8,048,457- "Saponin and Preservative Compositions"

Displacement of Commodities by Sorghum Distillers' Grains
December 5, 2016
Ryan A. Mass, PhD, ICM Feed Business Manager

An ingredient displacement model developed previously (Arora et al, 2008) requires expansion for sorghum distillers' grains. It is the professional opinion of ICM, Inc. that the only application of reduced oil sorghum distillers' grains which would result in reduced feeding value for livestock is for beef cattle in the feedlot. Opheim et al. (2016) demonstrated recently that all types of distillers' dried grains (whether from corn or sorghum, with or without full-oil) have the same feeding value for cattle when the diets were formulated to have the same amount of fat. Therefore, because oil had to be added at the expense of corn when reduced-oil sorghum distillers' dried grains were fed in that experiment, the corn displacement ratio for beef cattle has been lowered in the table commensurately for reduced oil sorghum distillers' grains by 1.89% compared to the full-oil option (see attached example rations which demonstrate how this concept is applied in a practical setting).

No effect of oil reduction in sorghum distillers' grains on the displacement of the feed ingredients listed would be observed for the other species. This phenomenon is explained by the fact that the oil itself provides little marginal benefit in those applications (over and above that of the energy and protein otherwise present). Ramirez et al. (2016) demonstrated recently that feeding reduced oil distillers' grains is beneficial to dairy cows because there is less likelihood for the onset of milk fat depression, which is caused by a fat-induced change in the rumen microbial community of those animals. Kerr et al. (2016) described several studies which have "have shown that increased concentrations of free fatty acids have a negative impact on lipid digestion and energy content" of cereal grains oils for swine and poultry.

	Sorghum Distillers' Grains Displacement Ratio (lb of ingredient / lb of SDGS, dry matter basis)							
	Beef Cattle		Dairy Cattle		Swine		Poultry	
Ingredient	Full-Oil	Reduced Oil	Full-Oil	Reduced Oil	Full-Oil	Reduced Oil	Full-Oil	Reduced Oil
Corn	1.196	1.173	0.731	0.731	0.890	0.890	-	-
Soybean Meal	-	-	0.633	0.633	0.095	0.095	-	-
Urea	0.056	0.056	-	-	-	-	-	-

Literature Cited

Arora et al., 2008. Argonne National Laboratory. Update of distillers grains displacement ratios for corn ethanol life-cycle analysis.

Kerr et al., 2016. Journal of Animal Science 94:2900-8. Lipid digestibility and energy content of distillers' corn oil in swine and poultry.

Opheim et al., 2016. Journal of Animal Science 94:227. Biofuel feedstock and blended coproducts compared with deoiled corn distillers grains in feedlot diets: Effects on cattle growth performance, apparent total tract nutrient digestibility, and carcass characteristics.

Ramirez et al., 2016. Journal of Dairy Science 99:1912-28. Reduced-fat dried distillers grains with solubles reduces the risk for milk fat depression and supports milk production and ruminal fermentation in dairy cows.

the energy of innovation™

October 31, 2016

Dear Sir or Madam,

I am writing to clarify a statement made on page 11 of the consulting report referenced in the sorghum oil petition. The plant in question, Plant A, had a fat requirement in its individual feed tag that required it to extract less oil than most plants. This was not a reflection of a problem but rather a specific matter related to Plant A's individual feed tag that was negotiated with that individual customer.

Feed tags are documents provided to customers detailing the composition of feed products, and these can vary by facility and feed type (wet, dry, partially dry, etc.). Thus, there is no single standard for distillers grains composition. This is the reason for the special feed tag requirement that led Plant A to extract less oil.

Thank you for the opportunity to comment, and please let me know if you have any questions.

Thanks,

Jeff Scharping
Director – ICM, Inc.

310 N. First Street | P.O. Box 397 | Colwich, Kansas 67030 USA | Phone: +1.316.796.0900 | Fax: +1.316.796.0570

www.icminc.com

commodities, llc

Dear Sir or Madam,

Conestoga Energy Partners and White Energy, through a joint venture known as C&W Commodities, market wet and dried sorghum and corn distillers grains with oil and without oil produced in six dry mill ethanol facilities in Kansas and Texas.

We market these products to livestock producers without any additional non-mechanical treatments. The only added step after the coproduct exits the facility is rotary drying for the feed we market on a dry matter basis. This process is identical for sorghum distillers grains with oil and without oil and corn distillers grains with oil and without oil.

The coproducts are segregated based on their moisture content and stored in staging facilities. Just prior to delivery or pickup, an auger or belt is used to load the coproduct onto a trailer for transport to livestock producers.

Thank you for the opportunity to comment, and please let me know if I can answer further questions.

Matt Durler
Vice-President of Marketing
C&W Commodities, LLC

WDC 373450807v2

Ration Analysis

DALEX CONNECT **Ryan Mass**

Bluebird Feeders

Prepared on:December 05, 2016

Pricing Sorghum DDGS - Ingredient Detail

Ingredient Name	AF lb	% of AF	% of DM	Ingredient AF $/ton	AF Shadow Price (ton)
Corn Grain - Flaked - 24 lb	1,325.21	66.26	63.81	142.86	
Sorghum DDGS- 9.75% fat	461.65	23.08	25.01	174.00	
Alfalfa Hay 17 - 46 NDF	108.75	5.44	5.89	100.00	
Molasses - Cane	60.00	3.00	2.64	200.00	
Limestone - Ground	22.00	1.10	1.32	52.00	
Distillers' Corn Oil	14.61	0.73	0.87	588.00	
Salt - White	4.15	0.21	0.25	56.00	
Vitamin ADE Premix 1	3.07	0.15	0.18	5,555.00	
Trace Mineral Premix	0.57	0.03	0.03	4,444.00	
Sorghum DDGS- 3.91% fat				1,000.00	165.07
Total	2,000.00	100.00	100.00		

Costs($/Formula)

