Message

From: Doniger, David [ddoniger@nrdc.org]
Sent: 4/6/2021 5:03:03 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Arroyo, Victoria [Arroyo.Victoria@epa.gov]; Hoffer, Melissa [Hoffer.Melissa@epa.gov]; Waterhouse, Carlton [Waterhouse.Carlton@epa.gov]; Fox, Radhika [Fox.Radhika@epa.gov]; Tsirigotis, Peter [Tsirigotis.Peter@epa.gov]; Culligan, Kevin [Culligan.Kevin@epa.gov]; Harvey, Reid [Harvey.Reid@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]
Subject: Pursuing an ambitious regulatory strategy to address power plant pollution
Attachments: Power Plant Standards Letter 4-6-21.pdf

Attached please find a letter from Earthjustice, Environmental Defense Fund, Evergreen Action, League of Conservation Voters, Moms Clean Air Force, Natural Resources Defense Council, Sierra Club, and the Union of Concerned Scientists, urging the administration to pursue an ambitious regulatory strategy under existing statutory authority to address climate, air, and water pollution from the nation's fossil fuel-fired power plants on an aggressive timeline. The letter, addressed to President Biden, was shared earlier today with National Climate Advisor McCarthy and Administrator Regan, and was made publicly available.

We look forward to working with you on all these initiatives in the coming year.

Best,

David Doniger

DAVID DONIGER
Senior Strategic Director
Climate and Clean Energy Program

NATURAL RESOURCES DEFENSE COUNCIL

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April 6, 2021

President Joseph R. Biden, Jr.
1600 Pennsylvania Ave., NW
Washington, DC 20500

Re: Vital Public Health and Climate Protections to Address the Nation's Power Plant Pollution

Dear President Biden:

On behalf of our millions of members, we thank you for your bold vision to combat climate change and your dedication, in the American Rescue Plan and the American Jobs Plan, to building back an economy that creates millions of well-paying jobs and that protects and builds opportunity in communities on the front lines of air pollution and climate change.

Coal- and gas-fired power plants are the country's largest industrial source of dangerous air pollution. Despite years of progress thanks to past clean air protections and the plummeting costs of clean energy, power plants still emitted more than 1.6 billion metric tons of carbon pollution in 2019, nearly one million tons of sulfur dioxide, and nearly 900,000 tons of nitrogen oxides. Three-quarters of coal-fired plants still lack modern air pollution controls 30 years after the Clean Air Act was last amended, and every year they also discharge more than a billion pounds of toxic chemicals and other pollutants into the nation's waterways and dump tens of millions of tons of coal ash into ponds and landfills that can leach into rivers and groundwater.

As a result, these power plants still cause tens of thousands of deaths and hundreds of thousands of illnesses each year, are the nation's largest stationary source of climate pollution, and cause massive damage to ecosystems and agriculture. The health harms, climate impacts, and other damages fall disproportionately on overburdened and disadvantaged communities. We strongly support your commitment to ensure environmental justice communities and leaders are thoroughly engaged—and heard—in shaping and designing our nation's pollution control priorities and policies.

We support your goal of achieving 100 percent clean electricity by 2035. We applaud your Day One executive order directing EPA to reverse the Trump administration's effort to undermine standards for mercury and other toxic air pollutants. We note the decision of the D.C. Circuit Court of Appeals the day before your inauguration throwing out the former administration's do-nothing standard for power plant carbon pollution, and giving EPA both a clear mandate and a clean slate to set new standards that protect public health and the environment. And we support your intention to announce a new national commitment under the Paris Agreement this month.

We urge you now to set a clear and aggressive schedule for EPA to adopt and implement ambitious multi-pollutant power sector protections to curb the full range of dangers power plants pose. EPA has urgent responsibilities under three of the nation's fundamental environmental laws—the Clean Air Act, the Clean Water Act, and the Resource Conservation and Recovery

Act—to address the serious public health and environmental threats from power plants. By carrying out EPA's responsibilities under current law in parallel with seeking new incentives, investments, and authority from Congress to limit pollution, your administration can protect all communities while creating millions of good jobs for workers across the country, including those in industries currently dependent on high-polluting fuels. It is critical to phase down power sector carbon emissions at least 80 percent below their 2005 peak levels by 2030, which will support your administration's 2035 target for 100 percent clean electricity. Cleaning up the power sector is also essential to a broader strategy of electrifying our vehicles, buildings, and industry, in order to reduce the health- and climate-harming pollution from those sectors.

A multi-pollutant power sector approach and schedule for action under our current laws should include at least the following key elements:

- Curbing toxic pollution: EPA must restore the "appropriate and necessary" finding and strengthen the current mercury and air toxics standards for power plants.

- Cleaning up deadly soot and smog: Every power plant must address its health-harming pollution. EPA must aggressively enforce existing ambient air quality standards for dangerous fine particles and ozone and should quickly update and strengthen those standards to reflect current science. The agency must strengthen the "good neighbor" and other implementation rules to protect millions of people afflicted by upwind pollution beyond their control, and must set state-of-the-art standards for smog-forming oxides of nitrogen from new gas plants. EPA must also require power plants to consistently use the control technologies they already have installed but frequently turn off or bypass, and the agency must close the illegal loopholes for pollution during startups, shutdowns, and malfunctions.

- Safeguarding our climate: Cutting climate pollution from the power sector is essential to addressing the climate crisis. EPA must adopt strong carbon pollution standards for existing coal and gas plants, and for new gas plants.

- Protecting our parks and visibility: EPA must protect the millions of visitors to our national parks and the local economies that depend on them by reinstating and strengthening pollution control requirements for power plants that pollute national parks and degrade vistas over vast areas of our beautiful country.

- Cutting toxic water pollution: EPA must close loopholes in the effluent limitations for coal-fired power plants and strengthen the standards based on state-of-the-art treatment technology.

- Curbing coal ash: EPA must restore and strengthen safeguards for disposal of coal ash, the toxic waste produced by coal-fired electric power generation.

These vital public health and climate protections should be implemented through a set of rulemakings proposed by the end of this year and promulgated in 2022.

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We urge your administration to fully carry out its responsibilities under our air, water, and waste laws to protect all people in all parts of our nation from the dangerous pollution from coal and gas plants. It is critical that these actions guarantee meaningful public health, climate, and environmental protections through quantifiable and enforceable pollution reductions.

In parallel with enforcing robust limits on power sector pollution, the administration should also seek new authority and investments from Congress to equitably curb the multiple dangers posed by fossil fuel-fired power plants and ensure that disadvantaged communities experience the benefits of the transformation to a clean energy economy. We enthusiastically support the commitments to environmental justice made in your Executive Order on Tackling the Climate Crisis at Home and Abroad and the American Jobs Plan, and urge the administration to engage directly with frontline communities to advance programs to address cumulative pollution impacts and to direct clean energy and energy efficiency investments to the communities where they are needed most.

Thank you for your leadership in rebuilding the economy, creating good jobs, protecting people's health, and reducing the ravages of the climate crisis. We are excited to work with you on all these initiatives to achieve our shared goals of meeting the demands of science while creating a stronger and more equitable future for us all.

Sincerely,

Mitchell S. Bernard
President & Chief Counsel
Natural Resources Defense Council

Dominique Browning
Director and Co-Founder
Moms Clean Air Force

Michael Brune
Executive Director
Sierra Club

Abigail Dillen
President
Earthjustice

Gene Karpinski
President
League of Conservation Voters

Fred Krupp
President
Environmental Defense Fund

Jamal Raad
Executive Director
Evergreen Action

Kathleen Rest
Executive Director & Interim President
Union of Concerned Scientists

CC: Gina McCarthy
National Climate Advisor

Michael Regan
Administrator, U.S. Environmental Protection Agency

ED_006073_00000138-00003

Message

From: Fox, Radhika [Fox.Radhika@epa.gov]
Sent: 4/21/2021 2:16:02 AM
To: Doniger, David [ddoniger@nrdc.org]; Goffman, Joseph [Goffman.Joseph@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Arroyo, Victoria [Arroyo.Victoria@epa.gov]; Hoffer, Melissa [Hoffer.Melissa@epa.gov]; Waterhouse, Carlton [Waterhouse.Carlton@epa.gov]; Tsirigotis, Peter [Tsirigotis.Peter@epa.gov]; Culligan, Kevin [Culligan.Kevin@epa.gov]; Harvey, Reid [Harvey.Reid@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]
Subject: RE: Pursuing an ambitious regulatory strategy to address power plant pollution

Thank you David for sharing the letter. I look forward to working with you, and the other signatory organizations as well. My best, Radhika

---

From: Doniger, David <ddoniger@nrdc.org>
Sent: Tuesday, April 6, 2021 10:03 AM
To: Goffman, Joseph <Goffman.Joseph@epa.gov>; Carbonell, Tomas <Carbonell.Tomas@epa.gov>; Arroyo, Victoria <Arroyo.Victoria@epa.gov>; Hoffer, Melissa <Hoffer.Melissa@epa.gov>; Waterhouse, Carlton <Waterhouse.Carlton@epa.gov>; Fox, Radhika <Fox.Radhika@epa.gov>; Tsirigotis, Peter <Tsirigotis.Peter@epa.gov>; Culligan, Kevin <Culligan.Kevin@epa.gov>; Harvey, Reid <Harvey.Reid@epa.gov>; Grundler, Christopher <grundler.christopher@epa.gov>
Subject: Pursuing an ambitious regulatory strategy to address power plant pollution

Attached please find a letter from Earthjustice, Environmental Defense Fund, Evergreen Action, League of Conservation Voters, Moms Clean Air Force, Natural Resources Defense Council, Sierra Club, and the Union of Concerned Scientists, urging the administration to pursue an ambitious regulatory strategy under existing statutory authority to address climate, air, and water pollution from the nation's fossil fuel-fired power plants on an aggressive timeline. The letter, addressed to President Biden, was shared earlier today with National Climate Advisor McCarthy and Administrator Regan, and was made publicly available.

We look forward to working with you on all these initiatives in the coming year.

Best,

David Doniger

DAVID DONIGER
Senior Strategic Director
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Message

From: Hoffer, Melissa [Hoffer.Melissa@epa.gov]
Sent: 4/27/2021 12:33:09 PM
To: Walter Echo-Hawk [wechohawk@ Ex. 6 PP
CC: Chase, Joann [Chase.Joann@epa.gov]; Nishida, Jane [Nishida.Jane@epa.gov]; Lael Echo-Hawk (b) (6) [redacted]; Chad Smith [Chad@chadsmith.com]; Michael Freeman [mfreeman@earthjustice.org]; Rumela Roy [rroy@earthjustice.org]
Subject: RE: Legal Conversation with President Echo-Hawk

Good morning and thank you. I will confer with my colleagues on these times.

Best,
Melissa

From: Walter Echo-Hawk <wechohawk Ex. 6 PP
Sent: Tuesday, April 27, 2021 8:30 AM
To: Hoffer, Melissa <Hoffer.Melissa@epa.gov>
Cc: Chase, Joann <Chase.Joann@epa.gov>; Nishida, Jane <Nishida.Jane@epa.gov>; Lael Echo-Hawk Ex. 6 PP >; Chad Smith <Chad@chadsmith.com>; Michael Freeman <mfreeman@earthjustice.org>; Rumela Roy <rroy@earthjustice.org>
Subject: Re: Legal Conversation with President Echo-Hawk

Good Morning Assistant General Counsel Hoffer,

Here are three windows for our call this week, in order of preference:

1. Friday, anytime after 1130am Eastern (this is the only time my entire team is available);
2. Wednesday morning anytime; or
3. Thursday, 3-5pm Eastern.

I appreciate your offer to host the call on TEAMS. Invites can be sent to email addresses of my team members who are copied above.

Thank you and best regards,

President Echo-Hawk

On Mon, Apr 26, 2021 at 5:37 PM Hoffer, Melissa <Hoffer.Melissa@epa.gov> wrote:

> Good evening President Echo-Hawk,
>
> Thank you for your email. I am hoping you and your colleagues might be able to provide a few windows this week that could work for a call. I will then coordinate with my EPA colleagues and our DOJ counsel and get back to you promptly with those times that would work on our end. We'd be happy to set up the call--we can meet via Teams so we can all see each other, or arrange a conference call line if that is easier, just let me know.

Thank you and we look forward to meeting.

Best regards,

Melissa

Melissa A. Hoffer

Acting General Counsel

Principal Deputy General Counsel

U.S. Environmental Protection Agency

Office of General Counsel

1200 Pennsylvania Avenue, NW

Washington, DC 20460

T: 202.440.1671

E: hoffer.melissa@@epa.gov

From: Walter Echo-Hawk <wechohawk@gmail.com>
Sent: Monday, April 26, 2021 2:51 PM
To: Chase, Joann <Chase.Joann@epa.gov>
Cc: Nishida, Jane <Nishida.Jane@epa.gov>; Hoffer, Melissa <Hoffer.Melissa@epa.gov>; Lael Echo-Hawk
(b) (6) [redacted] Chad Smith <Chad@chadsmith.com>; Michael Freeman <mfreeman@earthjustice.org>;
Rumela Roy <rroy@earthjustice.org>
Subject: Re: Legal Conversation with President Echo-Hawk

Good afternoon everyone,

Thanks to Joann for the email. May I suggest a call tomorrow morning at 10am Eastern Time? That time would work for our team, which will consist of myself, the Pawnee Nation Attorney General Chad Smith, attorney Lael Echo-Hawk who is on the Nation's Intergovernmental Affairs,

Michael Freeman and Rumela Roy of EarthJustice, and Ambassador Jonodev Chaudhuri of the MusKogee Creek Nation.

We hope to explore the nature of any legal concerns regarding the sixteen Tribal Nations' requests made to Administrator Regan. Once we are aware of the nature of those concerns, we would like an opportunity to brief those issues and can do so promptly. I appreciate your willingness to have a preliminary legal discussion with us tomorrow and hope we can ultimately chart a sound legal pathway for the Administrator to carry out the stated goals and priorities of this Administration.

Please let me know if 10am Eastern Time works, and whether your office can set up the conference?

I look forward to visiting with everyone.

Best regards,

President Echo-Hawk

On Mon, Apr 26, 2021 at 12:59 PM Chase, Joann <Chase.Joann@epa.gov> wrote:

> President Echo-Hawk,
>
> It's always good to speak with you. We're on quite a daily roll here!
>
> Thank you for your request to have a preliminary legal discussion. I am looping in Melissa so it can be scheduled accordingly among the legal teams.
>
> In Spirit,
>
> JoAnn

JoAnn K. Chase *(Mandan, Hidatsa & Arikara)*

Director, American Indian Environmental Office &

Senior Advisor

(202) 578-8006 *cell*

(202) 564-1728 *desk*

Message

From: Hoffer, Melissa [Hoffer.Melissa@epa.gov]
Sent: 5/16/2021 7:35:01 PM
To: Walter Echo-Hawk [wechohawk@ Ex. 6 Personal Privacy (PP)
CC: Chase, Joann [Chase.Joann@epa.gov]; Gray, David [gray.david@epa.gov]; Michael Freeman [mfreeman@earthjustice.org]; Rumela Roy [rroy@earthjustice.org]; Chad Smith [Chad@chadsmith.com]; Lael Echo-Hawk Ex. 6 PP; Wright, Felicia [Wright.Felicia@epa.gov]
Subject: RE: Following Up

Excellent—thank you, Walter.

Best,
Melissa

From: Walter Echo-Hawk <wechohawk@ Ex. 6 Personal Privacy (PP)
Sent: Friday, May 14, 2021 2:35 PM
To: Hoffer, Melissa <Hoffer.Melissa@epa.gov>
Cc: Chase, Joann <Chase.Joann@epa.gov>; Gray, David <gray.david@epa.gov>; Michael Freeman <mfreeman@earthjustice.org>; Rumela Roy <rroy@earthjustice.org>; Chad Smith <Chad@chadsmith.com>; Lael Echo-Hawk Ex. 6 PP; Wright, Felicia <Wright.Felicia@epa.gov>
Subject: Re: Following Up

Thank you, Melissa. We can ask Shiela Morago to help us find out which of the other 39 Tribes would like to participate today and hope we can obtain that information soon.

Have a nice weekend,

Walter

On Fri, May 14, 2021 at 12:22 PM Hoffer, Melissa <Hoffer.Melissa@epa.gov> wrote:

Thank you, Walter. I fully agree with the sentiments you express at the close of your email, and I know the Administrator is committed to ensuring our consultation process is meaningful.

It would be helpful to have a sense of which of the other 39 Tribes would like to participate—thank you. We are working to prepare the initial letter and want to make sure we include all interested Tribes.

I expect David will be reaching out to you shortly, if he hasn't already.

Best,

Melissa

From: Walter Echo-Hawk <wechohawk@[redacted]>
Sent: Wednesday, May 12, 2021 11:10 AM
To: Hoffer, Melissa <Hoffer.Melissa@epa.gov>
Cc: Chase, Joann <Chase.Joann@epa.gov>; Gray, David <gray.david@epa.gov>; Michael Freeman <mfreeman@earthjustice.org>; Rumela Roy <rroy@earthjustice.org>; Chad Smith <Chad@chadsmith.com>; Lael Echo-Hawk [redacted]
Subject: Re: Following Up

Good Morning Melissa,

I appreciate your update. I agree that our discussion on legal issues was very productive; and we will get our legal memorandum to you early next week to address those issues and help chart a legally-sound pathway for the Administrator to grant all the relief requested by the Tribal Nations and carry forward at the same time his related environmental justice priorities.

At minimum, I presume all Tribal Nations who signed the initial letter requesting the meeting with the Administrator, including those tribal representatives who were able to meet with the Administrator, will want to engage in formal government-to-government consultation with EPA to identify adverse impacts of the October 1 decision on each nation and to develop measures to mitigate those impacts. Normally, to be meaningful--agency consultations with Tribal Nations about proposed decisions that affect core tribal issues and vital tribal interests are done by the agency before the decision is made, not afterwards. However, if finding ways EPA can mitigate harm to vital tribal interests caused by the October 1 decision is the goal of the consultations, they can still be meaningful. The initial point-of-contact for initiating formal consultation with each Tribal Nation would be the signatories to the letter and the list tribal representatives who attended the meeting with the Administrator.

In addition, we think there is a strong possibility that some of the other 39 Tribal Nations in Oklahoma may also want the opportunity to enter into consultation with EPA as well; and we can ask Sheila Morago, Oklahoma Indian Gaming Association, if she could to reach out to those nations and inquire about their interest if you would like our assistance in that regard?

Thanks also for sharing those two pieces of information. First, I agree it is good to keep lines of communication open with the State of Oklahoma. Second, we would appreciate receiving from David more detail and a full list of anticipated approval actions; that would be very helpful.

I really appreciate my opportunity to work with you, as do all my colleagues and the tribal leaders who are involved in this matter. I look forward to working with you to help restore trust, good will, and strong working relationships between EPA and the Tribal Nations as we face the paramount challenge of our day--protecting Mother Earth and life on earth as we know

it. All of our other endeavors pale in importance; and the sooner we can turn our undivided attention to that task, the better it will be for the entire Nation.

Best wishes,

Walter

On Mon, May 10, 2021 at 11:38 AM Hoffer, Melissa <Hoffer.Melissa@epa.gov> wrote:

Good afternoon President Echo-Hawk,

Thank you again for our discussion on April 30, which was very helpful and which we appreciated very much. Thinking about the consultation process, we wanted to get a sense of which Tribes plan to participate. We welcome your thoughts, as well as any recommendations about who we should reach out to.

I also wanted to share two pieces of information. First, we will be following up this week with the Oklahoma Secretary of Energy & Environment, Ken Wagner, with an update. We plan to relay that, as we shared with you, our review of the 2020 SAFETEA decision is ongoing, although we have not paused implementation of that decision in the interim. We will also relay that we intend to initiate a formal consultation process, and that we would accept any written comments the state wishes to provide.

Second, the Region will soon be issuing a number of EPA approvals of state regulatory actions that may affect the Tribal territories at issue, for example, SIP approvals. I have copied David who can provide more detail and the full list of anticipated actions if that would be helpful. We wanted to make sure you knew in advance.

Please let me know if it would be helpful to discuss any of this. We look forward to hearing from you, and thank you.

Best regards,

Melissa

Melissa A. Hoffer

Acting General Counsel

Principal Deputy General Counsel

U.S. Environmental Protection Agency

Office of General Counsel

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T: 202.440.1671

E: hoffer.melissa@@epa.gov

Message

From: Rumela Roy [rroy@earthjustice.org]
Sent: 5/20/2021 8:22:06 PM
To: Hoffer, Melissa [Hoffer.Melissa@epa.gov]
CC: mfreeman@earthjustice.org; Chase, Joann [Chase.Joann@epa.gov]; Gray, David [gray.david@epa.gov]; Meghan Greenfield [Meghan.Greenfield@usdoj.gov]; wechohawk@pawneenation.org; chad@chadsmith.com
Subject: Pawnee Letter re EPA SAFETEA decision
Attachments: 2021.05.20 Pawnee Comment Letter re EPA SAFETEA.pdf

Good afternoon Ms. Hoffer,

On behalf of the Pawnee Nation of Oklahoma, we submit the attached comment letter discussing legal issues related to the October 1, 2020 EPA SAFETEA decision.

Thank you for your consideration, and please let us know if you have any questions or would like further information from us.

Best,

Mike Freeman and Rumela Roy
Counsel for the Pawnee Nation of Oklahoma

Rumela Roy
(She/her/hers)
Associate Attorney
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EARTHJUSTICE

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EARTHJUSTICE

May 20, 2021

Melissa A. Hoffer
Acting General Counsel
Principal Deputy General Counsel
U.S. Environmental Protection Agency
Office of General Counsel
1200 Pennsylvania Avenue, NW
Washington, DC 20460
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hoffer.melissa@epa.gov

BY ELECTRONIC MAIL

Dear Ms. Hoffer:

The Pawnee Nation of Oklahoma appreciates the opportunity to submit these comments regarding the October 1, 2020 Environmental Protection Agency (EPA) decision that grants the State of Oklahoma authority to administer 26 environmental programs on Indian lands in Oklahoma pursuant to Section 10211 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act of 2005: A Legacy for Users (SAFETEA) (the October 1 Decision).

The October 1 Decision violated the law and was arbitrary and capricious for at least four reasons.[1] First, EPA granted Oklahoma's request even though, under well-established precedent, Section 10211 of SAFETEA (the Rider) should be presumed to have expired. SAFETEA was a time-limited appropriation and authorization act that expired in 2009, and there is a strong presumption that riders in such acts—like Section 10211—are temporary legislation that do not remain in effect after the acts' expiration. EPA failed to consider this presumption: it never addressed the presumption or analyzed its application to the Rider. EPA also failed to consider or apply the federal Indian law canon of construction that statutes must be construed in favor of Indians, which further indicates that the Rider has expired. Indeed, EPA provided no reasoned explanation for why it believed that the Rider remains in effect. We believe Oklahoma's request should have been denied because the Rider had expired.

Second, even if EPA believed that the Rider remains in effect, the text of the Rider requires EPA to determine, before approving Oklahoma's request, whether each of the 26 Oklahoma environmental programs "meets applicable requirements of the law." SAFETEA, Pub. L. No. 109-59, 119 Stat. 1144, 1937 (Aug. 10, 2005). EPA violated SAFETEA by approving Oklahoma's request without making these findings.

[1] The October 1 Decision also raises serious constitutional and tribal sovereignty concerns. However, for purposes of these comments, we focus on the administrative deficiencies in EPA's decision.

Third, EPA ignored that it has the authority to impose appropriate conditions on any approval of Oklahoma's request, pursuant to Oklahoma Dep't of Envtl. Quality v. EPA, 740 F.3d 185, 190 (D.C. Cir. 2014). EPA's failure to consider imposing potential conditions was arbitrary and capricious.

Finally, EPA granted Oklahoma's request without providing any public notice and comment, engaging in any meaningful consultation or coordination with the Pawnee Nation and other affected Oklahoma tribes, or analyzing the environmental impacts of its approval. This was unlawful: notice and comment, tribal consultation, and environmental analyses are legal requirements that apply to EPA's approval of state environmental programs, and EPA should not have disregarded these requirements.

Because of these significant legal violations, the Pawnee Nation respectfully asks that the EPA (1) withdraw the October 1 Decision and (2) review and reconsider Oklahoma's SAFETEA request with a full and robust process that addresses the interests of tribal nations and the public. This process should include, for example, full government-to-government consultation with all Oklahoma tribes, a public comment period, and a National Environmental Policy Act (NEPA) analysis. Moreover, EPA should evaluate whether the Rider is still in effect, including addressing the strong presumption that appropriation and authorization riders such as Section 10211 are temporary legislation and applying the principle that statutes must be construed in favor of Indians. EPA should also address whether, for each of the programs covered by the October 1 Decision, Oklahoma's program meets the applicable requirements of federal environmental law, as mandated by SAFETEA.

For any approval of Oklahoma's request, EPA should consider and impose appropriate conditions. The Pawnee Nation would welcome the opportunity to coordinate with EPA regarding conditions that may be appropriate here.

BACKGROUND

A. The McGirt v. Oklahoma decision

On July 9, 2020, the United States Supreme Court held in McGirt v. Oklahoma that lands guaranteed by treaty to the Muscogee (Creek) Nation remain Indian country for purposes of the Major Crimes Act. 140 S. Ct. 2452, 2459 (2020). This decision affected a substantial area of northeastern Oklahoma where the state had for many years been exercising jurisdiction to prosecute crimes. In holding that these lands remain Indian country, the Supreme Court noted that, in a series of treaties in the 1830s, the U.S. government "solemnly guarantied" "[t]he Creek country west of the Mississippi" to the Muscogee (Creek) Nation and "establish[ed] boundary lines which will secure a country and permanent home to the whole Creek Nation of Indians." Id. at 2459–60 (quoting treaties) (alterations in original). The Supreme Court held that the Creek Reservation persists today, and rejected Oklahoma's argument that the lands in question are under state criminal jurisdiction. Id. at 2460–74.

The Supreme Court also rejected Oklahoma's argument that there would be "potentially 'transform[ative]'" consequences from upholding the Creek's treaty rights. Id. at 2478. Oklahoma

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contended that such a ruling "might be used by other tribes to vindicate similar treaty promises" and "Oklahoma fears that perhaps as much as half its land . . . could wind up within Indian country." Id. at 2479. The Court recognized that its holding could have implications for other tribes' jurisdiction. But it held that "[e]ach tribe's treaties must be considered on their own terms, and the only question before us concerns the Creek." Id.

Moreover, the Supreme Court rejected Oklahoma's claims that upholding the Creek's treaty rights would have "significant consequences" such as undermining past criminal convictions, adding burdens on federal and tribal courts, and disrupting settled expectations and practices under civil and regulatory law. Id. at 2478–82. The Court held that such concerns are not a license to disregard the law, and stated: "[M]any of the arguments before us today follow a sadly familiar pattern. Yes, promises were made, but the price of keeping them has become too great, so now we should just cast a blind eye. We reject that thinking." Id. at 2482. The Court observed: "[I]t is unclear why pessimism should rule the day. With the passage of time, Oklahoma and its Tribes have proven they can work successfully together as partners." Id. at 2481. The court noted, for example, that "[a]lready, the State has negotiated hundreds of intergovernmental agreements with tribes." Id.

In other words, the Court anticipated that Oklahoma could work collaboratively with tribes post-McGirt to resolve any jurisdictional and other issues. Id.

B. Oklahoma's request to assert environmental authority over Indian country

Oklahoma did not follow the Supreme Court's admonition to work with tribes. Instead, on July 22, 2020, less than two weeks after the McGirt decision, the Governor of Oklahoma submitted a request to then-EPA Administrator Andrew Wheeler requesting that EPA grant Oklahoma authority to administer all EPA-approved environmental programs in "areas of the State that are in Indian Country." Oklahoma did not give the tribes notice of its request, but it did apparently share its request with business interests in late July.[2]

In the July 22, 2020 letter, Oklahoma asserted that its request was "[c]onsistent with the extent to which the State of Oklahoma implemented environmental programs throughout the State prior to the U.S. Supreme Court's recent decision in McGirt v. Oklahoma." But Oklahoma's request extended well beyond the Muscogee (Creek) reservation to cover Indian lands statewide.

Oklahoma's request covered at least 26 different programs under six federal statutes: the Resource Conservation and Recovery Act (RCRA), the Safe Drinking Water Act (SDWA), the Clean Air Act (CAA), the Clean Water Act (CWA), the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), and the Toxic Substances Control Act (TSCA). The letter also stated that "[t]he State of Oklahoma reserves the right to amend this request or make future requests for approval" of programs in Indian country.

---

[2] Ti-Hua Chang, EPA Set Secret Deadline for Oklahoma Tribes to Fight Loss of Sovereignty, TYT Magazine (Sept. 18, 2020), https://tyt.com/stories/4vZLCHuQrYE4uKagy0oyMA/7yzOow5PLu5kOpyfovH5ET.

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Oklahoma made its sweeping request pursuant to a legislative rider (the Rider) attached at the last minute by Senator James Inhofe to a 2005 transportation appropriation and authorization bill known as the Safe, Accountable, Flexible, Efficient Transportation Equity Act of 2005: A Legacy for Users (SAFETEA), Pub. L. No. 109-59, 119 Stat. 1144 (Aug. 10, 2005). This Rider was inserted towards of the end of the 836-page SAFETEA bill after the House and Senate had agreed on the bill's final version.[3] It also bypassed consideration by the Senate Indian Affairs Committee, which would have typically been the proper place for the amendment to be debated.[4] The Rider passed without notice to Oklahoma tribes, EPA, or the Oklahoma Governor.[5] As then-Principal Chief of the Cherokee Nation Chad Smith stated, the Rider "was really a midnight rider . . . [i]t avoided all the process of good policy and legislative development."[6]

There is no apparent legislative history for the Rider. However, news reports suggest that Senator Inhofe inserted the Rider into the bill at the urging of the Oklahoma Independent Petroleum Association (OIPA) and the oil and gas industry.[7] The Rider came a few months after the EPA had approved the Pawnee Nation's application for Treatment as a State to administer certain Clean Water Act programs over OIPA's objections.[8] A Pawnee Nation attorney referred to the Rider in 2005 as "the most scary, direct, take-the-gloves-off-and-go for-the-jugular attack on tribal sovereignty [he had] ever seen."[9]

As relevant here, the Rider stated:

> OKLAHOMA. - Notwithstanding any other provision of law, if the Administrator of the Environmental Protection Agency (referred to in this section as the "Administrator") determines that a regulatory program submitted by the State of Oklahoma for approval by the Administrator under a law administered by the Administrator meets applicable requirements of the law, and the Administrator approves the State to administer the State program under the law with respect

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[3] Charles G. Curtis Jr. et al., Tribal "Treatment As State" Programs Under Federal Environmental Statutes: Key Provisions And Case Studies, Best Practices For Protecting Natural Resources on Tribal Lands Leading Lawyers Provide Background and Legal Framework for Protecting Rights Over Tribal Natural Resources, Aspatore, 2015 WL 9194946 at *19 (Nov. 2015); Tony Thornton, Indian leaders hear complaints about legislation, The Oklahoman (Nov. 2, 2005 12:00 AM), https://www.oklahoman.com/article/2918130/indian-leaders-hear-complaints-about-legislation.

[4] Travis Snell, Tribal officials angry over transportation bill, Cherokee Phoenix (May 3, 2006), https://www.cherokeephoenix.org/Article/index/1417.

[5] Keith S. Porter, Good Alliances Make Good Neighbors: The Case for Tribal-State-Federal Watershed Partnerships, 16 Cornell J.L. & Pub. Pol'y 495, 530 (2007) (citing Thornton, Indian leaders hear complaints about legislation).

[6] Snell, Tribal officials angry over transportation bill.

[7] Id.; see Thornton, Indian leaders hear complaints about legislation.

[8] Thornton, Indian leaders hear complaints about legislation; Snell, Tribal officials angry over transportation bill.

[9] Thornton, Indian leaders hear complaints about legislation.

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> to areas in the State that are not Indian country, on request of the State, the Administrator shall approve the State to administer the State program in the areas of the State that are in Indian country, without any further demonstration of authority by the State.

Section 10211(a), SAFETEA, Pub. L. No. 109-59, 119 Stat. 1144, 1937.

C. EPA's approval of Oklahoma's request

After receiving Oklahoma's July 22, 2020 request, EPA took more than a month to notify the Pawnee Nation and other affected tribes. On August 25, 2020, EPA sent a copy of Oklahoma's request to the Pawnee Nation and other Oklahoma tribes,[10] stating that the agency was "engaging your Tribal Nation in consultation and coordination." The letter committed that "[t]ribal consultation will be conducted in accordance with the EPA Policy on Consultation and Coordination with Indian Tribes."

EPA, however, did not follow its own consultation and coordination policies. In the August 25, 2020 letter, EPA stated that it would begin consultation by holding a conference call with the affected tribes on September 8, 2020. Then, agency allotted only one week—from September 8 to 15, 2020—for consultation meetings with individual tribes. Thus, despite making a decision affecting numerous tribes across Oklahoma that involved more than two dozen complex federal environmental programs, EPA allowed only three weeks for consultation with those tribes.

After its August 25, 2020 notice letter, EPA provided the Pawnee Nation with copies of the agency's consultation procedures. Pursuant to those procedures, the Pawnee Nation informed EPA that it wished to engage in formal government-to-government consultation, and requested additional information that it needed to formulate a position on Oklahoma's request and to meaningfully consult with EPA. For example, the Pawnee Nation sought more details on the extent to which its lands and authority would be affected by Oklahoma's request, how that request overlapped with lands affected by the Supreme Court's McGirt holding, documentation regarding whether the Rider continues to be in effect, and other material information.

On September 17, 2020, EPA responded with an email message informing the Pawnee Nation that the agency "has concluded the consultations." The EPA did not provide any of the information requested by the Pawnee Nation. And despite the Pawnee Nation's request, no consultation meeting with the tribe was held and no formal government-to-government consultation was initiated.

On September 30, 2020, EPA circulated to the Pawnee Nation and other tribes a "Summary Report of Tribal Consultation and Engagement" related to Oklahoma's request (EPA Summary Report). The following day, on October 1, 2020, EPA approved Oklahoma's request.

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[10] News reports indicate that not all Oklahoma tribal governments received EPA's August notice. See Ti-Hua Chang, EPA Set Secret Deadline for Oklahoma Tribes to Fight Loss of Sovereignty.

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EPA treated its approval of Oklahoma's request as a ministerial decision: its October 1 Decision runs just over six pages, with two of those pages devoted to listing the 26 programs being transferred to Oklahoma. The October 1 Decision did not evaluate the question of whether Section 10211(a) of SAFETEA even remained in effect.

EPA asserted that Section 10211(a) of SAFETEA applies to "(1) any regulatory program, (2) submitted by Oklahoma for approval by EPA under a law administered by EPA, where EPA has (3) determined that the program meets applicable requirements of the law, and (4) approved the program with respect to areas in the State that are not Indian country, and (5) the State requests to administer the program in areas of the State that are in Indian country." October 1 Decision at 2. Despite acknowledging that the relevant programs must meet "applicable requirements of the law," EPA did not evaluate whether the 26 Oklahoma environmental programs meet federal environmental requirements.

EPA also asserted that it had "no discretion to weigh additional factors in rendering its decision" beyond those provided in the text of the Rider, because the Rider "expressly abrogates any prior potentially inconsistent legal requirement or limitation of law, including any potential jurisdictional impediment to the State's regulation in Indian country or other requirement under federal environmental laws administered by EPA." October 1 Decision at 2. The October 1 Decision ignored that EPA has discretion to impose conditions on any approval of Oklahoma's request.

DISCUSSION

I. EPA's October 1 Decision Was Arbitrary and Capricious, and Contrary to Law.

Under the Administrative Procedure Act (APA), agency actions, findings, and conclusions are to be set aside if they are "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." 5 U.S.C. § 706(2)(A). An agency's action is arbitrary and capricious "if the agency . . . entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise." Utah Env'tl. Cong. v. Bosworth, 443 F.3d 732, 739 (10th Cir. 2006) (quoting Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 43 (1983)). "Likewise, an agency's decision is arbitrary and capricious if the agency failed to base its decision on consideration of the relevant factors, or if there has been a clear error of judgment on the agency's part." Biodiversity Conserv. All. v. Jiron, 762 F.3d 1036, 1060 (10th Cir. 2014) (internal quotation marks omitted). The APA mandates that agencies give "reasoned explanation[s]" for the actions that they take. Am. Wild Horse Pres. Campaign v. Perdue, 873 F.3d 914, 920 (D.C. Cir. 2017).

For the reasons discussed below, the October 1 Decision was contrary to governing law, and arbitrary and capricious, thus violating the APA.

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A. EPA ignored well-established precedent indicating that the Rider has expired, and it failed to provide any reasoned explanation for why it believed that the Rider remains in effect.

As an initial matter, the October 1 Decision violated the law, and was arbitrary and capricious, because EPA granted Oklahoma's request without first evaluating whether the Rider still remains in effect.[11] As a general rule, riders in time-limited appropriation and authorizations acts are presumed to be temporary legislation, unless a rider's language clearly indicates that Congress intended it to be permanent. SAFETEA was a time-limited authorization and appropriations act because it applied only for the fiscal years 2005 to 2009. The presumption against permanence therefore applies to Section 10211 of SAFETEA. Since the Rider contains no language suggesting permanence, it expired in 2009.

Moreover, EPA failed to apply the principle that statutes must be construed in favor of Indians. This principle further supports the conclusion that the Rider has expired.

EPA's failure to consider and apply these legal presumptions was arbitrary and capricious and contrary to law.

i. A rider in a time-limited appropriation and authorization act is presumed to be effective only for the time period that the act is in effect, unless the rider's language clearly indicates that it is intended to be permanent.

There is a "very strong presumption" that if a rider in a time-limited appropriations or authorization act changes substantive law, it does so only for the fiscal years that the act is in effect. Bldg. & Const. Trades Dep't, AFL-CIO v. Martin, 961 F.2d 269, 273 (D.C. Cir. 1992); see, e.g., Tin Cup, LLC v. U.S. Army Corps of Eng'rs, 904 F.3d 1068, 1072–73 (9th Cir. 2018) ("An appropriation of funds is generally not permanent or available continuously without an express provision. The same rule applies to provisions of appropriations acts altering substantive law.") (citation omitted); Atl. Fish Spotters Ass'n v. Evans, 321 F.3d 220, 224 (1st Cir. 2003) ("A provision in an annual appropriations bill presumptively applies only during the fiscal year to which the bill pertains."); Security Clearances at DOE, B-248926, 1992 WL 130552, at *3 (May 29, 1992) ("A general rule regarding construction of annual authorization and appropriations acts is that, absent a clear expression of permanence, material contained therein—even material of general applicability—is effective only for one year."); see also State Department – Assistance for Lebanon, B-303268, 2005 WL 41632, at *3–4 (Jan. 3, 2005) (applying presumption to authorization act but finding that it had been overcome by clear statutory language); Peter Raven-Hansen & William C. Banks, Pulling the Purse Strings of the Commander in Chief, 80 Va. L. Rev.

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[11] Prior to the October 1 Decision, the Pawnee Nation requested that EPA provide documentation and authority showing that Section 10211 is still in effect. EPA failed to provide any such support. In its summary report on tribal consultation, EPA stated—without any analysis—that "EPA has found no evidence . . . that indicates section 10211 has sunset and is therefore no longer valid." EPA Summary Report at 13. This dismissal of the issue ignores the presumption against permanence and the language of the statute, which indicate the Rider expired in 2009.

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833, 876 (1994) (substantive provisions contained in single-year appropriation and authorization acts "are presumed effective only for the fiscal year").

Courts recognize that this presumption sets a "high" bar that is difficult to overcome. Atl. Fish Spotters Ass'n, 321 F.3d at 225. The presumption against permanence can only be rebutted if "[the rider's] language clearly indicates that it is intended to be permanent." Martin, 961 F.2d at 274; see Atl. Fish Spotters Ass'n, 321 F.3d at 224 ("Congress may create permanent, substantive law through an appropriations bill only if it is clear about its intentions"). The mere fact that a rider has no express expiration date does not rebut the presumption. Martin, 961 F.2d at 273–74.

The "crucial" factor for assessing whether the presumption against permanence has been overcome looks to whether there is statutory language indicating "futurity", such as "hereafter" or "henceforth". Office of the General Counsel, U.S. General Accounting Office, Principles of Federal Appropriations Law 2-86–91 (4th ed. 2016) (GAO Principles).[12] "Given the strong presumption against appropriations acts enacting permanent changes in substantive law," courts often find that "the absence of a clear statement of futurity" in appropriation or authorizations acts is "dispositive" as to the rider's temporary nature. Tin Cup, LLC, 904 F.3d at 1075 ("[W]e require a clear statement of futurity in order to give permanent effect to a provision of an appropriations act.").

In some situations, courts also consider other factors such as: (a) legislative history, (b) the inclusion of the provision in the U.S. Code, and (c) non-inclusion of a provision in future acts. GAO Principles at 2-89–90. These additional considerations play a secondary role to the "words of futurity" factor and are used for the most part only to support a conclusion that is based primarily on the absence or presence of words of futurity. Id. at 2-92.

The presumption against permanence reflects important policy goals: while appropriation and authorization riders are permitted, there are strong reasons to disfavor them. Policymaking through the appropriations process is conducted without the benefit of review by the authorizing committee with appropriate subject expertise. Neal E. Devins, Regulation of Government Agencies Through Limitation Riders, 1987 Duke L.J. 456, 464–65 (1987). And such riders can undermine public confidence because they are most often added on the application of one member or a small group, and may not embody any considered policy preference reflecting a true consensus of Congress. Will Tress, Lost Laws: What We Can't Find in the United States Code, 40 Golden Gate U. L. Rev. 129, 141 (2010); see Sandra Beth Zellmer, Sacrificing Legislative Integrity at the Altar of Appropriations Riders: A Constitutional Crisis, 21 Harv. Envtl. L. Rev. 457, 510 (1997). The "controversy surrounding [these riders] is longstanding" because of "the deeply entrenched nature of the perverse political incentives created by appropriations legislation." Richard J. Lazarus, Congressional Descent: The Demise of Deliberative Democracy in Environmental Law, 94 Geo. L.J. 619, 637 (2006).

All of these considerations point to the expiration of the Rider prior to Oklahoma's 2020 request.

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[12] Available at https://www.gao.gov/legal/appropriations-law/red-book.

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ii. The presumption against permanence applies to Section 10211 of SAFETEA, and this presumption cannot be rebutted.

Under the above standards, Section 10211 of SAFETEA should be presumed to be temporary legislation that did not remain in effect after fiscal year 2009.

SAFETEA was an appropriation and authorization transportation act that authorized and provided funding for a five-year period, fiscal years 2005 to 2009 only. These authorizations and appropriations were explicitly intended to be temporary, and they expired after fiscal year 2009. See, e.g., SAFETEA, Section 1101(a), 119 Stat. 1144, 1153–56 (authorizing specific sums to be appropriated for various Federal-aid highway programs for fiscal years 2005 to 2009); Section 1103(a)(1), 119 Stat. 1144, 1161 (authorizing specific appropriations for administrative expenses of the Federal Highway Program for fiscal years 2005 to 2009); Section 1114(e)(2), 119 Stat. 1144, 1174–75 (providing appropriations for particular bridge activities for fiscal years 2005 to 2009); Section 2001(a), 119 Stat. 1144, 1519–20 (authorizing appropriations for highway safety and other related programs for fiscal years 2005 to 2009); Section 4101(a), 119 Stat. 1144, 1714 (similar for Motor Carrier Safety programs); Section 5101(a), 119 Stat. 1144, 1779 (similar for research and other programs); Section 7125, 119 Stat. 1144, 1908–09 (authorizing and providing appropriations related to hazardous materials preparedness for fiscal years 2005 to 2008). SAFETEA therefore was temporary legislation that expired in 2009.[13]

SAFETEA's temporary nature is also confirmed by the fact that, after SAFETEA expired in 2009, Congress had to pass shorter-term SAFETEA extension acts in order to continue providing reauthorization and funding for transportation past September 30, 2009. See, e.g., Legislative Branch Appropriations, 2010, Pub. L. No. 111-68, 123 Stat. 2023 (Oct. 1, 2009); Department of the Interior – Appropriation, 2010, Pub. L. No. 111-88, 123 Stat. 2904 (Oct. 30, 2009); Department of Defense Appropriations Act, 2010, Pub. L. No. 111-118, 123 Stat. 3409 (Dec. 19, 2009); Temporary Extension Act of 2010, Pub. L. No. 111-144, 124 Stat. 42 (Mar. 2, 2010). Once these extensions themselves expired, Congress replaced SAFETEA with another transportation authorization and appropriations act, the Moving Ahead for Progress in the 21st Century Act (MAP-21), Pub. L. No. 112-141, 126 Stat. 405 (July 6, 2012). MAP-21 was also temporary legislation, and it was duly replaced by the Fixing America's Surface Transportation Act (FAST Act), Pub. L. No. 114-94, 129 Stat. 1312 (Dec. 4, 2015).

Because SAFETEA itself is temporary, the Rider should be presumed to be temporary and to apply only for the 5-fiscal year period that the act was in effect. See, e.g., The Honorable John Edward Porter: House of Representatives, B-271412, 1996 WL 335238 (June 13, 1996) (provision in appropriations act applied only for the act's 2-fiscal year period); Martin, 961 F.2d at 273–74;

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[13] See, e.g., News Release, U.S. Dep't of Transp., $48.8 Billion In Highway Funds Now Available To States Annual Apportionment, Restored Dollars Will Enable States To Make Longer-term Plans, DOT 73-10 (Apr. 21, 2010) ("SAFETEA-LU expired September 30, 2009 . . ."); U.S. Int'l Trade Comm'n, Prestressed Concrete Steel Rail Tie Wire from China, Mexico, & Thailand, USITC Inv. No. 731-TA-1207 (June 1, 2013) ("SAFETEA-LU . . . had expired in September of 2009.").

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Atl. Fish Spotters Ass'n, 321 F.3d at 224; B-248926 (provisions in authorization and appropriations acts are temporary, absent a clear expression of permanence).

This presumption cannot be overcome because Section 10211(a) contains no language suggesting permanence. Tin Cup, LLC, 904 F.3d at 1075. The absence of the word "thereafter" is particularly telling. Martin, 961 F.2d at 274; GAO Principles at 2-89. Thus, the fact that the Rider does not have an express sunset provision is of no consequence here. Martin, 961 F.2d at 274 (rejecting argument that an appropriations rider was permanent legislation because the rider had no expiration date apparent on its face).[14]

The absence of words of futurity is dispositive, see Tin Cup, LLC, 904 F.3d at 1074–75, and establishes that the Rider was temporary. But several other factors also show that the presumption cannot be rebutted.

For example, the Rider was not codified in the U.S. Code or included in the historical and statutory notes in the U.S. Code, which indicates that it is only temporary. The "inclusion of a provision in the United States Code is relevant as an indication of permanence." GAO Principles at 2-90. As a general matter, provisions that are temporary are often not codified in the U.S. Code and do not appear in the Code notes. See Tress, Lost Laws, 40 Golden Gate U. L. Rev. at 130 ("Many enacted laws are left out of the Code entirely—even though of general applicability—because they are considered temporary."); id. at 164 ("General laws that are considered temporary, such as those included in appropriations acts, are left out of the Code entirely.").

Other SAFETEA provisions underscore this point. In the same title of SAFETEA where the Rider appears (Title X of SAFETEA), several other sections did amend the U.S. Code. See, e.g., SAFETEA, Sections 10141, 10142, 10143, 10208. The different treatment of the Rider indicates Congress did not intend it to permanently change the law. See Russello v. United States, 464 U.S. 16, 23 (1983) ("[W]here Congress includes particular language in one section of a statute but omits it in another section of the same Act, it is generally presumed that Congress acts intentionally and purposely in the disparate inclusion or exclusion.") (citation omitted) (alteration in original).

In addition, there is no legislative history suggesting a clear intent by Congress to make the Rider permanent. Indeed, there seems to be no legislative history relevant to Section 10211(a) at all.

Moreover, Congress did not include the Rider in subsequent transportation bills. "[T]he failure to repeat in subsequent appropriation acts a provision that does not contain words of futurity can . . . be viewed as an indication that Congress did not consider it to be permanent and simply

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[14] The words "[n]otwithstanding any other provision of law" are not words of futurity and, standing alone, offer no indication as to the duration of the Rider. See Martin, 961 F.2d at 274 (the words "notwithstanding any other provision of law" in the rider "goes to the breadth of the amendment's effect, not its duration"); GAO Principles at 2-88 (citing Letter, B-271412, 1996 WL 335238 (June 13, 1996); Nat'l R.R. Passenger Corp. (Amtrak): Permanency of Language in Appropriations Act, B-208705, 1982 WL 28676 (Sept. 14, 1982)).

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did not want it to continue." GAO Principles at 2-89. As noted above, SAFETEA was replaced by another transportation appropriation and authorization act. MAP-21, Pub. L. No. 112-141, 126 Stat. 405 (replaced SAFETEA); see also FAST Act, Pub. L. No. 114-94, 129 Stat. 1312 (replaced MAP-21). Section 10211's language was not included in either MAP-21 of the FAST Act. See generally MAP-21, Pub. L. No. 112-141, 126 Stat. 405 (not referencing Section 10211 of SAFETEA or incorporating its language); FAST Act, Pub. L. No. 114-94, 129 Stat. 1312 (same). This further suggests that Section 10211, which contains no words of futurity, is no longer in effect.

Finally, the opaque manner in which the Rider was adopted makes it particularly important to apply the presumption against permanence. The Rider was a last-minute addition to the SAFETEA bill, inserted after the House and Senate had agreed on the bill's final version and without consideration by the Senate Indian Affairs Committee.[15] Neither the affected tribes nor EPA received notice of the Rider.[16] The Rider, in fact, embodies the problems with using appropriations bills to substantively change the law. This is exactly the kind of midnight rider that should not be deemed permanent absent a clear indication of Congressional intent. See, e.g., Minis v. United States, 40 U.S. 423, 445–46 (1841). There was no such indication here.

This conclusion is further reinforced by the principle that statutes must be construed in favor of Indians. Cohen's Handbook of Federal Indian Law § 2.02[1] at 113 (2012 ed.).

In sum, the Rider expired prior to Oklahoma's 2020 request. EPA's failure to analyze whether the Rider was still in effect, to consider the presumption against permanence, and to consider the principle that statutes must be construed in favor of Indians, was arbitrary and capricious and contrary to law.

B. Even if the Rider remains in effect, the October 1 Decision violated the Rider's requirements.

Even if EPA assumes the Rider remained in effect, the October 1 Decision was unlawful because it violated the requirements of the Rider.

The Rider provides that, in approving Oklahoma's request, EPA must determine both that: (a) EPA "approve[d] the State to administer the State program under the [federal environmental] law with respect to" non-Indian lands, and (b) the Oklahoma program "meets applicable requirements of the law." Pub. L. No. 109-59, 119 Stat. 1144, 1937. EPA made the first finding—that it had previously approved Oklahoma to administer on non-Indian lands the 26 programs covered by Oklahoma's request—but failed to make the second finding. October 1 Decision at 2.

Instead of evaluating whether Oklahoma is administering the 26 programs in accordance with the relevant laws, EPA asserted that if a state program met requirements "at the time the program was previously approved outside of Indian country," then no further determination regarding current compliance with the law was necessary. October 1 Decision at 2 n. 2. This is contrary to the plain language of Section 10211(a), which treats the requirement that Oklahoma

[15] See supra at 4.
[16] Id.

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programs must "meet[ ] applicable requirements of the law" as an additional and separate requirement from EPA's prior approval of the program on non-Indian lands. By conflating the two requirements, EPA essentially rendered the second one superfluous and meaningless. After all, if Oklahoma did not meet the requirements of the law at the time the program was approved outside of Indian country, then EPA would not have approved the program in non-Indian lands to begin with. TRW Inc. v. Andrews, 534 U.S. 19, 31 (2001) ("It is a cardinal principle of statutory construction that a statute ought, upon the whole, to be so construed that, if it can be prevented, no clause, sentence, or word shall be superfluous, void, or insignificant.") (quotation marks and citation omitted).

EPA's failure to determine whether the 26 Oklahoma programs meet applicable laws is troubling because evidence suggests that the Oklahoma Department of Environmental Quality (ODEQ) is not living up to its responsibilities under at least some of the delegated environmental programs. For example, a 2020 EPA review of Oklahoma's CAA implementation in fiscal year 2018 revealed that "significant issues" and "routine and/or widespread performance issues" were found regarding Oklahoma's CAA programs.[17] In reviewing states' CWA, CAA, and RCRA programs, EPA categorizes states' performance into three levels. An "Area for Improvement" finding means:

> Significant issues are found. One or more metrics indicates routine and/or widespread performance issues related to quality, process, or policy. A recommendation for corrective action is issued which contains specific actions and schedule for completion. The EPA monitors implementation until completion.[18]

For Oklahoma's CAA program, EPA's review found two Areas for Improvement. These were:

> (1) ODEQ continues to have considerable time elapse before reporting high priority violations (HPVs).
> (2) As in the past, the state agency tends to require longer than the goal of 180 days to address HPVs. Further, the records maintained do not appear to fully satisfy the requirements of the case development and resolution timeline.[19]

As EPA recognized, these two issues regarding reporting and addressing high priority violations are significant. Moreover, these were not one-off issues, but "continue[d]" problems. This instance highlights the necessity of a full evaluation of whether Oklahoma's 26 programs are each meeting all legal requirements.

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[17] EPA Region 6, Final Report: State Review Framework, Oklahoma, Clean Water Act and Clean Air Act Implementation in Federal Fiscal Year 2018 and Resource Conservation and Recovery Act Implementation in Federal Fiscal Year 2019 (June 22, 2020), https://www.epa.gov/sites/production/files/2020-08/documents/srf-rd4-rev-ok.pdf.
[18] Id. at 3.
[19] Id. at 7, 21, 30.

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In addition, a 2019 EPA evaluation of ODEQ's CAA Title V permitting program discusses a variety of ways in which ODEQ is not fully living up to its obligations.[20] For example, regarding whether ODEQ is issuing permits that are consistent with the requirements of 40 C.F.R. § 70, EPA raised several different concerns about ODEQ's failure to thoroughly document its decisions during the Title V permit writing process. Regarding ODEQ's compliance with the public participation requirements for Title V permit issuance, EPA noted concerns about ODEQ's failure to ensure that its permit issuance process implementation fully satisfies 40 C.F.R. § 70.7(d)(1)(v) and failure to ensure that applicants applying for Title V minor permit modifications certify that the proposed modifications meet the Title V minor modification criteria. The significant and numerous concerns listed by EPA further illustrate why the agency should have evaluated all of Oklahoma's programs before granting the state's request.

Assessing the 26 environmental programs' performance is important not only for compliance with the Rider, but also to fulfill EPA's trust responsibilities to tribes. Oklahoma's power grab under SAFETEA has far-reaching impacts across Oklahoma, and deficiencies in state programs could have significant adverse impacts on Indian lands, natural resources, and tribal members. Issuance of the October 1 Decision without considering this important factor was arbitrary and capricious and contrary to law.

C. EPA ignored its authority to impose conditions on any approval of Oklahoma's request.

The October 1 Decision was arbitrary and capricious and unlawful for a third reason: EPA wrongly treated its decision as a mere ministerial task where it had "no discretion . . . in rendering its decision" beyond applying the factors listed in the text of the Rider. October 1 Decision at 2. This position ignores governing caselaw interpreting Section 10211.

The U.S. Court of Appeals for the District of Columbia Circuit has recognized that Section 10211 leaves EPA with discretion to impose conditions on an approval of Oklahoma's requests pursuant to SAFETEA. See Oklahoma Dep't of Envtl. Quality v. EPA, 740 F.3d at 190 (EPA could impose conditions when approving state's request under the Rider). By recognizing that EPA could attach such conditions, the D.C. Circuit made clear that EPA retains some discretion in making decisions under the Rider, and that those decisions are not merely ministerial. EPA's October 1 Decision completely ignored this law.

EPA should have exercised its discretion by considering whether to attach conditions to an approval of Oklahoma's sweeping request for authority. For example, in requesting consultation, the Pawnee Nation suggested that EPA could direct Oklahoma to negotiate an intergovernmental agreement or memorandum of understanding with the tribe on how the affected programs would be administered on Pawnee jurisdictional lands. EPA disregarded this suggestion and ignored the

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[20] EPA Region 6, Oklahoma Department of Environmental Quality Air Quality Division, Title V Operating Permit Program Evaluation (June 18, 2019), https://www.epa.gov/sites/production/files/2019-06/documents/2019_06_20_final_title_v_odeq_evaluation_report_with_transmittial_letter_and_summary_06202019.pdf.

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Oklahoma Dep't of Envtl. Quality precedent. EPA's failure to even consider this issue, and its failure to provide a reasoned explanation for not imposing conditions, were arbitrary and capricious.

D. EPA failed to provide public notice and comment, engage in any meaningful government-to-government consultation with tribes, or analyze the environmental impacts of its approval prior to approving Oklahoma's request.

EPA also disregarded several legal requirements that apply to the EPA's approval of state environmental programs: consultation with tribes, public notice and comment, and preparation of a NEPA analysis. These mandates are not overridden by the "notwithstanding any other provision of law" language in the Rider, because EPA can comply with these procedures while still satisfying the Rider's directive that the Oklahoma request "shall be approved" if certain terms are met.

Moreover, because EPA has discretion to impose conditions on any approval of Oklahoma's request, notice and comment, consultation, and NEPA play a valuable role in informing EPA's consideration of what conditions to require. These procedures can also assist EPA in determining whether Oklahoma's implementation of the 26 programs is in compliance with the law.

i. EPA provided no public notice and comment.

First, the October 1 Decision was arbitrary and capricious, and contrary to law, because EPA failed to provide public notice and comment opportunities as required for many of the 26 environment programs.

The October 1 Decision affects federal environmental laws that are administered by EPA, but which provide that EPA can approve states to implement them in the states' respective jurisdictions. See, e.g., 42 U.S.C. § 7410 (CAA state implementation plans). When considering applications by a state for approval, EPA is required to provide public notice and an opportunity to comment, as well as a public hearing. For example, for approval of certain state programs under the CWA, EPA must publish notice of the state's application in the Federal Register, allow no less than 45 days for public comment, and hold a public hearing before approving the application. 40 C.F.R. § 123.61. Similar requirements apply under other statutory programs, including the CAA, 40 C.F.R. § 70.4(i), the RCRA, 40 C.F.R. §§ 239.10, 271.20, SDWA, 42 U.S.C. §§ 300g-2, 300h-1; 40 C.F.R. § 145.31, and TSCA, 15 U.S.C. § 2684.

EPA ignored these requirements. It did not publish notice of a proposed decision in the Federal Register, provide a public comment period, or hold a public hearing, prior to making the October 1 Decision. This failure was arbitrary and capricious and contrary to law.

ii. EPA failed to engage in government-to-government consultation with tribes.

Second, EPA made no meaningful effort to engage in government-to-government consultation with the Pawnee Nation and other Oklahoma tribes affected by its decision. In doing

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so, EPA disregarded its own tribal consultation policies and NEPA's consultation requirement. See infra Part I.D.iii. This was not only arbitrary and capricious, and contrary to law, but also violated the agency's trust responsibility.

The federal government and its agencies, including EPA, have a trust obligation that requires the government to act in the best interest of Indian tribes. See United States v. Mitchell, 463 U.S. 206, 225–26 (1983). The trust obligation requires federal agencies such as EPA to consult with a tribe when an agency decision may have adverse impacts on tribes. Executive Order 13175 directs federal agencies to "establish regular and meaningful consultation and collaboration" with tribal officials when developing policies or actions that affect a tribe. Exec. Order No. 13175, 65 Fed. Reg. 67,249 (Nov. 6, 2000). The Order recognizes that "Indian tribes exercise inherent sovereign powers over their members and territory. The United States continues to work with Indian tribes on a government-to-government basis to address issues concerning Indian tribal self-government, tribal trust resources, and Indian tribal treaty and other rights." Id. § 2(b). On January 26, 2021, President Biden issued a Memorandum on Tribal Consultation and Strengthening Nation-to-Nation Relationships, which reaffirmed the policy announced in Exec. Order No. 13175 and promised that "[i]t is a priority of [the Biden] Administration to make respect for Tribal sovereignty and self-governance, commitment to fulfilling Federal trust and treaty responsibilities to Tribal Nations, and regular, meaningful, and robust consultation with Tribal Nations cornerstones of Federal Indian policy." 86 Fed. Reg. 7491 (Jan. 26, 2021).

EPA procedures on consultation require it to "notify a Tribe or Tribes of the opportunity to consult as early as possible to enhance meaningful discussion." EPA, Consultation And Coordination With Federally Recognized Indian Tribes: EPA Region 6 Consultation and Coordination Procedures (May 2015) at 5 (Region 6 Consultation Procedures); see also EPA, EPA Policy on Consultation and Coordination with Indian Tribes at 5 (May 4, 2011) ("Notification should occur sufficiently early in the process to allow for meaningful input by the tribe(s)."). EPA's procedures also direct that it must "[i]f requested, provide maps, technical data, and other explanatory or supporting information as appropriate and available" so that the tribe has sufficient information to meaningfully consult. Region 6 Consultation Procedures at 6.

Despite sending the Pawnee Nation copies of the agency's consultation procedures, EPA did not follow those policies. For example, EPA did not "notify a Tribe or Tribes of the opportunity to consult as early as possible to enhance meaningful discussion." Region 6 Consultation Procedures at 5. EPA took five weeks just to notify the Pawnee Nation of Oklahoma's July 22, 2020 request, and then terminated its consultation efforts only three weeks after providing that notice. A three-week "consultation period" was grossly inadequate for a decision with such far-reaching implications on the Pawnee Nation and other tribes. Moreover, apart from a preliminary September 18, 2020 conference call involving numerous tribes, EPA declined to hold any meetings with the Pawnee Nation, despite the Nation's request.

EPA also disregarded its policy directing it to "provide maps, technical data, and other explanatory or supporting information as appropriate and available" when requested by tribes. Region 6 Consultation Procedures at 6. After receiving a copy of EPA's procedures, the Pawnee Nation requested a variety of additional information about the geographic and regulatory scope of Oklahoma's request, and other legal and factual issues necessary for meaningful and informed

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consultation. EPA provided no response to those requests before terminating its consultation efforts on September 15, 2020.

EPA's approach violated the federal government's trust responsibility to the Pawnee Nation and other Oklahoma tribes, and was arbitrary and capricious and contrary to law. See Oglala Sioux Tribe of Indians v. Andrus, 603 F.2d 707, 721 (8th Cir. 1979) ("[f]ailure of the [agency] to make any real attempt to comply with its own policy of consultation not only violates those general principles which govern administrative decisionmaking . . . but also violates the distinctive obligation of trust incumbent upon the Government in its dealings with" tribes) (internally quotation marks and citations omitted); Cheyenne River Sioux Tribe v. Jewell, 205 F. Supp.3d 1052, 1058 (D.S.D. 2016) ("[M]eaningful consultation requires, at a minimum, that defendants comply with federal statutes and their own policies defining what constitutes adequate 'consultation.'"); Yankton Sioux Tribe v. Kempthorne, 442 F. Supp. 2d 774, 784 (D.S.D. 2006) (same); Cedar Band of Paiutes v. U.S. Dep't of Housing and Urban Dev., No. 4:19-cv-30-DN-PK, 2019 WL 3305919, **7–8 (D. Utah July 23, 2019) (same).

iii. EPA failed to prepare a NEPA analysis.

Lastly, EPA did not prepare any NEPA analysis assessing the reasonably foreseeable impacts of its October 1 Decision to air, water, land and other resources protected under the relevant environmental programs. This was improper.

Congress enacted NEPA to, among other things, "encourage productive and enjoyable harmony between man and his environment" and to promote efforts "which will prevent or eliminate damage to the environment." 42 U.S.C. § 4321. NEPA requires all federal agencies, including EPA, to take a hard look at the environmental consequences of their proposed actions. Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 350 (1989). In doing so, an agency must identify and disclose to the public the reasonably foreseeable impacts of a proposed action.

NEPA serves two goals. First, by requiring the agency to consider environmental impacts in advance, "NEPA ensures that important effects will not be overlooked or underestimated only to be discovered after resources have been committed or the die otherwise cast." Id. at 349. Second, NEPA requires "broad dissemination of relevant environmental information" so that the public can comment on and effectively participate in agency decision making. Id. at 350.

If an action may have a significant impact on the environment, NEPA requires the agency to prepare an environmental impact statement (EIS). 42 U.S.C. § 4332(2)(C). Where the impacts of a project are not significant, or the agency is uncertain about their significance, it may prepare a shorter analysis called an environmental assessment (EA). NEPA also requires federal agencies to consult "early" with tribal governments about a proposed action. 40 C.F.R. § 1501.2.

EPA did not do any NEPA analysis before it approved Oklahoma's request. EPA also ignored NEPA's consultation requirement, by taking five weeks just to notify the Pawnee Nation of Oklahoma's request and then terminating its consultation efforts three weeks later.

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EPA took the position that NEPA did not apply because under SAFETEA, it "lack[s] authority to consider environmental impacts." EPA Summary Report at 8 (citing Nat'l Ass'n of Home Builders v. Defenders of Wildlife, 551 U.S. 644 (2007)). Nat'l Ass'n of Home Builders, however, is inapposite because it involved a Clean Water Act provision that left EPA with no discretionary involvement or control. 551 U.S. at 673. In contrast, Oklahoma Dep't of Envtl. Quality ruled that Section 10211 leaves EPA with discretion to impose conditions on approval of Oklahoma's request. 740 F.3d at 190. Environmental impacts represent an important consideration when evaluating such conditions. EPA should have therefore conducted a NEPA analysis and followed NEPA's consultation requirements.

II. EPA Should Withdraw the October 1 Decision, and Review and Reconsider Oklahoma's SAFETEA Request with a Full Process That Complies with the Law.

As discussed above, EPA's October 1 Decision was contrary to governing law and arbitrary and capricious for multiple reasons.

The Pawnee Nation therefore asks that EPA promptly withdraw the October 1 Decision, and review and reconsider Oklahoma's request under SAFETEA with a full and robust process that complies with the law and addresses the interests of tribal nations and the public.

That process should include full government-to-government consultation with affected Oklahoma tribes pursuant to EPA policies, Exec. Order No. 13175, and President Biden's January 26, 2021 Memorandum on Tribal Consultation and Strengthening Nation-to-Nation Relationships. The process should also include a public comment period and preparation of a NEPA analysis. Under the Executive Order, to be "meaningful" the consultation must take place before EPA's decision is made, not afterward; and that is why EPA should withdraw the October 1 Decision before government-to-government consultations begin. Exec. Order No. 13175, 65 Fed. Reg. at 67,249–50.

Moreover, EPA should evaluate whether Section 10211 of SAFETEA is still in effect, including addressing the presumption against permanence that applies to appropriation and authorization riders such as Section 10211 and the principle that SAFETEA must be construed to favor the Pawnee Nation and other tribes. We believe such an assessment will show that the Rider has expired and thus Oklahoma's request must be denied.

The Pawnee Nation also asks that EPA's review address whether, for each of the programs covered by the October 1 Decision, Oklahoma's program meets the applicable requirements of the relevant federal environmental law, as mandated by SAFETEA. In addition, the review should address what regulatory gaps exist across different state and tribal programs and in different parts of the state where different tribal nations have jurisdiction.

Finally, EPA should consider and impose appropriate conditions on any new approval of Oklahoma's request, pursuant to Oklahoma Dep't of Envtl. Quality v. EPA, 740 F.3d at 190. For example, as a condition for approval, EPA could direct Oklahoma to negotiate an intergovernmental agreement or memorandum of understanding with individual tribes regarding

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how the relevant programs would be implemented. The Pawnee Nation would welcome the opportunity to coordinate with EPA regarding potential appropriate conditions.

CONCLUSION

Thank you for your consideration of these comments. If you have any questions or need further information, please feel free to contact President Walter Echo-Hawk of the Pawnee Nation ((303) 746-5836, wechohawk@pawneenation.org), or Michael Freeman, counsel for the Pawnee Nation ((303) 996-9615, mfreeman@earthjustice.org).

Sincerely,

Michael S. Freeman
Rumela Roy
Earthjustice
633 17th Street, No. 1600
Denver, CO 80202

Counsel for the Pawnee Nation of Oklahoma

Cc:
JoAnn Chase
David Gray
Meghan Greenfield
Walter Echo-Hawk
Chad Smith

ED_006073_00000650-00018

Appointment

From: Hoffer, Melissa [Hoffer.Melissa@epa.gov]
Sent: 4/30/2021 2:06:35 PM
To: Hoffer, Melissa [Hoffer.Melissa@epa.gov]; wechohawk@Ex. 6 PP; Chad@chadsmith.com; Ex. 6 PP; mfreeman@earthjustice.org; rroy@earthjustice.org; Siegal, Tod [Siegal.Tod@epa.gov]; Craig.Alexander@usdoj.gov; Meghan Greenfield [Meghan.Greenfield@usdoj.gov]; jchaudhuri@chaudhurilaw.com
CC: Nishida, Jane [Nishida.Jane@epa.gov]; Stewart, Lakita [Stewart.Lakita@epa.gov]; Patrick, Monique [Patrick.Monique@epa.gov]; Chase, Joann [Chase.Joann@epa.gov]; Ex. 6 PP

Subject: SAFETEA
Location: Microsoft Teams Meeting

Start: 4/30/2021 8:00:00 PM
End: 4/30/2021 9:00:00 PM
Show Time As: Busy

Required Attendees: wechohawk Ex. 6 Personal Privacy (PP) Chad@chadsmith.com; Ex. 6 PP; mfreeman@earthjustice.org; rroy@earthjustice.org; Siegal, Tod; Craig.Alexander@usdoj.gov; Meghan.Greenfield@usdoj.gov; jchaudhuri@chaudhurilaw.com
Optional Attendees: Nishida, Jane; Stewart, Lakita; Patrick, Monique; Chase, Joann

POC: Monique Patrick

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Appointment

From: Fox, Radhika [Fox.Radhika@epa.gov]
Sent: 5/19/2021 2:35:01 AM
To: Fox, Radhika [Fox.Radhika@epa.gov]; Chaudhary, Dimple [Chaudhary.Dimple@epa.gov]; Pinkham, Jaime A SES USARMY HQDA ASA CW (USA) [jaime.a.pinkham.civ@mail.mil]; McKalip, Doug - APHIS [douglas.mckalip@usda.gov]; John Goodin (Goodin.John@epa.gov) [Goodin.John@epa.gov]; Eisenberg, Mindy [Eisenberg.Mindy@epa.gov]; Jensen, Stacey M CIV USARMY HQDA ASA CW (USA) [stacey.m.jensen.civ@mail.mil]; Gloria.Montano@usda.gov; dwinters@fisheries.org; gbelan@americanrivers.org; tillston@americanrivers.org; gale@backcountryhunters.org; BHartl@biologicaldiversity.org; agrinberg@cleanwater.org; emeyers@conservationfund.org; jgonzalez@earthjustice.org; jrumpler@environmentamerica.org; amesnikoff@elpc.org; Jared Mott [jmott@iwla.org]; madeleine_foote@lcv.org; clord@npca.org; murphyj@nwf.org; ritterj@nwf.org; watkinsg@nwf.org; jdevine@nrdc.org; dalal.aboulhosn@sierraclub.org; Kelly Moser [kmoser@selcnc.org]; jsigaran@selcdc.org; james.hague@tnc.org; mkassen@trcp.org; steve.moyer@tu.org; kfoster@waterkeeper.org; jpeters@cleanwater.org; skuwayama@lcv.org
CC: Sabater, Juan [Sabater.Juan@epa.gov]; Aguirre, Janita [Aguirre.Janita@epa.gov]; Tiago, Joseph [Tiago.Joseph@epa.gov]; Kaiser, Russell [Kaiser.Russell@epa.gov]; Christensen, Damaris [Christensen.Damaris@epa.gov]; Benita Best-Wong [Best-Wong.Benita@epa.gov]; John Rumpler [john.rumpler@publicinterestnetwork.org]

Subject: Quarterly Environmental and Conservation Leaders Stakeholder Meeting with Office of Water
Attachments: Enviro + Conservation Stakeholder Mtg Agenda_05192021.docx
Location: ZoomGov Meeting

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End: 5/19/2021 5:45:00 PM
Show Time As: Tentative

Required Attendees: Pinkham, Jaime A SES USARMY HQDA ASA CW (USA); McKalip, Doug - APHIS; John Goodin (Goodin.John@epa.gov); Eisenberg, Mindy; Jensen, Stacey M CIV USARMY HQDA ASA CW (USA); Gloria.Montano@usda.gov; dwinters@fisheries.org; gbelan@americanrivers.org; tillston@americanrivers.org; gale@backcountryhunters.org; BHartl@biologicaldiversity.org; agrinberg@cleanwater.org; emeyers@conservationfund.org; jgonzalez@earthjustice.org; jrumpler@environmentamerica.org; amesnikoff@elpc.org; Jared Mott; madeleine_foote@lcv.org; clord@npca.org; murphyj@nwf.org; ritterj@nwf.org; watkinsg@nwf.org; jdevine@nrdc.org; dalal.aboulhosn@sierraclub.org; Kelly Moser; jsigaran@selcdc.org; james.hague@tnc.org; mkassen@trcp.org; steve.moyer@tu.org; kfoster@waterkeeper.org; jpeters@cleanwater.org; skuwayama@lcv.org; Chaudhary, Dimple
Optional Attendees: Sabater, Juan; Aguirre, Janita; Tiago, Joseph; Kaiser, Russell; Christensen, Damaris; Benita Best-Wong; John Rumpler

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Join by SIP
Ex. 6 Personal Privacy (PP)

Join by H.323
Ex. 6 Personal Privacy (PP) (US West)
(US East)
Meeting ID: Ex. 6 Personal Privacy (PP)

EPA Office of Water Attendees

- **Radhika Fox,** Principal Deputy Assistant Administrator
- **Benita Best-Wong,** Deputy Assistant Administrator
- **Janita Aguirre,** Chief of Staff
- **John Goodin,** Director, Office of Oceans, Wetlands, and Watersheds
- **Damaris Christensen,** Environmental Protection Specialist, Office of Oceans, Wetlands, and Watersheds
- **Mindy Eisenberg,** Associate Director, Oceans, Wetlands, and Communities Division
- **Russell Kaiser,** Acting Branch Chief of Program Development & Jurisdiction, Office of Oceans, Wetlands, and Watersheds
- **Juan Sabater,** Special Assistant

Federal Partner Attendees

- **Jaime A. Pinkham,** Acting Assistant Secretary of the Army for Civil Works
- **Stacey Jensen,** Assistant for Regulatory and Tribal Affairs, Office of the Assistant Secretary of the Army (Civil Works)
- **Gloria Montaño Greene**, Deputy Under Secretary for Farm Production and Conservation, USDA
- **Doug McKalip**, Senior Advisor to the Secretary, USDA

Stakeholders Attendees

- **Dalal Aboulhosn,** Sierra Club
- **Gary Belan,** American Rivers
- **Jon Devine,** Natural Resources Defense Council
- **Madeleine Foote,** League of Conservation Voters
- **John Gale,** Backcountry Hunters & Anglers
- **Julian Gonzalez,** Earth Justice
- **Andrew Grinberg,** Clean Water Action
- **Jimmy Hague,** The Nature Conservancy
- **Brett Hartl,** Center for Biological Diversity
- **Kelly Hunter Foster,** Waterkeepers Alliance
- **Ted Illiston,** American Rivers
- **Melinda Kassen,** Theodore Roosevelt Conservation Partnership
- **Chad Lord,** National Parks Conservation Association
- **Ann Mesnikoff,** Environmental Law and Policy Center
- **Erik Meyers,** Conservation Fund
- **Kelly Moser,** Southern Environmental Law Center
- **Jared Mott,** Izaak Walton League
- **Steve Moyer,** Trout Unlimited
- **Jim Murphy,** National Wildlife Federation
- **Jessie Ritter,** National Wildlife Federation

- **John Rumpler,** Environment America
- **Jamie Sigaran,** Southern Environmental Law Center
- **Glenn Watkins,** National Wildlife Federation
- **Drue Winters,** American Fisheries Society

Appointment

From: Hoffer, Melissa [Hoffer.Melissa@epa.gov]
Sent: 1/29/2021 5:50:46 AM
To: +1510220[redacted]; Application 207a6836-d031-4764-a9d8-c1193f455f21; teamsvisitor:2c83a6a097624956a680286e8bc51819; Livingston, Aron@ARB [aron.livingston@arb.ca.gov]; teamsvisitor:2ce41a715e714a509ff4e4ac34d48326; teamsvisitor:476b69606eec4f20b1faa43ba377ba6f; Peter, Ellen M. @ARB [ellen.peter@arb.ca.gov]; Dilley, Shannon@ARB [Shannon.Dilley@arb.ca.gov]; Segall, Craig@ARB [Craig.Segall@arb.ca.gov]; Marks, Matthew [Marks.Matthew@epa.gov]; Application 9e133cac-5238-4d1e-aaa0-d8ff4ca23f4e; teamsvisitor:7bd92a47d7f748b0bfe87be7be7daa13; Hogan, Stephanie [Hogan.Stephanie@epa.gov]; Hoffer, Melissa [Hoffer.Melissa@epa.gov]; Chaudhary, Dimple [Chaudhary.Dimple@epa.gov]; rfullmer@edf.org; Palmer, Karen [Palmer.Karen@epa.gov]; Gordon, Jessica@ARB [Jessica.Gordon@arb.ca.gov]

Subject: Meeting (ScheduledMeeting)/Thread Id:

Ex. 6 Personal Privacy (PP)

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End: 1/28/2021 9:58:49 PM
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Recurrence: (none)

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Appointment

From: Neil Gormley [ngormley@earthjustice.org]
Sent: 5/24/2021 10:45:28 PM
To: teamsvisitor:d832df950ccd4c8d8bda5b57b5b4bfa2; Chaudhary, Dimple [Chaudhary.Dimple@epa.gov]; Amy Laura Cahn [alcahn@vermontlaw.edu]; Mallen, Emily P. [emallen@sidley.com]; Patrice Simms [psimms@earthjustice.org]; Neil Gormley [ngormley@earthjustice.org]

Subject: Meeting (ScheduledMeeting)/Thread Id:
Ex. 6 Personal Privacy (PP)
Ex. 6 Personal Privacy (PP),Chaudhary, Dimple,Amy Laura Cahn,Mallen, Em...

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End: 5/24/2021 2:33:29 PM
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Recurrence: (none)

Required Attendees: teamsvisitor:d832df950ccd4c8d8bda5b57b5b4bfa2; Chaudhary, Dimple; Amy Laura Cahn; Mallen, Emily P.; Patrice Simms; Neil Gormley

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[5/24/2021 2:00:21 PM (UTC)] ngormley@earthjustice.org joined.
[5/24/2021 2:33:29 PM (UTC)] ngormley@earthjustice.org left.
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Appointment

From: Waterhouse, Carlton [Waterhouse.Carlton@epa.gov]
Sent: 3/5/2021 6:05:22 AM
To: teamsvisitor:69f179e5907c4390aa5f566c32bf7e44; teamsvisitor:db2e5c058ada4609b2bfc2fa3f19a801; Tim Maloney [tmaloney@hecweb.org]; teamsvisitor:fbabf922066a4c85988f9255c9213c86; Thomas Cmar [tcmar@earthjustice.org]; Lisa Evans [levans@earthjustice.org]; teamsvisitor:e117282e189148f1a56b49cba54aada4; teamsvisitor:f58c411d1f964898ba4bd25034f580ee; Jennifer Cassel [jcassel@earthjustice.org]; teamsvisitor:982385e9db2d41e2bb056ebf1211237c; teamsvisitor:3c53e58a1cd943d3be5c96b84dcea664; teamsvisitor:589ba8ab2b8847dda809336d1385a8b5; teamsvisitor:e5ed3134ecb247569bc0f684ae98d871; teamsvisitor:595454300f6a497399d2206bff960a8a; Madeleine Foote [madeleine_foote@lcv.org]; teamsvisitor:26ee90d985ed4cfc9cf191563a7a84c4; +180248[redacted]; Fine, Philip [Fine.Philip@epa.gov]; Application 9e133cac-5238-4d1e-aaa0-d8ff4ca23f4e; Chaudhary, Dimple [Chaudhary.Dimple@epa.gov]; Goldberg, Ruby [Goldberg.Ruby@epa.gov]; +1916271[redacted]; +192867[redacted]; Breen, Barry [Breen.Barry@epa.gov]; Tejada, Matthew [Tejada.Matthew@epa.gov]; abel russ [aruss@environmentalintegrity.org]; Celeste, Laurel [celeste.laurel@epa.gov]; Huggins, Richard [Huggins.Richard@epa.gov]; Hilosky, Nick [Hilosky.Nick@epa.gov]; Application ab5d1521-415b-4380-82e4-af803fb8bf2d; Application 556b15e7-452c-4773-b728-6313eaa47b77; Application 9cd07db6-fab5-438c-8e34-44117fac7650; Application 207a6836-d031-4764-a9d8-c1193f455f21; Hoskinson, Carolyn [Hoskinson.Carolyn@epa.gov]; 17396; Hammer, Becky [rhammer@nrdc.org]; Indra Frank [IFrank@hecweb.org]; teamsvisitor:5ec648e058f5435390ed507f32ad5f30; Lisa Widawsky Hallowell [lhallowell@environmentalintegrity.org]; teamsvisitor:3517c0fd22844ab090dc57cff6479db6; teamsvisitor:f3de4a1b41a04732aede8f2e677d6427; Waterhouse, Carlton [Waterhouse.Carlton@epa.gov]; DeRobertis, Cecilia [DeRobertis.Cecilia@epa.gov]; Celeste Flores [cflores@mamfrc.org]

Subject: Meeting (ScheduledMeeting)/Thread Id:

Ex. 6 Personal Privacy (PP)

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End: 3/4/2021 10:05:28 PM
Show Time As: Busy

Recurrence: (none)

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Appointment

From: Neil Gormley [ngormley@earthjustice.org]
Sent: 5/3/2021 8:44:50 PM
To: Patrice Simms [psimms@earthjustice.org]; Amy Laura Cahn [alcahn@vermontlaw.edu]; Chaudhary, Dimple [Chaudhary.Dimple@epa.gov]; tlorenzen@crowell.com; emallen@sidley.com; Lauren Williams [lwilliams@earthjustice.org]

Subject: substantive planning call for DC Bar environmental justice panel
Location: Microsoft Teams Meeting

Start: 5/24/2021 2:00:00 PM
End: 5/24/2021 2:45:00 PM
Show Time As: Tentative

Recurrence: (none)

If your availability has changed, let me and Emily know and we'll find another time.

Please come prepared with ideas for the format and discussion topics, and feel free to share ideas by email in advance of this call. Here again are the ideas we circulated to get the conversation started:

Possible approaches to the format:

Format option 1: talking heads + questions and discussion
Introductions; short (10 minute) presentations; 1-2 discussion questions from Patrice; audience questions

Format option 2: panel discussion
Introductions; 3-4 discussion questions from Patrice; audience questions

As to the substance, we've been thinking about this panel as focusing less on substantive environmental policy, and more on practical dimensions of advocacy, governance, and decision-making, i.e., *how will the administration's commitment to environmental justice change how you do your work?* More concretely, here are a few potential discussion questions topics. Please suggest additions, deletions, and modifications.

- *What new opportunities are there for communities to have a say in the environmental decisions that affect them?*
- *What changes should we expect in the areas of monitoring, reporting, compliance, and enforcement in response to environmental justice concerns?*
- *President Biden's Executive Orders emphasize that environmental and economic justice are intertwined. How can advocates, agencies, and the private sector advance that understanding and break down silos?*
- *Can we expect an increase in environmental justice litigation? For companies concerned about their exposure to this form of litigation, what are the legal theories that would be used to maintain a cause of action? What are the proactive and productive steps that they companies can take to work with communities and avoid litigation.*

Again, we welcome your ideas. Please don't be shy about proposing additions, deletions, and changes.

Neil and Emily

Microsoft Teams meeting

Join on your computer or mobile app
Click here to join the meeting

Or call in (audio only)
Ex. 6 Personal Privacy (PP) United States, San Francisco

Phone Conference ID: Ex. 6 Personal Privacy (PP)
Find a local number | Reset PIN

Learn More | Meeting options

Message

From: Lauren Williams [lwilliams@earthjustice.org]
Sent: 4/29/2021 2:15:41 PM
To: psimms@earthjustice.org; alcahn@vermontlaw.edu; ngormley@earthjustice.org; Chaudhary, Dimple [Chaudhary.Dimple@epa.gov]; tlorenzen@crowell.com
CC: emallen@sidley.com
Subject: RE: format and agenda ideas for environmental justice panel, 6/3

Hello,

Patrice is available during the following dates/times:

- Friday, May 21, at 10, 12,
- Monday, May 24 at 10, 11, 3
- Wednesday, May 26 at 10

Best,
Lauren K. Williams, MPS
Executive Assistant to the Vice Presidents of Litigation
Pronouns: She/Her/Hers

"Change will not come if we wait for some other person or some other time. We are the ones we've been waiting for. We are the change that we seek."
~Barack Obama

Earthjustice
1001 G Street NW, Suite 1000, Washington, DC 20001
D: (202) 745-5221 / F: (202) 667-2356 / www.earthjustice.org

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If you are not the intended recipient, any dissemination, distribution or copying is strictly prohibited.
If you think that you have received this email message in error, please notify the sender by reply email and delete the message and any attachments.

From: Patrice Simms <psimms@earthjustice.org>
Sent: Wednesday, April 28, 2021 1:16 PM
To: Amy Laura Cahn <alcahn@vermontlaw.edu>; Neil Gormley <ngormley@earthjustice.org>; chaudhary.dimple@epa.gov; tlorenzen@crowell.com
Cc: emallen@sidley.com; Lauren Williams <lwilliams@earthjustice.org>
Subject: RE: format and agenda ideas for environmental justice panel, 6/3

Looping in Lauren to help with my schedule.

Thanks.

From: Amy Laura Cahn <alcahn@vermontlaw.edu>
Sent: Wednesday, April 28, 2021 12:48 PM
To: Neil Gormley <ngormley@earthjustice.org>; chaudhary.dimple@epa.gov; tlorenzen@crowell.com; Patrice Simms <psimms@earthjustice.org>
Cc: emallen@sidley.com
Subject: Re: format and agenda ideas for environmental justice panel, 6/3

Thanks, Neil, for providing some additional times. I can do the following times:

Friday, May 21, at 10, 1
Monday, May 24 at 10, 11
Wednesday, May 26 at 10, 11, 3

All the best,
Amy Laura

Amy Laura Cahn | she/they
Visiting Professor
Acting Director, Environmental Justice Clinic
Vermont Law School
164 Chelsea Street, P.O. Box 96, South Royalton, VT 05068
917-771-3385 | alcahn@vermontlaw.edu

This e-mail message is intended only for the individual(s) to which it is addressed. This e-mail may contain information that is privileged, confidential, and exempt from disclosure under applicable law. If you received this e-mail by accident, please notify the sender immediately and destroy this e-mail and all copies of it.

From: Neil Gormley <ngormley@earthjustice.org>
Date: Monday, April 26, 2021 at 9:53 AM
To: Amy Laura Cahn <alcahn@vermontlaw.edu>, "chaudhary.dimple@epa.gov" <chaudhary.dimple@epa.gov>, "tlorenzen@crowell.com" <tlorenzen@crowell.com>, "psimms@earthjustice.org" <psimms@earthjustice.org>
Cc: "emallen@sidley.com" <emallen@sidley.com>
Subject: RE: format and agenda ideas for environmental justice panel, 6/3

Thanks, Amy Laura. I think it's fine to do our substantive planning call after 5/20. Can everyone let me know their availability at the following new dates/times?

Friday, May 21, at 10, 12, 1
Monday, May 24 at 10, 11, 3
Wednesday, May 26 at 10, 11, 3

Neil Gormley
(he/him/his)
Staff Attorney
Earthjustice
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Washington, DC 20001

T: 202.797.5239
earthjustice.org

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From: Amy Laura Cahn <alcahn@vermontlaw.edu>
Sent: Sunday, April 25, 2021 8:01 PM
To: Neil Gormley <ngormley@earthjustice.org>; chaudhary.dimple@epa.gov; tlorenzen@crowell.com; Patrice Simms <psimms@earthjustice.org>
Cc: emallen@sidley.com
Subject: Re: format and agenda ideas for environmental justice panel, 6/3

Dear Neil,

Thank you so much for this information. I am in favor of format option 2.

In terms of scheduling, I am scheduled to be off from 5/13-20, but I can make the 20th work, if that works for others.

All the best,

Amy Laura

Amy Laura Cahn | she/they
Visiting Professor
Acting Director, Environmental Justice Clinic
Vermont Law School
164 Chelsea Street, P.O. Box 96, South Royalton, VT 05068
917-771-3385 | alcahn@vermontlaw.edu

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From: Neil Gormley <ngormley@earthjustice.org>
Date: Friday, April 23, 2021 at 3:41 PM
To: Amy Laura Cahn <alcahn@vermontlaw.edu>, "chaudhary.dimple@epa.gov" <chaudhary.dimple@epa.gov>, "tlorenzen@crowell.com" <tlorenzen@crowell.com>, "psimms@earthjustice.org" <psimms@earthjustice.org>
Cc: "emallen@sidley.com" <emallen@sidley.com>
Subject: format and agenda ideas for environmental justice panel, 6/3

Dear Dimple, Patrice, Amy Laura, and Tom,

Thank you again for agreeing to join our DC Bar environmental justice discussion on June 3, titled *Environmental justice on the ground: how federal agencies, companies, and advocates are responding to calls for greater environmental justice accountability*. Emily and I are really excited about this event.

Based on excellent advice from Patrice, our moderator, we want to start a conversation about the best format and agenda for our June 3 event. You all are the experts on this issue, so we want to make sure you have the chance to cover what you want to cover. Please see below for a few initial ideas from us. We can have a discussion by email, followed by a planning call in May to tie up any loose ends (separate from the logistical planning call that DC Bar staff have scheduled for April 28 at 12:30).

Please let us know which of these dates/times work for you for a substantive planning call: May 17 at 10, 11, 3; May 18 at 10, 11, 3; May 20 at 10, 11, 3.

Here are a couple of possible approaches to the format. Please let us know what you think.

Format option 1: talking heads + questions and discussion
Introductions; short (10 minute) presentations; 1-2 discussion questions from Patrice; audience questions

Format option 2: panel discussion
Introductions; 3-4 discussion questions from Patrice; audience questions

As to the substance, we've been thinking about this panel as focusing less on substantive environmental policy, and more on practical dimensions of advocacy, governance, and decision-making, i.e., *how will the administration's commitment to environmental justice change how you do your work?* More concretely, here are a few potential discussion questions topics. Please suggest additions, deletions, and modifications.

- *What new opportunities are there for communities to have a say in the environmental decisions that affect them?*
- *What changes should we expect in the areas of monitoring, reporting, compliance, and enforcement in response to environmental justice concerns?*
- *President Biden's Executive Orders emphasize that environmental and economic justice are intertwined. How can advocates, agencies, and the private sector advance that understanding and break down silos?*
- *Can we expect an increase in environmental justice litigation? For companies concerned about their exposure to this form of litigation, what are the legal theories that would be used to maintain a cause of action? What are the proactive and productive steps that they companies can take to work with communities and avoid litigation.*

Again, we welcome your ideas. Please don't be shy about proposing additions, deletions, and changes.

Neil and Emily

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EARTHJUSTICE

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From: Mallen, Emily P. <emallen@sidley.com>
Sent: Monday, April 19, 2021 11:08 AM
To: Amy Laura Cahn <alcahn@vermontlaw.edu>; awilliams2@dcbar.org; chaudhary.dimple@epa.gov; tlorenzen@crowell.com
Cc: communitiesevents@dcbar.org; Neil Gormley <ngormley@earthjustice.org>; Patrice Simms <psimms@earthjustice.org>
Subject: RE: [EXT]RE: Environment, Energy and Natural Resources 6/3

In order to get this scheduled, let's finalize the planning call for Wednesday, April 28 at 12:30 – 1:00 pm. In addition, we will be sending a follow-up email on format for the event and will start publicizing accordingly.

Thanks again for everyone's willingness to participate!

Emily

EMILY P. MALLEN

SIDLEY AUSTIN LLP
+1 202 736 8447
emallen@sidley.com

From: Amy Laura Cahn <alcahn@vermontlaw.edu>
Sent: Wednesday, April 14, 2021 1:47 PM
To: Artdesha Williams <awilliams2@dcbar.org>; Mallen, Emily P. <emallen@sidley.com>; Chaudhary.Dimple@epa.gov; Lorenzen, Thomas <TLorenzen@crowell.com>
Cc: CommunitiesEvents <CommunitiesEvents@dcbar.org>; Neil Gormley <ngormley@earthjustice.org>; psimms@earthjustice.org
Subject: Re: [EXT]RE: Environment, Energy and Natural Resources 6/3

I am currently available at these times on the 28th: 2:30pm-1:00pm,2:30pm-3:00pm, 3:00pm-3:30pm

I could make the earlier times work, if needs be.

Amy Laura Cahn | she/they
Visiting Professor
Acting Director, Environmental Justice Clinic
Vermont Law School
164 Chelsea Street, P.O. Box 96, South Royalton, VT 05068
917-771-3385 | alcahn@vermontlaw.edu

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From: Artdesha Williams <awilliams2@dcbar.org>
Date: Wednesday, April 14, 2021 at 9:24 AM
To: "Mallen, Emily P." <emallen@sidley.com>, Amy Laura Cahn <alcahn@vermontlaw.edu>, "Chaudhary.Dimple@epa.gov" <Chaudhary.Dimple@epa.gov>, "Lorenzen, Thomas" <TLorenzen@crowell.com>
Cc: CommunitiesEvents <CommunitiesEvents@dcbar.org>, Neil Gormley <ngormley@earthjustice.org>, "psimms@earthjustice.org" <psimms@earthjustice.org>
Subject: RE: [EXT]RE: Environment, Energy and Natural Resources 6/3

Hello,

Thank you for reaching out I have included times for April 28th. Please let me know if those times work if not we can look at times and dates for the following week.

Wednesday, April 28th 11:00am-11:30am,11:30am-12:00pm, 12:30pm-1:00pm,2:30pm-3:00pm, 3:00pm-3:30pm

ARTDESHA WILLIAMS
Sr. Events Assistant, Communities
District of Columbia Bar
901 4th Street NW
Washington, DC 20001
☎: 202.737.4700 x2811
✉: awilliams2@dcbar.org
www.dcbar.org

From: Mallen, Emily P. <emallen@sidley.com>
Sent: Tuesday, April 13, 2021 9:04 PM
To: Artdesha Williams <awilliams2@dcbar.org>; alcahn@vermontlaw.edu; Chaudhary.Dimple@epa.gov; Lorenzen, Thomas <TLorenzen@crowell.com>
Cc: CommunitiesEvents <CommunitiesEvents@dcbar.org>; Neil Gormley <ngormley@earthjustice.org>; psimms@earthjustice.org
Subject: [EXT]RE: Environment, Energy and Natural Resources 6/3

Artdesha,
Thanks for your patience getting back to you about the planning call. We are confirmed for June 3 from noon – 1:30 for the actual panel. It appears none of the times you offered for April 26 or April 27 work for all 4 of our panelists. April 27 does not work at all and we have conflicting availability on April 26. Would it be possible to offer additional times on April 28, or possibly later in the day on April 26?

Thanks,
Emily

EMILY P. MALLEN

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emallen@sidley.com

From: Mallen, Emily P.
Sent: Thursday, April 8, 2021 1:03 PM
To: 'Artdesha Williams' <awilliams2@dcbar.org>; alcahn@vermontlaw.edu; Chaudhary.Dimple@epa.gov; Lorenzen, Thomas <TLorenzen@crowell.com>
Cc: CommunitiesEvents <CommunitiesEvents@dcbar.org>; 'Neil Gormley' <ngormley@earthjustice.org>; 'psimms@earthjustice.org' <psimms@earthjustice.org>
Subject: RE: Environment, Energy and Natural Resources 6/3

Artdesha,

We have our final panelist confirmed. Patrice Simms will serve as Moderator. His contact information is below and he is cc'd on this email.

Please also add Neil Gormley, cc'd on this email, to the planning call. And, we have requested that the program time be extended by 30 minutes, to occur from 12:00 – 1:30 pm on June 3. I am awaiting conformation from our speakers as to their availability for a planning call.

Thanks,
Emily

Patrice L. Simms
Vice President of Litigation, Washington, D.C.
Earthjustice
psimms@earthjustice.org
P: 202.667.4500 x5213

EMILY P. MALLEN

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emallen@sidley.com

From: Artdesha Williams <awilliams2@dcbar.org>
Sent: Wednesday, April 7, 2021 2:15 PM
To: alcahn@vermontlaw.edu; Chaudhary.Dimple@epa.gov; Lorenzen, Thomas <TLorenzen@crowell.com>; Mallen, Emily P. <emallen@sidley.com>
Cc: CommunitiesEvents <CommunitiesEvents@dcbar.org>
Subject: Environment, Energy and Natural Resources 6/3

Hello,

We hope that you all are staying safe and thank you for volunteering to speak at the D.C. Bar Communities program, **"Responding to Calls for Greater Environmental Justice Accountability "**by the Environment, Energy and Natural Resources Community. To ensure that the program goes smoothly, we would like to arrange a brief planning meeting between the Communities

Office Program Attorney and all speakers and organizers. This will be an opportunity for everyone to address the program's logistics, technical requirements and content, as well as any presentation materials and handouts there might be. The meeting should last about 15 to 30 minutes.

Please let us know your availability for the upcoming days:
Monday, April 26th 10:00am- 10:30am, 11:00am-11:30am,11:30am-12:00pm,
Tuesday, April 27th 10:00am-10:30am, 10:30am-11:00am-11:30am,11:30am-12:00pm, 12:30pm-1:00pm and let us know if there are any other co-organizers who should be invited to the call.

Also, in advance of your call, please read our updated speaker packet attached, which includes an updated speaker and materials release. Our Program Attorney and staff will be happy to discuss any questions or additional requirements you might have during the call.

We are excited to have you speak at a D.C. Bar Communities event look forward to a great program.

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Message

From: Patrice Simms [psimms@earthjustice.org]
Sent: 5/24/2021 4:02:08 PM
To: ngormley@earthjustice.org; alcahn@vermontlaw.edu; Chaudhary, Dimple [Chaudhary.Dimple@epa.gov]; tlorenzen@crowell.com; emallen@sidley.com
CC: psimms@earthjustice.org
Subject: Notes on our upcoming DC Bar Panel Discussion on EJ

Flag: Follow up

See the general overview of the plan for the panel below. Please feel free to make specific suggestions for changes/additions. Especially please add (1) some canned Q&A questions; and (2) some general issues/questions you hope to get to (that I can raise in our back and forth if it makes sense).

Thanks all!!
-Patrice

Overview:
- Program June 3; 11:45-1:30 pm. (program 12-1:30)
- Technical Aspects/technology
- Format
- Areas of Substantive Focus/Specific Moderator Questions
- Q&A seeding

Neil/Emily –

Audience? (Amy Laura)
- For the DC Bar, marketed pretty widely. Most likely to be joined by EENR community. Largely private practice and government. We've been thinking about this panel as **focusing less on substantive environmental policy, and more on practical dimensions of advocacy, governance, and decision-making**, i.e., *how will the administration's commitment to environmental justice change how you do your work?*
- How do we **inform the private bar** about EJ
  - Can provide oppty to talk about how *companies can avoid running into EJ issues*
  - Can note that *outreach and engagement will be important*. There will be opportunities related to affirmative projects (eg. SEPs; Comm Benefit Agreements; etc)
- Can Neil and Emily send us **the blub** that they are using to advertise? Yes. Will do.
  - *"The Biden Administration has placed a renewed focus on Environmental Justice, particularly through the recent issuances of Executive Orders 14008 and 13990. This program looks at Environmental Justice on the ground, and considers how federal agencies, companies, and advocates are responding to calls for greater Environmental Justice accountability. We bring together Environmental Justice experts from the realms of government, private practice, and advocacy groups to provide a portal into what environmental justice means from an advocacy perspective while also helping companies better understand their legal risks and opportunities related to environmental justice, and how the Federal government is interpreting its obligations under the executive orders."*

Format: *interactive panel discussion* – (1) Introductions and table setting [Patrice]; (2) 3-4 discussion questions from Patrice (with some back and forth); (3) audience questions.

Key Questions:

1. *What new opportunities are there for communities to have a say in the environmental decisions that affect them?*
2. *What changes should we expect in the areas of monitoring, reporting, compliance, and enforcement in response to environmental justice concerns?*
3. *President Biden's Executive Orders emphasize that environmental and economic justice are intertwined. How can advocates, agencies, and the private sector advance that understanding and break down silos?* (Justice 40 initiative likely to come up)
4. *Can we expect an increase in environmental justice litigation? For companies concerned about their exposure to this form of litigation, what are the legal theories that would be used to maintain a cause of action? What are the proactive and productive steps that they companies can take to work with communities and avoid litigation.*

Other Questions:

- State and federal interactions – states are starting to push the envelop in ways that go beyond federal activities – How does the interplay between the federal government and states shape the development of environmental justice law and policy?
- Federal legislation – there is proposed legislation; may be worth noting. How does this interact with ongoing EJ related efforts.
- Under what kinds of statutes are EJ effort likely to arise? CAA, Title VI, etc.
- Do policymakers have the tools that they need under existing statutory authorities to do what is necessary to address EJ and realize the Biden administration's vision?

Q& A: Process

- Will be typed into a **Chat function**, and I can pick.
- Possible that we *might not get a lot of question*.
    - We should probably have some ***questions for each other***
    - Should have a few ***'canned' questions*** to kick things off

Q&A QUESTIONS:

- Specific **Canned Questions and Questions for Each Other**
    - [add questions here]

Message

From: Neil Gormley [ngormley@earthjustice.org]
Sent: 5/24/2021 2:17:29 PM
To: psimms@earthjustice.org; alcahn@vermontlaw.edu; Chaudhary, Dimple [Chaudhary.Dimple@epa.gov]; tlorenzen@crowell.com; emallen@sidley.com
Subject: substantive planning call for DC Bar environmental justice panel

Program blurb:

The Biden Administration has placed a renewed focus on Environmental Justice, particularly through the recent issuances of Executive Orders 14008 and 13990. This program looks at Environmental Justice on the ground, and considers how federal agencies, companies, and advocates are responding to calls for greater Environmental Justice accountability. We bring together Environmental Justice experts from the realms of government, private practice, and advocacy groups to provide a portal into what environmental justice means from an advocacy perspective while also helping companies better understand their legal risks and opportunities related to environmental justice, and how the Federal government is interpreting its obligations under the executive orders.

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Message

From: Reynolds, Joel [jreynolds@nrdc.org]
Sent: 5/6/2021 4:01:25 PM
To: dimplechaudhary[redacted]; Chaudhary, Dimple [Chaudhary.Dimple@epa.gov]
Subject: FW: NRDC's Memorandum in Support of Request to Protect the Bristol Bay Watershed from the Pebble Mine Under Section 404(c) of the Federal Clean Water Act
Attachments: pebble.404c brief.cover.may 2 2021.final.pdf; Pebble.404c brief.may 2 2021.final (004).pdf

Flag: Follow up

Hi Dimple – I hope all is well at EPA in these increasingly hopeful times. I don't know what limitations there may be in engaging you on NRDC-related matters, and if you are precluded, please disregard this email.

Otherwise, I wanted to make sure you have seen an extensive memorandum that we submitted to Administrator Regan on Monday urging EPA to take action under CWA section 404(c), as requested by United Tribes of Bristol Bay in February, to protect the Bristol Bay region from the Pebble Mine. I have attached the document (and accompanying cover letter), and they are also linked here:

https://www.nrdc.org/sites/default/files/epa-memorandum-pebble-mine-20210503.pdf
https://www.nrdc.org/sites/default/files/memorandum-pebble-mine-20210503.pdf

Your assistance in directing these documents as appropriate within the agency would be very much appreciated.

Best regards, and thanks,

Joel

Joel Reynolds
Western Director
Senior Attorney
Natural Resources Defense Council
NRDC Action Fund
1314 Second Street
Santa Monica, CA 90401
(310) 434-2300
(310) 434-2399 (fax)

From: Johnson, Katiana <kjohnson@nrdc.org>
Sent: Monday, May 3, 2021 8:57 AM
To: regan.michael@epa.gov
Cc: nishida.jane@epa.gov; Cassady.alison@epa.gov; Dieu.martin@epa.gov; Berrios.lisa@epa.gov; Fox.radhika@epa.gov; sabater.juan@epa.gov; Reynolds, Joel <jreynolds@nrdc.org>; Kiekow Heimer, Taryn <tkiekowheimer@nrdc.org>; ahurley@utbb.org; Matthew Newman <mnewman@narf.org>
Subject: NRDC's Memorandum in Support of Request to Protect the Bristol Bay Watershed from the Pebble Mine Under Section 404(c) of the Federal Clean Water Act

Dear Administrator Regan:

Attached please find, with associated cover letter, NRDC's Memorandum in Support of Request to Protect the Bristol Bay Watershed from the Pebble Mine Under Section 404(c) of the Federal Clean Water Act.

On behalf of NRDC and its over 3 million members and activists, this memorandum is submitted in support of the February 18, 2021 formal request by United Tribes of Bristol Bay for such action under Section 404(c).

Very truly yours,

Joel Reynolds

Joel Reynolds
Western Director
Senior Attorney
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(310) 434-2399 (fax)

Appointment

From: Hoffer, Melissa [Hoffer.Melissa@epa.gov]
Sent: 1/27/2021 9:51:31 PM
To: Hoffer, Melissa [Hoffer.Melissa@epa.gov]; Srinivasan, Gautam [Srinivasan.Gautam@epa.gov]; Palmer, Karen [Palmer.Karen@epa.gov]; Hogan, Stephanie [Hogan.Stephanie@epa.gov]; Lynk, Brian (ENRD) [Brian.Lynk@usdoj.gov]; Marks, Matthew [Marks.Matthew@epa.gov]; eric.hostetler@usdoj.gov; susannah@donahuegoldberg.com; rfullmer@edf.org; Julia.Forgie@doj.ca.gov; Liz.Rumsey@doj.ca.gov; David.Zonana@doj.ca.gov; Segall, Craig@ARB [Craig.Segall@arb.ca.gov]; Shannon.Dilley@arb.ca.gov; 'Ellen.Peter@arb.ca.gov' [Ellen.Peter@arb.ca.gov]; Jessica.gordon@arb.ca.gov
CC: Chaudhary, Dimple [Chaudhary.Dimple@epa.gov]; Hooks, Samantha [hooks.samantha@epa.gov]; Razor, Lila [Razor.Lila@epa.gov]; Patrick, Monique [Patrick.Monique@epa.gov]

Subject: MSW Landfills Litigation
Location: Microsoft Teams Meeting

Start: 1/28/2021 9:30:00 PM
End: 1/28/2021 10:00:00 PM
Show Time As: Busy

Required Attendees: Srinivasan, Gautam; Palmer, Karen; Hogan, Stephanie; Brian.Lynk@usdoj.gov; Marks, Matthew; eric.hostetler@usdoj.gov; susannah@donahuegoldberg.com; rfullmer@edf.org; Julia.Forgie@doj.ca.gov; Liz.Rumsey@doj.ca.gov; David.Zonana@doj.ca.gov; Segall, Craig@ARB; Shannon.Dilley@arb.ca.gov; 'Ellen.Peter@arb.ca.gov'; Jessica.gordon@arb.ca.gov
Optional Attendees: Chaudhary, Dimple; Hooks, Samantha; Razor, Lila; Monique Patrick

POC: Monique Patrick

Microsoft Teams meeting

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Appointment

From: Fox, Radhika [Fox.Radhika@epa.gov]
Sent: 5/19/2021 2:35:01 AM
To: Fox, Radhika [Fox.Radhika@epa.gov]; Pinkham, Jaime A SES USARMY HQDA ASA CW (USA) [jaime.a.pinkham.civ@mail.mil]; McKalip, Doug - APHIS [douglas.mckalip@usda.gov]; John Goodin (Goodin.John@epa.gov) [Goodin.John@epa.gov]; Eisenberg, Mindy [Eisenberg.Mindy@epa.gov]; Jensen, Stacey M CIV USARMY HQDA ASA CW (USA) [stacey.m.jensen.civ@mail.mil]; Gloria.Montano@usda.gov; dwinters@fisheries.org; gbelan@americanrivers.org; tillston@americanrivers.org; gale@backcountryhunters.org; BHartl@biologicaldiversity.org; agrinberg@cleanwater.org; emeyers@conservationfund.org; jgonzalez@earthjustice.org; jrumpler@environmentamerica.org; amesnikoff@elpc.org; Jared Mott [jmott@iwla.org]; madeleine_foote@lcv.org; clord@npca.org; murphyj@nwf.org; ritterj@nwf.org; watkinsg@nwf.org; jdevine@nrdc.org; dalal.aboulhosn@sierraclub.org; Kelly Moser [kmoser@selcnc.org]; jsigaran@selcdc.org; james.hague@tnc.org; mkassen@trcp.org; steve.moyer@tu.org; kfoster@waterkeeper.org; jpeters@cleanwater.org; skuwayama@lcv.org; Chaudhary, Dimple [Chaudhary.Dimple@epa.gov]
CC: Sabater, Juan [Sabater.Juan@epa.gov]; Aguirre, Janita [Aguirre.Janita@epa.gov]; Tiago, Joseph [Tiago.Joseph@epa.gov]; Kaiser, Russell [Kaiser.Russell@epa.gov]; Christensen, Damaris [Christensen.Damaris@epa.gov]; Benita Best-Wong [Best-Wong.Benita@epa.gov]; John Rumpler [john.rumpler@publicinterestnetwork.org]; Beck, Whitney [beck.whitney@epa.gov]

Subject: Quarterly Environmental and Conservation Leaders Stakeholder Meeting with Office of Water
Attachments: Enviro + Conservation Stakeholder Mtg Agenda_05192021.docx
Location: ZoomGov Meeting

Start: 5/19/2021 4:30:00 PM
End: 5/19/2021 5:45:00 PM
Show Time As: Tentative

Required Attendees: Fox, Radhika; Pinkham, Jaime A SES USARMY HQDA ASA CW (USA); McKalip, Doug - APHIS; John Goodin (Goodin.John@epa.gov); Eisenberg, Mindy; Jensen, Stacey M CIV USARMY HQDA ASA CW (USA); Gloria.Montano@usda.gov; dwinters@fisheries.org; gbelan@americanrivers.org; tillston@americanrivers.org; gale@backcountryhunters.org; BHartl@biologicaldiversity.org; agrinberg@cleanwater.org; emeyers@conservationfund.org; jgonzalez@earthjustice.org; jrumpler@environmentamerica.org; amesnikoff@elpc.org; Jared Mott; madeleine_foote@lcv.org; clord@npca.org; murphyj@nwf.org; ritterj@nwf.org; watkinsg@nwf.org; jdevine@nrdc.org; dalal.aboulhosn@sierraclub.org; Kelly Moser; jsigaran@selcdc.org; james.hague@tnc.org; mkassen@trcp.org; steve.moyer@tu.org; kfoster@waterkeeper.org; jpeters@cleanwater.org; skuwayama@lcv.org; Chaudhary, Dimple
Optional Attendees: Sabater, Juan; Aguirre, Janita; Tiago, Joseph; Kaiser, Russell; Christensen, Damaris; Benita Best-Wong; John Rumpler; Beck, Whitney

Join ZoomGov Meeting

Meeting ID: Ex. 6 Personal Privacy (PP)
One tap mobile
Ex. 6 Personal Privacy (PP) US (San Jose)
US (New York)

Dial by your location
Ex. 6 Personal Privacy (PP) US (San Jose)
US (New York)
US
US (San Jose)
Meeting ID: Ex. 6 Personal Privacy (PP)
Find your local number: Ex. 6 Personal Privacy (PP)

Join by SIP
Ex. 6 Personal Privacy (PP)

Join by H.323
Ex. 6 Personal Privacy (PP) (US West)
(US East)
Meeting ID: Ex. 6 Personal Privacy (PP)

EPA Office of Water Attendees

- **Radhika Fox,** Principal Deputy Assistant Administrator
- **Benita Best-Wong,** Deputy Assistant Administrator
- **Janita Aguirre,** Chief of Staff
- **John Goodin,** Director, Office of Oceans, Wetlands, and Watersheds
- **Damaris Christensen,** Environmental Protection Specialist, Office of Oceans, Wetlands, and Watersheds
- **Mindy Eisenberg,** Associate Director, Oceans, Wetlands, and Communities Division
- **Russell Kaiser,** Acting Branch Chief of Program Development & Jurisdiction, Office of Oceans, Wetlands, and Watersheds
- **Juan Sabater,** Special Assistant

Federal Partner Attendees

- **Jaime A. Pinkham,** Acting Assistant Secretary of the Army for Civil Works
- **Stacey Jensen,** Assistant for Regulatory and Tribal Affairs, Office of the Assistant Secretary of the Army (Civil Works)
- **Gloria Montaño Greene**, Deputy Under Secretary for Farm Production and Conservation, USDA
- **Doug McKalip**, Senior Advisor to the Secretary, USDA

Stakeholders Attendees

- **Dalal Aboulhosn,** Sierra Club
- **Gary Belan,** American Rivers
- **Jon Devine,** Natural Resources Defense Council
- **Madeleine Foote,** League of Conservation Voters
- **John Gale,** Backcountry Hunters & Anglers
- **Julian Gonzalez,** Earth Justice
- **Andrew Grinberg,** Clean Water Action
- **Jimmy Hague,** The Nature Conservancy
- **Brett Hartl,** Center for Biological Diversity
- **Kelly Hunter Foster,** Waterkeepers Alliance
- **Ted Illiston,** American Rivers
- **Melinda Kassen,** Theodore Roosevelt Conservation Partnership
- **Chad Lord,** National Parks Conservation Association
- **Ann Mesnikoff,** Environmental Law and Policy Center
- **Erik Meyers,** Conservation Fund
- **Kelly Moser,** Southern Environmental Law Center
- **Jared Mott,** Izaak Walton League
- **Steve Moyer,** Trout Unlimited
- **Jim Murphy,** National Wildlife Federation
- **Jessie Ritter,** National Wildlife Federation

- **John Rumpler,** Environment America
- **Jamie Sigaran,** Southern Environmental Law Center
- **Glenn Watkins,** National Wildlife Federation
- **Drue Winters,** American Fisheries Society

Appointment

From: Neil Gormley [ngormley@earthjustice.org]
Sent: 5/3/2021 8:46:30 PM
To: Neil Gormley [ngormley@earthjustice.org]; Patrice Simms [psimms@earthjustice.org]; Amy Laura Cahn [alcahn@vermontlaw.edu]; Chaudhary, Dimple [Chaudhary.Dimple@epa.gov]; tlorenzen@crowell.com; emallen@sidley.com; Lauren Williams [lwilliams@earthjustice.org]

Subject: substantive planning call for DC Bar environmental justice panel
Location: Microsoft Teams Meeting

Start: 5/24/2021 2:00:00 PM
End: 5/24/2021 2:45:00 PM
Show Time As: Busy

Recurrence: (none)

If your availability has changed, let me and Emily know and we'll find another time.

Please come prepared with ideas for the format and discussion topics, and feel free to share ideas by email in advance of this call. Here again are the ideas we circulated to get the conversation started:

Possible approaches to the format:

Format option 1: talking heads + questions and discussion
Introductions; short (10 minute) presentations; 1-2 discussion questions from Patrice; audience questions

Format option 2: panel discussion
Introductions; 3-4 discussion questions from Patrice; audience questions

As to the substance, we've been thinking about this panel as focusing less on substantive environmental policy, and more on practical dimensions of advocacy, governance, and decision-making, i.e., *how will the administration's commitment to environmental justice change how you do your work?* More concretely, here are a few potential discussion questions topics. Please suggest additions, deletions, and modifications.

- *What new opportunities are there for communities to have a say in the environmental decisions that affect them?*
- *What changes should we expect in the areas of monitoring, reporting, compliance, and enforcement in response to environmental justice concerns?*
- *President Biden's Executive Orders emphasize that environmental and economic justice are intertwined. How can advocates, agencies, and the private sector advance that understanding and break down silos?*
- *Can we expect an increase in environmental justice litigation? For companies concerned about their exposure to this form of litigation, what are the legal theories that would be used to maintain a cause of action? What are the proactive and productive steps that they companies can take to work with communities and avoid litigation.*

Again, we welcome your ideas. Please don't be shy about proposing additions, deletions, and changes.

Neil and Emily

Microsoft Teams meeting

Join on your computer or mobile app
Click here to join the meeting

Or call in (audio only)
Ex. 6 Personal Privacy (PP) United States, San Francisco

Phone Conference ID: Ex. 6 Personal Privacy (PP)
Find a local number | Reset PIN

Learn More | Meeting options

Message

From: Peter Lehner [plehner@earthjustice.org]
Sent: 3/26/2021 8:38:31 PM
To: marianne.lado Ex. 6 Personal Privacy (PP)
CC: capfel@earthjustice.org; mpanditharatne@earthjustice.org; Engelman-Lado, Marianne [EngelmanLado.Marianne@epa.gov]
Subject: RE: Racial Equity EO

That makes good sense. We look forward to hearing what you learn. Have a good weekend!

Peter

From: Marianne Lado Ex. 6 Personal Privacy (PP)
Sent: Thursday, March 25, 2021 10:53 PM
To: Peter Lehner <plehner@earthjustice.org>
Cc: Carrie Apfel <capfel@earthjustice.org>; Mekela Panditharatne <mpanditharatne@earthjustice.org>; engelmanlado.marianne@epa.gov
Subject: Re: Racial Equity EO

Peter,

Great to hear from you.

I'm still in New York but am scheduled for Ex. 6 Personal Privacy (PP) and will need to make my way to DC soon. Glad to Ex. 6 Personal Privacy (PP)

I'm cc'ing my EPA email address for future reference.

As a result of the Biden ethics pledge, I'll need to check with our ethics team before setting up an appointment, so let me get back to you.

All the best,

Marianne

From: Peter Lehner <plehner@earthjustice.org>
Date: Thursday, March 25, 2021 at 7:20 PM
To: Marianne Lado Ex. 6 Personal Privacy (PP)
Cc: "capfel@earthjustice.org" <capfel@earthjustice.org>, "mpanditharatne@earthjustice.org" <mpanditharatne@earthjustice.org>
Subject: Racial Equity EO

Marianne,

Congratulations again on your wonderful post at EPA. Have you moved down to DC or will you do so once become less remote? Ex. 6 Personal Privacy (PP) Ex. 6 Personal Privacy (PP)

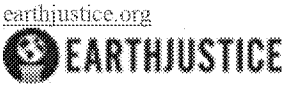
I do not have your new EPA email so I'm sending this to your personal email; I hope that is OK. I am hoping to introduce you to some new members of our team, copied here, and talk about the racial equity EO if you have time. We hope to find ways we might be able to collaborate on that effort. I am not sure if your team is working on this or if there others we should instead meet with on this, but thought I'd reach out to you first as this is certainly your area of expertise.

We'd love to learn more about how EPA is approaching its obligations under the racial equity EO, who is involved in the process, which stakeholders EPA is engaging with externally, how you're determining which programs to prioritize, and what your timeline is, as well as how/whether we can help you. Needless to say, we fully support the goals of the EO!

I look forward to re-connecting with you and discussing these issues with you.

Best,
Peter

Peter Lehner
Managing Attorney, Sustainable Food and Farming
48 Wall Street, 15th Floor
New York, NY 10005
917-886-8269 (cell for use during pandemic)
earthjustice.org



Because the earth needs a good lawyer

Message

From: Olson, Erik [eolson@nrdc.org]
Sent: 3/8/2021 1:42:48 PM
To: Enobakhare, Rosemary [Enobakhare.Rosemary@epa.gov]; Lee, Hubert (ENRD) [Hubert.Lee@usdoj.gov]; Jenifer Collins [CollinsJ@nwf.org]; Julian Gonzalez [jgonzalez@earthjustice.org]
CC: Stubblefield, Alexandra [Astubblefield@nrdc.org]
Subject: RE: Connecting re: LCR

Yes I can do 5:30

From: Enobakhare, Rosemary <Enobakhare.Rosemary@epa.gov>
Sent: Monday, March 8, 2021 8:42 AM
To: Lee, Hubert (ENRD) <Hubert.Lee@usdoj.gov>; Olson, Erik <eolson@nrdc.org>; Jenifer Collins <CollinsJ@nwf.org>; Julian Gonzalez <jgonzalez@earthjustice.org>
Cc: Stubblefield, Alexandra <Astubblefield@nrdc.org>
Subject: RE: Connecting re: LCR

Hi everyone, let's move this call to later in the day. Are folks available today at 5:30pm?

From: Lee, Hubert (ENRD) <Hubert.Lee@usdoj.gov>
Sent: Monday, March 8, 2021 8:38 AM
To: Olson, Erik <eolson@nrdc.org>; Enobakhare, Rosemary <Enobakhare.Rosemary@epa.gov>; Jenifer Collins <CollinsJ@nwf.org>; Julian Gonzalez <jgonzalez@earthjustice.org>
Cc: Stubblefield, Alexandra <Astubblefield@nrdc.org>
Subject: RE: Connecting re: LCR

Can we move the call to 9:30?

Hubert T. Lee
United States Department of Justice
Environment and Natural Resources Division
Ph: (202) 514-1806
Cell: (202) 305-5036

From: Olson, Erik <eolson@nrdc.org>
Sent: Monday, March 8, 2021 8:35 AM
To: Enobakhare, Rosemary <Enobakhare.Rosemary@epa.gov>; Jenifer Collins <CollinsJ@nwf.org>; Julian Gonzalez <jgonzalez@earthjustice.org>; Lee, Hubert (ENRD) <HLee@ENRD.USDOJ.GOV>
Cc: Stubblefield, Alexandra <Astubblefield@nrdc.org>
Subject: RE: Connecting re: LCR

Thanks Rosemary. My apologies for the late notice but Hubert Lee from the Justice Department (copied above) asked to be included. Sorry I am just seeing your email as I wasn't on email yesterday.
Erik

From: Enobakhare, Rosemary <Enobakhare.Rosemary@epa.gov>
Sent: Sunday, March 7, 2021 2:51 PM
To: Olson, Erik <eolson@nrdc.org>; Jenifer Collins <CollinsJ@nwf.org>; Julian Gonzalez <jgonzalez@earthjustice.org>
Cc: Stubblefield, Alexandra <Astubblefield@nrdc.org>
Subject: RE: Connecting re: LCR

Hi everyone, I Just sent over a calendar invite for 9am. Looking forward to connecting with you all.

I will let the team from OGC know that we are touching base tomorrow. Thank you all and looking forward to chatting.

Best,
Rosemary

Message

From: Seth Johnson [sjohnson@earthjustice.org]
Sent: 3/15/2021 11:50:38 PM
To: Gray, David [gray.david@epa.gov]
CC: Schoellkopf, Lynde [Schoellkopf.Lynde@epa.gov]; Ogbodo, Ndubisi [Ogbodo.Ndubisi@epa.gov]; alan.greenberg@usdoj.gov [Alan.Greenberg@usdoj.gov]; ngormley@earthjustice.org; Tejada, Matthew [Tejada.Matthew@epa.gov]; Fine, Philip [Fine.Philip@epa.gov]; schermbeck Ex. 6 Personal Privacy (PP)
Subject: RE: Meeting with Earthjustice to discuss environmental justice issues in DFW and HGB areas relating to Sierra Club v. EPA D.C. 20-1121
Attachments: Comments on Holcim 2020 permit copy.pdf; DARComments on GAF's TITLE V Permit Renewal copy.docx

I know our clients enjoyed speaking with you, as well.

Jim Schermbeck mentioned a Holcim cement plant permit modification in Midlothian, TX, and a Title V permit renewal for an asphalt shingle factory in Dallas, and I'm forwarding some of his advocacy on those issues.

Seth

From: Gray, David <gray.david@epa.gov>
Sent: Friday, March 12, 2021 3:33 PM
To: Seth Johnson <sjohnson@earthjustice.org>
Cc: schoellkopf.lynde@epa.gov; ogbodo.ndubisi@epa.gov; alan.greenberg@usdoj.gov; Neil Gormley <ngormley@earthjustice.org>; tejada.matthew@epa.gov; fine.philip@epa.gov
Subject: Re: Meeting with Earthjustice to discuss environmental justice issues in DFW and HGB areas relating to Sierra Club v. EPA D.C. 20-1121

Great hearing from everyone.

David Gray
Acting Regional Administrator
EPA Region 6 - Arkansas, Louisiana, New Mexico, Oklahoma, Texas
214-665-8120 o
214-789-2619 c

Sent from my iPhone

> On Mar 12, 2021, at 1:44 PM, Seth Johnson <sjohnson@earthjustice.org> wrote:
>
> I wanted to let you know we very much appreciate all the time you took yesterday to talk with us. We think there's real, swift progress that can be made on these rules, and related other ones, that will advance the agency's core mission of improving human health and the environment, especially in overburdened communities of color and low income communities, and help address the climate challenges that are also core to EPA's mission. We understand that you're reviewing these rules and are glad to stay in touch if further discussions, including more technical ones, would be helpful.
>
> Seth Johnson
>
> Seth Johnson

Staff Attorney
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From: Schoellkopf, Lynde <schoellkopf.lynde@epa.gov>
Sent: Thursday, March 11, 2021 1:19 PM
To: ogbodo.ndubisi@epa.gov; Seth Johnson <sjohnson@earthjustice.org>; alan.greenberg@usdoj.gov; ting.kaytrue@epa.gov; donaldson.guy@epa.gov; shar.alan@epa.gov; acosta.gerardo@epa.gov; vaughn.gloria@epa.gov; houston.robert@epa.gov; bianco.karen@epa.gov
Cc: Neil Gormley <ngormley@earthjustice.org>; ndoh.tina@epa.gov; burrell.omari@epa.gov; magee.melanie@epa.gov; young.carl@epa.gov; paige.carrie@epa.gov; smith.suzanne@epa.gov; mcguire.james@epa.gov; tejada.matthew@epa.gov; fine.philip@epa.gov; mckelvey.laura@epa.gov; lingard.robert@epa.gov; todd.robert@epa.gov; mathias.scott@epa.gov; brachtl.megan@epa.gov; stackhouse.butch@epa.gov; millar.emily@epa.gov; raps.virginia@epa.gov; damberg.rich@epa.gov; kornylak.vera@epa.gov; gray.david@epa.gov; balandran.olivia-r@epa.gov; garcia.david@epa.gov; ngo.kim@epa.gov; tanimura.erin@epa.gov; buzzelle.stanley@epa.gov; efron.brent@epa.gov; ling.michael@epa.gov
Subject: RE: Meeting with Earthjustice to discuss environmental justice issues in DFW and HGB areas relating to Sierra Club v. EPA D.C. 20-1121

Please note this is a Microsoft Teams Meeting – please use the link below for joining the Teams meeting. Apologies if our calendar invite indicated Skype.

-----Original Appointment-----
From: Ogbodo, Ndubisi <Ogbodo.Ndubisi@epa.gov>
Sent: Thursday, February 25, 2021 8:22 AM
To: Ogbodo, Ndubisi; Seth Johnson; Schoellkopf, Lynde; alan.greenberg@usdoj.gov; Ting, Kaytrue; Donaldson, Guy; Shar, Alan; Acosta, Gerardo; Vaughn, Gloria; Houston, Robert; Bianco, Karen
Cc: ngormley@earthjustice.org; Ndoh, Tina; Burrell, Omari; Magee, Melanie; Young, Carl; Paige, Carrie; Smith, Suzanne; McGuire, James; Tejada, Matthew; Fine, Philip; Mckelvey, Laura; Lingard, Robert; Todd, Robert; Mathias, Scott; Brachtl, Megan; Stackhouse, Butch; Millar, Emily; Raps, Virginia; Damberg, Rich; Kornylak, Vera S.; Gray, David; Balandran, Olivia-R; Garcia, David; Ngo, Kim; Tanimura, Erin; Buzzelle, Stanley; Efron, Brent; Ling, Michael
Subject: Meeting with Earthjustice to discuss environmental justice issues in DFW and HGB areas relating to Sierra Club v. EPA D.C. 20-1121
When: Thursday, March 11, 2021 2:00 PM-3:00 PM (UTC-06:00) Central Time (US & Canada).
Where: Micorsoft Teams Meeting Only- see link

Microsoft Teams meeting

Join on your computer or mobile app
Click here to join the meeting

Or call in (audio only)
Ex. 6 Personal Privacy (PP) United States, San Antonio
Phone Conference ID: Ex. 6 Personal Privacy (PP)
Find a local number | Reset PIN

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From: Seth Johnson <sjohnson@earthjustice.org>
Sent: Wednesday, February 17, 2021 9:18 AM
To: Schoellkopf, Lynde <Schoellkopf.Lynde@epa.gov>; Ogbodo, Ndubisi <Ogbodo.Ndubisi@epa.gov>; alan.greenberg@usdoj.gov; Ting, Kaytrue <Ting.Kaytrue@epa.gov>
Cc: ngormley@earthjustice.org
Subject: RE: Sierra Club v. EPA, DCC 20-1121

Thanks, Ndubisi and Lynde. It looks like the following ranges should work:

- Wednesday, March 3, 12-4 ET/11-3 CT/10-2 MT
- Tuesday, March 9, 12-3:30 ET/11-2:30 CT/10-1:30 MT
- Thursday, March 11, 1-3:30 ET/12-2:30 CT/11-1:30 MT

Seth

From: Schoellkopf, Lynde <schoellkopf.lynde@epa.gov>
Sent: Wednesday, February 10, 2021 12:57 PM
To: ogbodo.ndubisi@epa.gov; Seth Johnson <sjohnson@earthjustice.org>; alan.greenberg@usdoj.gov; ting.kaytrue@epa.gov
Cc: Neil Gormley <ngormley@earthjustice.org>
Subject: RE: Sierra Club v. EPA, DCC 20-1121

Seth and Neil,
If you can please reach out to your clients and discuss options for dates/times that work for them – we can then try to best coordinate one of those dates between our Regional and HQ offices. Thanks in advance for your assistance.
Lynde Schoellkopf

From: Ogbodo, Ndubisi <Ogbodo.Ndubisi@epa.gov>
Sent: Wednesday, February 10, 2021 10:47 AM

To: Seth Johnson <sjohnson@earthjustice.org>; alan.greenberg@usdoj.gov; Ting, Kaytrue <Ting.Kaytrue@epa.gov>; Schoellkopf, Lynde <Schoellkopf.Lynde@epa.gov>
Cc: ngormley@earthjustice.org
Subject: RE: Sierra Club v. EPA, DCC 20-1121

Hi Seth,

Thanks for providing more details. Do you have any suggestions for potential dates and times for the meeting? I would recommend sometime in early March. It would be helpful if you provide at least 3 dates for us to consider.

Thank you.
Ndubisi

From: Seth Johnson <sjohnson@earthjustice.org>
Sent: Wednesday, February 10, 2021 7:47 AM
To: alan.greenberg@usdoj.gov; Ting, Kaytrue <Ting.Kaytrue@epa.gov>; Schoellkopf, Lynde <Schoellkopf.Lynde@epa.gov>; Ogbodo, Ndubisi <Ogbodo.Ndubisi@epa.gov>
Cc: ngormley@earthjustice.org
Subject: RE: Sierra Club v. EPA, DCC 20-1121

They'd like to discuss the inequitable ramifications for communities of these rules resulting from the weakening of stationary source permitting requirements and other pollution control programs, steps to return protections in the Dallas and Houston areas to where they would have been 5 years ago absent these rules (and the 2015-2016 ones), and EPA's forthcoming review of the 2020 rules.

Seth

From: Greenberg, Alan (ENRD) <alan.greenberg@usdoj.gov>
Sent: Monday, February 8, 2021 4:03 PM
To: Seth Johnson <sjohnson@earthjustice.org>; ting.kaytrue@epa.gov; schoellkopf.lynde@epa.gov; ogbodo.ndubisi@epa.gov
Cc: Neil Gormley <ngormley@earthjustice.org>
Subject: RE: Sierra Club v. EPA, DCC 20-1121

Seth:

Thanks for the response. Can you please identify the specific concerns and issues you and your clients would like to discuss as they relate to the Dallas and Houston rules? This information will help EPA invite appropriate EPA staff to the meeting and develop an agenda.

Alan

From: Seth Johnson <sjohnson@earthjustice.org>
Sent: Monday, February 8, 2021 1:04 PM
To: Greenberg, Alan (ENRD) <AGreenberg@ENRD.USDOJ.GOV>; ting.kaytrue@epa.gov; schoellkopf.lynde@epa.gov; ogbodo.ndubisi@epa.gov
Cc: ngormley@earthjustice.org
Subject: RE: Sierra Club v. EPA, DCC 20-1121

Alan, Kaytrue, Lynde, and Ndubisi,

Thank you for the discussion this morning. I confirmed with our clients that they're interested in participating, along with us, in any meeting about environmental justice issues in the Dallas and Houston areas respecting the rules at issue here. We would appreciate having in such a meeting headquarters staff whose work bears directly on the issues. I'm very happy to be the point of contact on our side for helping make this happen and to make it as effective as possible for us all.

Seth

From: Seth Johnson
Sent: Thursday, February 4, 2021 2:33 PM
To: Greenberg, Alan (ENRD) <alan.greenberg@usdoj.gov>
Cc: Neil Gormley <ngormley@earthjustice.org>
Subject: RE: Sierra Club v. EPA, DCC 20-1121

Before 11 ET is available, though I recognize that may be a challenge for you. Other times that are available are 12:30-2 and 3-4:15 ET.

Seth

From: Greenberg, Alan (ENRD) <alan.greenberg@usdoj.gov>
Sent: Thursday, February 4, 2021 2:30 PM
To: Seth Johnson <sjohnson@earthjustice.org>
Cc: Neil Gormley <ngormley@earthjustice.org>
Subject: RE: Sierra Club v. EPA, DCC 20-1121

Unfortunately, we do not have times that work for the team later Friday afternoon. Do you have availability on Monday?

Alan

From: Seth Johnson <sjohnson@earthjustice.org>
Sent: Thursday, February 4, 2021 12:14 PM
To: Greenberg, Alan (ENRD) <AGreenberg@ENRD.USDOJ.GOV>
Cc: ngormley@earthjustice.org
Subject: RE: Sierra Club v. EPA, DCC 20-1121

Unfortunately, I've got another call with one of your colleagues about a different case at that time. I could do 1:30-4:15 ET.

Seth

From: Greenberg, Alan (ENRD) <alan.greenberg@usdoj.gov>
Sent: Thursday, February 4, 2021 2:05 PM
To: Seth Johnson <sjohnson@earthjustice.org>
Cc: Neil Gormley <ngormley@earthjustice.org>
Subject: RE: Sierra Club v. EPA, DCC 20-1121

Seth:

Thank you for your email. The EPA team and I could join you for a call at 1 pm eastern time tomorrow. If that works for you, I will send a conference call invite.

Alan

From: Seth Johnson <sjohnson@earthjustice.org>
Sent: Thursday, February 4, 2021 8:15 AM
To: Greenberg, Alan (ENRD) <AGreenberg@ENRD.USDOJ.GOV>
Cc: ngormley@earthjustice.org
Subject: Sierra Club v. EPA, DCC 20-1121

Alan,

I'm writing to ask about EPA's plans for proceedings in this case in light of the Biden-Harris administration's inclusion of the two challenged actions on its list of rules for review, as well as the January 21 letter from the acting OGC of EPA directing DOJ to seek to place cases like this in abeyance. In light of those documents, we would be amenable to a reasonable abeyance period. In such a period, we'd be interested in discussing environmental justice issues in Houston and Dallas with EPA. If it'd be easier to discuss by phone, I'm available by phone mid-late afternoon ET today and afternoon tomorrow.

Seth

Seth Johnson
Staff Attorney
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F: 202.667.2356
earthjustice.org

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Comments on:
Modifications to State Air Quality Permit Number 8996 and PSDTX454M4

Submitted by Downwinders at Risk
September 15th, 2020
to the
Texas Commission on Environmental Quality
Office of the Chief Clerk
MC 105, P.O. box 13087
Austin, Texas 78711-3087

Downwinders at Risk is a 26-year old organization with a long history of regulatory involvement with the facility that's the subject of this permit application.

We represent local Midlothian residents such as rancher Ex. 6 Personal Privacy (PP), who are directly affected by the pollution from Holcim's Midlothian cement plant because they live immediately adjacent to the plant's property, as Ex. 6 Personal Privacy (PP) does (Ex. 6 Personal Privacy (PP) Ex. 6 Personal Privacy (PP) or in close proximity of it (within one to two miles), and whose health and well-being have been, and continue to be, threatened by its routine operation.

We also represent residents who live in Cedar Hill, DeSoto, Duncanville, Arlington, Grand Prairie, Mansfield, Fort Worth, Dallas, and other communities whose health is directly affected by the voluminous pollution from Holcim's Midlothian cement plant because of the predominant wind direction as documented by TCEQ in numerous regulatory filings and findings. Our decades of official regulatory involvement with Holcim's operations are well established in the public record, as is Ex. 6 Personal Privacy (PP) eligibility for legal standing in matters regarding Holcim's operations governed by state and federal statutes.

Per Texas Administrative Code RULE §39.602, as persons who are filing public comment or hearing requests on or before the deadline for filing public comment or hearing requests, Downwinders at Risk requests to be mailed any correspondence related to the referenced permit application from this day forward at the address listed below.

Holcim's Midlothian cement manufacturing plant is a Major Source of air pollution in the nation's 4th largest metropolitan area, now in its 28th straight year of violating the Clean Air Act.

Since it began operation the Holcim plant has been snake-bit, rife with operational and process problems, and consistently more polluting than its Midlothian peers. Holcim blames this poor track record on quality of the limestone raw material but refuses to relocate its plant or import less-contaminated limestone. The history of the last two decades of Holcim's operation is the story of the company unsuccessfully trying to engineer its way out of their supposedly cursed raw material. Just how unsuccessful has Holcim been? According to the data the TCEQ collects, in 2017 it was the dirtiest, worst-performing cement plant in Texas, releasing 50% more pollution than the runner-up.

EPA "PRIORITY POLLUTANTS" TONS PER YEAR

2017 POINT SOURCE EMISSIONS

TEXAS CEMENT PLANTS

	CO	NOx	PM2.5	SO2	VOCs	TOTAL
GCC PERMIAN	159	938	35	18	52	1,204
LEHIGH	123	427	28	28	20	1,651
LONE STAR	483	502	61	95	57	3,336
CEMEX	1057	1738	52	34	22	1,951
TXI/HUNTER	867	912	105	16	49	2,905
ALAMO	759	2,500	25	3	47	1,180
CAPITOL	483	500	53	530	82	627
ASH GROVE	101	453	65	7	26	684
TXI/MID	247	185	70	435	42	1,992
HOLCIM	**2763**	**1057**	**193**	**970**	**207**	**5,193**

Approving Holcim's request to modify this permit to allow 100% use of the refinery waste Petroleum Coke to be burned will only make the Holcim Midlothian plant that much dirtier. Besides increasing CO2 emissions, it's also likely to increase NOX, PM, CO, VOC pollution as well. Increased NOX and VOC emissions will make it harder for DFW to come into compliance with the Clean Air Act. Increased PM pollution will add to local health burdens.

At the very least a trial burn using 100% Petroleum Coke should be required of Holcim before a decision on this permit modification is made by the Commission. The burden of proof should be on Holcim to prove the modification won't add additional pollution, not on citizens to prove it won't. The track record shows that citizens' skepticism of Holcim's - and the TCEQ's – exaggerated claims of "no harm" is well earned.

Downwinders is specifically concerned about Holcim's misapplication of EPA's "capable of accommodating" provisions of the PSD rules and the utter lack of enforceability of many of Holcim's assumptions about increases in pollution. With the company's own modeling showing little to no margin to meet the $PM_{2.5}$ National Ambient Air Quality Standards (NAAQS) in the immediate vicinity of its plant, the Commission shouldn't allow any modifications to the permit without a trial burn and monitoring demonstrating compliance.

Because the current version of the Holcim permit modification allows the possibility of potentially significant increases in pollution from its Midlothian cement plant and raises issues for local and regional public health, **Downwinders at Risk requests a contested case hearing on this permit application on behalf of our members such as** Ex. 6 Personal Privacy (PP) **and all our members who live adjacent to, in close proximity of, or immediately downwind of Holcim's Midlothian cement plant who are adversely affected by the pollution Holcim would or could release as a result of the referenced permit modification in a way not common to the general public.**

These members include populations of elderly residents like Ex. 6 Personal Privacy (PP) as well as children living adjacent to, or in close proximity of, or immediately downwind of Holcim's Midlothian cement plant whose health is more sensitive than the population as a whole to increased exposure to Particulate Matter, Nitrogen Oxide, and Carbon Monoxide pollution identified by the company as the consequence of granting its permit application request.

They also include members living adjacent to, or in close proximity of, or immediately downwind of Holcim's Midlothian cement plant, again like Ex. 6 Personal Privacy (PP) with pre-existing respiratory problems and illness, such as asthmatics, and those with compromised immune systems, whose health is more sensitive than the general public, and might be further impaired as a result of exposure to the increases in routine pollution identified by the company as the consequence of granting its permit application request.

I. Holcim's request for an increase in its Carbon Monoxide limit demonstrates poor combustion practices are still plaguing its Midlothian plant.

In an incinerator or cement kiln, excessive CO is consistently linked in the literature and in practice to poor combustion chemistry. According to "Boiler Room Basics," *"If there is insufficient air or inadequate mixing of fuel and air for complete combustion, the carbon reaction will not be completed, forming carbon monoxide."*

The National Board of Boiler and Pressure Vessel Inspectors states that, *"Carbon monoxide is the result of incomplete or improper combustion..."*

The 2015 textbook, "Improving Energy Efficiency of Boiler System" by Anuj Bhatia concludes *"When too little air is supplied to the burner, there is not enough oxygen to completely form CO2. It suggests incomplete combustion and is characterized by large amount of carbon monoxide (CO) in the stack."*

Nowhere could we find any engineering reference to increased CO pollution via an Regenerative Thermal Oxidizer linked to the decomposition of organic material in the kiln feed as Holcim suggests in making its excuse for a limit increase.

In fact, we found the opposite in a 1996 published paper in the periodical *Chemistry*, "Reduction of carbon monoxide emissions with regenerative thermal oxidizers," by S. Firmin, S. Lipke, and A. Bataray:

"Regenerative thermal oxidizers (RTOs) have been extensively used for the control of volatile organic compound (VOC) emissions from various sources. However, very little information is available on the ability of RTOs to control carbon monoxide (CO) emissions. This paper presents the results of extensive tests conducted on two RTOs to determine their VOC and CO control efficiencies. The inlet gas stream to the RTOs includes VOC and CO concentrations as high as 2,000 ppm and 3,600 ppm, respectfully. ***The testing demonstrated that both RTOs were capable of controlling greater than 98% of both inlet VOCs and CO."***

Indeed, many RTO manufacturer's websites tout their equipment as being effective in capturing CO pollution. Excessive CO emissions for any reason, much less the ones cities by Holcim are not addressed. We take this to mean this is not a common problem. And in fact it appears unique to Holcim's snake-bit Midlothian plant.

In addition, Holcim makes the further claim that that organic content has gone up in recent years compared to their baseline, and that increase also justifies a limit increase. But how is that possible if they're drawing their limestone raw material from the same quarry that they say has ALWAYS been higher in organic content? Ever since Holcim took ownership of the plant, the company has bemoaned its organic-laden limestone. This has been the default excuse for all of their past air pollution violations and attempted repairs. Despite being less than a mile from its nearest competitor and just across the highway from both their rivals, Holcim has always claimed their quarry has very different limestone than the other two in town.

So is Holcim mining a section of its quarry now that's *even higher* in organic content? It's extremely difficult to believe that given the company's history, it doesn't have a chemical characteristics map of their quarry that would identify the *very* high-in-organic-content limestone from just the merely high-in-organic-content limestone. If the recent CO increases are due to the raw material from one part of its quarry, can't the company use limestone from another part of its quarry to bring them down and avoid an increase in the limit?

Holcim states in its Executive Summary that *"operational difficulties such as significant waste build-up within the [regenerative thermal oxidizer] RTO has limited its operation for [carbon monoxide] CO control."* However, these operational difficulties are not described in any technical detail in the application. What's really causing the increase in CO pollution? Properly designed and operated RTOs, especially one that is relatively new like Holcim's, should reduce both VOC and CO emissions – yet, Holcim claims that while the RTO is successful in reducing VOC emissions, it can't reduce CO emissions. Why?

When it installed the RTO Holcim predicted the RTO would cut CO pollution by 50%. When it built its second kiln at the turn of the Century, it promised it would cut all pollution by 50%. Both of these predictions were grossly inaccurate. And yet by approving this permit before a trail burn is conducted, TCEQ is giving a company that could not have been more wrong in the past about its air pollution levels carte blanche to be wrong again.

Is the problem really with the raw material or perhaps with the Holcim plant itself? A well-thought-out trail burn scenario would be able to reveal the answer. This is why a trial burn is absolutely necessary before approving this permit modification.

II. Use of 100% Petroleum Coke in Kiln 2 Could Release Significantly More Smog-Forming Nitrogen Oxide (NOx) Pollution.

There is a high likelihood that burning 100% Petroleum Coke will result in large increases in smog-forming Nitrogen Oxide pollution. In the application, Holcim states:

"While changes to kiln firing system and fuel mix have the potential to change the NOX emissions profile in the kiln, no changes to actual stack emissions are expected."

So while Holcim admits in the application there could be swings in smog-forming Nitrogen Oxides as a result of 100% Petroleum Coke use, they don't *expect* to see any swings in actual stack emissions because of their NOx-capturing SNCR controls.

Holcim made the same prediction about the RTO's capacity to capture Carbon Monoxide. Without a trial burn, there's no way to prove what will happen to NOx pollution when 100% Petroleum Coke is burned. Holcim's SNCR system has not demonstrated a capacity to contain the kind of increase in NOx pollution that burning 100% Petroleum Coke could emit. Ellis County is in the DFW federal "non-attainment" area for ozone pollution. TCEQ is on the record as saying it's Nitrogen Oxide and Volatile Organic Compound pollution that drive DFW ozone levels. Allowing Holcim to potentially release more NOx pollution into the DFW airshed will make it more difficult to avoid 30 years of continuous violations of the Clean Air Act.

III. Holcim uses Unreliable "Capable of Accommodating" Adjustments for NO_x, VOC, SO_2, and Climate Crisis pollution to Avoid Triggering PSD requirements

Holcim repeatedly uses "capable of accommodating" adjustments to justify why SO_2, NO_x, and Climate Crisis pollution will not meet de minimis netting threshold for PSD determination.

In the application Holcim's "baseline emissions are assuming a full non-stop 8760 hours of operation a year – an impossible accomplishment for any cement plant and especially one as troubled as Holcim's. This is a baseline on paper, not one based in the real world. It's a technically lazy way to use the "capable of accommodating" adjustment provision and violates the PSD protocols.

The PSD emissions calculus in the application is inaccurate for NO_x, VOC, SO_2, and Climate Crisis pollution.

NOx is a good example and one specifically tied to DFW regulatory classifications. Holcim says it expects NO_x pollution to increase by 256 tons per year. That's a huge increase. It's 100 tons more NOx pollution than the entire TXI Midlothian cement plant reported releasing in 2017, and more than half of the Midlothian Ash Grove cement plant's NOx total for the same year. Usually an increase of just 40 tons per year would trigger a federal Prevention of Significant Deterioration review.

But Holcim tries to downplay this increase in two ways in the application.

By setting a paper "potential" baseline that's unrealistically high, the estimated increases don't seem as large. That 256 tons could be twice as big if the baseline was taken from actual annual operations. Secondly, by claiming a "capable of accommodating" exemption that assumes its existing NOx controls will handle this extra load, Holcim is wiping out the increase with an untested hypothesis on paper that they haven't earned the right to apply without a trial burn.

Without the control equipment tested at the estimated volume of new pollution, there's no way to know if it will actually work as efficiently. Note that Holcim is already the largest NOx polluter of the three Midlothian cement plants. Their SNCR system is already being taxed. Can it adequately handle another cement plant' worth of NOx pollution?

IV. National Ambient Air Standards for $PM_{2.5}$ Will Likely be Exceeded

As presented in the application, Holcim's modifications have it teetering on the brink of exceeding both the 24 hour and annual National Ambient Air Quality Standards for Particulate Matter 2.5 microns or smaller:

TABLE 12-4 NAAQS ANALYSIS RESULTS

POLLUTANT	AVERAGING PERIOD	MAXIMUM PREDICTED CONCENTRATIONS (µg/m³)	BACKGROUND CONCENTRATION (µg/m³)	TOTAL (µg/m³)	NAAQS (µg/m³)
$PM_{2.5}$	24-Hour	14.5	19.61	34.1	35
	Annual	2.90	8.688	11.6	12

There's little margin of error between Holcim's own self-interested predictions and violating the PM 2.5 NAAQS. This proximity alone should be prompting a more intense TCEQ review and actual operational evidence from a trial burn.

This is especially true since enforcement of Holcim's compliance with the PM 2.5 NAAQS is impossible with current air monitoring in the Midlothian area – or lack thereof. Without a PM 2.5 monitor at the modeled highest receptor location during a pre-permit trial burn or post-permit operation there is no way of know if the NAAQS will be violated by Holcim's modification or not.

Given the long and messy track record of this plant, a conservative approach to public health demands monitoring.

V. Impossibility of Enforcing "Good Combustion" as Best Available Control Technology for Carbon Monoxide.

Holcim suggests that it rely on "good combustion practices" and "properly controlled combustion" to comply with BACT for the capture of Carbon Monoxide. Holcim doesn't define what "good combustion" means. Downwinders at Risk would suggest that based on its track record Holcim is reluctant to define it since it's never practiced it.

Within the same permit application, Holcim both admits a massive failure to estimate or capture excess emissions of Carbon Monoxide and offers assurances of "good combustion" to capture that excess from here on out. What's kept Holcim from following "good combustion" practices prior to the submission of this application? If that's all there is to it, why haven't they been able to tweak their current production lines to reduce the excess CO?

In its 2014 permit request for the RTO, Holcim stated that it expected an increase of 25% in Carbon Monoxide (CO) pollution as a result of "the oxidation of the THC that is present in the kiln exhaust stream" as well as an increase in natural gas use, plus an almost 58,000 ton per year increase in CO2. The company assured the public and TCEQ that wet scrubbers alone and "good combustion practices" would be sufficient to control these increases. Once again it was wrong. It couldn't practice good combustion then and it shouldn't be allowed to use it as a loophole to escape pollution controls.

While the RTO was being pursued by Holcim, Downwinders argued that BACT for CO and VOCs both was really Selective Catalytic Reduction pollution control technology.

In October 2006, the Manufacturers of Emission Controls Association (MECA) submitted a written statement to the U.S. EPA regarding newly proposed emission standards for internal combustion engines. In that statement, MECA reported **one of the multi-pollutant benefits of SCR installations was a removal rate of over 80% of carbon monoxide.**

Diesel engine manufacturers have identified **CO reductions as large as 50-90% with use of SCR.**
(http://www.dieselforum.org/files/dmfile/SelectiveCatalyticReduction.pdf).

SCR manufacturers have **reported the same 50-90% CO removal rates.**
(http://www. factsaboutscr.com/scr/engine-control-standards.aspx)

In addition, **reliance on an SNCR unit like the one Holcim currently operates at its Midlothian cement plant can also *cause* CO and CO2 increases**:

*".... the use of ammonia-solution based SNCR for NOx control will adversely affect the oxidation of CO to CO2 because both reactions will compete for OH*radicals required for reduction of CO and NOx. One study revealed that a molar ratio of NH3to NOx of 0.4 increased CO emissions by up to 0.5 pounds per ton of clinker. When such ratio increased to 0.8 and 1.0,* ***the CO emissions were increased by up to 1.0 and 1.5 pounds per ton of clinker respectively.***("Prevention of Significant Air Quality Deterioration Review, Preliminary Determination" March, 2008 State of Georgia - Department of Natural Resources Environmental Protection Division - Air Protection Branch)

In this case, "good combustion practices" seem to translate to installation of SCR to prevent unnecessary CO and CO2 pollution increases, rather than allowing increases in CO limits.

Given Holcim's plant history and the ambiguity of the volumes of new air pollution potentially caused by approval of the application, the Public Health and Welfare of Midlothian and adjacent cities will only be served by requiring a trial burn to determine the accuracy of Holcim's pollution predictions before a permit modification is made.

Submitted by
Downwinders at Risk Education Fund
Jim Schermbeck, Director
1808 South Good Latimer
Dallas, Texas 75226

A hard copy of these comments is being mailed to the Chief Clerk's office.

ED_006073_00001590-00008

Comments on:
Renewal of Federal Operating Permit Title V
Draft Permit #02771 RN100788959
Building Materials Investment Corporation/GAF
2600 Singleton Blvd. Dallas Tx 75212

Submitted by Downwinders at Risk Education Fund
February 19th, 2021
to the Texas Commission on Environmental Quality
Office of the Chief Clerk
MC 105, P.O. box 13087
Austin, Texas 78711-3087

Downwinders at Risk is a 27-year-old environmental justice and clean air organization with a long history of official regulatory intervention in the permitting and operation of various air polluting facilities in the DFW region, including cement plants, coal plants, lead smelters, gas compressor stations, and batch plants.

In this matter we specifically represent West Dallas resident Ex. 6 Personal Privacy (PP) who resides at Ex. 6 Personal Privacy (PP) Ex. 6 Personal Privacy (PP) less than a mile northeast from the GAF asphalt shingle factory. Ex. 6 Personal Privacy (PP) Ex. 6 Personal Privacy (PP) and her family's health, quality of life, and enjoyment of their property have been, and still are, directly impacted by GAF's pollution regulated by this federal Title V permit.

We also represent other Downwinders at Risk Education Fund supporters who live in West Dallas, Oak Cliff, Dallas, and Grand Prairie who are potentially or already affected by GAF's pollution regulated by this permit.

Downwinders at Risk Education Fund strongly objects to the renewal of this Title V federal operating permit for the GAF asphalt shingle factory located in West Dallas and **we're requesting a public meeting on this matter on behalf of** Ex. 6 Personal Privacy (PP) **and our organization.**

Per Texas Administrative Code RULE §39.602, as persons who are filing public comment or hearing requests on or before the deadline for filing public comment or hearing requests, Downwinders at Risk requests to be mailed any correspondence related to the referenced permit application from this day forward at the address listed below.

We object to the renewal of GAF's Federal Title V Permit for the following reasons:

I. The Large Volume and Variety of Air Pollution from GAF should be Reviewed for Application of BACT and MACT as well as compliance with the National Ambient Air Quality Standards

According to the State of Texas' 2019 official emissions inventory, **GAF is the largest industrial Sulfur Dioxide polluter in Dallas County, comparable to the emissions of a giant cement plant or utility power station. It is the 4th largest source of industrial Particulate Matter pollution, and the ninth largest source of industrial Carbon Monoxide.**

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A. GAF's Particulate Matter Air Pollution

1. GAF is a Large PM Air Polluter

GAF is the largest PM polluter in West Dallas by a wide margin. Its annual volumes have ranged from **59 to 26 tons per year of PM 10, the majority of which was also the more dangerous PM 2.5.** These numbers are only from the yearly EPA Priority Pollutant inventories and do not include fugitive emissions, factory on-site truck traffic, or the operation of auxiliary equipment.

2. PM Health Harms Can Occur at Low Levels

Particulate Matter pollution has been linked to a long list health harms at or below levels considered safe and regulated by the EPA and the Texas Commission on Environmental Quality. In the largest effort of its kind, a nationwide Harvard School of Public Health study of more than 60 million senior citizens published in 2017 linked long-term exposure to PM pollution to thousands of premature deaths annually, ***even at levels well below the legal limits set by the U.S. Environmental Protection Agency.*** **The analysis found no sign of a "safe" level of pollution, below which the risk of dying early tapered off.**

There's now a substantial body of studies **associating PM exposure to neurological diseases**. In 2014, Harvard scientists found women exposed to higher levels of fine particulate matter during pregnancy may face up to twice the risk of having a child with **autism** than mothers living in areas with low particulate matter exposure. In 2013, USC researchers had concluded the same thing based on the proximity of pregnant women living near freeways. PM exposure has also been tied to attention deficit hyperactivity disorder, or **ADHD**, in children.

Some of the same kinds of health impacts have been noticed at the other end of the age spectrum. **Exposure to PM pollution has been tied to Parkinson's Disease, Dementia, Alzheimer's,** and general "cognitive decline" in adults. PM has also been linked to **immune and reproductive system damage.**

All of these health harms were documented at exposure levels at or below the EPA's National Ambient Air Quality Standards but since there's no fence line monitoring of PM pollution at GAF, there's no proof the plant is even meeting NAAQS standards for that pollutant off site, and no way to map potential PM hotspots.

3. There's No Cumulative Total of PM Pollution from GAF

Official PM air pollution totals being self-reported by GAF through the EPA Priority Pollutant Inventory **do not include fugitive emissions from raw materials piles, diesel emissions from truck traffic, or the air pollution from any other mobile equipment onsite such as locomotives or portable machinery.**

To obtain an accurate assessment of the risks posed by GAF's pollution it's necessary to have an accurate inventory of that pollution. GAF's residential neighbors currently only see a partial picture of the factory's total PM burden. To ascertain whether additional anti-pollution measures

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are necessary the factory and its property should be subject to a cumulative review of all sources of PM pollution, estimating the maximum impact of each.

That cumulative total should then be subject to new air modeling to determine potential hotspots and violations of the PM NAAQS.

GAF's PM pollution is being considered in isolation from all other sources of PM in the surrounding area which is not how residents actually experience the factory's pollution. They inhale GAF's air pollution in combination with the other industries and traffic along the Singleton corridor. To fully assess the impact of GAF's air pollution on its neighbors, cumulative modeling incorporating these other sources is required.

4. GAF's PM Pollution Should be Reviewed by EPA for Maximum Available Control Technology

Given GAF's close proximity to residential neighborhoods, the volume of its PM pollution, and the harmful nature of PM at even low levels of exposure, all state-of-the-art measures should be taken to reduce PM at the source. Beyond source reduction GAF should also be required to implement PM mitigation measures. EPA should fully review GAF's production processes and sources with the goal of going from enforcement of a NAAQS that's injurious to human health, to reducing total residential exposure as much as possible.

B. GAF's Sulfur Dioxide Pollution

1. GAF is Dallas County's Largest Sulfur Dioxide Air Polluter

For as long as it's been in operation, GAF has been among the largest industrial polluters of Sulfur Dioxide in Dallas County and North Texas. **Since at least 2014 it's been the largest SOx polluter in Dallas County, by a wide margin.** Its closest competitors are the County's two other asphalt shingle factories, although GAF's Sulfur Dioxide annual pollution easily eclipses their combined totals. In 2019 the factory reported releasing over 125 tons of the pollutant, more than many power plants and cement kilns.

2. Sulfur Dioxide is Hazardous to Human Health and the Source of Nuisance Conditions

Sulfur Dioxide is a gaseous pollutant with a strong odor. Its release often **triggers nuisance complaints associated with noxious smells and mild symptoms such as fatigue, headache, and nausea.** Ex. 6 Personal Privacy (PP) her family, and her neighbors already experience these kinds of nuisance conditions caused by GAF's SOx pollution and it's interfering with their quality of life and enjoyment of their property.

However anyone living near a source of Sulfur Dioxide pollution who can smell the pollution is also inhaling the pollution. Breathing Sulfur Dioxide can cause serious respiratory effects such as chest tightness and difficulty breathing. It also exacerbates existing respiratory diseases such as asthma. Children may be especially vulnerable to Sulfur Dioxide because they breathe larger volumes of air relative to their body weight than adults do. **Studies have shown that children exposed so SOx may develop more respiratory illnesses and make more emergency room visits than other children.** They may even develop other respiratory problems as they get older.

Children with asthma seem to be particularly sensitive to sulfur dioxide exposure. Sulfur Dioxide's harmful effects are magnified in combination with PM.

3. GAF Poses a Potential Non-Attainment Threat for SOx

Given how widespread GAF's neighbors' reports of nuisance odors are, the tremendous volume of SOx pollution being emitted, the relatively short GAF stacks that pollution is coming from, and the lack of fence line monitoring, **it's plausible that GAF is violating National Ambient Air Quality Standards for Sulfur Dioxide pollution.**

It's not unusual for a factory to be such a large polluter that it can single-handedly create a federal Non-Attainment area if control measures are not taken. In North Texas, the Exide lead smelter was solely responsible for a Non-Attainment Area for Lead in Central Frisco. More on point, in Midlothian the Holcim cement plant was forced to install scrubbers by EPA to prevent a Non-Attainment Area for **Sulfur Dioxide** encompassing all of Northern Ellis County.

GAF's maximum emission limits for SOX pollution as well as its annual self-reported SOx emissions should be independently modeled by EPA and long-term fence line monitoring should be deployed to determine GAF's compliance with NAAQS for Sulfur Dioxide.

4. GAF's Sulfur Dioxide Pollution Should be Reviewed by EPA for Maximum Available Control Technology

As noted, the SOx pollution from GAF dwarfs that of the other two asphalt shingle factories in Dallas County. The Owens Corning factory in Irving reported 76.4 tons of Sulfur Dioxide in 2019 and the TAMKO factory in Joppa reported 27.5 tons that year**. GAF says it released over 125 tons, or 36% of all Industrial SOx air pollution in Dallas County.** Although GAF's factory is larger, that difference in production doesn't alone account for how much more SOx GAF is releasing than its competitors.

Given the presence of nuisance conditions, the volume of pollution, the proximity of residential neighborhoods, and the lower SOx emissions of nearby similar factories, EPA should thoroughly review GAF to make sure the factory is employing all state-of-the-art measures to minimize Sulfur Dioxide pollution as much as possible.

C. GAF's Large Releases of Carbon Monoxide Pollution Could Indicate Poor Combustion Practices

Just as GAF's Sulfur Dioxide numbers are alarmingly larger than their asphalt shingle-making peers in Dallas County, their Carbon Monoxide pollution numbers also raise a red flag.

Owens Corning reports 15 tons of CO released in 2019, TAMKO 26.7. GAF reported its factory emitted 58.3 tons that same year, or more than the other two combined.

CO pollution can be a sign of poor combustion practices. Efficient combustion has a relatively low CO ratio and higher emissions can indicate Incomplete combustion taking place. Incomplete combustion can in turn lead to the release of toxic ***Products of Incomplete Combustion*** which are usually not accounted for in EPA Risk Assessments despite their documented harms at low levels of exposure.

EPA should fully review GAF's s production processes and sources to insure the most efficient combustion possible in all sources of CO pollution.

II. GAF's Location and Voluminous Pollution Require a Comprehensive Environmental Justice Review

GAF's 2-300 tons of annual pollution is being released in a central Dallas census tract with over 5000 people, an overwhelming majority of which are People of Color with a median income approximately one third of the Dallas average.

20% of the population is nine year of age or younger, 45% is 19 or younger - among the most vulnerable to the impacts of GAF's air pollution, including PM and Sulfur Dioxide. At least three early childhood program or day care centers and six school campuses are located in close proximity to his factory.

GAF's location in West Dallas is a dangerous legacy of 20th Century racist zoning that allowed large polluting factories to locate within close proximity of People of Color neighborhoods and Dallas Housing Authority units. It's only one of many heavy industries doing business along the Singleton corridor where an entire industrial district was allowed to develop next door to Black and Brown neighborhoods. Until the early 1980's this corridor hosted the notorious RSR lead smelter. In the early 1990's the waste from RSR created the nation's largest Superfund site. From the 1980's on, West Dallas has been a national environmental justice symbol.

GAF's continued operation is furthering that racist legacy. It's releasing copious amounts of noxious air pollution into West Dallas residential neighborhoods with impunity. It's placing disproportionate pollution burdens on some of Dallas most vulnerable populations already impacted by decades of environmental racism.

It's time the EPA subjected the plant to the kind of thorough review it would have received a long time ago if it had been located north of the Trinity River. For these reasons and others, we urge the rejection of GAF's Title V permit at this time.

Submitted by
Downwinders at Risk Education Fund
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ED_006073_00001591-00005

Message

From: Briana Kleiner [bkleiner@earthjustice.org]
Sent: 3/31/2021 9:46:05 PM
To: Regan, Michael [Regan.Michael@epa.gov]; Blevins, John [Blevins.John@epa.gov]; secyraimondo@doc.gov; paul.n.doremus@noaa.gov; Noah Valenstein [noah.valenstein@dep.state.fl.us]
CC: Fox, Radhika [Fox.Radhika@epa.gov]; Hoffer, Melissa [Hoffer.Melissa@epa.gov]; Starfield, Lawrence [Starfield.Lawrence@epa.gov]; scott.a.spellmon.mil@mail.mil; andrew.d.kelly@usace.army.mil
Subject: 60-Day Notice of Intent to Sue for Violations of the Endangered Species Act in Connection with EPA's Approval of Florida's Assumption of CWA 404 Permitting
Attachments: 60 Day - Notice of Intent - FL 404 Assumption.pdf

Good evening,

Please see attached the 60-Day Notice of Intent to Sue for Violations of the Endangered Species Act in Connection with EPA's Approval of Florida's Assumption of CWA 404 Permitting that was sent via certified mail today to all individuals addressed and CC'ed.

Thank you.

Best,

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she/her/hers
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EARTHJUSTICE

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EARTHJUSTICE

March 31, 2021
Via Certified Mail

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RE: 60-Day Notice of Intent to Sue for Violations of the Endangered Species Act in Connection with EPA's Approval of Florida's Assumption of CWA 404 Permitting

This letter serves as a 60-day notice of the Center for Biological Diversity's, Defenders of Wildlife's, Sierra Club's, Conservancy of Southwest Florida's, Florida Wildlife Federation's, Miami Waterkeeper's, and St. Johns Riverkeeper's intent to sue the Environmental Protection Agency ("EPA") for violation of the Endangered Species Act ("ESA") in connection with its approval of the Florida Department of Environmental Protection's ("FDEP") assumption of the administration of the dredge and fill permitting program under section 404 of the Clean Water Act. EPA's violations arise from its failure to comply with the substantive and procedural

requirements of section 7 of the ESA, as well as the prohibition on "take" of listed species in section 9, in approving the assumption. 16 U.S.C. §§ 1536, 1538. This letter constitutes notice required by the ESA, 16 U.S.C. § 1540(g)(2)(A)(i), prior to commencement of legal action.

I. THE ENDANGERED SPECIES ACT

Congress enacted the ESA in 1973 to provide for the conservation of endangered and threatened fish, wildlife, plants, and their natural habitats. 16 U.S.C. § 1531.[1] The ESA imposes substantive and procedural obligations on all federal agencies with regard to species that are listed or proposed for listing under the Act, as well as their critical habitats. *See id.* §§ 1536(a)(1), (a)(2), (a)(4), 1538(a); 50 C.F.R. § 402.01.

Section 7 of the ESA and its implementing regulations require each federal agency, in consultation with the appropriate wildlife agency—the U.S. Fish and Wildlife Service ("FWS") and/or National Marine Fisheries Service ("NMFS")—to insure that any action authorized, funded, or carried out by the agency is not likely to (1) jeopardize the continued existence of any threatened or endangered species or (2) result in the destruction or adverse modification of the critical habitat of such species. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14(a). "Action" is defined broadly to encompass "all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies." 50 C.F.R. § 402.02. "Jeopardize the continued existence of" is defined by regulation as engaging in an action that "reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species." 50 C.F.R. § 402.02. The obligation to "insure" against a likelihood of jeopardy or adverse modification requires agencies to give the benefit of the doubt to endangered species and to place the burden of risk and uncertainty on the proposed management action. *See Sierra Club v. Marsh*, 816 F.2d 1376, 1386 (9th Cir. 1987) (citing *Tennessee Valley Authority v. Hill*, 437 U.S. 153, 174-184 (1978)). The substantive duty imposed by section 7(a)(2) is constant, relieved only by an exemption from the Endangered Species Committee. 16 U.S.C. § 1536(h).

For each federal action, the federal action agency—here, EPA—must request from the wildlife agencies a list of any species listed or proposed for listing under the ESA that may be present in the area of the agency action. 16 U.S.C. § 1536(c)(1); 50 C.F.R. § 402.12. "Action area" is defined by regulation to be broader than simply the project area: it means "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." 50 C.F.R. § 402.02.

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[1] Congress defined "conservation" as "the use of *all* methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to [the Act] are no longer necessary." *Id.* § 1532(3) (emphasis added).

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Section 7 requires an action agency to engage in formal or informal consultation when it determines that its proposed action "may affect" listed species or critical habitat. *Id.* §§ 402.13, 402.14. "The minimum threshold for an agency action to trigger consultation with [the wildlife agencies] is low . . . ." *W. Watersheds Project v. Kraayenbrink*, 632 F.3d 472, 496 (9th Cir. 2011). "*Any possible* effect, whether *beneficial*, benign, adverse or of an undetermined character, triggers the formal consultation requirement . . . ." 51 Fed. Reg. 19,926, 19,949 (June 3, 1986) (emphases added); *see also* U.S. Fish & Wildlife Serv. & Nat'l Marine Fisheries Serv., *Endangered Species Consultation Handbook*, at xvi (1998) ("May affect [is] the appropriate conclusion when a proposed action may pose *any* effects on listed species or designated critical habitat."). Effects determinations must be based on the sum of *all* effects caused by the action. 50 C.F.R. § 402.02 (defining "effects of the action."). An action agency is not obligated to consult with the wildlife agencies *only* if the action agency properly determines that its proposed action will have no effect on listed species or critical habitats. *Id.* § 402.14. Both the action agency and the wildlife agency must "use the best scientific and commercial data available" in evaluating the action's effects. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14(d), (g)(8).

If an action may affect a listed species or critical habitat, the action agency must either engage in formal consultation or obtain the wildlife agency's written concurrence that the action is not likely to adversely affect listed species or critical habitat. 50 C.F.R. §§ 402.13(a), 402.14. Formal consultation concludes in the issuance of a biological opinion that determines whether the action is likely to jeopardize the continued existence of the listed species and/or adversely modify or destroy critical habitat. 16 U.S.C. § 1536(b)(3)(A); 50 C.F.R. § 402.14(h). Jeopardy exists if an action reasonably would be expected, directly or indirectly, to appreciably reduce the likelihood of the survival or recovery of a listed species in the wild. 50 C.F.R. § 402.02. "[D]estruction or adverse modification of critical habitat" is any "direct or indirect alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species." *Id.*

The action agency also has a mandatory duty to confer with wildlife agencies on any actions that are "likely to jeopardize the continued existence of any proposed species or result in the destruction or adverse modification of proposed critical habitat." *Id.* § 402.10(a). The conference process "is designed to assist the Federal agency and any applicant in identifying and resolving potential conflicts at an early stage in the planning process." *Id.*

Section 7 of the ESA requires that a biological opinion "detail[] how the agency action affects the species or its critical habitat." 16 U.S.C. § 1536(b)(3)(A); *see also* 50 C.F.R. § 402.14(h)(1)(ii), (iii). The wildlife agency must, in the biological opinion: 1) evaluate the current status and environmental baseline of affected species and critical habitats, 2) assess the effects of the action and cumulative effects on those species and habitats, and 3) analyze whether the effects of the action, when added to the environmental baseline together with any cumulative effects, is likely to jeopardize the continued existence of the species or adversely modify their critical habitats. 50 C.F.R. § 402.14(g). If the wildlife agency concludes that the proposed action is likely to jeopardize the species, it must specify reasonable and prudent

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alternatives that would avoid the likelihood of jeopardy. 16 U.S.C. § 1536(b)(3)(A); 50 C.F.R. § 402.14(h)(2).