Ingredient Cost	161.03

Pricing Sorghum DDGS - Nutrient Analysis (DM %)

Protein	%	15.30	Salt	%	0.25
Net Energy Gain / NRC96	Mcal/cwt	68.79	Selenium	ppm	0.30
Calcium	%	0.60	Sodium	%	0.12
Chlorine	%	0.24	Sulfur	%	0.13
Cobalt	ppm	0.80	Zinc	ppm	10.71
Copper	ppm	12.59	NDF	%	8.88
Iodine	ppm	0.73	Fat	%	6.00
Iron	ppm	92.35	Vitamin A	IU/lb	2,000.00
Magnesium	%	0.13	Vitamin D	IU/lb	199.41
Manganese	ppm	40.96	Vitamin E	IU/lb	92.32
Phosphorus	%	0.23	TDN / NRC96	%	70.47
Potassium	%	0.48	Moisture	%	16.93

Ration Analysis

DALEX CONNECT

Ryan Mass

Bluebird Feeders

Prepared on:December 05, 2016

Pricing Sorghum DDGS - Ingredient Detail

Ingredient Name	AF lb	% of AF	% of DM	Ingredient AF $/ton	AF Shadow Price (ton)
Corn Grain - Flaked - 24 lb	1,300.30	65.02	62.44	142.86	
Sorghum DDGS- 3.91% fat	462.85	23.14	25.00	151.00	
Alfalfa Hay 17 - 46 NDF	108.75	5.44	5.87	100.00	
Molasses - Cane	60.00	3.00	2.63	200.00	
Distillers' Corn Oil	38.31	1.92	2.28	588.00	
Limestone - Ground	22.00	1.10	1.31	52.00	
Salt - White	4.15	0.21	0.25	56.00	
Vitamin ADE Premix 1	3.07	0.15	0.18	5,555.00	
Trace Mineral Premix	0.57	0.03	0.03	4,444.00	
Total	2,000.00	100.00	100.00		

Costs($/Formula)	
Ingredient Cost	161.02

Pricing Sorghum DDGS - Nutrient Analysis (DM %)

Protein	%	15.17	Salt	%	0.25
Net Energy Gain / NRC96	Mcal/cwt	68.76	Selenium	ppm	0.30
Calcium	%	0.60	Sodium	%	0.12
Chlorine	%	0.24	Sulfur	%	0.12
Cobalt	ppm	0.81	Zinc	ppm	10.51
Copper	ppm	12.55	NDF	%	8.74
Iodine	ppm	0.74	Fat	%	6.00
Iron	ppm	91.71	Vitamin A	IU/lb	1,995.98
Magnesium	%	0.13	Vitamin D	IU/lb	199.01
Manganese	ppm	41.03	Vitamin E	IU/lb	92.13
Phosphorus	%	0.23	TDN / NRC96	%	71.58
Potassium	%	0.47	Moisture	%	16.70

	Hereford	Plainview	Russell		Western Plains Energy		Arkalon		Bonanza		Kansas Ethanol	
Month(Year)	WDGS	WDGS	WDGS	DDGS	WDGS	DDGS	WDGS	DDGS	WDGS	DDGS	WDGS	DDGS
November(11)												
December(11)												
January(12)												
February(12)												
March(12)												
April(12)												
May(12)												
June(12)												
July(12)												
August(12)												
September(12)												
October(12)												
November(12)												
December(12)												
January(13)												
February(13)												
March(13)												
April(13)												
May(13)												
June(13)												
July(13)												
August(13)												
September(13)												
October(13)												
November(13)												
December(13)												
January(14)												
February(14)												
March(14)												
April(14)												
May(14)												
June(14)												

CBI / Ex. 4

CONFIDENTIAL BUSINESS INFORMATION HIGHLIGHTED IN YELLOW

	Hereford	Plainview	Russell		Western Plains Energy		Arkalon		Bonanza		Kansas Ethanol	
Month(Year)	WDGS	WDGS	WDGS	DDGS	WDGS	DDGS	WDGS	DDGS	WDGS	DDGS	WDGS	DDGS
July(14)												
August(14)												
September(14)												
October(14)												
November(14)												
December(14)												
January(15)												
February(15)												
March(15)												
April(15)												
May(15)												
June(15)												
July(15)												
August(15)												
September(15)												
October(15)												
November(15)												
December(15)												
January(16)												
February(16)												
March(16)												
April(16)												
May(16)												
June(16)												
July(16)												
August(16)												
September(16)												

CBI / Ex. 4

CONFIDENTIAL BUSINESS INFORMATION HIGHLIGHTED IN YELLOW

USDA United States Department of Agriculture

Agriculture Marketing Service
Livestock, Poultry, & Seed Program
Livestock, Poultry & Grain Market News

http://www.ams.usda.gov/LPSMarketNewsPage

12819 Country Place Drive
Saint Joseph, Mo 64505
Voice: (816) 676-7000
Fax: (816) 279-8902
Email: *stjoe.lpgmn@usda.gov*

November 29, 2016

John Duff
Strategic Business Director
National Sorghum Producers
4201 North Interstate 27
Lubbock, TX 79403

To Whom It May Concern:

The USDA's Agricultural Marketing Service is responsible for the National Daily Ethanol Report. This is a bioenergy report that includes price data for dry, modified, and wet distillers grain, corn oil, and ethanol for the following states: Eastern Corn Belt (Illinois, Indiana, Ohio, Michigan), Iowa, Kansas, Minnesota, Missouri, Nebraska, South Dakota, and Wisconsin. Information included in this report is collected daily.

Corn and sorghum grain bids are collected and included on this report; however, corn-based and sorghum-based distillers grain prices are not separated on the report, as current industry practices are to blend corn and sorghum distillers grains and market as one product.

Thank you for the opportunity to comment.

Regards,

Russ Travelute,
Field Chief, LPGMN

Data Submission Template for Petitions Involving Fuel Production Processes Not Previously Modeled

Requested Pathway

Fuel Produced	Ethanol	
Feedstock	Grain Sorghum	
Process	Dry Grind	
D-Code Request (see Table V.C-7-D-Code Designations)	D-5	

Scenario: Expected performance of a processing plant based on past data from numerous plants. Yields are in accordance with the evaluation provided. The energy use constants are from estimations based on numerous reported plant data, and averaged. This plant is not operating any oil separation equipment and is drying 100% of it's DDGS.

	Mass		Volume		Lower Heating Value (LHV)		Data Source	
Mass and Energy Balance Information	Value	Units	Value	Units	Value	Units	Source (Required)	Year
Mass								

CBI / Ex. 4

[1]Energy balance information should include a list of any energy and process heat inputs and outputs used in the pathway, including such sources produced off site or by another entity.
[2]Energy input information should include fuels used by type, including purchased electricity. Indicate the source, type of fuel required, efficiency, and temperature/pressure for any steam or hot water purchased for the fuel production process.
[3]The extent to which excess electricity or other heat sources are generated and distributed outside the production facility should be described.

CONFIDENTIAL BUSINESS INFORMATION HIGHLIGHTED IN YELLOW

Data Submission Template for Petitions Involving Fuel Production Processes Not Previously Modeled

Requested Pathway

Fuel Produced	Ethanol	
Feedstock	Grain Sorghum	
Process	Dry Grind	
D-Code Request (see Table V.C-7-D-Code Designations)	D-5	

Scenario:

Expected performance of a processing plant based on past data from numerous plants. Yields are in accordance with the evaluation provided. This plant is operating oil removal equipment, and drying all DDGS co-product. The energy use constants are from estimations based on numerous reported plant data, and averaged. The increase in electricity from the equipment to remove corn oil is usually less than 2% of the plants total connected horsepower. The decrease in natural gas usage is due to less DDGS product overall being dried.

	Mass		Volume		Lower Heating Value (LHV)		Data Source	
Mass and Energy Balance Information	Value	Units	Value	Units	Value	Units	Source (Required)	Year
Mass								

CBI / Ex. 4

[1]Energy balance information should include a list of any energy and process heat inputs and outputs used in the pathway, including such sources produced off site or by another entity.
[2]Energy input information should include fuels used by type, including purchased electricity. Indicate the source, type of fuel required, efficiency, and temperature/pressure for any steam or hot water purchased for the fuel production process.
[3]The extent to which excess electricity or other heat sources are generated and distributed outside the production facility should be described.

CONFIDENTIAL BUSINESS INFORMATION HIGHLIGHTED IN YELLOW

ICM the energy of innovation™

To Whom It May Concern,

The attached EPA Pathway Sheets are an estimation based on ICM Inc.'s knowledge of the first generation ethanol process. The estimates were calculated on a number of different inputs which are to the best of our knowledge industry equivalents.

Sincerely,

Jeremy E. Javers, PhD

Director of Technology Development—St. Joseph

Phone: 316.977.8507

Cell: 316.648.1399

Jeremy.Javers@IcmInc.com

Data Submission Template for Petitions Involving Fuel Production Processes Not Previously Modeled

Requested Pathway

Fuel Produced	Biodiesel
Feedstock	Sorghum Oil
Process	Enzymatic
D-Code Request (see Table V.C-7-D-Code Designations)	

Scenario: Based on data for a 2.5MMGPY biodiesel facility utilizing corn oil as the feedstock. There is no fundamental difference between corn oil and sorghum oil as a feedstock for the biodiesel process.

	Mass		Volume		Lower Heating Value (LHV)		Data Source	
Mass and Energy Balance Information	Value	Units	Value	Units	Value	Units	Source (Required) - See cell C8	Year
Mass								

CBI / Ex. 4

[1]Energy balance information should include a list of any energy and process heat inputs and outputs used in the pathway, including such sources produced off site or by another entity.
[2]Energy input information should include fuels used by type, including purchased electricity. Indicate the source, type of fuel required, efficiency, and temperature/pressure for any steam or hot water purchased for the
[3]The extent to which excess electricity or other heat sources are generated and distributed outside the production facility should be described.

Saola Energy LLC
209 E William St, Suite 340A
Wichita, Kansas 67202

January 9, 2017

To Whom It May Concern,

Saola Energy LLC provides project management and process engineering support to clients on diverse projects in market sectors such as ethanol, renewable diesel, biodiesel and oil refining. The attached spreadsheets were completed based on Saola's expertise in these areas. Please do not hesitate to contact us if you have any questions.

Thank you,

Ben Root

Ben Root
Process Engineer

Data Submission Template for Petitions Involving Fuel Production Processes Not Previously Modeled

Requested Pathway

Fuel Produced	Renewable Diesel
Feedstock	Sorghum Oil
Process	Hydrodeoxygenation and Isomerization
D-Code Request (see Table V.C-7-D-Code Designations)	

Scenario: Based on data for a 4.5MMGPY renewable diesel facility utilizing corn oil as the feedstock. There is no fundamental difference between corn oil and sorghum oil as a feedstock for the renewable diesel process. Yield values are simulated and can vary with changing process conditions.

	Mass		Volume		Lower Heating Value (LHV)		Data Source	
Mass and Energy Balance Information	Value	Units	Value	Units	Value	Units	Source (Required) - See cell C8	Year

CBI / Ex. 4

[1]Energy balance information should include a list of any energy and process heat inputs and outputs used in the pathway, including such sources produced off site or by another entity.
[2]Energy input information should include fuels used by type, including purchased electricity. Indicate the source, type of fuel required, efficiency, and temperature/pressure for any steam or hot water purchased for
[3]The extent to which excess electricity or other heat sources are generated and distributed outside the production facility should be described.