The ESA requires the wildlife agency to provide an incidental take statement with the biological opinion when the agency anticipates that incidental taking of a threatened or endangered species will occur. 16 U.S.C. § 1536(b)(4); 50 C.F.R. § 402.14(i).[2] This requirement applies even if take of the species is not prohibited by statute or regulation. *Ctr. for Biological Diversity v. Salazar*, 695 F.3d 893, 910–11 (9th Cir. 2012). The statement must specify the permissible level of taking. 16 U.S.C. § 1536(b)(4); 50 C.F.R. § 402.14(i)(1)(i). Where the agency establishes that it cannot numerically quantify take, the statement may employ a "surrogate" to express the amount of take, but the surrogate must include "a clear standard for determining when the level of anticipated take has been exceeded." 50 C.F.R. § 402.14(i)(1)(i).

An incidental take statement serves as a check on the biological opinion's assumptions and conclusions, and provides for monitoring. 50 C.F.R. § 402.14(i)(3); *see also Salazar*, 695 F.3d at 911 (explaining purpose of ITS is to "serve[] as a check on the agency's original decision that the incidental take of listed species resulting from the proposed action will not [jeopardize the continued existence of the species]" (second alteration in original) (citation omitted)). The amount of take set out in the incidental take statement acts as a trigger that, if exceeded, invalidates the safe harbor, and requires the agencies to immediately reinitiate consultation. 50 C.F.R. § 402.14(i)(4). In addition, the incidental take statement must specify reasonable and prudent measures that the wildlife agency considers necessary or appropriate to minimize the effects of take, as well as reporting requirements and other terms and conditions with which the action agency must comply in order to implement the reasonable and prudent measures. 16 U.S.C. § 1536(b)(4)(B); 50 C.F.R. § 402.14(i)(1).

Once the action agency has initiated consultation, section 7(d) prohibits it from making "any irreversible or irretrievable commitment of resources with respect to the agency action which has the effect of foreclosing the formulation or implementation of any reasonable and prudent alternative measures" which would avoid violating ESA section 7(a)(2). 16 U.S.C. § 1536(d); 50 C.F.R. § 402.09. This prohibition is not an exception to the requirements of section 7(a)(2); it is in addition to the requirements of section 7(a)(2) and ensures that section 7(a)(2)'s substantive mandate is met. *See, e.g.*, *Pac. Rivers*, 30 F.3d at 1056–57 & n.14; *Defs. of Wildlife v. Jackson*, 791 F. Supp. 2d 96, 113 (D.D.C. 2011). This prohibition remains in effect until the procedural requirements of section 7(a)(2) are satisfied. 50 C.F.R. § 402.09.

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[2] Section 9 of the ESA prohibits "take" of endangered species by any person, which includes federal agencies. 16 U.S.C. § 1538(a)(1). "Take" means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect." *Id.* § 1532(19). FWS and NMFS have extended take prohibitions by regulation to most threatened species under their respective jurisdictions. *See* 50 C.F.R. § 17.31(a).

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Congress established the section 7 consultation process explicitly "to ensure compliance with the [ESA's] substantive provisions." *Thomas v. Peterson*, 753 F.2d 754, 764 (9th Cir. 1985) ("The ESA's procedural requirements call for a systematic determination of the effects of a federal project on endangered species. If a project is allowed to proceed without substantial compliance with those procedural requirements, there can be no assurance that a violation of the ESA's substantive provisions will not result."); *see also Wash. Toxics Coal. v. EPA*, 413 F.3d 1024, 1034 (9th Cir. 2005) ("The purpose of the consultation process . . . is to prevent later substantive violations of the ESA."); *Pac. Rivers Council v. Thomas*, 30 F.3d 1050, 1056–57 (9th Cir. 1994) ("Only after the [agency] complies with § 7(a)(2) can any activity that may affect the protected [species] go forward."). Therefore, until EPA completes the necessary consultation(s), it is out of compliance with both its procedural and substantive section 7(a)(2) obligations.

Even after the procedural requirements of a consultation are complete, however, the ultimate duty to ensure that an activity does not jeopardize a listed species lies with the action agency. An action agency's reliance on an inadequate, incomplete, or flawed biological opinion to satisfy its duty to avoid jeopardy is arbitrary and capricious. *See, e.g., Pyramid Lake Tribe of Indians v. U.S. Navy*, 898 F.2d 1410, 1415 (9th Cir. 1990); *Stop H-3 Ass'n. v. Dole*, 740 F.2d 1442, 1460 (9th Cir. 1984). Compliance with the biological opinion and its incidental take statement protects federal agencies, and others acting under the biological opinion, from enforcement action under section 9's prohibition against take;[3] however, take not in compliance with a biological opinion or absent a valid take statement is in violation of section 9 of the ESA. Thus, the substantive duty not to jeopardize listed species (or adversely modify critical habitat) remains in effect regardless of the status of the consultation.

II. BACKGROUND

A. EPA'S Approval of Florida's Assumption of CWA 404 Permitting

On August 20, 2020, EPA received an application from Florida requesting to assume the administration of the Clean Water Act's dredge and fill permitting program. Under the assumption, the Florida Department of Environmental Protection ("FDEP") would be responsible for permitting dredge and fill activities in all Waters of the United States ("WOTUS") in the State that are not retained by the U.S. Army Corps of Engineers. The Corps would retain permitting authority in tidal waters and adjacent wetlands within a 300-foot administrative boundary.

Dredging and filling in rivers, lakes, wetlands, and other WOTUS affects the environment and species not only in the immediate area, but also in upland and downstream areas. EPA accordingly recognized that it has a duty to complete ESA section 7 consultation on the effects that the 404 permitting program may have on protected species and critical habitats.[4]

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[3] 16 U.S.C. §§ 1536(o)(2); 1538(a); 50 C.F.R. § 17.31(a).

[4] *See, e.g.*, U.S. Envtl. Prot. Agency, *ESA Biological Evaluation for Clean Water Act Section 404 Assumption by the State of Florida* (Aug. 2020) [hereinafter BE].

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On November 22, 2019, FDEP sent a request to FWS and NMFS for input on a draft species list for Florida's assumption of the 404 Program. NMFS sent FDEP a response on April 15, 2020, stating that ESA-listed species under NMFS' jurisdiction "do not occur *in* waters that are assumable by the state"[5] On September 2, 2020, based on NMFS' April 15 jurisdictional determination, EPA determined that Florida's assumption of the 404 Program would have no effect on listed species under NMFS' jurisdiction. On September 3, 2020, NMFS concurred with EPA's determination—still premised on NMFS' jurisdictional determination.

EPA submitted its biological evaluation ("BE") to FWS and initiated formal consultation on September 2, 2020. EPA's BE found that Florida's assumption is "likely to adversely affect" 164 species under FWS' jurisdiction, is "not likely to adversely affect" 9 species (red wolf, gray bat, little brown bat, Indiana bat, Key Largo cotton mouse, whooping crane, Georgia blind salamander, bigcheek cave crayfish, and Ocala vetch), and would have "no effect" on 60 species.[6] Notably, EPA found the action would have "no effect" on shortnose sturgeon, Gulf sturgeon, or Atlantic sturgeon[7]— despite EPA's own comment that "the action could result in a [likely to adversely affect] determination" for shortnose sturgeon,[8] and NMFS' statement that all three species occur in Florida's rivers (and that critical habitat for Gulf sturgeon is designated in several Florida rivers).[9] EPA noted that critical habitat is designated for nearly 40 potentially affected species,[10] but did not map where critical habitat may exist within the action area or make any effects determinations for critical habitats.[11]

Just one month after EPA initiated formal consultation, FWS sent EPA its draft biological opinion on the proposed action. FWS issued a final biological opinion ("BiOp") shortly thereafter, on November 17, 2020. The BiOp purports to address the 235 species that EPA identified as being potentially affected in its BE.[12] FWS makes a cursory statement, with no analysis, that it "concurs with and adopts" EPA's list of species and "respective effect

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[5] Letter from Cathryn E. Tortorici, Chief, ESA Interagency Cooperation Division, Office of Protected Resources, NMFS to Heather Mason, PWS, Environmental Administrator, Submerged Lands and Environmental Resources Coordination, FDEP (Apr. 15, 2020) [hereinafter NMFS letter].

[6] BE at 252–177 (Table C.1.b). Due to an apparent error in page numbering in the BE's footer, all BE citations in this letter are to the PDF page number.

[7] *Id.* at 260.

[8] *Id.*

[9] NMFS letter.

[10] BE at 39–51 (Table 3-1).

[11] *Id.* at 52.

[12] BiOp at 45. Table C.1.b in the BE only lists 233 species, however.

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determinations."[13] FWS claims it is "not possible" to detail the effects of the action, so only "briefly summarizes major categories of impacts"—*i.e.*, biotic stressors, physical stressors, and physiochemical water quality stressors.[14] FWS also claims "it is not feasible, nor is it required, to conduct a meaningful . . . species-specific effects analysis in this BiOp."[15] FWS accordingly refers to a generic table of potential effects on listed species and offers a vague summary of effects that could occur to taxonomic groups (not to individual species).[16]

FWS concludes the approval of the proposed assumption "is not likely to jeopardize the continued existence of ESA-listed species [] identified in this BiOp and is not likely to destroy or adversely modify designated critical habitat identified in this BiOp."[17] This conclusion is based not on any analysis of effects to species, but rather on FWS' assumption that the technical assistance process detailed in the BiOp, and authorized by a Memorandum of Understanding ("MOU") between state and federal agencies, will provide a process to avoid jeopardy and adverse modification from individual fill and dredge permits in the future.[18] The MOU however does not require FWS to review, more less comment on, any permit and instead defers all meaningful analysis to the state.[19] Moreover, FWS' consideration of the likelihood of jeopardy or adverse modification from the issuance of individual permits does not assess the likelihood of jeopardy or adverse modification from the entire action under consultation—assumed authority for *all* dredge and fill permits.

The BiOp also includes an Incidental Take Statement ("ITS") that fails to quantify likely incidental take or specify the impacts such taking will have on affected species.[20] Rather, FWS asserts the information in the BE "did not allow [FWS] to . . . estimate the number of individuals that might be affected by the permitted activities."[21] FWS claims that will be provided information later, after the conclusion of this consultation, which may allow it in coordination with the state agencies to estimate incidental take on a project-specific basis.[22] FWS does not state that such information would allow it to estimate the *total* incidental take from EPA's action. FWS notes that it will "track the levels of take estimated through the technical assistance

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[13] *Id.* Although 235 species are listed as "potentially affected species" in EPA's BE Table 3-1, only 233 species were included in EPA's determination list in Table C.1.b (Effects of the Action on ESA-listed Species).
[14] *Id.* at 57–58.
[15] *Id.* at 54.
[16] *Id.* at 57–65.
[17] *Id.* at 68.
[18] *Id.* at 68–69
[19] Memorandum of Understanding between Fla. Fish & Wildlife Conservation Comm'n, U.S. Fish & Wildlife Servs., & the Fla. Dep't of Env't Prot., Nov. 16, 2020.
[20] *Id.* at 69–73.
[21] *Id.* at 69; *see also id.* at 70 (asserting FWS cannot "accurately estimate the specific amount of incidental take at this time that is anticipated to occur as a result of the action.").
[22] *Id.* at 70.

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process" on an ongoing basis, but does not explain how it will estimate take numbers (or surrogates), how it will analyze cumulative effects, how it will analyze whether projects jeopardize species or destroy critical habitat, or indicate what it will do with that information.[23] The ITS includes no incidental take limit that would trigger reinitiation of consultation if exceeded.[24] Yet FWS states that "[i]ncidental take exemption will be afforded to EPA when its approval of the State's assumption [of 404 permitting] is carried out"—*before* FWS even receives information on project-specific incidental take.[25]

B. Listed Species and Designated Critical Habitats

EPA's approval of Florida's assumption may affect hundreds of terrestrial, aquatic, and avian species and critical habitats protected under the ESA. Dredge and fill of the assumed waters can affect and cause harm to species and habitats under FWS' jurisdiction, as well as marine and coastal species and habitats under NMFS' jurisdiction.

EPA's BE identifies 235 potentially affected species under FWS' jurisdiction, and notes that critical habitat has been designated for 40 of those species. However, neither the BE nor BiOp includes nesting sea turtles, which fall under FWS' jurisdiction. FWS explains that dredge and fill activities in assumed waters can have direct and indirect effects on species that inhabit Florida's beaches.[26] Those activities can similarly affect sea turtles that nest on those beaches (loggerhead, green, leatherback, hawksbill, and Kemp's ridley sea turtles), most considerably by causing coastal development that eliminates nesting habitat and disrupts nesting behavior through lighting and other disturbances.[27]

Dredge and fill activities also may affect sturgeon while they are in freshwater (when they are under FWS' jurisdiction), as well as Atlantic sturgeon critical habitat in the St. Marys River. Despite EPA's determination that the action will have "no effect" on the Florida's three ESA-listed sturgeon species, FWS acknowledges that "sedimentation, water quality degradation, and to a lesser extent direct habitat loss are potential effects."[28]

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[23] *Id.*

[24] *See id.* at 73 (referring to 50 C.F.R. § 402.16 take exceedance reinitiation requirement in context of individual permits).

[25] *Id.* at 70.

[26] *Id.* at 60.

[27] *See id.* at 59 ("Dredge and fill activities are also frequently associated with coastal development.").

[28] *Id.* at 63.

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Moreover, the effects of the approval are not limited to only the assumed waters. The action area also includes indirectly affected habitats.[29] In particular, dredge and fill in assumed waters can affect downstream estuarine, marine, and tidal waters and the species that inhabit them.[30] For example, these activities can increase sedimentation and turbidity, change water temperature, resuspend and transport pollutants, alter water flows (temporally, spatially, and by magnitude), and increase or change nutrient runoff.[31] As a result, marine and coastal habitats may experience more frequent and/or widespread red tide events, changes to salinity or bathymetry, loss of seagrass and other aquatic vegetation, changes in nutrient deposition, and higher contaminant loads. Dredge and fill activities in upstream habitats can also alter food webs that provide prey for marine and coastal species.

Dozens of ESA-protected species and critical habitats (under NMFS' jurisdiction) are found in Florida's bays, lagoons, inlets, and other intertidal, neritic, and nearshore oceanic environments and may be affected by impacts from dredge and fill in assumed waters. These include the threatened loggerhead sea turtle, the threatened green sea turtle, the endangered Kemp's ridley sea turtle, the endangered leatherback sea turtle, the endangered hawksbill sea turtle, the threatened giant manta ray, the threatened Nassau grouper, the endangered smalltooth sawfish, the endangered shortnose sturgeon, the endangered Atlantic sturgeon, and the threatened Gulf sturgeon. Dredge and fill activities can also affect the ESA-protected Johnson's seagrass and elkhorn, staghorn, boulder star, mountainous star, lobed star, rough cactus, and pillar corals in Florida's waters. Critical habitat along the Florida coast for the loggerhead sea turtle, smalltooth sawfish, elkhorn coral, staghorn coral, and Johnson's seagrass also may be affected by dredge and fill activities in assumed waters. Yet the BE does not address effects to these species or critical habitats.

III. NOTICE OF VIOLATION OF ESA SECTION 7, 16 U.S.C. § 1536(A)(2)

EPA's approval of FDEP's assumption of CWA 404 permitting authority violates the agency's procedural and substantive obligations under ESA section 7(a)(2) and its implementing regulations. 16 U.S.C. § 1536(a)(2). EPA's approval is an "action" under ESA section 7. *See* 50 C.F.R. § 402.02. ESA section 7 requires EPA to complete consultation if its action "may affect" listed species or critical habitat. 16 U.S.C. § 1536(a)(2); 50 C.F.R. §§ 402.02,

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[29] *Cf. id.* at 38 ("The action area consists of, and is limited to, the State-assumed waters (assumed waters) *and areas affected directly or indirectly* by the action, including affected upland, terrestrial areas. (emphasis added).

[30] *See, e.g.,* BiOp at 42 (explaining how "freshwater eventually makes its way to the nearly 2,000 miles of Florida coastline and marine ecosystem"); BE at 58 (Fig. 4-1 – Historic freshwater flows compared to freshwater flows after C&SF Project), 256 (describing adverse impacts to coastal and marine birds).

[31] *See, e.g.,* BiOp at 61 ("Permitted activities may also result in changes to hydrologic regimes and water quality in coastal areas."); BE at 256 (stating action could cause "[i]mpacts to habitat, hydrology, and water quality" affecting birds in coastal and marine habitats).

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402.13, 402.14. EPA is not in compliance with this duty until the required consultation has been *completed*, and a legally valid biological opinion has been produced. *See* 16 U.S.C. § 1536(b); *Pac. Rivers Council*, 30 F.3d at 1056–57; *Stop H-3*, 740 F.2d at 1460.

EPA's approval may affect several species and critical habitats on which EPA failed to consult. And EPA has failed to satisfy its section 7 duties for the species on which it did consult because the BiOp on which EPA relies is arbitrary and capricious and contrary to law. In addition, EPA's reliance on the MOU between FDEP, FWCC, and FWS constitutes an unlawful delegation of EPA's section 7 duties, in violation of the ESA. The BiOp states that the FWS' actions in reviewing and prescribing protective measures is not an action subject to the ESA. However, since avoiding jeopardy and adverse modification of critical habitat hinges entirely on the content of those measures, FWS' actions are federal actions and must comport with the ESA consultation and substantive requirements. In taking these actions, EPA is also violating section 7(d) of the ESA.

A. Unlawful No Effect Determination on Species and Critical Habitats under NMFS' Jurisdiction

EPA failed to lawfully consider the effects the approval may have on ESA-protected species and critical habitats under NMFS' jurisdiction and arbitrarily assumed the approval would have "no effect" on such species in violation of its obligations under ESA section 7.[32]

EPA's no effect determination appears to be based on finding that "ESA-listed species under NMFS' jurisdiction do not occur *in* waters that are assumable by the state" (emphasis added) as stated in NMFS' April 15, 2020 letter.[33] However, the ESA places an independent duty on EPA to ensure that its action will not jeopardize species or adversely modify critical habitat, wherever the species or habitat may be located.

ESA section 7(a)(2) consultation must occur for species and critical habitat that are in the "action area" and "action area means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." 50 C.F.R. 402.02(d).

NMFS' April letter however was solely based on an action area that consisted of "assumed" waters. To the contrary, the "action area" is not limited to the assumed waters; it also includes areas that would be indirectly impacted by the Federal action, like waters downstream of assumed waters. EPA therefore failed to consider, much less analyze, all areas that would be affected directly or indirectly, as required under federal law. See 16 U.S.C. 1536(a)(2); 50 C.F.R. § 402.02(d).

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[32] BE at 35.

[33] NMFS letter.

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There is ample evidence that the approval may affect NMFS jurisdictional species and habitats, as explained above.[34] The undersigned and other members of the public also submitted comments on the proposed approval identifying EPA's duty to consult on species under NMFS' jurisdiction and setting forth facts on effects to protected species that could result from the proposed approval.[35]

EPA is required by ESA section 7(a)(2) to initiate and complete consultation with NMFS to insure the state's assumption will not jeopardize the continued existence of ESA-listed loggerhead sea turtles, green sea turtles, Kemp's ridley sea turtles, leatherback sea turtles, hawksbill sea turtles, giant manta rays, Nassau grouper, smalltooth sawfish, shortnose sturgeon, Atlantic sturgeon, Gulf sturgeon, Johnson's seagrass, elkhorn coral, staghorn coral, boulder star coral, mountainous star coral, lobed star coral, rough cactus coral, or pillar coral, or adversely modify or destroy designated critical habitat for the loggerhead sea turtle, smalltooth sawfish, elkhorn coral, staghorn coral, or Johnson's seagrass. EPA has not done so, therefore is in violation of the ESA and its implementing regulations.

B. Failure to Properly Consult on Certain Species under FWS' Jurisdiction

EPA did not consider or make an effects determination for ESA-listed sea turtles that nest on Florida's beaches, and accordingly did not consult with FWS on the effects the approval may have on those sea turtles. In addition, EPA made arbitrary "no effect" determinations that are not based on the best available science for several other species under FWS' jurisdiction, so failed to consult on those species. EPA also failed to obtain FWS' written concurrence for most of its determinations that the action is not likely to adversely affect certain species. Finally, EPA did not make effects determinations or complete consultation on critical habitats under FWS' jurisdiction that may be affected by the approval. EPA's failure to complete consultation on these FWS jurisdictional species and habitats violates EPA's procedural and substantive obligations under ESA section 7.

As described above, dredge and fill activities in assumed waters may affect nesting sea turtles in various ways. EPA therefore was required to consult with FWS on those effects, but did not.

There is also ample evidence that dredge and fill activities in assumed waters may affect listed sturgeon that are found in Florida rivers. EPA appears to acknowledge the effects in its BE, but irrationally determined the proposed action would have "no effect" on shortnose sturgeon, Atlantic sturgeon, or Gulf sturgeon. EPA's "no effect" determination for smalltooth sawfish similarly disregards "[i]mpacts to aquatic habitat, hydrology, and water quality" that

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[34] *See also* BE at 255–58 (finding action is likely to adversely affect several species that inhabit the same coastal waters as NMFS jurisdictional species).

[35] Letter from Tania Galloni et. al, to Kelly Laylock, EPA, Nov. 2, 2020.

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dredge and fill activities may cause.[36] The possible effects on these species (as well as Atlantic sturgeon critical habitat in the St. Marys River) make EPA's "no effect" determinations arbitrary and capricious, and require EPA to complete consultation with FWS. EPA failed to do so.

For the same reasons that EPA's approval may affect marine and coastal species under NMFS' jurisdiction (as described above), it may affect the black-capped petrel. EPA notes the species is found "in relatively shallow waters near shore,"[37] where indirect effects are likely. EPA's determination that its approval will have "no effect" on the species is thus arbitrary and capricious. EPA is required to complete consultation with FWS on the petrel, but has not done so.

EPA failed to obtain FWS' written concurrence for its "not likely to adversely affect" determinations for eight species: the gray bat, little brown bat, Indiana bat, Key Largo cotton mouse, whooping crane, Georgia blind salamander, bigcheek cave crayfish, and Ocala vetch. While FWS expressly concurred with EPA's not likely to adversely affect determination for the red wolf,[38] it issued no similar concurrences for the other species.[39] Rather, the BiOp indicates that several of these species *are* likely to be adversely affected. For example, it states that mice in tropical hardwood hammock/mangrove habitats (where the Key Largo cotton mouse is found) are "likely to be impacted."[40] FWS also states that "water quality degradation, and both chemical and from sedimentation [*sic*], could have adverse effects" on cave-dwelling amphibians[41]—*e.g.*, the Georgia blind salamander. And it lists adverse effects likely to occur to crustaceans in caves, wells, or sinkhole habitats[42]—*e.g.*, bigcheek cave crayfish. Without FWS' proper written concurrence, EPA's "not likely to adversely affect" determinations for these species are not final and cannot satisfy its section 7 consultation duties. EPA therefore has failed to complete consultation as required for these eight species.

Finally, the BE notes that critical habitat has been designated for 40 potentially affected species. Dredge and fill activities in assumed waters may affect these critical habitats, including but not limited to critical habitat for the Everglades snail kite, smalltooth sawfish, and Florida manatee and proposed critical habitat for the Florida bonneted bat. EPA therefore is required to consult with FWS on the effects the approval may have on critical habitats for these species. Yet

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[36] BE at 260.
[37] *Id.* at 257.
[38] *See* BiOp at 59.
[39] The BiOp contains a statement that some bats that occur in limestone karst caves are unlikely to be adversely affected because they "are rare/unlikely to occur in the state." *Id.* at 60. But it is unclear to which species this statement refers. The BE indicates that the gray bat does occur in the Panhandle, and that the little brown bat is "occasionally detected" in Florida, so the BiOp's statement is inapplicable to at least those two species. BE at 252–53.
[40] BiOp at 59.
[41] *Id.* at 62; *see also id.* at 64 (listing adverse impacts to crustaceans cave-dwelling).
[42] *Id.* at 64.

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EPA apparently did not make effect determinations for or consult with FWS on these critical habitats.

EPA is required by ESA section 7(a)(2) to initiate and complete consultation with FWS to insure the Assumption will not jeopardize the continued existence of ESA-listed loggerhead sea turtles, green sea turtles, Kemp's ridley sea turtles, leatherback sea turtles, hawksbill sea turtles, shortnose sturgeon, Atlantic sturgeon, or Gulf sturgeon, or adversely modify or destroy designated critical habitat for Atlantic sturgeon, Florida manatees, or other species identified in BE Table 3-1. EPA has not done so, therefore is in violation of the ESA and its implementing regulations.

C. Reliance on Inadequate and Legally Flawed Biological Opinion

EPA has failed to comply with its duty to insure against jeopardy or adverse modification for the species and critical habitats covered by FWS' BiOp because the BiOp is arbitrary and capricious and contrary to law. FWS concluded in the BiOp that FDEP's assumption of CWA section 404 permitting would not jeopardize the survival or recovery of 235 species identified in Appendix C of EPA's BE. The BiOp is arbitrary, capricious, and contrary to law for several reasons.

First, FWS did not adequately describe or analyze the effects of action, as required by the ESA and its implementing regulations. Section 7 of the ESA requires that a biological opinion "detail[] how the agency action affects the species or its critical habitat."[43] The ESA's implementing regulations specify that a biological opinion must include: "A detailed discussion of the environmental baseline of the listed species and critical habitat [and] [a] detailed discussion of the effects of the action on listed species or critical habitat."[44] The BiOp provides only vague information on the environmental baseline and the proposed action's effects on the more than 200 species it purports to assess—it does not come close to providing the detail required by law. In the BiOp's effects section, FWS simply cites a table from EPA's BE that contains cursory acknowledgements that the proposed action is likely to adversely affect 163 species.[45] Nowhere in the BiOp or BE does FWS or EPA, respectively, provide any detail on the type or magnitude of effects the action may have on any particular species. Rather, FWS states it cannot and will not detail or analyze "species-specific effects."[46] That fails to satisfy the ESA's mandate to detail how the agency action affects species.

Second, and relatedly, FWS made a blanket "no jeopardy" determination for hundreds of species in one fell swoop, without offering any species-specific support or rationale.[47] FWS

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[43] 16 U.S.C. § 1536(b)(3)(A).
[44] 50 C.F.R. § 402.14(h)(1)(ii), (iii).
[45] BiOp at 45.
[46] *Id.* at 54, 57–58.
[47] BiOp at 68.

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did not attempt to conduct any jeopardy analysis for any given species, nor could it given its refusal to assess the species-specific effects of the action. FWS' hollow, blanket jeopardy "analysis" fails employ the best available science or otherwise comply with the ESA.[48]

Third, FWS' reliance on the technical assistance process laid out in the BiOp and MOU in making its no jeopardy determination violates the ESA's consultation requirements. In addition to unlawfully delegating ESA duties from the action agency, as described below, the MOU authorizes a process that does not allow the agencies to assess whether the federal action—EPA's approval of FDEP's CWA section 404 assumption—may jeopardize listed species or adversely modify critical habitat. Both the MOU and BiOp set the scale of the jeopardy analysis at the individual 404 permit-level, *not* the federal action level. Assessing jeopardy in such a piecemeal, segmented way unlawfully prevents an assessment of whether the entire federal action may jeopardize listed species or adversely modify critical habitat. There is no indication that FWS or EPA will at any point in the future consider whether the cumulative effects of all individual permits issued under the MOU (the effect of the agency action) may jeopardize any species or adversely modify critical habitat. Even if they did, that would be inadequate to satisfy the requirement to insure against jeopardy *before* the federal agency acts.[49] By relying on the MOU, FWS' no jeopardy determination is arbitrary and capricious and contrary to law.

Fourth, the ITS in the BiOp is arbitrary and capricious and contrary to law. The ITS must quantify likely incidental take and specify the impacts such taking will have on affected species.[50] It must include a rational take trigger and this trigger cannot be an amount of take that causes jeopardy.[51] The amount of take authorized may not be coextensive with the scope of the agency action because such a take limit will not serve as a check on the assumptions underlying the no-jeopardy conclusion or a trigger for reinitiation of consultation.[52] FWS expressly declines to quantify any amount of expected incidental take or specify the impacts of such taking on any species.[53] It does not attempt to set a surrogate to measure or limit take. It thus establishes no limit on the allowable amount of take that the delegation will cause. And it fails to set any rational take trigger for reinitiating consultation.[54]

FWS' apparent reliance on the MOU process (which is not a section 7 consultation) to quantify take in the future is likewise unlawful.[55] FWS' regulations detailing consultation on programmatic action explain that an ITS is not required at the programmatic level because any

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[48] 16 U.S.C. § 1536(a)(2), (b).
[49] *See Pac. Rivers Council v. Thomas*, 30 F.3d 1050, 1056–57 (9th Cir. 1994).
[50] 16 U.S.C. § 1536(b)(4); 50 C.F.R. § 402.14(i)(1)(i).
[51] 50 C.F.R. § 402.14(i)(4); *Salazar*, 695 F.3d at 911.
[52] *Or. Nat. Res. Council v. Allen*, 476 F.3d 1031, 1038–41 (9th Cir. 2007).
[53] BiOp at 70.
[54] *See id.* at 73.
[55] *See* 50 C.F.R. § 402.14(i)(6) (permitting deferral of ITS requirements *only* if those requirements "will be addressed in subsequent section 7 consultation").

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incidental take resulting from any subsequent action under that program "will be addressed in subsequent section 7 *consultation*."[56] According to EPA, the subsequent actions under the program, i.e. assumption, will explicitly not be addressed in subsequent consultation, but instead will go through a "coordination process . . . that is similar" to section 7 consultation.[57] Therefore, FWS is not following its own regulations regarding programmatic consultation.

The ITS also must include adequate measures to minimize take and must compel federal agencies and applicants to implement such measures.[58] The ITS, however, relies on a *future* process to minimize take, which lacks sideboards to ensure that the take will not cause jeopardy or be at odds with the biological opinion's assumptions and conclusions. It provides EPA take coverage once the CWA delegation is approved without requiring EPA to implement ESA take minimization measures. It also appears to provide permittees conditional take coverage if they comply with all permit conditions that minimize take. The nature and adequacy of such conditions is not yet known, however, so FWS lacks a reasoned basis for determining the permits and permittee actions in compliance with them will not result in an unacceptable amount of take. Accordingly, the ITS fails to specify or require the reasonable and prudent measures necessary to minimize take, or ensure that such measures are adequate. The ITS fails to comply with the requirements of the ESA and its implementing regulations, and, accordingly, the BiOp is invalid because it lacks a valid ITS.[59]

The substantive goal of consultation under ESA section 7(a)(2) is to ensure that federal actions do not jeopardize the continued existence of listed species or adversely modify critical habitat. Federal agencies may not take action that could harm a listed species until they have completed the ESA section 7(a)(2) consultation process and have received a *valid* biological opinion. The BiOp is not valid for the reasons described above, so EPA may not rely on this document to conclude that its actions will avoid jeopardy or to satisfy its procedural duties under the ESA. Under these circumstances, the ESA requires that EPA avoid any action that causes harm to listed species or designated critical habitat pending compliance with the procedural requirements of section 7(a)(2). By approving FDEP's assumption request, EPA is in violation of section 7(a)(2).

D. Unlawful Delegation of ESA Section 7 Obligations

Section 7(a) of the ESA places the duty on EPA to determine what effects a state's assumption of the 404 program may have on listed species and their critical habitats and to ensure its action (approval of state assumption) will not jeopardize the continued existence of listed species.[60] The FDEP, USFWS and FWCC MOU lays out a process whereby the EPA will

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[56] *Id.* (emphasis added).
[57] MOU at 4.
[58] *Id.* § 402.14(i)(1)(ii), (iv).
[59] 16 U.S.C. § 1536(b)(4); 50 C.F.R. § 402.14(i).
[60] 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14.

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rely on a then-future, abridged programmatic biological opinion that merely instructs FDEP and FWCC to determine at the project level if an activity may affect listed species or critical habitat, determine whether there will be jeopardy, and determine what conditions may be necessary to ensure no jeopardy. However, these determinations must be made by the federal action agency in consultation with the federal wildlife agencies.[61]

The MOU makes FWS' oversight of future permits only limited and discretionary. EPA's effective delegation of its section 7(a)(2) obligations to state agencies through the MOU is arbitrary and capricious and violates the ESA. Moreover, there is no factual basis to make a no jeopardy finding in light of Florida's track record regarding the protection of listed species.[62] Indeed, the approval of the MOU itself which memorializes FWS' action of creating a new technical assistance process intended to supplant section 7 consultation, is itself FWS agency action subject to consultation. It does not appear FWS has conducted the necessary intra-agency consultation on the MOU.

EPA's effective delegation of its section 7(a)(2) obligations to state agencies through the MOU is also arbitrary and capricious and violates the ESA.

Under this scheme, avoiding jeopardy and adverse modification of critical habitat will depend entirely on the content of FWS' review of projects and its proposed protective measures. Neither the delegation nor the BiOp establishes binding standards for such measures. The BiOp states that FWS' review and protective measures are not actions subject to section 7 of the ESA, which purports to divorce FWS' actions from the substantive jeopardy standard. Because FWS' review plays such a central role, which will greatly impact and even possibly determine the survival and recovery of listed species in Florida, it will result in actions subject to section 7 and the BiOp's attempt to exempt those actions from section 7 itself violates that section.

IV. NOTICE OF VIOLATION OF ESA SECTION 7, 16 U.S.C. § 1536(d)

Section 7(d) of the ESA prevents federal agencies from making "any irreversible or irretrievable commitment of resources . . . which has the effect of foreclosing the formulation or implementation of any reasonable and prudent alternative measures."[63] "This prohibition . . . continues until the requirements of section 7(a)(2) are satisfied."[64] The additional restrictions imposed by section 7(d) are in effect because EPA initiated the consultation process, but it has not completed the process lawfully with the issuance of a valid biological opinion. The prohibition against the irreversible and irretrievable commitment of resources applies to EPA's approval of FDEP's assumption, and adoption and implementation of FWS' BiOp.

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[61] 16 U.S.C. § 1536(a)(2).

[62] Letter from Tania Galloni et. al, to Kelly Laylock, EPA, Nov. 2, 2020.

[63] 16 U.S.C. § 1536(d).

[64] 50 C.F.R. § 402.09.

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EPA is violating this prohibition by taking actions that could potentially foreclose implementation of measures required to avoid jeopardy, including but not limited to approving FDEP's assumption of the CWA section 404 program and ability to immediately begin permitting dredge and fill activities in assumed waters. Such permitted activities may not be able to be reversed before EPA comes into compliance with section 7(a)(2). These and other actions that make irreversible or irretrievable commitments of resources violate ESA section 7(d).

V. NOTICE OF VIOLATION OF ESA SECTION 9, 16 U.S.C. § 1538

Without a biological opinion from FWS and NMFS and accompanying ITS including reasonable and prudent measures and terms and conditions to minimize impacts and incidental take, the EPA and FDEP do not have incidental take authorization, and therefore any actions they authorize that result in take violate section 9 of the ESA.[65]

* * *

If EPA fails to cure its violations within 60 days of receiving this letter, the Center for Biological Diversity, Defenders of Wildlife, Conservancy of Southwest Florida, Florida Wildlife Federation, Miami Waterkeeper, and St. Johns Riverkeeper intend to file suit for declaratory and injunctive relief. *See* 5 U.S.C. § 706(2); 16 U.S.C. § 1540(g)(1)(A).

If you believe any of the foregoing is in error, have any questions, or would like to discuss this matter, please do not hesitate to contact us.

Sincerely,

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[65] 16 U.S.C. § 1536(b)(4); 16 U.S.C. § 1538.

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Message

From: Suzanne Novak [snovak@earthjustice.org]
Sent: 4/27/2021 3:14:03 PM
To: Regan, Michael [Regan.Michael@epa.gov]; Freedhoff, Michal [Freedhoff.Michal@epa.gov]; Hoffer, Melissa [Hoffer.Melissa@epa.gov]; Collazo Reyes, Yvette [CollazoReyes.Yvette@epa.gov]
CC: ppookkulam@earthjustice.org
Subject: CORRECTED 5 U.S.C. § 553(e) petition enclosed
Attachments: PFAS PMN Exemptions Petition 04-27-2021.pdf

Dear Administrator Regan, Deputy Assistant Administrator Freedhoff, Director Collazo-Reyes, and Acting General Counsel Hoffer,

Attached please find a slightly corrected version of the petition sent earlier this morning.

Thank you,

Suzanne Novak
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From: Suzanne Novak <snovak@earthjustice.org>
Sent: Tuesday, April 27, 2021 10:36 AM
To: Regan.Michael@epa.gov; Freedhoff.Michal@epa.gov; Collazo.yvette@epa.gov; hoffer.melissa@epa.gov
Cc: Priya Pookkulam <ppookkulam@earthjustice.org>
Subject: 5 U.S.C. § 553(e) petition enclosed

Dear Administrator Regan, Deputy Assistant Administrator Freedhoff, Director Collazo, and Acting General Counsel Hoffer,

Attached please find a Petition, pursuant to 5 U.S.C. § 553(e), on behalf of Advance Carolina; Alaska Communities Against Toxics; BlueGreen Alliance; Buxmont Coalition for Safer Water; Clean Cape Fear; Defend Our Health; Delaware Riverkeeper Network; Democracy Green; Environmental Defense Fund; International Association of Fire Fighters; Merrimack Citizens for Clean Water; the National PFAS Contamination Coalition; Natural Resources Defense Council (NRDC); Safer Chemicals, Healthy Families; and, Union of Concerned Scientists. The Petition requests that EPA prohibit the use of certain exemptions to the premanufacture notice requirements of the Toxic Substances Control Act for per- and polyfluoroalkyl substances (PFAS).

We are also sending this by First Class Mail to Administrator Regan.

Please do not hesitate to contact me with any questions.

Respectfully,

Suzanne Novak
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PETITION TO THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

To prohibit the use of certain exemptions to the premanufacture notice requirements of the Toxic Substances Control Act for per- and polyfluoroalkyl substances (PFAS)

SUBMITTED ON BEHALF OF:

Advance Carolina; Alaska Community Action on Toxics; BlueGreen Alliance; Buxmont Coalition for Safer Water; Clean Cape Fear; Defend Our Health; Delaware Riverkeeper Network; Democracy Green; Environmental Defense Fund; International Association of Fire Fighters; Merrimack Citizens for Clean Water; the National PFAS Contamination Coalition; Natural Resources Defense Council; Safer Chemicals, Healthy Families; and Union of Concerned Scientists

BY: **EARTHJUSTICE**
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DATE: April 27, 2021

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April 27, 2021

Via mail and e-mail

Michael Regan, Administrator
Michal Freedhoff, Principal Deputy Assistant Administrator Office of Chemical Safety and Pollution Prevention
Yvette Collazo Reyes, Director of the Office of Pollution Prevention and Toxics
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460

RE: Petition to prohibit the use of certain exemptions to the premanufacture notice requirements of the Toxic Substances Control Act for per- and polyfluoroalkyl substances (PFAS)

Dear Administrator Regan, Deputy Assistant Administrator Freedhoff, and Director Collazo Reyes,

Earthjustice, on behalf of Advance Carolina; Alaska Community Action on Toxics; BlueGreen Alliance; Buxmont Coalition for Safer Water; Clean Cape Fear; Defend Our Health; Delaware Riverkeeper Network; Democracy Green; Environmental Defense Fund; International Association of Fire Fighters; Merrimack Citizens for Clean Water; the National PFAS Contamination Coalition; Natural Resources Defense Council; Safer Chemicals, Healthy Families; and Union of Concerned Scientists (collectively, "Petitioners")[1] submit this petition requesting that the Environmental Protection Agency (EPA) amend regulations relating to the new chemical review process under the Toxic Substances Control Act (TSCA). *See* 5 U.S.C. § 553(e) (providing that each agency shall provide persons the right to petition for the "issuance, amendment, or repeal of a rule"). More specifically, Petitioners respectfully request that EPA

[1] Statements of interest from each Petitioner are set forth in Appendix A.

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amend four EPA-created exemptions from TSCA's pre-manufacture notice (PMN) requirement—the Byproducts Exemption, the Low Volume Exemption (LVE), the Low Release and Exposure Exemption (LoREX), and the Polymer Exemption—to prohibit their use for per- and polyfluoroalkyl substances ("PFAS").

INTRODUCTION

The United States is awash with PFAS: human-made, long-lasting, toxic, and often bioaccumulative chemicals. Thousands of these structurally similar and largely unregulated chemicals have been used across various industries and goods, including in firefighting foam, non-stick cookware, food packaging, and many other household products. People are exposed to PFAS through various sources, including the products we use, the food we eat, the air we breathe, and the water we drink, and PFAS from those various sources accumulate in our bodies. PFAS are pervasive in the environment and present in the bodies of virtually every person in the U.S.

The weight of the scientific evidence developed over the past few years has shown that exposure to even small amounts of a variety of PFAS is associated with numerous adverse health effects, including cancer and immune suppression. And PFAS pose even greater risks to potentially exposed or susceptible subpopulations ("greater risk populations"), including firefighters, communities living in polar regions, communities living near facilities that release PFAS, infants, children, and developing fetuses. Scientists agree that all yet-unstudied PFAS may have similar effects on human health.

Wide usage and poor regulation of PFAS have led to extensive contamination throughout the United States and an emerging public health crisis. Yet, EPA continues to permit new PFAS

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to enter commerce through TSCA's new chemicals program, despite the risks they pose. Moreover, in recent years, most of those approvals occurred through exemptions to EPA's PMN program—thereby curtailing or entirely sidestepping a process designed to require an individual safety review of potentially toxic chemicals and keep the public apprised of those reviews. Three of those exemptions are the primary subjects of this petition—the Byproducts Exemption, the LVE, and the LoREX Exemption (collectively, "Challenged Exemptions"). At least one environmental contamination crisis in the Cape Fear River Basin in North Carolina involved PFAS released into communities through such a loophole; yet it is unknown how many other similar crises exist or are in the making since there is little public information about PFAS approved through such loopholes.

TSCA permits use of PMN exemptions only for chemicals that EPA determines *will not* present an unreasonable risk of injury to human health or the environment. Thus, as EPA has acknowledged, if a class of chemicals cannot or no longer can meet that high standard for a particular exemption, TSCA requires EPA to make that class of chemicals ineligible for the exemption. The Byproduct, LVE, and LoREX Exemptions were enacted decades ago, long before the risks associated with exposure to even low levels of PFAS were known and before TSCA required EPA to consider risks to greater risk populations when deciding whether the "will not present an unreasonable risk" standard had been met. In light of the information now known about PFAS and the changes made by the 2016 amendments to TSCA's "unreasonable risk" assessment, EPA cannot conclude that new PFAS that would otherwise meet the non-risk criteria for the Byproduct, LVE, and LoREX Exemptions will not present an unreasonable risk. As discussed further herein, it is legally impermissible—as well as dangerous—to continue to permit approval of new PFAS via the Byproduct, LVE, and LoREX Exemptions. EPA therefore

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must and should grant this Petition and make PFAS ineligible for those Challenged Exemptions. For similar reasons, EPA should also amend the Polymer Exemption—which already makes certain PFAS ineligible for it—to ensure the exclusion of all PFAS polymers.

FACTUAL BACKGROUND

A. Overview of PFAS Characteristics and Uses

Per- and polyfluoroalkyl substances ("PFAS") are a "large, complex, and ever-expanding" family of human-made organic chemicals used in hundreds of products and industrial processes, including airplane jet engines, firefighting foam, and everyday products like waterproof jackets, nonstick pans, and paints.[2] PFAS typically have a linear or branched carbon chain or "backbone," characterized by the replacement of hydrogen (H) atoms with fluorine (F) atoms that are bonded to the carbon chain.[3] PFAS, for purposes of this Petition, are defined by having at least one perfluoroalkyl moiety, or a carbon atom from which all bonded H atoms have been replaced with F atoms.[4] The carbon-fluorine bond is "one of the strongest ever created by man," making PFAS extremely persistent in the environment and difficult to break down or remediate.[5] PFAS also often have bioaccumulative qualities (they can build up in the human

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[2] *See* EPA, *Per- and Polyfluoroalkyl Substances (PFASs): Chemistry and Behavior*, CLU-IN, https://clu-in.org/contaminantfocus/default.focus/sec/Per-_and_Polyfluoroalkyl_Substances_(PFASs)/cat/Chemistry_and_Behavior/ (last updated Apr. 20, 2021). *See also* Organisation for Economic Co-operation and Development (OECD), *Toward a New Comprehensive Global Database of Per- And Polyfluoroalkyl Substances (PFASs): Summary Report on Updating the OECD 2007 List of Per- And Polyfluoroalkyl Substances (PFASs)* (2018), https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=ENV-JM-MONO(2018)7&doclanguage=en; KEMI Swedish Chemicals Agency, *Occurrence and Use of Highly Fluorinated Substances and Alternatives* (2015), https://www.kemi.se/download/18.6df1d3df171c243fb23a98ea/1591454109137/report-7-15-occurrence-and-use-of-highly-fluorinated-substances-and-alternatives.pdf; Julian Glüge et al., *An Overview of the Uses of Per- and Polyfluoroalkyl Substances (PFAS)*, 12 Env't Sci: Process & Impacts 2345 (2020), https://pubs.rsc.org/en/content/articlelanding/2020/EM/D0EM00291G#!divAbstract.

[3] Robert C. Buck et al., *Perfluoroalkyl and Polyfluoroalkyl Substances in The Environment: Terminology, Classification, and Origins*, 7 Integrated Env't Assessment & Mgmt. 513 (2011), https://setac.onlinelibrary.wiley.com/doi/full/10.1002/ieam.258.

[4] *Id.*

[5] *See Examining the Federal Response to the Risks Associated with Per- and Polyfluoroalkyl Substances (PFAS): Hearing Before the S. Comm. on Env't & Pub. Works*, 116th Cong. 2 (2019) (testimony of Linda S. Birnbaum, Dir., Nat'l Inst. Env't Health Sci. & Nat'l Toxicology Program, Nat'l Ins. Health); Zhanyun Wang et al., *A Never-Ending Story of Per- and Polyfluoroalkyl Substances (PFASs)?*, 51 Env't Sci. & Tech. 2508 (2017), https://pubs.acs.org/doi/10.1021/acs.est.6b04806.

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body over time) and, as discussed further herein, have been shown to be toxic at very low levels.[6]

PFAS encompass a wide array of chemicals with varying size, structure, and chemical composition. The original PFAS, such as PFOA and PFOS, are referred to as "long-chain" (because of the length of the carbon chain and the number of fluorine atoms bonded to the carbon chain). In an attempt to address growing concerns over the toxicity, environmental persistence, and biological uptake of long-chain PFAS, manufacturers shifted towards producing and using shorter-chain or "replacement" PFAS in more recent years,[7] resulting in significant increases of those PFAS in the environment.[8] EPA estimates there are over 6,000 known PFAS, for over 1,000 of which EPA does not have a defined chemical structure.[9] These known PFAS include short- and long-chain PFAS, PFAS polymers, and PFAS "precursors," or compounds that may degrade to long- and short-chain PFAS in the environment.[10]

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[6] *See, e.g.*, Carol F. Kwiatkowski et al., *Scientific Basis for Managing PFAS as a Chemical Class*, 7 Env't Sci. & Tech. Letters 532 (2020), https://pubs.acs.org/doi/abs/10.1021/acs.estlett.0c00255.

[7] Stephen K. Ritter, *Fluorochemicals Go Short*, c&en (Feb. 1, 2020), https://cen.acs.org/articles/88/i5/Fluorochemicals-Short.html.

[8] Buck et al., *supra* note 3, at 524. *See also* Mei Sun et al., *Legacy and Emerging Perfluoroalkyl Substances Are Important Drinking Water Contaminants in the Cape Fear River Watershed Of North Carolina*, 3 Env't Sci. & Tech. Letters 415 (2016), https://pubs.acs.org/doi/full/10.1021/acs.estlett.6b00398; Xianming Zhang et al., *Source Attribution of Poly- and Perfluoroalkyl Substances (PFASs) in Surface Waters from Rhode Island and the New York Metropolitan Area*, 3 Env't Sci. & Tech. Letters 316 (2016), https://pubs.acs.org/doi/abs/10.1021/acs.estlett.6b00255.

[9] *PFAS Master List of PFAS Substances (Version 2)*, EPA, https://comptox.epa.gov/dashboard/chemical_lists/pfasmaster (last updated Sept. 16, 2020). Lists PFAS "from within and outside EPA, encompass PFAS of potential interest based on environmental occurrence (through literature reports and analytical detection) and manufacturing process data, as well as lists of PFAS chemicals procured for testing within EPA research programs. The consolidated list contains 6330 PFAS CAS-name substances, with 5264 represented with a defined chemical structure."

[10] Kwiatkowski et al., *supra* note 6; Buck et al., *supra* note 3.

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B. A Growing Body of Research Demonstrates the Serious Risks PFAS Pose to Human Health

Human exposure to several well-studied and widely-produced PFAS has been linked to a variety of adverse health effects, including cancer, elevated cholesterol, obesity, immune suppression, pre-eclampsia, liver and kidney damage, and endocrine disruption.[11] Some of these adverse effects have been linked to both short- and long-term exposures at extremely low concentrations.[12] For purposes of comparison, most chemicals that have been deemed toxic at low levels of exposure, like cyanide, are considered toxic at exposure concentrations of parts per billion. However, some PFAS exert toxicity at the parts per trillion level; this means that these PFAS are linked to harm at exposure levels 1,000 times lower than cyanide.[13]

The link between PFAS exposure and cancer has garnered increasing attention over the past few years. Most members of the Science Advisory Board to EPA concluded that PFOA is "likely to be carcinogenic to humans," and the International Agency for Research on Cancer (IARC), a branch of the World Health Organization, has characterized PFOA as "possibly carcinogenic to humans."[14] Several epidemiological studies have established a link between PFOA exposure and certain cancers. For example, a 2013 study examining a group of people residing near a chemical plant in the Mid-Ohio Valley found significant associations between exposure to PFOA and kidney and testicular cancer.[15] Short-chain "replacement" PFAS were

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[11] Agency for Toxic Substances and Disease Registry (ATSDR), U.S. Dep't Health & Hum. Servs., *Toxicological Profile for Perfluoroalkyls: Draft for Public Comment* (2018), https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf.
[12] *Id.*
[13] *See Ground Water and Drinking Water*, EPA, https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations (last updated Jan. 5, 2021).
[14] Letter from Dr. M. Granger Morgan, Chair, EPA Sci. Advisory Bd., & Dr. Deborah Cory-Slechta, Chair, PFOA Risk Assessment Rev. Panel, to Stephan L. Johnson, Adm'r, EPA at 3 (May 30, 2006), https://nepis.epa.gov/Exe/ZyPDF.cgi/901S0J00.PDF?Dockey=901S0J00.PDF; IARC Working Grp. on the Evaluation of Carcinogenic Risks to Hums., *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 110: Some Chemicals Used as Solvents and in Polymer Manufacture* ch. 6.3 (Int'l Agency for Rsch. on Cancer 2017), https://www.ncbi.nlm.nih.gov/books/NBK436276/#a006.sec6.3.
[15] Vaughn Barry et al., *Perfluorooctanoic Acid (PFOA) Exposures and Incident Cancers Among Adults Living Near a Chemical Plant*, 121 Env't Health Persp. 1313 (2013) https://pubmed.ncbi.nlm.nih.gov/24007715/.

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also detected in North Carolina's Cape Fear River watershed,[16] which serves as the drinking water supply for several counties that have been identified as potential cancer clusters for testicular and thyroid cancer.[17] Studies are currently underway to establish possible associations between the PFAS and those cancer clusters.[18]

Amidst the global COVID-19 pandemic, the effects of certain PFAS on the immune system are especially concerning. In 2016, the National Toxicology Program concluded that PFOA and PFOS are presumed to pose "an immune hazard to humans based on a high level of evidence that PFOA [and PFOS] suppressed the antibody response."[19] These conclusions were based in part upon a study examining a cohort of children that linked high serum concentrations of PFOA and PFOS in the children to a weakened antibody response following vaccination.[20]

C. Research Also Demonstrates PFAS's Risks to Aquatic Organisms

PFAS exposure is also associated with acute and chronic toxicity in many aquatic species, including algae, invertebrates, amphibians, and fish. In these species, PFAS exposure was associated with increased mortality, immunotoxicity, and a range of growth and developmental effects.[21] For example, high serum levels of PFAS were detected in striped bass

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[16] Sun et al., *supra* note 8.

[17] N.C. Dep't Health & Hum. Servs., *Summary of Selected Cancer Rates for Bladen, Brunswick, New Hanover and Pender Counties, 1996 – 2015, and Comparison to Statewide Rates* (2018), https://epi.dph.ncdhhs.gov/oee/pfas/Summary%20of%20Selected%20Cancer%20Rates_all%20counties_7Nov2018.pdf.

[18] Stapleton Lab, *PFAS Research*, Duke Nicholas School of the Environment, https://sites.nicholas.duke.edu/stapletonlab/research/pfas-research/ (last visited Mar. 15, 2021).

[19] Nat'l Toxicology Program, U.S. Dep't Health & Hum. Servs., *NTP Monograph on Immunotoxicity Associated with Exposure to Perfluorooctanoic Acid (PFOA) or Perfluorooctane Sulfonate (PFOS)* 1 (2016), https://ntp.niehs.nih.gov/ntp/ohat/pfoa_pfos/pfoa_pfosmonograph_508.pdf.

[20] Philippe Grandjean et al., *Serum Vaccine Antibody Concentrations in Children Exposed to Perfluorinated Compounds*, 307 JAMA 1142 (2012), https://pubmed.ncbi.nlm.nih.gov/22274686/.

[21] Lutz Ahrens & Mirco Bundschuh, *Fate and Effects of Poly- and Perfluoroalkyl Substances in the Aquatic Environment: A Review*, 33 Env't Toxicology & Chemistry 1921 (2014), https://setac.onlinelibrary.wiley.com/doi/full/10.1002/etc.2663; John P. Giesy et al., *Aquatic Toxicology of Perfluorinated Chemicals*, 202 Rev. Env't Contamination & Toxicology 1 (2010), https://link.springer.com/chapter/10.1007%2F978-1-4419-1157-5_1; R. Wesley Flynn et al., *Chronic Per-/Polyfluoroalkyl Substance Exposure Under Environmentally Relevant Conditions Delays Development in Northern*

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in North Carolina's Cape Fear River, an economically important, yet declining, commercial and recreational fish population in the region. The levels were the highest recorded of any fish species studied in the country, and were associated with immune and liver dysfunction, potentially reducing survival for this commercially important fish population.[22]

PFAS also biomagnify along ecosystem food chains, which results in greater risks of adverse health effects to both larger animals and to people who eat them. More specifically, PFAS can be absorbed by plants and algae that are then subsequently ingested by wildlife, accumulating up the food chain.[23] This phenomenon results in the buildup of PFAS in larger organisms, like marine mammals.

D. PFAS Contamination Is a Widespread Problem Throughout the United States

As a result of their: chemical characteristics; widespread use; and limited regulation of their manufacture, disposal, and releases into the environment, PFAS are now pervasive environmental contaminants.[24] PFAS enter the environment in several ways, including from the

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Leopard Frog (Rana pipiens) Larvae, 40 Evn't Toxicology & Chemistry 711 (2020), https://setac.onlinelibrary.wiley.com/doi/abs/10.1002/etc.4690; R. Wesley Flynn et al., *Dietary Exposure and Accumulation of Per- and Polyfluoroalkyl Substances Alters Growth and Reduces Body Condition of Post-Metamorphic Salamanders*, 765 Sci. Total Env't 142730 (2021), https://www.sciencedirect.com/science/article/abs/pii/S0048969720362598; Gerald T. Ankley et al., *Assessing the Ecological Risks of Per- and Polyfluoroalkyl Substances: Current State-of-the Science and a Proposed Path Forward*, 40 Env't Toxicology & Chemistry 564 (2020), https://setac.onlinelibrary.wiley.com/doi/10.1002/etc.4869; Georgia M. Sinclair et al., *What Are the Effects of PFAS Exposure at Environmentally Relevant Concentrations?*, 258 Chemosphere 127340 (2020), https://www.sciencedirect.com/science/article/pii/S0045653520315332#bib53.

[22] Theresa C. Guillette et al., *Elevated Levels of Per-And Polyfluoroalkyl Substances in Cape Fear River Striped Bass (Morone Saxatilis) Are Associated with Biomarkers of Altered Immune and Liver Function*, 136 Env't Int'l 105358 (2020), https://www.sciencedirect.com/science/article/pii/S0160412019334762.

[23] *See, e.g.*, Claudia E. Müller et al., *Biomagnification of Perfluorinated Compounds in a Remote Terrestrial Food Chain: Lichen–Caribou–Wolf*, 45 Env't Sci. & Tech. 8665 (2011), https://pubs.acs.org/doi/10.1021/es201353v.

[24] *See, e.g.*, Xindi C. Hu et al., *Detection of Poly- and Perfluoroalkyl Substances (PFASs) in US Drinking Water Linked to Industrial Sites, Military Fire Training Areas, and Wastewater Treatment Plants*, 3 Env't Sci. & Tech. Letters 344 (2016), https://pubs.acs.org/doi/abs/10.1021/acs.estlett.6b00260; Keegan Rankin et al., *A North American and Global Survey of Perfluoroalkyl Substances in Surface Soils: Distribution Patterns and Mode of Occurrence*, 161 Chemosphere 333 (2016), https://www.researchgate.net/publication/305498037_A_North_American_and_global_survey_of_perfluoroalkyl_substances_in_surface_soils_Distribution_patterns_and_mode_of_occurrence; Belén González-Gaya et al., Perfluoroalkylated Substances in the Global Tropical and Subtropical Surface Oceans. 48 Env't Sci. & Tech. 13076 (2014), https://pubs.acs.org/doi/10.1021/es503490z.

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manufacturing, processing, use, and disposal of PFAS and products that either contain PFAS or generate PFAS as a waste byproduct.[25] In addition, PFAS precursors that are emitted or released into the environment via these pathways can biotransform into other PFAS, including long-chain PFAS like PFOA that have been largely phased out.[26]

People are then routinely exposed to these chemicals from multiple sources, including their water, food, and products and materials they use or contact. PFAS exposure occurs inside homes through treated furniture and rugs, cookware and cleaning supplies, and inhalation of household dust particles carrying PFAS molecules. As a result of these varied and continuing exposures, PFAS have been detected in nearly 99 percent of Americans.[27]

In the United States, PFAS-contaminated drinking water is a significant exposure route of concern.[28] A 2016 study estimated that 16.5 million Americans across 33 states and three American territories were supplied drinking water with detectable levels of PFAS. For six million of these individuals, PFOS and PFOA levels exceeded EPA's health advisory level of 70 ppt.[29] The 2016 study, however, likely underestimates how many people in the U.S. are drinking

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[25] Buck et al., *supra* note 3, at 518; Martin Scheringer & Zhanyun Wang, OECD & UNEP Global PFC Group, *Synthesis Paper on Per- and Polyfluorinated Chemicals (PFCs)* 21 (2013), https://www.oecd.org/chemicalsafety/risk-management/synthesis-paper-on-per-and-polyfluorinated-chemicals.htm. *See also* Andrew B. Lindstrom et al., *Application of WWTP Biosolids and Resulting Perfluorinated Compound Contamination of Surface and Well Water in Decatur, Alabama, USA*, 45 Env't Sci. & Tech. 8-15 (2011), https://pubs.acs.org/doi/10.1021/es1039425; N.C. Dep't Env't Quality, *GenX Frequently Asked Questions* (2017), https://files.nc.gov/ncdeq/GenX/FAQ_updated_100417-5.pdf (stating that GenX is "also produced as a byproduct during other manufacturing processes and it may have been present in the environment for many years before being produced commercially as GenX.").

[26] Kwiatkowski et al., *supra* note 6; Craig Butt et al., *Biotransformation Pathways of Fluorotelomer-based Polyfluoroalkyl Substances: A Review*, 33 Env't Toxicology & Chemistry 243 (2013), https://doi.org/10.1002/etc.2407; Buck et al., *supra* note 3.

[27] Antonia M. Calafat et al., *Polyfluoroalkyl Chemicals in the US population: Data from the National Health and Nutrition Examination Survey (NHANES) 2003–2004 and Comparisons with NHANES 1999–2000*, 115 Env't Health Persps. 1596 (2007), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2072821/. *See also* CDC, ATSDR, *An Overview of Perfluoroalkyl and Polyfluoroalkyl Substances and Interim Guidance for Clinicians Responding to Patient Exposure Concerns* (2018), https://stacks.cdc.gov/view/cdc/77114.

[28] Hu et al., *supra* note 24.

[29] *Id.* at 344.

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water contaminated with PFAS, the level of PFAS in U.S. drinking water, and the extent to which individuals are potentially harmed by this PFAS contamination because: 1) EPA's available water testing methods have the capability to detect only a few dozen out of the thousands of PFAS in circulation; and 2) adverse health effects are associated with exposure to PFAS at lower levels than PFAS are tested for in the environment, or reported.[30]

Once PFAS enter the environment, they can stay there for decades or longer.[31] In fact, DuPont scientists have confirmed that certain PFAS take between "1200 and 1700 years" to degrade. Due to their persistent nature and high mobility in water, PFAS undergo a process called global distillation, or the "grasshopper effect," that causes PFAS in the environment to migrate to polar regions over time.[32] Global ocean current patterns represent a significant pathway for this long-range transport of PFAS to the Arctic; for example, an estimated two to twelve metric tons of PFOA are transported to the Arctic every year.[33] Recent studies also detected the replacement PFAS GenX in remote Arctic waters.[34] The transported PFAS accumulate over time in the environment and in biological organisms.[35] Arctic mammals and

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[30] Jody Shoemaker & Dan Tettenhorst, EPA, Office Rsch. & Dev., EPA/600/R-18/352, *Method 537.1: Determination of Selected Per- and Polyfluorinated Alkyl Substances in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)* (2018), https://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=343042&Lab=NERL&simpleSearch=0&showCriteria=2&searchAll=Determination+of+Selected+Per-+and+Polyfluorinated+Alkyl+Substances+&TIMSType=&dateBeginPublishedPresented=11%2F02%2F2016.

[31] Wang et al., *supra* note 5.

[32] Samuel Byrne et al., *Exposure to Polybrominated Diphenyl Ethers and Perfluoroalkyl Substances in a Remote Population of Alaska Natives*, 231 Env't Pollution 387 (2017), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6945979/pdf/nihms-967862.pdf.

[33] Konstantinos Prevedouros et al., *Sources, Fate and Transport of Perfluorocarboxylates*, 40 Env't Sci. & Tech. 32 (2006), https://pubmed.ncbi.nlm.nih.gov/16433330/.

[34] Hanna Joerss et al., *Transport of Legacy Perfluoroalkyl Substances and the Replacement Compound HFPO-DA through the Atlantic Gateway to the Arctic Ocean—Is the Arctic a Sink or a Source?*, 54 Env't Sci. & Tech. 9958 (2020), https://pubs.acs.org/doi/abs/10.1021/acs.est.0c00228.

[35] Inputs of PFOA to the Arctic via ocean currents are nearly two times greater than those from atmospheric deposition of precursor breakdown products. Derek C. G. Muir & Cynthia A. de Wit, *Trends of Legacy and New Persistent Organic Pollutants in the Circumpolar Arctic: Overview, Conclusions, and Recommendations*, 408 Sci. Total Env't 3044 (2010), https://www.sciencedirect.com/science/article/abs/pii/S004896970901147 4; Prevedouros et al., *supra* note 33.

birds inhabiting supposedly pristine habitats have detectable PFAS concentrations in their blood serum, liver, and fat tissues.[36] This includes sensitive species such as beluga whales and polar bears.[37]

E. Greater Risk Populations Experience Greater Risks of Harm from PFAS Exposure

While PFAS are pervasive environmental contaminants and are detectable in the blood serum of most Americans,[38] scientific studies have identified certain subpopulations that are more vulnerable to the adverse health effects of PFAS exposure due to either greater exposure or greater susceptibility to harm than the general population. Such greater risk populations include occupational workers, firefighters, communities living in polar regions, communities living near facilities that release PFAS, children, infants, and the developing fetus. Firefighters, for instance, are highly exposed to PFAS from both their presence in the fire-fighting foam as well as the PFAS-coated protective gear for heat resistance (i.e. "turnout gear") and combusted PFAS-treated household items like carpets and furniture.[39] Additionally, biomonitoring data of workers in the fluorochemical industry over decades have demonstrated consistently higher levels of PFAS in blood serum compared to the general population.[40] Arctic communities, including Alaskan Indigenous Tribal Communities, particularly those that subsist on fish and marine mammals, also experience disproportionately high levels of PFAS exposure due to the

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[36] *See, e.g.*, Wouter A. Gebbink et al., *Observation of Emerging Per- and Polyfluoroalkyl Substances (PFASs) in Greenland Marine Mammals*, 144 Chemosphere 2384 (2016), https://pubmed.ncbi.nlm.nih.gov/26610298/.
[37] *Id*; Jonathan W. Martin et al., *Identification of Long-Chain Perfluorinated Acids in Biota from the Canadian Arctic*, 38 Env't Sci. & Tech. 373 (2004), https://pubs.acs.org/doi/10.1021/es034727%2B.
[38] Calafat et al., *supra* note 27. *See also* ATSDR *Overview of Perfluoroalkyl and Polyfluoroalkyl Substances*, *supra* note 27.
[39] *See UArizona Researchers Study Health Risks of Chemicals in Firefighter Foam, Gear*, FireEngineering (Feb. 13, 2020), https://www.fireengineering.com/2020/02/13/484059/uarizona-researchers-study-health-risks-of-chemicals-in-firefighter-foam-gear/#gref.
[40] *See* Geary W. Olsen, *PFAS Biomonitoring in Higher Exposed Populations*, *in* Toxicological Effects of Perfluoroalkyl and Polyfluoroalkyl Substances 77, 80–99 (Jamie C. DeWitt ed., Springer Int'l Publ'g 2015).

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aforementioned long-range transport of PFAS to polar regions and bioaccumulation in Arctic aquatic organisms.[41]

Children, infants, and the developing fetus are also exposed to higher levels of PFAS and are more susceptible to harm from these exposures. PFAS can transfer across the placenta, and have been found in umbilical cord blood,[42] putting the developing fetus at risk of exposure.[43] Exposure to even low levels of certain PFAS during pregnancy has been linked to decreased birth weight,[44] and altered growth, learning, and immune responses in infants and older children.[45] PFAS have also been detected in breast milk, prolonging exposures beyond pregnancy and into infancy and early childhood.[46] And because of their small size, dietary intake, and increased likelihood of hand-to-mouth behaviors, children and infants bear higher body burdens (i.e. have higher serum concentration per body weight) and experience higher PFAS exposures than older individuals.[47]

Scientists describe the period of early life, spanning from early pregnancy to early childhood as a "critical window" of development during which rapid growth, differentiation,

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[41] Samuel C. Byrne et al., *Exposure to Polybrominated Diphenyl Ethers and Perfluoroalkyl Substances in a Remote Population of Alaska Natives*, 231 Env't Pollution 387 (2017), https://doi.org/10.1016/j.envpol.2017.08.020; Samuel C. Byrne et al., *Exposure to Perfluoroalkyl Substances and Associations with Serum Thyroid Hormones in a Remote Population of Alaska Natives*, 166 Env't Rsch. 537 (2018), https://doi.org/10.1016/j.envres.2018.06.014.
[42] *See, e.g.*, Tye E. Arbuckle et al., *Umbilical Cord Blood Levels of Perfluoroalkyl Acids and Polybrominated Flame Retardants*, 216 Int'l J. Hygiene & Env't Health 184 (2013), https://www.sciencedirect.com/science/article/abs/pii/S143846391200034X.
[43] Kerstin Winkens et al., *Early Life Exposure to Per- and Polyfluoroalkyl Substances (PFASs): A Critical Review*, 3 Emerging Contaminants 55 (2017), https://www.sciencedirect.com/science/article/pii/S2405665017300033.
[44] ATSDR *Toxicological Profile for Perfluoroalkyls*, *supra* note 11, at 12–14; Cathrine C. Bach et al., *Perfluoroalkyl and Polyfluoroalkyl Substances and Human Fetal Growth: A Systematic Review*, 45 Critical Revs. in Toxicology 53, https://doi.org/10.3109/10408444.2014.952400; Paula I. Johnson et al., *The Navigation Guide—Evidence-Based Medicine Meets Environmental Health: Systematic Review of Human Evidence for PFOA Effects on Fetal Growth*, 122 Env't Health Persps. 1028, https://doi.org/10.1289/ehp.1307893.
[45] Kristen M. Rappazzo et al., *Exposure to Perfluorinated Alkyl Substances and Health Outcomes in Children: A Systematic Review of the Epidemiologic Literature*, 14 Int'l J. Env't Rsch. & Pub. Health 691 (2017), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5551129/.
[46] *See, e.g.*, Arbuckle et al., *supra* note 42.
[47] Winkens et al., *supra* note 43.

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nutrition uptake, and formation of final organ structures occur. For these reasons, toxic chemicals can have devastating, life-long impacts even at low levels of exposure during early development.[48] Studies have linked early life exposures to some PFAS—including both long-chain and replacement PFAS—to impaired growth, learning, and immune response,[49] as well as delayed puberty[50] and decreased antibody response following childhood vaccinations.[51] This early life sensitivity to PFAS exposure is reflected in scientific assessments conducted by federal agencies: ATSDR calculated that the minimal risk levels ("MRLs") (an estimate of the amount of a chemical a person can eat, drink, or breathe each day without a detectable risk to health) for children who drink water contaminated with certain PFAS, including PFOA, PFOS, PFHxS, and PFNA, are a quarter to a third of the MRLs for healthy adults.[52]

Finally, communities residing near PFAS-contaminated sites should also be considered greater risk populations because they experience higher levels of PFAS exposure and could be additionally burdened by other non-chemical stressors that increase susceptibility to harm from PFAS.

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[48] Jerrold J. Heindel et al., *Developmental Origins of Health and Disease: Integrating Environmental Influences*, 156 Endocrinology 3416 (2015), https://bit.ly/3b3ibNZ; Deborah Bennett et al., *Project TENDR: Targeting Environmental Neuro-Developmental Risks the TENDR Consensus Statement*, 124 Env't Health Persps. A118 (2016), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4937840/.

[49] Rappazzo et al., *supra* note 45; Chunyuan Fei, *Perfluorinated Chemicals and Fetal Growth: A Study within the Danish National Birth Cohort*, 115 Env't Health Persps. 1677 (2007), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2072850/.

[50] Maria-Jose Lopez-Espinosa et al., *Association of Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate* (PFOS) with *Age* of *P*uberty among *Children Living Near* a *Chemical Plant*, 45 Env't Sci. & Tech. 8160 (2011), https://pubs.acs.org/doi/10.1021/es1038694.

[51] *See, e.g.*, Berit Granum et al., *Pre-Natal Exposure to Perfluoroalkyl Substances May Be Associated with Altered Vaccine Antibody Levels and Immune-Related Health Outcomes in Early Childhood*, 10 J. Immunotoxicology 373 (2013), https://www.tandfonline.com/doi/full/10.3109/1547691X.2012.755580; Winkens et al., *supra* note 43.

[52] ATSDR converted the MRL to drinking water concentrations by accounting for an average adult's or child's weight and water intake. ATSDR, *ATSDR's Minimal Risk Levels (MRLs) and Environmental Media Evaluation Guides (EMEGs) for PFAS* (2018), https://www.atsdr.cdc.gov/pfas/docs/PFAS-MRL-HA-H.pdf.

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F. Replacement PFAS Can Be Presumed to Pose Similar Risks to Human Health and the Environment

Scientists agree that PFAS—including both long-chains and their replacements—have the capability to exert similar, serious harm to human and environmental health. As the federal government's own scientists have recognized, the entire class of PFAS is comprised of structurally similar compounds that scientists can "reasonably expect to act through the same pathways and have similar effects."[53] Recent studies examining toxicity of the shorter-chain, replacement PFAS support this idea.[54] For example, an animal toxicity study demonstrated that exposure to the widely used short-chain replacement GenX was associated with many of the same health effects as long-chain PFAS, including developmental toxicity.[55] In particular, "[m]ultiple lines of evidence," including human and animal studies, indicate that old and new PFAS are immunotoxicants.[56]

By virtue of their carbon-fluorine bonds, PFAS, including short-chain replacement compounds, are expected to persist in the body and environment.[57] A group of the world's top scientists in PFAS research stated that "replacement[] [PFAS] will be similarly resistant to ultimate degradation, i.e. persistent, in the environment as long-chain PFAS[]."[58] Indeed, EPA itself has stated that "[s]hort-chain PFAS are as persistent in the environment as their longer-

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[53] Testimony of Linda S. Birnbaum, *supra* note 5, at 4; *see also* Wang et al., *supra* note 5.
[54] *See PFAS-Tox Database: Easy Access to Health and Toxicology Data on PFAS*, PFAS-TOX Database, https://pfastoxdatabase.org/ (last visited Apr. 23, 2021).
[55] Justin M. Conley et al., *Adverse Maternal, Fetal, and Postnatal Effects of Hexafluoropropylene Oxide Dimer Acid (GenX) from Oral Gestational Exposure in Sprague-Dawley Rats*, 127 Env't Health Persps. 037008 (2019), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6768323/.
[56] Kwiatkowski et al., *supra* note 6, at 534.
[57] Geary W. Olsen et al., *Half-life of Serum Elimination of Perfluorooctanesulfonate, Perfluorohexanesulfonate, and Perfluorooctanoate in Retired Fluorochemical Production Workers*, 115 Env't Health Persps. 1298 (2007), https://pubmed.ncbi.nlm.nih.gov/17805419/. *See also* ATSDR *Toxicological Profile for Perfluoroalkyls*, *supra* note 11, at 4.
[58] Martin Scheringer et al., *Helsingør Statement on Poly-and Perfluorinated Alkyl Substances (PFASs)*, 114 Chemosphere 337, 337 (2014), https://www.sciencedirect.com/science/article/pii/S004565351400678X.

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chain analogues."[59] As a result, as mentioned above, both old and new PFAS have been detected in remote and pristine lands near the Arctic, reflecting their similar long-range mobility and persistence.[60] Some replacement PFAS may present even greater risks to the environment than the long-chain PFAS they replaced. The weight of the scientific evidence shows that replacement PFAS may be equally, if not more, mobile in aqueous environmental media and in soil,[61] potentially resulting in contamination across greater distances.[62] And, recent studies suggest that traditional water treatment systems used to remove long-chain PFAS may be less efficient at absorbing and capturing shorter-chain, replacement PFAS.[63]

Large-scale biomonitoring studies are already showing an increasing trend of unidentified PFAS compounds in people,[64] which suggests that people are being exposed to new and unidentifiable PFAS, likely as a result of: environmental releases of complex mixtures of older and newer PFAS from industrial processes; poorly regulated or unregulated disposal of PFAS and PFAS-containing mixtures and products; and from use of products containing PFAS.

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[59] EPA, *EPA's Per- and Polyfluoroalkyl Substances (PFAS) Action Plan* 13 (2019), https://nepis.epa.gov/Exe/ZyPDF.cgi/P100W32I.PDF?Dockey=P100W32I.PDF.
[60] *See* Joerss et al., *supra* note 34; Muir & de Wit, *supra* note 35.
[61] John W. Washington et al., *Nontargeted Mass-Spectral Detection of Chloroperfluoropolyether Carboxylates in New Jersey Soils*, 368 Science 1103 (2020), https://science.sciencemag.org/content/368/6495/1103.
[62] Stephan Brendel et al., *Short-chain Perfluoroalkyl Acids: Environmental Concerns and a Regulatory Strategy under REACH*, 30 Env't Scis. Eur. 9 (2018), https://enveurope.springeropen.com/articles/10.1186/s12302-018-0134-4.
[63] Philip McCleaf et al., *Removal Efficiency of Multiple Poly-and Perfluoroalkyl Substances (PFASs) in Drinking Water Using Granular Activated Carbon (GAC) and Anion Exchange (AE) Column Tests*, 120 Water Rsch. 77 (2017), Water research, https://pubmed.ncbi.nlm.nih.gov/28478297/.
[64] Leo W. Y. Yeung & Scott A. Mabury, *Are Humans Exposed to Increasing Amounts of Unidentified Organofluorine?*, 13 Env't Chemistry 102 (2015), http://www.publish.csiro.au/en/EN15041.

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BACKGROUND & LEGAL FRAMEWORK

A. Pre-Manufacture Notice—Safety Review and Approval of New Chemicals

TSCA's Pre-Manufacture Notice (PMN) requirement is designed to identify and protect against substances that may present unreasonable risks—*before* those substances enter the market.[65] A company intending to manufacture (which TSCA defines as encompassing both domestic production and import) a new chemical substance[66] for commercial purposes in the United States must submit to EPA a PMN at least 90 days before the date it wishes to commence manufacture. 15 U.S.C. § 2604(a)(1); *id.* at (i)(1) (defining manufacture as meaning manufacturing for commercial purposes); 15 U.S.C. § 2602 (defining manufacture to mean manufacture, produce, or import); 40 C.F.R. § 720.22. The applicable review period is 90 days, which the Administrator may extend for up to an additional 90 days when necessary to review all relevant information.[67] 15 U.S.C. §§ 2604(a)(1)(B), 2604(c), 2604(i). During this period, EPA must conduct a safety review for the new chemical and make one of five determinations:

> (1) that the substance "presents an unreasonable risk of injury to health or the environment;"

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[65] *See* S. Rep. No.94-698, at 10 (1976) ("[Tlhe premarket notification provisions of the committee bill forms the backbone of the preventive aspects of health protection sought by this legislation."); *see also* Env't & Nat'l Res. Pol'y Div, Libr. of Cong., *Legislative History of the Toxic Substances Control Act Together with a Section-By-Section Index* 215 (1976), http://fluoridealert.org/wp-content/uploads/tsca.legislative-history.pdf ("[A] strong premarket screening process is a key factor in effective operation of this legislation.") (Remarks of Sen. Tunney) ("TSCA Legislative History"); H.R. Rep. No.94-1341, at 1 (1976) ("[T]hrough its testing and premarket notification provisions, the bill provides for the evaluation of the hazard-causing potential of new chemicals before commercial production begins."); TSCA Legislative History at 534 ("This bill principally is intended to have new chemicals coming on the market regularly tested to see that they are not going to harm people or the environment.") (Remarks of Rep. Staggers); TSCA Legislative History at 208 (Remarks of Sen. Tunney); *Id.* at 216 (Remarks of Sen. Hartke); *Id.* at 539 (Remarks of Rep. Metcalfe); *Id.* at 734 (Remarks of Sen. Moss); *Id.* at 735 (Remarks of Sen. Pearson); *Id.* at 740 (Remarks of Sen. Magnuson); and *Id.* at 747 (Remarks of Rep. Murphy).

[66] A "new chemical substance" is defined as any chemical substance that is not included on the TSCA Chemical Substance Inventory. 15 U.S.C. § 2602(11); 40 C.F.R. § 710.3.

[67] *See Reviewing New Chemicals Under the Toxic Substances Control Act (TSCA): Premanufacture Notices (PMNs) and Significant New Use Notices (SNUNs) Table*, EPA, https://www.epa.gov/reviewing-new-chemicals-under-toxic-substances-control-act-tsca/premanufacture-notices-pmns-and (last updated Apr. 23, 2021).

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(2) that "the information available to the Administrator is insufficient to permit a reasoned evaluation of the health and environmental effects" of the substance;

(3) that "the manufacture, processing, distribution in commerce, use, or disposal of [the] substance, or any combination of such activities, may present an unreasonable risk of injury to health or the environment,"

(4) that the "substance is or will be produced in substantial quantities, and such substance either enters or may reasonably be anticipated to enter the environment in substantial quantities or there is or may be significant or substantial human exposure to the substance," or

(5) "that the relevant chemical substance or significant new use is not likely to present an unreasonable risk of injury to health or the environment."

15 U.S.C. § 2604(a)(3). Amendments to TSCA in 2016 ("the Lautenberg Amendments") specifically require EPA to evaluate whether the chemical may pose an unreasonable risk to "potentially exposed or susceptible subpopulations," 15 U.S.C. § 2604(a)(3) (referred to in this Petition as "greater risk populations"),[68] and EPA must rely on the best available science and make decisions based on the weight of the scientific evidence[69] when conducting those reviews.

If EPA determines that the substance "is not likely to present an unreasonable risk," the chemical can enter commerce unrestricted. 15 U.S.C. § 2604(g). If the Administrator determines that the substance "presents an unreasonable risk," s/he must take actions "to the extent necessary to protect against such risk," including prohibiting or limiting its manufacture. 15 U.S.C. §§ 2604(a)(3), (f). EPA must also regulate the chemical if: it lacks information to

[68] 15 U.S.C. § 2602(12) defines "potentially exposed or susceptible subpopulation" as, "a group of individuals within the general population identified by the [EPA] Administrator who, due to either greater susceptibility or greater exposure, may be at greater risk than the general population of adverse health effects from exposure to a chemical substance or mixture." The statutory provision includes "infants, children, pregnant women, workers, or the elderly" in a non-exhaustive list of examples of such populations. In the context of PFAS contamination the language of this statutory provision covers the developing fetus, occupational workers, firefighters, communities living in polar regions, and communities living near facilities that release PFAS. *See supra* Factual Background § E.
[69] *Id.* §§ 2625(h), (i).

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make a reasoned evaluation; given that lack of information, determines that the chemical may present an unreasonable risk; or the quantities of manufacture or exposure to the substance may reach the "substantial" level. *See* 15 U.S.C. § 2604(e).

The PMN process was designed to further TSCA's overarching purpose, which is to "prevent the general environment from becoming the laboratory in which harmful effects of chemicals are discovered." *Cf. Dow Chem. Co. v. U.S. E.P.A.*, 605 F.2d 673, 676 (3d Cir. 1979); *see* S. Rep. No. 94-698, at 3 (1976) ("[W]e have become literally surrounded by a man-made chemical environment. … [T]oo frequently, we have discovered that certain of these chemicals present lethal health and environmental dangers."). To more fully align TSCA with its purpose, Congress amended the statute in 2016, and one of the most significant amendments was to require EPA to review and make an affirmative determination on each PMN before manufacturing could commence. *See* 15 U.S.C. § 2604(a)(1)(B)(ii). Before the amendments, a PMN was "deemed approved" even if EPA failed to act within the allotted timeframe.[70] Under the amended TSCA, PMNs can no longer be "deemed approved," even if EPA fails to act within the review period. *See* 15 U.S.C. § 2604(a)(4)(A). That change was a recognition that allowing manufacture of new chemicals to proceed when EPA has not been able to affirmatively evaluate potential risks and impose needed conditions endangers public health.

PMNs must contain certain information so that EPA can conduct the required safety review during the review period. They must include information on: the chemical's identity, structure, and formula; byproducts and impurities; environmental releases; intended uses; and, disposal practices. 15 U.S.C. § 2604(d)(1); *see also* 40 C.F.R. § 720.45. The applicant must

[70] S. Rep. No. 114-67 (2015); Kevin McLean, Harv. L. Sch., *Three Years After— Where Does Implementation of the Lautenberg Act Stand?* 19 (2020), http://eelp.law.harvard.edu/wp-content/uploads/McLean-TSCA.pdf.

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provide a diagram and description of its production process, inform EPA of its estimated maximum production volume, and provide all test data in the applicant's possession or control and a description of all other data the applicant knows of or can reasonably ascertain. *See* 40 C.F.R. §§ 720.45 and 720.50; EPA Sample PMN Form at 1,[71] attached as Exhibit A. If the submitter becomes aware of new relevant information during the review period, it must provide it to EPA within ten days of receiving it and no later than five days before the review period expires. 40 C.F.R. § 720.40(f).

B. Exemptions to the PMN Process

Exemptions to the PMN process are tightly circumscribed. TSCA includes a few, very limited exceptions to the PMN requirement in the statute itself. *See, e.g.*, 15 U.S.C. § 2604(h)(1) (test marketing exemption); *id.* § 2604(h)(3) (research and development exemption). It also authorizes EPA to promulgate rules granting additional exemptions from the PMN requirement, but only if EPA determines that the chemicals falling within the exemption "*will not present* an unreasonable risk of injury to health or the environment, including an unreasonable risk to a potentially exposed or susceptible subpopulation." 15 U.S.C. § 2604(h)(4) (emphasis added). Thus, while EPA may permit a specific new chemical assessed through the PMN process to be manufactured if it determines that the chemical is "*not likely*" to present an unreasonable risk, a new chemical or group of new chemicals may circumvent the PMN process *altogether* if and only if a much higher level of certainty is met—that those chemicals "*will not*" present an unreasonable risk.

[71] EPA, OMB No. 2070-0012, Premanufacture Notice for New Chemical Substances Form, https://www.epa.gov/sites/production/files/2020-02/documents/section_5_main_form_updated_omb_and_expiration_01142020.pdf.

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And, as with the assessment of chemicals under the PMN process, the 2016 TSCA Amendments required that the high bar of "will not present" for an exemption to be valid must take into consideration and ensure protection of greater risk populations. 15 U.S.C. § 2604(h)(4) (2016). In other words, EPA cannot allow an exemption to the PMN process to be used to approve chemicals where the best available science establishes that those chemicals may present an unreasonable risk to a greater risk population, regardless of its assessment of risk for the population as a whole.