CONFIDENTIAL BUSINESS INFORMATION HIGHLIGHTED IN YELLOW

Month	Kansas Ethanol Oil Production (millions of pounds)	Kansas Ethanol Grain Sorghum Use (percent of total bushels used)	White Energy Hereford Oil Production (millions of pounds)	White Energy Hereford Grain Sorghum Use (percent of total bushels used)	White Energy Plainview Oil Production (millions of pounds)	White Energy Plainview Grain Sorghum Use (percent of total bushels used)	Western Plains Energy Oil Production (millions of pounds)	Western Plains Energy Grain Sorghum Use (percent of total bushels used)	Conestoga Energy Partners Bonanza Oil Production (millions of pounds)	Conestoga Energy Partners Bonanza Grain Sorghum Use (percent of total bushels used)	Conestoga Energy Partners Arkalon Oil Production (millions of pounds)	Conestoga Energy Partners Arkalon Grain Sorghum Use (percent of total bushels used)
May 2016												
April 2016												
March 2016												
February 2016												
January 2016												
December 2015												
November 2015												
October 2015												
September 2015												
August 2015												

CBI / Ex. 4

July 2015
June 2015
May 2015
April 2015
March 2015
February 2015
January 2015
December 2014
November 2014
October 2014
September 2014
August 2014
July 2014
June 2014
May 2014

CBI / Ex. 4

April 2014	CBI / Ex. 4
March 2014	
February 2014	
January 2014	
December 2013	
November 2013	
October 2013	

1. Fuel Pathway Description (No information claimed CBI)

Through this petition, we are asking the EPA to approve renewable fuel pathways for the production of certain biofuels from grain sorghum oil. Our proposed pathways meet and exceed the regulatory requirements for approval as advanced biofuels and will have no adverse impact on the number of acres planted for the production of food, nor on the use of the de-oiled, dry grain sorghum distiller's grains as animal feed. Moreover, the EPA's approval of these fuel pathways will result in near-immediate introduction of a monthly volume of 310,725 gallons (466,088 million ethanol-equivalent gallons[1]) of grain sorghum oil biomass-based diesel and advanced biofuels into the stream of commerce. This was calculated by multiplying the cumulative monthly volume of sorghum oil produced by the six dry mill ethanol production facilities discussed in this petition multiplied by the biofuel yield per pound of oil divided by the number of gallons of biofuel per pound. See section B(4) for a detailed explanation of this and related calculations.

Comment [j1]: Note of clarification added at EPA's request.

With the exception of the feedstock used, the pathways described in this petition for the production of biodiesel, renewable diesel, jet fuel, heating oil, naphtha and LPG (collectively referred to as "biofuels" in this document) are *identical to the pathways used in the production of biofuels from non-food grade corn oil ("NFGCO")*.[2] The greenhouse gas benefits of grain sorghum oil and its co-products are comparable to those for NFGCO. Accordingly, we are seeking RIN D-codes identical to those approved for NFGCO.

The feedstock in this petition is grain sorghum oil derived from dry mill ethanol production. The oil is separated from the distillers' grains with solubles ("DGS") by a process identical to that used to separate the NFGCO from DGS in a dry mill ethanol facility using corn as a feedstock. Separation involves centrifuging the DGS to remove the sorghum oil, which is then used for the production of biofuels onsite or at a separate facility. The de-oiled DGS is sold as animal feed.

The separation process is powered by electricity, and this petition presents no new energy-saving technology for the separation of grain sorghum oil compared to that of NFGCO.[3] The key differences between NFGCO and grain sorghum oil are modest lifecycle and marketing distinctions for the ethanol co-products produced when using the alternative plant feedstocks.

The EPA has previously approved grain sorghum as a feedstock for both conventional (D-code 6) and advanced (D-code 5) RINs. In those pathway approvals; however, the greenhouse gas ("GHG") lifecycle analysis ("LCA") was based on "whole DGS"; i.e., with oil included.

The EPA previously considered livestock feed replacement rates for de-oiled corn DGS. (See section 5.1.2.3 of the RIA.) The RIA did not analyze feed replacement rates for de-oiled grain sorghum DGS, however.

---

[1] See section D(2)(iii) for discussion of equivalence values.

[2] The NFGCO biofuel pathways were discussed at length in the RFS2 Regulatory Impact Analysis ("RIA") (EPA-420-R-10-006).

[3] Individual producers are free to obtain the necessary electricity from renewable sources, like solar or wind, but we do not assume such sourcing for purposes of this petition.

Message

From: Schwab, Justin [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=EED0F609C0944CC2BBDB05DF3A10AADB-SCHWAB, JUS]
Sent: 6/15/2017 9:30:53 PM
To: Reeve Brian USGR [brian.reeve@syngenta.com]
Subject: Re: Justin - many thanks for meeting with us today....

Thanks! Great meeting (in person or virtually) the committee.

Sent from my iPhone

On Jun 15, 2017, at 5:14 PM, Reeve Brian USGR <brian.reeve@syngenta.com> wrote:

> It was great to hear your remarks and appreciate the opportunity to share some background and perspectives at the CLA Law Committee meeting.
>
> I'm sorry I couldn't be there in person - look forward to meeting you.
>
> Best regards,
> Brian Reeve
> *Senior Regulatory Counsel*
> *Syngenta Crop Protection, LLC*
> *410 Swing Road*
> *Greensboro, NC 27409*
> **Ex. 6** *(office)*
> *(mobile)*
>
>

Message

From: Schwab, Justin [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=EED0F609C0944CC2BBDB05DF3A10AADB-SCHWAB, JUS]
Sent: 5/26/2017 7:45:46 PM
To: Joe Bischoff [JBischoff@cgagroup.com]
CC: Tim Lust [tim@sorghumgrowers.com]
Subject: Re: Impact of recent changes to risk assessment

Thank you for this. I will make sure it gets to the right policy people here.

Sent from my iPhone

> On May 26, 2017, at 3:20 PM, Joe Bischoff <JBischoff@cgagroup.com> wrote:
>
>
>
> Justin,
>
> My apologies for taking so long to get back to you with examples of how things have significantly changed in the registration and re-registration of pesticides in recent years. I am still gathering examples, as they are a more difficult to tease out than I initially anticipated but they remain very much real and impactful to growers.
>
> We know that there have been significant changes to risk assessment, not through stakeholder engagement or notice and comment but through fiat. These changes were first signaled by Dr. Thomas Burke (Former Dep. Assistant Administrator at EPA) in 2009 when he presented, "New Directions for Risk Assessmentin the Incoming Administration and Beyond" to the Wharton School of Business. While the changes were done through policy and model shifts within the agency the impacts have been profound.
>
> HERBICIDE
> The first example is in regards to Atrazine, which is the second most widely used herbicide in the United States, primarily on corn, sorghum, soybean and sugarcane production. Atrazine has been around for more than 50 years and few chemicals have been studied more closely. Atrazine is currently going through re-registration at EPA, as it did in 2003, but this time through significant policy changes appear to have been made and the goalposts moved. Below I have provided a list of some of the major concerns. Attached, you'll find two documents that provide additional details about these concerns. One document (ATZ summary) was produced by folks at Syngenta. The other document (ATZ EPA Review Memo) was produced through the Triazine Network which is a coalition of grower organizations, including the National Sorghum Producers).
>
> *   EPA ignored the recommendations of their own Science Advisory Panels (2007, 2009, 2012) in setting aquatic level of concern (LOCs).
> *   Preliminary assessment focuses on models that clearly overestimate potential environmental concentrations of atrazine in water and ignores real-world and robust data taken over a 10 year period that completely contradicts the imaginative models used by EPA.
> *   Different outcomes despite the same information
>   *   In 2003 EPA concluded "atrazine is practically non-toxic to slightly toxic to birds and mammals". But in 20016, despite the thresholds remaining unchanged EPA concluded that atrazine posted a chronic risk to mammals.
>   *   In 2003 EPA concluded "atrazine is practically non-toxic to slightly toxic to birds." But in 2016 EPA concluded that there was acute risk for plant-eating, insect-eating and omnivorous birds for nearly all use patterns.
>
> PESTICIDES AND POLLINATORS: Decisions based on hazards and not on risk assessment
> I have attached the National Sorghum Producers' comments on the registration of sulfoxaflor (EPA-HQ-OPP-2010-0889) and a 2015 letter from EPA to the registrants instructing them not to pursue further neonicotinoid uses. I provided these two documents to help illustrate how OPP has made registration decisions that were influenced by the NGO outcry about honeybees and other pollinators without documenting risk (e.g., exposure). These are hazard-based decisions that have been repeated over and over and are not in keeping with a risk-benefit evaluation as required under FIFRA. Below I have highlighted some of the specific concerns captured and further explained in the attached documents.
>
> *   EPA identified the hazard and assumed a harmful exposure without data to support their assumptions.
>   *   Crops like sorghum, soybean and citrus were prevented from being registered uses, keeping a useful tool out of producers hands.
> *   EPA's letter prohibiting new neonic registrations has kept cost effective tools out of growers hands do to their "no risk" approach to bees.
>   *   Sorghum faces a new and devastating pest (sugarcane aphid). Studies have shown that an imidacloprid in-furrow treatment would be effective and inexpensive for this low-input cost crop.

Unfortunately, EPA has told the registrants not to apply for the use due to their presumed concerns about bees.
> * The letter circumvents the risk/benefit evaluation process required under FIFRA and blocks registrations without evidence.
> * A letter from OPP instructing registrants that the moratorium no-longer applies would be a strong message and encourage innovation and new uses.
> * Honeybees are non-native livestock in the United States. Beekeeping is a form of agriculture. However, EPA has chosen that form of agriculture over all others.
> * While beekeepers do have significant pest and pathogen challenges, we have more honeybee colonies in the U.S. than we have had in 20 years.
> * The abundance of caution and concern that EPA is exhibiting to bees, and honeybees in particular, is keeping important crop protection tools out of the hands of producers and ignoring their needs to control pests.
>
> I am working to gather specific examples of how the models have changed and the resulting impacts on registrations. Hope to have that to you in the next week or two.
>
> On a different topic, can you tell us if there has been any progress on the sorghum oil pathway? We are still waiting to hear from EPA regarding next steps, which we hope is a letter providing the approval.
>
> Thank you for your continued attention to our issues and please let me know if you have any questions. Hope you enjoy the holiday weekend.
>
> – Joe
> ________________________________
>
> Joe Bischoff, PhD | Senior Vice President
> Cornerstone Government Affairs
>
> Annapolis | Atlanta | Austin | Baton Rouge | Chicago | Des Moines
> Houston | Jackson | Richmond | Springfield| Washington
>
> Ex. 6 mobile | Ex. 6 direct
> www.cgagroup.com<http://www.cgagroup.com/>
> @CGAgroup
>
>
>
>
>
>
>
>
>
>
>
> <ATZ EPA Review Memo_5.16.2017[2].docx>
> <Atz summary - 11may17[2].docx>
> <neonicotinoid-new-use.pdf>
> <2016_06_17_Sulfoxaflor_EPA-HQ-OPP-2010-0889-Final.docx>

Message

From: Schwab, Justin [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=EED0F609C0944CC2BBDB05DF3A10AADB-SCHWAB, JUS]
Sent: 5/17/2017 12:54:30 PM
To: tim@sorghumgrowers.com
Subject: RE: Sorghum Oil

Tim,

We did receive the material and are following up internally to figure out what the issues are with your application and how they can best be addressed.