C. The PMN Exemptions to Which this Petition Seeks Amendment

This Petition seeks to make PFAS ineligible for approval under the following four EPA-created exemptions: the Byproducts Exemption, the LVE, the LoREX Exemption, and the Polymer Exemption. These exemptions, described further below, were created several decades ago. The Byproducts, LVE, and Polymer exemptions were promulgated in the 1980s, soon after TSCA's enactment. *See* Premanufacture Notice Requirements and Review Procedures, 48 Fed. Reg. 21,722 (May 13, 1987) (codified at 40 C.F.R. pt. 720) (Byproducts); Premanufacture Notification Exemption; Exemption for Chemical Substances Manufactured in Quantities of 1,000 Kg or Less Per Year, 50 Fed. Reg. 16,477 (Apr. 26, 1985) (codified at 40 C.F.R. pt. 723) (LVE); Exemptions for Polymers, 49 Fed. Reg. 46,066, 46,066 (Nov. 21, 1984) (to be codified at 40 C.F.R. pt. 723). The LoREX exemption was enacted in the 1990s. *See* Low Release and Exposure Exemption, 60 Fed. Reg. 16,336 (Mar. 29, 1995) (codified at 30 C.F.R. pt. 723) (LoREX).[72]

[72] Excerpts of relevant statutes and regulations pertaining to these exemptions can be found in the Appendix to this petition.

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1. The Byproducts Exemption

For purposes of this petition, the "Byproducts Exemption" refers to all new chemicals that are byproducts within the meaning of 40 C.F.R. §§ 720.30(g) or (h)(2) for which EPA does not require submission of a PMN. Understanding what is exempted under those provisions first requires an understanding of how TSCA treats new chemical byproducts.

Under TSCA, PMNs are required for byproducts. More specifically, PMNs must be submitted for new "chemical substances" manufactured, processed, or imported "for commercial purposes." *See* 15 U.S.C. § 2604(a)(1), *see also id.* at (i)(1) (defining manufacture as meaning manufacturing for commercial purposes). Chemical byproducts meet the definition of chemicals substances. *See* 15 U.S.C. § 2602(2); 40 C.F.R. § 720.3(d). And when a parent chemical is manufactured "for commercial purposes" the byproducts of that chemical are also manufactured "for commercial purposes." The term "manufacture *for* commercial purposes" is defined to mean "[t]o produce, with the purpose of obtaining an immediate or eventual commercial advantage for the manufacturer." 40 C.F.R. § 716.3 (emphasis added). The term includes byproducts because "[b]yproducts . . . without separate commercial value are nonetheless produced for the purpose of obtaining a commercial advantage, since they are part of the manufacture of a chemical substance for commercial purposes." 40 C.F.R. § 710.3. Thus, when new byproducts are produced during an activity with a purpose of obtaining a commercial advantage, a PMN is required for them.

EPA, however, has created an exemption for a subset of byproducts manufactured *for* commercial purposes—those byproducts that are not *used* for commercial purposes. 40 C.F.R. § 720.30(h)(2). In its regulations, EPA interprets TSCA as differentiating between when a chemical is manufactured *for* a commercial purpose and when it is *used* for a commercial

purpose: "Although [byproducts not *used for* commercial purposes] are *manufactured for* commercial purposes under the Act, they are not manufactured for distribution in commerce as chemical substances per se and have no commercial purpose separate from the substance, mixture, or article of which they are a part." *Id*; *see also* 40 C.F.R. § 720.3(d) (defining "byproduct" as "a chemical substance produced without a separate commercial intent during the manufacture, processing, use, or disposal of another chemical substance or mixture"). Thus, a byproduct could be *manufactured for* a commercial purpose—and thus fall within the definition of chemical substance under TSCA requiring a PMN—but, under EPA's interpretation of TSCA, if the byproduct is discarded and not itself used commercially, it is not *used for* a commercial purpose and is exempt from the PMN requirement under EPA regulations.

And even when a byproduct is used for a commercial purpose, EPA's regulations provide that a PMN still need not be submitted for byproducts in the following three circumstances: "[a]ny byproduct if its only commercial purpose is for use by public or private organizations that (1) burn it as a fuel, (2) dispose of it as a waste, including in a landfill or for enriching soil, or (3) extract component chemical substances from it for commercial purposes." 40 C.F.R. § 720.30(g).

Byproducts are subject to virtually no review under this exemption, as described further in Reasons to Grant the Petition § II.A.

2. The Low Volume Exemption

Under the "Low Volume Exemption" or LVE, PMNs need not be filed for new "[c]hemical substances manufactured in quantities of 10,000 kilograms [approximately 11.02

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tons] or less per year." 40 C.F.R. § 723.50(a)(1)(i).[73] The review process for LVE applications allows approval by default after just 30 days. 40 C.F.R. § 723.50(g)(2). In contrast to PMN applications, if EPA experiences a backlog and simply is unable to complete its review, the manufacturer may commence production.

3. The Low Release and Exposure Exemption

Under the "Low Release and Exposure Exemption" or LoREX Exemption, PMNs need not be filed for what EPA considers "[c]hemical substances with low environmental releases and human exposures." 40 C.F.R. § 723.50(a)(1)(ii). In order to qualify for the LoREX Exemption, a manufacturer must show that the substance would meet certain specified criteria such as no dermal exposure, no inhalation exposure (except from certain air releases from incineration), and drinking water exposure and surface water concentrations under a certain amount. 40 C.F.R. § 723.50(c)(2).[74] When EPA reviews a LoREX application, it principally focuses on release and

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[73] 10,000 kg per year is not considered "low volume" by other regulatory agencies around the world. The EU, Canada, China, Japan, Korea, Taiwan, Australia and the Philippines all maintain a 1,000 kg/year threshold in recognition of the dangers that even small quantities of chemicals can pose. *See Comparison of Small Volume New Substance Registration*, ChemSafetyPRO (Feb. 8, 2017), www.chemsafetypro.com/Topics/Registration/Comparison_of_Small_Volume_Exemption_for_New_Chemical_Substance_Registrations.html.

[74] The full non-risk criteria to meet the LoREX exemption are as follows:

(i) Consumers and the general population. For exposure of consumers and the general population to the new chemical substance during all manufacturing, processing, distribution in commerce, use, and disposal of the substance:

(A) No dermal exposure.

(B) No inhalation exposure (except as described in paragraph (c)(2)(iv) of this section.

(C) Exposure in drinking water no greater than a 1 milligram per year....

(ii) Workers. For exposure of workers to the new chemical substance during all manufacturing, processing, distribution in commerce, use and disposal of the substance:

(A) No dermal exposure (this criterion is met if adequate dermal exposure controls are used in accordance with applicable EPA guidance).

(B) No inhalation exposure (this criterion is considered to be met if adequate inhalation exposure controls are used in accordance with applicable EPA guidance).

(iii) Ambient surface water. For ambient surface water releases, no releases resulting in surface water concentrations above 1 part per billion...unless EPA has approved a higher surface water concentration....

(iv) Incineration. For ambient air releases from incineration, no releases of the new chemical substance above 1 microgram per cubic meter maximum annual average concentration....

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exposure and not toxicity. *See* 60 Fed. Reg. at 16,337. Like with the LVE exemption, the review process for LoREX Exemption applications is just 30 days. 40 C.F.R. § 723.50(g)(2). And similar to the LVE, if EPA experiences a backlog and is not able to complete its 30-day review of a LoREX exemption application, the manufacturer may commence production. *Id.*

4. The Polymer Exemption

The Polymer Exemption allows polymers meeting a list of criteria pertaining to the molecular weight (MW) of the polymer and its composition to enter commerce without going through PMN review. *See* 40 C.F.R. § 723.250(e). The Polymer Exemption lists six categories of polymers that, despite otherwise meeting the eligibility criteria for the exemption, may not use it and must undergo PMN review. *See* 40 C.F.R. § 723.250(d). As described further below, one of these categories contains certain PFAS polymers. *See id.* 40 C.F.R. § 723.250(d)(6).

(v) Land or groundwater. For releases to land or groundwater, no releases to groundwater, to land, or to a landfill unless the manufacturer has demonstrated to EPA's satisfaction in a notice under paragraph (e) of this section that the new substance has negligible groundwater migration potential. 40 C.F.R. § 723.50(c)(2).

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REASONS TO GRANT THE PETITION

I. TSCA REQUIRES EPA TO MAKE PFAS INELIGIBLE FOR THE BYPRODUCTS, LVE, AND LOREX EXEMPTIONS

Developments in PFAS research and in the law have made it untenable to allow new PFAS to gain entry to the market through the Challenged Exemptions. These three exemptions were created long before the risks associated PFAS were understood.[75] A tremendous amount of information has come to light since the promulgation of the Challenged Exemptions demonstrating that PFAS share similar characteristics with respect to toxicity and persistence, and in many cases bioaccumulation, resulting in similar effects.[76] The agency also created the Challenged Exemptions before enactment of the 2016 Lautenberg Amendments to TSCA, which mandate that EPA consider the risks posed to greater risk populations when making unreasonable risk determinations regarding new chemicals.

EPA cannot conclude that PFAS chemicals produced as byproducts, or in the amounts or conditions permitted under the LVE and LoREX exemptions "will not present an unreasonable risk" to human health and the environment, including to greater risk populations. *See* 15 U.S.C. § 2604(h)(4). Scientific evidence developed over the last decade has shown that: 1) new PFAS meeting the non-risk criteria for the Challenged Exemptions at issue may present unreasonable risks, including to greater risk populations; and 2) in some instances, EPA lacks sufficient data or time to make a determination about whether new PFAS meeting the non-risk criteria for the Challenged Exemptions will not present an unreasonable risk. Because EPA cannot make the § 2604(h)(4) "will not present" finding for any PFAS, even if they meet the non-risk criteria for the Challenged Exemptions, EPA may not continue to approve PFAS under those exemptions.

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[75] *See supra* Background & Legal Framework § C.
[76] *See supra* Factual Background §§ A–B.

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40 C.F.R. § 723.50(d) similarly requires EPA to make new PFAS ineligible for the LVE and LoREX exemptions. That provision prohibits the approval under these two exemptions of substances that may cause serious acute, serious chronic, or significant environmental effects. All PFAS may cause these deleterious effects.

A. TSCA Requires EPA to Make Chemical Substances Ineligible for a PMN Exemption if EPA Cannot Conclude Those Chemicals "Will Not Present an Unreasonable Risk of Injury," Including to a Greater Risk Population

TSCA is clear: PMN exemptions are only for new chemicals that can meet the high burden that they "will not present an unreasonable risk of injury to health or the environment, including an unreasonable risk to a potentially exposed or susceptible subpopulation." 15 U.S.C. § 2604(h)(4). Thus, EPA has acknowledged a corollary to that standard: *excluding* a group of chemicals from eligibility for an exemption is "necessary [when] . . . EPA can no longer conclude that [such chemicals] 'will not present an unreasonable risk to human health or the environment,' which is the determination necessary to support an exemption under TSCA." Amendment of Polymer Exemption Rule to Exclude Certain Perfluorinated Polymers, 71 Fed. Reg. 11,484, 11,484 (Mar. 7, 2006) (codified at 40 C.F.R. pt. 723.250); *see also* Amendment of Polymer Exemption Rule to Exclude Certain Perfluorinated Polymers, 75 Fed. Reg. 4,295, 4,295 (Jan. 27, 2010) (codified at 40 C.F.R. § 723.250); 71 Fed. Reg. at 11,498 (explaining that 15 U.S.C. § 2604(h)(4) authorizes EPA to amend and repeal rules it enacted under that section).[77]

Indeed, EPA has previously excluded certain PFAS from one of the several exemptions to the PMN process precisely because it was unable to make the "will not present an unreasonable risk" finding. And it reached this conclusion even before TSCA was amended to

[77] Wendy Wagner et al., *Dynamic Rulemaking*, 92 N.Y.U. L. Rev. 183, 206 (2017).

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require consideration of greater risk populations when making a finding of "no unreasonable risk."

In 2010, EPA enacted a rule excluding certain PFAS from being eligible for the "polymer exemption" to the PMN requirement. 75 Fed. Reg. at 4,295.[78] EPA noted that, by their very nature, exemptions under § 2604(h)(4) are for chemicals EPA believes pose a low risk of injury to health or the environment. 71 Fed. Reg. at 11,498. Thus, it explained, certain chemicals have and must be excluded from using such an exemption when EPA either: (1) has information suggesting that the conditions for an exemption under § 2604(h)(4) are not met for certain chemicals/ those chemicals may present unreasonable risks; or (2) has insufficient data and review experience to support a finding that such chemicals falling under the exemption will not present an unreasonable risk. *Id.*[79]

Based on those criteria, EPA determined that it must exclude the group of PFAS from eligibility to use the polymer exemption because it could no longer conclude that those polymers will not present an unreasonable risk to human health or the environment. 71 Fed. Reg. at 11,484; 11,488; *see also* 75 Fed. Reg. at 4,295. EPA explained that polymers containing certain PFAS may degrade and release PFAS into the environment, which "are expected to persist in the environment, may bioaccumulate, and may be highly toxic." 75 Fed. Reg. at 4,296. EPA acknowledged that of the thousands of PFAS, the most well studied are PFOA and PFOS, which studies show have a "high level of toxicity . . . at very low dose levels in exposed laboratory

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[78] The proposed and final rule making certain PFAS ineligible to use the polymer exemption applies to only a subcategory of PFAS. As explained in Reasons to Grant the Petition § III, petitioners urge EPA to further amend the Polymer Exemption to ensure it includes all PFAS.

[79] This two-part rule is a corollary of TSCA section 2604(h) and is echoed in other regulatory text. *See, e.g.*, 60 Fed. Reg. at 16,337 (stating that "Any [LVE] exemption application will be denied if the Agency is unable to affirmatively find that manufacture, processing, distribution in commerce, use, and disposal of the exempted substance pursuant to the exemption will not present an unreasonable risk of injury to human health or the environment.").

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animals." 71 Fed. Reg. at 11,498. It emphasized that, in prohibiting approval of new polymers containing PFAS via the exemption, it was not concluding that other PFAS "*categorically share* similar toxicity, bioaccumulation, and persistence characteristics with PFOS and PFOA." 75 Fed. Reg. at 4,298 (emphasis added). Rather, it was concluding "that they *may, or are expected to, share similar characteristics*, based on available information and its professional judgment and experience." 75 Fed. Reg. at 4,298–99. Thus, EPA could no longer make a generally applicable finding that the manufacture, processing, distribution in commerce, use, and/or disposal of the PFAS at issue would not present an unreasonable risk of injury to health or the environment, and therefore it could no longer allow such PFAS to enter commerce under this exemption. 71 Fed. Reg. at 11,498; 75 Fed. Reg. at 4,301.

EPA also rejected a proposal to limit the carve-out from the exemption to only those PFAS at issue that contain greater than four carbons in the alkyl chain. 71 Fed. Reg. at 11,499. The agency stated that: (1) "based on available information, EPA cannot continue to find that" the PFAS polymers at issue containing fewer than five carbon atoms "will not present an unreasonable risk to human health and the environment," *id.*; and (2) "EPA has insufficient evidence at this time . . . to definitively establish a lower carbon chain length limit to meet the 'will not present an unreasonable risk' finding, which is the determination necessary to support an exemption under . . . TSCA." 71 Fed. Reg. at 11,486 (citation omitted).[80]

In sum, as EPA concluded in the 2010 polymer exemption exclusion, when a new chemical or group of chemicals may share characteristics that prevent EPA from concluding that

[80] Notably, EPA concluded that it had "insufficient evidence . . . to definitively establish a carbon chain length at which" the PFAS at issue "[would] not present an unreasonable risk." 71 Fed. Reg. at 11,499; *see also* 75 Fed. Reg. at 4,299.

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they "will not present an unreasonable risk," section 2604(h)(4) requires that they be excluded from the exemption. In such circumstances, individual chemicals and the potential risks to the environment and human health they present "should be evaluated during the 90-day PMN review period that Congress contemplated for new chemicals under section 5(a)(1)(A) of TSCA … so that EPA can better evaluate and address the[] concerns" posed by such chemicals. 71 Fed. Reg. at 11,497–98; *see also* 75 Fed. Reg. at 4,301.

EPA's decision to exclude PFAS from the Polymer Exemption is consistent with (and, indeed, required by) TSCA's mandate that chemicals *even possibly* presenting an unreasonable risk to the environment must undergo a full PMN safety review. *See* 15 U.S.C. 2604(h)(4). For the same reason that TSCA required EPA's decision to exclude certain PFAS polymers from the Polymer Exemption, it must exclude PFAS from the other Section 2604(h) exemptions that are the subject of this petition. A refusal to apply that reasoning when considering this petition would be akin to having "a rule for Monday, another for Tuesday." *Shaw's Supermarkets, Inc. v. Nat'l Lab. Rels. Bd.*, 884 F.2d 34, 37 (1st Cir. 1989).

As discussed further below, those mandates of TSCA section 2604(h), considered together with: (1) the requirement that EPA now consider potentially exposed or susceptible subpopulations when assessing whether it can make a finding of "will not present an unreasonable risk;" and (2) the growing body of scientific evidence that PFAS as a class may present unreasonable risk, compels EPA to make any PFAS ineligible to use the Challenged Exemptions.

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B. TSCA Requires EPA to Make New PFAS Ineligible for the Byproducts, LVE, and LoREX Exemptions Because EPA Cannot Conclude that PFAS Manufactured, Used, Disposed of, or Distributed under these Exemptions "Will Not Present an Unreasonable Risk of Injury"

As a matter of law, EPA must prohibit the use of the Byproducts Exemption, LVE, and LoREX Exemptions for PFAS because the agency cannot conclude that PFAS manufactured, used, disposed of, or distributed under these exemptions "will not present an unreasonable risk of injury to health or the environment, including an unreasonable risk to a potentially exposed or susceptible subpopulation." 15 U.S.C. § 2604(h)(4).[81] As discussed above, EPA must make a group of chemicals ineligible to use an exemption when either: 1) the agency has information suggesting that those chemicals may, or are expected to, present an unreasonable risk; or 2) has insufficient data and review experience to support a finding that such chemicals falling under the exemption will not present an unreasonable risk. *See* 75 Fed. Reg. at 4,301.[82] The best available science demonstrates that all PFAS *may* present unreasonable risk because the studied members of the class are associated with severe hazards often at extremely low levels of exposure, as well as having persistent and bioaccumulative characteristics, and none of the exemption criteria eliminate the inherent potential risk these chemicals pose.

1. EPA is required to make PFAS ineligible for the Byproducts Exemption because the agency has information demonstrating that PFAS byproducts may present an unreasonable risk.

The Byproducts Exemption includes no limitations on the amounts of a PFAS manufactured or released. Rather, under EPA's current approach, the availability of the Byproduct Exemption turns on the purpose for which the chemical will be used, meaning that

[81] Because there is no independent statutory basis for excluding byproducts produced during the manufacture of a commercial chemical from the PMN process, Petitioners presume, for the sake of argument, that this exemption was promulgated under 15 U.S.C. § 2604(h)(4).
[82] *See supra* Reasons to Grant the Petition § I.A.

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PFAS may qualify for this exemption as long as they are used for non-commercial purposes, or one of a handful of commercial purposes, even if it is reasonably foreseen that they will enter the environment at high volume. 40 C.F.R. §§ 720.30(g); (h)(2). There is no statutory basis on which to exempt PFAS from PMN review based on the purpose for which they are used. Whether manufactured as a parent chemical or a byproduct, PFAS are PFAS. The weight of the scientific evidence shows that PFAS may present unreasonable risks to human health and the environment based on the class of chemicals' similar toxic, persistent, and bioaccumulative characteristics.[83] The weight of the scientific evidence also suggests that PFAS exposure increases risk of adverse health outcomes, including harm to vital organs, the immune system, and reproductive health.[84] While EPA does not know that every unstudied PFAS will behave akin to well-understood PFAS, such a determination is not necessary. *See* 75 Fed. Reg. at 4,298–99 (acknowledging that EPA was required to prohibit certain PFAS from using polymer exemption because chemicals may or were expected to share similar characteristics to PFOA and PFOS and that the agency did not and need not make a finding that other PFAS "categorically share similar toxicity, bioaccumulation, and persistence characteristics with PFOS and PFOA").[85] Because EPA can no longer make a finding that the manufacture, processing, distribution in commerce, use, and/or disposal of PFAS byproducts "will not present an unreasonable risk of injury to health or the environment," it can no longer allow such PFAS to escape PMN review under the Byproducts Exemption. 71 Fed. Reg. at 11,498; 75 Fed. Reg. at

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[83] *See* Wang et al., *supra* note 5; Testimony of Linda S. Birnbaum, *supra* note 5 (PFAS are structurally similar compounds that scientists can "reasonably expect to act through the same pathways and have similar effects"); *see also supra* Factual Background § F.
[84] Testimony of Linda S. Birnbaum, *supra* note 5; Kwiatkoswki et al., *supra* note 6; ATSDR *Toxicological Profile for Perfluoroalkyls*, *supra* note 11.
[85] *See supra* Reasons to Grant the Petition § I.A.

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4,301 (making similar finding with respect to Polymer Exemption); 75 Fed. Reg. at 4,298–99 (same).

Indeed, the case for excluding PFAS from the Byproducts Exemption has grown only stronger in the years since EPA excluded certain PFAS from the Polymer Exemption in 2010. Not only has the weight of the scientific evidence about PFAS confirmed what was expected in 2010, but the 2016 Lautenberg Amendments now require EPA's "will not present unreasonable risk" assessment for exemptions to consider risks to greater risk populations before approving new chemicals.[86] Studies highlighted earlier in this petition demonstrate that PFAS present greater risks to subpopulations such as firefighters, communities living in polar regions, infants, children, and developing fetuses.

Thus, EPA must initiate a rulemaking to prohibit future use of the Byproducts Exemption for new PFAS. That rulemaking should also prohibit the continued manufacture of any PFAS byproduct under the auspices of the Byproducts Exemption unless and until such PFAS has undergone a full PMN review and been approved by EPA, with a two-year window for manufacturers to receive such approval.

2. *EPA is required to make new PFAS ineligible for the LoREX and LVE exemptions because the agency has information demonstrating that PFAS manufactured, distributed, disposed of, or used under these exemptions may present an unreasonable risk.*

EPA must also exclude the manufacture of new PFAS from eligibility for the LVE and LoREX Exemptions because accumulating scientific evidence shows that contamination

[86] *See supra* Background & Legal Framework § A.

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expected from those exemption thresholds may present unreasonable risk, meaning they cannot meet the "will not present an unreasonable risk" criterion for PMN exemptions.

For example, under both the LVE and LoREX exemptions, EPA expects levels of contamination far in excess of what can be presumed safe for PFAS. This is a grave public health concern as 200 million people in the United States rely on surface water as a source of drinking water.[87] EPA estimates the LVE threshold of manufacturing 10,000 kilograms per year of a chemical substance will result in releases of the chemical substance that correspond to a range of concentrations from 500 to 5,200,000 parts per trillion (ppt) in surface water. 60 Fed. Reg. at 16,343. But concentrations in that range would correspond to levels of PFAS contamination in drinking water that are unsafe. Surface water concentrations at the lower end of that range translate to drinking water concentrations that could result in exposure levels that are 20 times higher than levels even ATSDR considers unsafe for PFOA, PFNA, and PFOS,[88] levels that have been criticized as not being health protective.[89] 60 Fed. Reg. at 16,338. The LoREX Exemption allows PFAS contamination levels in drinking water that could similarly result in exposures[90] that are significantly higher than EPA's own national drinking water health advisories for PFOA and PFOS, state health-based water guidance and contamination limits for

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[87] EPA, *FACTOIDS: Drinking Water and Ground Water Statistics for 2007* 4 (2008), https://nepis.epa.gov/Exe/ZyPDF.cgi/P100N2VG.PDF?Dockey=P100N2VG.PDF.

[88] ATSDR has set its minimum risk level dosage for PFOS and PFNA at 3 nanograms per kilogram bodyweight per day, and 2 ng/kg/day for PFOA. Using the agency's standard calculation at 80 kg bodyweight for adults, that level translates to 0.05 milligrams per year, or 20 times 1,000 ppt. See ATSDR *Toxicological Profile for Perfluoroalkyls*, *supra* note 11, at 15.

[89] *See* Letter from Anna Reade, Staff Scientist, Nat. Res. Def. Council, to ATSDR (Sept. 6, 2018), https://www.nrdc.org/sites/default/files/comments-on-atsdr-toxicological-profile-on-perfluoroalkyls-2018-draft_2018-08-21.pdf.

[90] The exemption allows up to 1 milligram PFAS in drinking water per year. 40 C.F.R. § 723.50(c)(2)(i), *see also* (iii). For ATSDR minimum risk levels corresponding to yearly exposure levels in drinking water, *see supra* note 88.

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various PFAS, and ATSDR's minimum risk level dosage for PFOA and PFOS in drinking water.[91]

The high level of expected surface and drinking water contamination that could be expected from PFAS that are approved through the LVE and LoREX exemptions puts infants and children—greater risk populations EPA must now take into account when assessing eligibility for a PMN exemption—at especially high risk. These subpopulations are at risk of harm from exposure to PFAS through drinking water at much lower concentrations than those that pose risk to healthy adults.[92] For example, in 2018, the ATSDR set minimum risk levels ("MRLs")[93] for PFAS and converted these values into drinking water concentrations for children at 21 ppt for PFOA and 14 ppt for PFOS compared to 78 ppt and 52 ppt, respectively, for adults.[94] Those concentration conversions, however, have been criticized for relying on calculations that underestimate exposures to infants.[95] Using EPA's drinking water assumptions and parameters specific to infants,[96] drinking water concentrations as low as 3 and 2 ppt for PFOA and PFOS, respectively, would pose health risks to infants.[97] While EPA has failed to adopt any enforceable drinking water limits for PFAS, several states have enacted protective

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[91] *See infra* p. 35.
[92] *Minimum Risk Levels (MRLs)*, ATSDR, https://www.atsdr.cdc.gov/minimalrisklevels/index.html (last updated June 4, 2018).
[93] ATSDR defines MRL as "an estimate of the amount of a chemical a person can eat, drink, or breathe each day without a detectable risk to health. MRLs are developed for health effects other than cancer." *See id.*
[94] ATSDR *Minimum Risk Levels*, *supra* note 92; *See* Letter from Anna Reade, *supra* note 89.
[95] Anna Reade et al., NRDC, *Scientific and Policy Assessment for Addressing Per- and Polyfluoroalkyl Substances (PFAS) in Drinking Water* 37, 77–81 (2019), https://www.nrdc.org/sites/default/files/assessment-for-addressing-pfas-chemicals-in-michigan-drinking-water.pdf.
[96] *See, e.g.*, Memorandum from Mark A. Levine, Comm'r, Vt. Dep't Health, to Emily Boedecker, Comm'r, Vt. Dep't Health 4 (July 10, 2018), https://www.healthvermont.gov/sites/default/files/documents/pdf/ENV_DW_PFAS_HealthAdvisory.pdf (using EPA-recommended body weight adjusted water intake rates and relative source contribution values specific to infants to calculate protective drinking water health advisory levels for four PFAS).
[97] Reade et al. *Scientific and Policy Assessment*, *supra* note 95, at 37, 77–81.

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drinking water limits for PFAS that account for risk to infants and children at levels considerably lower than those calculated by ATSDR.[98]

Thus, on the basis of risk of PFAS in water alone, EPA cannot conclude that new PFAS manufactured at the thresholds allowed by the LVE and LoREX exemptions "will not present an unreasonable risk," as required for PMN exemptions.[99] At the very least, "a closer examination of the conditions of manufacturing, processing, distribution, use, and disposal [of said chemical] during a full 90-day PMN review" is necessary. *See* 75 Fed. Reg. at 4,301.

An additional example of unsafe contamination that would result if EPA continued to make the LVE and LoREX Exemptions eligible for new PFAS relates to ambient air releases. The LoREX Exemption permits ambient air releases of chemicals from incineration in amounts up to "1 microgram per cubic meter maximum annual average concentration." 40 C.F.R. § 723.50(c)(2)(iv). It is likely, however, that 1 microgram per cubic meter maximum annual average concentration of PFAS would be too high a threshold to ensure that the chemical "will not present an unreasonable risk." Indeed, Michigan's Department of Air Quality recently developed health-based PFOA and PFOS air emissions screening levels to be protective of sensitive individuals, including children and the elderly, at 0.07 microgram per cubic meter with

[98] *See* Chart collecting state action levels, *Per- and Polyfluoroalkyl Substances (PFAS)*, Association of State Water Administrators, www.asdwa.org/pfas/ (last visited April 26, 2021).

[99] The majority of the health-based drinking water guidance and legal limits mentioned above were developed specifically to be protective of sensitive and more highly exposed subpopulations. S*ee, e.g.*, Helen M. Goeden et al., *A Transgenerational Toxicokinetic Model and its Use in Derivation of Minnesota PFOA Water Guidance*, 29 J. Exposure Sci. & Env't Epidemiology 183, https://www.nature.com/articles/s41370-018-0110-5. These are precisely the kinds of populations Congress had in mind when it instructed EPA, through revisions to 15 U.S.C. § 2604(h), to ensure that greater risk populations would be protected.

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a 24-hour averaging time,[100] more than 10 times lower than the ambient air release concentration allowed by the LoREX.

3. EPA is required to make new PFAS ineligible for the LoREX and LVE Exemptions because the agency has insufficient information on which to conclude that PFAS manufactured, distributed, disposed of, or used under these exemptions will not present an unreasonable risk.

EPA also has insufficient data to support a finding that new PFAS falling under the LVE and LoREX exemptions "will not present an unreasonable risk" from expected air emissions. In short, this is because EPA has no adequate method for assessing the safety of PFAS air emissions at the thresholds permitted by the two exemptions. Indeed, EPA's own publications suggest that the agency's air emission tests do not supply "sufficient information to" to establish that a new PFAS will not present an unreasonable risk. [101]

For example, under the LVE, EPA assumes that if a chemical is manufactured at the LVE threshold of 10,000 kilograms per year, expected air emissions will not present an unreasonable risk to human health or the environment. Specifically, the agency estimates that a facility that manufactures 10,000 kilograms of a chemical per year will release 300 to 2,000 kilograms per year of the substance into the air. 60 Fed. Reg. at 16,343. But the agency cannot draw inferences about the health effects of PFAS from these figures with the level of certainty required to approve a new chemical under 15 U.S.C. § 2604(h)(4). A complete LVE safety review would require an estimation of inhalation exposure based upon the concentration of PFAS in the air and the duration of exposure. EPA's release estimates do not offer that

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[100] *Michigan PFAS Action Response Team: Air Quality Related Issues*, Michigan.gov, https://www.michigan.gov/pfasresponse/0,9038,7-365-86704_94366---,00.html (select "What health-based screening levels exist for air?" drop down) (last visited Apr. 16, 2021).

[101] *See* Letter from Timothy Watkins, Dir., EPA Ctr. for Env't Measurement & Modeling, to Steven E. Flint, Dir. Div. Air Res., N.Y. Dep't Env't Conservation (Dec. 2, 2019), https://www.dec.ny.gov/docs/remediation_hudson_pdf/nysdecrept12219.pdf.

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information. *See, e.g.*, 60 Fed. Reg. at 16,343. Thus, the agency has insufficient information to determine that PFAS air emissions permitted under the LVE will not present an unreasonable risk.

Similarly, EPA has admitted that it lacks the standardized and validated methodology to properly collect data on PFAS air emissions resulting from incineration, which the agency needs in order to adequately confirm whether a PFAS subject to a LoREX application can be incinerated in compliance with the exemption's 1 microgram per cubic meter maximum annual average ambient air release threshold for incineration.[102] *See* 40 C.F.R. § 723.50(c)(2)(iv). Without the ability to accurately measure whether or not a PFAS can be incinerated in compliance with the LoREX ambient air release threshold, EPA cannot determine that a PFAS for which a LoREX exemption is sought will not present an unreasonable risk.

That EPA has insufficient data to conclude that new PFAS that meet the LVE and LoREX Exemption non-risk criteria will not present an unreasonable risk provides an additional reason why EPA must exclude PFAS from the LVE and LoREX exemptions.

C. EPA Must also Make PFAS Ineligible for the LVE and LoREX Exemptions in Order to Faithfully Apply 40 C.F.R. § 723.50(d)

Approving PFAS under the LVE and LoREX exemptions would also violate 40 C.F.R. § 723.50(d). That provision states that chemicals cannot be approved under the LVE or LoREX exemptions when the substances[103] "*may* cause ...(1) Serious acute (lethal or sublethal) effects[;] (2) Serious chronic (including carcinogenic and teratogenic) effects[; or] (3) Significant

[102] *See, e.g.*, Interim Guidance on PFAS Destruction and Disposal at 45, Dkt. No. EPA-HQ-OLEM-2020-0527-0002 (Dec. 18, 2020), https://www.regulations.gov/document/EPA-HQ-OLEM-2020-0527-0002.

[103] The provision also applies to "any reasonably anticipated metabolites, environmental transformation products, or byproducts of the substance." 40 C.F.R. § 723.50(d). As a result, this statutory provision may create additional hurdles for the approval of long-chain PFAS, which have significant issues with transformation products.

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environmental effects." 40 C.F.R. § 723.50(d) (emphasis added). The inquiry into whether or not a chemical has lethal, carcinogenic, or teratogenic effects is purely evidence-based. The answer is based on existing data and studies, and leaves little to no room for administrative discretion. When making science-based decisions, EPA is required both to use "the best available science" and to make the decisions "based on the weight of the scientific evidence." 15 U.S.C. §§ 2625(h), (i). The weight of scientific evidence demonstrates that exposure to PFAS meeting the non-risk criteria for manufacture, release, and exposure permitted under these exemptions *may* cause the adverse health and environmental effects set forth in § 723.50(d). For example, they may cause cancer, liver damage, and immunosuppression, which constitute serious acute and/or chronic health effects. *See* 40 C.F.R. §§ 723.50(b)(6)–(8); *see also id.* § 720.30(b)(10); *id.* § 720.3.[104]

The weight of the scientific evidence also demonstrates that PFAS at the LVE and LoREX non-risk thresholds may also cause significant environmental effects, including growth impairment and lethality in aquatic organisms.[105] Indeed, growth impairment was observed in fish exposed to PFAS at concentrations nearly 10,000 times lower than the higher end of the allowable range under LVE.[106] PFAS also induced adverse effects in a species of salamander that is closely related to the endangered California Tiger Salamander. Given the bioaccumulative nature of many PFAS, these effects are likely to persist for long periods of time.

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[104] *See supra* Factual Background § B.

[105] Gerald T. Ankley et al., *Assessing the Ecological Risks of Per- and Polyfluoroalkyl Substances: Current State-of-the Science and a Proposed Path Forward*, 40 Env't Toxicology & Chemistry 564 (2020), https://setac.onlinelibrary.wiley.com/doi/10.1002/etc.4869; Georgia M. Sinclair et al., *What Are the Effects of PFAS Exposure at Environmentally Relevant Concentrations?*, 258 Chemosphere 127340 (2020), https://www.sciencedirect.com/science/article/pii/S0045653520315332#bib53.

[106] Susanne Keiter et al., *Long-term Effects of a Binary Mixture of Perfluorooctane Sulfonate (PFOS) and bisphenol A (BPA) in Zebrafish (Danio rerio)*, 118–119 Aquatic Toxicology 116 (2012), https://www.sciencedirect.com/science/article/pii/S0166445X12001300?via%3Dihub.

Thus, PFAS that meet the non-risk criteria for LVE and LoREX may cause significant environmental effects, as defined by EPA. *See* 40 C.F.R. § 723.50(b)(8).[107]

Thus, the faithful application of 40 C.F.R. § 723.50(d) requires any new PFAS to be made ineligible for the LoREX and LVE exemptions and EPA must formalize the blanket ineligibility of these substances through an explicit regulatory amendment. Such an amendment would provide clear notice to PFAS manufacturers that EPA will not approve new PFAS via exemptions to the PMN review process. The amendment would also alleviate the inefficiencies involved in EPA making individual determinations on applications to manufacture new PFAS via PMN exemptions given that no PFAS can meet the "will not present" standard.[108]

Put simply, PFAS simply cannot meet the "will not present an unreasonable risk" standard. When a category of chemicals cannot meet the statute's "will not present an unreasonable risk" standard, that category of chemicals must be excluded from eligibility for the exemption, and must go through the more detailed PMN review process. EPA must immediately stop accepting and approving LVE and LoREX notices for new PFAS and initiate a rulemaking to amend § 723.50 in order to codify this change.[109]

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[107] R. Wesley Flynn et al., *Dietary Exposure and Accumulation of Per- and Polyfluoroalkyl Substances Alters Growth and Reduces Body Condition of Post-Metamorphic Salamanders*, 765 Sci. Total Env't 142730 (2021), https://www.sciencedirect.com/science/article/abs/pii/S0048969720362598.

[108] It is also questionable whether EPA could make an individualized safety determination for new PFAS under 40 C.F.R. § 723.50(d) in the allotted 30 days. A manufacturer would need to submit test data demonstrating that a new PFAS is safe in order to overcome the weight of the scientific evidence on the risks that may be posed by PFAS. EPA itself has admitted that the agency "will generally be unable to conduct a thorough review of any submitted test data within the allotted review period" and that "manufacturers with submissions which involve extensive data reviews may, in some cases, be better served under a PMN review." 60 Fed. Reg. at 16,337.

[109] EPA has the authority to prohibit use of the LVE and LoREX exemptions for the reasons set forth in 40 C.F.R. § 723.50(d) for the entire category of PFAS. *See* 15 U.S.C. § 2625(c).

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II. EPA HAS PLACED COMMUNITIES AROUND THE COUNTRY IN HARM'S WAY BY FAILING TO REGULATE PFAS BYPRODUCTS AND ALLOWING MANUFACTURERS TO BRING PFAS TO MARKET UNDER THE LVE AND LOREX EXEMPTIONS

EPA is legally compelled to amend the Challenged Exemptions to ensure that PFAS will no longer be approved under these loopholes for the reasons stated above. But even if the Agency disagrees with the legal arguments above, it still has reason to grant this Petition.

15 U.S.C. § 2604(h)(4) provides EPA with discretion to create, modify, and revoke exemptions to the PMN process. EPA is not required to exercise its discretion to create an exemption, but when the agency does so it must act in accordance with the purposes of TSCA. Chief among these purposes is the prevention of "unreasonable risks of injury to health or the environment associated with the manufacture, processing, distribution in commerce, use, or disposal of chemical substances."[110] Unfortunately, as written, the Challenged Exemptions put the public at increased risk of exposure to PFAS substances in ways that are at odds with this fundamental purpose of TSCA.

The Challenged Exemptions are bad public policy. They prevent EPA from sufficiently reviewing and regulating PFAS before these chemicals are released into communities and nature. Inadequate review and regulation are compounded by the lack of robust disclosure requirements. Without adequate information about PFAS that slip through these exemptions, the public is unable to take steps to protect itself. Thus, EPA should exercise its discretion and amend the Challenged Exemptions as requested by Petitioners.

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[110] David Markell, *An Overview of TSCA, Its History and Key Underlying Assumptions, and Its Place in Environmental Regulation*, 32 Wash. Univ. J. L. & Pol'y 333 (2010) (quoting S. Rep. No. 94-698, at 1 (1976), *as reprinted in* 1976 U.S.C.C.A.N. 4491, 4491), https://openscholarship.wustl.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1084&context=law_journal_law_policy.

A. PFAS Byproducts Are Subject to Virtually No TSCA Regulatory Oversight to the Detriment of Human Health and the Environment

Allowing PFAS manufacturers to take advantage of the Byproducts Exemption results in minimal, if any, EPA review and regulation of these chemicals. The Exemption does not require manufacturers to submit an application for approval of the byproduct to the agency. Rather, any premanufacture information EPA collects on the byproduct comes only from the PMN application for the parent chemical. And that application simply requires "[a] description of the byproducts resulting from the manufacture, processing, use, and disposal of the new chemical substance." 40 C.F.R. § 720.45(d). More specifically, a PMN applicant must submit the name of the byproduct; or "a class or range of structures (e.g., C_6 - C_{18} fatty acid salts or polychlorinated cyclic and acyclic hydrocarbons in the range C_5 - C_{12}); or the source (e.g., pyrolysis products of cellulose or coal tar residues)." [111]

As EPA has explained, test data on byproducts[112]—even if it is reasonably discoverable or within the manufacturer's possession—is *not* required as part of a manufacturers' PMN application for the parent chemical in which the byproduct is present. *See* Toxic Substances; Revisions of Premanufacture Notification Regulations, 51 Fed. Reg. 15,096, 15,100 (Apr. 22, 1986) (codified at 40 C.F.R. pt. 720). That EPA does not even require such data when it exists suggests that the agency does not assess risks associated with byproducts or take appropriate regulatory action to prevent harm they might cause to the public.

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[111] *See* EPA, Instruction Manual for Reporting Under the TSCA §5 New Chemicals Program 43 (2015), https://www.epa.gov/sites/production/files/2015-06/documents/instruction_manual_2015_5-26-2015.pdf.

[112] Such data includes "information concerning the objectives, experimental methods and materials, protocols, results, data analyses, recorded observations, monitoring data, measurements, and conclusions from a test or experiment." 40 C.F.R. § 720.3(ff).

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EPA cannot justify its failure to regulate PFAS byproducts. Real life circumstances have demonstrated that excluding PFAS byproducts from PMN review can be as dangerous to humans and the environment as failing to review and regulate PFAS that are used for a commercial purpose. As mentioned above, one of the key paths through which PFAS enter the environment is from the manufacturing, processing, use, and disposal of products that contain PFAS or generate PFAS as a waste byproduct.[113] PFAS precursors that are emitted or released into the environment via these pathways can biotransform into other PFAS, including long-chain PFAS like PFOA and PFOS.[114]

One vivid example of such contamination of the environment by PFAS byproducts and the attendant human consequences is the drinking water tragedy involving the Cape Fear River in North Carolina—a tragedy that might have been avoided through PMN review. In 2017, officials from Chemours admitted that one of their plants, formerly owned by DuPont, had been discharging GenX, a toxic shorter-chain PFAS, into Cape Fear River for close to 40 years.[115] EPA did not regulate under TSCA the GenX discharge into the river because the PFAS chemical was likely a byproduct of a vinyl ether process.[116] Levels of GenX in the drinking water of the Cape Fear Public Utility Authority average 631 ppt.[117] EPA's own drinking water exposure

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[113] Buck et al., *supra* note 3, at 518; Scheringer & Wang, *supra* note 25. *See also* Lindstrom et al., *supra* note 25; N.C. Dep't Env't Quality, *supra* note 25.
[114] Buck et al., *supra* note 3, at 518; Scheringer & Wang, *supra* note 25. *See also* Lindstrom et al., *supra* note 25.
[115] Adam Wagner & Tim Buckland, *Chemours: GenX Polluting the Cape Fear since 1980*, StarNews Online (June 15, 2017), https://www.starnewsonline.com/news/20170615/chemours-genx-polluting-cape-fear-since-1980#:~:text=WILMINGTON%20%2D%2D%20A%20former%20DuPont,from%20DuPont%2Dspinoff%20Chemours%20Co.
[116] *Id.*
[117] Sharon Lerner, *New Teflon Toxin Found in North Carolina Drinking Water*, The Intercept (June 17, 2017), .https://theintercept.com/2017/06/17/new-teflon-toxin-found-in-north-carolina-drinking-water/.

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limits for PFOA and PFOS suggest that GenX levels at 296 ppt would be hazardous to lactating mothers and 91 ppt in drinking water would be hazardous to infants, a greater risk population.[118]

The only reason researchers were even able to identify GenX as a chemical in the residents' drinking water was because more than a decade after DuPont began dumping the chemical as a byproduct into Cape Fear River, it decided to use GenX commercially in another context and thus submitted a PMN for it.[119] GenX, when produced commercially, was regulated in a consent order as a result of the PMN process; GenX as a byproduct, however, both before and after a PMN was submitted for its commercial use, was not. The consent order—a seemingly standard consent order by EPA—explicitly stated that it did not apply to GenX as a byproduct. Indeed, the high levels of toxic GenX contamination were discovered not because it was subject to EPA regulation, but only because an academic researcher decided to test the water from the river.[120]

The revelations about GenX discovered in the Cape Fear River raised alarm among residents of Wilmington, North Carolina, some of whom stopped drinking their GenX-contaminated tap water.[121] The revelations also led to more testing. Researchers found hydrolyzed GenX (hexafluoropropylene) in the urine of several Wilmington residents.[122] And compounding the problem, the researchers looking for GenX contamination in Wilmington

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[118] Anna Reade et al., *PFAS in Drinking Water 2019* 42, 85–86 (2019), https://www.nrdc.org/sites/default/files/media-uploads/nrdc_pfas_report.pdf.
[119] *See GenX Chemicals Studies*, EPA, https://www.epa.gov/pfas/genx-chemicals-studies (last updated Apr. 30, 2018).
[120] Sharon Lerner, *A Chemical Shell Game: How DuPont Concealed the Dangers of the New Teflon Toxin*, The Intercept (Mar. 3, 2016), https://theintercept.com/2016/03/03/how-dupont-concealed-the-dangers-of-the-new-teflon-toxin/.
[121] Cheryl Hogue, *The Hunt Is on for GenX Chemicals in People*, c&en (Apr. 7, 2019), https://cen.acs.org/environment/persistent-pollutants/hunt-GenX-chemicals-people/97/i14.
[122] *Id.*

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residents also discovered several other novel PFAS in blood samples.[123] These novel PFAS were all byproducts produced by Chemours.[124] Animal studies—conducted in response to this avoidable tragedy and not any sort of regulation of byproducts—have thus far linked at least one of those PFAS byproducts with harmful liver effects.[125]

B. Companies Regularly Circumvent the PMN Process for New PFAS Via the LVE and LoREX Exemptions

When proposing the LVE and LoREX exemptions, EPA explained that the exemption would not lead to unreasonable risk because, among other things, "the benefits to the public and the Agency from the Agency's enhanced ability to utilize its limited resources to focus on reviewing new chemical substances and uses of *higher risk and concern*." 60 Fed. Reg. at 16,345 (emphasis added). But PFAS are precisely the kinds of "higher risk and concern" substances that EPA should focus on. Indeed, EPA has repeatedly acknowledged both that "[m]any Americans are concerned about potential health impacts from exposure to [PFAS],"[126] and that "[a]ggressively addressing PFAS has been an active and ongoing priority" for EPA.[127] Yet, permitting new PFAS to enter commerce via the LVE and LoREX exemptions *undermines* EPA's goal of closely reviewing new chemical substances that are of higher risk and concern to both the public and the agency.

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[123] *Id.*
[124] *Id.*
[125] Hua Guo et al., *Comparative Hepatotoxicity of Novel PFOA Alternatives (Perfluoropolyether Carboxylic Acids) on Male Mice*, 53 Env't Sci. & Tech. 3929 (2019), https://pubs.acs.org/doi/abs/10.1021/acs.est.9b00148?source=cen.
[126] EPA *PFAS Action Plan*, *supra* note 59, at 8.
[127] Press Release, EPA, *Federal Partners Kick Off Workshop on Federal Government Human Health PFAS Research with the National Academies of Sciences, Engineering and Medicine* (Oct. 26, 2020), https://www.epa.gov/newsreleases/federal-partners-kick-workshop-federal-government-human-health-pfas-research-national; *see also* Press Release, EPA, *EPA Releases Testing Data Showing PFAS Contamination from Fluorinated Containers* (Mar. 5, 2021), https://www.epa.gov/newsreleases/epa-releases-testing-data-showing-pfas-contamination-fluorinated-containers ("As the U.S. Environmental Protection Agency (EPA) pursues its mission to protect human health and the environment, addressing risks related to PFAS is a priority.").

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The repercussions of this failure of adequate regulatory oversight are not hypothetical. To the contrary, chemical manufacturers use the LVE for new PFAS, thereby evading full PMN review for such chemicals, with tremendous frequency. EPA's own calculations show that from 2006-2016, companies sought approval for PFAS through the LVE far more often than through the PMN process.[128] This trend continued after the 2016 TSCA amendments.[129]

EPA also approves a high proportion of LVE exemption notices. Between the summer of 2016 and the March of 2021, EPA approved over 85 percent of all LVE applications.[130] The approval rate specifically for PFAS is just as high. Between 2006 and June 2016, EPA received 328 LVEs for PFAS and granted 272—equivalent to 83 percent—of them.[131] Thus, not only do the many individual, minimally assessed PFAS present dangers on their own, but the rapid and relatively easy approval of multiple new PFAS present additional concerns: simultaneous human exposure to multiple PFAS that can have compounding negative effects.[132]

Manufacturers—understandably for them, but alarmingly to the public—see the LVE option as a boon. Industry uses the LVE loophole to avoid precisely what Congress intended when amending the PMN provisions in 2016: a close review and regulation when necessary for toxic chemicals, with no approval by default.[133] As one law firm explained, the LVE is "an

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[128] Off. Pollution, Prevention, & Toxics, EPA, *Per- and Polyfluoroalkyl Substances (PFAS) Summary Report* 4-4 fig.4-5 (2018). Attached as Exhibit B.
[129] *See* Richard Denison, *Greasing the Skids: The Trump EPA is Green-Lighting Dozens of New PFAS under TSCA*, EDF (July 28, 2020), http://blogs.edf.org/health/2020/07/28/greasing-the-skids-the-trump-epa-is-green-lighting-dozens-of-new-pfas-under-tsca/.
[130] *Id.* - Richard Denison, *Greasing the Skids: The Trump EPA is Green-Lighting Dozens of New PFAS under TSCA*, EDF (July 28, 2020), http://blogs.edf.org/health/2020/07/28/greasing-the-skids-the-trump-epa-is-green-lighting-dozens-of-new-pfas-under-tsca/.
[131] Letter from Troy M. Lyons, Assoc. Adm'r, EPA, to Paul D. Tonko, Representative, U.S. H.R. (June 6, 2019). Attached as Exhibit C.
[132] *See infra* Reasons to Grant the Petition § II.C.
[133] EPA recently stated that it reviewed more than 300 LVE notices for PFAS substances since 2006, "most of which were granted based on restrictions/controls in the original or amended submissions." EPA *PFAS Action Plan*, *supra*

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attractive option for high-toxicity substances," noting that "[if] submitted as a PMN, the same substance might well wind up being regulated under section 5(e)."[134] While the LoREX Exemption is not presently used with the same frequency as the LVE, it is crucial that the agency closes both loopholes in the regulation of PFAS concurrently. If the LVE loophole is closed, the LoREX Exemption may become the new "attractive option for high-toxicity substances" to evade PMN review and appropriate regulation.

C. Exposure to Multiple PFAS Can Have Compounding Negative Health Effects that Are Not Taken into Account When PFAS Come to Market Through the Challenged Exemptions

EPA should also exclude PFAS from the Challenged Exemptions because exposure to multiple PFAS may present additional risks on top of those presented by one, yet none of the Challenged Exemptions require such risks to be taken into account before allowing PFAS to get to market through them. Simultaneous exposure to multiple PFAS—an example of cumulative exposure—has become increasingly prevalent as a result of environmental contamination, which can result in more frequent and higher exposures to multiple PFAS in humans over the same time period, and consequentially increase the potential for compounding adverse health effects. Because PFAS are persistent and many have bioaccumulative qualities, they can build up in the human body over time and linger in certain tissues for as long as decades before being excreted,

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note 59, at 18. Even if EPA's approvals of LVE applications for PFAS have sometimes been premised on restrictions or controls in the manufacturer's submission, it would not cure the fundamental problems outlined in this petition. Ad hoc regulation of PFAS under the LVE cannot justify upholding an otherwise invalid regulation that violates the letter and purpose of a statute. *See F.C.C. v. Fox Television Stations, Inc.*, 556 U.S. 502, 536 (2009) (citing 5 U.S.C. § 706(2)(C)) ("the agency action must not be 'in excess of statutory jurisdiction, authority, or limitations, or short of statutory right'").

[134] Keller and Heckman LLP, *The Constantly Pending PMN: Low Volume Exemption Applications Are Living Documents*, Martindale (Mar. 11, 2011), https://www.martindale.com/chemicals/article_Keller-Heckman-LLP_1255440.htm.

extending the window of opportunity to adversely affect health.[135] This raises additional concerns; several studies have indicated that simultaneous exposure to multiple PFAS in humans and animals can have compounding negative effects.[136]

Yet the Challenged Exemptions do not take these potential cumulative risks into account. For example, the LoREX Exemption sets limits on a chemical's release, but only one chemical at a time. But assessing the potential adverse effects of these PFAS individually does not sufficiently protect the public. Each new PFAS released into the environment has the potential to compound the adverse effects of the last. Thus, the only way to mitigate the PFAS contamination crisis our country faces is to stop the manufacturing and release of new PFAS altogether; at the very least, EPA should ensure that any new PFAS go through a full PMN review that accounts for cumulative exposures and risks.

D. Because the Byproducts, LVE, and LoREX Exemptions Fail to Provide for Adequate Public Notification, Use of Such Exemptions for PFAS Places Communities Across the Country at Heightened Risk of Harm

The Challenged Exemptions allow manufacturers to place PFAS into commerce while making it difficult for communities to know about their existence or the risks they pose. Congress recognized that when a new chemical is brought to market, it is critical that the public—whose health and well-being could be at risk—be able to learn about it.[137] The public, particularly those residents living near chemical manufacturing facilities, has a pressing interest

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[135] Paul Jones et al., *Binding of Perfluorinated Fatty Acids to Serum Proteins*, 22 Env't Toxicology & Chemistry 2639 (2003); Suzanne Fenton et al., *Per- and Polyfluoroalkyl Substance Toxicity and Human Health Review: Current State of Knowledge and Strategies for Informing Future Research*, 40 Env't Toxicology & Chemistry 606 (2020), https://setac.onlinelibrary.wiley.com/doi/full/10.1002/etc.4890.

[136] *See, e.g.*, Caroline Carr et al., *Testing for Departures from Additivity in Mixtures of Perfluoroalkyl Acids (PFAAs)*, 306 Toxicology 169 (2013), https://pubmed.ncbi.nlm.nih.gov/23470359/; Guanghui Ding et al., *Combined Effects of PFOS and PFOA on Zebrafish (Danio rerio) Embryos*, 64 Archives Env't Contamination & Toxicology 668 (2013), https://pubmed.ncbi.nlm.nih.gov/23479250/.

[137] *See* H.R. Rep. No. 94-1679, at 67 (1976) (Conf. Rep.) (explaining that the public notice requirement in TSCA § 5(d)(2) was included "[i]n order that the public receive timely notification of any new chemical substance ...."); 162 Cong. Rec. S3,511–12 (2016) (statement of Sen. Mark Udall); 162 Cong. Rec. E785-02 (2016) (statement of Rep. Loretta Sanchez).

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both in knowing when manufacturers seek to market substances that could threaten public health or the environment, and in closely following decisions EPA makes about such requests. EPA has acknowledged as much, stating that "Congress intended informed citizen involvement in review of new chemical substances. . . Public participation cannot be effective unless meaningful information is made available to interested persons." Premanufacture Notification; Premanufacture Notice Requirements and Review Procedures, 48 Fed. Reg. 21,722, 21,737 (May 13, 1983).

The PMN process is designed to meet these goals. TSCA requires EPA to alert the public when a PMN has been submitted and to provide the public with access to information about the PMN chemical. 15 U.S.C. § 2604(d)(1). Within five business days of receiving a PMN application, EPA is required to publish in the Federal Register a notice of the chemical substance proposed to be manufactured, a list of the substance's uses as identified in the application, and a description of the tests performed on the substance and any information EPA required to submitter to develop. 15 U.S.C. § 2604(d)(2). It must make all PMNs and Significant New Use Notices (SNUNs) publicly available to any interested person, *id.* § 2604(d)(1), as well as all information submitted with the notices, *id.* § 2604(b)(3) and 40 C.F.R. § 720.95. EPA must also make the public files electronically available. 40 C.F.R. §§ 700.17(b)(1), 720.95. And although companies may request that certain confidential business information be redacted from public disclosure, TSCA explicitly forbids withholding health and safety studies or associated information. 15 U.S.C. § 2613(b)(2).[138]

[138] *See generally* 15 U.S.C. § 2613(d). Congress underscored its commitment to transparency in this domain through the 2016 Lautenberg amendments, which required upfront justification and EPA review of most claims of confidentiality of business information. Even information traditionally considered confidential must be disclosed if EPA determines that disclosure is necessary to protect against an unreasonable risk of injury to health or the environment, including to greater risk populations. *Id.* § 2613(d)(3).

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If EPA determines after the safety review that the reviewed substance "is not likely to present an unreasonable risk," EPA must make a public statement of such a finding, which is then required to be published in the Federal Register as soon as practicable. 15 U.S.C. § 2604(g). Unfortunately, the public has not been able to track PMN applications because EPA has not been faithfully implementing the public notice provisions of TSCA and EPA's own regulations.[139]

The Challenged Exemptions do not even offer the public much in the way of transparency on paper. Instead, the Challenged Exemptions deny the public access to much of the information required when new chemical approval is sought by means of a PMN. Unlike for PMNs, a notice of receipt of an exemption application does not need to be published in the Federal Register. If EPA allows a chemical falling under an exemption to come to market, it does not publish a decision-making document containing an assessment or finding that the chemical will not present an unreasonable risk public. *Cf.* 15 U.S.C. § 2604(g) (requiring public statement and publishing in Federal Register for a PMN-reviewed chemical that EPA determined was not likely to present an unreasonable risk). As described in Reasons to Grant the Petition § II.B, manufacturers that produce PFAS under the Byproducts Exemption are required to submit only a few sparse details on the chemicals. The only information EPA makes publicly accessible about PFAS submitted through the LVE and LoREX Exemption is that in EPA's TSCA Exemptions Table, and the table makes it impossible to know whether any of the substances

[139] *See, e.g.*, Erin Fitzgerald, *Report: Trump's EPA Sued for Concealing Health Studies, Violating Its Chemical Laws*, Earthjustice (Mar. 18, 2020), https://earthjustice.org/news/press/2020/report-trumps-epa-sued-for-concealing-health-studies-violating-its-chemical-laws; Richard Denison, *EPA Is Keeping the Public in the Dark on Premanufacture Notices for New Chemicals under TSCA*, EDF (Apr. 2, 2018), http://blogs.edf.org/health/2018/04/02/epa-is-keeping-the-public-in-the-dark-on-premanufacture-notices-for-new-chemicals-under-tsca/ (detailing the nonprofit Environmental Defense Fund's frustrated efforts to obtain information on PMNs).

listed on it are PFAS, as no chemical names are provided.[140] This table merely lists a case number, receipt date, focus meeting date, status, and effective date.

Using Cape Fear's tragedy as an example, one can see why approving new PFAS under the Challenged Exemptions hinders communities' ability to protect themselves. Had the PFAS byproducts undergone PMN review, information about their existence and the risks they presented to the public may have been disseminated prior to, rather than after, North Carolinians were exposed. EPA has itself recognized that communities expect the agency to "communicate effectively with the public and to be transparent in sharing what is known and unknown [about PFAS] in a timely manner" and that such information can help these communities engage in risk management.[141] Such communication and ability to engage in risk management is absent when new PFAS are permitted to circumvent the PMN process.

Requiring PFAS—toxic at low levels and ubiquitous in our lives—to proceed through the PMN process would bring assessment of new PFAS a step closer to fulfilling the mandate of Congress to make information about potentially dangerous chemicals available to the public and allow communities impacted by contamination to take steps to protect themselves.

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[140] *Reviewing New Chemicals Under the Toxic Substances Control Act (TSCA): Exemptions Table*, EPA, www.epa.gov/reviewing-new-chemicals-under-toxic-substances-control-act-tsca/exemptions-table (last updated Apr. 22, 2021). Limited information on PFAS submitted through the LVE and/or LoREX Exemption is available on US EPA's ChemView, but this information can be accessed only when searching by chemical name or other chemical identifiers (e.g., CAS number, etc.).
[141] EPA *PFAS Action Plan*, *supra* note 59, at 37–38.

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III. TSCA REQUIRES EPA TO ENSURE THAT ALL PFAS POLYMER ARE INELIGIBLE FOR THE POLYMER EXEMPTION

As mentioned earlier, EPA's current regulations make certain PFAS ineligible for approval under the Polymer Exemption. *See* 40 C.F.R. § 723.250(d). Specifically, a PFAS polymer is ineligible for the exemption only if it "contains as an integral part of its composition, except as impurities" the following specific perfluoroalkyl moieties: "Perfluoroalkyl sulfonates . . ., perfluoroalkyl carboxylates . . . , fluorotelomers, or perfluoroalkyl moieties that are covalently bound to either a carbon or sulfur atom where the carbon or sulfur atom is an integral part of the polymer molecule." *Id.*

This exemption carve-out hinges on whether the perfluoroalkyl moiety is bound to either a carbon or sulfur atom that is an integral part of the polymer molecule, which is unclear and not consistent with the most current scientific definition of PFAS. —As discussed at length throughout this petition, 15 U.S.C. § 2604(h)(4) requires EPA to make substances ineligible for EPA-created exemptions like the Polymer Exemption unless those substances *will not* present an unreasonable risk to human health and the environment. And as EPA itself has admitted, the agency is statutorily required to make PFAS containing polymers ineligible for the Polymer Exemption if the substances "may, or are expected to, share similar characteristics" with known hazardous PFAS. 75 Fed. Reg. at 4,298.

The weight of the scientific evidence demonstrates that a polymer of any chain length containing any perfluoroalkyl moiety may present an unreasonable risk, regardless of whether the perfluoroalkyl moiety is bound to either a carbon or sulfur atom that is an integral part of the polymer molecule. EPA therefore must notify manufacturers via a Federal Register notice that

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they should not use this exemption for any new PFAS polymers as defined in this Petition.[142] EPA must also initiate a rulemaking to amend the PFAS exception to the Polymer Exemption in 40 C.F.R. § 723.250(d)(6) to ensure that it includes all PFAS as defined in this Petition. That rulemaking should also establish a two-year window after which the continued manufacture of any PFAS polymer previously manufactured under the Polymer Exemption is prohibited unless such PFAS has undergone a full PMN review and been approved by EPA.

IV. WHEN NEW PFAS ARE SUBJECTED TO PMN REVIEW, EPA WILL BE UNABLE TO MAKE "NOT LIKELY TO PRESENT UNREASONABLE RISK" FINDINGS

This Petition explains why PFAS as a class cannot as a matter of law be eligible for certain exemptions to the PMN review process; rather, we argue, TSCA requires all proposed new PFAS to go through PMN review. This Petition further explains how EPA's increasingly frequent practice of approving PFAS via PMN exemptions rather than via the PMN review process has put communities and the environment at risk and deprived the public of information about proposed new PFAS that it would be entitled to during the PMN process. Nothing in these arguments should be read to suggest that Petitioners believe EPA could lawfully find that any proposed new PFAS "is not likely to present an unreasonable risk of injury to health or the environment," 15 U.S.C. § 2604(a)(3), the legal standard that must be met for manufacture to commence after submission of a PMN.

Rather, we submit that if EPA complies with the requirements of 15 U.S.C. § 2604 by ceasing to allow PFAS to enter commerce and/or the environment via PMN exemptions, and requiring manufacturers of proposed new PFAS to use the PMN process, the Agency will have

[142] EPA should use its inspection powers under 40 C.F.R. § 723.250(m) ensure that manufacturers do not bring any new PFAS polymers to market through the Polymer Exemption.

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more time and information[143] on which to make science-based determinations regarding whether the PFAS is "not likely" to present unreasonable risk (including to greater risk populations), and the public will have the opportunity, intended by Congress, to provide input into that determination. We further submit that if EPA follows the law and the science, it will cease approving PMNs for new PFAS.

[143] During a PMN review, EPA has the authority to request additional time to conduct a safety review. *See* 15 U.S.C. 2604(c); *see also supra* Background & Legal Framework § A. The agency may also require a manufacturer to provide additional information if the PMN notice is incomplete and/or order testing if test data supplied by the manufacturer is insufficient to conduct a safety review. *See* 40 C.F.R. § 720.65(c); 15 U.S.C. § 2604(e).

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REQUESTED AGENCY ACTION

Allowing manufacturers of PFAS to circumvent the PMN process and instead to seek approval of new PFAS via the Byproducts, LVE, LoREX, and/or Polymer exemptions threatens public health and contravenes the text and intent of TSCA. We therefore ask EPA to prohibit the use of these exemptions for PFAS as follows:

1. EPA must initiate a rulemaking to prohibit: a) future use of the Byproducts Exemption for new PFAS, and b) continued manufacture of any PFAS byproduct under the auspices of the Byproducts Exemption unless and until such PFAS has undergone a full PMN review and been approved by EPA, with a two-year window for manufacturers to receive such approval.
2. EPA should immediately stop permitting the use of the LVE, LoREX, and Polymer exemptions for any new PFAS.

EPA must codify these changes and should do so by making the following amendments and revisions to its regulations:

PART 720—[AMENDED]

1. Section 720.30 is amended by revising paragraphs (g) and (h)(2) to read as follows:

§ 720.30 Chemicals not subject to notification requirements.

...

> (g) Any byproduct <u>that does not contain one or more perfluoroalkyl moieties,</u> if its only commercial purpose is for use by public or private organizations that (1) burn it as a fuel, (2) dispose of it as a waste, including in a landfill or for enriching soil, or (3) extract component chemical substances from it for commercial purposes. (This exclusion only applies to the byproduct; it does not apply to the component substances extracted from the byproduct.) <u>Any byproduct that does contain one or more perfluoroalkyl moieties that has been manufactured previously under this section prior to [insert effective date of amendment] may no</u>

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longer be manufactured under this section after [insert two years after effective date of amendment].

…

(h) …

(2) Any byproduct which is not used for commercial purposes and which does not contain at least one perfluoroalkyl moiety. Any byproduct that does contain one or more perfluoroalkyl moieties that has been manufactured previously under this section prior to [insert effective date of this regulatory amendment] may no longer be manufactured under this section after [insert two years after effective date of this regulatory amendment].

PART 723—[AMENDED]

1. Section 723.250 is amended by revising paragraph (d)(6) to read as follows:

§ 723.250 Polymers. …

(d) …

(6) *Polymers which contain* ~~*certain*~~ *perfluoroalkyl moieties* ~~*consisting of a CF3- or longer chain length*~~. ~~Except as provided in paragraph (d)(6)(i), after February 26, 2010, a~~ A polymer cannot be manufactured under this section if the polymer contains ~~as an integral part of its composition, except as impurities,~~ one or more ~~of the following~~ perfluoroalkyl moieties ~~consisting of a CF3- or longer chain length: Perfluoroalkyl sulfonates (PFAS), perfluoroalkyl carboxylates (PFAC), fluorotelomers, or perfluoroalkyl moieties that are covalently bound to either a carbon or sulfur atom where the carbon or sulfur atom is an integral part of the polymer molecule~~.

(i) Any polymer that has been manufactured previously in full compliance with the requirements of this section prior to ~~February 26, 2010~~ [insert effective date of amendment] may no longer be manufactured under this section after ~~January 27, 2012~~ [insert two years after effective date of amendment].

2. Section 723.50 is amended by adding a new paragraph (o) to read as follows:

§ 723.50 Chemical substances manufactured in quantities of 10,000 kilograms or less per year, and chemical substances with low environmental releases and human exposures.

…

(o) *Chemical substances which contain perfluoroalkyl moieties.* A chemical substance cannot be manufactured under this section if the chemical substance contains one or more perfluoroalkyl moieties.

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Respectfully Submitted,

EARTHJUSTICE*

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Submitted on behalf of Advance Carolina; Alaska Community Action on Toxics; BlueGreen Alliance; Buxmont Coalition for Safer Water; Clean Cape Fear; Defend Our Health; Delaware Riverkeeper Network; Democracy Green; Environmental Defense Fund; International Association of Fire Fighters; Merrimack Citizens for Clean Water; National PFAS Contamination Coalition; Natural Resources Defense Council; Safer Chemicals, Healthy Families; and Union of Concerned Scientists.

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** Non-lawyer signatories contributed to the scientific, research, and/or factual portions of this document, and did not provide legal services or legal analysis.

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Appendix A

APPENDIX A: PETITIONER STATEMENTS OF INTEREST

Advance Carolina

Advance Carolina was formed to help advocate for Black and Brown North Carolina residents, who have historically been under attack. Advance Carolina reimagines and works to ensure the safety of these communities along several dimensions including, but not limited to: safety from multiple catastrophic hurricanes; safety from racist, state-sanctioned violence; and safety from voter intimidation.

One key focus of the group's work involves drawing attention to and working to reverse racial health disparities in North Carolina. The organization is committed to ensuring Black and Brown communities are safe from toxic pollutants released into communities by corporations and industry. To this end, Advance Carolina prioritizes the safety of Black and Brown North Carolina residents impacted by PFAS pollution in Cape Fear. This commitment has become pronounced in light of the coronavirus pandemic, the effects of which have been exacerbated by such pollutants. Thus, Advance Carolina has an interest in this petition, which seeks to limit PFAS contamination across the country.

Alaska Community Action on Toxics

Alaska Community Action on Toxics ("ACAT") was founded in 1997 to assist Alaskans coping with the consequences of environmental contaminants. ACAT's goals include protecting everyone's right to know about the health and environmental hazards of chemicals that are present in air, water, soil, and foods; and having chemicals that are persistent, bioaccumulative, and harmful to health—such as PFAS—phased out and replaced with safe alternatives. ACAT engages in research, policy advocacy, and education to further its goals. For example, in September 2019, ACAT published a report on pervasive PFAS contamination throughout Alaska to aid residents and state and federal policymakers in making informed decisions to protect current and future generations from continued exposure to PFAS.

ACAT has an interest in this petition because the introduction of new PFAS into Alaska's communities and environment would compound the crisis of PFAS contamination in the state. Alaskans have unique exposure to new potentially hazardous PFAS because PFAS can undergo a process known as "global distillation," or the "grasshopper effect." Through this phenomenon, PFAS emitted to the air or entering water from polluting sources in Europe, Asia, and North America are picked up by oceanic and atmospheric currents and deposited in colder climates, often in the polar regions including the Arctic and Alaska. Alaskan Indigenous Tribal Communities are especially vulnerable to PFAS exposure because once in the Arctic ecosystem, PFAS, together with other persistent pollutants, can accumulate in living organisms, reaching high concentrations in larger animals like marine mammals, including seals and whales, which serve as integral components of the traditional diets and cultures of Indigenous peoples of Alaska and the Arctic.

The BlueGreen Alliance

The BlueGreen Alliance unites labor unions and environmental organizations to solve today's environmental challenges in ways that create and maintain quality jobs and build a clean, thriving, and equitable economy. The organization is guided by the principle that there cannot be a choice between good jobs and a clean environment—that the actions taken to create quality jobs and to protect working people and the environment must go hand-in-hand, and that by working together it will be possible to build a clean, thriving, and fair economy. The organization's mission includes reducing the impact of hazardous toxics such as PFAS, and eliminating them altogether if at all possible. PFAS has deleterious health effects to individuals and the communities represented by the BlueGreen Alliance generally, but particularly those most vulnerable. As an organization committed to addressing unsafe workplaces and communities, the BlueGreen Alliance stands in solidarity with colleagues at various organizations to stop the approval of PFAS through PMN exemptions.

Buxmont Coalition for Safer Water

Petitioner Buxmont Coalition for Safer Water ("Buxmont") is a nonprofit formed by residents of Pennsylvania's Bucks and Montgomery counties in response to growing awareness of the risks posed and harms caused by the historical use of PFAS-laden firefighting foam at Naval Air Development Center in Warminster, PA and The Willow Grove Naval Air Base and Air Reserve Station in Horsham PA. Blood samples taken in 2018 from more than 200 residents who live near these military bases showed a troublingly high amount of PFAS exposure on average. These residents had twice as much PFOS and more than five and half times as much PFHxS in their blood samples as the national average, along with elevated levels of PFOA and other PFAS.

The organization advocates on behalf of the 85,000 residents of Pennsylvania's Bucks and Montgomery counties at risk of PFAS exposure to PFAS. The organization helps raise public awareness through avenues such as local and national media and its website. Buxmont also engages in legislative and administrative advocacy for the regulation of PFAS, including by testifying before the U.S. Congress and the Senate. Buxmont joins this Petition because the organization is concerned that the regulatory exemptions at issue place communities, including their own already burdened local community, at increased risk of even more exposure to PFAS. Buxmont is aware that at least two manufacturers with facilities in Bucks and Montgomery County, Gelest Inc. and Heraeus Precious Metals, brought two new PFAS to market through the Low Volume Exemption.

Clean Cape Fear

Clean Cape Fear is an organization based in the Wilmington, North Carolina area, with a mission to stop and remediate PFAS contamination. The organization formed after information came to light that a Chemours plant, formerly owned by DuPont, had been discharging PFAS into the Cape Fear River for nearly 40 years. This news raised alarm as the lower Cape Fear River serves as the primary source of drinking water for approximately 300,000 people in three counties. Community fears were substantiated by a number of revelations, including a 2018 study which found that Wilmington residents had two times as much PFOS and three times as much PFOA in their blood as the national average. Clean Cape Fear has attempted to mitigate this crisis through public awareness campaigns about PFAS contamination in the river and efforts to ensure that residents have access to contaminant-free water.

Clean Cape Fear has a particular interest in closing the exemptions that are the subject of the petition because manufacturers' use of at least one of the exemptions contributed to the contamination of the Cape Fear River. The PFAS GenX initially escaped regulatory review and was discharged into the Cape Fear River, likely as a byproduct of a vinyl ether process at the facility. Indeed, researchers were able to identify GenX as a chemical in the residents' drinking water decades after DuPont began dumping the substance only because DuPont eventually sought regulatory approval for it so that it could use GenX commercially. Researchers have since discovered several other previously unknown PFAS byproducts manufactured at the Chemours plant in blood samples of Wilmington residents.

Defend Our Health

Defend Our Health works to create a world where all people are thriving, with equal access to safe food and drinking water, healthy homes, and products that are toxic-free and climate-friendly. The organization has worked directly with communities impacted by PFAS in its home state of Maine, which has seen widespread contamination of land and drinking water as the result of land application of contaminated sludge. Defend Our Health is advancing efforts on a state and national level to control existing PFAS pollution, and thus the organization has an interest in the petition. The organization is particularly concerned that EPA is continuing to approve new sources of exposure through exemptions to the PMN process.

Delaware Riverkeeper Network

Petitioner Delaware Riverkeeper Network ("DRN") is a Pennsylvania non-profit organization whose mission is to protect and restore the Delaware River and its tributaries, habitats, and resources. It was established in 1988 and has approximately 25,000 members. DRN has been working on the problems posed by the presence of PFAS in the communities served by the organization since 2005, when its staff collected tap water samples containing PFOA from homes in the neighborhoods close to DuPont's Chambers Works facility in Deepwater, New

Jersey on the Delaware River. After this revelation, DRN began an advocacy campaign, which, over the years, has involved raising public awareness about PFAS contamination and the submission of technical information, scientific analysis, and policy analysis through comments, testimony, and correspondence to government agencies.

An ongoing matter of concern for DRN has been PFAS contamination from the Solvay Specialty Polymers USA, LLC manufacturing facility in Gloucester County, New Jersey. This facility has released PFAS compounds into New Jersey's water and air for decades and continues to do so. Perfluorononanoic acid (PFNA), a PFAS compound, was found near the facility at the highest reported water concentration in the world at the time through sampling of groundwater supplies by the New Jersey Department of Environmental Protection. DRN continues to be concerned about PFAS contamination in the Delaware River area and the lack of transparency about those chemicals and their potential risks. The New Jersey Department of Environmental Protection recently became aware of the release of "replacement" PFAS substances from Solvay into the environment. The agency, however, has been unable to ascertain the chemical identities of the majority of these potentially hazardous compounds. Making matters worse, Solvay has been unwilling to release important emissions and safety information and data on the replacement PFAS. DRN believes closing the regulatory loopholes described in this petition is one important step towards ensuring more oversight of PFAS and transparency about potential exposure to them.

Democracy Green

Democracy Green does work at the intersection of democracy and environmental justice and prioritizes community expertise to inform equitable solutions for Black and Brown communities in North Carolina. The organization was formed in response to the historic use of Black neighborhoods as dumping grounds, which has poisoned the air, water, and food of these frontline communities. The organization knows that environmental justice must be prioritized in democracy reform efforts, policy, and litigation.

To this end, Democracy Green has made PFAS contamination a priority. Black and Brown communities across the state, with a concentration along the Cape Fear Neuse River, have experienced cumulative impacts and layered exposure to this class of chemicals through groundwater contamination, fast food exposure in food-insecure areas, and contamination in confinement facilities. In particular, essential franchise and plant workers as well as renters in PFAS-contaminated infrastructure have been subject to troubling levels of exposure by these substances. To deal with this contamination crisis, Democracy Green demands corporate accountability, stricter permit enforcement, community resource support to remediate the harms of contamination, equitable testing of contamination levels, research into improving clinical guidelines, and policy shifts to address racial inequities in this area. The organization has an interest in this petition because it outlines a set of actions EPA could undertake to address a part of this crisis.

Environmental Defense Fund

Founded in 1967, EDF is a 501(c)(3) nonprofit organization, with more than 2.5 million members and activists located in all 50 states and the District of Columbia, that uses science, economics, and law to restore the quality of our air, water, and other natural resources. EDF's Health Program aims to reduce human health risks and disparities posed by exposure to industrial and commercial chemicals and chemicals in everyday products, food, and drinking water. To accomplish our mission, EDF advocates for appropriate implementation of the Toxic Substances Control Act. Our efforts rely on the Environmental Protection Agency conducting robust safety reviews and disclosing information about new chemicals, including chemicals such as PFAS that may present risks if allowed to enter commerce without adequate review and transparency. For years, EDF has repeatedly raised concerns over industry's use of exemptions from the full pre-manufacture review process, which result in curtailed safety reviews and are shrouded in secrecy. This petition seeks to address these concerns.

The International Association of Fire Fighters

The International Association of Fire Fighters (IAFF) represents more than 324,000 full-time professional fire fighters and paramedics in more than 3,500 affiliates in the United States and Canada. IAFF members protect more than 85 percent of the population in communities throughout the two countries.

Over the last 100 years, the IAFF has been the driving force behind nearly every advance in fire and emergency services in the 21st century and is the nation's leading voice on health and safety issues impacting the fire service. Fire fighters face significant exposures to PFAS on the job due to the vast quantity of such substances added to building materials, consumer products, firefighting foam, and the gear our members use every day. Scientific studies have linked PFAS to cancer, which is today the leading cause of death of firefighters. The IAFF joins this petition because the health and safety of fire fighters depends upon EPA actively safeguarding the public and the environment against the potential health hazards posed by new PFAS.

Merrimack Citizens for Clean Water

Merrimack Citizens for Clean Water was founded in 2016 by residents who had no choice but to become their own self-educated advocates about PFAS contamination in Merrimack, NH. Two of the town's six water wells and hundreds of private water wells in the greater Merrimack area have tested over the New Hampshire regulatory limit at that time for the combined PFOA/PFOS total of 70 ppt. The organization has since learned that air emissions and industry discharges from two significant users of PFAS, Saint Gobain Performance Plastics and TCI, have resulted in

the presence of 21 additional PFAS chemicals in the entire community's water supply as well as in the drinking water of six surrounding communities.

Merrimack Citizens for Clean Water has an interest in this petition because the town would benefit from more affirmative regulation of PFAS by the EPA. The organization would welcome regulatory action on PFAS in addition to PFOA and PFOS, as the residents of Merrimack have had to deal with contamination from an array of substances in this class, including unidentified PFAS suspected of being byproducts. This petition would help ensure that the agency would take measures to protect the residents of Merrimack before any new PFAS are introduced into their community.

The National PFAS Contamination

The National PFAS Contamination Coalition was formed in June 2017 by community leaders who were concerned about the PFAS drinking water contamination in their neighborhoods. The coalition seeks to better support local organizing for clean water and health protection by sharing local campaign stories and information and connecting to experts. The coalition also aims to build a bigger movement for national change on these issues by working on state and national campaigns together for solutions and building a collaborative and powerful force to take on big polluters. The coalition has grown to be 30 community groups in 17 states. The National PFAS Contamination Coalition has an interest in this petition because the manufacture, release, and distribution of new PFAS threaten the water and health of the communities the coalition was established to support.

Natural Resources Defense Council

Natural Resources Defense Council's ("NRDC") mission is to safeguard the Earth: its people, its plants and animals, and the natural systems on which all life depends. NRDC strives to advance the long-term welfare of present and future generations. NRDC's Health and Communities Program works to protect the public from exposure to toxic chemicals that pose a risk to human health. This includes work to eliminate exposures to toxic chemicals from drinking water, food, and household products, and to the pollution created by industrial production and disposal of products. As part of NRDC's mission to protect people from toxics, we regularly submit comments on agency rulemakings relating to industrial and household chemicals and advocate for vigorous implementation of the Toxic Substances Control Act (TSCA).

NRDC has an interest in this petition as an organization working extensively at both the state and federal level to address the ongoing PFAS crisis. This work has included advocacy in support of state laws imposing restrictions on specific uses of PFAS and setting strong health protective standards for drinking water in states such as California, Michigan, New York, and New Hampshire. NRDC has testified before House and Senate committees on the need for numerous pieces of legislation to regulate PFAS. NRDC has also commented to EPA in opposition to its

continued approval of new PFAS through the PMN program, and the need to adopt stronger protections from existing PFAS by strengthening and expanding the use of Significant New Use Rules. NRDC has also played a leading role in market-based campaigns to remove PFAS from consumer products, including rugs, carpets, and building materials. NRDC has also played a leadership role in developing scientific understanding of PFAS, including co-authoring papers on the need to regulate PFAS as a class and creating a database of more than 700 health studies of PFAS.

Safer Chemicals, Healthy Families

Safer Chemicals, Healthy Families fights for strong chemical policy, works with retailers to phase out hazardous chemicals, and educates the public about ways to protect our families from toxic chemicals. The organization advocates solutions to the PFAS crisis that "turn off the tap" on these "forever" chemicals by supporting strong federal and state policies to protect public health and the environment. Safer Chemicals Healthy Families is a program of Toxic Free Future.

Union of Concerned Scientists

The Union of Concerned Scientists is a national nonprofit organization working to ensure science informs decisions that affect our health, safety, and environment. As the Union of Concerned Scientists works to elevate the role of evidence in policymaking and the regulatory process, the organization has an interest in ensuring the process by which chemicals like PFAS are assessed for safety under the Toxic Substances Control Act relies on the best available science and is protective of overburdened and vulnerable populations.

Appendix B

APPENDIX B: SELECT RELEVANT STATUTES AND REGULATIONS

Pre-Manufacture Notice (PMN) Requirement: 15 U.S.C. § 2604(a)(1)(B)

A person may [manufacture a new chemical substance] if—

(i) such person submits to the Administrator, at least 90 days before such manufacture or processing, a notice . . . of such person's intention to manufacture or process such substance and . . .

(ii) the Administrator—

> (I) conducts a review of the notice; and
> (II) makes a determination under subparagraph (A), (B), or (C) of paragraph (3) and takes the actions required in association with that determination under such subparagraph within the applicable review period.

Permitted Exemptions from PMN Requirement When Substances Will Not Present Unreasonable Risk: 15 U.S.C. § 2604(h)(4)

The Administrator may, upon application and by rule, exempt the manufacturer of any new chemical substance from all or part of the requirements of this section if the Administrator determines that the manufacture, processing, distribution in commerce, use, or disposal of such chemical substance, or that any combination of such activities, will not present an unreasonable risk of injury to health or the environment, including an unreasonable risk to a potentially exposed or susceptible subpopulation identified by the Administrator under the conditions of use.

Byproducts Exemption to the PMN Requirement: 40 C.F.R. § 720.30(g), 40 C.F.R. § 720.30(h)(2) (emphases added)

The following substances are not subject to the notification requirements of this part:

> . . .
>
> (g) Any byproduct if its only commercial purpose is for *use* by public or private organizations that (1) burn it as a fuel, (2) dispose of it as a waste, including in a landfill or for enriching soil, or (3) extract component chemical substances from it for commercial purposes. (This exclusion only applies to the byproduct; it does not apply to the component substances extracted from the byproduct.)
>
> (h) The chemical substances described below: (Although they are manufactured *for commercial purposes* under the Act, they are not manufactured for distribution in

commerce as chemical substances per se and have no commercial purpose separate from the substance, mixture, or article of which they are a part.)

. . .

(2) Any byproduct which is not *used for* commercial purposes.

Low Volume Exemption to the PMN Requirement: 40 C.F.R. § 723.50(a)(1)(i)

(a) Purpose and scope.

(1) This section grants an exemption from the premanufacture notice requirements of section 5(a)(1)(A) of the Toxic Substances Control Act (15 U.S.C. 2604(a)(1)(A)) for the manufacture of:

(i) Chemical substances manufactured in quantities of 10,000 kilograms or less per year.[145]

Low Release and Exposure Exemption to the PMN Requirement: 40 C.F.R. § 723.50

(a) Purpose and scope.

(1) This section grants an exemption from the premanufacture notice requirements of section 5(a)(1)(A) of the Toxic Substances Control Act (15 U.S.C. 2604(a)(1)(A)) for the manufacture of: …

(ii) Chemical substances with low environmental releases and human exposures. …

(c) Exemption categories …

(2) Any manufacturer of a new chemical substance satisfying all of the following low environmental release and low human exposure eligibility criteria:

(i) Consumers and the general population. For exposure of consumers and the general population to the new chemical substance during all manufacturing, processing, distribution in commerce, use, and disposal of the substance: …

(C) Exposure in drinking water no greater than a 1 milligram per year (estimated average dosage resulting from drinking water exposure in streams from the maximum allowable concentration level from ambient surface water releases established under paragraph (c)(2)(iii) of this section or a higher concentration authorized by EPA under paragraph (c)(2)(iii) of this section). …

(iii) Ambient surface water. For ambient surface water releases, no releases resulting in surface water concentrations above 1 part per billion …

[145] 10,000 kilograms is equal to approximately 11.02 tons.

(iv) Incineration. For ambient air releases from incineration, no releases of the new chemical substance above 1 microgram per cubic meter maximum annual average concentration, calculated using the formula:

(kg/day of release after treatment) multiplied by (number of release days per year) multiplied by (9.68×10^{-6}) micrograms per cubic meter.