Best,

Justin

-----Original Message-----
From: tim@sorghumgrowers.com [mailto:tim@sorghumgrowers.com]
Sent: Wednesday, May 17, 2017 8:51 AM
To: Schwab, Justin <schwab.justin@epa.gov>
Subject: Sorghum Oil

Justin, just checking in on the sorghum oil information we sent last week to make sure you got it. Please let us know your thoughts. It has taken us longer on pesticide change examples than we expected but will have to you soon. May just send Atrazine first as we have it ready but are working on other examples as well. Regards, Tim

Message

From: Schwab, Justin [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=EED0F609C0944CC2BBDB05DF3A10AADB-SCHWAB, JUS]
Sent: 5/9/2017 7:41:31 PM
To: John Duff [john@sorghumgrowers.com]
CC: Tim Lust [tim@sorghumgrowers.com]; Chris Cogburn [chris@sorghumgrowers.com]; Bernadette Bern Rappold, Esq. [rappoldb@gtlaw.com]; dohales@gtlaw.com
Subject: Re: Sorghum Oil Update

Thank you for these materials and this discussion.

Sent from my iPhone

> On May 9, 2017, at 3:38 PM, John Duff <john@sorghumgrowers.com> wrote:
>
> Justin,
>
> This email includes all the information relevant to the sorghum oil pathway process. The email includes a large amount of information, so I have grouped similar pieces of information and included bold headings and brief italicized summaries of each group for ease of reference.
>
> Applicable Executive Orders
>
> The provisions of Executive Order 13771 requiring two regulations be eliminated for every one issued do not apply given approving sorghum oil is a permitting action that imposes no compliance cost. Furthermore, this Order as well as EO 13783 demonstrate intent by the Administration to streamline the regulatory process and remove regulatory obstacles for businesses.
>
> On our May 4 phone call with EPA staff, Sharyn Lie stated Executive Order 13771 would preclude a straightforward rulemaking (or similar approval) given it would require two regulations to be eliminated as well. This requirement is not applicable in this case given approving sorghum oil as a biodiesel feedstock does not increase compliance costs but rather functions as a permit for the petitioners to engage in a business activity. Subjecting our petition for approval to EO 13771 would undermine the intent of the EO, which was to reduce unnecessary costs of regulatory compliance.
>
> The Order states in section 1: "It is the policy of the executive branch to be prudent and financially responsible in the expenditure of funds, from both public and private sources." This demonstrates an intent for the process of approving new regulations to be streamlined. An expeditious approval of sorghum oil as a biodiesel feedstock would save significant taxpayer resources and assist U.S. companies subject to a renewable volume obligation with compliance. In addition, we believe our proposed pathway is so similar to existing pathways that approval by letter, rather than rulemaking (as EPA has done in the past), is appropriate.
>
> Similarly, section 1(c) of Executive Order 13783 states:
>
> "Accordingly, it is the policy of the United States that executive departments and agencies (agencies) immediately review existing regulations that potentially burden the development or use of domestically produced energy resources and appropriately suspend, revise, or rescind those that unduly burden the development of domestic energy resources beyond the degree necessary to protect the public interest or otherwise comply with the law."
>
> In section 2, the Order further directs:
>
> "The heads of agencies shall review all existing regulations, orders, guidance documents, policies, and any other similar agency actions (collectively, agency actions) that potentially burden the development or use of domestically produced energy resources, with particular attention to oil, natural gas, coal, and nuclear energy resources."
>
> It continues by defining "burden" in section 2(b):
>
> "For purposes of this order, 'burden' means to unnecessarily obstruct, delay, curtail, or otherwise impose significant costs on the siting, permitting, production, utilization, transmission, or delivery of energy resources."
>
> Taken together, these sections demonstrate a desire by the Administration to remove regulatory obstacles to greater energy production. When conducting its review under EO 13783, we suggest the EPA examine ways to reduce the burden on renewable fuels producers. As described below, our lengthy journey to obtain a permit for a much-needed domestic energy source is a perfect example of the kind of burden the Administration seeks to eliminate.
>
> Pathway petition and related documents sent to EPA staff