Polymer Exemption to the PMN Requirement: 40 C.F.R. § 723.250

(a) Purpose and scope.
(1) This section grants an exemption from certain of the premanufacture notice requirements of section 5(a)(1)(A) of the Toxic Substances Control Act (15 U.S.C. 2604(a)(1)(A)) for the manufacture of certain polymers…

(d) Polymers that cannot be manufactured under this section—…

(6) Polymers which contain certain perfluoroalkyl moieties consisting of a CF3- or longer chain length. Except as provided in paragraph (d)(6)(i), after February 26, 2010, a polymer cannot be manufactured under this section if the polymer contains as an integral part of its composition, except as impurities, one or more of the following perfluoroalkyl moieties consisting of a CF3- or longer chain length: Perfluoroalkyl sulfonates (PFAS), perfluoroalkyl carboxylates (PFAC), fluorotelomers, or perfluoroalkyl moieties that are covalently bound to either a carbon or sulfur atom where the carbon or sulfur atom is an integral part of the polymer molecule.

(i) Any polymer that has been manufactured previously in full compliance with the requirements of this section prior to February 26, 2010 may no longer be manufactured under this section after January 27, 2012. …

Exhibit A

PMN Page 1

Form Approved. O.M.B. No. 2070-0012. Approval Expires 12/31/2022

U.S. ENVIRONMENTAL PROTECTION AGENCY	AGENCY USE ONLY
EPA — PREMANUFACTURE NOTICE — FOR NEW CHEMICAL SUBSTANCES	Date of receipt:
When completed, send this form to: If sending by Courier: Office of Pollution Prevention and Toxics, Document Control Office (7407M), US EPA, 1201 Constitution Ave NW, WASHINGTON, D.C. 20460, Contact Numbers 202-564-8930/8940. If sending by US Mail: Office of Pollution Prevention and Toxics, Document Control Office (7407M), US EPA, 1200 Pennsylvania Ave NW, WASHINGTON, D.C. 20460	Submission Report Number

Total Number of Pages	TS Number
18	

GENERAL INSTRUCTIONS

- You must provide all information requested in this form to the extent that it is known to or reasonably ascertainable by you. Make reasonable estimates if you do not have actual data.
- Before you complete this form, you should read the "Instructions Manual for Premanufacture Notification" (the Instructions Manual is available from the Toxic Substances Control Act (TSCA) Information Service by calling 202-554-1404, or faxing 202-554-5603).
- If a fee has been remitted for this notice (40 CFR 700.45), indicate in the boxes above the TS fee identification number you have generated. Remember, your fee ID number must also appear on your corresponding fee remittance. For mailing address information see the Help instructions in the e-PMN tool.

Part I – GENERAL INFORMATION

You must provide the currently correct Chemical Abstracts (CA) Name of the new chemical substance, even if you claim the identity as confidential. You may authorize another person to submit chemical identity information for you, but your submission will not be complete and the review will not begin until EPA receives this information. A letter in support of your submission should reference your TS fee identification number. For all Section 5 Notice submissions (paper or electronic) you must submit an original notice including all test data; if you claimed any information as confidential, an original sanitized copy must also be submitted.

Part II – HUMAN EXPOSURE AND ENVIRONMENTAL RELEASE

If there are several manufacture, processing, or use operations to be described in Part II, sections A and B of this notice, reproduce the sections as needed.

Part III – LIST OF ATTACHMENTS

For paper submissions, attach additional sheets if there is not enough space to answer a question fully. Label each continuation sheet with the corresponding section heading. In Part III, list these attachments, any test data or other data and any optional information included in the notice.

OPTIONAL INFORMATION

You may include any information that you want EPA to consider in evaluating the new substance. On page 3 of this form, space has been provided for you to describe pollution prevention and recycling information you may have regarding the new substance. "Binding" boxes are included throughout this form for you to indicate your willingness to be bound to certain statements you make in this section, such as use, production volume, protective equipment . . . The intention is to reduce delays that routinely accompany the development of consent orders or Significant New Use Rules. Checking a "binding" box in a PMN does not by itself prohibit the submitter from later deviating from the information (except chemical identity) reported in the form; however, in the case of exemption applications (such as TMEA, LVE, LOREX) certain information provided in such notifications is binding on the submitter when the Agency approves the exemption application, especially if the production volume "binding" box is chosen in a LVE.

CONFIDENTIALITY CLAIMS

You may claim any information in this notice as confidential. To assert a claim on the form, mark (X) the confidential box next to the information that you claim as confidential. To assert a claim in an attachment, circle or bracket the information you claim as confidential. If you claim information in the notices as confidential, you must also provide a sanitized version of the notice, (including attachments). For additional instructions on claiming information as confidential, read the Instructions Manual.

TEST DATA AND OTHER DATA

You are required to submit all test data in your possession or control and to provide a description of all other data known to or reasonably ascertainable by you, if these data are related to the health and environmental effects on the manufacture, processing, distribution in commerce, use, or disposal of the new chemical substance. Standard literature citations may be submitted for data in the open scientific literature. Complete test data (written in English), not summaries of data, must be submitted if they do not appear in the open literature. You should clearly identify whether test data is on the substance or on an analog. Also, the chemical composition of the tested material should be characterized. Following are examples of test data and other data. Data should be submitted according to the requirements of §720.50 of the Premanufacture Notification Rule (40 CFR Part 720).

Test Data (Check Below any included in this notice)

- ☐ Environmental fate data
- ☐ Health effects data
- ☐ Environmental effects data
- ☐ Physical/Chemical Properties (A physical and chemical properties worksheet is located on the last page of this form.)
- ☐ Test data not in the possession or control of the submitter
- ☐ Other Data
- ☐ Risk Assessments
- ☐ Structure/activity relationships

TYPE OF NOTICE (Check Only One)

- ☐ **PMN** (Premanufacture Notice)
- ☐ **SNUN** (Significant New Use Notice)
- ☐ **TMEA** (Test Marketing Exemption Application)
- ☐ **LVE** (Low Volume Exemption) @ 40 CFR 723.50(c)(1)
- ☐ **LOREX** (Low Release/Low Exposure Exemption) @ 40 CFR 723.50(c)(2)
- ☐ **LVE** Modification
- ☐ **LOREX** Modification
- ☐ **Mock Submission**
- ☐ Mark (X) if pending Letter of Support

N — IS THIS A CONSOLIDATED PMN (Y/N)?

0 — # of chemicals or polymers (Prenotice Communication # required, enter # on p. 3)

☐ Mark (X) if any information in this notice is claimed as confidential.

Not for Submission

PMN Page 2

The public reporting and recordkeeping burden for this collection of information is estimated to average 93 hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed EPA Form 7710-25 to this address.

CERTIFICATION -- A printed copy of this signature page, with original signature, must be submitted with CD or paper submission.

I hereby certify to the best of my knowledge and belief that all information entered on this form is complete and accurate. I further certify that, pursuant to 15 U.S.C. § 2613(c), for all claims for protection for any confidential information made with this submission, all information submitted to substantiate such claims is true and correct, and that it is true and correct that the person submitting the claim has:

(i) taken reasonable measures to protect the confidentiality of the information;

(ii) determined that the information is not required to be disclosed or otherwise made available to the public under any other Federal law

(iii) a reasonable basis to conclude that disclosure of the information is likely to cause substantial harm to the competitive position of the person; and

(iv) a reasonable basis to believe that the information is not readily discoverable through reverse engineering.

Any knowing and willful misrepresentation is subject to criminal penalty pursuant to 18 U.S.C. § 1001.

Additional Certification Statements:

If you are submitting a PMN, SNUN, LoREX, LVE, or TMEA, check the following Fees Certification statement that applies:

- ☐ The Company named in Part I, Section A is a "small business concern" as defined under 40 CFR 700.43 and will remit the fee as specified in 40 CFR 700.45(c).
- ☐ The Company named in Part I, Section A will remit the fee as specified in 40 CFR 700.45(c).
- ☐ This joint submission includes at least one Company which is a "small business concern" and at least one Company which is not a "small business concern," as defined under 40 CFR 700.43. The fee will be remitted with the joint submission. Any remaining balance due for this joint submission is to be paid by the secondary submitter(s).
- ☐ The company named in Part I, Section A is submitting a sustainable futures TME. The company has graduated from EPA's Sustainable Futures program and is therefore exempt from fees for this sustainable futures TME.

If you are submitting a **Low Volume Exemption (LVE)** application in accordance with 40 CFR 723.50(c)(1) or a **Low Release and Low Exposure Exemption (LoRex)** application in accordance with 40 CFR 723.50(c)(2), check the following certification statements:

- ☐ The manufacturer submitting this notice intends to manufacture or import the new chemical substance for commercial purposes, other than in small quantities solely for research and development, under the terms of 40 CFR 723.50.
- ☐ The manufacturer is familiar with the terms of this section and will comply with those terms; and
- ☐ The new chemical substance for which the notice is submitted meets all applicable exemption conditions.
- ☐ If this application is for an LVE in accordance with 40 CFR 723.50(c)(1), the manufacturer intends to commence manufacture of the exempted substance for commercial purposes within 1 year of the date of the expiration of the 30 day review period.

				Confidential
Signature and title of Authorized Official (Original Signature Required)		Date		☐

Not for Submission

PMN Page 3

Part I – GENERAL INFORMATION

Section A – SUBMITTER IDENTIFICATION

Mark (X) the "Confidential" box next to any subsection you claim as confidential

1a.	Person Submitting Notice (in U.S.)					Confidential
Name of Authorized Official	(first)		(last)			☐
Position						
Company						
Mailing Address (number & street)						
City		State		Postal Code		
email						

b.	Agent (if Applicable)					Confidential
Name of Authorized Official	(first)		(last)			☐
Position						
Company						
Mailing Address (number & street)						
City		State		Postal Code		
e-mail			Telephone (include area code)			

c.	Joint Submitter (if applicable)					Confidential
If you are submitting this notice as part of a joint submission, mark (X)					☐	☐
Name of Authorized Official	(first)		(last)			
Position						
Company						
Mailing Address (number & street)						
City		State		Postal Code		
e-mail			Telephone (include area code)			

2.	Technical Contact (in U.S.)					Confidential
Name of Authorized Official	(first)		(last)			☐
Position						
Company						
Mailing Address (number & street)						
City		State		Postal Code		
e-mail			Telephone (include area code)			

			Mark (X) if none	Confidential
3.	If you have had a prenotice communication (PC) concerning this notice and EPA assigned a PC Number to the notice, enter the number.		☐	☐
4.	If you previously submitted an exemption application for the chemical substance covered by this notice, enter the exemption number assigned by EPA. If you previously submitted a PMN for this substance enter the PMN number assigned by EPA (i.e. withdrawn or incomplete).		☐	☐
5.	If you have submitted a notice of Bona fide intent to manufacture or import for the chemical substance covered by this notice, enter the notice number assigned by EPA.		☐	☐

6.	Type of Notice – Mark (X)					
1.	Manufacture Only ☐ Binding Option ☐	2.	Import Only ☐ Binding Option ☐	3.	Both ☐	

Not for Submission

Part I – GENERAL INFORMATION -- Continued

Section B – CHEMICAL IDENTITY INFORMATION: You must provide a currently correct Chemical Abstracts (CA) name of the substance based on current CA index nomenclature rules and conventions.

Mark (X) the "Confidential" box next to any item you claim as confidential

Complete either item 1 (Class 1 or 2 substances) or 2 (Polymers) as appropriate. Complete all other items.

If another person will submit chemical identity information for you (for either Item 1 or 2), mark (X) the box at the right. Identify the name, company, and address of that person in a continuation sheet. ☐

1. Class 1 or 2 chemical substances (for definitions of class 1 and class 2 substances, see the Instructions Manual)	Class 1	Class 2	CBI
a. Class of substance - Mark (X)	☐	☐	☐

b. Chemical name (Currently correct Chemical Abstracts (CA) Name that is consistent with TSCA Inventory listings for similar substances. For Class 1 substances a CA Index Name must be provided. For Class 2 substances either a CA Index Name or CA Preferred Name must be provided, which ever is appropriate based on current CA index nomenclature rules and conventions). ☐

CAS Registry Number (if a number already exists for the substance)

c. Please identify which method you used to develop or obtain the specified chemical identity information reported in this notice: (check one).

Method 1 (CAS Inventory Expert Service - a copy of the Identification report obtained from the CAS Inventory Expert Services must be submitted as an attachment to this notice) ☐	IES Order Number		**Method 2** (Other Source) ☐

Enter Attachment filename for Part I, Section B, 1. c. ☐

d. Molecular formula ☐

e. For a class 1 substance, provide a complete and correct chemical structure diagram. For a class 2 substance, provide a correct representative or partial chemical structure diagram, as complete as can be known, if one can be reasonably ascertained. ☐

Enter Attachment filename for Part I, Section B, 1. e. ☐

Not for Submission

PMN Page 4a

For a class 2 substance - (1) List the immediate precursor substances with their respective CAS Registry Numbers. (2) Describe the nature of the reaction or process. (3) Indicate the range of composition and the typical composition (where appropriate).	Confidential

e. (1) List the immediate precursor substance names with their respective CAS Registry Numbers. ☐

Enter Attachment filename for Part I, Section B, 1. e. (1)		☐

e. (2) Describe the nature of the reaction or process. ☐

Enter Attachment filename for Part I, Section B, 1. e. (2)		☐

e. (3) Indicate the range of composition and the typical composition (where appropriate). ☐

Enter Attachment filename for Part I, Section B, 1. e. (3)		☐

Not for Submission

Part I -- GENERAL INFORMATION -- Continued

Section B -- CHEMICAL IDENTITY INFORMATION -- Continued

2. Polymers (For a definition of polymer, see the Instructions Manual.)	Confidential
a. Indicate the number-average weight of the lowest molecular weight composition of the polymer you intend to manufacture. Indicate maximum weight percent of low molecular weight species (not including residual monomers, reactants, or solvents) below 500 and below 1,000 absolute molecular weight of that composition.	☐

Describe the methods of measurement or the basis for your estimates:

GPC ☐	Other (Specify Below) ☐	

Specify Other:

(i) lowest number average molecular weight:	(ii) maximum weight % below 500 molecular weight:	(iii) maximum weight % below 1000 molecular weight:

Enter Attachment filename for Part I, Section B, 2. a.		☐

b. You must make separate confidentiality claims for monomer or other reactant identity, composition information, and residual information. Mark (X) the "Confidential" box next to any item you claim as confidential

(1) - Provide the specific chemical name and CAS Registry Number (if a number exists) of each monomer or other reactant used in the manufacture of the polymer.
(2) - Mark (X) this column if entry in column (1) is confidential.
(3) - Indicate the typical weight percent of each monomer or other reactant in the polymer.
(4) - Choose "yes" from drop down menu if you want a monomer or other reactant used at two weight percent or less to be listed as part of the polymer description on the TSCA Chemical Substance Inventory.
(5) - Mark (X) this column if entries in columns (3) and (4) are confidential.
(6) - Indicate the maximum weight percent of each monomer or other reactant that may be present as a residual in the polymer as manufactured for commercial purposes.
(7) - Mark (X) this column if entry in column (6) is confidential.

Monomer or other reactant specific chemical name (1)	CBI (2)	Typical composition (3)	Include in identity (4)	CBI (5)	Max residual (6)	CBI (7)
CAS Registry Number (1)						
CAS Registry Number (1)						
CAS Registry Number (1)						
CAS Registry Number (1)						
CAS Registry Number (1)						

Mark (X) this box if the data continues on the next page. ☐

Not for Submission

PMN Page 5a

c. Please identify which method you used to develop or obtain the specified chemical identity information reported in this notice (check one).				CBI
Method 1 (CAS Inventory Expert Service - a copy of the identification report obtained from CAS Inventory Expert Service must be submitted as an attachment to this notice) ☐	IES Order Number		**Method 2** (other source) ☐	
Enter Attachment filename for Part I, Section B, 2. c.				☐

d. The currently correct Chemical Abstracts (CA) name for the polymer that is consistent with TSCA Inventory listings for similar polymers.	☐
CAS Registry Number (if a number already exists for the substance)	

e. Provide a correct representative or partial chemical structure diagram, as complete as can be known, if one can be reasonably ascertained.	☐
Enter Attachment filename for Part I, Section B, 2. e.	☐

Not for Submission

Part I -- GENERAL INFORMATION -- Continued

Section B -- CHEMICAL IDENTITY INFORMATION -- Continued

3. Impurities
   (a) - Identify each impurity that may be reasonably anticipated to be present in the chemical substance as manufactured for commercial purpose. Provide the CAS Registry Number if available. If there are unidentified impurities, enter "unidentified."
   (b) - Estimate the maximum weight % of each impurity. If there are unidentified impurities, estimate their total weight %.

Impurity (a)	CAS Registry Number (a)	Maximum Percent % (b)	Confi-dential

Mark (X) this box if the data continues on the next page. ☐

Enter Attachment filename for Part I, Section B, 3. ☐

4. Synonyms - Enter any chemical synonyms for the new chemical identified in subsection 1 or 2. ☐

Enter Attachment filename for Part I, Section B, ☐

5. Trade identification - List trade names for the new chemical substance identified in subsection 1 or 2. ☐

Enter Attachment filename for Part I, Section B, 5. ☐

6. Generic chemical name - If you claim chemical identity as confidential, you must provide a generic name for your substance that reveals the specific chemical identity of the new chemical substance to the maximum extent possible. Refer to the TSCA Chemical Substance Inventory, 1985 Edition, Appendix B for guidance on developing generic names.

Enter Attachment filename for Part I, Section B, 6.

7. Byproducts - Describe any byproducts resulting from the manufacture, processing, use, or disposal of the new chemical substance. Provide the CAS Registry Number if available.

Byproduct (1)	CAS Registry Number (2)	Confi-dential

Mark (X) this box if the data continues on the next page. ☐

Not for Submission

Part I -- GENERAL INFORMATION -- Continued

Section C -- PRODUCTION, IMPORT, AND USE INFORMATION:

The information on this page refers to consolidated chemical number(s): ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6

Mark (X) the "Confidential" box next to any item you claim as confidential.

1. **Production volume** -- Estimate the **maximum** production volume during the first 12 months of production. Also estimate the maximum production volume for any consecutive 12-month period during the first three years of production. Estimates should be on 100% new chemical substance basis. For a Low Volume Exemption application, if you choose to have your notice reviewed at a lower production volume than 10,000 kg/yr, specify the volume and mark (x) in the binding box. If granted, you are bound to this volume.

Maximum first 12-month production (kg/yr) (100% new chemical substance basis)	Maximum 12-month production (kg/yr) (100% new chemical substance basis)	Confidential	Binding Option Mark (X)
		☐	☐

Enter Attachment filename for Part I, Section C, 1.		CBI ☐

2. **Use Information** -- You must make separate confidentiality claims for the description of the category of use, the percent of production volume devoted to each category, the formulation of the new substance, and other use information. Mark (X) the "Confidential" Box next to any item you claim as confidential.
   a. (1) --Describe each intended category of use of the new chemical substance by function and application.
   (2) --Mark (X) this column if entry column (1) is confidential business information (CBI).
   (3) --Indicate your willingness to have the information provided in column (1) binding.
   (4) --Estimate the percent of total production for the first three years devoted to each category of use.
   (5) --Mark (X) this column if entry in column (4) is confidential business information (CBI).
   (6) --Estimate the percent of the new substance as formulated in mixtures, suspensions, emulsions, solutions, or gels as manufactured for commercial purposes at sites under your control associated with each category of use.
   (7) --Mark (X) this column if entry in column (6) is confidential business information (CBI).
   (8) --Indicate % of product volume expected for the listed "use" sectors. Mark more than one box if appropriate. Mark (X) to indicate your willingness to have the use type provided in (8) binding.
   (9) --Mark (X) this column if entry(ies) in column (8) is (are) confidential business information (CBI).

Category of use (1) (by function and application i.e. a dispersive dye for finishing polyester fibers)	CBI (2)	Binding Option Mark (X) (3)	Production % (4)	CBI (5)	% in Formulation (6)	CBI (7)	% of substance expected per use (8)					CBI (9)
							Site-limited	Consumer*	Industrial	Commercial	Binding Option	

* If you have identified a "consumer" use, please provide on a continuation sheet a detailed description of the use(s) of this chemical substance in consumer products. In addition include estimates of the concentration of the new chemical substance as expected in consumer products and describe the chemical reactions by which this substance loses its identity in the consumer product.

Mark (X) this box if the data continues on the next page. ☐

b. Generic use description — If you claim any category of use description in subsection 2a as confidential, enter a generic description of that category. Read the Instruction Manual for examples of generic use descriptions.

Enter Attachment filename for Part I, Section C, 2. b.		CBI ☐

3. **Hazard Information** -- Include in the notice a copy of reasonable facsimile of any hazard warning statement, label, material safety data sheet, or other information which will be provided to any person who is reasonably likely to be exposed to this substance regarding protective equipment or practices for the safe handing, transport, use, or disposal of the new substance. List in part III hazard information you include.

Mark (X) this box if you attach hazard information. ☐	Binding Option Mark (X) ☐

Not for Submission

Part II-- HUMAN EXPOSURE AND ENVIRONMENTAL RELEASE

Section A -- INDUSTRIAL SITES CONTROLLED BY THE SUBMITTER

Mark (X) the "Confidential" box next to any item you claim as confidential

The information on pages 8 and 8a refer to consolidated chemical number(s): ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6

Complete section A for each type of manufacture, processing, or use operation involving the new chemical substance at industrial sites you control. Importers do not have to complete this section for operations outside the U.S.; however, you may still have reporting requirements if there are further industrial processing or use operations after import. You must describe these operations. See instructions manual

1. Operation description
   a. Identity -- Enter the identity of the site at which the operation will occur.

				Confi-dential
Name				☐
Site address (number and street)				
City		County		
State		ZIP code		

If the same operation will occur at more than one site, enter the number of sites. Identify the additional sites on a continuation sheet, and if any of the sites have significantly different production rates or operations, include all the information requested in this section for those sites as attachments. → ☐

Mark (X) this box if the data continues on the next page. ☐

b. Type -- Mark (X) Manufacturing ☐ Processing ☐ Use ☐ ☐

c. Amount and Duration -- Complete 1 or 2 as appropriate

				Confi-dential
1. Batch	Maximum kg/batch (100% new chemical substance)	Hours/batch	Batches/year	☐
2. Continuous	Maximum kg/day (100% new chemical substance)	Hours/day	Days/year	☐

d. Process description — Mark (X) to indicate your willingness to have your process description binding. → ☐

(1) Diagram the major unit operation steps and chemical conversions. Include interim storage and transport containers (specify- e.g. 5 gallon pails, 55 gallon drum, rail car, tank truck, etc.).
(2) Provide the identity, the approximate weight (by kg/day or kg/batch on a 100% new chemical substance basis), and entry point of all starting materials and feedstocks (including reactants, solvents, catalysts, etc.), and of all products, recycle streams, and wastes. Include cleaning chemicals (note frequency if not used daily or per batch.).
(3) Identify by number the points of release, including small or intermittent releases, to the environment of the new chemical substance. If releasing to two media at the same step, assign a second release number for the second medium.

☐

Not for Submission

PMN Page 8a

Diagram of the major unit operation steps.	Confidential ☐

Not for Submission

Enter Attachment filename for Part II, Section A, 1. d.	☐

Part II-- HUMAN EXPOSURE AND ENVIRONMENTAL RELEASE -- Continued

Section A -- INDUSTRIAL SITES CONTROLLED BY THE SUBMITTER -- Continued

The information on pages 9 and 9a refer to consolidated chemical number(s): ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6

2. Occupational Exposure -- You must make separate confidentiality claims for the description of worker activity, physical form of the new chemical substance, number of workers exposed, and duration of activity. Mark (X) the "Confidential" box next to any item you claim as confidential.

(1) -- Describe the activities (i.e. bag dumping, tote filling, unloading drums, sampling, cleaning, etc.) in which workers may be exposed to the substance.
(2) -- Mark (X) this column if entry in column (1) is confidential business information (CBI).
(3) -- Describe any protective equipment and engineering controls used to protect workers.
(4) and (6) -- Indicate your willingness to have the information provided in column (3) or (5) binding.
(5) -- Indicate the physical form(s) of the new chemical substance (e.g., solid: crystal, granule, powder, or dust) and % new chemical substance (if part of a mixture) at the time of exposure.
(7) -- Mark (X) this column if entries in columns (3) and (5) are confidential business information (CBI).
(8) -- Estimate the maximum number of workers involved in each activity for all sites combined.
(9) -- Mark (X) this column if entry in column (8) is confidential business information (CBI).
(10) and (11) -- Estimate the maximum duration of the activity for any worker in hours per day and days per year.
(12) -- Mark (X) this column if entries in columns (10) and (11) are confidential business information (CBI).

Worker activity (i.e., bag dumping, filling drums) (1)	CBI (2)	Protective Equipment/ Engineering Controls (3)	Binding Option Mark (X) (4)	Physical form(s) & % new substance (5)	Binding Option Mark (X) (6)	CBI (7)	# of Workers Exposed (8)	CBI (9)	Maximum Duration		CBI (12)
									Hrs/Day (10)	Days/Yr (11)	

Mark (X) this box if the data continues on the next page. ☐

Enter Attachment filename for Part II, Section A on the bottom of page 9a. ☐

Not for Submission

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3. Environmental Release and Disposal -- You must make separate confidentiality claims for the release number and the amount of the new chemical substance released and other release and disposal information. Mark (X) the "Confidential" box next to each item you claim as confidential.

(1) -- Enter the number of each release point identified in the process description, part II, section A, subsection 1d(3).
(2) -- Estimate the amount of the new substance released (a) directly to the environment or (b) into control technology (in kg/day or kg/batch).
(3) -- Mark (X) this column if entries in columns (1) and (2) are confidential business information (CBI).
(4) -- Identify the media (stack air, fugitive air (optional-see Instruction Manual), surface water, on-site or off-site land or incineration, POTW, or other (specify)) to which the new substance will be released from that release point.
(5) -- a. Describe control technology, if any, and control efficiency that will be used to limit the release of the new substance to the environment. For releases disposed of on land, characterize the disposal method and state whether it is approved for disposal of RCRA hazardous waste. On a continuation sheet, for each site describe any additional disposal methods that will be used and whether the waste is subject to secondary or tertiary on-site treatment. b. Estimate the amount released to the environment after control technology (in kg/day).
(6) -- Mark (X) this column if entries in columns (4) and (5) are confidential business information (CBI).
(7) -- Identify the destination(s) of releases to water. Please supply NPDES (National Pollutant Discharge Elimination System) numbers for direct discharges or NPDES numbers of the POTW (Publicly Owned Treatment Works). Mark (X) if the POTW name or NPDES # is confidential business information (CBI).

Release Number	Amount of New Substance Released		CBI	Medium of release e.g. Stack air	Control technology and efficiency (you may wish to optionally attach efficiency data)			CBI
(1)	(2a)	(2b)	(3)	(4)	(5a)	Binding Mark (X)	(5b)	(6)
Mark (X) this box if the data continues on the next page.								☐

(7) Mark (X) the destination(s) of releases to water.		NPDES#	CBI
☐ POTW--provide name(s)			☐
☐ Navigable waterway-- provide name(s)			☐
☐ Other--Specify			☐
Enter Attachment filename for Part II, Section A.			☐

Not for Submission

Part II-- HUMAN EXPOSURE AND ENVIRONMENTAL RELEASE -- Continued

Section B -- INDUSTRIAL SITES CONTROLLED BY OTHERS

The information on pages 10 and 10a refer to consolidated chemical number(s): ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6

Complete section B for typical processing or use operations involving the new chemical substance at sites you do not control. Importers do not have to complete this section for operations outside the U.S.; however, you must report any processing or use activities after import. See the Instructions Manual. *Complete a separate section B for each type of processing, or use operation involving the new chemical substance.* If the same operation is performed at more than one site describe the typical operation common to these sites. Identify additional sites on a continuation sheet.

1(a). Operation Description -- To claim information in this section as confidential, bracket (e.g. {}) the specific information that you claim as confidential.

(1) -- Diagram the major unit operation steps and chemical conversions, including interim storage and transport containers (specify - e.g. 5 gallon pails, 55 gallon drums, rail cars, tank trucks, etc). On the diagram, identify by letter and briefly describe each worker activity.

(2) -- Either in the diagram or in the text field 1(b) below, provide the identity, the approximate weight (by kg/day or kg/batch, on an 100% new chemical substance basis), and entry point of all feedstocks (including reactants, solvents and catalysts, etc) and all products, recycle streams, and wastes. Include cleaning chemicals (note frequency if not used daily or per batch).

(3) -- Either in the diagram or in the text field 1(b) below, identify by number the points of release, including small or intermittent releases, to the environment of the new chemical substance.

(4) -- Please enter the # of sites (remember to identify the locations of these sites on a continuation sheet):

	Number of Sites		Confidential ☐

1(b). (Optional) This space is for a text description to clarify the diagram above. Confidential ☐

Enter Attachment filename for Part II, Section B on the bottom of page 10a.	☐

Not for Submission

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2. Worker Exposure/Environmental Release

(1) -- From the diagram above, provide the letter for each worker activity. Complete 2-8 for each worker activity described.
(2) -- Estimate the number of workers exposed for all sites combined.
(4) -- Estimate the typical duration of exposure per worker in (a) hours per day and (b) days per year.
(6) -- Describe physical form of exposure and % new chemical substance (if in mixture), and any protective equipment and engineering controls, if any, used to protect workers.
(7) -- Estimate the percent of the new substance as formulated when packaged or used as a final product.
(9) -- From the process diagram above, enter the number of each release point. Complete 9-13 for each release point identified.
(10) -- Estimate the amount of the new substance released (a) directly to the environment or (b) into control technology to the environment (in kg/day or kg/batch).
(12) -- Describe media of release i.e. stack air, fugitive air (optional-see Instructions Manual), surface water, on-site or off-site land or incineration, POTW, or other (specify) and control technology, if any, that will be used to limit the release of the new substance to the environment.
(14) -- Identify byproducts which may result from the operation.
(3), (5), (8), (11), (13) and (15) -- Mark (X) this column if any of the proceeding entries are confidential business information (CBI).

Letter of Activity	# of Workers Exposed	CBI	Duration of Exposure		CBI	Protective Equip./Engineering Controls/Physical Form	% new substance	% in Formulation	CBI
(1)	(2)	(3)	(4a)	(4b)	(5)	(6)	(7)	(7)	(8)

Release Number	Amount of New Substance Released		CBI	Media of Release & Control Technology	CBI
(9)	(10a)	(10b)	(11)	(12)	(13)

Mark (X) this box if the data continues on the next page. ☐

(14) Byproducts: **(15) CBI** ☐

Enter Attachment filename for Part II, Section B. ☐

Not for Submission

OPTIONAL POLLUTION PREVENTION INFORMATION

To claim information in the following section as confidential, bracket (e.g. {}) the specific information that you claim as confidential.

In this section you may provide information not reported elsewhere in this form regarding your efforts to reduce or minimize potential risks associated with activities surrounding manufacturing, processing, use and disposal of the PMN substance. Please include new information pertinent to pollution prevention, including source reduction, recycling activities and safer processes or products available due to the new chemical substance. Source reduction includes the reduction in the amount or toxicity of chemical wastes by technological modification, process and procedure modification, product reformulation, and/or raw materials substitution. Recycling refers to the reclamation of useful chemical components from wastes that would otherwise be treated or released as air emissions or water discharges, or land disposal. Quantitative or qualitative descriptions of pollution prevention, source reduction and recycling should emphasize potential risk reduction in addition to compliance with existing regulatory requirements. The EPA is interested in the information to assess overall net reductions in toxicity or environmental releases and exposures, not the shifting of risks to other media (e.g., air to water) or nonenvironmental areas (e.g., occupational or consumer exposure). To the extent known, information about the technology being replaced will assist EPA in its relative risk determination. In addition, information on the relative cost or performance characteristics of the PMN substance to potential alternatives may be provided.

Describe the expected net benefits, such as

(1) an overall reduction in risk to human health or the environment;
(2) a reduction in the generation of waste materials through recycling, source reduction or other means;
(3) a reduction in the use of hazardous starting materials, reagents, or feedstocks;
(4) a reduction in potential toxicity, human exposure and/or environmental release; or
(5) the extent to which the new chemical substance may be a substitute for an existing substance that poses greater overall risk to human health or the environment.

Information provided in this section will be taken into consideration during the review of this submission. See PMN Instructions Manual and Pollution Prevention Guidance manual for guidance and examples.

Not for Submission

Enter Attachment filename for Pollution Prevention Page 11.	

Part III -- LIST OF ATTACHMENTS

Attach continuation sheets for sections of the form, test data and other data (including physical/chemical properties and structure/activity information), and optional information after this page. Clearly identify the attachment and the section of the form to which it relates, if appropriate. Number consecutively the pages of any paper attachments. In the Number of Pages column below, enter the inclusive page numbers of each attachment for paper submissions or enter the total number of pages for each attachment for electronic submissions. Electronic attachments can be identified by filename.
Mark (X) the "Confidential" box next to any attachment name or filename you claim as confidential. Read the Instructions Manual for guidance on how to claim any information in an attachment as confidential. You must include with the sanitized copy of the notice form a sanitized version of any attachment in which you claim information as confidential.

#	Attachment Name	Attachment Filename	Number of Pages	Associated PMN Section Number	CBI

Mark (X) this box if the data continues on the next page. ☐

Not for Submission

PMN Page 13

PHYSICAL AND CHEMICAL PROPERTIES WORKSHEET

The information on this page refers to chemical number(s): ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6

To assist EPA's review of physical and chemical properties data, please complete the following worksheet for data you provide and include it in the notice. Identify the property measured, the value of the property, the units in which the property is measured (as necessary), and whether or not the property is claimed as confidential. Give the attachment number (found on page 12) in column (b). The physical state of the neat substance should be provided. These measured properties should be for the neat (100% pure) chemical substance. Properties that are measured for mixtures or formulations should be so noted (% PMN substance in ___). You are not required to submit this worksheet; however, EPA strongly recommends that you do so, as it will simplify the review and ensure that confidential information is properly protected. You should submit this worksheet as a supplement to your submission of test data. This worksheet is not a substitute for submission of test data.

Property (a)		Unit	Mark X if Provided	Attachment Number (b)	Value (c)			Measured or Estimate (M or E)	CBI Mark (X) (d)
Physical state of neat substance			☐		(solid) ☐	(liquid) ☐	(gas) ☐		
Vapor Pressure @ Temperature		°C	☐				Torr		
Density/relative density			☐				g/cm3		
Solubility									
@ Temperature		°C	☐				g/L		
Solvent									
Solubility in Water @ Temperature		°C	☐				g/L		
Melting Temperature			☐				°C		
Boiling / Sublimation temperature @		Torr	☐				°C		
Spectra			☐						
Dissociation constant			☐						
Octanol / water partition coefficient			☐						
Henry's Law constant			☐						
Volatilization from water			☐						
Volatilization from soil			☐						
pH@ concentration			☐						
Flammability			☐						
Explodability			☐						
Adsorption / Coefficient			☐						
Particle Size Distribution			☐						
Other -- Specify			☐						

Not for Submission

EPA FORM 7710-25 (Rev. 12-19)

Exhibit B

Per- and Polyfluoroalkyl Substances (PFAS) Summary Report

Final

September 5, 2018

Economic and Policy Analysis Branch
Chemistry, Economics & Sustainable Strategies Division
Office of Pollution, Prevention, and Toxics
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue
Washington, DC 20460

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1. Introduction

Per- and polyfluoroalkyl substances (PFAS) are a group of manmade chemicals that includes perfluorooctanoic acid (PFOA), perfluorooctane sulfonate (PFOS), GenX, and many other chemicals. PFAS have been manufactured and used in a variety of industries around the globe, including in the United States since the 1940s. PFAS are found in a wide range of consumer products that people use daily such as cookware, pizza boxes, and stain repellants (U.S. Environmental Protection Agency (EPA) 2018b).

Most people have been exposed to PFAS. Certain PFAS, such as PFOA and PFOS, can accumulate and stay in the human body for long periods of time. There is evidence that exposure to PFAS can lead to adverse health outcomes in humans. PFOA and PFOS have been the most extensively produced and studied of these chemicals. Studies indicate that PFOA and PFOS can cause reproductive and developmental, liver and kidney, and immunological effects in laboratory animals. Both chemical groups have caused tumors in animals. The most consistent findings are increased cholesterol levels among exposed populations, with more limited findings related to

- low infant birth weights,
- effects on the immune system,
- cancer (for PFOA), and
- thyroid hormone disruption (for PFOS; EPA 2018b).

The purpose of this summary report is to provide information on all PFAS[1] in the Toxic Substances Control Act (TSCA) Chemicals Substances Inventory (hereafter referred to as the Inventory), rather than only on a subset such as PFOA or long-chain perfluoroalkyl carboxylic acids (PFCAs). Section 1 provides a definition of PFAS and describes how PFAS are classified in this report. Section 2 provides a brief overview of regulatory actions impacting PFAS manufacture and use. Section 3 describes PFAS manufacturing and import, and Section 4 presents an overview of PFAS uses and applications.

1.1 PFAS Definition and Classification

PFAS refer to a sub-group of per- and polyfluorinated chemicals (PFCs).[2,3] PFCs are organic compounds with fluorine replacing some or all of the chemical's hydrogen (OECD 2018b). Though EPA has historically used the term PFC to refer to fluorinated compounds more generally, the accepted terminology within the Agency has shifted to PFAS. The term includes chemicals such as PFOA and PFOS. EPA previously used the PFAS abbreviation for perfluoroalkyl sulfonic acid, which now is abbreviated as PFSA. For the purpose of this summary report, the term PFAS is used to describe the broader categories of chemicals.

Thousands of PFAS have been produced and used globally. The Organization for Economic Co-operation and Development (OECD) classifies the chemicals as shown in Figure 1-1.[4] The Figure presents commonly recognized categories of PFAS in OECD's Global Database. The classification is

[1] PFAS include per- and polyfluorinated substances of C2 and greater for the purpose of this report (and the underlying TSCA data utilized in it).

[2] PFCs has also been used to abbreviate a related group of fluorinated chemicals called perfluorocarbons.

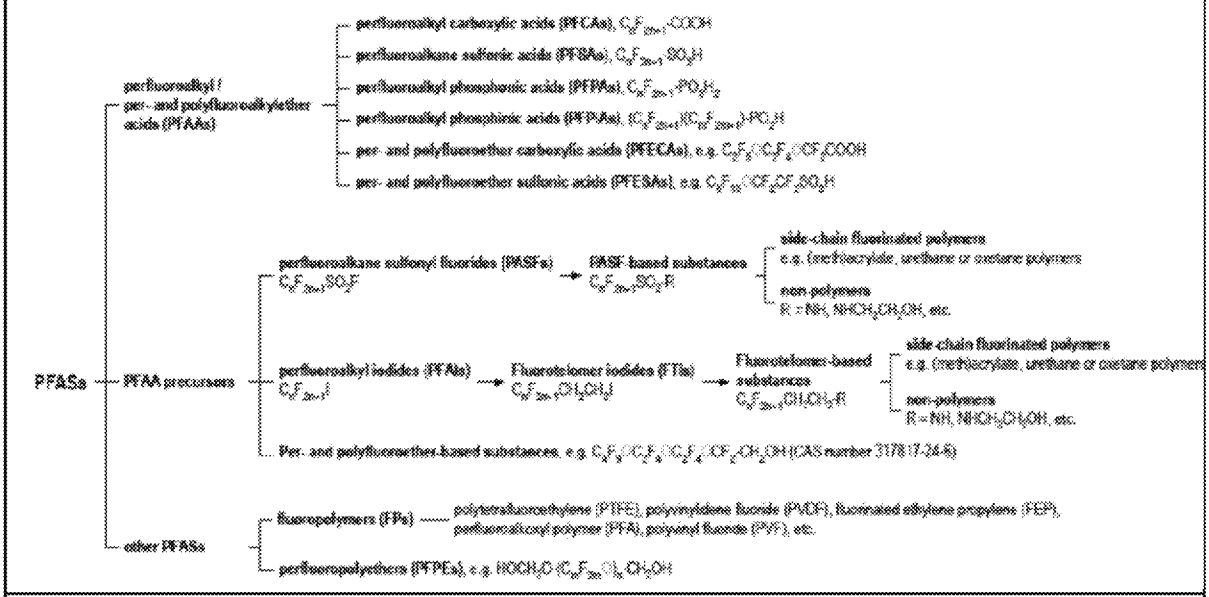
[3] See https://www.epa.gov/pfas/what-are-pfcs-and-how-do-they-relate-and-polyfluoroalkyl-substances-pfass

[4] The structural parameters that constitute PFAS can differ between countries and organizations.

being adopted in this market report to help facilitate the discussion. PFAS are broken into three major categories

1. perfluoroalkyl/per- and polyfluoroalkylether acids (PFAAs),
2. PFAA precursors,
3. and other PFAS.

Figure 1-1: General Classification of Per- and Polyfluoroalkyl Substances (PFAS)



Source(s):
OECD (2018b)

Historically, EPA was interested in two broad categories of PFAS within the PFAA group, long-chain perfluoroalkyl sulfonic acids (PFSAs), which include PFOS, and long-chain perfluoroalkyl carboxylic acids (PFCAs), which include PFOA. The focus of this report has expanded this traditional focus to include all PFAS, both short- and long-chain.

PFSAs and PFCAs are classified as either long-chain or short-chain depending on the number of perfluoroalkyl carbons or the number of total carbons. Definitions for long-chain versus short-chain PFAS vary. For example, long-chain PFSAs have been defined as chemicals with 6 or more perfluoroalkyl carbons (or 6 or more total carbons). Long-chain PFCAs have been defined as chemicals with 7 or more perfluoroalkyl carbons (or 8 or more total carbons). OECD only defines long-chain for PFSAs and PFCAs. However, Buck et al. (2011) considers other PFAS with 7 or more perfluoroalkyl carbons as long-chain. For the purposes of TSCA, definitions of short and long chain have also varied, particularly between PFAS sub-categories, for example, in the Significant New Use Rule (SNUR) amendment for long-chain perfluoroalkyl carboxylate (LCPFAC). For simplicity and illustration in this summary report, short-chain PFAS are defined as ($< 7\ CF_2$) and long chain as ($\geq 7\ CF_2$).

The first step in identifying chemicals within the PFAS universe was to search the Inventory for the presence of these chemicals. This was done by searching for the term poly- and perfluoro (with 2 or

greater carbons) in the chemicals names listed on the Inventory. The list of Chemical Abstracts Services (CAS) registry numbers that fit this description was provided by the Industrial Chemistry Branch (ICB) of the Environmental Protection Agency (EPA) and includes 1,220 PFAS. Of the 1,220 PFAS, 824 are non-CBI and 396 are CBI (see Table 1-1).

Table 1-1: Summary of PFAS in the Inventory

Parameter	Number of Chemicals
Total Number of PFAS	1,220
Non-CBI PFAS	824
CBI-PFAS	396

Table 1-2 presents the commercial status designation of the 1,220 PFAS chemicals on the Inventory. A total of 551 chemicals are of known active status. Active status indicates that the chemical was commercially active during the 10 years prior to June 22nd 2016 when TSCA was reauthorized. Chemical processors are still reporting to EPA regarding the chemicals they manufacture and import. The reporting period for processors closes on October 5, 2018, after which, all Inventory substances will be classified with either an active or inactive designation.

Table 1-2: Commercial Status Designation of PFAS in the Inventory

TSCA Chemicals	Total	Active
Non-CBI PFAS	**824**	322
CBI PFAS	**396**	229
Total	**1,220**	**551**

Table 1-3 presents the TSCA Inventory PFAS list according to eight major PFAS subcategories that are derived from the hierarchy provided in Figure 1-1. Chemical categories were applied by searching the OECD global database by the CAS number, and assigning the corresponding PFAS category to each chemical. The perfluoroalkane sulfonyl compounds (e.g., PFSAs) group comprised the largest number of PFAS with a total of 310 (68 active). This was followed by the fluorotelomer-related compounds (e.g. FTIs) group, which comprises a total of 212 PFAS (97 active). Table A-1 presents a more detailed description of the PFAS subcategories and respective chemical groups within each subcategory.

Table 1-3: Non-CBI TSCA Inventory PFAS by PFAS Category

PFAS Category	Total	Active
perfluoroalkyl carbonyl compounds (e.g., PFCA)	78	22
perfluoroalkane sulfonyl compounds (e.g., PFSA)	310	68
perfluoroalkyl phosphate compounds (e.g., PFPA)	2	2
fluorotelomer-related compounds (e.g., FTI)	212	97
per- and polyfluoroalkyl ether-based compounds (e.g. PFECA)	58	31
other PFAA precursors and related compounds - perfluoroalkyl ones	38	22
other PFAA precursors or related compounds – semi fluorinated (e.g., HFE)	15	13
fluoropolymers (e.g., PTFE)	54	40
Not Classified	57	27
Total	**824**	**322**

For the remainder of this report, only Active substances will be discussed. The next step was to determine the number of short- and long-chain PFAS. In this report, perfluoroalkyl carbon chain length thresholds for short- and long-chain PFAS are defined as less than 7 CF_2 for short-chain and greater than or equal to 7 CF_2 for long-chain. These definitions are based on Buck et al. (2011). Table 1-4 presents the number of active short-chain and long-chain PFAS. The chain lengths were extracted from the OECD global database. It is important to note that not all of the 322 Active Inventory chemicals could be categorized in the OECD database and the data presented in Table 1-4 reflect this limitation. A total of 254 PFAS (of the 322) could be classified as short- or long-chain, these are presented in Table 1-4.[5] A total of 68 PFAS were excluded from the table, 27 because they were not in the OECD global database and 41 because they have multiple perfluoroalkyl carbon chain lengths reported or have unclear chemical descriptions.[6,7] Of the 254 active PFAS summarized in Table 1-4, 111 are short-chain and 143 are long-chain PFAS.

Table 1-4: Perfluoroalkyl Carbon Chain Length of Active PFAS in the Inventory

PFAS Category	Total	Perfluoroalkyl Carbon Chain Length[1,2]	
		Short-chain (< 7 CF_2)	Long-chain (≥ 7 CF_2)
perfluoroalkyl carbonyl compounds (e.g., PFCA)	21	14	7
perfluoroalkane sulfonyl compounds (e.g., PFSA)	64	37	27
perfluoroalkyl phosphate compounds (e.g., PFPA)	0	0	0
fluorotelomer-related compounds (e.g., FTI)	65	27	38
per- and polyfluoroalkyl ether-based compounds (e.g. PFECA)	31	10	21
other PFAA precursors and related compounds - perfluoroalkyl ones	21	14	7
other PFAA precursors or related compounds – semi fluorinated (e.g., HFE)	12	9	3
fluoropolymers (e.g., PTFE)	40	0	40
Total	**254**	**111**	**143**

Note(s):

[1] Only PFAS in the OECD global database are categorized by perfluoroalkyl carbon chain length. Of the 322 Active PFAS, the 254 Active PFAS are summarized in this table. A total of 68 Active PFAS are excluded from the table, 27 because they were not in the OECD global database and 41 because they have variable or unclear perfluoroalkyl carbon chain lengths.

[2] Perfluoroalkyl carbon chain length thresholds presented in this table (short-chain, < 7; long-chain, $CF_2 \geq 7$ CF_2) are guideline thresholds appearing in Buck et al. (2011). Only PFSAs and PFCAs have thresholds defined by OECD. According to OECD, long-chain PFSAs refer to PFSAs with 6 or more perfluoroalkyl carbons and long-chain PFCAs refer to PFCAs with 7 or more perfluoroalkyl carbons.

Table 1-5 presents the number of PFAS reported in the Chemical Data Reporting (CDR) database from 2006 to 2016. The total number of PFAS (824) in the Inventory were cross-referenced with all of the chemicals reported in the 2006, 2012, and 2016 CDR by CAS number. A total of 161 were reported in 2016, of which 90 were listed as non-CBI PFAS. Note that three chemicals reported in the 2006 CDR are not active in the current Inventory. The largest category was FTI chemicals with 38 non-CBI reported in 2016.

[5] According to OECD, long chain PFSAs refer to PFSAs with 6 or more perfluoroalkyl carbons and long chain PFCAs refer to PFCAs with 7 or more perfluoroalkyl carbons.

[6] Many of the chemicals that have multiple chain lengths reported have unspecified or partially unspecified chemical formulas (OECD 2018a). For chemicals that have specified chemical formulas, it is unclear why each has multiple chain lengths reported.

[7] Unclear descriptions include chemicals described with ambiguous descriptions such as "reaction products", described with unclear terms, or registered with only trade names and general descriptions (OECD2018b).

Table 1-5: Number of PFAS Reported in the CDR

PFAS Category	2006 CDR	2012 CDR	2016 CDR
Non CBI			
perfluoroalkyl carbonyl compounds (e.g., PFCA)	4	4	4
perfluoroalkane sulfonyl compounds (e.g., PFSA)	3	5	8
perfluoroalkyl phosphate compounds (e.g., PFPA)	0	0	2
fluorotelomer-related compounds (e.g., FTI)	27	28	38
per- and polyfluoroalkyl ether-based compounds (e.g. PFECA)	8	13	12
other PFAA precursors and related compounds - perfluoroalkyl ones	5	4	8
other PFAA precursors or related compounds – semi fluorinated (e.g., HFE)	5	8	9
fluoropolymers (e.g., PTFE)	0	0	1
Not Classified	10	8	8
Total	**62**	**70**	**90**
CBI			
Total		**29**	**71**
Non-CBI and CBI			
Total		**99**	**161**

2. Regulatory Background

EPA has undertaken several key regulatory actions to address PFAS. Table 2-1 provides a chronological overview of some of these major efforts. In particular, EPA has published significant new use rules (SNURs) for PFAS, beginning in 2002, that require manufacturers to notify EPA at least 90 days before manufacturing, importing, or processing PFAS. Table 2-2 provides more details about those SNURs.

Table 2-1: EPA Actions to on PFAS

Title	EPA Office	Date	Summary
New Chemicals Program Review of Alternatives for PFOA and Related Chemicals	OPPT	Ongoing	EPA reviewed hundreds of new chemical substitutes for PFOA, PFOS, and other long-chain PFAS under EPA's New Chemicals Program since 2000. EPA reviews the new substances to identify whether the range of toxicity, fate and bioaccumulation issues that have caused past concerns with perfluorinated substances may be present, as well as any issues that may arise by new chemistries, to ensure that the new chemical may not present an unreasonable risk to health or the environment. One outcome of EPA's review of a PMN or MCAN for a new chemical substance or review of a SNUN for a significant new use is the issuance of an order under section 5(e) of TSCA. Most TSCA section 5(e) Orders issued by EPA are Consent Orders that are negotiated with the submitter of the notification.
Lifetime Health Advisories and Health Effects Support Documents for PFOA and PFOS	OW	May 16th 2016	EPA announced the release of lifetime health advisories (HAs) and health effects support documents for PFOA and PFOS. EPA's HAs, which identify the concentration of PFOA and PFOS in drinking water at or below which adverse health effects are not anticipated to occur over a lifetime of exposure, are: 70 parts per trillion (ppt) for PFOA and PFOS.
Significant New Use Rules (SNURs): Long-Chain Perfluoroalkyl Carboxylate and Perfluoroalkyl Sulfonate Chemical Substances Proposed Rule	OPPT	January 21st 2015	EPA proposed a SNUR for Long-Chain Perfluoroalkyl Carboxylate (LCPFAC) chemical substances that would require manufacturers (including importers) of PFOA and PFOA-related chemicals, including as part of articles, and processors of these chemicals to notify EPA at least 90 days before starting or resuming new uses of these chemicals in any products.
Significant New Use Rules: Perfluoroalkyl Sulfonates and Long-Chain Perfluoroalkyl Carboxylate Chemical Substances (Final)	OPPT	October 22nd 2013	EPA amended a SNUR to designate as a significant new use PFAS that have completed the new chemical review process under TSCA but have not yet commenced production or import and processing. EPA also finalized a SNUR to designate as a significant new use LCPFAC chemical substances used in manufacturing (including importing) and processing of carpets or for treating carpet.
Revisions to the Unregulated Contaminant Monitoring Rule for Public Water Systems	OW	May 2nd 2012	The UCMR3 required monitoring for 30 contaminants (28 chemicals and two viruses) between 2013 and 2015 using analytical methods developed by EPA, consensus organizations, or both. The purpose of UCMR3 was to collect occurrence data for contaminants suspected to be present in drinking water, but that do not have health-based standards set under the SDWA. Six perfluorinated compounds were included in the UCMR3: PFOS, PFOA, PFNA, PFHxS, PFBS, and perfluoroheptanoic acid (PFHpA). Of these 6 compounds, PFOA and PFOS were found in the greatest number of samples. However, less than one percent of the public water systems sampled had results that exceeded the reference dose (lifetime HA limit of 70 ppt or 0.07µg/L).
Premanufacture Notification Exemption for Polymers; Amendment of Polymer Exemption Rule to Exclude Certain Perfluorinated Polymers	OPPT	January 27th 2010	EPA published a final rule that amended the Polymer Exemption Rule to no longer exclude from eligibility polymers that include any one or more of the following: PFAS, PFAC, or perfluoroalkyl moieties that are covalently bound to either a carbon or sulfur atom where the carbon or sulfur atom is an integral part of the polymer molecule. Compliance date was January 27, 2012.

Table 2-1: EPA Actions to on PFAS

Title	EPA Office	Date	Summary
Provisional Health Advisories for PFOA and PFOS	OW	January 8th 2009	EPA conducted limited testing of agricultural sites in Alabama where sewage sludge was applied from a local wastewater treatment plant that receives wastewater from numerous industrial sources, including facilities that manufacture and use PFOA and other PFAS. The results of this limited testing showed elevated levels of PFAS in sludge and in soil that received the sludge.
Significant New Use Rule: Perfluoroalkyl Sulfonates	OPPT	October 9th 2007	EPA finalized a SNUR on 183 PFAS chemicals believed to be no longer manufactured, imported, or used in the U.S. The SNUR required manufacturers and importers to notify EPA at least 90 days before commencing the manufacture or import of the PFAS chemicals for the significant new uses described.
Significant New Use Rule: Perfluoroalkyl Sulfonates	OPPT	December 9th, 2002 (Origination Date)	EPA issued a SNUR for 75 PFAS, requiring manufacturers and importers to notify EPA at least 90 days before starting the manufacture or importation of these chemical substances for the significant new uses described.
Significant New Use Rule; Final Rule and Supplemental Proposed Rule: Perfluoroalkyl Sulfonates	OPPT	March 11th 2002 (Origination Date)	EPA published a SNUR to require notification to EPA before any future manufacture (including import) of 13 PFAS chemicals specifically included in the voluntary phaseout of PFOS by 3M that took place between 2000 and 2002.

Source(s):
EPA (2018a)

Significant New Use Rules (SNURs) have restricted the manufacture, import, and use of many PFAS. Table 2-2 presents the Significant New Use Rules (SNURs) for existing PFAS. The first SNUR was proposed in 2000 covering 90 long-chain PFSAs, more specifically, long-chain PFOSs. From 2002 to 2007, EPA identified a total of 270 PFSAs. In 2010, EPA amended the Polymer Exemption Rule to exclude from eligibility polymers containing as an integral part of their composition, except as impurities, certain perfluoroalkyl moieties consisting of a CF3- or longer chain length. Beginning in 2013, EPA shifted attention to long-chain PFCAs to limit uses in carpets and carpet treatment products.

Table 2-2: Significant New Use Rules for Existing PFAS
October 18, 2000 - Proposed SNUR on 90 perfluorooctyl sulfonyl (PFOS) long-chain chemicals (65 FR 62319)
March 11, 2002 - Final SNUR on 13 perfluoroalkyl sulfonate (PFAS) chemicals (67 FR 11008)
March 11, 2002 -Proposed SNUR on 74 PFAS chemicals, including PFOS (67 FR 11014)
December 9, 2002 - Final SNUR on 74 PFAS/PFOS chemicals (67 FR 72854)
October 9, 2007 - Final SNUR on 183 PFAS chemicals believed to no longer be manufactured (including imported) or used in the United States (72 FR 57222)
January 27, 2010 - Polymer Exemption Rule revoking exemption from full PMN reporting for new PFC polymers (75 FR 4295)
October 22, 2013 - Proposed SNUR amendment at 40 CFR 721.10536 for LCPFAC chemical substances by designating manufacturing (including importing) or processing of LCPFAC chemical substances listed in Table 1 of the Rule for any use that is no longer ongoing after December 31, 2015, as a significant new use; designating manufacturing (including importing) or processing of PFOA or its salts for any use as a significant new use; and designating manufacturing (including importing) or processing of all other LCPFAC chemical substances for any use not ongoing as of the date on which this proposed rule is published as a significant new use.
January 21, 2015 - Proposed SNUR on LCPFAC chemical substances to ensure that perfluorinated chemicals that have been phased out do not re-enter the marketplace without review (80 FR 2885)

In 2006, EPA invited eight major leading companies in PFAS industry to join in a global stewardship program (2010/2015 PFOA Stewardship Program) with two goals:

1. To commit to achieve, no later than 2010, a 95 percent reduction, measured from a year 2000 baseline, in both facility emissions to all media of PFOA, precursor chemicals that can break down to PFOA, and related higher homologue chemicals, and product content levels of these chemicals; and
2. To commit to working toward the elimination of these chemicals from emissions and products by 2015.

Participants in the Stewardship Program included

- Arkema
- Asahi Glass Company
- BASF Corporation (successor to Ciba Specialty Chemicals Corporation)
- Clariant

- Daikin
- 3M/Dyneon
- DuPont
- Solvay Solexis

At the time of initiation of the Stewardship Program, these companies represented the majors global manufacturers of long-chain PFCAs. All companies have met the PFOA Stewardship Program goals. Final progress reports are available on EPA's website.[8]

Table 2-3 present the number of active non-CBI and CBI PFAS in the Inventory with any associated regulatory flags. Table 2-3 also indicates if the CBI PFAS is provisional. The regulatory flags provide an indication of rulemakings that impact PFAS in the Inventory and reporting requirements for manufactured or imported PFAS. A total of 202 PFAS are identified in final SNURs, 145 non-CBI PFAS and 57 CBI PFAS (see Table 2-3).

Table 2-3: Regulatory Flags for Active TSCA Inventory PFAS[1]

PFAS Category	Total	PMN	5E	S	SP	XU	FRI
Non-CBI							
perfluoroalkyl carbonyl compounds (e.g., PFCA)	22	0	0	8	3	0	0
perfluoroalkane sulfonyl compounds (e.g., PFSA)	68	7	3	51	0	1	0
perfluoroalkyl phosphate compounds (e.g., PFPA)	2	0	0	2	0	0	0
fluorotelomer-related compounds (e.g., FTI)	97	30	3	67	17	3	0
per- and polyfluoroalkyl ether-based compounds (e.g. PFECA)	31	18	4	5	0	9	0
other PFAA precursors and related compounds - perfluoroalkyl ones	22	5	1	2	0	1	0
other PFAA precursors or related compounds – semi fluorinated (e.g., HFE)	13	12	0	5	0	0	0
fluoropolymers (e.g., PTFE)	40	25	13	2	0	26	1
Not Classified	27	13	0	3	0	6	0
Subtotal	**322**	**110**	**24**	**145**	**20**	**46**	**1**
CBI							
Provisional Status							
Yes	45	44	42	34	0	0	0
No	184	184	75	23	3	77	5
Subtotal	**229**	**228**	**117**	**57**	**3**	**77**	**5**
Non-CBI and CBI							
Total	**551**	**338**	**141**	**202**	**23**	**123**	**6**

Note(s):

[1] Regulatory Flags: PMN - indicates a commenced PMN substance; 5E - indicates a substance that is subject of a TSCA section 5(e) order; S - indicates a substance that is identified in a final Significant New use Rule; SP - indicates a substance that is identified in a proposed Significant New Use Rule; XU -indicates a substance exempt from reporting under the Chemical Data Reporting Rule, (40 CFR 711); FRI - indicates a polymeric substance containing no free-radical initiator in its Inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.

[8] https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/epas-non-cbi-summary-tables-2015-company-progress

3. Manufacturing and Import of PFAS

Manufacturers and Importers of PFAS chemicals were identified by searching the CDR and the Toxics Release Inventory (TRI). CDR was searched to identify PFAS parent companies that reported manufacturing and\or importing PFAS(s) in the non-CBI 2016 CDR. A total of 14 parent companies were identified and are presented in Table 3-1. Four of these 14 parent companies: 3M Company, AGC Chemicals America, Inc., Daikin America, Inc and Solvay Specialty Polymers USA, LLC took part in the PFOA Stewardship Program (see Chapter 2).

Table 3-2 presents the PFAS parent companies, their related manufacturing sites, and the number of PFAS reported at each site as reported in the 2016 CDR. A total of 31 sites reported 90 different PFAS. One site and at least one parent company are listed as CBI. The Chemours Company manufactured the largest number of PFAS (39 different PFAS). Appendix B, Table B-1 presents the combined manufacture and import volume as well as the national aggregate production volume for each PFAS reported in the 2016 CDR. The manufacturing and import volumes for all PFAS reported were withheld and only 18 of the 90 PFAS reported provide a range of national aggregate production volume (see Table B-1).

Table 3-1: Parent Companies Reporting PFAS in the 2016 CDR

Parent Company[1]
3M COMPANY
AGC CHEMICALS AMERICAS, INC.
ATOTECH USA, INC.
DAIKIN AMERICA, INC.
Dow Corning Corporation
FORD MOTOR COMPANY
HONEYWELL INTERNATIONAL INC
LANXESS CORPORATION
LINDE NORTH AMERICA, INC
PEACH STATE LABS INC
SOLVAY SPECIALTY POLYMERS USA, LLC
SUMITOMO CORPORATION OF AMERICAS
The Chemours Co
TYCO FIRE PRODUCTS LP

Note(s):
[1] Two parent companies were removed because they appeared to be duplicates with slightly different spellings.

Table 3-2: Number of PFAS Chemicals Manufactured by Parent Company and Site in the 2016 CDR

Parent Company	Manufacturing Site Name	Site State	Number of Chemicals Manufactured	
			Parent Company	Site
3M COMPANY	3M COMPANY	MN	4	3
3M COMPANY	3M COMPANY/3M CORDOVA	IL	4	1
AGC CHEMICALS AMERICAS, INC.	AGC CHEM AMER INC BUS & TECH CTR	PA	4	4
ATOTECH USA, INC.	ATOTECH USA	SC	2	2
CBI	3M COMPANY	AL	CBI	4
CBI	3M COMPANY/3M CORDOVA	IL	CBI	13
CBI	3M COTTAGE GROVE CENTER	MN	CBI	2
CBI	AIR PROD & CHEM HAMILTON BLVD FAC	PA	CBI	2
CBI	CBI	CBI	CBI	12
CBI	INNOVATIVE CHEMICAL TECHNOLOGIES INC	GA	CBI	4
CBI	INNOVATIVE CHEMICAL TECHNOLOGY AT ORTEC INC	SC	CBI	1
CBI	SOLENIS LLC	DE	CBI	1
CBI	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	CBI	10
DAIKIN AMERICA INC.	DAIKIN AMERICA INC.	NY	1	1
DAIKIN AMERICA, INC.	DAIKIN AMERICA, INC.	AL	8	8
Dow Corning Corporation	DOW CORNING CORP MIDLAND PLANT	MI	1	1
FORD MOTOR COMPANY	Ford Motor Company	MI	1	1
HONEYWELL INTERNATIONAL INC	HONEYWELL INTERNATIONAL INC - BATON ROUGE PLANT	LA	1	1
LANXESS CORPORATION	LANXESS CORP	PA	1	1
LINDE NORTH AMERICA, INC	LINDE ELECTRONICS AND SPECIALTY GASES	NJ	1	1
PEACH STATE LABS INC	PEACH STATE LABS INC COLUMBUS	GA	2	2
Peach State Labs LLC	PEACH STATE LABS, LLC	GA	4	4
SOLVAY SPECIALTY POLYMERS USA, LLC	SOLVAY SPECIALTY POLYMERS USA LLC	TX	2	1
SOLVAY SPECIALTY POLYMERS USA, LLC	SOLVAY SPECIALTY POLYMERS USA, LLC	GA	2	1
SUMITOMO CORPORATION OF AMERICAS	SUMITOMO CORPORATION OF AMERICAS	TX	1	1
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	39	21
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CORPUS CHRISTI)	TX	39	1
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	39	3
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (HEADQUARTERS)	DE	39	5
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (PASCAGOULA)	MS	39	2
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (WASHINGTON WORKS)	WV	39	7
TYCO FIRE PRODUCTS LP	CHEMGUARD INC	TX	8	8
Number of Unique Chemicals				**90**

The 2016 TRI List of Reportable Chemicals contained five of the 824 PFAS chemicals identified by EPA (see Table 3-3). Table 3-4 presents the facilities reporting PFAS in the 2016 TRI. Of the five TRI reportable PFAS chemicals, two were reported by nine facilities in the 2016 TRI. Four facilities produce the chemicals that they reported. PFAS as a category of chemicals are not reported to the Toxic Release Inventory. As for the five that are listed, those are among the many CFCs and HCFCs that EPA was petitioned to add during the 1990s.

Figure 3-1 provides a U.S. map illustrating the location of the importing and manufacturing sites as indicated in the 2016 CDR. The map also shows waterbodies of greater than 10 square miles in proximity to the sites.

Table 3-3: PFAS on the 2016 TRI List of Reportable Chemicals

CAS	Chemical	Reported in 2016 TRI
124-73-2	Dibromotetrafluoroethane (Halon 2402)	No
507-55-1	1,3-Dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb)	No
422-56-0	3,3-Dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca)	No
76-14-2	Dichlorotetrafluoroethane (CFC-114)	Yes
76-15-3	Monochloropentafluoroethane (CFC-115)	Yes

Table 3-4: Facilities Reporting PFAS in the 2016 TRI

Parent Company Name	Manufacturing Facility Name	Manufacturing Facility Address	CAS	Chemical Name	Produce	Import
A-GAS US HOLDINGS INC	A-GAS AMERICAS	1100 HASKINS RD WOOD, OH 43402	76142	DICHLOROTETRAFLUOROETHANE (CFC-114)	NO	NO
AIRGAS INC	AIRGAS REFRIGERANTS INC SMYRNA	5211 INDUSTRIAL CT SE COBB, GA 30080	76142	DICHLOROTETRAFLUOROETHANE (CFC-114)	NO	NO
HERITAGE-WTI LLC	HERITAGE THERMAL SERVICES	1250 ST GEORGE ST COLUMBIANA, OH 43920	76142	DICHLOROTETRAFLUOROETHANE (CFC-114)	NO	NO
HONEYWELL INTERNATIONAL INC	HONEYWELL INTERNATIONAL INC DANVILLE WORKS	209 BREWER RD VERMILION, IL 61834	76142	DICHLOROTETRAFLUOROETHANE (CFC-114)	NO	NO
HONEYWELL INTERNATIONAL INC	HONEYWELL INTERNATIONAL INC GEISMAR PLANT	5525 HWY 3115 ASCENSION PARISH, LA 70721	76142	DICHLOROTETRAFLUOROETHANE (CFC-114)	YES	NO
HONEYWELL INTERNATIONAL INC	HONEYWELL INTERNATIONAL INC GEISMAR PLANT	5525 HWY 3115 ASCENSION PARISH, LA 70721	76153	MONOCHLOROPENTAFLUOROETHANE	YES	NO
HONEYWELL INTERNATIONAL INC	HONEYWELL INTERNATIONAL INC-BATON ROUGE PLANT	CORNER OF LUPINE & ONTARIO STR EETS EAST BATON ROUGE PARISH, LA 70805	76142	DICHLOROTETRAFLUOROETHANE (CFC-114)	YES	NO
THE CHEMOURS CO	CHEMOURS WASHINGTON WORKS	8480 DUPONT RD BUILDING 1 WOOD, WV 26181	76142	DICHLOROTETRAFLUOROETHANE (CFC-114)	YES	NO
THE CHEMOURS CO FC LLC	THE CHEMOURS CO FC LLC	HWY 361 SAN PATRICIO, TX 78359	76142	DICHLOROTETRAFLUOROETHANE (CFC-114)	YES	NO
THE CHEMOURS CO FC LLC	THE CHEMOURS CO FC LLC	HWY 361 SAN PATRICIO, TX 78359	76153	MONOCHLOROPENTAFLUOROETHANE	YES	NO
US DEPARTMENT OF DEFENSE	US DEFENSE LOGISTICS AGENCY DEFENSE SUPPLY CENTER RICHMOND	8000 JEFFERSON DAVIS HWY CHESTERFIELD, VA 23297	76142	DICHLOROTETRAFLUOROETHANE (CFC-114)	NO	NO

Source(s):
EPA (2017)

Figure 3-1: Location of 2016 PFAS CDR Manufacturing and Importing Sites

Note(s):

[1] The source of the main water bodies and rivers and streams data is a 2014 U.S. Geological Survey (USGS) dataset that includes data on streams and water bodies and wetlands within the contiguous U.S. at a 1:1,000,000 scale.

[2] There are no PFAS sites outside of the contiguous U.S.

4. Uses of PFAS Chemicals

PFAS are a broad class of substances with differing structural features (e.g. varying carbon lengths, differing fluorine content and functional groups) that can impart special properties that have a variety of industrial applications. PFAS provide characteristics such as thermo-stability, ability to adapt to a variety of surface characteristics, high chemical stability, and other characteristics. Fluoropolymers, n particular, have properties that include fire resistance and oil, stain, grease, and water repellency. Fluorotelomers can be used in surface treatment products and impart the following properties: soil, stain, grease, and water resistance. Fluorotelomers can also be used as surfactants to help products flow more evenly (EPA 2009). Table 4-1 presents a list of broad use categories with examples for each use category.

Table 4-1: Summary of PFAS Uses and Applications

Use Category	Example(s)
Adhesive, paint, and coating additive	Nonstick coating in cookware
Chemical manufacturing	Chemical intermediate; polymerization aid
Component of a photoresist substance	Semiconductors
Component of electronic products	Cables and wiring; insulating tape; "solder sleeves"; smudge-resistant touch screens
Component of firefighting foams	Aqueous film-forming foams (AFFFs)
Component of rubber compounds	Hose, tubing, and piping; rubber and plumbing fluxing agents
Foam additive	Flame-retardant insulation in soft furnishings
Lubricant and lubricant additive	Automotive manufacturing
Specialized industrial chemical	Improved mold release for pneumatic tires; liquid crystal displays; wetting agents
Mechanical components	Conveyor belting; low-friction bearings and seals; coating/surfactant on semiconductors, wiring, tubing, seals, etc.
Clothing, footwear, and textiles	Protection against oil, water, and soil; wind and rain barrier; firefighting clothing
Scientific and medical instruments	Photographic film; x-ray film; artificial body parts; medical product packaging
Wetting agent	Floor polishes; metal plating

Source(s):
EPA (2013, 2016, 2018a); OECD (2013); FluoroCouncil (2018)

Table 4-2 presents the industrial sectors associated with PFAS reported in the 2016 CDR. The sectors with the largest number of chemicals included all other basic organic chemical manufacturing (19), all other chemical product and preparation manufacturing (19), plastic material and resin manufacturing (17), and computer and electronic product manufacturing (16). A total of 33 entries were blank and 15 reported as CBI. Table 4-3 provides the number of PFAS by chemical function as reported in the 2016 CDR. This includes the highest categories as intermediates (29), functional fluids (10), solvents (for cleaning and degreasing) (9), and firefighting foam agents (8). A total of 33 entries were blank and 15 reported as CBI. Appendix B, Table B-2 presents the combined use, function, and sector information for all PFAS reported in the 2016 CDR. However, little can be concluded without the production volumes corresponding to each use.

Table 4-4 presents the number of PFAS reported for product categories reported in the 2016 CDR, and whether the product is used in the consumer and/or commercial sector. The majority (76) had

blank entries. The largest number of chemicals were reported to firefighting foam agents (8), electrical and electronic components (5), and cleaning and furnishing care products (4).

Table 4-2: Number of PFAS Manufactured by Sector Reported in the 2016 CDR

Sector	Number of PFAS
(blank)	33
CBI	15
Adhesive manufacturing	2
All other basic inorganic chemical manufacturing	1
All other basic organic chemical manufacturing	19
All other chemical product and preparation manufacturing	19
Computer and electronic product manufacturing	16
Fabricated metal product manufacturing	2
Industrial gas manufacturing	2
Miscellaneous manufacturing	4
Not known or reasonably ascertainable	2
Oil and gas drilling, extraction, and support activities	1
Paint and coating manufacturing	4
Paper manufacturing	1
Pesticide, fertilizer, and other agricultural chemical manufacturing	2
Plastic material and resin manufacturing	17
Primary metal manufacturing	1
Printing ink manufacturing	1
resale of chemicals	1
Soap, cleaning compound, and toilet preparation manufacturing	3
Stored on site in rail cars, no commercial use	1
Textiles, apparel, and leather manufacturing	5
Wholesale and retail trade	1

Table 4-3: Number of PFAS Manufactured by Function Reported in the 2016 CDR

Function	Number of PFAS
(blank)	33
CBI	15
Finishing agents	2
Fire Extinguishing Medium	1
Firefighting foam agents	8
Functional fluids (closed systems)	10
Functional fluids (open systems)	3
Intermediates	29
Lubricants and lubricant additives	1
Not known or reasonably ascertainable	1
Paint additives and coating additives not described by other categories	1
Plating agents and surface treating agents	4
Processing aids, not otherwise listed	5
Processing aids, specific to petroleum production	1
Solvents (for cleaning and degreasing)	9
Solvents (which become part of product formulation or mixture)	1
Stored on site in rail cars, no commercial use	1
Surface active agents	7
Transfilling and purifying	1

Table 4-4: Number of PFAS by Use Category as Reported in the 2016 CDR

Product Category	Consumer/Commercial/Both	Number of PFAS
(blank)	(blank)	76
CBI	Commercial	2
Adhesives and sealants	Commercial	1
Automotive care products	Consumer	1
Cleaning and furnishing care products	Both	4
Electrical and electronic products	Commercial	5
Fabric, textile, and leather products not covered elsewhere	Both	1
Fire Extinguishing medium	Commercial	1
Firefighting foam agents	Commercial	8
Food packaging	Both	1
Ink, toner, and colorant products	Consumer	1
Metal products not covered elsewhere	Both	2
Paints and coatings	Both	1

To gain further perspective on recent uses of PFAS, Table 4-5 presents TSCA submission types (including LVEs, premanufacture notices (PMNs), SNUNS, LOREX and TMAs) between 2006 through 2016 and their related use categories and production volume. Thirteen major uses categories are noted. Lubricant and lubricant additive and component of rubber compounds uses categories represent the highest average annual production volume (229,100 kg and 212,200 kg, respectively).

Table 4-5: Categories of Use by Submission Type (FY 2006 to 2016)[1]

Use	LVE	PMN	SNUN	LOREX	TMEA	Average Annual Production Volume (kg/yr)[2]
Adhesive, paint, and coating additive	74	41	2	-	1	13,100
Chemical Intermediate	38	37	-	-	-	12,700
Component of a photoresist substance	99	4	-	1	-	1,600
Component of electronic products	7	5	-	-	-	20,400
Component of firefighting foams	-	10	-	-	-	52,800
Component of rubber compounds	5	5	-	-	-	212,200
Cross-linking agent	1	1	-	-	-	1,000
Finishing agents	64	144	2	-	-	48,100
Foam additive	3	4	-	-	-	15,600
Lubricant and Lubricant Additive	15	5	-	-	-	229,100
Polymerization Aid	7	8	-	-	-	8,000
Specialized Industrial Chemical	8	8	-	-	-	13,400
Tracer Chemical	27	-	-	-	-	400
Total	**348**	**272**	**4**	**1**	**1**	

Note(s):

[1] PMN - Premanufacture Notices; SNUN - Significant New Use Notices; LVE - Low Volume Exemptions; LM - Low Volume Exemption Modifications; LOREX - Low Exposure/Low Release Exemptions; XM - Low Exposure/Low Release Exemption Modifications; TMEA - Test Marketing Exemption Applications.

[2] Reflects average annual production volume for all notice types

[3] Due to the implementation of the PFOA Stewardship Program between the reported years, the average annual production volumes may not be an accurate indicator of the current PFAS use trends.

Appendix A: PFAS Categories

Table A-1: PFAS Categories[1]
perfluoroalkyl carbonyl compounds
perfluoroalkyl carbonyl halides
perfluoroalkyl carboxylic acids (PFCAs), their salts and esters
other perfluoroalkyl carbonyl-based nonpolymers
perfluoroalkyl carbonyl amides / amido ethanols and other alcohols
perfluoroalkyl carbonyl silanes
perfluoroalkyl carbonyl (meth)acrylate
other perfluoroalkyl carbonyl-based side-chain fluorinated polymers
perfluoroalkyl carbonyl (meth)acrylate polymers
perfluoroalkyl carbonyl dicarbonyl halides
perfluoroalkyl carbonyl dicarboxylic acids and non-polymers
1-H perfluoroalkyl carbonyl halides
1-H perfluoroalkyl carboxylic acids
1-H perfluoroalkyl carbonyl-based non-polymers
perfluoroalkane sulfonyl compounds
perfluoroalkane sulfonyl halides
perfluoroalkane sulfonic acids (PFSAs), their salts and esters
perfluoroalkane sulfonyl-based nonpolymers
perfluoroalkane sulfonyl amides/amido ethanols (xFASA/Es) and other alcohols
perfluoroalkane sulfonyl amido ethanols, phosphate esters (SAmPAPs)
perfluoroalkane sulfonyl (meth)acrylates
perfluoroalkane sulfonyl silanes
perfluoroalkane sulfonyl acetic acids & esters
perfluoroalkane sulfonyl-based side-chain fluorinated polymers
perfluoroalkane sulfonyl (meth)acrylate polymers
perfluoroalkane sulfonyl urethane polymers
perfluoroalkane sulfonyl siloxanes/silicon polymers
perfluoroalkane sulfinic acids
1-H perfluoroalkane sulfonic acids
1-H perfluoroalkane sulfonyl-based non-polymers
perfluoroalkane disulfonic acids
perfluoroalkane disulfonyl-based non-polymers
perfluoroalkyl phosphate compounds
perfluoroalkyl phosphate-related halides
bis(perfluoroalkyl) phosphinyl halides
perfluoroalkyl phosphorus halides
perfluoroalkyl phosphonic acids (PFPAs), their salts and esters
perfluoroalkyl phosphinic acids (PFPiAs), their salts and esters
bis(perfluoroalkyl) phosphinyl-based nonpolymers
bis(perfluoroalkyl) phosphinyl amids (PFPiAMs)
fluorotelomer-related compounds
perfluoroalkyl iodides (PFAIs)
n:2 fluorotelomer-based non-polymers
n:2 fluorotelomer iodides (n:2 FTIs)
n:2 fluorotelomer olefins (n:2 FTOs)
n:2 fluorotelomer alcohols (n:2 FTOHs) / thiols
n:2 fluorotelomer alcohol, phosphate esters (PAPs)
n:2 fluorotelomer-based silanes
n:2 fluorotelomer-based (meth)acrylate
n:2 fluorotelomer sulfonic acids (n:2 FTSAs)
n:2 fluorotelomer sulfonyl-based compounds
n:2 fluorotelomer phosphonic / phosphinic acids
n:2 FTOH ethoxylates
n:2 FT amine, amino & derivatives
n:2 FT-thiol derivatives

Table A-1: PFAS Categories[1]
n:2 fluorotelomer carboxylic acids (FTCAs)
n:3 acids
FTAL
n:2 fluorotelomer-based side-chain fluorinated polymers
n:2 fluorotelomer-based (meth)acrylate polymers
n:2 fluorotelomer-based urethane polymers
n:2 fluorotelomer-based siloxanes/silicon polymers
n:2 fluorotelomer-based sulfonyl (meth)acrylate polymers
n:1 fluorotelomer-based non-polymers
n:1 fluorotelomer alcohols
n:1 FT (meth)acrylate
n:1 PAPs
n:1 silanes
n:1 FT sulfonyl-based substances
n:1 FTAL
n:1 fluorotelomer-based side-chain fluorinated polymers
n:1 fluorotelomer-based (meth)acrylic polymers
fluorotelomer epoxides and derivatives
fluorotelomer epoxides
fluorotelomer epoxides derivatives
Hydrofluorotelomer non-polymers
hydrofluorotelomer-based side chain fluorinated polymers
perfluoroalkyl diiodides
1-H n:1 FT
per- and polyfluoroalkyl ether-based compounds
perfluoroalkyl ethers / alkanes + aromatics
perfluoroalkyl ethers / alkanes + aromatics – monoethers
perfluoroalkyl ethers / alkanes + aromatics – diethers
perfluoroalkyl ethers / alkanes + aromatics – triethers
perfluoroalkyl ethers / alkanes + aromatics - 4-10 ether linkages
perfluoroalkyl ethers / alkanes + aromatics - more than 10 ether linkages
per- and polyfluoroalkyl ether carboxylic acids (PFECAs), their salts and esters, as well as derivatives such as amides
PFECAs, salts and esters – monoethers
PFECAs, salts and esters – diethers
PFECAs, salts and esters – triethers
PFECAs, salts and esters - 4-10 ether linkages
PFECAs, salts and esters - more than 10 ether linkages
PFECA-related substances – monoethers
PFECA-related substances – diethers
PFECA-related substances – triethers
PFECA-related substances - 4-10 ether linkages
PFECA-related substances - more than 10 ether linkages
per- and polyfluoroalkyl ether sulfonic acids (PFESAs), their salts and esters, as well as derivatives
PFESAs, salts and esters – monoethers
PFESAs, salts and esters – diethers
PFESAs, salts and esters – triethers
PFESAs, salts and esters - 4-10 ether linkages
PFESAs, salts and esters - more than 10 ether linkages
PFESA-related substances – monoethers
PFESA-related substances – diethers
PFESA-related substances – triethers
PFESA-related substances - 4-10 ether linkages
PFESA-related substances - more than 10 ether linkages
perfluoroethers alkenes and derivatives
perfluoroethers alkenes and derivatives – monoethers
perfluoroethers alkenes and derivatives – diethers

Table A-1: PFAS Categories[1]
perfluoroethers alkenes and derivatives – triethers
perfluoroethers alkenes and derivatives - 4-10 ether linkages
perfluoroethers alkenes and derivatives - more than 10 ether linkages
per- and polyfluoroalkyl ether halides (except F)
per- and polyfluoroalkyl ether halides (except F) – monoethers
per- and polyfluoroalkyl ether halides (except F) – diethers
per- and polyfluoroalkyl ether halides (except F) – triethers
per- and polyfluoroalkyl ether halides (except F) - 4-10 ether linkages
per- and polyfluoroalkyl ether halides (except F) - more than 10 ether linkages
per - and polyfluoroalkyl ether + telomer-based substances
per - and polyfluoroalkyl ether + telomer-based substances - monoethers
per - and polyfluoroalkyl ether + telomer-based substances - diethers
per - and polyfluoroalkyl ether + telomer-based substances - triethers
per - and polyfluoroalkyl ether + telomer-based substances - 4-10 ether linkages
per - and polyfluoroalkyl ether + telomer-based substances - more than 10 ether linkages
other per- and polyfluoroalkyl ether-based compounds
other per- and polyfluoroalkyl ether-based compounds - monoethers
other per- and polyfluoroalkyl ether-based compounds - diethers
other per- and polyfluoroalkyl ether-based compounds - triethers
other per- and polyfluoroalkyl ether-based compounds - 4-10 ether linkages
other per- and polyfluoroalkyl ether-based compounds - more than 10 ether linkages
other PFAA precursors and related compounds - perfluoroalkyl ones
perfluoroalkyl silanes
perfluoroalkyl alcohols
perfluoroalkyl alcohol-based side-chain fluorinated polymers
perfluoroalkanes & aromatics
perfluoroalkenes & derivatives
perfluoroalkyl amines
perfluoroalkyl epoxides & derivatives
perfluoroalkyl ketones
perfluoroalkyl halides (other than iodides)
perfluoroalkyl radicals
perfluoroalkyl cyanide
perfluoroalkyl metal
perfluoroalkyl thiol and derivatives
perfluoroalkyl sulfide
other PFAA precursors or related compounds - semi fluorinated
hydrofluorocarbons (HFCs), semi fluorinated alkanes (SFAs) and their derivatives
HFCs and derivatives
SFAs and derivatives
hydrofluoroethers (HFEs) and derivatives
HFEs
HFE-based silanes
other HFE-based derivatives
hydrofluoroolefins (HFOs)
semi-fluorinated ketones
side-chain fluorinated aromatics
fluoropolymers
polytetrafluoroethylene (PTFE)
non-functionalized PTFE
functionalized PTFE
polyvinylidene fluoride (PVDF)
non-functionalized PVDF
functionalized PVDF
fluorinated ethylene propylene (FEP)
perfluoralkoxyl polymer (PFA)
polyvinyl fluoride (PVF)
Ethylene tetrafluoroethylene (ETFE)

Table A-1: PFAS Categories[1]
VDF-HFP
PCTFE
THV
oxetane polymer

Note(s):
[1] Categories as presented in OECD (2018a)

Appendix B: 2016 CDR PFAS Reporting

Table B-1: PFAS Manufacture and Import Reported in the 2016 CDR

Parent Company	Site Name	Site State	CAS	Chemical Name	Manufacture and Import	National Aggregate PV
3M COMPANY	3M COMPANY	MN	311-89-7	1-Butanamine, 1,1,2,2,3,3,4,4,4-nonafluoro-N,N-bis(1,1,2,2,3,3,4,4,4-nonafluorobutyl)-	Withheld	Withheld
3M COMPANY	3M COMPANY	MN	34454-97-2	1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-nonafluoro-N-(2-hydroxyethyl)-N-methyl-	Withheld	Withheld
3M COMPANY	3M COMPANY	MN	86508-42-1	Perfluoro compounds, C5-18	Withheld	Withheld
3M COMPANY	3M COMPANY/3M CORDOVA	IL	132182-92-4	Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-(trifluoromethyl)-	Withheld	Withheld
AGC CHEMICALS AMERICAS, INC.	AGC CHEM AMER INC BUS & TECH CTR	PA	2043-57-4	Octane, 1,1,1,2,2,3,3,4,4,5,5,6,6-tridecafluoro-8-iodo-	Withheld	1,000,000 - 10,000,000 lb
AGC CHEMICALS AMERICAS, INC.	AGC CHEM AMER INC BUS & TECH CTR	PA	355-43-1	Hexane, 1,1,1,2,2,3,3,4,4,5,5,6,6-tridecafluoro-6-iodo-	Withheld	1,000,000 - 10,000,000 lb
AGC CHEMICALS AMERICAS, INC.	AGC CHEM AMER INC BUS & TECH CTR	PA	422-56-0	Propane, 3,3-dichloro-1,1,1,2,2-pentafluoro-	Withheld	< 25,000 lb
AGC CHEMICALS AMERICAS, INC.	AGC CHEM AMER INC BUS & TECH CTR	PA	507-55-1	Propane, 1,3-dichloro-1,1,2,2,3-pentafluoro-	Withheld	< 25,000 lb
ATOTECH USA, INC.	ATOTECH USA	SC	27619-97-2	1-Octanesulfonic acid, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-	Withheld	Withheld
ATOTECH USA, INC.	ATOTECH USA	SC	56773-42-3	Ethanaminium, N,N,N-triethyl-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonate (1:1)	Withheld	< 25,000 lb
CBI	3M COMPANY	AL	212335-64-3	2-Propenoic acid, reaction products with N-[3-(dimethylamino)propyl]-1,1,2,2,3,3,4,4,4-nonafluoro-1-butanesulfonamide	Withheld	Withheld

Table B-1: PFAS Manufacture and Import Reported in the 2016 CDR

Parent Company	Site Name	Site State	CAS	Chemical Name	Manufacture and Import	National Aggregate PV
CBI	3M COMPANY	AL	332350-90-0	Phosphonium, tributyl(2-methoxypropyl)-, salt with 1,1,2,2,3,3,4,4,4-nonafluoro-N-methyl-1-butanesulfonamide (1:1)	Withheld	Withheld
CBI	3M COMPANY	AL	332350-93-3	Phosphonium, triphenyl(phenylmethyl)-, salt with 1,1,2,2,3,3,4,4,4-nonafluoro-N-methyl-1-butanesulfonamide (1:1)	Withheld	Withheld
CBI	3M COMPANY	AL	34454-97-2	1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-nonafluoro-N-(2-hydroxyethyl)-N-methyl-	Withheld	Withheld
CBI	3M COMPANY/3M CORDOVA	IL	163702-05-4	Butane, 1-ethoxy-1,1,2,2,3,3,4,4,4-nonafluoro-	Withheld	Withheld
CBI	3M COMPANY/3M CORDOVA	IL	163702-06-5	Propane, 2-(ethoxydifluoromethyl)-1,1,1,2,3,3,3-heptafluoro-	Withheld	Withheld
CBI	3M COMPANY/3M CORDOVA	IL	163702-07-6	Butane, 1,1,1,2,2,3,3,4,4-nonafluoro-4-methoxy-	Withheld	Withheld
CBI	3M COMPANY/3M CORDOVA	IL	163702-08-7	Propane, 2-(difluoromethoxymethyl)-1,1,1,2,3,3,3-heptafluoro-	Withheld	Withheld
CBI	3M COMPANY/3M CORDOVA	IL	297730-93-9	Hexane, 3-ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-(trifluoromethyl)-	Withheld	Withheld
CBI	3M COMPANY/3M CORDOVA	IL	335-42-2	Butanoyl fluoride, 2,2,3,3,4,4,4-heptafluoro-	Withheld	Withheld
CBI	3M COMPANY/3M CORDOVA	IL	375-03-1	Propane, 1,1,1,2,2,3,3-heptafluoro-3-methoxy-	Withheld	Withheld
CBI	3M COMPANY/3M CORDOVA	IL	375-72-4	1-Butanesulfonyl fluoride, 1,1,2,2,3,3,4,4,4-nonafluoro-	Withheld	Withheld
CBI	3M COMPANY/3M CORDOVA	IL	382-28-5	Morpholine, 2,2,3,3,5,5,6,6-octafluoro-4-(trifluoromethyl)-	Withheld	Withheld
CBI	3M COMPANY/3M CORDOVA	IL	756-13-8	3-Pentanone, 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-	Withheld	Withheld
CBI	3M COMPANY/3M CORDOVA	IL	76-19-7	Propane, 1,1,1,2,2,3,3,3-octafluoro-	Withheld	Withheld
CBI	3M COMPANY/3M CORDOVA	IL	813-45-6	3-Hexanone, 1,1,1,2,4,4,5,5,6,6,6-undecafluoro-2-(trifluoromethyl)-	Withheld	Withheld
CBI	3M COMPANY/3M CORDOVA	IL	86508-42-1	Perfluoro compounds, C5-18	Withheld	Withheld

Table B-1: PFAS Manufacture and Import Reported in the 2016 CDR

Parent Company	Site Name	Site State	CAS	Chemical Name	Manufacture and Import	National Aggregate PV
CBI	3M COTTAGE GROVE CENTER	MN	375-03-1	Propane, 1,1,1,2,2,3,3-heptafluoro-3-methoxy-	Withheld	Withheld
CBI	3M COTTAGE GROVE CENTER	MN	484024-67-1	1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-nonafluoro-N-(2-hydroxyethyl)-, ammonium salt (1:1)	Withheld	Withheld
CBI	AIR PROD & CHEM HAMILTON BLVD FAC	PA	559-40-0	Cyclopentene, 1,2,3,3,4,4,5,5-octafluoro-	Withheld	Withheld
CBI	AIR PROD & CHEM HAMILTON BLVD FAC	PA	76-16-4	Ethane, 1,1,1,2,2,2-hexafluoro-	Withheld	Withheld
CBI	CBI	CBI	2043-54-1	Dodecane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10-heneicosafluoro-12-iodo-	Withheld	Withheld
CBI	CBI	CBI	2043-57-4	Octane, 1,1,1,2,2,3,3,4,4,5,5,6,6-tridecafluoro-8-iodo-	Withheld	1,000,000 - 10,000,000 lb
CBI	CBI	CBI	27905-45-9	2-Propenoic acid, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl ester	Withheld	< 25,000 lb
CBI	CBI	CBI	422-61-7	Propanoyl fluoride, 2,2,3,3,3-pentafluoro-	Withheld	Withheld
CBI	CBI	CBI	647-42-7	1-Octanol, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-	Withheld	1,000,000 - 10,000,000 lb
CBI	CBI	CBI	67584-55-8	2-Propenoic acid, 2-[methyl[(1,1,2,2,3,3,4,4,4-nonafluorobutyl)sulfonyl]amino]ethyl ester	Withheld	Withheld
CBI	CBI	CBI	68140-18-1	Thiols, C4-10, .gamma.-.omega.-perfluoro	Withheld	Withheld
CBI	CBI	CBI	68140-20-5	Thiols, C6-12, .gamma.-.omega.-perfluoro	Withheld	Withheld
CBI	CBI	CBI	68187-47-3	1-Propanesulfonic acid, 2-methyl-, 2-[[1-oxo-3-[(.gamma.-.omega.-perfluoro-C4-16-alkyl)thio]propyl]amino] derivs., sodium salts	Withheld	Withheld
CBI	CBI	CBI	68391-08-2	Alcohols, C8-14, .gamma.-.omega.-perfluoro	Withheld	Withheld
CBI	CBI	CBI	70969-47-0	Thiols, C8-20, .gamma.-.omega.-perfluoro, telomers with acrylamide	Withheld	Withheld
CBI	CBI	CBI	70983-60-7	1-Propanaminium, 2-hydroxy-N,N,N-trimethyl-, 3-[(.gamma.-.omega.-perfluoro-C6-20-alkyl)thio] derivs., chlorides	Withheld	Withheld

Table B-1: PFAS Manufacture and Import Reported in the 2016 CDR

Parent Company	Site Name	Site State	CAS	Chemical Name	Manufacture and Import	National Aggregate PV
CBI	INNOVATIVE CHEMICAL TECHNOLOGIES INC	GA	142636-88-2	2-Propenoic acid, 2-methyl-, octadecyl ester, polymer with 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,12-heneicosafluorododecyl 2-propenoate, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl 2-propenoate and 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,14-pentacosafluorotetradecyl 2-propenoate	Withheld	Withheld
CBI	INNOVATIVE CHEMICAL TECHNOLOGIES INC	GA	65545-80-4	Poly(oxy-1,2-ethanediyl), .alpha.-hydro-.omega.-hydroxy-, ether with .alpha.-fluoro-.omega.-(2-hydroxyethyl)poly(difluoromethylene) (1:1)	Withheld	25,000 - 100,000 lb
CBI	INNOVATIVE CHEMICAL TECHNOLOGIES INC	GA	68412-68-0	Phosphonic acid, perfluoro-C6-12-alkyl derivs.	Withheld	Withheld
CBI	INNOVATIVE CHEMICAL TECHNOLOGIES INC	GA	68412-69-1	Phosphinic acid, bis(perfluoro-C6-12-alkyl) derivs.	Withheld	Withheld
CBI	INNOVATIVE CHEMICAL TECHNOLOGY AT ORTEC INC	SC	142636-88-2	2-Propenoic acid, 2-methyl-, octadecyl ester, polymer with 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,12-heneicosafluorododecyl 2-propenoate, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl 2-propenoate and 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,14-pentacosafluorotetradecyl 2-propenoate	Withheld	Withheld
CBI	SOLENIS LLC	DE	355-43-1	Hexane, 1,1,1,2,2,3,3,4,4,5,5,6,6-tridecafluoro-6-iodo-	Withheld	1,000,000 - 10,000,000 lb
CBI	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	10493-43-3	Ethene, 1,1,2-trifluoro-2-(1,1,2,2,2-pentafluoroethoxy)-	Withheld	Withheld
CBI	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	13252-13-6	Propanoic acid, 2,3,3,3-tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-	Withheld	Withheld

Table B-1: PFAS Manufacture and Import Reported in the 2016 CDR

Parent Company	Site Name	Site State	CAS	Chemical Name	Manufacture and Import	National Aggregate PV
CBI	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	16090-14-5	Ethanesulfonyl fluoride, 2-[1-[difluoro[(1,2,2-trifluoroethenyl)oxy]methyl]-1,2,2,2-tetrafluoroethoxy]-1,1,2,2-tetrafluoro-	Withheld	Withheld
CBI	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	1623-05-8	Propane, 1,1,1,2,2,3,3-heptafluoro-3-[(1,2,2-trifluoroethenyl)oxy]-	Withheld	Withheld
CBI	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	2062-98-8	Propanoyl fluoride, 2,3,3,3-tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-	Withheld	Withheld
CBI	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	3330-14-1	Propane, 1-[1-[difluoro(1,2,2,2-tetrafluoroethoxy)methyl]-1,2,2,2-tetrafluoroethoxy]-1,1,2,2,3,3,3-heptafluoro-	Withheld	Withheld
CBI	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	3825-26-1	Octanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-, ammonium salt (1:1)	Withheld	Withheld
CBI	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	4089-58-1	Propanoyl fluoride, 2,3,3,3-tetrafluoro-2-[1,1,2,3,3,3-hexafluoro-2-[1,1,2,2-tetrafluoro-2-(fluorosulfonyl)ethoxy]propoxy]-	Withheld	Withheld
CBI	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	62037-80-3	Propanoic acid, 2,3,3,3-tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-, ammonium salt (1:1)	Withheld	Withheld
CBI	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	69116-73-0	Propanoic acid, 3-[1-[difluoro[1,2,2,2-tetrafluoro-1-(fluorocarbonyl)ethoxy]methyl]-1,2,2,2-tetrafluoroethoxy]-2,2,3,3-tetrafluoro-, methyl ester	Withheld	Withheld
DAIKIN AMERICA INC.	DAIKIN AMERICA INC.	NY	2043-57-4	Octane, 1,1,1,2,2,3,3,4,4,5,5,6,6-tridecafluoro-8-iodo-	Withheld	1,000,000 - 10,000,000 lb

Table B-1: PFAS Manufacture and Import Reported in the 2016 CDR

Parent Company	Site Name	Site State	CAS	Chemical Name	Manufacture and Import	National Aggregate PV
DAIKIN AMERICA, INC.	DAIKIN AMERICA, INC.	AL	115-25-3	Cyclobutane, 1,1,2,2,3,3,4,4-octafluoro-	Withheld	1,000,000 - 10,000,000 lb
DAIKIN AMERICA, INC.	DAIKIN AMERICA, INC.	AL	1547-26-8	1-Pentene, 2,3,3,4,4,5,5-heptafluoro-	Withheld	Withheld
DAIKIN AMERICA, INC.	DAIKIN AMERICA, INC.	AL	1623-05-8	Propane, 1,1,1,2,2,3,3-heptafluoro-3-[(1,2,2-trifluoroethenyl)oxy]-	Withheld	Withheld
DAIKIN AMERICA, INC.	DAIKIN AMERICA, INC.	AL	17527-29-6	2-Propenoic acid, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl ester	Withheld	1,000,000 - 10,000,000 lb
DAIKIN AMERICA, INC.	DAIKIN AMERICA, INC.	AL	17741-60-5	2-Propenoic acid, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,12-heneicosafluorododecyl ester	Withheld	Withheld
DAIKIN AMERICA, INC.	DAIKIN AMERICA, INC.	AL	2144-53-8	2-Propenoic acid, 2-methyl-, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl ester	Withheld	Withheld
DAIKIN AMERICA, INC.	DAIKIN AMERICA, INC.	AL	25291-17-2	1-Octene, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-	Withheld	Withheld
DAIKIN AMERICA, INC.	DAIKIN AMERICA, INC.	AL	27905-45-9	2-Propenoic acid, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl ester	Withheld	< 25,000 lb
Dow Corning Corporation	DOW CORNING CORP MIDLAND PLANT	MI	125476-71-3	Silicic acid (H4SiO4), sodium salt (1:2), reaction products with chlorotrimethylsilane and 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluoro-1-decanol	Withheld	Withheld
FORD MOTOR COMPANY	Ford Motor Company	MI	65545-80-4	Poly(oxy-1,2-ethanediyl), .alpha.-hydro-.omega.-hydroxy-, ether with .alpha.-fluoro-.omega.-(2-hydroxyethyl)poly(difluoromethylene) (1:1)	Withheld	25,000 - 100,000 lb
HONEYWELL INTERNATIONAL INC	HONEYWELL INTERNATIONAL INC - BATON ROUGE PLANT	LA	76-14-2	Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro-	Withheld	Withheld

Table B-1: PFAS Manufacture and Import Reported in the 2016 CDR

Parent Company	Site Name	Site State	CAS	Chemical Name	Manufacture and Import	National Aggregate PV
LANXESS CORPORATION	LANXESS CORP	PA	56773-42-3	Ethanaminium, N,N,N-triethyl-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonate (1:1)	Withheld	< 25,000 lb
LINDE NORTH AMERICA, INC	LINDE ELECTRONICS AND SPECIALTY GASES	NJ	115-25-3	Cyclobutane, 1,1,2,2,3,3,4,4-octafluoro-	Withheld	1,000,000 - 10,000,000 lb
PEACH STATE LABS INC	PEACH STATE LABS INC COLUMBUS	GA	647-42-7	1-Octanol, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-	Withheld	1,000,000 - 10,000,000 lb
PEACH STATE LABS INC	PEACH STATE LABS INC COLUMBUS	GA	68188-12-5	Alkyl iodides, C4-20, .gamma.-.omega.-perfluoro	Withheld	25,000 - 100,000 lb
Peach State Labs LLC	PEACH STATE LABS, LLC	GA	17527-29-6	2-Propenoic acid, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl ester	Withheld	1,000,000 - 10,000,000 lb
Peach State Labs LLC	PEACH STATE LABS, LLC	GA	2043-57-4	Octane, 1,1,1,2,2,3,3,4,4,5,5,6,6-tridecafluoro-8-iodo-	Withheld	1,000,000 - 10,000,000 lb
Peach State Labs LLC	PEACH STATE LABS, LLC	GA	647-42-7	1-Octanol, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-	Withheld	1,000,000 - 10,000,000 lb
Peach State Labs LLC	PEACH STATE LABS, LLC	GA	68188-12-5	Alkyl iodides, C4-20, .gamma.-.omega.-perfluoro	Withheld	25,000 - 100,000 lb
SOLVAY SPECIALTY POLYMERS USA, LLC	SOLVAY SPECIALTY POLYMERS USA LLC	TX	35397-13-8	Propane, 1,1,1,2,2,3,3-heptafluoro-3-[(1,2,2-trifluoroethenyl)oxy]-, polymer with 1-chloro-1,2,2-trifluoroethene and ethene	Withheld	Withheld
SOLVAY SPECIALTY POLYMERS USA, LLC	SOLVAY SPECIALTY POLYMERS USA, LLC	GA	200013-65-6	Diphosphoric acid, polymers with ethoxylated reduced Me esters of reduced polymd. oxidized tetrafluoroethylene	Withheld	Withheld
SUMITOMO CORPORATION OF AMERICAS	SUMITOMO CORPORATION OF AMERICAS	TX	17527-29-6	2-Propenoic acid, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl ester	Withheld	1,000,000 - 10,000,000 lb

Table B-1: PFAS Manufacture and Import Reported in the 2016 CDR

Parent Company	Site Name	Site State	CAS	Chemical Name	Manufacture and Import	National Aggregate PV
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	1224429-82-6	Phosphoric acid, mixed esters with polyethylene glycol and 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-1-octanol, ammonium salts	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	124-73-2	Ethane, 1,2-dibromo-1,1,2,2-tetrafluoro-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	17527-29-6	2-Propenoic acid, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl ester	Withheld	1,000,000 - 10,000,000 lb
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	17741-60-5	2-Propenoic acid, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,12-heneicosafluorododecyl ester	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	19430-93-4	1-Hexene, 3,3,4,4,5,5,6,6,6-nonafluoro-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	2043-53-0	Decane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-iodo-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	2043-54-1	Dodecane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10-heneicosafluoro-12-iodo-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	2043-55-2	Hexane, 1,1,1,2,2,3,3,4,4-nonafluoro-6-iodo-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	2043-57-4	Octane, 1,1,1,2,2,3,3,4,4,5,5,6,6-tridecafluoro-8-iodo-	Withheld	1,000,000 - 10,000,000 lb

Table B-1: PFAS Manufacture and Import Reported in the 2016 CDR

Parent Company	Site Name	Site State	CAS	Chemical Name	Manufacture and Import	National Aggregate PV
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	2144-53-8	2-Propenoic acid, 2-methyl-, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl ester	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	27905-45-9	2-Propenoic acid, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl ester	Withheld	< 25,000 lb
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	30046-31-2	Tetradecane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12-pentacosafluoro-14-iodo-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	34362-49-7	2-Propenoic acid, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,15,15,16,16,16-nonacosafluorohexadecyl ester	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	34395-24-9	2-Propenoic acid, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,14-pentacosafluorotetradecyl ester	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	39239-77-5	1-Tetradecanol, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,14-pentacosafluoro-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	60699-51-6	1-Hexadecanol, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,15,15,16,16,16-nonacosafluoro-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	647-42-7	1-Octanol, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-	Withheld	1,000,000 - 10,000,000 lb
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	65510-55-6	Hexadecane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14-nonacosafluoro-16-iodo-	Withheld	Withheld

Table B-1: PFAS Manufacture and Import Reported in the 2016 CDR

Parent Company	Site Name	Site State	CAS	Chemical Name	Manufacture and Import	National Aggregate PV
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	678-39-7	1-Decanol, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluoro-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	76-16-4	Ethane, 1,1,1,2,2,2-hexafluoro-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	865-86-1	1-Dodecanol, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,12-heneicosafluoro-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CORPUS CHRISTI)	TX	76-14-2	Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	2641-34-1	Propanoyl fluoride, 2,3,3,3-tetrafluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propoxy]-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	335-66-0	Octanoyl fluoride, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-	Withheld	< 25,000 lb
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	335-67-1	Octanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (HEADQUARTERS)	DE	115-25-3	Cyclobutane, 1,1,2,2,3,3,4,4-octafluoro-	Withheld	1,000,000 - 10,000,000 lb
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (HEADQUARTERS)	DE	138495-42-8	Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (HEADQUARTERS)	DE	15290-77-4	Cyclopentane, 1,1,2,2,3,3,4-heptafluoro-	Withheld	Withheld

Table B-1: PFAS Manufacture and Import Reported in the 2016 CDR

Parent Company	Site Name	Site State	CAS	Chemical Name	Manufacture and Import	National Aggregate PV
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (HEADQUARTERS)	DE	507-63-1	Octane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-8-iodo-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (HEADQUARTERS)	DE	62037-80-3	Propanoic acid, 2,3,3,3-tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-, ammonium salt (1:1)	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (PASCAGOULA)	MS	27619-97-2	1-Octanesulfonic acid, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (PASCAGOULA)	MS	34455-29-3	1-Propanaminium, N-(carboxymethyl)-N,N-dimethyl-3-[[(3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl)sulfonyl]amino]-, inner salt	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (WASHINGTON WORKS)	WV	115-25-3	Cyclobutane, 1,1,2,2,3,3,4,4-octafluoro-	Withheld	1,000,000 - 10,000,000 lb
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (WASHINGTON WORKS)	WV	354-64-3	Ethane, 1,1,1,2,2-pentafluoro-2-iodo-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (WASHINGTON WORKS)	WV	355-42-0	Hexane, 1,1,1,2,2,3,3,4,4,5,5,6,6,6-tetradecafluoro-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (WASHINGTON WORKS)	WV	355-43-1	Hexane, 1,1,1,2,2,3,3,4,4,5,5,6,6-tridecafluoro-6-iodo-	Withheld	1,000,000 - 10,000,000 lb
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (WASHINGTON WORKS)	WV	423-39-2	Butane, 1,1,1,2,2,3,3,4,4-nonafluoro-4-iodo-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (WASHINGTON WORKS)	WV	423-62-1	Decane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10-heneicosafluoro-10-iodo-	Withheld	Withheld

Table B-1: PFAS Manufacture and Import Reported in the 2016 CDR

Parent Company	Site Name	Site State	CAS	Chemical Name	Manufacture and Import	National Aggregate PV
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (WASHINGTON WORKS)	WV	507-63-1	Octane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-8-iodo-	Withheld	Withheld
TYCO FIRE PRODUCTS LP	CHEMGUARD INC	TX	1078715-61-3	1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-[2-[(.gamma.-.omega.-perfluoro-C4-20-alkyl)thio]acetyl] derivs., inner salts	Withheld	25,000 - 100,000 lb
TYCO FIRE PRODUCTS LP	CHEMGUARD INC	TX	27619-89-2	1-Octanesulfonyl chloride, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-	Withheld	25,000 - 100,000 lb
TYCO FIRE PRODUCTS LP	CHEMGUARD INC	TX	34455-29-3	1-Propanaminium, N-(carboxymethyl)-N,N-dimethyl-3-[[(3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl)sulfonyl]amino]-, inner salt	Withheld	Withheld
TYCO FIRE PRODUCTS LP	CHEMGUARD INC	TX	65545-80-4	Poly(oxy-1,2-ethanediyl), .alpha.-hydro-.omega.-hydroxy-, ether with .alpha.-fluoro-.omega.-(2-hydroxyethyl)poly(difluoromethylene) (1:1)	Withheld	25,000 - 100,000 lb
TYCO FIRE PRODUCTS LP	CHEMGUARD INC	TX	68140-18-1	Thiols, C4-10, .gamma.-.omega.-perfluoro	Withheld	Withheld
TYCO FIRE PRODUCTS LP	CHEMGUARD INC	TX	68140-20-5	Thiols, C6-12, .gamma.-.omega.-perfluoro	Withheld	Withheld
TYCO FIRE PRODUCTS LP	CHEMGUARD INC	TX	68187-47-3	1-Propanesulfonic acid, 2-methyl-, 2-[[1-oxo-3-[(.gamma.-.omega.-perfluoro-C4-16-alkyl)thio]propyl]amino] derivs., sodium salts	Withheld	Withheld
TYCO FIRE PRODUCTS LP	CHEMGUARD INC	TX	70969-47-0	Thiols, C8-20, .gamma.-.omega.-perfluoro, telomers with acrylamide	Withheld	Withheld

Table B-2: Number of PFAS Manufactured by Use Reported in the 2016 CDR

Type/Process/Use	Sector	Function	Number of PFAS
(blank)	(blank)	(blank)	33
CBI	CBI	CBI	10
Processing as a reactant	Adhesive manufacturing	Intermediates	1
Processing as a reactant	All other basic organic chemical manufacturing	Intermediates	16
Processing as a reactant	All other basic organic chemical manufacturing	Processing aids, not otherwise listed	2
Processing as a reactant	Computer and electronic product manufacturing	Intermediates	1
Processing as a reactant	Industrial gas manufacturing	Intermediates	1
Processing as a reactant	Miscellaneous manufacturing	Intermediates	1
Processing as a reactant	Not known or reasonably ascertainable	Not known or reasonably ascertainable	1
Processing as a reactant	Paint and coating manufacturing	Intermediates	1
Processing as a reactant	Plastic material and resin manufacturing	Intermediates	13
Processing as a reactant	Textiles, apparel, and leather manufacturing	Intermediates	4
Processing—incorporation into article	Paint and coating manufacturing	Plating agents and surface treating agents	1
Processing—incorporation into article	Paper manufacturing	Finishing agents	1
Processing—incorporation into article	Textiles, apparel, and leather manufacturing	Finishing agents	1
Processing—incorporation into formulation, mixture, or reaction product	Adhesive manufacturing	Surface active agents	1
Processing—incorporation into formulation, mixture, or reaction product	All other basic inorganic chemical manufacturing	Surface active agents	1
Processing—incorporation into formulation, mixture, or reaction product	All other basic organic chemical manufacturing	Processing aids, not otherwise listed	1
Processing—incorporation into formulation, mixture, or reaction product	All other chemical product and preparation manufacturing	Firefighting foam agents	8
Processing—incorporation into formulation, mixture, or reaction product	All other chemical product and preparation manufacturing	Solvents (for cleaning and degreasing)	6
Processing—incorporation into formulation, mixture, or reaction product	All other chemical product and preparation manufacturing	Surface active agents	2
Processing—incorporation into formulation, mixture, or reaction product	CBI	CBI	2
Processing—incorporation into formulation, mixture, or reaction product	CBI	Surface active agents	1
Processing—incorporation into formulation, mixture, or reaction product	Computer and electronic product manufacturing	Functional fluids (closed systems)	1

Table B-2: Number of PFAS Manufactured by Use Reported in the 2016 CDR

Type/Process/Use	Sector	Function	Number of PFAS
Processing—incorporation into formulation, mixture, or reaction product	Computer and electronic product manufacturing	Solvents (which become part of product formulation or mixture)	1
Processing—incorporation into formulation, mixture, or reaction product	Computer and electronic product manufacturing	Surface active agents	1
Processing—incorporation into formulation, mixture, or reaction product	Miscellaneous manufacturing	Plating agents and surface treating agents	2
Processing—incorporation into formulation, mixture, or reaction product	Oil and gas drilling, extraction, and support activities	Surface active agents	1
Processing—incorporation into formulation, mixture, or reaction product	Paint and coating manufacturing	Paint additives and coating additives not described by other categories	1
Processing—incorporation into formulation, mixture, or reaction product	Paint and coating manufacturing	Surface active agents	1
Processing—incorporation into formulation, mixture, or reaction product	Pesticide, fertilizer, and other agricultural chemical manufacturing	Surface active agents	2
Processing—incorporation into formulation, mixture, or reaction product	Plastic material and resin manufacturing	Processing aids, specific to petroleum production	1
Processing—incorporation into formulation, mixture, or reaction product	Plastic material and resin manufacturing	Solvents (which become part of product formulation or mixture)	1
Processing—incorporation into formulation, mixture, or reaction product	Printing ink manufacturing	Processing aids, not otherwise listed	1
Processing—incorporation into formulation, mixture, or reaction product	resale of chemicals	Plating agents and surface treating agents	1
Processing—incorporation into formulation, mixture, or reaction product	Soap, cleaning compound, and toilet preparation manufacturing	Surface active agents	3
Processing—incorporation into formulation, mixture, or reaction product	Wholesale and retail trade	CBI	1
Processing—repackaging	All other chemical product and preparation manufacturing	Plating agents and surface treating agents	1
Processing—repackaging	All other chemical product and preparation manufacturing	Solvents (for cleaning and degreasing)	1
Processing—repackaging	Industrial gas manufacturing	transfilling and purifying	1
Processing—repackaging	Miscellaneous manufacturing	Solvents (for cleaning and degreasing)	1
Processing—repackaging	Paint and coating manufacturing	Paint additives and coating additives not described by other categories	1
Processing—repackaging	Plastic material and resin manufacturing	Intermediates	1

Table B-2: Number of PFAS Manufactured by Use Reported in the 2016 CDR

Type/Process/Use	Sector	Function	Number of PFAS
Processing—repackaging	Plastic material and resin manufacturing	Solvents (which become part of product formulation or mixture)	1
Use—non-incorporative activities	All other chemical product and preparation manufacturing	Fire Extinguishing Medium	1
Use—non-incorporative activities	All other chemical product and preparation manufacturing	Functional fluids (open systems)	1
Use—non-incorporative activities	CBI	CBI	2
Use—non-incorporative activities	CBI	Functional fluids (closed systems)	2
Use—non-incorporative activities	Computer and electronic product manufacturing	CBI	1
Use—non-incorporative activities	Computer and electronic product manufacturing	Functional fluids (closed systems)	9
Use—non-incorporative activities	Computer and electronic product manufacturing	Functional fluids (open systems)	1
Use—non-incorporative activities	Computer and electronic product manufacturing	Plating agents and surface treating agents	1
Use—non-incorporative activities	Computer and electronic product manufacturing	Solvents (for cleaning and degreasing)	7
Use—non-incorporative activities	Fabricated metal product manufacturing	Solvents (for cleaning and degreasing)	2
Use—non-incorporative activities	Miscellaneous manufacturing	Solvents (for cleaning and degreasing)	1
Use—non-incorporative activities	Not known or reasonably ascertainable	Lubricants and lubricant additives	1
Use—non-incorporative activities	Plastic material and resin manufacturing	Processing aids, not otherwise listed	2
Use—non-incorporative activities	Primary metal manufacturing	Functional fluids (open systems)	1
Use—non-incorporative activities	Stored on site in rail cars, no commercial use	Stored on site in rail cars, no commercial use	1

Appendix C: References

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Exhibit C

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

Ex. C

JUN 0 5 2019

OFFICE OF
CONGRESSIONAL AND
INTERGOVERNMENTAL
RELATIONS

The Honorable Paul D. Tonko
U.S. House of Representatives
Washington, DC 20515

Dear Congressman Tonko:

Thank you for the letter of December 7, 2018, to the Environmental Protection Agency (EPA) concerning per- and polyfluoroalkyl substances (PFAS).

The EPA's New Chemicals Review Program evaluates new chemicals to determine whether they may present unreasonable risk to human health or the environment. Once the EPA's review is complete, submitters may commercialize the chemical substance (subject to any restrictions the Agency may have placed on the manufacture, processing, distribution in commerce or use of the chemical substance) after having submitted a Notice of Commencement (NOC), indicating intent to commence manufacture or import of the chemical. However, it is often the case that submitters either delay or do not choose to commercialize chemicals that have undergone review. Hence, the responses below provide the number of notices for PFAS chemicals for which the EPA received an NOC, as this is the EPA's best indication of whether a PFAS chemical may have entered commerce. The numbers below are current as of early February 2019.

Since 2006, when the PFOA Stewardship Initiative began, the EPA received 148 NOCs for PFAS chemicals that underwent New Chemicals Program review. Of the PFAS chemicals for which EPA has received NOCs, 146 were received prior to June 22, 2016, and 2 after that date.

The Agency also receives exemption notices for chemical substances, which are exempt from full premanufacture notice (PMN) review under TSCA section 5, provided they meet the criteria and maintain certain conditions and controls throughout the duration of the exemption. One such exemption for chemical substances manufactured at 10,000 kg/year or less per year is the Low-Volume Exemption (LVE). Since 2006, the EPA received 528 LVEs for PFAS chemicals and granted 272 of them. Of those granted, 262 were granted prior to June 22, 2016, and 10 after that date.

Regarding new PFAS chemicals entering the market, between 2006 and April 2019, the EPA placed restrictions on new PFAS chemicals through the issuance of 171 orders and 178 significant new use rules (SNURs). As mentioned above, the new chemicals review program evaluates new chemicals and significant new uses of existing chemicals to determine whether

they may present unreasonable risk to human health or the environment. When the EPA determines that a chemical substance may present an unreasonable risk, the EPA must issue an order under TSCA section 5(e). A section 5(e) order typically contains some of the following requirements: limits on specific conditions for manufacturing, processing, distribution or use of the chemical, limits on releases to water and air, toxicity testing, environmental fate testing, worker protection measures (e.g., exposure limits and personal protective equipment), hazard communication language and record-keeping.

The EPA notes that submitters sometimes decide to withdraw their PMN from review once they learn that the EPA has found that the substance may present unreasonable risk and the Agency intends to issue an order under section 5(e). Since 2006, 46 PFAS chemicals have been withdrawn (42 PMN and 2 LVE). Of those withdrawn, 44 were prior to June 22, 2016, and 2 after that date.

Regarding new PFAS chemicals subject to consent orders requiring the development of test data, since 2006, EPA has issued section 5(e) orders that have testing requirements[1] for 157 PFAS chemicals. Of these orders, 34 were issued prior to June 22, 2016, and 122 were issued after that date.

Again, thank you for your letter. If you have further questions, please contact me or our staff may contact Sven-Erik Kaiser in the EPA's Office of Congressional and Intergovernmental Relations at kaiser.sven-erik@epa.gov or at (202) 566-2753.

Sincerely,

Troy M. Lyons
Associate Administrator

[1] Although all orders generally describe testing requirements or potentially useful information, the Agency works with submitters of like chemicals to tailor testing requirements in order to avoid unnecessary vertebrate tests so the number of orders does not necessarily equal the number of test submissions.

Appointment

From: Hoffer, Melissa [Hoffer.Melissa@epa.gov]
Sent: 4/21/2021 5:27:29 AM
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Recurrence: (none)

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Message

From: Vickie Patton [vpatton@edf.org]
Sent: 4/26/2021 12:52:03 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]; Hoffer, Melissa [Hoffer.Melissa@epa.gov]; Tsirigotis, Peter [Tsirigotis.Peter@epa.gov]; Culligan, Kevin [Culligan.Kevin@epa.gov]; Anderson, Lea [anderson.lea@epa.gov]; Sasser, Erika [Sasser.Erika@epa.gov]; Versace, Paul [Versace.Paul@epa.gov]
CC: Rama Zakaria [rzakaria@edf.org]; Benjamin Levitan [blevitan@edf.org]; Dena Adler [dadler@edf.org]; Susannah Weaver (susannah@donahuegoldberg.com) [susannah@donahuegoldberg.com]; Sean Donahue (sean@donahuegoldberg.com) [sean@donahuegoldberg.com]
Subject: Mercury and Air Toxics Standards: Several Retrospective Compliance Cost Assessments Show Actual Costs a Fraction of Projected Costs
Attachments: Calpine et al Comments on Proposed Supplemental MATS Finding DMEAST_24208034(1).pdf; ADA Carbon Solutions Letter - MATS.pdf; impact of MATS_20190416.pdf

Dear EPA Officials,

When EPA finalized the MATS rule in December 2011, it estimated annualized compliance costs of $9.4 billion in 2015 for coal-fired units (this annualized cost from EPA's December 2011 Regulatory Impact Analysis for the final MATS rule includes amortized capital costs, variable and fixed O&M costs, and fuel costs). In January 2016, expert consultant Dr. Jim Staudt assessed the actual costs of complying with MATS and found that the true cost of complying with MATS was $7.2 billion per year less than estimated by EPA, making the true cost of the rule approximately $2 billion, or less than one-quarter of what EPA originally estimated the rule to cost (see attached Staudt report as part of Calpine et al January 2016 Comments).

Additional updated analyses by Dr. Staudt of the cost of compliance with MATS focused on ongoing O&M costs of controls show lower and declining O&M costs since MATS was finalized: in 2017, Dr. Staudt found annual variable and fixed O&M costs of roughly $600 million (see attached Staudt report as part of ADA Carbon Solutions June 2018 Letter) and in 2019, Dr. Staudt found annual O&M costs were lower at roughly $200 million (see attached 2019 Staudt report). By comparison, EPA's IPM modeling of the final MATS rule shows estimated annual variable and fixed O&M costs of roughly $4 billion.

Dr. Staudt's bio is appended below.

Sincerely yours,
Vickie Patton
Environmental Defense Fund

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https://www.andovertechnology.com/james-e-staudt-phd-cfa/

James E. Staudt, Ph.D., CFA

Dr. Staudt is the Principal Owner of Andover Technology Partners (ATP), a management and technology consulting business that commenced operations in mid-1997.

In that time ATP has satisfied a list of clients that includes some of the most important companies in the energy industry and major government agencies. Most engagements involve developing strategies for growth or increased earnings, economic and technical evaluation of technologies, valuation of technology-based businesses, or other business strategy matters that our clients have an interest in. In some cases, the consulting services concern strictly technical issues, particularly relating to clean energy or air pollution control, fossil fuel combustion, or power generation.

Dr. Staudt is a nationally recognized expert on air pollution control and clean energy. Dr. Staudt has authored emissions control technology documents and software that are used by air pollution control and energy professionals in the United States, Europe, and Asia. He has developed cost and performance algorithms that are used by the US Environmental Protection Agency. On behalf of his clients, he has testified in litigation, and public hearings, appeared on television and made presentations before Congressional staff.

Some of his activities include assistance on clean energy initiatives, development of US EPA's Greenhouse Gas Technology database, development of cost and performance data on clean energy technology, emission control technologies, new facilities and energy efficiency measures for US EPA's new industrial sector modeling tool, support of state rulemaking measures, benchmarking of GHG emissions technologies for private sector clients, and development/deployment of power plant technologies.

Dr. Staudt has extensive experience leading businesses in commercializing advanced technology for the energy industry. During his career, he has been in senior management positions with several technology companies serving the energy sector. He had a key role in the commercialization and sale of technologies that are currently used in hundreds of industrial facilities worldwide. Specific accomplishments at three of his previous employers are briefly discussed below:

- As Vice President for Business Development at Spectrum Diagnostix (SDX), Dr. Staudt directed the commercial activities for this development-stage company. During the period of his employment, SDX released its core product – an advanced process gas analyzer – to the petrochemical, electric utility, and chemical process industries. The commercial potential of the product attracted an investment by BOVAR, Inc. of Calgary, Alberta, Canada for 100% of SDX

stock. SDX was previously owned by Physical Sciences, Inc. (PSI) of Andover, MA. While an employee of PSI from 1990-91, Dr. Staudt wrote the original business plan for the business that was to become PSI Environmental Instruments in 1992 and Spectrum Diagnostix in 1995.

- As Product Director of NOx Control at Research-Cottrell from 1992-1995, Dr. Staudt started a new product line for the company that posted four years of consistent growth and increasing net income with positive cash flow. In this time Research-Cottrell's market position in the nascent NOx Control market went from no position at all to a leading supplier of Selective Non-Catalytic Reduction. Under Dr. Staudt's leadership, by 1995 Research-Cottrell had licensed 1,731 MWe of electric utility generating plants with Research-Cottrell NOx control technology and had supplied the technology to several facilities from other industries. Research-Cottrell was a wholly-owned subsidiary of Air and Water Technologies (Amex: AWT) and is now owned by the Hamon Group of Belgium. Hamon Research Cottrell has been a client of Andover Technology Partners.
- As Programs Manager at Fuel Tech, Inc. from 1988-1990, Dr. Staudt managed a chemical process engineering group in the United States and managed company field operations in Germany and Japan. Fuel Tech supplies proprietary air pollution control technologies and furnace additives to major industries worldwide. Fuel Tech is currently the market leader in Selective Non-Catalytic Reduction technology and trades on the NASDAQ small cap market under (FTEK).
- As a Project Engineer at Northern Research and Engineering, an Ingersoll-Rand subsidiary, Dr. Staudt designed pioneering gas turbines and other turbomachinery, including development of a new intercooled Dresser-Rand gas turbine.

J. Staudt, Education and Professional Credentials

- B.S. in Mechanical Engineering from the U.S. Naval Academy (1979)
- M.S. (1986) and Ph.D (1987) in Engineering from the Massachusetts Institute of Technology (M.I.T.).
- Studied business management and finance at the M.I.T. Sloan Business School.
- Chartered Financial Analyst (CFA) designation, 2001

Awards

- An inventor on two US patents
- 2007 US Environmental Protection Agency Science and Technology Achievement Award

Business and Professional Associations

- Member, CFA Institute

Military Service

From 1979 to 1984 Dr. Staudt served as a commissioned officer in the U.S. Navy in the Engineering Department of the nuclear-powered aircraft carrier USS ENTERPRISE (CVN-65), attaining the rank of Lieutenant (O-3) prior to leaving the service. As a naval officer, Dr. Staudt qualified as Chief Engineer for US Navy nuclear powered vessels.

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COMMENTS OF CALPINE CORPORATION, EXELON CORPORATION, AND PUBLIC SERVICE ENTERPRISE GROUP, INC. ON

U.S. ENVIRONMENTAL PROTECTION AGENCY'S PROPOSED SUPPLEMENTAL FINDING THAT IT IS APPROPRIATE AND NECESSARY TO REGULATE HAZARDOUS AIR POLLUTANTS FROM COAL- AND OIL-FIRED ELECTRIC UTILITY STEAM GENERATING UNITS

Docket ID No. EPA-HQ-OAR-2009-0234
80 Fed. Reg. 75,025 (December 1, 2015)

January 15, 2016

I. INTRODUCTION AND EXECUTIVE SUMMARY

Calpine Corporation ("Calpine"), Exelon Corporation ("Exelon"), and Public Service Enterprise Group, Inc. ("PSEG") (collectively, "Commenters") respectfully submit the following comments on the U.S. Environmental Protection Agency's ("EPA" or the "Agency") proposed Supplemental Finding That It Is Appropriate and Necessary to Regulate Hazardous Air Pollutants From Coal- and Oil-Fired Electric Utility Steam Generating Units, 80 Fed. Reg. 75,025 (Dec. 1, 2015) (the "Proposed Finding").

Commenters collectively own or operate 72 gigawatts of electricity generation capacity. Commenters have long supported EPA's efforts to improve air quality that yield significant public health and environmental benefits. For example, Commenters intervened in support of EPA's long-awaited rule that addresses emissions of criteria pollutants from electric generating units ("EGUs") that interfere with air quality in downwind states (the "Cross-State Air Pollution Rule"), and Commenters intervened in support EPA's rule limiting emissions of hazardous air pollutants ("HAPs") from coal- and oil-fired EGUs (the "Mercury and Air Toxics Rule" or "MATS").

Calpine owns 83 natural gas-fired and renewable geothermal power plants in operation or under construction that are capable of delivering nearly 27,000 megawatts of electricity to customers in the United States. Calpine operates the largest fleet of natural gas combined cycle and combined heat and power facilities in the country. Calpine is also the nation's largest producer of electricity from renewable, baseload geothermal resources. Of the 10 largest U.S. electricity generators, Calpine has the lowest emissions intensity for both nitrogen oxides and sulfur dioxide.[1] Calpine also has the lowest emissions intensity for carbon dioxide among the fossil fleets of those 10 largest electricity generators.[2]

Exelon is among the largest gas and electric utilities in the nation. Exelon owns a diverse fleet of over 32,000 megawatts of generation capacity that includes nuclear, natural gas, coal, hydroelectric and renewable generation resources. Exelon also provides energy products and services to retail and wholesale customers across 46 states, the District of Columbia and Canada. The company's Constellation business unit provides energy products and services to more than two million residential, public sector and business customers, including more than two-thirds of the Fortune 100. Exelon's utilities deliver electricity and natural gas to more than 7.9 million customers in southeastern Pennsylvania ("PECO"), central Maryland ("BGE"), and northern Illinois ("ComEd").

MATS encourages investment in modern, low-pollution generation technologies, including upgrades to existing nuclear plants, and investments in alternative and renewable

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1 Natural Resources Defense Council et al., *Benchmarking Air Emissions of the 100 Largest Electric Power Producers in the United States*, 10 (July 2015), available at http://www.nrdc.org/air/pollution/benchmarking/files/benchmarking-2015.pdf (emissions and generation data from 2013).

2 *Id.*

technologies, co-generation, and new, combined cycle gas-fired plants, as well as in traditional pollution controls at coal-fired plans. Exelon has made investment in clean energy a part of its business strategy. Current efforts include energy-efficiency and Smart Grid programs, investments in renewable energy generation projects, and increased output at Exelon's existing nuclear plants ("uprates"). Under this effort, Exelon has placed into service projects representing 383 megawatts of new, emissions-free nuclear generation.

PSEG is a diversified energy company with more than $35 billion in assets. Its operating companies include: PSEG Power, one of the nation's leading wholesale energy producers which owns and operates a 13,250 megawatt generation fleet in the Mid-Atlantic and Northeast regions and has grid-connected solar facilities throughout the country; PSE&G, the largest electric and gas utility in New Jersey; and PSEG Long Island, which operates the electric distribution and transmission system of the Long Island Power Authority.

For eight consecutive years, PSEG has been named to the Dow Jones Sustainability North America Index, which recognizes forward-thinking companies based on an appraisal of the company's strategy, management and performance in dealing with opportunities and risks deriving from economic, environmental and social developments. PSEG has invested substantially in clean generation technologies while working hard to reduce its environmental footprint. These efforts place it at the forefront of the electric generation and transmission industry in implementing environmental solutions to meet sustainability challenges.

As explained in more detail in these comments, the Commenters recommend that EPA finalize its Proposed Finding: (1) to find that considering cost does not alter the Agency's previous determination that it is appropriate and necessary to regulate coal- and oil-fired EGUs under section 112 of the Clean Air Act; and (2) to conclude that coal-and oil-fired EGUs are properly included on the Clean Air Act section 112(c) list of sources that must be regulated under section 112(d). Commenters support EPA's decision to measure the reasonableness of MATS compliance costs using four cost metrics relevant to the industry: revenues; capital expenditures; retail electricity price impacts; and retirements. Commenters also support EPA's conclusions that each comparison independently shows that it remains appropriate to regulate HAP emissions from EGUs under section 112 after considering costs. In addition, more recent data than EPA evaluated in the Proposed Finding demonstrate it is appropriate to regulate HAP emissions from EGUs under section 112 after considering costs. EPA should consider this more recent data and should conclude – as an independent basis for the Proposed Finding – that it is "appropriate" to regulate EGU HAP emissions under section 112 even considering that data. Commenters offer these comments on the Proposed Finding with the purpose of supporting the appropriate and necessary finding and ensuring that the important benefits of MATS are not interrupted.

II. COMMENTS ON THE PROPOSED FINDING

A. Background

EPA promulgated MATS in 2012, and as part of that rulemaking, reaffirmed its finding originally made in 2000 under section 112(n)(1) of the Clean Air Act that it is appropriate and necessary to regulate hazardous air pollutant emissions from coal- and oil-fired

EGUs under section 112. On appeal to the U.S. Court of Appeals for the District of Columbia Circuit, the D.C. Circuit upheld MATS in all respects. *White Stallion Energy Center v. EPA*, 748 F.3d 1222 (April 15, 2014). At the request of some parties challenging MATS, the Supreme Court agreed to hear a single issue: "Whether the Environmental Protection Agency unreasonably refused to consider costs in determining whether it is appropriate to regulate hazardous air pollutants emitted by electric utilities." The Supreme Court answered that question affirmatively and remanded the case to the D.C. Circuit. *Michigan v. EPA*, 135 S. Ct. 2699, 2712 (2015). In so doing, the Supreme Court explained that it was not holding that a particular analysis of costs was required, and that on remand "[i]t [would] be up to the Agency to decide . . . how to account for cost." *Id.* at 2711. Following the Supreme Court's decision, it was clear that EPA must reconsider its "appropriate and necessary finding" (the "Finding").

Back in the D.C. Circuit, the parties argued over whether MATS, or at least the Finding, should be vacated during the reconsideration proceeding. The parties challenging MATS vigorously argued that MATS should be vacated. EPA, and the respondent-intervenors supporting EPA, including Commenters, argued that the court should not order vacatur because EPA is likely to reaffirm the Finding after considering costs and because vacatur would perpetuate the significant hazards to public health and the environment from HAP emitted by EGUs, eliminate the substantial reductions in HAP emissions achieved by MATS, and disrupt the electric generation industry. In a unanimous decision, the D.C. Circuit ordered that the proceeding be remanded to EPA without vacatur of MATS, noting that EPA represented to the court that it is on track to issue a final supplemental finding by April 15, 2016. *White Stallion Energy Center, LLC v. EPA*, No. 12-1100 (D.C. Cir. *order issued* Dec. 15, 2015).

B. The actual compliance costs of MATS have been substantially lower than EPA estimated.

The MATS compliance deadline was April 16, 2015, or for units that received a one-year compliance extension, April 16, 2016. In the Regulatory Impact Analysis ("RIA") that it prepared when it adopted MATS in 2012, EPA projected that annual compliance costs (both capital and operating costs) would peak in 2015 at $9.6 billion. Yet, as often happens, the actual costs incurred by industry have been far lower than EPA estimated. James Staudt, Ph.D. Eng., analyzed the actual costs of compliance with MATS by reviewing control equipment installations through June 30, 2015, and projecting the additional controls that might be installed by the extended deadline of April 2016 for complying with MATS. Dr. Staudt concluded that the industry's annual compliance costs are approximately $2 billion, less than one-quarter of the $9.6 billion annual cost EPA estimated for MATS.[3]

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[3] James E. Staudt, *Review and Analysis of the Actual Costs of Complying with MATS in Comparison to Predicted in EPA's Regulatory Impact Analysis*, 1, attached hereto as Exhibit 2 to Exhibit A. Dr. Staudt's cost estimate did not include compliance costs for oil-fired units or costs for monitoring, reporting and recordkeeping. In the RIA, EPA estimated costs of control for oil-fired units were $56 million and monitoring, reporting and recordkeeping costs were $158 million, and compliance costs associated with applying MATS to coal-fired units were $9.4 billion, for a total of $9.6 billion. 80 Fed. Reg. at 75,033 n.26. Dr. Staudt's cost estimate, then, should fairly be compared with

As is typically the case, the power industry and its suppliers in the pollution control industry developed more cost-effective compliance techniques and new technologies that reduced costs significantly from those EPA projected.[4] The dramatic cost reductions are the result of three key factors: (1) improvements in the materials used to control acid gases and mercury have resulted in reduced operating costs and increased efficiency; (2) far fewer power plants than EPA estimated have required installation of high cost pollution controls, such as fabric filters and flue gas desulfurization systems ("FGD" or "scrubbers") or system upgrades; and (3) natural gas prices have been significantly lower than EPA projected, reducing the cost of gas conversion and related compliance strategies.[5]

Dr. Staudt compared the total generation capacity that EPA predicted would install each type of control technology with the actual generation capacity that had installed or planned to install such controls by April 2016. He then deducted (or added) the incremental cost (capital and operating) associated with those missing controls from EPA's $9.6 billion annual cost estimate.[6] As a result of the factors described above and others, the amortized capital costs, variable operating and maintenance costs, fixed operating and maintenance costs, and fuel change costs incurred by industry are only a small fraction of the amount EPA predicted.

Virtually all capital investments that will be required to comply with MATS have either been made or contractually committed, and so are included in Dr. Staudt's compilation.[7] Though some power plants have received extensions and will not be required to comply with MATS until April 2016, those plants that will install capital intensive controls have already contracted for those controls to be installed.[8] While some minor controls might still be installed, these will not materially affect the industry's annual compliance costs. Accordingly, Dr. Staudt's estimate of $2 billion, less than 23 cents on each dollar estimated by EPA, reflects not only current compliance costs, but compliance costs through the extended deadline of April 2016.[9]

EPA's estimate of $9.4 billion. *See also* Declaration of James E. Staudt, ¶¶ 5, 12, 14 (Sept. 24, 2015) (attached hereto as Exhibit A, and previously filed with the U.S. Court of Appeals for the District of Columbia Circuit in *White Stallion Energy Center, LLC, et al. v. EPA*, No. 12-1100 (D.C. Cir. *filed* Sept. 24, 2015)).

4 Staudt Declaration ¶¶ 6-10.

5 Staudt Report at 3-11; Staudt Declaration ¶¶ 6-9, 11.

6 Staudt Report at 11; Staudt Declaration ¶¶ 6-9.

7 Staudt Declaration ¶¶ 3, 15.

8 *Id.*

9 *Id.*

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C. EPA's metrics for considering costs are appropriate and show that compliance costs are reasonable for the industry to bear.

Commenters agree with EPA that the Clean Air Act, specifically section 112(n)(1)(A), gives EPA discretion to identify a reasonable approach to incorporate cost into the analysis required under section 112(n)(1)(A). Commenters also agree with EPA that, in determining whether it is appropriate to regulate HAP emissions from EGUs, it is reasonable to focus on whether the power sector can reasonably absorb the cost of compliance with MATS, and to consider whether the costs of MATS would hamper the sector's ability to perform its functions of generating, transmitting, and distributing electricity reliably and affordably.

Commenters support EPA's decision to measure the reasonableness of MATS compliance costs using four cost metrics relevant to the industry: revenues; capital expenditures; retail electricity price impacts; and retirements. Commenters also support EPA's conclusions that each comparison independently shows that it remains appropriate to regulate HAP emissions from EGUs under section 112 after considering costs.

EPA explained that for the four analyses, it used figures for years up to 2011 because later information would not have been available during the development of MATS. 80 Fed. Reg. at 75,033 n.29. That is a reasonable approach. Commenters also understand EPA's decision to use in those four analyses EPA's 2012 projection in the RIA that peak annual compliance costs would be $9.6 billion, though actual compliance costs have been far lower, as discussed above. Under the statutory structure, the listing decision is made well before the section 112(d) standards are actually developed. Indeed, the Supreme Court recognized that only a "preliminary estimate" of cost would be available to the Agency at the time the listing decision is made. *Michigan*, 135 S. Ct. at 2711. Therefore, it is reasonable to consider now in this reconsideration proceeding what types of cost information would have been available at the time EPA reaffirmed its listing decision in 2011.[10]

However, more recent figures also show it is appropriate to regulate HAP emissions from EGUs under section 112 after considering costs. EPA should consider this more recent data and should conclude – as an independent basis for the Proposed Finding – that it is "appropriate" to regulate EGU HAP emissions under section 112 even considering current data. Opponents of MATS have already criticized EPA's analytical approach to the Proposed Finding for its use of 2011 data and projected, rather than actual, compliance costs. EPA can easily answer those concerns by addressing currently available data in the final supplemental finding.

1. Annual compliance costs as a percent of power sector sales

First, EPA compared compliance costs of MATS to power sector electricity sales based on data from the U.S. Energy Information Administration ("EIA"). 80 Fed. Reg. at 75,033. Using this "sales test" to evaluate whether hazardous air pollutant regulatory

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[10] Even at that, EPA used in the Proposed Finding information and data developed based on the final MATS rule, making its cost estimate much further refined than it would have been at the time EPA made its original finding in 2000.

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compliance costs are reasonable is not novel for EPA.[11] In 2011, revenues from retail electricity sales were $349.6 billion. 80 Fed. Reg. at 75,033. The $9.6 billion in annual compliance costs of MATS that EPA projected for 2015 would represent about 2.7% of 2011 power sector revenues from retail electricity sales. *Id.* EPA concluded, after considering the potential costs of MATS in light of power sector sales, that the costs to the power sector are reasonable. *Id.* Commenters agree.

More recent data reinforce that analysis and conclusion. Retail electricity sales data are available from the EIA through 2014. In 2014, revenues from retail electricity sales were $349.3 billion, almost identical to 2011 revenues.[12] Even using EPA's 2012 projection of annual compliance costs, the $9.6 billion in estimated costs would also represent about 2.7% of 2014 power sector revenues. Considering the most recent revenue data also shows that the costs to the power sector are reasonable.

More importantly, *actual* compliance costs represent an even smaller portion of industry revenue. EPA's assumptions that led to its 2012 projection of $9.6 billion in annual compliance costs were extremely conservative. Using Dr. Staudt's finding that actual compliance costs through April 2016 are approximately $2 billion per year, compliance costs would represent only 0.6% of 2014 power sector revenues from retail electricity sales. That analysis, using the most current data, demonstrates even more convincingly that the costs to the power sector are reasonable.

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[11] *See, e.g.,* U.S. EPA, Economic Impact and Small Business Analysis–Mineral Wool and Wool Fiberglass RTRs and Wool Fiberglass Area Source NESHAP, 7 (June 2015) (applying sales test and calculating annualized compliance costs as a share of sales for each company), *available at* http://www3.epa.gov/ttnecas1/regdata/EIAs/EconomicImpactAnalysisfinalMWWFRTRreportvffJune2015.pdf; U.S. EPA, Economic Impact Analysis of Final Coke Ovens NESHAP, 1-4 (Sept. 2002) (applying sales test to calculate compliance costs as a share of sales for affected companies that own coke batteries), *available at* http://www3.epa.gov/ttn/ecas/regdata/EIAs/CokeEIA_Final.pdf; U.S. EPA, Economic Impact Analysis For the Proposed Cyanide Manufacturing NESHAP, 12 (May 2000) (applying sales test to calculate compliance costs as a percentage of annual sales), *available at* http://www3.epa.gov/ttnecas1/regdata/EIAs/Cyanideeia.pdf; U.S. EPA, Economic Impact and Small Business Analysis: Metal Furniture Coating, 4-6 (2000) (evaluating compliance cost for the metal furniture coating source category by calculating compliance costs as a percentage of shipment values for 1997), *available at* http://www3.epa.gov/ttnecas1/regdata/EIAs/MF_finaleia.pdf; *see also* U.S. EPA, Interim Guidance for Implementing the Small Business Regulatory Enforcement Fairness Act and Related Provisions of the Regulatory Flexibility Act (1997) (discussing application of the sales test), *available at* http://www3.epa.gov/ttnecas1/econdata/Rmanual2/6.2.html.

[12] http://www.eia.gov/electricity/data/eia826/ (dollar figures adjusted to 2007 dollars).

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2. *Annual compliance capital expenditures compared to the power sector's annual capital expenditures*

Next, EPA compared the estimated incremental capital expenditures to the power sector's annual capital expenditures. 80 Fed. Reg. at 75,034. In the RIA, EPA estimated the amortized capital expenditures needed for MATS compliance in 2015 to be $2.4 billion, which represents about 3% of 2011 power sector-level capital expenditures ($79.2 billion), according to data from the U.S. Census Bureau. *Id.* After considering the potential impacts of MATS on industry capital expenditures, EPA concluded that the costs to the power sector are reasonable. Commenters agree. *Id.*

Here again, more recent data reinforce EPA's analysis and conclusion. Power sector-level capital expenditures data are available from the U.S. Census Bureau through 2013. In 2013, capital expenditures were $82.0 billion, a small (3.5%) increase over 2011.[13] The $2.4 billion in incremental capital expenditures estimated by EPA to be necessary to comply with MATS would represent about 2.9% of 2013 power sector-level capital expenditures. Moreover, using actual MATS compliance cost data, Dr. Staudt concluded that annualized capital expenditures are only about $1 billion.[14] The $1 billion in capital expenditures represents only 1.2% of 2013 power sector-level capital expenditures.

From the industry's perspective, these costs are reasonable for the industry to bear. Compliance with environmental regulations is simply a cost of doing business, and the costs of MATS are within the realm of reasonable capital costs. While the costs associated with MATS compliance are material, it is worth noting that they are modest by comparison to other industry costs. For example, major investor-owned electric utilities – just one subset of the industry – spend roughly $17 billion on "administrative and general expenditures" that do not include the costs of producing, transmitting and distributing power and servicing customers.[15]

3. *Impact on retail price of electricity*

Third, EPA evaluated the projected effect of MATS on retail electricity prices and compared that projected impact to historical variations in electricity prices from year to year. 80 Fed. Reg. at 75,035. In evaluating the impacts of Clean Air Act regulation, EPA frequently considers the projected impacts on electricity consumers.[16] In the RIA, EPA estimated that retail

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13 http://www.census.gov/econ/aces/index.html (dollar figures adjusted to 2007 dollars).

14 Staudt Declaration ¶ 15.

15 Edison Electric Institute, Statistical Yearbook/2013 Data, tbl. 9.3.

16 *See, e.g.*, U.S. EPA, Regulatory Impact Analysis for the Proposed Carbon Pollution Guidelines for Existing Power Plants and Emission Standards for Modified and Reconstructed Power Plants, 3-38 to 3-43, 7-8 to 7-9 (June 2014) (Clean Power Plan), *available at* http://www3.epa.gov/ttnecas1/regdata/RIAs/111dproposalRIAfinal0602.pdf; U.S. EPA, Regulatory Impact Analysis for the Federal Implementation Plans to Reduce Interstate Transport of Fine Particulate Matter and Ozone in 27 States; Correction of SIP

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electricity prices for 2015 would increase from 9.0 cents per kilowatt-hour (kWh) in the base case[17] to 9.3 cents/kWh in the policy case, an increase of about 3.1%. 80 Fed. Reg. at 75,035. EPA observes in the Proposed Finding that the projected 0.3 cents/kWh increase in national average retail electricity price under MATS is well within the range of annual variability over the 2000-2011 period. *Id.* During that period, the largest year-to-year decrease in retail electricity price was 0.2 cents/kWh and the largest increase was 0.5 cents/kWh. *Id.* EPA concludes that the estimated increase in electricity price is well within the historical range of annual average price fluctuations and is reasonable. *Id.*

Once again, actual data available in the years since EPA reaffirmed the Finding in 2011 support EPA's conclusion about the reasonableness of projected retail impacts. Annual electricity price data are available from the EIA through 2014. The average retail electricity price was 9.33 cents/kWh in 2011, 9.04 cents/kWh in 2012, 9.10 cents/kWh in 2013, and 9.28 cents/kWh in 2014.[18] Thus, the net change in average retail electricity price from 2011 to 2014 was a *decrease* of 0.05 cents/kWh, even while many sources were incurring costs to comply with MATS. Moreover, the year-to-year changes from 2011 to 2014 – a decrease of 0.29 cents kW/h in 2012, then increases of 0.06 and 0.18 cents/kWh – were all well within the range seen in the prior decade. Thus, these more recent data also show that a 0.3 cents/kWh increase in electricity prices remains within the historical range of year-to-year variations and is reasonable.

Electricity price data through the end of 2015 are not available. Data available through October 2015 show that the national average retail electricity price for the first three quarters of 2015 was 9.18 cents/kWh. The most recent data show that EPA's estimate of 9.3 cents/kWh for 2015 was conservative, that actual electricity prices have been lower than EPA projected, and that actual electricity prices increased only 0.18 cents/kWh over EPA's projection under the base case of 9.0 cents/kWh. The most recent electricity price data reinforce EPA's conclusion that it remains appropriate to regulate HAP emissions from EGUs because the industry can comply with MATS while continuing to provide affordable electricity.

4. Impact on power sector generating capacity

EPA next looked at coal-fired capacity retirements attributable to MATS as a way of assessing whether the industry could comply with MATS while maintaining a reliable supply of electricity. 80 Fed. Reg. at 75,035-36. EPA estimated that approximately 4.7 gigawatts

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Approvals for 22 States, 266-67 (June 2011) (Cross-State Air Pollution Rule) *available at* http://www3.epa.gov/airtransport/pdfs/FinalRIA.pdf.

17 In evaluating the impacts of MATS, EPA used sophisticated economic modeling to project the behavior of EGU owners in response to the rule. EPA modeled a "base case" estimating changes that would occur within the industry even without the rule, and compared those results to a modeling scenario based on the requirements of the final rule (the "policy case"). The difference between these modeling cases represents the projected incremental impact of the rule.

18 http://www.eia.gov/electricity/data/browser (dollar figures adjusted to 2007 dollars).

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("GW") of coal-fired capacity would retire by 2015 as a result of MATS,[19] representing less than 2% of all coal-fired generation capacity projected in 2015 (310 GW) and less than 0.5% of total projected generation capacity (1,026 GW). 80 Fed. Reg. at 75,035-36. In the Proposed Finding, EPA reasonably concluded that the power sector would be able to absorb the costs of MATS compliance and remain operational. *Id.* at 75,036. This conclusion is particularly reasonable in light of the fact that the MATS compliance deadline passed on April 16, 2015, and the industry proved its ability to comply with MATS while maintaining a reliable supply of electricity.

Retirement decisions are based on consideration of numerous factors other than MATS compliance obligations, including the age of the unit, capacity factors, and the price of fuel for the unit and competing fuels. For that reason, it is impossible to determine from actual retirement figures that a given coal- or oil-fired unit retired solely or primarily due to MATS compliance obligations or due to other unrelated factors that make operation uneconomic, such as low wholesale electricity prices resulting from historically low natural gas prices. The only reliable way to isolate the impact of a single variable (such as MATS compliance) on retirements is to model retirements with and without that variable, which is exactly what EPA did in the RIA when it compared retirements under the base case with retirements under the policy case. Therefore, EPA's modeling and analysis in the MATS RIA provides the best estimate of the impact of MATS on retirements.

For this reason, unlike EPA's other decision criteria in the Proposed Finding, its analysis of retirements does not benefit from comparison with recent data. As noted above, a decision to retire an EGU takes into account many plant-specific factors and external conditions that make continued operation of a plant uneconomic. Some of these external conditions, in particular low electricity demand, low cost alternative fuels, and low wholesale electricity prices, have created a market environment in which retirements have been higher than estimated by EPA under the policy case. However, the fact that retirements have been higher than projected does not suggest that MATS *caused* these additional retirements, much less that EPA erred in concluding that the retirement of 4.7 GW of generation capacity would be a reasonable burden for the electric power industry to bear.

Moreover, to the extent that EPA is focused on the consequences of coal- and oil-fired unit retirements to electric system reliability, the amount of coal- and oil-fired capacity that retires is just one factor to consider, and other metrics provide a better picture of whether those retirements actually raise reliability concerns. A robust reliability assessment considers many other factors including availability of alternative capacity, projected generation resource additions, the function of capacity markets to ensure reliability several years out, and reserve margins – the degree to which capacity exceeds forecasted electricity demand. Coal- and oil-fired generation represented only about 40% of total U.S. electricity generation in 2014.[20] Other, lower-emitting energy sources that are not at risk of retirement due to MATS are adequately

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[19] In the RIA, EPA determined that retirements under the policy case reflecting MATS would be 4.7 GW greater than retirements under the base case. 80 Fed. Reg. at 75,035-36.

[20] https://www.eia.gov/tools/faqs/faq.cfm?id=427&t=3.

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available to ensure electric system reliability, and EPA's assessment should consider the availability of those alternative capacity resources.

Resource adequacy analyses show that reserve margins can be maintained while the power sector complies with MATS. For example, even in the absence of new gas-fired generating capacity added since 2012 and even considering all recent and planned coal- and oil-fired unit retirements, reserve margins in the PJM Interconnection will remain about 18% through at least 2020 and reserve margins in the MISO (Midcontinent Independent System Operator) will reach nearly 30% through 2020. For comparison, PJM's reserve margin target is only 16.5%[21] and MISO's planning reserve margin requirement is only 15.2%.[22] Considering new gas-fired generation and other forms of generating capacity that have come online since 2012 boosts reserve margins even higher. A resource adequacy analysis shows that while the power sector has been complying with MATS, there are, and will be, adequate generation resources to meet projected load and generating reserve requirements.

III. CONCLUSION

Commenters recommend that EPA finalize its proposal: (1) to find that considering cost does not alter the Agency's previous determination that it is appropriate and necessary to regulate coal- and oil-fired EGUs under section 112 of the Clean Air Act; and (2) to conclude that coal-and oil-fired EGUs are properly included on the Clean Air Act section 112(c) list of sources that must be regulated under section 112(d). EPA's cost analyses in the Proposed Finding are reasonable and demonstrate that the power sector can reasonably absorb the costs of MATS compliance without impairing the ability to reliably and affordably deliver electricity to consumers. EPA also should consider more recent data for three of the cost metrics and for actual compliance costs and should conclude – as an independent basis for the Proposed Finding – that it is "appropriate" to regulate EGU HAP emissions under section 112 even considering current data.

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21 2015 PJM Reserve Requirement Study, at 8 (Oct. 8, 2015), *available at* http://www.pjm.com/~/media/committees-groups/subcommittees/raas/20150930/20150930-pjm-reserve-requirement-study.ashx.

22 MISO Planning Year 2016-2017 Loss of Load Expectation Study Report (draft), *available at* http://www.misoenergy.org.

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EXHIBIT A

TO

COMMENTS OF CALPINE CORPORATION, EXELON CORPORATION, AND PUBLIC SERVICE ENTERPRISE GROUP, INC. ON U.S. ENVIRONMENTAL PROTECTION AGENCY'S PROPOSED SUPPLEMENTAL FINDING THAT IT IS APPROPRIATE AND NECESSARY TO REGULATE HAZARDOUS AIR POLLUTANTS FROM COAL- AND OIL-FIRED ELECTRIC UTILITY STEAM GENERATING UNITS

Docket ID No. EPA-HQ-OAR-2009-0234
80 Fed. Reg. 75,025 (December 1, 2015)

ARGUED DECEMBER 10, 2013
DECIDED APRIL 15, 2014

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

WHITE STALLION ENERGY CENTER, LLC, et al.,	)	
Petitioners,	)	**Case No. 12-1100, and consolidated cases**
v.	)	
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY,	)	
Respondent.	)	

DECLARATION OF JAMES E. STAUDT, PH.D., CFA

I, James E. Staudt, make the following declaration in support of the Motion of Industry Respondent Intervenors to Govern Future Proceedings, and declare under penalty of perjury that the following is true to the best of my knowledge, information and belief:

1. I am an engineer and Chartered Financial Analyst with decades of experience in all aspects of energy and air pollution control in the electricity generation sector, as reflected in my CV attached hereto as Exhibit 1. I conduct market studies for the air pollution control industry and, as part of my business,

routinely track the installation of air pollution control equipment on power plants. This is done by review of publicly available information and by direct interaction with people who work at air pollution control companies and at power companies.

2. As reflected in the report attached hereto as Exhibit 2, I have conducted a review of the actual costs that have been incurred by the power generation industry to comply with EPA's Mercury and Air Toxics Standards (the "Rule") and compared these costs to those that EPA estimated *ex ante* as reflected in EPA's Regulatory Impact Analysis ("RIA") for the final Rule.

3. The data regarding costs reflect the final data regarding actual compliance costs through June 30, 2015 and projections of additional measures that might be implemented by the extended deadline of April 2016 for complying with the Rule. The data reflect all existing contracts for the installation of any air pollution control systems that represented any material aspect of EPA's cost estimate in the RIA. Further, all contracts that would be required to install equipment to meet the requirements of the Rule by even the extended deadlines will have been executed and will be reflected in the publicly available data.

4. To the extent that a contract has not been executed for a generating unit operating under a compliance extension, the owner of the generating unit will plan to retire that unit or to use natural gas in lieu of coal or oil to fuel the unit.

5. Experience with technologies deployed for compliance with the Rule has shown them to be less expensive and more effective than originally assumed in EPA's analysis. Technological improvements and a lower price of natural gas than originally projected have further reduced costs. As a result, the true cost of complying with the Rule is approximately $7 billion per year less than estimated by EPA, making the true cost of the Rule approximately $2 billion or less than one-quarter of what EPA originally estimated the Rule to cost.

6. The reduced actual cost of meeting the Rule's emissions limits are due to the facts that: (1) improvements in dry sorbent injection ("DSI") and activated carbon injection ("ACI") technologies have significantly lowered the costs of those pollution control systems; (2) natural gas prices have been significantly lower than those upon which EPA's estimates were premised; and (3) EPA overestimated the generation capacity that would require installation of fabric filters (also known as baghouses), dry flue gas desulfurization ("FGD") systems and wet FGD upgrades. As a result of EPA's overestimate of the generation capacity requiring those systems, the amortized capital costs, costs associated with fuel changes, variable operating and maintenance costs, and fixed operating and maintenance costs associated with each of these systems were also overestimated. The effect has been that the actual costs have been significantly lower than EPA's *ex ante* estimates.

7. With respect to fabric filter installations, EPA's Air Markets Program Data show only about 82 GW of Electric Utility or Small Power Producer Generation equipped with baghouses for particulate matter control at the end of second quarter 2015. My firm and its clients, who include manufacturers of pollution control equipment, are aware of about 8.7 GW in capacity of additional fabric filter projects currently underway at power plants that received compliance extensions and are not associated with new FGD systems. In other words, the RIA overestimated the fabric filter installations by about 100 GW (191 GW of total fabric filter projected to be installed versus about 91 GW).

8. With respect to dry FGD, EPA's RIA forecast 51 GW of dry FGD to be installed in the Policy Case versus 29 GW in the Base Case, when, in fact, Air Markets Program Data show that at the end of second quarter 2015 there were only about 33 GW of dry FGD installed, so that the RIA overestimated the required installations by 18 GW. Although additional dry FGD installations are planned in the coming years, these are primarily being installed for Regional Haze Rules or for other SO_2 reduction needs.

9. With respect to wet FGD upgrades, EPA's forecast of 63 GW in wet FGD upgrades is also higher than the actual capacity that has been installed. In 2015 there was about 170 GW of wet FGD installed on coal-fired electric utility units or small power plants and just over 2 GW of additional wet scrubber capacity in

requested compliance extensions. On the other hand, a review of EPA's 2009 Information Collection Request data shows only about 7,600 MW of the roughly 52,000 MW of capacity with wet FGD installed that reported hydrochloric acid emissions to the Information Collection Request, or about 15%, had hydrochloric acid emissions in excess of the Rule's emissions limit. This would suggest only about 30 GW of wet FGD upgrades to be expected. About 16 GW of wet FGD upgrades have been identified in applications for compliance extensions. While there is no official data showing the level of wet FGD upgrades, it is reasonable to assume that at least 16 GW and no more than 30 GW of wet FGD upgrades will be performed for compliance with the Rule. To that point, most of the wet FGD upgrades were justified on the basis of improved SO_2 control for other regulatory programs such as the Cross-State Air Pollution Rule.

10. EPA's estimates for the operating costs associated with DSI and for ACI did not account for the improved performance of these reagents or sorbents in reducing the demand for reagent/sorbent or the cost of waste disposal. EPA also forecast an increase in fuel cost as natural gas replaced coal as utility fuels.

11. EPA's forecast Policy Case projected a cost of natural gas in 2015 of $5.66/MMBtu versus $5.40/MMBtu in its Base Case. Data from the Energy Information Administration indicates that in 2015 natural gas to utility customers has ranged from a high of $4.99/thousand cubic feet down to $3.24/thousand cubic

feet, or about $4.99/MMBtu to about $3.24/MMBtu because a cubic foot of gas has very close to 1,000 Btu's of energy. Therefore, much lower natural gas prices than forecast by EPA have made gas a much more attractive fuel and has resulted in the cost of compliance with the Rule to be much lower than anticipated.

12. Table 1 summarizes the overestimate in costs resulting from EPA's overestimate of the new air pollution control equipment that would be required to comply with the Rule:

Table 1. Approximate overestimate of costs

	FF [1]	dry FGD [2]	DSI [3]	wet FGD [4]	ACI [5]	Total
Capital, million $	$16,072	$8,838	$0	$5,692	$414	$31,016
Annualized, capital, million $	$1,816	$999	$0	$643	$47	$3,505
Operating costs, million $	$102	$391	$1,400	$37	$1,787	$3,718
Total Annual Million $	$1,918	$1,390	$1,400	$680	$1,834	$7,223

Notes:

1. *The overestimate of FF is the amount over actual installations that is not explained by dry FGD*
2. *Dry FGD estimate for excess dry FGD over actual installed*
3. *DSI estimate assumes that actual reagent is roughly one third of EPA assumption.*
4. *Wet FGD upgrade assumes 30 GW of actual upgrade versus 63 GW predicted. No formal data is available. Also factors in the fact that the actual reduction in wet FGD versus the Base Case was greater than forecast by EPA*
5. *Accounts for: EPA assumption about fly ash waste for facilities where fly ash is collected with carbon; higher carbon demand from units with ESP versus TOXECON because EPA assumed more TOXECON installations, which include new baghouses; overestimate of ACI installations after rule is fully implemented*

13. My analysis of the dramatic reductions in cost is also reflected in the securities filings of electricity generating companies, which show a consistent pattern of actual costs falling significantly below those that were originally projected, as reflected in Exhibit 3.

14. EPA's original estimate of cost of $9.6 billion per year in 2015 exceeds the actual cost to utilities by over $7 billion. These results are neither unusual nor are they surprising. In virtually all cases where *ex ante* estimates of the costs of complying with pollution control requirements are compared with actual pollution control costs, the actual costs are significantly lower than the costs originally estimated both by EPA and by industry, sometimes by an order of magnitude.

15. Moreover, at this point all fixed capital expenses have already been incurred or must be paid pursuant to existing contracts. Therefore, a large portion of the expense of the Rule is already committed. I have also conducted a rough bottom up estimate of the costs of the Rule, in which I have used conservative estimates. This estimate is that the total cost of the Rule is now slightly less than $2 billion per year, with almost half of that cost amortized capital that has already been committed. Thus, the remaining costs will likely be less than $1 billion.

16. Finally, the companies that supply activated carbon and DSI reagents have invested at least several hundred million dollars and perhaps close to one billion dollars in the United States into new manufacturing plants, plant expansions, additional personnel, and supply chain infrastructure in order to produce the materials necessary to meet the anticipated ongoing and future demand of the utility industry for these materials in complying with the Rule. These investments were necessary for the development and production of the improved reagents that

have enabled the utility industry to avoid many of the capital costs identified in paragraphs 7 through 9 and are also responsible for the reduction in operating costs associated with DSI and ACI as discussed in paragraph 10. In the event the Rule is vacated, this will dramatically reduce the demand for these products, have a severe negative impact on these companies and their employees, and will disrupt the ability of these companies to serve the electric utility and other markets in the future.

Dated: September 24, 2015

James E. Staudt

Exhibit 1

James E. Staudt, Ph.D., CFA

Dr. Staudt has been involved in the energy sector for several decades, and is a nationally-recognized expert in the energy and air pollution control and monitoring industries. He has experience that spans many aspects of power generation to include use of fossil energy, turbomachinery, nuclear energy, energy storage and process sensor development. His experience also spans other energy-intensive industries, such as Portland Cement, Refining, Iron & Steel, Pulp & Paper and others. Dr. Staudt has a deep knowledge of both the technical issues of the energy industry as well as economics and finance as they relate to this industry.

- Dr. Staudt has authored emissions control technology documents and software that are licensed by professionals in the United States, Europe, and Asia.
- He has worked with state and federal agencies on regulation of emissions from fossil fueled power plants and major industrial facilities.
- He has advised owners of energy and manufacturing facilities on how to most cost-effectively meet their environmental obligations.
- He has advised technology suppliers on business strategy, to include market analysis, mergers and acquisitions, and valuation of businesses.
- He has advised investors in energy and environmental sector companies.to include valuations
- Dr. Staudt is a reviewer for the Mass Ventures START program for the Commonwealth of Massachusetts. START is a program funded by the Commonwealth of Massachusetts to assist Massachusetts-based companies that have been successful in the Federal Small Business Innovation Research (SBIR) program.

Dr. Staudt's experience in the energy and air pollution sectors spans over three decades. Prior to starting his consulting practice, Andover Technology Partners (ATP), in 1997, Dr. Staudt was employed by suppliers of air pollution control or monitoring technology and energy industry equipment. At these employers he was in senior management roles and developed technologies that are widely used at industrial facilities. He was a founder of a process sensor and analyzer company. Previous employment also includes serving as a commissioned officer in the US Navy nuclear power program.

Dr. Staudt has published over 60 technical papers, articles or reports and has also authored numerous reports for clients as part of his consulting practice.

Education and Professional Credentials

- B.S. in Mechanical Engineering from the U.S. Naval Academy (1979)
- M.S. (1986) in Engineering from the Massachusetts Institute of Technology (M.I.T.)
- Ph.D (1987) in Engineering from the Massachusetts Institute of Technology (M.I.T.) with a minor in Business Management
- Chartered Financial Analyst (CFA) designation (2001)

Awards

2007 US Environmental Protection Agency Science and Technology Achievement Award

- *Providing the Public with a Comprehensive Summary of Technologies for Control of Mercury Emissions from Electric Utility Boilers*

Business and Professional Associations

- Member, CFA Institute
- Associate Member, Institute of Clean Air Companies

Military Service

From 1979 to 1984 Dr. Staudt served as a commissioned officer in the U.S. Navy in the Engineering Department of the nuclear-powered aircraft carrier USS ENTERPRISE (CVN-65), attaining the rank of Lieutenant (O-3) prior to leaving the service.

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James E. Staudt, Ph.D.

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Exhibit 2

Andover Technology Partners 978-683-9599
Consulting to the Air Pollution Control Industry

REVIEW AND ANALYSIS OF THE ACTUAL COSTS OF COMPLYING WITH MATS IN COMPARISON TO PREDICTED IN EPA'S REGULATORY IMPACT ANALYSIS

At this point we are in a position to make a post-hoc assessment of what the cost has been to comply with US EPA's Mercury and Air Toxics Standards (MATS) for power plants. In its Regulatory Impact Analysis (RIA) for the final rule.[1] EPA estimated a cost for the rule of $9.6 billion (2007 dollars) versus quantified benefits of between $33 billion to $81 billion, depending upon discount rate (plus other unquantified benefits). The $9.6 billion annual cost is primarily the cost to control coal-fired units, at an estimated $9.4 billion. This $9.4 billion includes the following components:

- Amortized capital
- Costs associated with change in fuel
- Variable operating and maintenance (VOM)
- Fixed operating and maintenance (FOM)

These costs are estimated using the Integrated Planning Model (IPM), which is described later. The fuel costs are associated with the costs of switching to natural gas or to lower chlorine coal.

Experience with technologies deployed for MATS compliance has shown them to be less expensive and more effective than originally assumed in EPA's analysis. Technological improvements and a lower price of natural gas than originally projected have further reduced costs. As a result, the true cost of complying with the MATS rule is approximately $7 billion per year per year less than estimated by EPA, making the true cost of the rule approximately $2 billion, or less than one-quarter of what EPA originally estimated the Rule to cost.

Except for the fuel charge, EPA's forecast of the cost impact of the MATS rule is determined in large part by the forecast of installed air pollution control equipment, which is shown in Figure 1. This figure shows the forecast installations (expressed as GW of installed capacity) in the Base Case and forecast installations in the case of the MATS rule. As shown, EPA forecast a reduction in wet FGD systems (fewer FGD retrofits in the policy case than in the Base Case) and increases in dry FGD systems, FGD upgrades, increase in Dry Sorbent Injection (DSI), an increase in Activated Carbon Injection (ACI), and increases in Fabric Filters (FF) and ESP upgrades. These forecasts are determined using ICF International's Integrated Planning Model (IPM), which is described briefly in the insert on the following

[1] Regulatory Impact Analysis for the Final Mercury and Air Toxics Standards, EPA-452/R-11-011, December 2011

page, and the methodology and assumptions for IPM are described in detail in the documentation found on EPA's web site.

Methods to comply with the regulation may include addition of control technology, changing fuels, or even retirement. For every technology considered EPA makes assumptions about the capital and operating cost of the technology and the performance of the technology with regard to emissions control performance. Costs for fuels are considered as well, and this is particularly important when an option is to change to different fuels. IPM selects the approach that provides the lowest cost to comply, or, alternatively, the highest future value for operation of the facility. IPM estimates the future dispatch of the facility based upon the economics of that facility relative to other facilities in the region. In cases where the facility is determined to be uneconomical to operate in the future, IPM will determine that the facility will be retired and electricity supplied from other sources.

EPA uses the Integrated Planning Model (IPM) to analyze the projected impact of environmental policies on the electric power sector in the 48 contiguous states and the District of Columbia. Developed by ICF Consulting, Inc. and used to support public and private sector clients, IPM is a multi-regional, dynamic, deterministic linear programming model of the U.S. electric power sector. It provides forecasts of least-cost capacity expansion, electricity dispatch, and emission control strategies for meeting energy demand and environmental, transmission, dispatch, and reliability constraints. IPM can be used to evaluate the cost and emissions impacts of proposed policies to limit emissions of sulfur dioxide (SO_2), nitrogen oxides (NO_x), carbon dioxide (CO_2), and mercury (Hg) from the electric power sector. The IPM was a key analytical tool in developing the Clean Air Interstate Rule (CAIR).

Among the factors that make IPM particularly well suited to model multi-emissions control programs are (1) its ability to capture complex interactions among the electric power, fuel, and environmental markets; (2) its detail-rich representation of emission control options encompassing a broad array of retrofit technologies along with emission reductions through fuel switching, changes in capacity mix and electricity dispatch strategies; and (3) its capability to model a variety of environmental market mechanisms, such as emissions caps, allowances, trading, and banking. IPM's ability to capture the dynamics of the allowance market and its provision of a wide range of emissions reduction options are particularly important for assessing the impact of multi-emissions environmental policies like CAIR.