>
> We have submitted three documents to EPA staff totaling 325 pages. The original petition was submitted in July 2016, and follow-up submissions answering staff questions were sent in January 2017 and April 2017. We also sent a follow-up answer to Aaron Levy on May 4. He assured us the question we answered with this email would be the last in this process.
>
> The first three attachments constitute our submissions to EPA staff. The first is the original petition submitted in July 2016. The second includes our answers to their first round of questions submitted in January 2017. The third includes our answers to their second round of questions submitted in April 2017.
>
> We answered their third round of questions on May 4 with the following email to Aaron Levy, who assured us via phone this would be all staff needs to finish the pathway. On the questions of a) why we are unable to provide separate market data for sorghum DDGS with oil and sorghum DDGS without oil and b) why nutritionist Ryan Mass stated cattle feeders pay less for de-oiled DDGS:
>
> "Per our discussion, these two statements are not contradictory. First, on the question of marketing sorghum DDGS with and without oil, the two products are not physically separated and sold as such by the ethanol producer. An ethanol producer deploying oil extraction for the first time will not change anything with regard to storing or selling the DDGS.
>
> Second, on the question about Dr. Mass's statement, he is correct in that cattle feeders do pay less for DDGS without oil. However, he also emphasizes the dynamic nature of feed markets. This applies to all feed ingredients as these are commodity markets and thus change on a minute-by-minute basis. Therefore, feed buyers do pay different prices for DDGS depending on market conditions for a multitude of ingredients.
>
> For example, local supply and demand of soybean oil often has a significantly larger impact on the price and needed quantity of oil in DDGS than the oil content in DDGS itself. Other key prices in this calculation are the domestic and international supply and demand factors affecting energy as well as local availability of other energy sources. Prices of other ingredients, such as protein and starch, also exert influence. This holds for both corn and sorghum DDGS as the change in composition from sorghum DDGS with oil to sorghum DDGS without oil is the same as the change in composition from corn DDGS with oil to corn DDGS without oil.
>
> As Dr. Mass noted, species other than beef cattle (e.g., poultry, swine and dairy cattle) in many cases perform better on de-oiled DDGS. And, in the case of beef cattle, there is still a large amount of oil left to meet the animals' needs. Furthermore, as stated above, feed markets are dynamic and complex, and feed buyers continuously change the price they are willing to pay based on a number of factors. This is the same whether the ingredient in question is sorghum DDGS or corn DDGS."
>
> Modeling
>
> No new modeling is required as extensive modeling has already taken place for related feedstocks and processes. Adding oil extraction means sorghum ethanol producers should achieve a footprint reduction of approximately 35-40%. This is because a) adding oil extraction improves the environmental footprint and b) sorghum ethanol has a better footprint than corn ethanol.
>
> As Aaron Levy verified via phone, adding oil extraction to an ethanol production facility actually improves the environmental footprint of the ethanol produced from the de-oiled grain (keep in mind a smaller footprint means a higher "score"). This is important as EPA staff is particularly interested in ensuring nothing related to the oil extraction process will adversely impact the footprint of the ethanol produced from the de-oiled grain.
>
> Per section V.C. of the RFS2 final rule:
>
> "Based on the above, corn ethanol facilities using natural gas or biomass as the process energy source will meet the applicable 20% GHG performance threshold if it either also uses at least two of the technologies Table V.C–6 or one of the technologies in Table V.C–6 but marketing at least 35% of its DGS as wet. Alternatively, a facility using none of the advanced technologies listed in Table V.C–6 will qualify as producing ethanol meeting the 20% performance threshold if it sells at least 50% of its DGS prior to drying."
>
> Here is the table to which the passage refers:
>
> [Inline image 1]
>
> This reference to corn oil extraction as an advanced technology indicates it improves the footprint. Furthermore, per the following passage from section 1.4.1.3 of the RFS2 regulatory impact analysis:
>
> "The oil recovered using the corn oil extraction process is distressed oil and cannot be sold as a food grade product. Markets for this product do exist, however, as an additive to cattle feed or as a biodiesel feedstock. In addition to generating an additional revenue stream, extracting the corn oil has several other benefits for the ethanol producer. Because the oil is an insulator, removing it improves the heating efficiency of the DGS dryers and reduces the energy demand of the ethanol plant. Reducing the oil content of the DGS also improves its flowability and concentrates its protein content."
>
> This passage details the reasons why corn oil extraction improves the footprint, and the following table provides a quantification. This table is included in the RFS2 notice of proposed rulemaking:

>
> [Inline image 3]
>
> Notice adding corn oil fractionation (which in the notice of proposed rulemaking primarily means oil separated via centrifuge, or the process sorghum ethanol producers use) to a facility producing DDGS improves the footprint by 8%. For a facility producing WDGS, adding oil extraction improves the footprint by 3%. The coproduct credit is included in both cases.
>
> According to the grain sorghum notice of data availability (EPA-HQ-OAR-2011-0542; FRL-9680-8), grain sorghum ethanol achieves a 32% footprint reduction, easily meeting the 20% reduction threshold necessary for qualification as a conventional biofuel eligible to generate RINs under RFS2. Accordingly, adding oil extraction means sorghum ethanol producers should achieve a footprint reduction of approximately 35-40%.
>
> As noted above, EPA staff is particularly interested in ensuring nothing related to the oil extraction process will adversely impact the footprint of the ethanol produced from the de-oiled grain. Any adverse impacts would relate to the coproduct credit, which improves the footprint by offsetting the amount of grain needed to replace the grain diverted away from the feed supply to produce ethanol.
>
> It is important to note the modeling summarized in table VI.C.1-2 above includes the coproduct credit. Given the similarities between corn and sorghum DDGS we have demonstrated in our submissions and sorghum's smaller footprint, sorghum ethanol with oil extraction has already been effectively modeled with the result being an approximate 35-40% footprint reduction. Therefore, per EPA's own models, sorghum ethanol produced with de-oiled grain easily qualifies as a conventional biofuel eligible to generate RINs under RFS2. For this reason, sorghum oil qualifies as a biodiesel feedstock.
>
> Between the wealth of data we have provided and the similarities between sorghum oil and other grain oils, the EPA has ample information that would allow it to quickly approve our pathway. In fact, the EPA's prior actions in approving renewable fuel pathways suggest there is already legal precedent for more streamlined action. Well-researched, proven sources of energy like our proposed pathway have usually qualified for expedited approval without the need for a lengthy rulemaking.
>
> Legal precedents
>
> At least three precedents for expeditious approval exist. The first two were approvals of biodiesel pathways (in 2013 and 2014) using assumptions and models already approved. Neither approval included a protracted process, and one required no new modeling at all. The third was an approval of all grain kernel fibers (in 2014) based on similarities to corn kernel fiber. No modeling was performed for this approval at all.
>
> Here is an excerpt Bernadette Rappold prepared for us detailing what EPA has done in the past:
>
> "Every element of our proposed pathway has been evaluated during prior pathway approvals, which should provide the EPA with most of the models and data needed to complete a quick analysis. In particular, the EPA's approval of renewable fuel pathways with non-food grade corn oil (NFGCO) and grain sorghum feedstock should provide the necessary background and a blueprint for your analysis of our proposed grain sorghum oil pathway.
>
> Since 2013, several proposed pathways for biodiesel produced from corn oil and other crop residue oils have been approved with minimal additional analysis because of their similarity to previously approved pathways. For example, in October 2013, the EPA approved a pathway petition from Diamond Green Diesel, LLC, after comparing DGD's proposal to existing modeling for three previously approved pathways that had the same components as DGD's proposal. Although DGD's proposal included several feedstock options in addition to NFGCO (soybean oil, canola oil, and biogenic waste oils/fats/greases), much of the EPA's straightforward analysis utilized the assumptions and models applicable to the already approved hydrotreating process, NFGCO, and Camelina satvia oil feedstock, which had all been carefully evaluated. Similarly, in March 2014, the EPA determined that Duonix Beatrice's proposal to produce biodiesel from NFGCO, beef tallow, and/or yellow grease through transesterification did not even require a new fuel pathway petition because of its similarity to existing approved pathways.
>
> Just like the DGD and Duonix Beatrice pathways, almost all aspects of our proposed pathway have been analyzed during the approval process for NFGCO pathways. Given the current industry practices of blending corn-based and sorghum-based distillers' grains, we would expect any analysis concerning the impact of sorghum grain oil feedstock to be virtually identical to the analysis already conducted for corn oil. Further, in the EPA's July 2014 RFS Pathways II rule identifying corn kernel fiber as a crop residue feedstock, it acknowledged the similarity between corn kernel fiber and other grain kernel fibers: 'The impacts of fiber on the digestion of ruminants, swine, and poultry are extremely similar, regardless of what grain that fiber came from, because all grain fiber is virtually 100 percent cellulosic. Therefore, we are confident that diverting that fiber to a fuel production stream would have similarly insignificant market and other GHG impacts to those of corn kernel fiber...' Environmental Protection Agency; Regulation of Fuels and Fuel Additives: RFS Pathways II, and Technical Amendments to the RFS Standards and E15 Misfueling Mitigation Requirements, 79 Fed. Reg. 42,150 (July 18, 2014)."
>
> We believe the last reference, in particular, is key. I have attached this rule. As noted in the reference the key passage can be found on page 150, which is page 24 of the attachment. You will notice all grain fibers were approved with little to no analysis based on similarity to corn fiber.
>