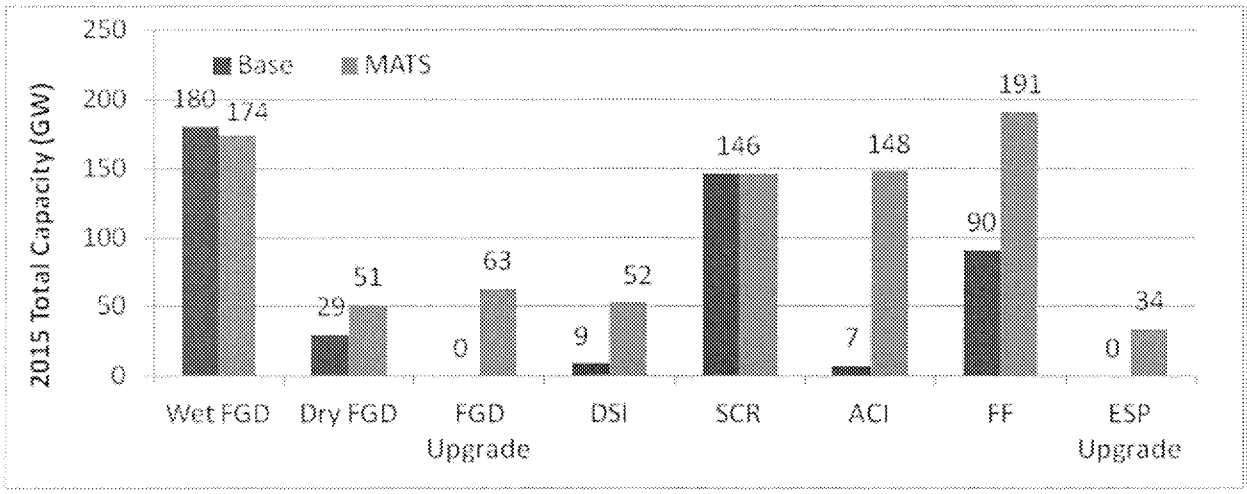
http://www.epa.gov/airmarkets/progsregs/epa-ipm/

According to the RIA issued with the final rule: *"This analysis projects that by 2015, the final rule will drive the installation of an additional 20 GW of dry FGD (dry scrubbers), 44 GW of DSI, 99 GW of additional ACI, 102 GW of additional fabric filters, 63 GW of scrubber upgrades, and 34 GW of ESP upgrades. . . .With respect to the increase in operating ACI, some of this increase represents existing ACI capacity on units built before 2008. EPA's modeling does not reflect the presence of state mercury rules, and EPA assumes that ACI controls on units built before 2008 do not operate in the absence of these rules. In the policy case, these controls are projected to operate and the projected compliance cost thus reflects the operating cost of these controls. Since these controls are in existence, EPA does not count their capacity toward new retrofit construction, nor does EPA's compliance costs projection reflect the capital cost of these controls (new retrofit capacity is reported in the previous paragraph)."*

Now that we know what companies have done to comply with the MATS rule, we are in a position to determine how accurate this forecast was. There are a few things that stand out about the methods that were projected by EPA for industry to comply with the rule:

- The very high level of projected fabric filter systems
- The level of projected dry FGD systems
- The level of scrubber upgrades
- The high cost of dry sorbent injection ("DSI") and activated carbon injection ("ACI") systems that did not take account of technological advances reducing those costs
- The limited amount of fuel switching compared to actual levels driven by low shale gas prices

Figure 1. Operating Pollution Control Capacity on Coal-fired Capacity (by Technology) under the Base Case and with MATS, 2015 (GW)[2]



Fabric Filter - EPA's Air Markets Program Data shows only about 82 GW of Electric Utility or Small Power Producer Generation equipped with baghouses for particulate matter control at the end of second quarter 2015. Another 8.7 GW of fabric filter projects – not part of dry FGD projects - are underway with extensions for a total of perhaps 91 GW.[3] In other words, IPM overestimated the baghouse installations by about 100 GW (191 GW of total FF projected to be installed versus 91 GW) as shown in Figure 2. This is related to assumptions about DSI, dry FGD and the need for PM upgrades.

Dry FGD - IPM forecast 51 GW of dry FGD to be installed in the MATS policy case versus 29 GW in the Base Case when, in fact, AMPD data shows that at the end of second quarter 2015 there were only about 33 GW of dry FGD installed – or an overestimate of 18 GW as shown in Figure 2. Although there are an estimated 22 GW of dry FGD projects underway to be completed in the coming years and MATS extensions have been permitted associated with these projects,[3] these

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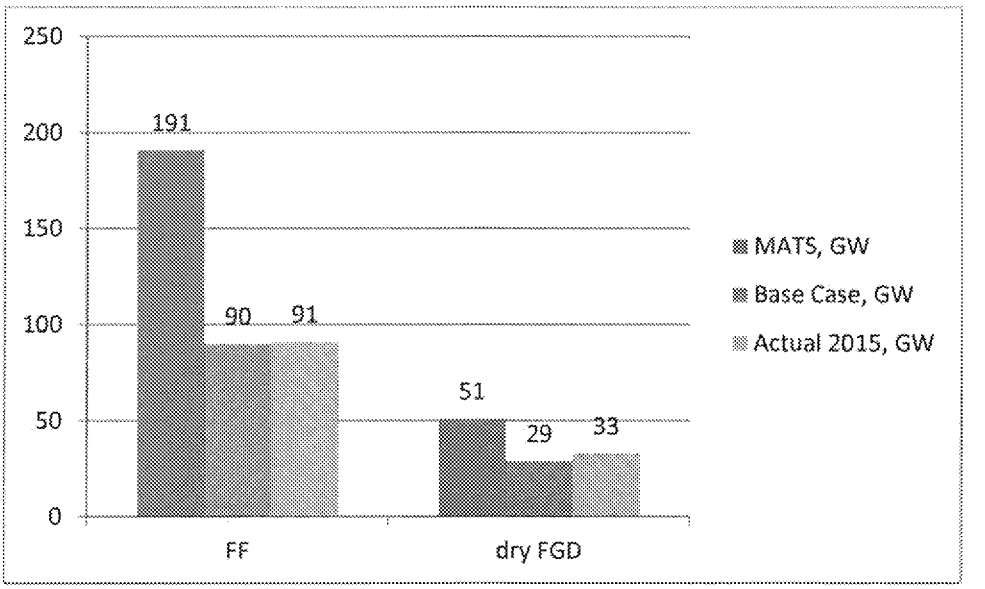
2 Note: The difference between controlled capacity in the base case and under the MATS may not necessarily equal new retrofit construction, since controlled capacity above reflects incremental operation of dispatchable controls in 2015. Additionally, existing ACI installed on those units online before 2008 are not included in the base case to reflect removal of state mercury rules from IPM modeling. For these reasons, and due to rounding, numbers in the text below may not reflect the increments displayed in this figure. See IPM Documentation for more information on dispatchable controls.

3 Michael J. Bradley and Associates, "MATS Compliance Extension Status Update", MJB&A Issue Brief, June 24, 2015. Examination of the underlying data showed that of the 17 GW of FF with extensions, 8.3 GW were associated with FGD systems, leaving 8.7 GW of FF not associated with FGD.

dry FGD systems are primarily part of plans for compliance with the Regional Haze Rule or other SO_2 control requirements.

Scrubber upgrades – EPA's forecast of 63 GW in wet FGD upgrades is higher than actual. In 2015 there was about 170 GW of wet FGD installed on coal fired electric utility units or small power plants. On the other hand, a review of the Information Collection Request (ICR) data shows only about 7,600 MW of the roughly 52,000 MW of capacity with wet FGD installed that reported HCl emissions to the ICR, or about 15%, had HCl emissions in excess of the MATS limit. This would suggest only about 30 GW of FGD upgrades to be expected. About 16 GW of scrubber upgrades have been identified in applications for MATS extensions.[3] While there is no official data showing the level of wet FGD upgrades, it is reasonable to assume that at least 16 GW and no more than 30 GW of scrubber upgrades were performed. To that point, most of the FGD system upgrades were justified on the basis of improved SO_2 control for CAIR or CSAPR rather than MATS.

Figure 2. MATS and Base Case projections, and 2015 actual or planned installations of FF and dry FGD, expected to be directly a result of MATS, GW



The projected fixed and variable operating costs are also impacted by the type of equipment projected to be used and the assumed reagent usage rates for this equipment. Of particular concern with regard to variable operating cost are reagent usage assumptions relating to dry sorbent injection (DSI).
This Report will review each of the following as they relate to EPA's projection of cost to the MATS rule.

- Capital and operating cost projections relating to EPA forecasts for DSI
- Capital and operating cost projections relating to EPA forecasts for dry FGD
- Forecasts for PM control retrofits to fabric filters
- Forecasts for ACI variable operating and maintenance costs

- Fuel cost projections

Projections for the capital and operating costs for Dry Sorbent Injection (DSI)

In practice, DSI may be deployed for control of SO_3, HCl or SO_2. For SO_3 control the DSI system may be deployed in combination with an ACI system to enhance the Hg capture of the ACI system. On the other hand, IPM only forecasts DSI systems for MATS compliance as a means for controlling HCl. Therefore, many of the DSI systems installed to enhance Hg control in response to the MATS rule were not installed to control the pollutant EPA targeted DSI for. By and large, DSI systems for SO_3 control, however, are quite inexpensive to own and operate compared to those used for SO_2 or HCl control as a result of the comparatively very low reagent demand necessary to control SO_3. Therefore, the costs of the DSI systems associated with SO_3 capture can be ignored when compared against these other costs.

DSI capital cost

EPA's assumptions regarding use of a fabric filter in combination with DSI and EPA's assumptions about DSI treatment rates for controlling HCl introduce a number of issues. As described in Section 5.5.3 of the IPM documentation, EPA assumes that facilities that select DSI for reduction of HCl emissions always install a fabric filter. Treatment rate is assumed by EPA to be at a Normalized Stoichiometric Ratio of 1.55 using milled Trona per Appendix 5-4 of the IPM v4.10 documentation.[4] Experience has shown that lower treatment rates are possible without the need to retrofit a fabric filter.

Sodium based sorbents, such as Trona actually improve ESP capture efficiency due to the beneficial impact on fly ash resistivity making a fabric filter retrofit unnecessary. In fact, very few DSI systems that have been installed in response to the MATS rule entailed installation of a fabric filter. EPA's overestimation of fabric filters is due in part to the assumption that use of DSI for HCl control requires a baghouse. Assuming that the 9 GW of DSI forecast in the Base Case does not have FF, this means that IPM forecast at least an additional 43 GW of DSI that was equipped with FF (52 GW projected in the policy case versus 9 GW in the Base Case). Fabric filters increase the installed cost of a DSI system by a substantial amount – costing on the order of $150-$250/kW, depending upon the size of the facility and other factors.

Although EPA assumed that a fabric filter would be necessary for control of HCl, it is also worth examining the capital costs EPA uses for use of DSI upstream of an ESP, because this is by far the most common application of DSI. Appendix 5-4 of the IPM documentation describes the cost estimating approach developed by Sargent & Lundy for use in the IPM.[4] This methodology predicts capital costs of $40/kW for a 500 MW plant and costs well in excess of $100/kW for plants of about 100 MW in size. Discussions of these costs with both utilities and technology providers indicates pretty clearly that these capital cost estimates are well above what has been experienced in practice. This may be the result of the overestimation of Trona demand – that would necessitate more equipment than in fact is necessary.

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[4] Sargent & Lundy, "IPM Model – Updates to Cost and Performance for APC Technologies Dry Sorbent Injection for SO2 Control Cost Development Methodology Final", August 2010 Project 12301-007

DSI operating costs

DSI operating costs are also lower than estimated. EPA assumed that DSI would provide 90% HCl removal and would require a normalized stoichiometric ratio (NSR) of 1.55 when using DSI in combination with a baghouse for capturing HCl. Studies by Solvay[5] showed DSI achieving over 98% HCl removal at much lower treatment rates. They examined several sorbents at different milling levels.

- Trona (S200) - d50 : 30 µm
- Milled Trona (S250) - d50 : 15 µm, d90 : 60 µm
- Milled Sodium Bicarbonate (S350) - d50 : 12 µm, d90 : 40 µm
- Finely Milled Sodium Bicarbonate (S450) - d50 : 7 µm ,d90 : 17 µm
- Hydrated Lime - d90 : 45 µm, purity: 96.8%

Figures 3a and 3b show the results of pilot tests performed with injection upstream of an ESP and Figures 4a and 4b show the results of pilot tests performed with injection upstream of a baghouse. As demonstrated by Figure 3a, 90% HCl capture was achieved with milled Trona (D250) with an NSR or roughly 0.3 and 99% capture was achieved with an NSR of roughly 0.6. This compares to an assumed forecast of 1.55 for 90% capture. EPA's assumed treatment rate at 90% removal was therefore almost five times what is shown in this data. As demonstrated in Figure 3a, with an ESP milled trona produced 90% capture at an NSR of about 0.35 and 99% capture with an NSR of about 0.70. However, in this case much better performance was provided by the more reactive sodium bicarbonate (S350 and S450). While any given facility may experience slightly different results than shown in these pilot tests, it is clear that whether using trona or sodium bicarbonate it is possible to achieve well in excess of 90% without a fabric filter at treatment rates well below those assumed by EPA.

SO_2 capture is normally well below that of HCl because SO_2 is slower to react, and Figures 3b and 4b confirm that. At treatment rates where milled trona is expected to achieve 90% HCl capture, roughly 20% SO_2 capture is expected, and at treatment rates where 99% HCl capture is achieved, roughly 40% SO_2 capture is expected. These significant levels of SO_2 capture are nonetheless lower than the 70% assumed by EPA.

Another aspect of operating costs is waste disposal. EPA assumes that the by-product must be disposed of at a much higher cost than normally used for landfill of coal combustion products. This is an unnecessary cost because sodium by product can be blended or neutralized and disposed of as a non-hazardous waste at a much lower cost. Moreover, if this were a sufficiently large concern, the facility owner could use calcium-based reagent, such as hydrated lime, which produces a highly stable product.

Other factors that caused the IPM forecast of fabric filters to be too high was the result of overestimation of dry FGD, overestimation of waste disposal costs associated with ACI, and underestimation of the ability of existing ESPs to achieve the MATS PM emission standard with simple upgrades.

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[5]. Yougen Kong, Mike Wood, Solvay Chemicals Inc.," HCl Removal in the Presence of SO2 Using Dry Sodium Sorbent Injection", Houston, Texas, available at www.solvay.com

Figure 3a. HCl removal with injection upstream of an ESP

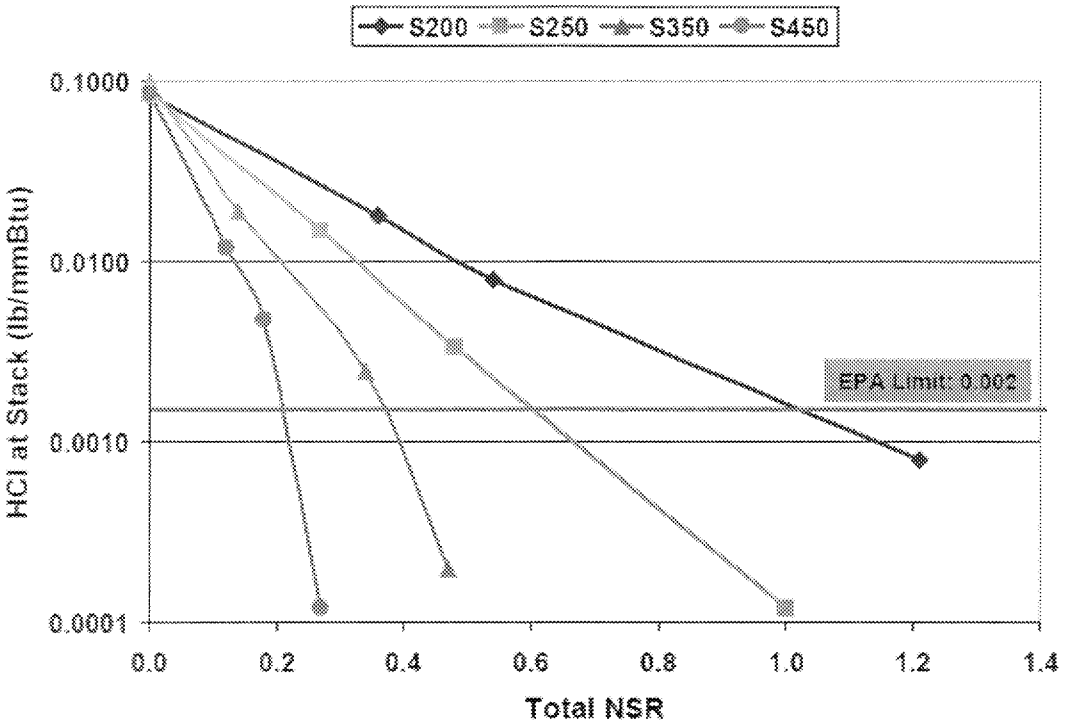


Figure 3b. SO_2 reduction with injection upstream of an ESP

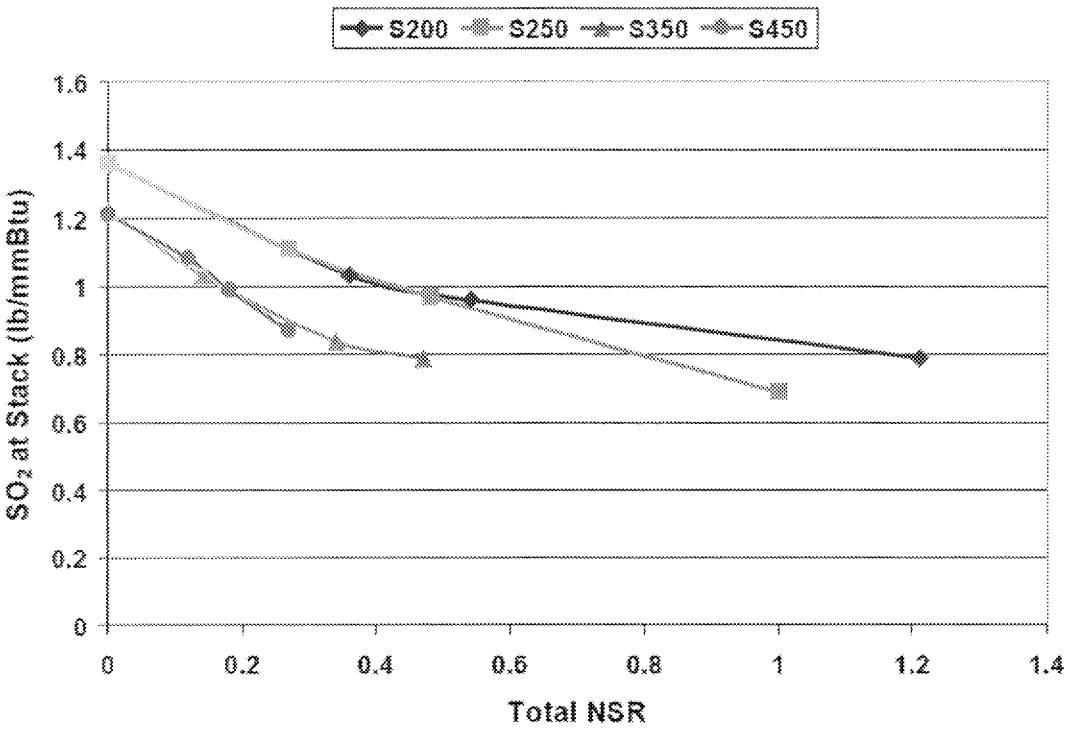


Figure 4a. HCl removal with injection upstream of baghouse

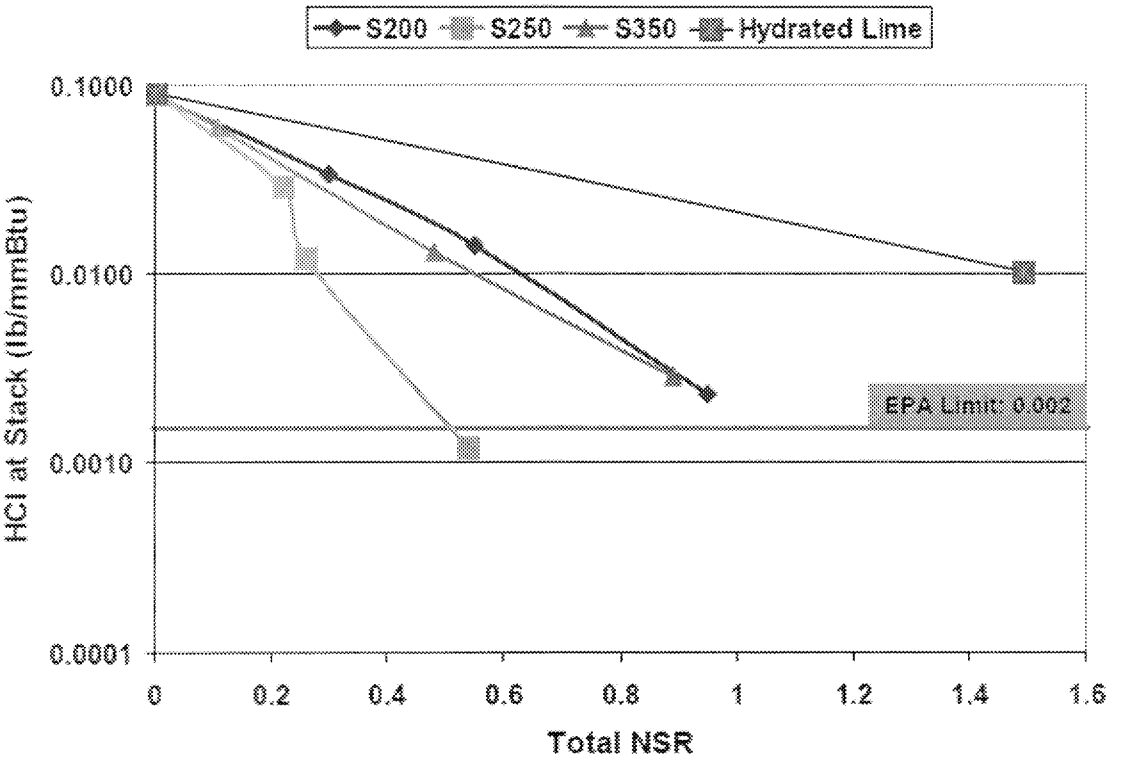
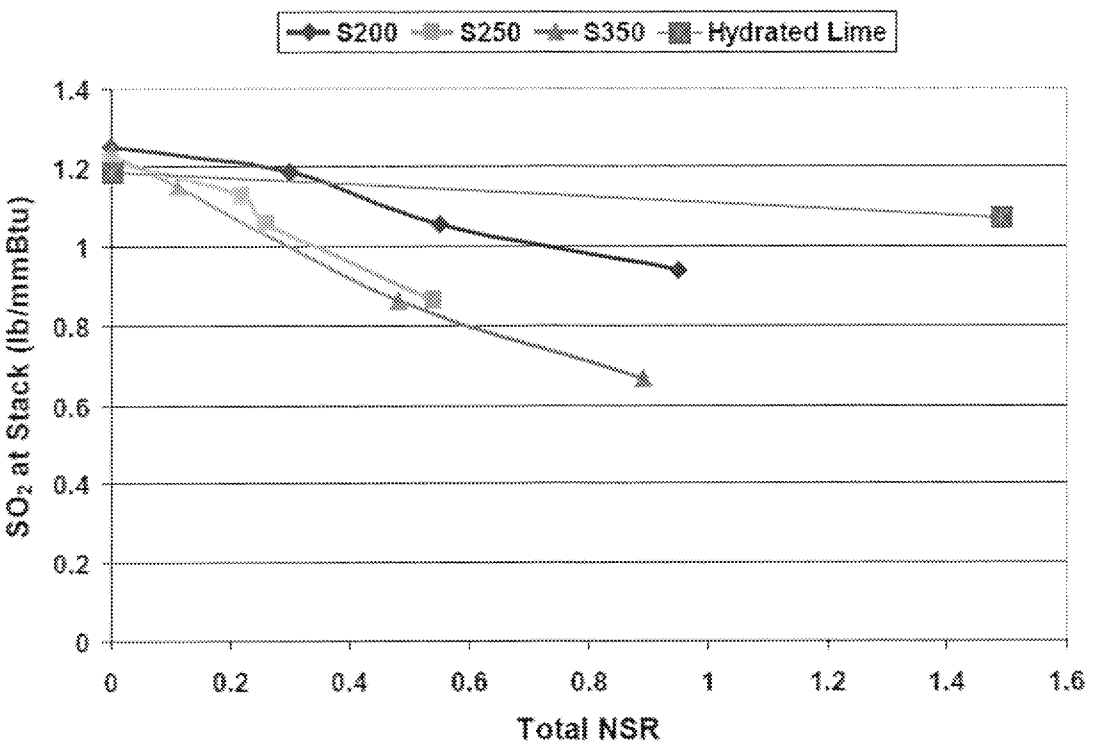


Figure 4b. SO_2 reduction with injection upstream of a baghouse



Projections for dry FGD

Dry FGD systems are commonly installed with fabric filters. As a result, an overestimation of dry FGD installations will result in an overestimation of fabric filter installations. The reason for the high forecast for dry FGD is likely the result of forecasts for DSI costs with a fabric filter (that may have made the incremental cost for dry FGD more acceptable) or the assumption by EPA that DSI is limited to only 90% HCl capture (that would force dry FGD to be selected by the IPM if greater than 90% HCl reduction was necessary). These assumptions would cause IPM to project that companies would select dry FGD for acid gas control rather than DSI in situations where DSI is, in fact, capable of providing adequate acid gas control. But, the effects of DSI and dry FGD can explain about 65 GW[6] of the roughly 100 GW of FF that were forecast but are not actually installed.

Projections for PM control

EPA's assumptions regarding DSI and dry FGD do not adequately explain the overestimation of fabric filters in their MATS cost estimate. EPA also made assumptions about the need to retrofit fabric filters for PM control to meet the MATS PM standard or for use in ACI systems. The assumptions for PM were used in a spreadsheet to identify facilities projected to need upgrade of their ESP or retrofit of a fabric filter. The projection developed with the spreadsheet was exogenously input to the IPM model to determine if improvement in PM collection efficiency was needed and, if so, what kind of improvement would be performed and what it would cost. In this manner that spreadsheet determined if a PM retrofit with a baghouse was necessary or if ESP upgrade was adequate. The approach used apparently underestimated the ability of the existing ESP to achieve the MATS PM emission standard. In fact, most ESPs were capable of achieving the emission standard without any modifications or with relatively modest changes – at most changes to the transformer rectifier sets and perhaps electrodes. In many cases rebalancing of flows was adequate at minimal cost.

The result is that EPA projected more fabric filter retrofits than were, in fact, built. EPA's modeling attributes 101 GW of FF to MATS versus the Base Case, some of which are attributed to dry scrubbers. Moreover, EPA also likely overestimated the cost of modifying existing ESPs to comply with the regulation. ATP's estimate of the market size for ESP upgrades in 2014 was only in the range of about $50 million based upon interviews with discussions with suppliers of these services and equipment.

ACI variable operating and maintenance costs

According to Appendix 5-3 to Chapter 5 of the IPM documentation,[7] EPA assumes that when activated carbon and fly ash are collected in the same PM control device that the cost of disposal for all solids – fly ash and activated carbon – are increased. The effect is that the projected cost of waste disposal exceeds that of the carbon sorbent – more than doubling the VOM. This is based upon the presumption that addition of activated carbon renders beneficial reuse of fly ash impossible. In practice, this does not

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6 22 GW of additional dry FGD for MATS versus the Base Case plus 43 GW of additional FF on DSI for MATS versus the Base Case

7 Sargent & Lundy, "IPM Model – Revisions to Cost and Performance for APC Technologies Mercury Control Cost Development Methodology, Final", March 2011, Project 12301-009

happen. First, despite the desirability of beneficially reusing fly ash as a concrete additive, in practice most fly ash is not used for this purpose because of local market conditions or other reasons. Furthermore, activated carbon suppliers have developed "cement friendly" carbons that do not have the adverse impact of conventional carbons. The assumption that waste disposal costs increase so much may also partially account for the overestimate of fabric filters, as installation of an additional fabric filter would facilitate segregation of fly ash from activated carbon.

EPA also overestimated the ACI that is attributable to MATS – 148 GW of ACI forecast for MATS versus 7 GW in the Base Case. According to ATP's estimates, *at least* 20 GW of ACI was in operation in 2014, clearly well over the 7 GW attributed by EPA to the Base Case. Furthermore, EPA's estimate of 148 GW of ACI exceeds somewhat ATP's estimates of total ACI systems, which is about 120 GW once MATS is fully implemented. ATP estimates that with the rule fully implemented, about 100 GW of ACI is attributable to MATS.

Fuel Costs

Facility owners will convert to natural gas or switch to higher cost coal if in their estimation this is a less costly approach to complying with the MATS rule. EPA's forecast Policy Case projected a cost of natural gas in 2015 of $5.66/MMBtu versus $5.40/MMBtu in its Base Case. Data from the Energy Information Administration indicates that in 2015 natural gas to utility customers has ranged from a high of $4.99/thousand cubic feet down to $3.24/thousand cubic feet, or about $4.99/MMBtu to about $3.24/MMBtu because a cubic foot of gas has very close to 1,000 Btu's of energy. Therefore, much lower natural gas prices than forecast by EPA have made gas a much more attractive fuel and has resulted in the cost of compliance with the rule to be much lower.

Impact on cost

A rough estimate of the impact on cost of the various assumptions addressed in this memo is shown in Table 1. This shows the estimated excess costs associated with:

- the fabric filter overestimate that is not associated with dry FGD,
- the overestimate of dry FGD
- the overestimate of reagent consumption associated with DSI
- the overestimate of capital cost associated with wet FGD upgrades,
- the overestimate associated with waste disposal assumptions for ACI,
- an adjustment to account for the underestimate of carbon use if the facilities that are assumed to install TOXECON systems do not,
- the overestimate of the ACI systems attributable to the MATS rule

Section 8 of the IPM documentation states that a capital charge rate of 11.3% is used for environmental retrofits, which is what is used to determine amortized capital charges. the assumed capacity factor is 65%. Cost estimates are developed using capital costs ($/kW), VOM ($/MWh) and FOM ($/kW-yr) rates taken from the IPM v4.10 documentation used to develop the MATS rule. The fabric filter overestimate

is clearly the most significant, followed by the overestimate of dry FGD and the overestimate associated with DSI.

The overestimate of FF that is not explained by dry FGD is 82 GW. 43 GW of this is explained by DSI attributed to MATS, leaving 40 GW unexplained by DSI or dry FGD. This results in an additional 40 GW that can be ACI systems in TOXECON arrangements. As a result, there are roughly 101 GW (141 GW – 40 GW) that are ACI systems without TOXECON that where waste-disposal costs are overestimated. This is offset in part by the underestimate of sorbent costs if the 40 GW of forecast TOXECON systems are made to be conventional ACI systems upstream of an ESP.

Table 1. Approximate overestimate of costs

	FF [1]	dry FGD [2]	DSI [3]	wet FGD upgrade [4]	Wet FGD [5]	ACI Waste [6]	ACI carbon [7]	ACI excess [8]	Total
million $	$16,072	$8,838	$0	$4,700	$992	$0	$0	$414	$31,016
Annualized, capital, million $	$1,816	$999	$0	$531	$112	$0	$0	$47	$3,505
Operating costs, million $	$102	$391	$1,400	$0	$37	$1,196	-$207	$798	$3,718
Million $	$1,918	$1,390	$1,400	$531	$149	$1,196	-$207	$845	$7,223

Notes:

1. *The overestimate of FF is the amount over actual installations that is not explained by dry FGD*
2. *Dry FGD estimate for excess dry FGD over actual installed*
3. *DSI estimate assumes that actual reagent is roughly one third of EPA assumption.*
4. *Wet FGD upgrade assumes 30 GW of actual upgrade versus 63 GW predicted. No formal data is available.*
5. *The actual reduction in wet FGD versus the Base Case was greater than forecast by EPA*
6. *Accounts for EPA assumption about fly ash waste for facilities where fly ash is collected with carbon*
7. *Accounts for higher carbon demand from units with ESP versus TOXECON. EPA assumed more TOXECON installations, which include new baghouses.*
8. *Accounts for overestimate of ACI installations after rule is fully implemented. Only includes carbon for VOM as waste already addressed.*

Conclusion

Experience with technologies deployed for MATS compliance has shown them to be less expensive and more effective than originally assumed in EPA's analysis. As a result, the true cost of complying with the MATS rule is more than $7 billion per year less than estimated by EPA, making the true cost of the rule about one quarter of what EPA originally estimated the rule to cost.

Exhibit 3

Company	Original Compliance Cost Estimates	Actual Cost of Compliance
FirstEnergy	Respecting the pending maximum achievable control of technology rules for mercury and hazardous air pollutants, *we still expect investments of about $2 billion to $3 billion in our generation fleet to comply*. Our investments are expected to primarily focus on reducing mercury, and particulate emissions at our supercritical units. -- 2011 Q3 Earnings Call, Anthony Alexander CEO Now last year, I told you that our spend -- *our capital spend was $2 billion to $3 billion to comply with this rule when it was MACT. Now that we understand the rule and we've dug into it and analyzed the situation more deeply, we are right now looking at a $1.3 billion to $1.7 billion spend to comply*. And we continue to work further to reduce that cost. And we will be in compliance by the spring of 2015. – 2011 Q4 Earnings Call, James H. Lash The new MATS were finalized at the end of 2011, ... *Our current estimate is that it may cost approximately $1.3 - $1.7 billion to bring our remaining units into compliance*.-- 2012 10-K As a result of this analysis, we have significantly reduced our projected capital investment related to MATS compliance. *We now estimate investment of about $975 million across our Fossil Fleet. This is down from the $1.3 billion to $1.7 billion estimate we provided in February and well below our initial projections of $2 billion to $3 billion*. While we still have work to do to confirm and refine our current estimate, we're clearly moving in the right direction. -- 2012 Q2 Earnings Call, Anthony Alexander, CEO "As a result of this analysis, we have significantly reduced our projected capital investment related to MATS compliance. *We now estimate investment of about $975 million across our Fossil Fleet. This is down from the $1.3 billion to $1.7 billion estimate we provided in February and well below our initial projections of $2 billion to $3 billion*. While we still have work to do to confirm and refine our current estimate, we're clearly moving in the right direction. -- 2012 Q2 Earnings Call, Tony Alexander We also significantly decreased our competitive cost structure. Annual operating expenses have been reduced through our continued focus on managing fuel costs and O&M expense. And more importantly, our projected capital spending in the generation group over the next several years has been reduced by more than	On December 28, 2012, the WVDEP granted a conditional extension through April 16, 2016 for MATS compliance at the Fort Martin, Harrison and Pleasants stations. On March 20, 2013, the PADEP granted an extension through April 16, 2016 for MATS compliance at the Hatfield's Ferry and Bruce Mansfield stations. In December 2014, FG requested an extension through April 16, 2016 for MATS compliance at the Bay Shore and Sammis stations and await a decision from OEPA. In addition, an EPA enforcement policy document contemplates up to an additional year to achieve compliance, through April 2017, under certain circumstances for reliability critical units. MATS was challenged in the U.S. Court of Appeals for the D.C. Circuit by various entities, including FirstEnergy's challenge of the PM emission limit imposed on petroleum coke boilers, such as Bay Shore Unit 1. On April 15, 2014, MATS was upheld by the U.S. Court of Appeals for the D.C. Circuit, however, the Court refused to decide FirstEnergy's challenge of the PM emission limit imposed on petroleum coke boilers due to a January 2013 petition for reconsideration still pending but not addressed by EPA. On November 25, 2014, the U.S. Supreme Court agreed to review MATS, specifically, to determine if EPA should have evaluated the cost of MATS prior to regulating. Depending on the outcome of the U.S. Supreme Court review and how the MATS are ultimately implemented, *FirstEnergy's total capital cost for compliance (over the 2012 to 2018 time period) is currently expected to be approximately $370 million (CES segment of $178 million and Regulated Distribution segment of $192 million), of which $133 million has been spent through 2014* ($56 million at CES and $77 million at Regulated Distribution). -- 2014 10-K, p. 16 *We're investing $370 million in upgrades to comply with MATS. Most of [the investments] will have been made by the time the Supreme Court rules.* -- First Energy spokeswoman Stephanie Walton in March 30, 2015 in RTO Insider article

Company	Original Compliance Cost Estimates	Actual Cost of Compliance
	$1 billion through our recent actions. *This includes additional reductions in our expected spend for compliance with Mercury and Air Toxics Standards , which is now at $465 million across the entire generation fleet, with only an estimated $240 million at our competitive units.* The majority of the remaining capital will be invested in projects to extend the life of our nuclear assets, with new steam generators at Davis-Besse in 2014 and new steam generators and reactor head at Beaver Valley 2 in 2017. – 2013 Q3 Earnings Call, Anthony Alexander, CEO	
Southern Company	As you'll recall, we previously provided a MATS compliance capital projection of up to $2.7 billion for the 2012 through 2014 time frame. We also indicated that this amount could be reduced by $500 million to $1 billion, depending primarily on the number of baghouses in our final compliance strategy, bringing the final number to between $1.7 billion and $2.2 billion….*Based on our current analysis, our projection for MATS compliance for 2012 through 2014 now totals $1.8 billion, representing a reduction of $900 million from our previous estimates.* While the number of baghouses has been reduced to 4 or 5 from a high of as many as 17, other costs have been added to our plan to reflect the need for additive injection systems and related plant modifications. As before, this plan also includes significant investment in transmission projects as well as fuel switching to natural gas. – 2012 Q2 Earnings Call, Art Beattie, CFO So it's -- so at least in terms of kind of what we said before with respect to MATS, we said $2.7 billion. And then we -- as we got kind of the new rule, not the proposed rule, we said it could be between *$0.5 billion or $1 billion less, and therefore, we said $1.7 billion to $2.2 billion. Well, sure enough, it ended up at $1.8 billion. When you think about the total amount of CapEx, it was $18.2 billion or $18.3 billion, and now we kind of think it's going to be $16.4 billion, $16.3 billion, somewhere in that realm.* -- 2012 Q2 Earnings Call, Thomas Fanning, CEO With respect to the impact of the MATS rule on capital spending from 2012 through 2014, the Southern Company system's preliminary analysis anticipates that potential incremental environmental compliance capital expenditures to comply with the MATS rule are likely to be substantial and could be up to *$2.7 billion from 2012 through 2014.* – 2012 10-K p. II-22	The Company has developed a compliance plan for the MATS rule which includes reliance on existing emission control technologies, the construction of baghouses to provide an additional level of control on the emissions of mercury and particulates from certain generating units, the use of additives or other injection technology, the use of existing or additional natural gas capability, and unit retirements. Additionally, certain transmission system upgrades are required. 2015 10-K p II-134 The Southern Company system expects that capital expenditures to comply with environmental statutes and regulations will total approximately *$2.1 billion from 2015 through 2017, with annual totals of approximately $1.0 billion, $0.5 billion, and $0.6 billion for 2015, 2016, and 2017*, respectively. -- 2015 10-K p. II-22 Southern Company has made about *$9 billion in investments in environmental control technology and anticipates spending an additional $2.1 billion over the next three years to comply with MATS* and other environmental regulations – Southern Company spokesman Jack Bonnikson to Bloomberg BNA via e-mail for April 2015 article

Company	Original Compliance Cost Estimates	Actual Cost of Compliance
AEP	Estimating the capital spend for our environmental effort. *Originally, we started with a $6 billion to $8 billion anticipated capital outlay for these types of requirements. And that changed, from $5 billion to $7 billion, over a period of time when the EPA came up with the -- came out the rules, particularly on particulate matter.* We had one situation where, instead of achieving 99.7% removal rate, the proposed rule was saying you had to achieve 99.9%, and that 0.2% was costing us about $800 million. So the EPA did listen and made the adjustments, so that adjusted reduction down as a result. *And then now, we're saying the cost is going to be from $4 billion to $5 billion.* And we've looked at technologies. We believe from a compliance standpoint that we can achieve further compliance reductions as a result of technology improvements, but also how we run the generation. So those are the kinds of things that we're looking at as well. -- 2012 Q4 Earnings Call, Nicholas Akins, CEO *So we believe it's going to be $4 billion to $5 billion, and we're committed to continuing down that process. But now, right now, it says $4 billion to $5 billion.*-- 2012 Q4 Earnings Call, Nicholas Akins, CEO "So we continue to also move forward on the EPA-related mandates, such as Mercury HAPs MACT and others, as we transition our fleet with the planned . . . retrofits and refueling of 11,000 megawatts at a cost of around $*4 billion to $5 billion over the 2012 to 2020 time period.* - 2013 Q1 Earnings Call, Nicholas Akins, CEO	Emissions of nitrogen and sulfur oxides, mercury and particulates from fossil fueled generation plants are subject to increased regulations, controls and mitigation expenses. Compliance with these legal requirements requires us to commit significant capital toward environmental monitoring, installation of pollution control equipment, emission fees and permits at all of our facilities and could cause us to retire generating capacity prior to the end of its estimated useful life. . . . *If we retire generation plants prior to the end of their estimated useful life, there can be no assurance that we will recover the remaining costs associated with such plants. We typically recover our expenditures for pollution control technologies, replacement generation, undepreciated plant balances and associated operating costs from customers through regulated rates in regulated jurisdictions.* -- 2014 10-K p 41 (See table below as well) We continue to refine the cost estimates of complying with these rules and other impacts of the environmental proposals on our coal-fired generating facilities. *Based upon our estimates, additional investment to meet these proposed requirements ranges from approximately $2.8 billion to $3.3 billion through 2020. These amounts include investments to convert some of our coal generation to natural gas..* -- 2014 10-K p 10

Company	Original Compliance Cost Estimates	Actual Cost of Compliance
DTE	These rules have led to additional controls on fossil-fueled power plants to reduce nitrogen oxide, sulfur dioxide, mercury and other emissions. To comply with these requirements, DTE Electric has spent approximately $1.9 billion through 2012. *The Company estimates DTE Electric will make capital expenditures of approximately $335 million in 2013 and up to approximately $1.6 billion of additional capital expenditures through 2020 based on current regulation* -- 2012 10-K p 90	DTE Electric is subject to the EPA ozone and fine particulate transport and acid rain regulations that limit power plant emissions of sulfur dioxide and nitrogen oxides. The EPA and the State of Michigan have issued emission reduction regulations relating to ozone, fine particulate, regional haze, mercury, and other air pollution. These rules have led to controls on fossil-fueled power plants to reduce nitrogen oxide, sulfur dioxide, mercury and other emissions. *To comply with these requirements, DTE Electric spent approximately $2.2 billion through 2014. The Company estimates DTE Electric will make capital expenditures of approximately $100 million in 2015 and up to approximately $30 million of additional capital expenditures through 2019 based on current regulations.* -- 2014 10-K p 25 Estimated $400 million capital investment for environmental compliance for the years 2015-2019 -- August 2015 Business Update
PPL	...from an environmental perspective, I think you're aware that on a competitive fleet side, we're very well equipped to deal with the MATS and the CSAPR. *So we're not looking at any major new incremental investments on the environmental side.*- 2012 Q1 Earnings Call, William Spence, CEO Now that we've signed contracts with various vendors, we've updated our estimate of capital spending necessary to complete our previously discussed environmental compliance projects [MATS and CSAPR]. *We now estimate these projects will come in closer to $2.5 billion, a reduction of $500 million from our original forecast.* We're able to deliver these savings to customers in Kentucky because we proactively addressed EPA regulations and were able to secure bids before others. - 2012 Q3 Earnings Call, William Spence, CEO "I think at this juncture, we don't see a lot of incremental CapEx required on the environmental front, for either Brunner Island or Montour stations in Pennsylvania. I think we are in fairly decent shape. There is some related to the math. Really, folks more around mercury control than it is around SOX or NOX. So at this point, I don't see any significant addition that we would need to make." -- Q1 2014 Earnings Call, William Spence, CEO	LG&E, KU and PPL Energy Supply have received compliance extensions for certain plants. PPL, PPL Energy Supply, LKE, LG&E and KU are generally well-positioned to comply with MATS, primarily due to recent investments in environmental controls at PPL Energy Supply and approved ECR plans to install additional controls at some of LG&E's and KU's Kentucky plants. With respect to PPL Energy Supply's Pennsylvania plants, PPL Energy Supply believes that installation of chemical additive systems and other controls may be necessary at certain coal-fired plants, the capital cost of which is not expected to be significant. PPL Energy Supply continues to analyze the potential impact of MATS on operating costs. *PPL Energy Supply is retrofitting the scrubbers at its Colstrip, Montana plant, the cost of which is not expected to be significant.. ... LG&E's and KU's anticipated retirement of certain coal-fired electricity generating units located at Cane Run and Green River is in response to MATS and other environmental regulations. The retirement of these units is not expected to have a material impact on the financial condition or results of operations of PPL, LKE, LG&E or KU....*-- 2014 10-K p 102

Company	Original Compliance Cost Estimates	Actual Cost of Compliance
Duke Energy	One of the reasons that we were pursuing the variance from the Multi-Pollutant Standard with the Illinois Pollution Control Board was in fact that we were able to comply with the MATS rules without that scrubber. And it was really these Illinois rules that were imposing the need to construct that scrubber…*So, we do believe that the capital expenditure plans that we've laid out, will -- while as to comply with MATS.* And it's really a function of a number of things. It's a function of the investments that we've already made in our plans overtime. We've made significant investments in pollution control equipment…We also burned low sulfur coal, which helps with our overall emissions. And as a result of compliance with the Multi-Pollutant Standard Illinois we are already using significant amounts of activated carbon for control of mercury. *So, through the -- I'd say the compliance with the Multi-Pollutant Standard, we've actually built into our operations of those things that are needed to comply with the MATS rules.* -- Q3 2012 Earnings Call, Marty Lyons, Senior Vice President and CFO "At the end of this year we expect to have retired more than 3800 megawatts of this capacity. *As a combined company we have already invested around $7 billion in control equipment for our existing coal plants positioning now for compliance with more stringent air emission regulations. However we estimate we will spend an additional $5 billion to $6 billion over the next decade to comply with pending environmental regulations on air, water and coal ash."* -- Q4 2012 Earnings Call, Jim Rogers As a group, these non-GHG environmental regulations will require the Duke Energy Registrants to install additional environmental controls and accelerate retirement of some coal-fi red units. While the ultimate regulatory requirements for the Duke Energy Registrants from the group of EPA regulatory actions will not be known until all the rules have been finalized, for planning purposes, the Duke Energy Registrants *currently estimate the cost of new control equipment that may need to be installed to comply with this group of rules could total $5 billion to $6 billion, excluding AFUDC, over the next 10 years. This range includes estimated costs for new control equipment necessary to comply with the MATS of $650 million to $800 million.*-- 2012 10-K p 67 *$1.4 billion in environmental capex from '13-'15 (Includes $600-$650 million for MATS compliance)* --2013 Analyst Meeting *Anticipated ~$5-6 billion in compliance costs for approved or pending air, water, and waste regulations over the next 10 years* -- Q2 2014 Earning Review and Business Update	Duke Energy Registrants are on track to meet the requirements. Strategies to achieve compliance include installation of new air emission control equipment, development of monitoring processes, fuel switching and acceleration of retirement for some coal-fired electric-generation units. -- 2015 Q2 10-Q p 116 "As of June 30, we now have total ARO obligations of *$4.5 billion*, which represents our best estimate to comply with state and federal rules. These costs will be spent over the next several decades. We will continue to refine this estimated liability as plans are finalized." Q2 2015 Earnings call, Steve Young, EVP, CFO "Duke Energy is currently reviewing today's ruling by the Supreme Court…*at this time, there will be no immediate effect on Duke Energy's MATS compliance program. All Duke Energy power plants will continue existing compliance activities."* -- June 29, 2015 Spokesman Chad Eaton, via email for an article in Platts

AEP 2014 10K p 13

Historical and Projected Environmental Investments

	2012 Actual	2013 Actual	2014 Actual	2015 Estimate	2016 Estimate	2017 Estimate
	(in thousands)					
Total AEP (a)	$ 241,000	$ 424,200	$ 539,800	$ 661,000	$ 401,000	$ 531,000
APCo	52,400	44,800	31,300	70,000	53,000	151,000
I&M	30,000	28,300	51,400	40,000	49,000	84,000
OPCo (b)	70,300	129,300	—	—	—	—
PSO	26,300	56,100	72,100	85,000	49,000	9,000
SWEPCo	24,200	135,700	225,300	316,000	86,000	66,000

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June 29, 2018

Via Federal Express and Email to tsirigotis.peter@epa.gov

Peter Tsirigotis
Director, Office of Air Quality Planning and Standards
U.S. Environmental Protection Agency
4930 Old Page Road
Durham, NC 27703

Re: National Emission Standards for Hazardous Air Pollutants for Coal- and Oil-Fired Electric Utility Steam Generating Units (the "Mercury and Air Toxics Standards"), EPA Docket ID No. EPA-HQ-OAR-2009-0234.

Dear Mr. Tsirigotis:

ADA Carbon Solutions, LLC ("ACS") understands that the U.S. Environmental Protection Agency ("EPA" or "Agency") may be re-evaluating the Mercury and Air Toxics Standards ("MATS" or "Rule")[1] and the underlying finding that regulation of hazardous air pollutants from coal- and oil-fired electric utility steam generating units ("power plants") under section 112 of the Clean Air Act is appropriate and necessary.[2] ACS offers this letter to inform EPA's analysis of these issues.

EPA should leave MATS in place unaltered, and should not disturb the Agency's "Supplemental Finding" that even after considering costs it remains appropriate and necessary to regulate power plants' hazardous air pollutant emissions.[3] EPA must recognize that any action EPA takes to undermine the Supplemental Finding could also undermine the legal foundation of the Rule. EPA should take no action against the Supplemental Finding or the Rule, which has now been in force for over three years and with which the electric power industry has now fully complied.

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1 77 Fed. Reg. 9304 (Feb. 16, 2012).

2 *Murray Energy Corporation v. EPA*, Docket No. 16-1127, ECF Doc. No. 1671687 (D.C. Cir. filed Apr. 18, 2017); *see also id.*, Order dated April 27, 2017, ECF Doc. No. 1672987 (holding cases in abeyance while EPA evaluates whether to reconsider the Supplemental Finding).

3 81 Fed. Reg. 24,420 (Apr. 25, 2016).

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Both the electric power industry and the activated carbon industry have made substantial investments in reliance on the Rule, which was first published over six years ago and immediately provoked a market response. Since 2012, the Rule has provided the regulatory certainty needed to support the investments necessary not only to achieve compliance, but to increase efficiency and reduce compliance costs. Those investments will be jeopardized if EPA repeals or undermines the Rule or the Supplemental Finding, and any such action would not lead to significant cost savings for the electric power industry. The capital costs of complying with MATS already have been incurred, and repealing the Rule will not return those costs to the electric power industry. Further, as explained in this letter, costs avoided without the Rule—that is, the costs of operating and maintaining emissions controls and monitoring systems that have already been installed—would have a negligible impact on retail electricity prices. As implemented today, the Rule provides substantial, cost-effective health and environmental benefits by reducing emissions of mercury—a persistent neurotoxin—from the largest source category of those emissions.

MATS has been far less expensive for the electric power industry to meet than EPA had anticipated in 2012. In the end, the costs of the Rule do not suggest that regulation under section 112 is inappropriate in light of the substantial health and environmental benefits and the industrial investments that derive from the Rule.

MATS

MATS was announced in December 2011 and published in February 2012, more than six years ago. The Rule required existing coal- and oil-fired power plants to meet emissions limitations for mercury and other hazardous air pollutants by April 2015, or for sources that obtained a one-year extension, by April 2016. At this point, power plants have made and implemented their compliance decisions—whether to add controls, to switch from coal to natural gas as fuel, or to retire a unit—and those decisions will not be undone even if EPA repeals MATS.

When EPA promulgated MATS in 2012, the Agency satisfied a longstanding obligation to regulate hazardous air pollutant emissions from power plants under section 112 of the Clean Air Act. In December 2000, more than a decade earlier, the Agency had made its determination under section 112(n)(1)(A) of the Clean Air Act that regulating emissions of hazardous air pollutants from power plants under section 112 was "appropriate and necessary."[4] EPA reaffirmed its "appropriate and necessary" finding when it promulgated MATS in 2012.[5] Although the Rule itself was upheld against all legal challenges, the Supreme Court concluded that EPA had erred by not considering costs of compliance in evaluating whether regulation was "appropriate and necessary" within the meaning of section 112(n)(1)(A) and remanded the case to the D.C. Circuit without vacating the rule.[6] On remand the D.C. Circuit left MATS in place while EPA re-evaluated its finding. EPA conducted a formal notice and comment rulemaking and, in April 2016, EPA concluded in its Supplemental Finding that even after considering costs

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4 65 Fed. Reg. 79,825 (Dec. 20, 2000).

5 77 Fed. Reg. 9304 (Feb. 16, 2012).

6 *Michigan v. EPA*, 135 S. Ct. 2699 (2015).

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in a variety of ways and other relevant factors, regulating hazardous air pollutant emissions from coal- and oil-fired power plants was "appropriate and necessary."[7]

The Costs Avoided by Rescinding MATS Would Be Very Small

As others reported to EPA at the time of the Supplemental Finding, the actual costs that the electric power industry incurred to comply with MATS were much lower than EPA had estimated when it promulgated the Rule. An analysis prepared by Andover Technology Partners in 2015 concluded that the true cost of complying with the Rule on an annualized basis was less than one-quarter of EPA's original cost estimate.[8] Part of what drove the lower costs were the substantial investments by ACS and others in the pollution control industry that enabled some power plants to comply with MATS using less capital-intensive emission controls than EPA had predicted.

At this point, more than six years after MATS was promulgated and more than three years after the Rule took effect, sources have made the investments in controls to comply, and these capital costs will not be saved if EPA repeals MATS. Thus, the only costs that are "avoidable" if MATS is rescinded are the costs associated with operating and maintaining controls and with monitoring to comply with the Rule.

A more recent analysis by James Staudt of Andover Technology Partners prepared in May 2017 analyzed those avoidable costs.[9] Andover Technology Partners performed a "bottom-up" analysis that identified the installations of pollution control technologies from 2014 through 2016 associated with MATS, and determined the related variable and fixed operating and maintenance costs of those controls. This included evaluating: (1) operating and maintenance costs for activated carbon injection for mercury control, which include the cost of using activated carbon, waste disposal, power consumption, and fixed operating and maintenance costs; (2) operating and maintenance costs of dry sorbent injection and lime injection systems installed to control acid gases, which include the cost of lime or trona, energy consumption, waste disposal, and

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7 81 Fed. Reg. 24,420 (Apr. 25, 2016).

8 Andover Technology Partners, Review and Analysis of the Actual Costs of Complying with MATS in Comparison to Predicted in EPA's Regulatory Impact Analysis, at 11, included as Exhibit 2 to Exhibit A of "Motion of Industry Respondent Intervenors to Govern Future Proceedings," *White Stallion Energy Center, LLC v. EPA*, D.C. Cir. Docket No. 12-1100, ECF Doc. No. 1574838 (filed Sept. 24, 2015), also attached as Exhibit 2 of Exhibit A to Comments of Calpine Corporation, Exelon Corporation, and Public Service Enterprise Group on EPA's Proposed Supplemental Finding (Jan. 15, 2016), EPA Docket ID No. EPA-HQ-OAR-2009-0234-20549, *available at* https://www.regulations.gov/document?D=EPA-HQ-OAR-2009-0234-20549; *see also* Declaration of James Staudt, Exhibit A to "Motion of Industry Respondent Intervenors to Govern Future Proceedings," *White Stallion Energy Center, LLC v. EPA*, ECF Doc. No. 1574838, at ¶¶ 14-15.

9 James E. Staudt, Andover Technology Partners, "Update of the Cost of Compliance with MATS – Ongoing Cost of Controls," White Paper (May 25, 2017), attached hereto as Exhibit 1.

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fixed operating and maintenance costs; (3) operating and maintenance costs associated with chemical injection, which include the cost of oxidizing chemicals (such as bromine) and chemicals used to control reemission of mercury in wet scrubbers and fixed operating and maintenance costs; and (4) costs associated with monitoring of mercury and hydrochloric acid and increased frequency of particulate matter measurements. These are the only costs that would be "avoided" if MATS were not in effect.[10]

As explained in Exhibit 1, Dr. Staudt's updated analysis reveals that the costs that could be avoided if MATS were not in effect amount to only approximately $0.50 per megawatt hour, *i.e.*, $0.0005 per kilowatt hour. One-twentieth of a penny per kilowatt hour is very small relative to annual average retail electricity prices, which from 2014 through 2017 ranged from a low of $0.1027 per kilowatt hour in 2016 to a high of $0.1054 per kilowatt hour in 2017 (in nominal dollars).[11] In other words, the costs that are avoidable in the absence of the Rule amount to less than 0.5 percent of retail electricity rates, and therefore have a negligible impact on the cost of electricity.

Repealing MATS simply would not have a material effect on electricity prices or on the operating costs of fossil fuel-fired power plants.

Repealing MATS Would Cause Substantial Environmental and Economic Harm

At the same time, repealing MATS would impose substantial harm on public health and the environment, the pollution control industry, and the electric generators who have invested to comply.

First, MATS provides substantial health and environmental benefits that could be lost or diminished if MATS is upended. Mercury is a persistent neurotoxin, and exposure to methylmercury can result in long-term neurological harms.[12] Before MATS was adopted, power plants contributed half of anthropogenic mercury emissions in the United States.[13] By requiring power plants to meet federal emission standards for mercury, MATS has reduced those emissions. Nevertheless, fish advisories (both recreational and subsistence fishing) remain commonplace, and more work is needed to make fisheries safe from mercury contamination and to eliminate the risk to humans from the consumption of mercury-contaminated fish. If MATS

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10 The analysis also determined the fixed and variable operating and maintenance costs associated with fabric filters (also known as baghouses) that were installed to control particulate matter (as a surrogate for non-mercury HAP metals). However, because sources cannot simply "turn off" fabric filters even in the absence of MATS, sources will incur these operating and maintenance costs regardless of whether EPA leaves the Rule in place, alters it, or repeals it. Therefore, these costs should not be included in assessing the avoidable costs if MATS were not in effect.

11 U.S. Energy Information Administration, Electricity Data Browser, http://www.eia.gov/electricity/data/browser (accessed June 8, 2018).

12 *See* 76 Fed. Reg. 24,976, 24,999-25,003, 25,006-11, 25,018 (May 3, 2011).

13 76 Fed. Reg. at 25,002; 77 Fed. Reg. at 9310.

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were repealed, power plant owners could and would simply turn off their activated carbon injection systems or other mercury emission controls. Mercury emissions would increase, raising the risk of harm to human health and the environment from mercury, and reversing the effort to provide reductions necessary to protect Americans from the dangers of mercury consumption. MATS remains an effective and necessary rule to address serious health and environmental problems.

Second, both the electric power industry and the activated carbon industry have made substantial investments in response to MATS, and repealing MATS would jeopardize those investments and the jobs they support. The electric power industry invested billions of dollars to install controls to comply with MATS. The activated carbon industry invested over $750 million to build the manufacturing and logistics assets necessary to supply power plants with activated carbon for mercury control and to support research and development to provide better, more efficient activated carbon products. ACS is a leading provider of activated carbon products optimized for emission control in the electric power industry. ACS alone has invested over $350 million in activated carbon production capacity, including building the largest, most automated and most environmentally-friendly activated carbon plant for mercury capture in North America, located near Coushatta, Louisiana.

Activated carbon is made from coal, and the activated carbon industry's response to MATS resulted in the opening of two new coal mines—the Five Forks Mine in Louisiana owned by ACS and the Marshall Mine in Texas owned by Cabot Corporation, another activated carbon producer. Activated carbon manufacturing facilities that support the electric power industry are located in Wyoming, Texas, Oklahoma, Louisiana, Mississippi and Kentucky. These facilities collectively have operating budgets in the hundreds of millions of dollars and the investments made in response to MATS have provided good-paying jobs, while also supporting employment in mining, transportation, distribution and other industries, including in the coal industry. Repealing MATS would itself eliminate jobs or inhibit job creation.

The investments made by ACS and others in the activated carbon industry have resulted in new and improved activated carbon products that dramatically improve the efficiency of pollution control. Today, ACS sells products that are as much as 60 percent more efficient than those available when the MATS rulemaking began. As a result, power plants use much less activated carbon for mercury control than originally anticipated, leading to corresponding reductions in storage and logistics demands, waste production, and, above all, compliance costs. ACS sells products that allow power plants to maintain the ability to sell their fly ash, avoiding increased costs associated with waste disposal. Further, new products from ACS have enabled some power plants to avoid the high-capital investment of installing baghouses to comply with MATS.

If MATS is repealed now, members of the electric power industry and the pollution control industry may be unable to recover their substantial investments. It would punish the companies that invested to achieve compliance in a cost-effective manner. Further, given the long history of the MATS Rule, repealing MATS likely will make the pollution control industry skeptical about committing to future investments to support compliance with environmental rules before those rules are fully litigated and unless the pollution control industry can obtain reasonable comfort that EPA will not subsequently revoke the rule. Absent investments by the pollution control industry, the cost of compliance with environmental rules will increase. Moreover, the absence of comprehensive federal regulation of mercury and other hazardous air pollutants from power

plants would encourage states to adopt (or resurrect) their own restrictions, creating a patchwork of potentially inconsistent state regulatory programs.

The Costs of MATS are Reasonable

It is also important that EPA recognize that its conclusion that regulation under section 112(n)(1)(A) was appropriate and necessary was, and remains, valid. EPA should not potentially disrupt MATS by concluding that compliance costs somehow render regulation inappropriate.

Section 112(n)(1)(A) is an idiosyncratic provision that calls for EPA to make a one-time decision regarding power plant emissions; the consideration of cost under this section has no precedential bearing on other determinations EPA must make under the Clean Air Act or other statutes. EPA may consider costs in any number of ways, without being compelled to evaluate costs in the same way in future rulemakings. Moreover, in making the evaluation called for by section 112(n)(1)(A), EPA must consider all other relevant factors and not limit its evaluation to costs.

In the Supplemental Finding, EPA considered costs in several different ways that did not depend upon considering "co-benefits" of reducing non-hazardous air pollutants under the Rule. In its "preferred method," EPA: (1) evaluated annual compliance costs as a percent of revenue from the power sector's annual retail electricity sales; (2) compared annual capital expenditures to comply with MATS to the range of variation of the power sector's annual capital expenditures; and (3) evaluated the anticipated impact of the Rule's compliance costs on the retail price of electricity.[14] EPA also evaluated the projected impact on capacity and reliability, concluding that the Rule would not adversely affect reliability and resource adequacy.[15] Based on these considerations of costs, and evaluating them in the context of other relevant factors, EPA recognized that the costs were reasonable and that regulation was appropriate and necessary.

Importantly, EPA's cost analyses in the Supplemental Finding relied on EPA's 2012 estimate of $9.6 billion in annual compliance costs, which wildly overestimated the actual capital and operating costs of compliance with the Rule. Dr. Staudt's analysis in 2015 confirmed that expected compliance costs as of that time were less than one-quarter of EPA's original estimate. Dr. Staudt's more recent analysis of avoidable costs if MATS is repealed further demonstrates that compliance costs remain low and are substantially lower than EPA had anticipated.

Beyond that, if EPA were to look to more recent data on average retail electricity prices, it would see that MATS has not led to any large spike in prices. The nominal average retail electricity price in 2017 was $0.1054 per kilowatt hour compared with $0.1044 per kilowatt hour in 2014,[16] when sources likely started to install controls to address MATS. This is a modest increase of

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14 81 Fed. Reg. at 24,423-27; *see also* 80 Fed. Reg. 75,025, 75,033-35 (Dec. 1, 2015). EPA relied on a cost-benefit analysis that considered "co-benefits" as part of an alternative justification for the Supplemental Finding, but EPA's "preferred method" provides an independent basis for the "appropriate and necessary" determination.

15 81 Fed. Reg. at 24,424-25, 24,425-27; 80 Fed. Reg. at 75,035-36.

16 U.S. Energy Information Administration, Electricity Data Browser, http://www.eia.gov/electricity/data/browser (accessed June 8, 2018).

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$0.0010 per kilowatt hour (less than 1 percent of the 2014 rate), and when adjusted for inflation, the *real* average retail electricity price in 2017 *decreased* as compared with 2014.[17]

As EPA concluded in its Supplemental Finding, the costs that the electric power industry have incurred and will incur to comply with MATS are reasonable in light of all relevant factors. That the costs are in fact significantly less than EPA anticipated in the Supplemental Finding only reinforces this conclusion. EPA's Supplemental Finding appropriately considered costs using supportable, well-established economic principles that EPA can readily defend in challenges to the Supplemental Finding. Any determination today that regulation is not "appropriate and necessary" would be vulnerable to judicial reversal in light of the substantial record, built over more than 20 years of research and study and throughout the more than 16 years of litigation leading to the Rule, of the substantial harms associated with mercury and other hazardous air pollutant emissions, the availability of controls to reduce those emissions, and the reasonable costs associated with employing those controls.

For all of these reasons, ACS urges EPA to keep MATS in place, and not to alter EPA's conclusion that regulation under section 112 is "appropriate and necessary." EPA's staff should reach out to me directly if we can be of further assistance.

Sincerely,

Brian Leen,
President and Chief Executive Officer

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17 Measured in 2007 dollars (the standard EPA employed in the Supplemental Finding), the inflation-adjusted average retail electricity price in 2014 was $0.0935, and decreased to $0.0904 in 2017. Calculations were made using the U.S. Bureau of Economic Analysis Gross Domestic Product-Implicit Price Deflator, available at FRED, Federal Reserve Bank of St. Louis, https://fred.stlouisfed.org/series/GDPDEF (accessed June 8, 2018).

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EXHIBIT 1

Andover Technology Partners 978-685-9577
Consulting to the Air Pollution Control Industry

Update of the Cost of Compliance with MATS – Ongoing Cost of Controls

White Paper

By

James E. Staudt, Ph.D.
Andover Technology Partners
May 25, 2017

Purpose

The purpose of this effort is to estimate annual operating costs associated with MATS. In effect, what the impact would be in terms of operating costs if MATS was rescinded. These operating costs include:

1. Operating and maintenance costs associated with ACI – this includes the cost of activated carbon as well as any energy used for the systems, waste disposal and maintenance costs.
2. Operating and maintenance costs associated with DSI - this includes the cost of lime or trona as well as any energy used for the systems, waste disposal and maintenance costs.
3. Operating and maintenance costs associated with chemical injection – this would include the costs associated with bromine (or other oxidizing chemicals) as well as chemicals used to control reemission of mercury in wet scrubbers
4. Operating and maintenance costs associated with fabric filters – this will include the costs associated with the energy demand associated with the increased pressure drop across the device, periodic replacement of filter media, and other maintenance or operating labor or materials. It is worth noting that were MATS rescinded, these costs would not go away because the fabric filter cannot be simply "turned off" in the manner that ACI, DSI or the chemical addition can. Rescinding MATS would therefore have no impact on these costs.
5. Operating and maintenance costs associated with monitoring Hg and HCl and increased frequency of PM measurements

Although there were some scrubber and ESP upgrades performed for MATS, these generally do not result in an increase in operating or maintenance costs.

The methodology for this effort will also differ from the methodology used in the past.[1] In that earlier effort Andover Technology Partners (ATP) examined how the United States Environmental Protection Agency (EPA) overestimated the cost of compliance with MATS when they issued the final rule. While EPA provided information about the MW of capacity retrofit in various means, EPA only provided limited detail of the components of the cost. Moreover, EPA's analysis included costs associated with changes in the fuels used in the generation fleet. As a result, the method used to assess how much EPA overestimated the cost of controls was by necessity using their estimated total cost as a starting point and then backing out various cost components per the actual installations and using the cost methodology used by EPA that is described in the documentation for the integrated planning model.

If the previous method examined cost from a "top-down" approach that started with the total cost estimated by EPA, in this effort the operating costs will be built up from a "bottom up" approach. This is done by looking at the total installations of various technologies and determining the associated operating cost. This approach will not examine any costs associated with changes in the fleet fuel mix that might be attributable to MATS. First, because the cost of natural gas is so much less than the expected cost of natural gas when MATS was promulgated, it is likely that MATS had a very small impact

[1] Declaration of James E. Staudt, Ph.D., CFA, United States Court of Appeals for the District of Columbia Circuit, White Stallion Energy Center, LLC, et al, v United States Environmental Protection Agency, Case No. 12-1100, Argued December 10, 2013, Decided April 15, 2014, Declaration submitted September 24, 2015.

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on decisions to increase use of natural gas for power generation. Also, this is a question whose answer is almost indeterminable because many different factors influence fuel switching and plant retirement decisions. Another impact is the effect of retirements. While there were a substantial number of coal retirements during the time period leading up to the MATS compliance dates and even coincident with MATS dates, most of these facilities were uneconomical even without MATS and were destined for retirement.

Also, in examining the impact of MATS versus state rules requiring mercury control it was determined that only those facilities that installed Hg controls in 2014 through 2016 would be regarded as being subject to MATS as opposed to a state rule. Therefore, facilities that installed mercury controls either before or after that period are not included in this estimate.

For the purpose of this effort it will be assumed that all MATS control technology was installed in the years 2014 through 2016. Installations prior to 2014 were likely the result of state regulations, consent decrees, or other requirements. It is possible that some installations during 2014-2016 were in response to requirements other than MATS, such as state regulations; however, it is likely that the large majority of the installations in those years were for MATS compliance. In any event, EIA Form 860 data indicates that most facilities installed technology for MATS compliance from 2014-2016 and very few facilities installed mercury controls in 2013. The results of an analysis of EIA form 860 Environmental Association, EIA form 860 generator data and EIA Form 923 unit generation data are shown in Table 1. The 2016 generation is the 2016 generation associated with the facilities installed with a particular technology in a given year and will be used to help estimate variable operating costs associated with that equipment. In making estimates of future cost it is assumed that all of the associated facilities continue to operate at a level similar to that of 2016, except for those where announcements to retire by 2018 were made.

Operating and Maintenance Costs Associated with ACI installed for MATS Compliance

Operating costs for ACI include variable operating costs associated with sorbent consumption (VOMR), waste disposal, if needed (VOMW), power consumption (VOMP) and fixed operating and maintenance costs (FOM). Variable operating costs for sorbent consumption for any application will vary based upon the conditions. Table 2 shows estimated VOMR for activated carbon for a range of applications.

The costs therefore range from under 0.10 mill/kWh to under 1.0 mill/kWh. The most costly conditions are those where there is SO_3 conditioning or high sulfur coal. These, fortunately, are not the most common situations. The more common situations utilize lower treatment rates, resulting in costs on the order of 0.60 mills/kWh or less.

Variable operating costs will also include disposal costs for waste. Activated carbon will increase the amount of fly ash that must be disposed of. Generally, it does not adversely impact fly ash sales because suppliers have developed "concrete friendly" carbons and are also able to utilize much lower treatment rates than in the past. Trends have been for increases in fly ash utilization, despite the increased use of activated carbon. In fact, in 2015 52% of coal combustion products (CCPs) were

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reutilized.[2] If fly ash is sold there is no impact on the cost of waste disposal. If fly ash is disposed of it will increase the cost of disposal in proportion to the carbon used. If disposal cost is $50/ton ($0.025/lb) and carbon costs around $1/lb, disposal cost is roughly 2.5% of the cost of purchasing the carbon. In light of the increased utilization of fly ash that will mitigate the likelihood of disposal, this assumption is a conservative one.

Table 1. Installation of control technologies associated with MATS from 2014-2016 and associated generation in 2016. Developed from EIA data – Forms 860 and 923

Year	Tech	number	Capacity (MW)	2016 Generation (MWh)	Capital Cost ($1000)
2014	ACI	21	8,470	34,337,506	222,988
2015	ACI	88	39,608	183,651,033	496,218
2016	ACI	88	38,256	186,905,590	322,191
Total	ACI	197	86,333	404,894,129	1,041,397
2014	LIJ	1	641	3,384,917	2,307
2015	LIJ	2	1,398	8,369,775	1,646
2016	LIJ	5	2,065	9,400,899	17,000
Total	LIJ	8	4,104	21,155,591	20,953
2014	DSI	1	477	2,469,155	81,240
2015	DSI	9	2,918	11,504,817	179,155
2016	DSI	14	6,176	24,552,813	94,201
Total	DSI	24	9,571	38,526,785	354,596
2014	OT	1	151	62,319	11,800
2015	OT	18	5,983	32,928,191	26,227
2016	OT	12	3,648	8,752,470	303,387
Total	OT	31	9,782	41,742,980	341,414
2014	BP	9	4,614	25,387,390	402,076
2015	BP	11	4,539	21,010,362	495,120
2016	BP	11	6,833	32,147,754	420,248
Total	BP	31	15,986	78,545,506	1,317,444

ACI = activated carbon injection
LIJ = Lime injection
DSI = Dry sorbent injection
OT = Other
BP = Pulse jet baghouse

[2] American Coal Ash Association, "Coal Ash Recycling Reaches 52 Percent As Production and Use Trends Shift", October 12, 2016, https://www.acaa-usa.org/Portals/9/Files/PDFs/News-Release-Coal-Ash-Production-and-Use-2015.pdf

Table 2. The variable operating cost of sorbent for current, state of the art, commercial carbons.[3]

Coal-Fired Site	Product	AQCS	Fuel	DSI	FGC	% Removal Hg	mill/Kwh
1	DARCO® Hg-LH EXTRA SP	SCR/FF	Low Chlorine Subbit.	None	None	94	0.086
2	DARCO® Hg-LH EXTRA SP	CS-ESP	Local W.Subbit	None	None	80	0.222
3	DARCO® Hg-LH EXTRA SP	CS-ESP	Local W.Subbit	None	None	80	0.244
4	DARCO® Hg-LH EXTRA SP	CS-ESP	Low Chlorine Subbit.	None	None	87	0.328
5	DARCO® Hg-LH EXTRA TR	CS-ESP/wFGD	High Sulfur Bit.	Calcium-based	None	82	0.375
6	DARCO® Hg-LH EXTRA TR	CS-ESP	PRB/Bit. Blend	Sodium-based	None	88	0.663
7	DARCO® Hg EXTRA	CS-ESP	Low Chlorine Subbit.	None	SO_3 (6ppm)	90	0.789
8	DARCO® Hg-LH EXTRA SR	CS-ESP	PRB	None	SO_3 (7ppm)	90	0.872
9	DARCO® Hg EXTRA SR	SNCR/ESP/wFGD	High Sulfur Bit.	None	None	96	0.980

Other variable operating costs include energy, estimated as about $0.01/MWh of generation from the Sargent & Lundy study on mercury control. [4]

Fixed operating costs for operation and maintenance are estimated at 1.4% of capital cost, including overhead, per the Sargent & Lundy study.

Using these factors and the information in Table 1, the costs for operating ACI systems is estimated to be:

Table 3. Operating costs for ACI systems installed for MATS compliance

VOMR	$242,936,000	FOM	$14,580,000	Total VOM + FOM
VOMW	$6,073,000			
VOMP	$4,049,000			
VOMTotal	$253,058,000		$14,580,000	$267,638,000
			Cost in $/MWh	$0.66

Operating and Maintenance Costs for DSI Systems installed for MATS compliance

EIA Form 860 shows both lime injection systems (LIJ) and DSI systems. DSI systems potentially include trona as well as lime injection systems. The average cost of the LIJ systems in EIA Form 860 are significantly lower than those of the DSI systems ($5/kW compared to $37/kW), suggesting that the LIJ systems were primarily used for SO3 control while many of the DSI systems were for HCl control.

VOMR is estimated by assuming roughly 2 lb of lime reagent per lb of total acid gas (using SO2 since it is usually present in much larger quantities than HCl), an average 2lb SO2/MMBtu coal, average heat rate

[3] Fessenden, J., Satterfield, J., "Cost Effective Reduction of Mercury Using Powder Activated Carbon Injection", March 2, 2017

[4] Sargent & Lundy, "IPM Model – Updates to Cost and Performance for APC Technologies Mercury Control Cost Development Methodology Final", March 2013, Project 12847-002, Systems Research and Applications Corporation

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of 10,500 Btu/kWh, and a cost of activated lime equal to $125/ton. [5] It should be noted that for units that fire coal from the Powder River Basin (PRB), the lime consumption would be much less and in many cases no lime would be necessary to be added – the DSI system is added primarily as a precaution.

Variable operating costs will also include disposal costs for waste. DSI will increase the amount of fly ash that must be disposed of. Generally, it does not adversely impact fly ash sales because the most commonly used reagent is lime, which will generally improve fly ash marketability. If fly ash is disposed of, it will increase the cost of disposal in proportion to the lime used. Disposal cost is estimated at $50/ton. Since 52% or more of the industry's coal ash is recycled, it is reasonable to assume that 48% of the facilities need to dispose of waste.

Other variable operating costs include energy, estimated as about $0.39/MWh from the Sargent & Lundy study on DSI. [6]

Fixed operating costs for operation and maintenance are estimated at 1.4% of capital cost, including overhead, per the Sargent & Lundy study. The Sargent & Lundy study includes two additional operators for a DSI system. This is not correct. DSI systems are simple systems that generally do not require additional operators.

Using these factors, the costs for operating DSI and LIJ systems is estimated to be:

Table 3. Operating costs for DSI and LIJ systems installed for MATS compliance

VOMR	$78,333,000	**FOM**	$5,257,000	**Total VOM + FOM**
VOMW	$32,228,000*			
VOMP	$23,276,000			
VOMTotal	$133,837,000		$5,257,000	$139,094,000
Total cost $/MWh				$2.33
* assumes 48% of facilities dispose of waste				

This is a very conservatively high estimate of cost because in many cases not as much reagent is needed because sulfur and HCl content may be low, as in the case of PRB fuel. Moreover, many of these systems are likely to be primarily for SO_3 control rather than HCl control and therefore use much lower reagent treatment rates. Also, the additional calcium may actually make the fly ash more attractive for beneficial reuse, lowering the waste disposal costs.

[5] Treatment rate from: Fitzgerald, H., "Hydrated Lime DSI - Solution for Acid Gas Control (SO3, HCl, and HF)", MARAMA /ICAC SO2/HCl CONTROL TECHNOLOGIES WEBINAR, July 19, 2012
Also, USGS Minerals Yearbook, shows 2014 cost of lime of $122/metric ton, or about $110 per short ton. $125/short ton is than assumed in this evaluation.

[6] Sargent & Lundy, "IPM Model – Updates to Cost and Performance for APC Technologies, Dry Sorbent Injection for SO2 Control Cost Development Methodology – Final", March 2013, Project 12847-002, Systems Research and Applications Corporation

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Operating and Maintenance Costs for Other technologies installed for MATS compliance

EIA Form 860 includes a category of "other" for other technologies. Most are listed as used for mercury control. Because of the capital cost of many of these technologies (averaging $35/kW) this may include chemical addition, but likely also includes ESP and FGD upgrades. ESP and FGD upgrades do not entail any additional operating or maintenance costs. Chemical additives do. Hg oxidation and scrubber additives for mercury control were estimated in the 2015 ICAC Market forecast[7] to be in the range of $80-$100 million for the years 2018-2019. For the purpose of this work, we will assume a cost of $90 million per year. Energy used for chemical addition systems are minimal.

While the total capital cost of "OT" items is $342 million, most of that cost is likely to be associated with technologies other than chemical addition (scrubber or ESP upgrades, perhaps). In any event, FOM cost will be assumed to be 1.4% of total capital cost, similar to ACI or DSI. The costs are shown in Table 4.

Table 4. Operating and Maintenance costs for Chemical Addition

VOM	$90,000,000
FOM	$4,780,000
TOTAL	$94,780,000
$/MWh	$2.19

Operating and Maintenance Costs for Baghouses installed for MATS compliance

There are no reagents used with baghouses (aka. "fabric filters"). Baghouses require some labor from operators and also require power and periodic replacement of filter media. Total VOM and FOM are estimated as $0.42/MWh and $0.68/kW-year, respectively.[8] Costs are shown in Table 5. It is important to recognize, however, that if MATS is rescinded, these costs will not go away because a fabric filter, unlike the other technologies, cannot simply be turned off without also turning off the rest of the associated boiler.

Table 5. Operating and Maintenance costs for Fabric Filters

VOM	$32,989,000
FOM	$10,870,000
TOTAL	$43,859,000
$/MWh	$0.56

[7] Institute of Clean Air Companies, 2015 Annual Market Study, pp 19-20. Available at www.icac.com

[8] Sargent & Lundy, "IPM Model – Updates to Cost and Performance for APC Technologies, Particulate Control Cost Development Methodology – Final", March 2013, Project 12847-002, Systems Research and Applications Corporation, pg 8

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Operating and Maintenance Costs of Hg CEMS

Operating costs of Hg CEMS include the labor and materials for operating and maintaining the equipment as well as the cost of Relative Accuracy Test Audits and other compliance requirements of the CEMS. This was estimated as roughly $100,000 per year in a 2010 NESCAUM Report. At the end of 2016 there were 664 coal units in the United States operating that generated 1,158,929,439 MWh of electricity. Of them, 233 units among 84 plants had common chimneys. The total number of common chimneys was 111 for the 233 units. Therefore, there are a total of 542 chimneys in the US coal fleet that must be monitored. This means that the total ongoing cost of monitoring is roughly $54 million across the coal fleet for a total cost of $0.05/MWh. This cost estimate likely overestimates the cost because many facilities already had requirements imposed upon them by state Hg control regulations.

Operating and Maintenance Costs of HCl monitoring

Scrubbed units for the most part can demonstrate compliance with the HCl requirements of MATS maintaining adequately low SO_2 emission rates. Therefore, for most scrubbed units there is no additional monitoring need for HCl. For units that are not equipped with scrubbers, stack testing of HCl is necessary. Based upon a sort of 2016 AMPD data, at the end of 2016 there were 266 unscrubbed coal utility or small power producer units that generated 252,190,593 MWh of electricity. Of these, 165 units had individual chimneys and 101 units had common chimneys. Those 101 units had among them 39 common chimneys, resulting in a total of 204 chimneys for all of the unscrubbed units.

It is assumed that the cost of monitoring HCl is similar to that of Hg at $100,000/year per chimney. Therefore, the ongoing operating cost of monitoring HCl emissions is $20.4 million in total. Dividing that by the 2016 generation for those units results in $0.08/MWh

Operating costs associated with increased PM measurement frequency

For those facilities that do not already have a PM CEMS due to Consent Decree or other requirement, facilities will need to increase PM measurement frequency to quarterly. Some facilities may already have quarterly measurement requirements that are imposed by the state. Others may only have annual requirements. It is not possible to determine the incremental cost of increased PM measurement due to MATS frequency industrywide because of the use of PM CEMS under Consent Decrees and other factors. However, like Hg and HCl measurement costs, it will be substantially less than the cost of controls and likely less than the incremental cost of HCl measurement and reporting.

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Total operating costs for all MATS technologies

Total operating costs for all MATS technologies for all 664 coal units, including fabric filters is as shown in Table 6 and totals roughly $620 million. If fabric filter operating costs are removed, the total operating costs are roughly $576 million.

Table 6. Total Operating Costs for MATS technologies.

ACI	$267,638,000
DSI	$139,094,000
OT	$94,780,000
FF	$43,859,000
Hg CEMS	$54,200,000
HCl monitoring	$20,400,000
Total	$619,971,000

The total cost (including FF cost) divided by total 2016 generation for all 664 units results in a cost of $0.53/MWh. If FF costs are excluded, the cost per MWh is $0.50/MWh. It is reasonable to exclude FF costs because a fabric filter (or, baghouse) cannot be turned off without turning off the power plant. Therefore these costs would not go away if MATS were rescinded or relaxed.

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Andover Technology Partners 978-683-9599
Consulting to the Air Pollution Control Industry

Update of the Cost of Compliance with MATS – Ongoing Cost of Controls

White Paper

By

James E. Staudt, Ph.D., CFA
Andover Technology Partners
April 15, 2019

James E. Staudt, Ph.D., CFA

Purpose

The purpose of this effort is to estimate annual operating costs associated with the Mercury and Air Toxic Standards (MATS). In effect, what the impact would be in terms of operating costs if MATS was rescinded. These operating costs include:

1. Operating and maintenance costs associated with Activated Carbon Injection (ACI) – this includes the cost of activated carbon as well as any energy used for the systems, waste disposal and maintenance costs.
2. Operating and maintenance costs associated with Dry Sorbent Injection (DSI) - this includes the cost of lime or trona as well as any energy used for the systems, waste disposal and maintenance costs.
3. Operating and maintenance costs associated with chemical injection – this would include the costs associated with bromine (or other oxidizing chemicals) as well as chemicals used to control reemission of mercury in wet scrubbers
4. Operating and maintenance costs associated with monitoring Hg and HCl

Although there were some scrubber and Electrostatic Precipitator (ESP) upgrades performed for MATS, these generally do not result in an increase in operating or maintenance costs. Also, any fabric filter retrofits performed for MATS (which were few in number) cannot be "undone". Therefore, rescinding the MATS rule will not make a change in the operating costs for those units that retrofit fabric filters in response to MATS.

This methodology will estimate the costs that were incurred in 2018 as that is the last full year of operating data. This update is important for a number of reasons.

1. The complexion of the coal utility fleet has changed substantially over the past few years, as many units, particularly unscrubbed units, have been retired. This impacts the need for consumables such as activated carbon which is used mostly on unscrubbed boilers.
2. Those facilities that have continued to operate are often operating at a lower capacity factor than they were a few years ago, which also impacts the operating costs.
3. There is more data available on the operation of air pollution control and monitoring technologies than there was during the previous estimate, making current estimates more accurate and reflective of actual costs being incurred.

In this effort the operating costs will be built up from a "bottom up" approach. This is done by looking at the total installations of various technologies and determining the associated operating cost. This approach will not examine any costs associated with changes in the fleet fuel mix that might be attributable to MATS. First, as determined by the Department of Energy, the primary reason for the increased use of natural gas versus coal was sustained low natural gas prices.[1] As a result MATS had a very small impact on decisions to increase use of natural gas for power generation. Another impact

[1] United States Department of Energy, "Staff Report to the Secretary on Electricity Markets and Reliability", August 2017, pg 13.

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that is not explored here is the effect of MATS retirements. While there were a substantial number of coal retirements during the time period leading up to the MATS compliance dates and even coincident with MATS dates, most of these facilities were uneconomical even without MATS, in part due to the competition from natural gas and other generating technologies, and were destined for retirement.

Also, in examining the impact of MATS versus state rules requiring mercury control it was determined that only those facilities that did not already have state rules in place would be impacted with regard to mercury monitoring and controls in the event MATS were rescinded. On the other hand, these facilities would be impacted with respect to other MATS emissions requirements.

Finally, some facilities use more capital intensive technologies, such as capture membranes, that have low operating costs. These facilities are also relatively few in number. Because of the small numbers and the low operating costs associated with these technologies, they will not be addressed in this study.