> Based on these precedents, we believe that the EPA could approve our sorghum oil pathway by letter, just as it did with the DGD and Duonix Beatrice pathways described above. If it still believes rulemaking is necessary, the 2014 RFS rule approving several grain kernel fibers provides an ideal blueprint for an efficient rule that approves sorghum oil based on its similarities to corn oil, soybean oil as well as other approved crop residue oils and includes the approval in a related rulemaking (i.e., renewable volume obligations). The EPA already has the information it needs for an efficient approval, and we ask that it acts on our petition in the same manner that it did in its past approvals.
>
> Please do not hesitate to let me know if you have questions.
>
> Thanks,
>
> John
>
> [sig]
> John Duff
> Strategic Business Director
> Ex. 6 office
> cell
> sorghumgrowers.com<http://sorghumgrowers.com>
> Sorghum: The Smart Choice.
> [twitter]<https://twitter.com/#!/SorghumGrowers> [facebook]
<https://www.facebook.com/nationalsorghumproducers> [youtube] <http://www.youtube.com/sorghumgrowers>
>
> <image (6).png>
> <image.png>
> <Grain Sorghum Oil Pathway Petition (2).pdf>
> <NSP Responses to EPA Questions on Sorghum Oil Petition (1).pdf>
> <NSP Responses to EPA Questions April 24 (4).pdf>
> <373478145_v 1_RFS approvals Fed Reg July 2014 (1).PDF>

TABLE VI.C.1–2—LIFECYCLE GHG EMISSIONS CHANGES FOR VARIOUS CORN ETHANOL PATHWAYS IN 2022 RELATIVE TO THE 2005 PETROLEUM BASELINE

Corn ethanol production plant type	Percent change from 2005 petroleum baseline (100 yr 2%)	Percent change from 2005 baseline (30 yr 0%)
Natural Gas Dry Mill with dry DGs	−16	+5
Natural Gas Dry Mill with dry DGs and CHP	−19	+2
Natural Gas Dry Mill with dry DGs, CHP, and Corn Oil Fractionation	−27	−6
Natural Gas Dry Mill with dry DGs, CHP, Corn Oil Fractionation, and Membrane Separation	−30	−10
Natural Gas Dry Mill with dry DGs, CHP, Corn Oil Fractionation, Membrane Separation, and Raw Starch Hydrolysis	−35	−14
Natural Gas Dry Mill with wet DGs	−27	−6
Natural Gas Dry Mill with wet DGs and CHP	−30	−9
Natural Gas Dry Mill with wet DGs, CHP, and Corn Oil Fractionation	−33	−12
Natural Gas Dry Mill with wet DGs, CHP, Corn Oil Fractionation, and Membrane Separation	−36	−15
Natural Gas Dry Mill with wet DGs, CHP, Corn Oil Fractionation, Membrane Separation, and Raw Starch Hydrolysis	−39	−18
Coal Fired Dry Mill with dry DGs	+13	+34
Coal Fired Dry Mill with dry DGs and CHP	+10	+31
Coal Fired Dry Mill with dry DGs, CHP, and Corn Oil Fractionation	−5	+15
Coal Fired Dry Mill with dry DGs, CHP, Corn Oil Fractionation, and Membrane Separation	−13	+8
Coal Fired Dry Mill with dry DGs, CHP, Corn Oil Fractionation, Membrane Separation, and Raw Starch Hydrolysis	−21	−1
Coal Fired Dry Mill with wet DGs	−9	+12
Coal Fired Dry Mill with wet DGs and CHP	−11	+10
Coal Fired Dry Mill with wet DGs, CHP, and Corn Oil Fractionation	−17	+3
Coal Fired Dry Mill with wet DGs, CHP, Corn Oil Fractionation, and Membrane Separation	−25	−4
Coal Fired Dry Mill with wet DGs, CHP, Corn Oil Fractionation, Membrane Separation, and Raw Starch Hydrolysis	−30	−9
Biomass Fired Dry Mill with dry DGs	−39	−18
Biomass Fired Dry Mill with wet DGs	−40	−19
Natural Gas Fired Wet Mill	−7	+14

[313] The treatment of emissions over time is not critical if international land use change emissions are excluded because the results without land use change are consistent over time. Therefore the overall lifecycle GHG results do not vary with time or discount rate assumptions.

TABLE V.C–6—MODELED ADVANCED TECHNOLOGIES

Corn oil fractionation
Corn oil extraction
Membrane separation
Raw starch hydrolysis
Combined heat and power