The US Environmental Protection Agency's 2018 Air Markets Program Data (AMPD) was used to determine the pollution controls installed, the level of generation, the capacity,[2] the number of units and the number of chimneys.[3] This is shown in Table 1. For unscrubbed facilities, it was assumed that these facilities had ACI for mercury controls even if no mercury controls were reported. Also, if DSI was reported for a facility that also had a scrubber, it was assumed that the DSI system was for SO3 rather than HCl because the scrubbers were adequate for HCl compliance (below 0.20 lb/MMBtu SO2). Besides, these are few in number and will not impact the total by much. For the purpose of this effort the operating costs for mercury controls on facilities in states with mercury rules that predate MATS and would stay regardless of rescinding of MATS are shown, but are subtracted from the costs that would be saved in the event of rescinding of MATS.

Operating and Maintenance Costs Associated with ACI installed for MATS Compliance

Operating costs for ACI include variable operating costs associated with sorbent consumption (VOMR), waste disposal, if needed (VOMW), power consumption (VOMP) and fixed operating and maintenance costs (FOM). Variable operating costs for sorbent consumption for any application will vary based upon the conditions. Table 2 shows estimated VOMR for activated carbon for a range of applications.

The costs therefore range from about 0.10 mill/kWh to about 1.0 mill/kWh. The most costly conditions are those where there is SO_3 conditioning or high sulfur coal. These, fortunately, are not the most common situations. The more common situations utilize lower treatment rates, resulting in costs on the order of 0.30 to 0.70 mills/kWh or less.

Variable operating costs will also include disposal costs for waste. Activated carbon will increase the amount of fly ash that must be disposed of. In many cases it does not adversely impact fly ash sales because suppliers have developed "concrete friendly" carbons and are also able to utilize much lower treatment rates than in the past. Trends have been for increases in fly ash utilization, despite more

[2] Capacity in MW was estimated as dividing the reported rated heat input in MMBtu/hr by 10.5 (assuming a heat rate of 10.5 million Btu/MWhr

[3] Because of common chimneys at some plants, there are fewer chimneys than electric generating units.

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widespread use of activated carbon. In fact, in 2017 64% of coal combustion products (CCPs) were reutilized, a record.[4] If fly ash is sold, there is no waste impact. If fly ash is disposed ofit will increase the cost of disposal in proportion to the carbon used. If disposal cost is $50/ton ($0.025/lb) and carbon costs around $1/lb, disposal cost is roughly 2.5% of the cost of purchasing the carbon. In light of the increased utilization of fly ash that will mitigate the likelihood of disposal, this assumption is a conservative one.

Table 1. Control Technologies

	MW rating	# of chimneys	# of units	Total MWh
No State Hg Rules (total)	**244,150**	**387**	**438**	**1,001,117,603**
ACI	5,475	13	14	12,407,787
ACI	18,668	37	38	82,057,285
ACI DSI	6,829	8	9	29,613,640
FF	3,949	8	16	16,282,022
FF PAC	10,067	17	17	44,922,314
FF PAC DSI	1,792	3	3	9,417,212
Scrubber, ESP no ACI	67,893	87	106	247,908,135
Scrubber, ESP ACI	15,555	24	24	71,234,233
Scrubber, ESP, ACI, DSI	447	1	1	1,373,206
Scrubber, FF no ACI	67,137	115	127	275,712,012
Scrubber, FF ACI	42,796	66	73	204,409,791
Scrubber, FF, ACI, DSI	741	2	2	3,128,205
HS ACI	446	2	3	742,376
HS ACI	637	1	1	979,761
HS ACI FF	813	1	1	427,082
HS ACI FF	906	2	3	502,544
State Hg Rules (total)	**61,169**	**116**	**125**	**215,058,853**
ACI	4,408	10	12	14,118,051
ACI	5,771	14	15	17,339,033
ACI DSI	3,571	5	8	10,480,991
FF	1,197	7	8	3,632,220
FF PAC	250	1	1	103,496
FF PAC DSI	751	2	2	2,753,440
Scrubber, ESP no ACI	18,329	28	33	71,270,330
Scrubber, ESP ACI	6,577	9	11	18,187,734
Scrubber, FF no ACI	7,781	22	17	19,946,891
Scrubber, FF ACI	11,881	16	16	55,786,497
HS ACI	274	1	1	465,408
HS ACI	380	1	1	974,763
Grand Total	**305,319**	**503**	**563**	**1,216,176,456**

[4] American Coal Ash Association, "Coal Ash Recycling Reaches Record 64 Percent Amid Shifting Production and Use Patterns", November 13, 2018, https://www.acaa-usa.org/Portals/9/Files/PDFs/Coal-Ash-Production-and-Use-2017.pdf

Table 2. The variable operating cost of sorbent for current, state of the art, commercial carbons.[5]

Coal-Fired Site	Product	AQCS	Fuel	DSI	FGC	% Removal Hg	mill/Kwh
1	DARCO® Hg-LH EXTRA SP	SCR/FF	Low Chlorine Subbit.	None	None	94	0.086
2	DARCO® Hg-LH EXTRA SP	CS-ESP	Local W.Subbit	None	None	80	0.222
3	DARCO® Hg-LH EXTRA SP	CS-ESP	Local W.Subbit	None	None	80	0.244
4	DARCO® Hg-LH EXTRA SP	CS-ESP	Low Chlorine Subbit.	None	None	87	0.328
5	DARCO® Hg-LH EXTRA TR	CS-ESP/wFGD	High Sulfur Bit.	Calcium-based	None	82	0.375
6	DARCO® Hg-LH EXTRA TR	CS-ESP	PRB/Bit. Blend	Sodium-based	None	88	0.663
7	DARCO® Hg EXTRA	CS-ESP	Low Chlorine Subbit.	None	SO_3 (6ppm)	90	0.789
8	DARCO® Hg-LH EXTRA SR	CS-ESP	PRB	None	SO_3 (7ppm)	90	0.872
9	DARCO® Hg EXTRA SR	SNCR/ESP/wFGD	High Sulfur Bit.	None	None	96	0.980

Other variable operating costs include energy, estimated as about $0.01/MWh from the Sargent & Lundy memo on mercury control. [6]

Fixed operating costs for operation and maintenance are estimated at 1.4% of capital cost, including overhead, per the Sargent & Lundy memo. ACI capital costs are assumed to be $15/kW on average.

Using these factors and the information in Table 1, the costs for operating ACI systems are shown in Table 3. This is a significant drop from what was estimated only about two years ago. The reason is twofold. First, generation levels for facilities that are equipped with ACI are much lower than they were. Second, facility owners and mercury sorbent suppliers have optimized their operation and sorbent products to reduce the amount of material that is needed.

Table 3: Estimated operating costs for ACI systems

	VOMR	VOMW	VOMP	FOM	Total
ACI in States without Hg Rules	$99,757,000	$2,494,000	$4,729,000	$22,666,000	$129,646,000
ACI in states with Hg rules	$29,897,000	$746,000	$1,239,000	$7,364,000	$39,246,000
Total	$129,654,000	$3,240,000	$5,968,000	$30,030,000	$168,892,000

Operating and Maintenance Costs for DSI Systems installed for MATS compliance

DSI systems potentially include trona as well as lime injection systems. VOMR is estimated by assuming roughly 2 lb of lime or trona reagent per lb of total acid gas (using SO_2 since it is usually present in much larger quantities than HCl), an average 0.50lb SO_2/MMBtu coal[7], average heat rate of 10,500 Btu/kWh,

[5] Fessenden, J., Satterfield, J., "Cost Effective Reduction of Mercury Using Powder Activated Carbon Injection", March 2, 2017

[6] Sargent & Lundy, "IPM Model – Updates to Cost and Performance for APC Technologies Mercury Control Cost Development Methodology Final", March 2013, Project 12847-002, Systems Research and Applications Corporation

[7] The average weighted outlet SO_2 emission rate for DSI equipped units was 0.20 lb/MMBtu. Assuming an average SO_2 capture rate of 60% (about midway between 50% and 70% - the typical rates for ESP or FF equipped units, respectively) results in and uncontrolled rate of 0.50 lb/MMBtu

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and a cost of hydrated lime or trona equal to $150/short ton. [8] It should be noted that for units that fire coal from the Powder River Basin (PRB), the lime or trona consumption would be much less and in many cases no lime or trona would be necessary to be added – the DSI system is added primarily as a precaution.

Variable operating costs will also include disposal costs for waste. DSI will increase the amount of fly ash that must be disposed of. Generally, it does not adversely impact fly ash sales because the most commonly used reagent is lime, which will generally improve fly ash marketability. If fly ash is disposed of, it will increase the cost of disposal in proportion to the lime used. Disposal cost is estimated at $50/ton. Since 64% or more of the industry's coal ash is recycled, it is reasonable to assume that 36% of the facilities already need to dispose of waste.

Other variable operating costs include energy, estimated as about $0.39/MWh from the Sargent & Lundy memo on DSI. [9]

Fixed operating costs for operation and maintenance are estimated at 1.4% of capital cost, including overhead, per the Sargent & Lundy memo. The Sargent & Lundy memo includes two additional operators for a DSI system, which would increase operating costs from what is assumed. This is not correct. DSI systems are simple systems that do not require additional operators. In any event, the impact of this is small compared to the VOMR.

Using these factors, the estimated costs for operating DSI systems is shown in Table 4

Table 4. Estimated operating costs for DSI systems

	VOMR	VOMW	VOMP	FOM	Total
DSI operating costs	$16,600,000	$5,608,000	$21,604,000	$4,789,000	$53,812,000

This is lower than previously estimated, largely because the previous estimate was based upon an assumed SO_2 rate that turned out to be far too high as most DSI systems are in fact on lower sulfur coal units. Other factors include lower generation rates and retirements.

Operating and Maintenance Costs for Other technologies installed for MATS compliance

Chemical additives for Hg compliance add operating cost. Hg oxidation and scrubber additives for mercury control were estimated in the 2015 ICAC Market forecast[10] to be in the range of $80-$100 million for the years 2018-2019. It was estimated at a cost of $90 million per year. On the other hand,

[8] Treatment rate from: Fitzgerald, H., "Hydrated Lime DSI - Solution for Acid Gas Control (SO3, HCl, and HF)", MARAMA /ICAC SO2/HCl CONTROL TECHNOLOGIES WEBINAR, July 19, 2012

Also, USGS 2018 Minerals Commodity Summary , shows 2018 cost of lime hydrate of $150/metric ton, or about $135 per short ton. $150/short ton is than assumed in this evaluation. Trona had similar costs.

[9] Sargent & Lundy, "IPM Model – Updates to Cost and Performance for APC Technologies, Dry Sorbent Injection for SO2 Control Cost Development Methodology – Final", March 2013, Project 12847-002, Systems Research and Applications Corporation

[10] Institute of Clean Air Companies, 2015 Annual Market Study, pp 19-20

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this needs to be adjusted for revised generation levels versus the assumptions used at that time. In that previous estimate a total coal generation level of about 1 billion MWh[11] was assumed for units with wet FGD, versus 728 million MWh actually experienced on units with wet FGD systems 2018. Therefore, the $90 million value previously assumed is adjusted for the lower generation to about $66 million, shown in Table 5. This is distributed between those states with state rules versus those without on the basis of generation with wet FGD in those states.

Table 5. Operating costs for Chemical Addition

States without Hg rules	$52,858,000
States with Hg rules	$12,675,000
Total	$65,533,000

Operating and Maintenance Costs of Hg CEMS

Operating costs of Hg CEMS include the labor and materials for operating and maintaining the equipment as well as the cost of Relative Accuracy Test Audits and other compliance requirements of the CEMS. This was estimated as roughly $40,000 per year[12] and with 387 chimneys in states without Hg rules and 116 chimneys in states with Hg rules. This results in costs of shown in Table 6. The $40,000/year estimate is lower than previous estimates and is based upon more recent, published information.

Table 6. Operating costs for Hg CEMS

States without Hg rules	$15,480,000
States with Hg rules	$4,640,000
Total	$20,120,000

[11] 998,749,500 MWh, this was taken from Andover Technology Partners' proprietary model which assumed a 70% capacity factor.

[12] Estimated from slide 20 Wilber, K., "EGU MATS Compliance - Hg CEM Systems Challenges and Opportunities", Electric Utility and Energy Confernce, February 16-18, 2015, San Diego

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Operating and Maintenance Costs of HCl monitoring

Scrubbed units for the most part can demonstrate compliance with the HCl requirements of MATS maintaining adequately low SO_2 emission rates. Therefore, for most scrubbed units there is no additional monitoring need for HCl. There are 133 chimneys on unscrubbed units. Most facilities will comply through periodic stack tests with EPA Method 26A. Since, like a PM test it is an extractive sample, this is estimated to cost in the same range as a PM stack test (which is also performed quarterly at an estimated price of $8500/time[13] or $34,000 per year). This equates to $4.5 million per year in total as shown in Table 7.

Table 7. Operating and Maintenance costs of HCl Monitoring

Total	4,522,000

Operating costs associated with increased PM measurement frequency

For those facilities that do not already have a PM CEMS due to Consent Decree or other requirement, facilities have had to increase PM measurement frequency to quarterly measurements as a result of MATS. Some facilities may already have quarterly measurement requirements that are imposed by the state. Others may only have annual requirements. It is not possible to determine the incremental cost of increased PM measurement due to MATS frequency industrywide because of the use of PM CEMS under Consent Decrees and other factors. However, like Hg and HCl measurement costs, it will be substantially less than the cost of controls.

Total possible cost savings industrywide in the event of MATS being rescinded

Total annual operating costs for all MATS technologies that would be reduced or eliminated in the event MATS was rescinded are shown in Table 8. These do not include those costs associated with mercury controls and monitoring in those states that have Hg rules that predated MATS and would stay in effect regardless of whether or not MATS was rescinded. As shown, the total impact is on the order of $203 million. It is true that this does not account for the cost associated with PM or non-mercury metals measurements. However, these should be small compared to the $203 million for other costs. The impact on generation costs nationwide would average only about $0.17/MWh for energy generated by coal-fired power plants, which accounts for less than one-third of all generation.[14]

[13] $8500 per quarter, from https://www.powermag.com/simplify-mats-compliance-particulate-matter-continuous-emission-monitors/?printmode=1

[14] In 2018 total generation from coal was only 27.4% of total generation https://www.eia.gov/tools/faqs/faq.php?id=427&t=3

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Table 8. Total Annual Operating Costs for MATS technologies.

ACI in States without Hg Rules	$129,646,000
DSI	$53,812,000
Hg CEMS (no state rules)	$15,480,000
HCl	$4,522,000
Scrubber Chemicals (no state Hg rules)	$52,858,345
Total incremental cost of MATS	$203,460,000
Total 2018 MWh gross – all electric utility coal units	1,216,176,456*
$/MWh gross savings	$0.17*
Note: Not included in the above are mercury control and monitoring costs in states with pre-existing mercury rules that would remain in effect regardless of MATS * Net generation from coal in 2018 is reported as 1,146,000,000 MWh, which would result in a cost of $0.18/MWh.	

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Message

From: Vickie Patton [vpatton@edf.org]
Sent: 3/13/2021 4:27:49 AM
To: Hoffer, Melissa [Hoffer.Melissa@epa.gov]
Subject: Moment to Talk

Dear Ms. Hoffer, Do you have a moment to talk on Monday? Sincerely yours, Vickie Patton

This e-mail and any attachments may contain confidential and privileged information. If you are not the intended recipient, please notify the sender immediately by return e-mail, delete this e-mail and destroy any copies. Any dissemination or use of this information by a person other than the intended recipient is unauthorized and may be illegal.

Appointment

From: Casey Roberts [casey.roberts@sierraclub.org]
To: Hoffer, Melissa [hoffer.melissa@epa.gov]; Casey Roberts [casey.roberts@sierraclub.org]

Subject: Steam Electric Reconsideration Rule
Location: Microsoft Teams Meeting

Start: 5/24/2021 2:30:00 PM
End: 5/24/2021 3:30:00 PM
Show Time As: Tentative

Recurrence: (none)

POC: Monique Patrick

Microsoft Teams meeting
Join on your computer or mobile app
Click here to join the meeting< Ex. 6 Personal Privacy (PP)
Ex. 6 Personal Privacy (PP) 3a%
Or call in (audio only)
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options< Ex. 6 Personal Privacy (PP)
Ex. 6 Personal Privacy (PP)

Message

From: Suzanne Novak [snovak@earthjustice.org]
Sent: 4/27/2021 2:36:03 PM
To: Regan, Michael [Regan.Michael@epa.gov]; Freedhoff, Michal [Freedhoff.Michal@epa.gov]; collazo.yvette@epa.gov; Hoffer, Melissa [Hoffer.Melissa@epa.gov]
CC: ppookkulam@earthjustice.org
Subject: 5 U.S.C. § 553(e) petition enclosed
Attachments: PFAS PMN Exemptions Petition 04-27-2021.pdf

Dear Administrator Regan, Deputy Assistant Administrator Freedhoff, Director Collazo, and Acting General Counsel Hoffer,

Attached please find a Petition, pursuant to 5 U.S.C. § 553(e), on behalf of Advance Carolina; Alaska Communities Against Toxics; BlueGreen Alliance; Buxmont Coalition for Safer Water; Clean Cape Fear; Defend Our Health; Delaware Riverkeeper Network; Democracy Green; Environmental Defense Fund; International Association of Fire Fighters; Merrimack Citizens for Clean Water; the National PFAS Contamination Coalition; Natural Resources Defense Council (NRDC); Safer Chemicals, Healthy Families; and, Union of Concerned Scientists. The Petition requests that EPA prohibit the use of certain exemptions to the premanufacture notice requirements of the Toxic Substances Control Act for per- and polyfluoroalkyl substances (PFAS).

We are also sending this by First Class Mail to Administrator Regan.

Please do not hesitate to contact me with any questions.

Respectfully,

Suzanne Novak
Staff Attorney
Earthjustice Northeast Office
48 Wall Street, 15th Floor
New York, NY 10005
T: 212.823.4981
Pronouns: she/her/hers
earthjustice.org

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PETITION TO THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

To prohibit the use of certain exemptions to the premanufacture notice requirements of the Toxic Substances Control Act for per- and polyfluoroalkyl substances (PFAS)

SUBMITTED ON BEHALF OF:

Advance Carolina; Alaska Community Action on Toxics; BlueGreen Alliance; Buxmont Coalition for Safer Water; Clean Cape Fear; Defend Our Health; Delaware Riverkeeper Network; Democracy Green; Environmental Defense Fund; International Association of Fire Fighters; Merrimack Citizens for Clean Water; the National PFAS Contamination Coalition; Natural Resources Defense Council; Safer Chemicals, Healthy Families; and Union of Concerned Scientists

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DATE: April 27, 2021

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April 27, 2021

Via mail and e-mail

Michael Regan, Administrator
Michal Freedhoff, Principal Deputy Assistant Administrator Office of Chemical Safety and Pollution Prevention
Yvette Collazo, Director of the Office of Pollution Prevention and Toxics
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RE: Petition to prohibit the use of certain exemptions to the premanufacture notice requirements of the Toxic Substances Control Act for per- and polyfluoroalkyl substances (PFAS)

Dear Administrator Regan, Deputy Assistant Administrator Freedhoff, and Director Collazo,

Earthjustice, on behalf of Advance Carolina; Alaska Community Action on Toxics; BlueGreen Alliance; Buxmont Coalition for Safer Water; Clean Cape Fear; Defend Our Health; Delaware Riverkeeper Network; Democracy Green; Environmental Defense Fund; International Association of Fire Fighters; Merrimack Citizens for Clean Water; the National PFAS Contamination Coalition; Natural Resources Defense Council; Safer Chemicals, Healthy Families; and Union of Concerned Scientists (collectively, "Petitioners")[1] submit this petition requesting that the Environmental Protection Agency (EPA) amend regulations relating to the new chemical review process under the Toxic Substances Control Act (TSCA). *See* 5 U.S.C. § 553(e) (providing that each agency shall provide persons the right to petition for the "issuance, amendment, or repeal of a rule"). More specifically, Petitioners respectfully request that EPA amend four EPA-created exemptions from TSCA's pre-manufacture notice (PMN)

[1] Statements of interest from each Petitioner are set forth in Appendix A.

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requirement—the Byproducts Exemption, the Low Volume Exemption (LVE), the Low Release and Exposure Exemption (LoREX), and the Polymer Exemption—to prohibit their use for per- and polyfluoroalkyl substances ("PFAS").

INTRODUCTION

The United States is awash with PFAS: human-made, long-lasting, toxic, and often bioaccumulative chemicals. Thousands of these structurally similar and largely unregulated chemicals have been used across various industries and goods, including in firefighting foam, non-stick cookware, food packaging, and many other household products. People are exposed to PFAS through various sources, including the products we use, the food we eat, the air we breathe, and the water we drink, and PFAS from those various sources accumulate in our bodies. PFAS are pervasive in the environment and present in the bodies of virtually every person in the U.S.

The weight of the scientific evidence developed over the past few years has shown that exposure to even small amounts of a variety of PFAS is associated with numerous adverse health effects, including cancer and immune suppression. And PFAS pose even greater risks to potentially exposed or susceptible subpopulations ("greater risk populations"), including firefighters, communities living in polar regions, communities living near facilities that release PFAS, infants, children, and developing fetuses. Scientists agree that all yet-unstudied PFAS may have similar effects on human health.

Wide usage and poor regulation of PFAS have led to extensive contamination throughout the United States and an emerging public health crisis. Yet, EPA continues to permit new PFAS to enter commerce through TSCA's new chemicals program, despite the risks they pose.

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Moreover, in recent years, most of those approvals occurred through exemptions to EPA's PMN program—thereby curtailing or entirely sidestepping a process designed to require an individual safety review of potentially toxic chemicals and keep the public apprised of those reviews. Three of those exemptions are the primary subjects of this petition—the Byproducts Exemption, the LVE, and the LoREX Exemption (collectively, "Challenged Exemptions"). At least one environmental contamination crisis in the Cape Fear River Basin in North Carolina involved PFAS released into communities through such a loophole; yet it is unknown how many other similar crises exist or are in the making since there is little public information about PFAS approved through such loopholes.

TSCA permits use of PMN exemptions only for chemicals that EPA determines *will not* present an unreasonable risk of injury to human health or the environment. Thus, as EPA has acknowledged, if a class of chemicals cannot or no longer can meet that high standard for a particular exemption, TSCA requires EPA to make that class of chemicals ineligible for the exemption. The Byproduct, LVE, and LoREX Exemptions were enacted decades ago, long before the risks associated with exposure to even low levels of PFAS were known and before TSCA required EPA to consider risks to greater risk populations when deciding whether the "will not present an unreasonable risk" standard had been met. In light of the information now known about PFAS and the changes made by the 2016 amendments to TSCA's "unreasonable risk" assessment, EPA cannot conclude that new PFAS that would otherwise meet the non-risk criteria for the Byproduct, LVE, and LoREX Exemptions will not present an unreasonable risk. As discussed further herein, it is legally impermissible—as well as dangerous—to continue to permit approval of new PFAS via the Byproduct, LVE, and LoREX Exemptions. EPA therefore must and should grant this Petition and make PFAS ineligible for those Challenged Exemptions.

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For similar reasons, EPA should also amend the Polymer Exemption—which already makes certain PFAS ineligible for it—to ensure the exclusion of all PFAS polymers.

FACTUAL BACKGROUND

A. Overview of PFAS Characteristics and Uses

Per- and polyfluoroalkyl substances ("PFAS") are a "large, complex, and ever-expanding" family of human-made organic chemicals used in hundreds of products and industrial processes, including airplane jet engines, firefighting foam, and everyday products like waterproof jackets, nonstick pans, and paints.[2] PFAS typically have a linear or branched carbon chain or "backbone," characterized by the replacement of hydrogen (H) atoms with fluorine (F) atoms that are bonded to the carbon chain.[3] PFAS, for purposes of this Petition, are defined by having at least one perfluoroalkyl moiety, or a carbon atom from which all bonded H atoms have been replaced with F atoms.[4] The carbon-fluorine bond is "one of the strongest ever created by man," making PFAS extremely persistent in the environment and difficult to break down or remediate.[5] PFAS also often have bioaccumulative qualities (they can build up in the human

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[2] *See* EPA, *Per- and Polyfluoroalkyl Substances (PFASs): Chemistry and Behavior*, CLU-IN, https://clu-in.org/contaminantfocus/default.focus/sec/Per-_and_Polyfluoroalkyl_Substances_(PFASs)/cat/Chemistry_and_Behavior/ (last updated Apr. 20, 2021). *See also* Organisation for Economic Co-operation and Development (OECD), *Toward a New Comprehensive Global Database of Per- And Polyfluoroalkyl Substances (PFASs): Summary Report on Updating the OECD 2007 List of Per- And Polyfluoroalkyl Substances (PFASs)* (2018), https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=ENV-JM-MONO(2018)7&doclanguage=en; KEMI Swedish Chemicals Agency, *Occurrence and Use of Highly Fluorinated Substances and Alternatives* (2015), https://www.kemi.se/download/18.6df1d3df171c243fb23a98ea/1591454109137/report-7-15-occurrence-and-use-of-highly-fluorinated-substances-and-alternatives.pdf; Julian Glüge et al., *An Overview of the Uses of Per- and Polyfluoroalkyl Substances (PFAS)*, 12 Env't Sci: Process & Impacts 2345 (2020), https://pubs.rsc.org/en/content/articlelanding/2020/EM/D0EM00291G#!divAbstract.

[3] Robert C. Buck et al., *Perfluoroalkyl and Polyfluoroalkyl Substances in The Environment: Terminology, Classification, and Origins*, 7 Integrated Env't Assessment & Mgmt. 513 (2011), https://setac.onlinelibrary.wiley.com/doi/full/10.1002/ieam.258.

[4] *Id.*

[5] *See Examining the Federal Response to the Risks Associated with Per- and Polyfluoroalkyl Substances (PFAS): Hearing Before the S. Comm. on Env't & Pub. Works*, 116th Cong. 2 (2019) (testimony of Linda S. Birnbaum, Dir., Nat'l Inst. Env't Health Sci. & Nat'l Toxicology Program, Nat'l Ins. Health); Zhanyun Wang et al., *A Never-Ending Story of Per- and Polyfluoroalkyl Substances (PFASs)?*, 51 Env't Sci. & Tech. 2508 (2017), https://pubs.acs.org/doi/10.1021/acs.est.6b04806.

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body over time) and, as discussed further herein, have been shown to be toxic at very low levels.[6]

PFAS encompass a wide array of chemicals with varying size, structure, and chemical composition. The original PFAS, such as PFOA and PFOS, are referred to as "long-chain" (because of the length of the carbon chain and the number of fluorine atoms bonded to the carbon chain). In an attempt to address growing concerns over the toxicity, environmental persistence, and biological uptake of long-chain PFAS, manufacturers shifted towards producing and using shorter-chain or "replacement" PFAS in more recent years,[7] resulting in significant increases of those PFAS in the environment.[8] EPA estimates there are over 6,000 known PFAS, for over 1,000 of which EPA does not have a defined chemical structure.[9] These known PFAS include short- and long-chain PFAS, PFAS polymers, and PFAS "precursors," or compounds that may degrade to long- and short-chain PFAS in the environment.[10]

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[6] *See, e.g.*, Carol F. Kwiatkowski et al., *Scientific Basis for Managing PFAS as a Chemical Class*, 7 Env't Sci. & Tech. Letters 532 (2020), https://pubs.acs.org/doi/abs/10.1021/acs.estlett.0c00255.

[7] Stephen K. Ritter, *Fluorochemicals Go Short*, c&en (Feb. 1, 2020), https://cen.acs.org/articles/88/i5/Fluorochemicals-Short.html.

[8] Buck et al., *supra* note 3, at 524. *See also* Mei Sun et al., *Legacy and Emerging Perfluoroalkyl Substances Are Important Drinking Water Contaminants in the Cape Fear River Watershed Of North Carolina*, 3 Env't Sci. & Tech. Letters 415 (2016), https://pubs.acs.org/doi/full/10.1021/acs.estlett.6b00398; Xianming Zhang et al., *Source Attribution of Poly- and Perfluoroalkyl Substances (PFASs) in Surface Waters from Rhode Island and the New York Metropolitan Area*, 3 Env't Sci. & Tech. Letters 316 (2016), https://pubs.acs.org/doi/abs/10.1021/acs.estlett.6b00255.

[9] *PFAS Master List of PFAS Substances (Version 2)*, EPA, https://comptox.epa.gov/dashboard/chemical_lists/pfasmaster (last updated Sept. 16, 2020). Lists PFAS "from within and outside EPA, encompass PFAS of potential interest based on environmental occurrence (through literature reports and analytical detection) and manufacturing process data, as well as lists of PFAS chemicals procured for testing within EPA research programs. The consolidated list contains 6330 PFAS CAS-name substances, with 5264 represented with a defined chemical structure."

[10] Kwiatkowski et al., *supra* note 6; Buck et al., *supra* note 3.

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B. A Growing Body of Research Demonstrates the Serious Risks PFAS Pose to Human Health

Human exposure to several well-studied and widely-produced PFAS has been linked to a variety of adverse health effects, including cancer, elevated cholesterol, obesity, immune suppression, pre-eclampsia, liver and kidney damage, and endocrine disruption.[11] Some of these adverse effects have been linked to both short- and long-term exposures at extremely low concentrations.[12] For purposes of comparison, most chemicals that have been deemed toxic at low levels of exposure, like cyanide, are considered toxic at exposure concentrations of parts per billion. However, some PFAS exert toxicity at the parts per trillion level; this means that these PFAS are linked to harm at exposure levels 1,000 times lower than cyanide.[13]

The link between PFAS exposure and cancer has garnered increasing attention over the past few years. Most members of the Science Advisory Board to EPA concluded that PFOA is "likely to be carcinogenic to humans," and the International Agency for Research on Cancer (IARC), a branch of the World Health Organization, has characterized PFOA as "possibly carcinogenic to humans."[14] Several epidemiological studies have established a link between PFOA exposure and certain cancers. For example, a 2013 study examining a group of people residing near a chemical plant in the Mid-Ohio Valley found significant associations between exposure to PFOA and kidney and testicular cancer.[15] Short-chain "replacement" PFAS were

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[11] Agency for Toxic Substances and Disease Registry (ATSDR), U.S. Dep't Health & Hum. Servs., *Toxicological Profile for Perfluoroalkyls: Draft for Public Comment* (2018), https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf.
[12] *Id.*
[13] *See Ground Water and Drinking Water*, EPA, https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations (last updated Jan. 5, 2021).
[14] Letter from Dr. M. Granger Morgan, Chair, EPA Sci. Advisory Bd., & Dr. Deborah Cory-Slechta, Chair, PFOA Risk Assessment Rev. Panel, to Stephan L. Johnson, Adm'r, EPA at 3 (May 30, 2006), https://nepis.epa.gov/Exe/ZyPDF.cgi/901S0J00.PDF?Dockey=901S0J00.PDF; IARC Working Grp. on the Evaluation of Carcinogenic Risks to Hums., *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 110: Some Chemicals Used as Solvents and in Polymer Manufacture* ch. 6.3 (Int'l Agency for Rsch. on Cancer 2017), https://www.ncbi.nlm.nih.gov/books/NBK436276/#a006.sec6.3.
[15] Vaughn Barry et al., *Perfluorooctanoic Acid (PFOA) Exposures and Incident Cancers Among Adults Living Near a Chemical Plant*, 121 Env't Health Persp. 1313 (2013) https://pubmed.ncbi.nlm.nih.gov/24007715/.

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also detected in North Carolina's Cape Fear River watershed,[16] which serves as the drinking water supply for several counties that have been identified as potential cancer clusters for testicular and thyroid cancer.[17] Studies are currently underway to establish possible associations between the PFAS and those cancer clusters.[18]

Amidst the global COVID-19 pandemic, the effects of certain PFAS on the immune system are especially concerning. In 2016, the National Toxicology Program concluded that PFOA and PFOS are presumed to pose "an immune hazard to humans based on a high level of evidence that PFOA [and PFOS] suppressed the antibody response."[19] These conclusions were based in part upon a study examining a cohort of children that linked high serum concentrations of PFOA and PFOS in the children to a weakened antibody response following vaccination.[20]

C. Research Also Demonstrates PFAS's Risks to Aquatic Organisms

PFAS exposure is also associated with acute and chronic toxicity in many aquatic species, including algae, invertebrates, amphibians, and fish. In these species, PFAS exposure was associated with increased mortality, immunotoxicity, and a range of growth and developmental effects.[21] For example, high serum levels of PFAS were detected in striped bass

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[16] Sun et al., *supra* note 8.

[17] N.C. Dep't Health & Hum. Servs., *Summary of Selected Cancer Rates for Bladen, Brunswick, New Hanover and Pender Counties, 1996 – 2015, and Comparison to Statewide Rates* (2018), https://epi.dph.ncdhhs.gov/oee/pfas/Summary%20of%20Selected%20Cancer%20Rates_all%20counties_7Nov2018.pdf.

[18] Stapleton Lab, *PFAS Research*, Duke Nicholas School of the Environment, https://sites.nicholas.duke.edu/stapletonlab/research/pfas-research/ (last visited Mar. 15, 2021).

[19] Nat'l Toxicology Program, U.S. Dep't Health & Hum. Servs., *NTP Monograph on Immunotoxicity Associated with Exposure to Perfluorooctanoic Acid (PFOA) or Perfluorooctane Sulfonate (PFOS)* 1 (2016), https://ntp.niehs.nih.gov/ntp/ohat/pfoa_pfos/pfoa_pfosmonograph_508.pdf.

[20] Philippe Grandjean et al., *Serum Vaccine Antibody Concentrations in Children Exposed to Perfluorinated Compounds*, 307 JAMA 1142 (2012), https://pubmed.ncbi.nlm.nih.gov/22274686/.

[21] Lutz Ahrens & Mirco Bundschuh, *Fate and Effects of Poly- and Perfluoroalkyl Substances in the Aquatic Environment: A Review*, 33 Env't Toxicology & Chemistry 1921 (2014), https://setac.onlinelibrary.wiley.com/doi/full/10.1002/etc.2663; John P. Giesy et al., *Aquatic Toxicology of Perfluorinated Chemicals*, 202 Rev. Env't Contamination & Toxicology 1 (2010), https://link.springer.com/chapter/10.1007%2F978-1-4419-1157-5_1; R. Wesley Flynn et al., *Chronic Per-/Polyfluoroalkyl Substance Exposure Under Environmentally Relevant Conditions Delays Development in Northern*

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in North Carolina's Cape Fear River, an economically important, yet declining, commercial and recreational fish population in the region. The levels were the highest recorded of any fish species studied in the country, and were associated with immune and liver dysfunction, potentially reducing survival for this commercially important fish population.[22]

PFAS also biomagnify along ecosystem food chains, which results in greater risks of adverse health effects to both larger animals and to people who eat them. More specifically, PFAS can be absorbed by plants and algae that are then subsequently ingested by wildlife, accumulating up the food chain.[23] This phenomenon results in the buildup of PFAS in larger organisms, like marine mammals.

D. PFAS Contamination Is a Widespread Problem Throughout the United States

As a result of their: chemical characteristics; widespread use; and limited regulation of their manufacture, disposal, and releases into the environment, PFAS are now pervasive environmental contaminants.[24] PFAS enter the environment in several ways, including from the

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Leopard Frog (Rana pipiens) Larvae, 40 Evn't Toxicology & Chemistry 711 (2020), https://setac.onlinelibrary.wiley.com/doi/abs/10.1002/etc.4690; R. Wesley Flynn et al., *Dietary Exposure and Accumulation of Per- and Polyfluoroalkyl Substances Alters Growth and Reduces Body Condition of Post-Metamorphic Salamanders*, 765 Sci. Total Env't 142730 (2021), https://www.sciencedirect.com/science/article/abs/pii/S0048969720362598; Gerald T. Ankley et al., *Assessing the Ecological Risks of Per- and Polyfluoroalkyl Substances: Current State-of-the Science and a Proposed Path Forward*, 40 Env't Toxicology & Chemistry 564 (2020), https://setac.onlinelibrary.wiley.com/doi/10.1002/etc.4869; Georgia M. Sinclair et al., *What Are the Effects of PFAS Exposure at Environmentally Relevant Concentrations?*, 258 Chemosphere 127340 (2020), https://www.sciencedirect.com/science/article/pii/S0045653520315332#bib53.

[22] Theresa C. Guillette et al., *Elevated Levels of Per-And Polyfluoroalkyl Substances in Cape Fear River Striped Bass (Morone Saxatilis) Are Associated with Biomarkers of Altered Immune and Liver Function*, 136 Env't Int'l 105358 (2020), https://www.sciencedirect.com/science/article/pii/S0160412019334762.

[23] *See, e.g.*, Claudia E. Müller et al., *Biomagnification of Perfluorinated Compounds in a Remote Terrestrial Food Chain: Lichen–Caribou–Wolf*, 45 Env't Sci. & Tech. 8665 (2011), https://pubs.acs.org/doi/10.1021/es201353v.

[24] *See, e.g.*, Xindi C. Hu et al., *Detection of Poly- and Perfluoroalkyl Substances (PFASs) in US Drinking Water Linked to Industrial Sites, Military Fire Training Areas, and Wastewater Treatment Plants*, 3 Env't Sci. & Tech. Letters 344 (2016), https://pubs.acs.org/doi/abs/10.1021/acs.estlett.6b00260; Keegan Rankin et al., *A North American and Global Survey of Perfluoroalkyl Substances in Surface Soils: Distribution Patterns and Mode of Occurrence*, 161 Chemosphere 333 (2016), https://www.researchgate.net/publication/305498037_A_North_American_and_global_survey_of_perfluoroalkyl_substances_in_surface_soils_Distribution_patterns_and_mode_of_occurrence; Belén González-Gaya et al., Perfluoroalkylated Substances in the Global Tropical and Subtropical Surface Oceans. 48 Env't Sci. & Tech. 13076 (2014), https://pubs.acs.org/doi/10.1021/es503490z.

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manufacturing, processing, use, and disposal of PFAS and products that either contain PFAS or generate PFAS as a waste byproduct.[25] In addition, PFAS precursors that are emitted or released into the environment via these pathways can biotransform into other PFAS, including long-chain PFAS like PFOA that have been largely phased out.[26]

People are then routinely exposed to these chemicals from multiple sources, including their water, food, and products and materials they use or contact. PFAS exposure occurs inside homes through treated furniture and rugs, cookware and cleaning supplies, and inhalation of household dust particles carrying PFAS molecules. As a result of these varied and continuing exposures, PFAS have been detected in nearly 99 percent of Americans.[27]

In the United States, PFAS-contaminated drinking water is a significant exposure route of concern.[28] A 2016 study estimated that 16.5 million Americans across 33 states and three American territories were supplied drinking water with detectable levels of PFAS. For six million of these individuals, PFOS and PFOA levels exceeded EPA's health advisory level of 70 ppt.[29] The 2016 study, however, likely underestimates how many people in the U.S. are drinking

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[25] Buck et al., *supra* note 3, at 518; Martin Scheringer & Zhanyun Wang, OECD & UNEP Global PFC Group, *Synthesis Paper on Per- and Polyfluorinated Chemicals (PFCs)* 21 (2013), https://www.oecd.org/chemicalsafety/risk-management/synthesis-paper-on-per-and-polyfluorinated-chemicals.htm. *See also* Andrew B. Lindstrom et al., *Application of WWTP Biosolids and Resulting Perfluorinated Compound Contamination of Surface and Well Water in Decatur, Alabama, USA*, 45 Env't Sci. & Tech. 8-15 (2011), https://pubs.acs.org/doi/10.1021/es1039425; N.C. Dep't Env't Quality, *GenX Frequently Asked Questions* (2017), https://files.nc.gov/ncdeq/GenX/FAQ_updated_100417-5.pdf (stating that GenX is "also produced as a byproduct during other manufacturing processes and it may have been present in the environment for many years before being produced commercially as GenX.").

[26] Kwiatkowski et al., *supra* note 6; Craig Butt et al., *Biotransformation Pathways of Fluorotelomer-based Polyfluoroalkyl Substances: A Review*, 33 Env't Toxicology & Chemistry 243 (2013), https://doi.org/10.1002/etc.2407; Buck et al., *supra* note 3.

[27] Antonia M. Calafat et al., *Polyfluoroalkyl Chemicals in the US population: Data from the National Health and Nutrition Examination Survey (NHANES) 2003–2004 and Comparisons with NHANES 1999–2000*, 115 Env't Health Persps. 1596 (2007), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2072821/. *See also* CDC, ATSDR, *An Overview of Perfluoroalkyl and Polyfluoroalkyl Substances and Interim Guidance for Clinicians Responding to Patient Exposure Concerns* (2018), https://stacks.cdc.gov/view/cdc/77114.

[28] Hu et al., *supra* note 24.

[29] *Id.* at 344.

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water contaminated with PFAS, the level of PFAS in U.S. drinking water, and the extent to which individuals are potentially harmed by this PFAS contamination because: 1) EPA's available water testing methods have the capability to detect only a few dozen out of the thousands of PFAS in circulation; and 2) adverse health effects are associated with exposure to PFAS at lower levels than PFAS are tested for in the environment, or reported.[30]

Once PFAS enter the environment, they can stay there for decades or longer.[31] In fact, DuPont scientists have confirmed that certain PFAS take between "1200 and 1700 years" to degrade. Due to their persistent nature and high mobility in water, PFAS undergo a process called global distillation, or the "grasshopper effect," that causes PFAS in the environment to migrate to polar regions over time.[32] Global ocean current patterns represent a significant pathway for this long-range transport of PFAS to the Arctic; for example, an estimated two to twelve metric tons of PFOA are transported to the Arctic every year.[33] Recent studies also detected the replacement PFAS GenX in remote Arctic waters.[34] The transported PFAS accumulate over time in the environment and in biological organisms.[35] Arctic mammals and

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[30] Jody Shoemaker & Dan Tettenhorst, EPA, Office Rsch. & Dev., EPA/600/R-18/352, *Method 537.1: Determination of Selected Per- and Polyfluorinated Alkyl Substances in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)* (2018), https://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=343042&Lab=NERL&simpleSearch=0&showCriteria=2&searchAll=Determination+of+Selected+Per-+and+Polyfluorinated+Alkyl+Substances+&TIMSType=&dateBeginPublishedPresented=11%2F02%2F2016.

[31] Wang et al., *supra* note 5.

[32] Samuel Byrne et al., *Exposure to Polybrominated Diphenyl Ethers and Perfluoroalkyl Substances in a Remote Population of Alaska Natives*, 231 Env't Pollution 387 (2017), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6945979/pdf/nihms-967862.pdf.

[33] Konstantinos Prevedouros et al., *Sources, Fate and Transport of Perfluorocarboxylates*, 40 Env't Sci. & Tech. 32 (2006), https://pubmed.ncbi.nlm.nih.gov/16433330/.

[34] Hanna Joerss et al., *Transport of Legacy Perfluoroalkyl Substances and the Replacement Compound HFPO-DA through the Atlantic Gateway to the Arctic Ocean—Is the Arctic a Sink or a Source?*, 54 Env't Sci. & Tech. 9958 (2020), https://pubs.acs.org/doi/abs/10.1021/acs.est.0c00228.

[35] Inputs of PFOA to the Arctic via ocean currents are nearly two times greater than those from atmospheric deposition of precursor breakdown products. Derek C. G. Muir & Cynthia A. de Wit, *Trends of Legacy and New Persistent Organic Pollutants in the Circumpolar Arctic: Overview, Conclusions, and Recommendations*, 408 Sci. Total Env't 3044 (2010), https://www.sciencedirect.com/science/article/abs/pii/S004896970901147 4; Prevedouros et al., *supra* note 33.

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birds inhabiting supposedly pristine habitats have detectable PFAS concentrations in their blood serum, liver, and fat tissues.[36] This includes sensitive species such as beluga whales and polar bears.[37]

E. Greater Risk Populations Experience Greater Risks of Harm from PFAS Exposure

While PFAS are pervasive environmental contaminants and are detectable in the blood serum of most Americans,[38] scientific studies have identified certain subpopulations that are more vulnerable to the adverse health effects of PFAS exposure due to either greater exposure or greater susceptibility to harm than the general population. Such greater risk populations include occupational workers, firefighters, communities living in polar regions, communities living near facilities that release PFAS, children, infants, and the developing fetus. Firefighters, for instance, are highly exposed to PFAS from both their presence in the fire-fighting foam as well as the PFAS-coated protective gear for heat resistance (i.e. "turnout gear") and combusted PFAS-treated household items like carpets and furniture.[39] Additionally, biomonitoring data of workers in the fluorochemical industry over decades have demonstrated consistently higher levels of PFAS in blood serum compared to the general population.[40] Arctic communities, including Alaskan Indigenous Tribal Communities, particularly those that subsist on fish and marine mammals, also experience disproportionately high levels of PFAS exposure due to the

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[36] *See, e.g.*, Wouter A. Gebbink et al., *Observation of Emerging Per- and Polyfluoroalkyl Substances (PFASs) in Greenland Marine Mammals*, 144 Chemosphere 2384 (2016), https://pubmed.ncbi.nlm.nih.gov/26610298/.
[37] *Id*; Jonathan W. Martin et al., *Identification of Long-Chain Perfluorinated Acids in Biota from the Canadian Arctic*, 38 Env't Sci. & Tech. 373 (2004), https://pubs.acs.org/doi/10.1021/es034727%2B.
[38] Calafat et al., *supra* note 27. *See also* ATSDR *Overview of Perfluoroalkyl and Polyfluoroalkyl Substances*, *supra* note 27.
[39] *See UArizona Researchers Study Health Risks of Chemicals in Firefighter Foam, Gear*, FireEngineering (Feb. 13, 2020), https://www.fireengineering.com/2020/02/13/484059/uarizona-researchers-study-health-risks-of-chemicals-in-firefighter-foam-gear/#gref.
[40] *See* Geary W. Olsen, *PFAS Biomonitoring in Higher Exposed Populations*, *in* Toxicological Effects of Perfluoroalkyl and Polyfluoroalkyl Substances 77, 80–99 (Jamie C. DeWitt ed., Springer Int'l Publ'g 2015).

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aforementioned long-range transport of PFAS to polar regions and bioaccumulation in Arctic aquatic organisms.[41]

Children, infants, and the developing fetus are also exposed to higher levels of PFAS and are more susceptible to harm from these exposures. PFAS can transfer across the placenta, and have been found in umbilical cord blood,[42] putting the developing fetus at risk of exposure.[43] Exposure to even low levels of certain PFAS during pregnancy has been linked to decreased birth weight,[44] and altered growth, learning, and immune responses in infants and older children.[45] PFAS have also been detected in breast milk, prolonging exposures beyond pregnancy and into infancy and early childhood.[46] And because of their small size, dietary intake, and increased likelihood of hand-to-mouth behaviors, children and infants bear higher body burdens (i.e. have higher serum concentration per body weight) and experience higher PFAS exposures than older individuals.[47]

Scientists describe the period of early life, spanning from early pregnancy to early childhood as a "critical window" of development during which rapid growth, differentiation,

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[41] Samuel C. Byrne et al., *Exposure to Polybrominated Diphenyl Ethers and Perfluoroalkyl Substances in a Remote Population of Alaska Natives*, 231 Env't Pollution 387 (2017), https://doi.org/10.1016/j.envpol.2017.08.020; Samuel C. Byrne et al., *Exposure to Perfluoroalkyl Substances and Associations with Serum Thyroid Hormones in a Remote Population of Alaska Natives*, 166 Env't Rsch. 537 (2018), https://doi.org/10.1016/j.envres.2018.06.014.
[42] *See, e.g.*, Tye E. Arbuckle et al., *Umbilical Cord Blood Levels of Perfluoroalkyl Acids and Polybrominated Flame Retardants*, 216 Int'l J. Hygiene & Env't Health 184 (2013), https://www.sciencedirect.com/science/article/abs/pii/S143846391200034X.
[43] Kerstin Winkens et al., *Early Life Exposure to Per- and Polyfluoroalkyl Substances (PFASs): A Critical Review*, 3 Emerging Contaminants 55 (2017), https://www.sciencedirect.com/science/article/pii/S2405665017300033.
[44] ATSDR *Toxicological Profile for Perfluoroalkyls*, *supra* note 11, at 12–14; Cathrine C. Bach et al., *Perfluoroalkyl and Polyfluoroalkyl Substances and Human Fetal Growth: A Systematic Review*, 45 Critical Revs. in Toxicology 53, https://doi.org/10.3109/10408444.2014.952400; Paula I. Johnson et al., *The Navigation Guide—Evidence-Based Medicine Meets Environmental Health: Systematic Review of Human Evidence for PFOA Effects on Fetal Growth*, 122 Env't Health Persps. 1028, https://doi.org/10.1289/ehp.1307893.
[45] Kristen M. Rappazzo et al., *Exposure to Perfluorinated Alkyl Substances and Health Outcomes in Children: A Systematic Review of the Epidemiologic Literature*, 14 Int'l J. Env't Rsch. & Pub. Health 691 (2017), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5551129/.
[46] *See, e.g.*, Arbuckle et al., *supra* note 42.
[47] Winkens et al., *supra* note 43.

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nutrition uptake, and formation of final organ structures occur. For these reasons, toxic chemicals can have devastating, life-long impacts even at low levels of exposure during early development.[48] Studies have linked early life exposures to some PFAS—including both long-chain and replacement PFAS—to impaired growth, learning, and immune response,[49] as well as delayed puberty[50] and decreased antibody response following childhood vaccinations.[51] This early life sensitivity to PFAS exposure is reflected in scientific assessments conducted by federal agencies: ATSDR calculated that the minimal risk levels ("MRLs") (an estimate of the amount of a chemical a person can eat, drink, or breathe each day without a detectable risk to health) for children who drink water contaminated with certain PFAS, including PFOA, PFOS, PFHxS, and PFNA, are a quarter to a third of the MRLs for healthy adults.[52]

Finally, communities residing near PFAS-contaminated sites should also be considered greater risk populations because they experience higher levels of PFAS exposure and could be additionally burdened by other non-chemical stressors that increase susceptibility to harm from PFAS.

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[48] Jerrold J. Heindel et al., *Developmental Origins of Health and Disease: Integrating Environmental Influences*, 156 Endocrinology 3416 (2015), https://bit.ly/3b3ibNZ; Deborah Bennett et al., *Project TENDR: Targeting Environmental Neuro-Developmental Risks the TENDR Consensus Statement*, 124 Env't Health Persps. A118 (2016), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4937840/.

[49] Rappazzo et al., *supra* note 45; Chunyuan Fei, *Perfluorinated Chemicals and Fetal Growth: A Study within the Danish National Birth Cohort*, 115 Env't Health Persps. 1677 (2007), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2072850/.

[50] Maria-Jose Lopez-Espinosa et al., *Association of Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate* (PFOS) with *Age* of *P*uberty among *Children Living Near* a *Chemical Plant*, 45 Env't Sci. & Tech. 8160 (2011), https://pubs.acs.org/doi/10.1021/es1038694.

[51] *See, e.g.*, Berit Granum et al., *Pre-Natal Exposure to Perfluoroalkyl Substances May Be Associated with Altered Vaccine Antibody Levels and Immune-Related Health Outcomes in Early Childhood*, 10 J. Immunotoxicology 373 (2013), https://www.tandfonline.com/doi/full/10.3109/1547691X.2012.755580; Winkens et al., *supra* note 43.

[52] ATSDR converted the MRL to drinking water concentrations by accounting for an average adult's or child's weight and water intake. ATSDR, *ATSDR's Minimal Risk Levels (MRLs) and Environmental Media Evaluation Guides (EMEGs) for PFAS* (2018), https://www.atsdr.cdc.gov/pfas/docs/PFAS-MRL-HA-H.pdf.

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F. Replacement PFAS Can Be Presumed to Pose Similar Risks to Human Health and the Environment

Scientists agree that PFAS—including both long-chains and their replacements—have the capability to exert similar, serious harm to human and environmental health. As the federal government's own scientists have recognized, the entire class of PFAS is comprised of structurally similar compounds that scientists can "reasonably expect to act through the same pathways and have similar effects."[53] Recent studies examining toxicity of the shorter-chain, replacement PFAS support this idea.[54] For example, an animal toxicity study demonstrated that exposure to the widely used short-chain replacement GenX was associated with many of the same health effects as long-chain PFAS, including developmental toxicity.[55] In particular, "[m]ultiple lines of evidence," including human and animal studies, indicate that old and new PFAS are immunotoxicants.[56]

By virtue of their carbon-fluorine bonds, PFAS, including short-chain replacement compounds, are expected to persist in the body and environment.[57] A group of the world's top scientists in PFAS research stated that "replacement[] [PFAS] will be similarly resistant to ultimate degradation, i.e. persistent, in the environment as long-chain PFAS[]."[58] Indeed, EPA itself has stated that "[s]hort-chain PFAS are as persistent in the environment as their longer-

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[53] Testimony of Linda S. Birnbaum, *supra* note 5, at 4; *see also* Wang et al., *supra* note 5.
[54] *See PFAS-Tox Database: Easy Access to Health and Toxicology Data on PFAS*, PFAS-TOX Database, https://pfastoxdatabase.org/ (last visited Apr. 23, 2021).
[55] Justin M. Conley et al., *Adverse Maternal, Fetal, and Postnatal Effects of Hexafluoropropylene Oxide Dimer Acid (GenX) from Oral Gestational Exposure in Sprague-Dawley Rats*, 127 Env't Health Persps. 037008 (2019), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6768323/.
[56] Kwiatkowski et al., *supra* note 6, at 534.
[57] Geary W. Olsen et al., *Half-life of Serum Elimination of Perfluorooctanesulfonate, Perfluorohexanesulfonate, and Perfluorooctanoate in Retired Fluorochemical Production Workers*, 115 Env't Health Persps. 1298 (2007), https://pubmed.ncbi.nlm.nih.gov/17805419/. *See also* ATSDR *Toxicological Profile for Perfluoroalkyls*, *supra* note 11, at 4.
[58] Martin Scheringer et al., *Helsingør Statement on Poly-and Perfluorinated Alkyl Substances (PFASs)*, 114 Chemosphere 337, 337 (2014), https://www.sciencedirect.com/science/article/pii/S004565351400678X.

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chain analogues."[59] As a result, as mentioned above, both old and new PFAS have been detected in remote and pristine lands near the Arctic, reflecting their similar long-range mobility and persistence.[60] Some replacement PFAS may present even greater risks to the environment than the long-chain PFAS they replaced. The weight of the scientific evidence shows that replacement PFAS may be equally, if not more, mobile in aqueous environmental media and in soil,[61] potentially resulting in contamination across greater distances.[62] And, recent studies suggest that traditional water treatment systems used to remove long-chain PFAS may be less efficient at absorbing and capturing shorter-chain, replacement PFAS.[63]

Large-scale biomonitoring studies are already showing an increasing trend of unidentified PFAS compounds in people,[64] which suggests that people are being exposed to new and unidentifiable PFAS, likely as a result of: environmental releases of complex mixtures of older and newer PFAS from industrial processes; poorly regulated or unregulated disposal of PFAS and PFAS-containing mixtures and products; and from use of products containing PFAS.

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[59] EPA, *EPA's Per- and Polyfluoroalkyl Substances (PFAS) Action Plan* 13 (2019), https://nepis.epa.gov/Exe/ZyPDF.cgi/P100W32I.PDF?Dockey=P100W32I.PDF.
[60] *See* Joerss et al., *supra* note 34; Muir & de Wit, *supra* note 35.
[61] John W. Washington et al., *Nontargeted Mass-Spectral Detection of Chloroperfluoropolyether Carboxylates in New Jersey Soils*, 368 Science 1103 (2020), https://science.sciencemag.org/content/368/6495/1103.
[62] Stephan Brendel et al., *Short-chain Perfluoroalkyl Acids: Environmental Concerns and a Regulatory Strategy under REACH*, 30 Env't Scis. Eur. 9 (2018), https://enveurope.springeropen.com/articles/10.1186/s12302-018-0134-4.
[63] Philip McCleaf et al., *Removal Efficiency of Multiple Poly-and Perfluoroalkyl Substances (PFASs) in Drinking Water Using Granular Activated Carbon (GAC) and Anion Exchange (AE) Column Tests*, 120 Water Rsch. 77 (2017), Water research, https://pubmed.ncbi.nlm.nih.gov/28478297/.
[64] Leo W. Y. Yeung & Scott A. Mabury, *Are Humans Exposed to Increasing Amounts of Unidentified Organofluorine?*, 13 Env't Chemistry 102 (2015), http://www.publish.csiro.au/en/EN15041.

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BACKGROUND & LEGAL FRAMEWORK

A. Pre-Manufacture Notice—Safety Review and Approval of New Chemicals

TSCA's Pre-Manufacture Notice (PMN) requirement is designed to identify and protect against substances that may present unreasonable risks—*before* those substances enter the market.[65] A company intending to manufacture (which TSCA defines as encompassing both domestic production and import) a new chemical substance[66] for commercial purposes in the United States must submit to EPA a PMN at least 90 days before the date it wishes to commence manufacture. 15 U.S.C. § 2604(a)(1); *id.* at (i)(1) (defining manufacture as meaning manufacturing for commercial purposes); 15 U.S.C. § 2602 (defining manufacture to mean manufacture, produce, or import); 40 C.F.R. § 720.22. The applicable review period is 90 days, which the Administrator may extend for up to an additional 90 days when necessary to review all relevant information.[67] 15 U.S.C. §§ 2604(a)(1)(B), 2604(c), 2604(i). During this period, EPA must conduct a safety review for the new chemical and make one of five determinations:

> (1) that the substance "presents an unreasonable risk of injury to health or the environment;"

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[65] *See* S. Rep. No.94-698, at 10 (1976) ("[Tlhe premarket notification provisions of the committee bill forms the backbone of the preventive aspects of health protection sought by this legislation."); *see also* Env't & Nat'l Res. Pol'y Div, Libr. of Cong., *Legislative History of the Toxic Substances Control Act Together with a Section-By-Section Index* 215 (1976), http://fluoridealert.org/wp-content/uploads/tsca.legislative-history.pdf ("[A] strong premarket screening process is a key factor in effective operation of this legislation.") (Remarks of Sen. Tunney) ("TSCA Legislative History"); H.R. Rep. No.94-1341, at 1 (1976) ("[T]hrough its testing and premarket notification provisions, the bill provides for the evaluation of the hazard-causing potential of new chemicals before commercial production begins."); TSCA Legislative History at 534 ("This bill principally is intended to have new chemicals coming on the market regularly tested to see that they are not going to harm people or the environment.") (Remarks of Rep. Staggers); TSCA Legislative History at 208 (Remarks of Sen. Tunney); *Id.* at 216 (Remarks of Sen. Hartke); *Id.* at 539 (Remarks of Rep. Metcalfe); *Id.* at 734 (Remarks of Sen. Moss); *Id.* at 735 (Remarks of Sen. Pearson); *Id.* at 740 (Remarks of Sen. Magnuson); and *Id.* at 747 (Remarks of Rep. Murphy).

[66] A "new chemical substance" is defined as any chemical substance that is not included on the TSCA Chemical Substance Inventory. 15 U.S.C. § 2602(11); 40 C.F.R. § 710.3.

[67] *See Reviewing New Chemicals Under the Toxic Substances Control Act (TSCA): Premanufacture Notices (PMNs) and Significant New Use Notices (SNUNs) Table*, EPA, https://www.epa.gov/reviewing-new-chemicals-under-toxic-substances-control-act-tsca/premanufacture-notices-pmns-and (last updated Apr. 23, 2021).

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(2) that "the information available to the Administrator is insufficient to permit a reasoned evaluation of the health and environmental effects" of the substance;

(3) that "the manufacture, processing, distribution in commerce, use, or disposal of [the] substance, or any combination of such activities, may present an unreasonable risk of injury to health or the environment,"

(4) that the "substance is or will be produced in substantial quantities, and such substance either enters or may reasonably be anticipated to enter the environment in substantial quantities or there is or may be significant or substantial human exposure to the substance," or

(5) "that the relevant chemical substance or significant new use is not likely to present an unreasonable risk of injury to health or the environment."

15 U.S.C. § 2604(a)(3). Amendments to TSCA in 2016 ("the Lautenberg Amendments") specifically require EPA to evaluate whether the chemical may pose an unreasonable risk to "potentially exposed or susceptible subpopulations," 15 U.S.C. § 2604(a)(3) (referred to in this Petition as "greater risk populations"),[68] and EPA must rely on the best available science and make decisions based on the weight of the scientific evidence[69] when conducting those reviews.

If EPA determines that the substance "is not likely to present an unreasonable risk," the chemical can enter commerce unrestricted. 15 U.S.C. § 2604(g). If the Administrator determines that the substance "presents an unreasonable risk," s/he must take actions "to the extent necessary to protect against such risk," including prohibiting or limiting its manufacture. 15 U.S.C. §§ 2604(a)(3), (f). EPA must also regulate the chemical if: it lacks information to

[68] 15 U.S.C. § 2602(12) defines "potentially exposed or susceptible subpopulation" as, "a group of individuals within the general population identified by the [EPA] Administrator who, due to either greater susceptibility or greater exposure, may be at greater risk than the general population of adverse health effects from exposure to a chemical substance or mixture." The statutory provision includes "infants, children, pregnant women, workers, or the elderly" in a non-exhaustive list of examples of such populations. In the context of PFAS contamination the language of this statutory provision covers the developing fetus, occupational workers, firefighters, communities living in polar regions, and communities living near facilities that release PFAS. *See supra* Factual Background § E.
[69] *Id.* §§ 2625(h), (i).

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make a reasoned evaluation; given that lack of information, determines that the chemical may present an unreasonable risk; or the quantities of manufacture or exposure to the substance may reach the "substantial" level. *See* 15 U.S.C. § 2604(e).

The PMN process was designed to further TSCA's overarching purpose, which is to "prevent the general environment from becoming the laboratory in which harmful effects of chemicals are discovered." *Cf. Dow Chem. Co. v. U.S. E.P.A.*, 605 F.2d 673, 676 (3d Cir. 1979); *see* S. Rep. No. 94-698, at 3 (1976) ("[W]e have become literally surrounded by a man-made chemical environment. … [T]oo frequently, we have discovered that certain of these chemicals present lethal health and environmental dangers."). To more fully align TSCA with its purpose, Congress amended the statute in 2016, and one of the most significant amendments was to require EPA to review and make an affirmative determination on each PMN before manufacturing could commence. *See* 15 U.S.C. § 2604(a)(1)(B)(ii). Before the amendments, a PMN was "deemed approved" even if EPA failed to act within the allotted timeframe.[70] Under the amended TSCA, PMNs can no longer be "deemed approved," even if EPA fails to act within the review period. *See* 15 U.S.C. § 2604(a)(4)(A). That change was a recognition that allowing manufacture of new chemicals to proceed when EPA has not been able to affirmatively evaluate potential risks and impose needed conditions endangers public health.

PMNs must contain certain information so that EPA can conduct the required safety review during the review period. They must include information on: the chemical's identity, structure, and formula; byproducts and impurities; environmental releases; intended uses; and, disposal practices. 15 U.S.C. § 2604(d)(1); *see also* 40 C.F.R. § 720.45. The applicant must

[70] S. Rep. No. 114-67 (2015); Kevin McLean, Harv. L. Sch., *Three Years After— Where Does Implementation of the Lautenberg Act Stand?* 19 (2020), http://eelp.law.harvard.edu/wp-content/uploads/McLean-TSCA.pdf.

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provide a diagram and description of its production process, inform EPA of its estimated maximum production volume, and provide all test data in the applicant's possession or control and a description of all other data the applicant knows of or can reasonably ascertain. *See* 40 C.F.R. §§ 720.45 and 720.50; EPA Sample PMN Form at 1,[71] attached as Exhibit A. If the submitter becomes aware of new relevant information during the review period, it must provide it to EPA within ten days of receiving it and no later than five days before the review period expires. 40 C.F.R. § 720.40(f).

B. Exemptions to the PMN Process

Exemptions to the PMN process are tightly circumscribed. TSCA includes a few, very limited exceptions to the PMN requirement in the statute itself. *See, e.g.*, 15 U.S.C. § 2604(h)(1) (test marketing exemption); *id.* § 2604(h)(3) (research and development exemption). It also authorizes EPA to promulgate rules granting additional exemptions from the PMN requirement, but only if EPA determines that the chemicals falling within the exemption "*will not present* an unreasonable risk of injury to health or the environment, including an unreasonable risk to a potentially exposed or susceptible subpopulation." 15 U.S.C. § 2604(h)(4) (emphasis added). Thus, while EPA may permit a specific new chemical assessed through the PMN process to be manufactured if it determines that the chemical is "*not likely*" to present an unreasonable risk, a new chemical or group of new chemicals may circumvent the PMN process *altogether* if and only if a much higher level of certainty is met—that those chemicals "*will not*" present an unreasonable risk.

[71] EPA, OMB No. 2070-0012, Premanufacture Notice for New Chemical Substances Form, https://www.epa.gov/sites/production/files/2020-02/documents/section_5_main_form_updated_omb_and_expiration_01142020.pdf.

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And, as with the assessment of chemicals under the PMN process, the 2016 TSCA Amendments required that the high bar of "will not present" for an exemption to be valid must take into consideration and ensure protection of greater risk populations. 15 U.S.C. § 2604(h)(4) (2016). In other words, EPA cannot allow an exemption to the PMN process to be used to approve chemicals where the best available science establishes that those chemicals may present an unreasonable risk to a greater risk population, regardless of its assessment of risk for the population as a whole.

C. The PMN Exemptions to Which this Petition Seeks Amendment

This Petition seeks to make PFAS ineligible for approval under the following four EPA-created exemptions: the Byproducts Exemption, the LVE, the LoREX Exemption, and the Polymer Exemption. These exemptions, described further below, were created several decades ago. The Byproducts, LVE, and Polymer exemptions were promulgated in the 1980s, soon after TSCA's enactment. *See* Premanufacture Notice Requirements and Review Procedures, 48 Fed. Reg. 21,722 (May 13, 1987) (codified at 40 C.F.R. pt. 720) (Byproducts); Premanufacture Notification Exemption; Exemption for Chemical Substances Manufactured in Quantities of 1,000 Kg or Less Per Year, 50 Fed. Reg. 16,477 (Apr. 26, 1985) (codified at 40 C.F.R. pt. 723) (LVE); Exemptions for Polymers, 49 Fed. Reg. 46,066, 46,066 (Nov. 21, 1984) (to be codified at 40 C.F.R. pt. 723). The LoREX exemption was enacted in the 1990s. *See* Low Release and Exposure Exemption, 60 Fed. Reg. 16,336 (Mar. 29, 1995) (codified at 30 C.F.R. pt. 723) (LoREX).[72]

[72] Excerpts of relevant statutes and regulations pertaining to these exemptions can be found in the Appendix to this petition.

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1. The Byproducts Exemption

For purposes of this petition, the "Byproducts Exemption" refers to all new chemicals that are byproducts within the meaning of 40 C.F.R. §§ 720.30(g) or (h)(2) for which EPA does not require submission of a PMN. Understanding what is exempted under those provisions first requires an understanding of how TSCA treats new chemical byproducts.

Under TSCA, PMNs are required for byproducts. More specifically, PMNs must be submitted for new "chemical substances" manufactured, processed, or imported "for commercial purposes." *See* 15 U.S.C. § 2604(a)(1), *see also id.* at (i)(1) (defining manufacture as meaning manufacturing for commercial purposes). Chemical byproducts meet the definition of chemicals substances. *See* 15 U.S.C. § 2602(2); 40 C.F.R. § 720.3(d). And when a parent chemical is manufactured "for commercial purposes" the byproducts of that chemical are also manufactured "for commercial purposes." The term "manufacture *for* commercial purposes" is defined to mean "[t]o produce, with the purpose of obtaining an immediate or eventual commercial advantage for the manufacturer." 40 C.F.R. § 716.3 (emphasis added). The term includes byproducts because "[b]yproducts . . . without separate commercial value are nonetheless produced for the purpose of obtaining a commercial advantage, since they are part of the manufacture of a chemical substance for commercial purposes." 40 C.F.R. § 710.3. Thus, when new byproducts are produced during an activity with a purpose of obtaining a commercial advantage, a PMN is required for them.

EPA, however, has created an exemption for a subset of byproducts manufactured *for* commercial purposes—those byproducts that are not *used* for commercial purposes. 40 C.F.R. § 720.30(h)(2). In its regulations, EPA interprets TSCA as differentiating between when a chemical is manufactured *for* a commercial purpose and when it is *used* for a commercial

purpose: "Although [byproducts not *used for* commercial purposes] are *manufactured for* commercial purposes under the Act, they are not manufactured for distribution in commerce as chemical substances per se and have no commercial purpose separate from the substance, mixture, or article of which they are a part." *Id*; *see also* 40 C.F.R. § 720.3(d) (defining "byproduct" as "a chemical substance produced without a separate commercial intent during the manufacture, processing, use, or disposal of another chemical substance or mixture"). Thus, a byproduct could be *manufactured for* a commercial purpose—and thus fall within the definition of chemical substance under TSCA requiring a PMN—but, under EPA's interpretation of TSCA, if the byproduct is discarded and not itself used commercially, it is not *used for* a commercial purpose and is exempt from the PMN requirement under EPA regulations.

And even when a byproduct is used for a commercial purpose, EPA's regulations provide that a PMN still need not be submitted for byproducts in the following three circumstances: "[a]ny byproduct if its only commercial purpose is for use by public or private organizations that (1) burn it as a fuel, (2) dispose of it as a waste, including in a landfill or for enriching soil, or (3) extract component chemical substances from it for commercial purposes." 40 C.F.R. § 720.30(g).

Byproducts are subject to virtually no review under this exemption, as described further in Reasons to Grant the Petition § II.A.

2. The Low Volume Exemption

Under the "Low Volume Exemption" or LVE, PMNs need not be filed for new "[c]hemical substances manufactured in quantities of 10,000 kilograms [approximately 11.02

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tons] or less per year." 40 C.F.R. § 723.50(a)(1)(i).[73] The review process for LVE applications allows approval by default after just 30 days. 40 C.F.R. § 723.50(g)(2). In contrast to PMN applications, if EPA experiences a backlog and simply is unable to complete its review, the manufacturer may commence production.

3. The Low Release and Exposure Exemption

Under the "Low Release and Exposure Exemption" or LoREX Exemption, PMNs need not be filed for what EPA considers "[c]hemical substances with low environmental releases and human exposures." 40 C.F.R. § 723.50(a)(1)(ii). In order to qualify for the LoREX Exemption, a manufacturer must show that the substance would meet certain specified criteria such as no dermal exposure, no inhalation exposure (except from certain air releases from incineration), and drinking water exposure and surface water concentrations under a certain amount. 40 C.F.R. § 723.50(c)(2).[74] When EPA reviews a LoREX application, it principally focuses on release and

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[73] 10,000 kg per year is not considered "low volume" by other regulatory agencies around the world. The EU, Canada, China, Japan, Korea, Taiwan, Australia and the Philippines all maintain a 1,000 kg/year threshold in recognition of the dangers that even small quantities of chemicals can pose. *See Comparison of Small Volume New Substance Registration*, ChemSafetyPRO (Feb. 8, 2017), www.chemsafetypro.com/Topics/Registration/Comparison_of_Small_Volume_Exemption_for_New_Chemical_Substance_Registrations.html.

[74] The full non-risk criteria to meet the LoREX exemption are as follows:

(i) Consumers and the general population. For exposure of consumers and the general population to the new chemical substance during all manufacturing, processing, distribution in commerce, use, and disposal of the substance:

(A) No dermal exposure.

(B) No inhalation exposure (except as described in paragraph (c)(2)(iv) of this section.

(C) Exposure in drinking water no greater than a 1 milligram per year....

(ii) Workers. For exposure of workers to the new chemical substance during all manufacturing, processing, distribution in commerce, use and disposal of the substance:

(A) No dermal exposure (this criterion is met if adequate dermal exposure controls are used in accordance with applicable EPA guidance).

(B) No inhalation exposure (this criterion is considered to be met if adequate inhalation exposure controls are used in accordance with applicable EPA guidance).

(iii) Ambient surface water. For ambient surface water releases, no releases resulting in surface water concentrations above 1 part per billion...unless EPA has approved a higher surface water concentration....

(iv) Incineration. For ambient air releases from incineration, no releases of the new chemical substance above 1 microgram per cubic meter maximum annual average concentration....

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exposure and not toxicity. *See* 60 Fed. Reg. at 16,337. Like with the LVE exemption, the review process for LoREX Exemption applications is just 30 days. 40 C.F.R. § 723.50(g)(2). And similar to the LVE, if EPA experiences a backlog and is not able to complete its 30-day review of a LoREX exemption application, the manufacturer may commence production. *Id.*

4. The Polymer Exemption

The Polymer Exemption allows polymers meeting a list of criteria pertaining to the molecular weight (MW) of the polymer and its composition to enter commerce without going through PMN review. *See* 40 C.F.R. § 723.250(e). The Polymer Exemption lists six categories of polymers that, despite otherwise meeting the eligibility criteria for the exemption, may not use it and must undergo PMN review. *See* 40 C.F.R. § 723.250(d). As described further below, one of these categories contains certain PFAS polymers. *See id.* 40 C.F.R. § 723.250(d)(6).

(v) Land or groundwater. For releases to land or groundwater, no releases to groundwater, to land, or to a landfill unless the manufacturer has demonstrated to EPA's satisfaction in a notice under paragraph (e) of this section that the new substance has negligible groundwater migration potential. 40 C.F.R. § 723.50(c)(2).

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REASONS TO GRANT THE PETITION

I. TSCA REQUIRES EPA TO MAKE PFAS INELIGIBLE FOR THE BYPRODUCTS, LVE, AND LOREX EXEMPTIONS

Developments in PFAS research and in the law have made it untenable to allow new PFAS to gain entry to the market through the Challenged Exemptions. These three exemptions were created long before the risks associated PFAS were understood.[75] A tremendous amount of information has come to light since the promulgation of the Challenged Exemptions demonstrating that PFAS share similar characteristics with respect to toxicity and persistence, and in many cases bioaccumulation, resulting in similar effects.[76] The agency also created the Challenged Exemptions before enactment of the 2016 Lautenberg Amendments to TSCA, which mandate that EPA consider the risks posed to greater risk populations when making unreasonable risk determinations regarding new chemicals.

EPA cannot conclude that PFAS chemicals produced as byproducts, or in the amounts or conditions permitted under the LVE and LoREX exemptions "will not present an unreasonable risk" to human health and the environment, including to greater risk populations. *See* 15 U.S.C. § 2604(h)(4). Scientific evidence developed over the last decade has shown that: 1) new PFAS meeting the non-risk criteria for the Challenged Exemptions at issue may present unreasonable risks, including to greater risk populations; and 2) in some instances, EPA lacks sufficient data or time to make a determination about whether new PFAS meeting the non-risk criteria for the Challenged Exemptions will not present an unreasonable risk. Because EPA cannot make the § 2604(h)(4) "will not present" finding for any PFAS, even if they meet the non-risk criteria for the Challenged Exemptions, EPA may not continue to approve PFAS under those exemptions.

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[75] *See supra* Background & Legal Framework § C.
[76] *See supra* Factual Background §§ A–B.

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40 C.F.R. § 723.50(d) similarly requires EPA to make new PFAS ineligible for the LVE and LoREX exemptions. That provision prohibits the approval under these two exemptions of substances that may cause serious acute, serious chronic, or significant environmental effects. All PFAS may cause these deleterious effects.

A. TSCA Requires EPA to Make Chemical Substances Ineligible for a PMN Exemption if EPA Cannot Conclude Those Chemicals "Will Not Present an Unreasonable Risk of Injury," Including to a Greater Risk Population

TSCA is clear: PMN exemptions are only for new chemicals that can meet the high burden that they "will not present an unreasonable risk of injury to health or the environment, including an unreasonable risk to a potentially exposed or susceptible subpopulation." 15 U.S.C. § 2604(h)(4). Thus, EPA has acknowledged a corollary to that standard: *excluding* a group of chemicals from eligibility for an exemption is "necessary [when] . . . EPA can no longer conclude that [such chemicals] 'will not present an unreasonable risk to human health or the environment,' which is the determination necessary to support an exemption under TSCA." Amendment of Polymer Exemption Rule to Exclude Certain Perfluorinated Polymers, 71 Fed. Reg. 11,484, 11,484 (Mar. 7, 2006) (codified at 40 C.F.R. pt. 723.250); *see also* Amendment of Polymer Exemption Rule to Exclude Certain Perfluorinated Polymers, 75 Fed. Reg. 4,295, 4,295 (Jan. 27, 2010) (codified at 40 C.F.R. § 723.250); 71 Fed. Reg. at 11,498 (explaining that 15 U.S.C. § 2604(h)(4) authorizes EPA to amend and repeal rules it enacted under that section).[77]

Indeed, EPA has previously excluded certain PFAS from one of the several exemptions to the PMN process precisely because it was unable to make the "will not present an unreasonable risk" finding. And it reached this conclusion even before TSCA was amended to

[77] Wendy Wagner et al., *Dynamic Rulemaking*, 92 N.Y.U. L. Rev. 183, 206 (2017).

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require consideration of greater risk populations when making a finding of "no unreasonable risk."

In 2010, EPA enacted a rule excluding certain PFAS from being eligible for the "polymer exemption" to the PMN requirement. 75 Fed. Reg. at 4,295.[78] EPA noted that, by their very nature, exemptions under § 2604(h)(4) are for chemicals EPA believes pose a low risk of injury to health or the environment. 71 Fed. Reg. at 11,498. Thus, it explained, certain chemicals have and must be excluded from using such an exemption when EPA either: (1) has information suggesting that the conditions for an exemption under § 2604(h)(4) are not met for certain chemicals/ those chemicals may present unreasonable risks; or (2) has insufficient data and review experience to support a finding that such chemicals falling under the exemption will not present an unreasonable risk. *Id.*[79]

Based on those criteria, EPA determined that it must exclude the group of PFAS from eligibility to use the polymer exemption because it could no longer conclude that those polymers will not present an unreasonable risk to human health or the environment. 71 Fed. Reg. at 11,484; 11,488; *see also* 75 Fed. Reg. at 4,295. EPA explained that polymers containing certain PFAS may degrade and release PFAS into the environment, which "are expected to persist in the environment, may bioaccumulate, and may be highly toxic." 75 Fed. Reg. at 4,296. EPA acknowledged that of the thousands of PFAS, the most well studied are PFOA and PFOS, which studies show have a "high level of toxicity . . . at very low dose levels in exposed laboratory

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[78] The proposed and final rule making certain PFAS ineligible to use the polymer exemption applies to only a subcategory of PFAS. As explained in Reasons to Grant the Petition § III, petitioners urge EPA to further amend the Polymer Exemption to ensure it includes all PFAS.

[79] This two-part rule is a corollary of TSCA section 2604(h) and is echoed in other regulatory text. *See, e.g.*, 60 Fed. Reg. at 16,337 (stating that "Any [LVE] exemption application will be denied if the Agency is unable to affirmatively find that manufacture, processing, distribution in commerce, use, and disposal of the exempted substance pursuant to the exemption will not present an unreasonable risk of injury to human health or the environment.").

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animals." 71 Fed. Reg. at 11,498. It emphasized that, in prohibiting approval of new polymers containing PFAS via the exemption, it was not concluding that other PFAS "*categorically share* similar toxicity, bioaccumulation, and persistence characteristics with PFOS and PFOA." 75 Fed. Reg. at 4,298 (emphasis added). Rather, it was concluding "that they *may, or are expected to, share similar characteristics*, based on available information and its professional judgment and experience." 75 Fed. Reg. at 4,298–99. Thus, EPA could no longer make a generally applicable finding that the manufacture, processing, distribution in commerce, use, and/or disposal of the PFAS at issue would not present an unreasonable risk of injury to health or the environment, and therefore it could no longer allow such PFAS to enter commerce under this exemption. 71 Fed. Reg. at 11,498; 75 Fed. Reg. at 4,301.

EPA also rejected a proposal to limit the carve-out from the exemption to only those PFAS at issue that contain greater than four carbons in the alkyl chain. 71 Fed. Reg. at 11,499. The agency stated that: (1) "based on available information, EPA cannot continue to find that" the PFAS polymers at issue containing fewer than five carbon atoms "will not present an unreasonable risk to human health and the environment," *id.*; and (2) "EPA has insufficient evidence at this time . . . to definitively establish a lower carbon chain length limit to meet the 'will not present an unreasonable risk' finding, which is the determination necessary to support an exemption under . . . TSCA." 71 Fed. Reg. at 11,486 (citation omitted).[80]

In sum, as EPA concluded in the 2010 polymer exemption exclusion, when a new chemical or group of chemicals may share characteristics that prevent EPA from concluding that

[80] Notably, EPA concluded that it had "insufficient evidence . . . to definitively establish a carbon chain length at which" the PFAS at issue "[would] not present an unreasonable risk." 71 Fed. Reg. at 11,499; *see also* 75 Fed. Reg. at 4,299.

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they "will not present an unreasonable risk," section 2604(h)(4) requires that they be excluded from the exemption. In such circumstances, individual chemicals and the potential risks to the environment and human health they present "should be evaluated during the 90-day PMN review period that Congress contemplated for new chemicals under section 5(a)(1)(A) of TSCA … so that EPA can better evaluate and address the[] concerns" posed by such chemicals. 71 Fed. Reg. at 11,497–98; *see also* 75 Fed. Reg. at 4,301.

EPA's decision to exclude PFAS from the Polymer Exemption is consistent with (and, indeed, required by) TSCA's mandate that chemicals *even possibly* presenting an unreasonable risk to the environment must undergo a full PMN safety review. *See* 15 U.S.C. 2604(h)(4). For the same reason that TSCA required EPA's decision to exclude certain PFAS polymers from the Polymer Exemption, it must exclude PFAS from the other Section 2604(h) exemptions that are the subject of this petition. A refusal to apply that reasoning when considering this petition would be akin to having "a rule for Monday, another for Tuesday." *Shaw's Supermarkets, Inc. v. Nat'l Lab. Rels. Bd.*, 884 F.2d 34, 37 (1st Cir. 1989).

As discussed further below, those mandates of TSCA section 2604(h), considered together with: (1) the requirement that EPA now consider potentially exposed or susceptible subpopulations when assessing whether it can make a finding of "will not present an unreasonable risk;" and (2) the growing body of scientific evidence that PFAS as a class may present unreasonable risk, compels EPA to make any PFAS ineligible to use the Challenged Exemptions.

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B. TSCA Requires EPA to Make New PFAS Ineligible for the Byproducts, LVE, and LoREX Exemptions Because EPA Cannot Conclude that PFAS Manufactured, Used, Disposed of, or Distributed under these Exemptions "Will Not Present an Unreasonable Risk of Injury"

As a matter of law, EPA must prohibit the use of the Byproducts Exemption, LVE, and LoREX Exemptions for PFAS because the agency cannot conclude that PFAS manufactured, used, disposed of, or distributed under these exemptions "will not present an unreasonable risk of injury to health or the environment, including an unreasonable risk to a potentially exposed or susceptible subpopulation." 15 U.S.C. § 2604(h)(4).[81] As discussed above, EPA must make a group of chemicals ineligible to use an exemption when either: 1) the agency has information suggesting that those chemicals may, or are expected to, present an unreasonable risk; or 2) has insufficient data and review experience to support a finding that such chemicals falling under the exemption will not present an unreasonable risk. *See* 75 Fed. Reg. at 4,301.[82] The best available science demonstrates that all PFAS *may* present unreasonable risk because the studied members of the class are associated with severe hazards often at extremely low levels of exposure, as well as having persistent and bioaccumulative characteristics, and none of the exemption criteria eliminate the inherent potential risk these chemicals pose.

1. EPA is required to make PFAS ineligible for the Byproducts Exemption because the agency has information demonstrating that PFAS byproducts may present an unreasonable risk.

The Byproducts Exemption includes no limitations on the amounts of a PFAS manufactured or released. Rather, under EPA's current approach, the availability of the Byproduct Exemption turns on the purpose for which the chemical will be used, meaning that

[81] Because there is no independent statutory basis for excluding byproducts produced during the manufacture of a commercial chemical from the PMN process, Petitioners presume, for the sake of argument, that this exemption was promulgated under 15 U.S.C. § 2604(h)(4).
[82] *See supra* Reasons to Grant the Petition § I.A.

PFAS may qualify for this exemption as long as they are used for non-commercial purposes, or one of a handful of commercial purposes, even if it is reasonably foreseen that they will enter the environment at high volume. 40 C.F.R. §§ 720.30(g); (h)(2). There is no statutory basis on which to exempt PFAS from PMN review based on the purpose for which they are used. Whether manufactured as a parent chemical or a byproduct, PFAS are PFAS. The weight of the scientific evidence shows that PFAS may present unreasonable risks to human health and the environment based on the class of chemicals' similar toxic, persistent, and bioaccumulative characteristics.[83] The weight of the scientific evidence also suggests that PFAS exposure increases risk of adverse health outcomes, including harm to vital organs, the immune system, and reproductive health.[84] While EPA does not know that every unstudied PFAS will behave akin to well-understood PFAS, such a determination is not necessary. *See* 75 Fed. Reg. at 4,298–99 (acknowledging that EPA was required to prohibit certain PFAS from using polymer exemption because chemicals may or were expected to share similar characteristics to PFOA and PFOS and that the agency did not and need not make a finding that other PFAS "categorically share similar toxicity, bioaccumulation, and persistence characteristics with PFOS and PFOA").[85] Because EPA can no longer make a finding that the manufacture, processing, distribution in commerce, use, and/or disposal of PFAS byproducts "will not present an unreasonable risk of injury to health or the environment," it can no longer allow such PFAS to escape PMN review under the Byproducts Exemption. 71 Fed. Reg. at 11,498; 75 Fed. Reg. at

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[83] *See* Wang et al., *supra* note 5; Testimony of Linda S. Birnbaum, *supra* note 5 (PFAS are structurally similar compounds that scientists can "reasonably expect to act through the same pathways and have similar effects"); *see also supra* Factual Background § F.
[84] Testimony of Linda S. Birnbaum, *supra* note 5; Kwiatkoswki et al., *supra* note 6; ATSDR *Toxicological Profile for Perfluoroalkyls*, *supra* note 11.
[85] *See supra* Reasons to Grant the Petition § I.A.

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4,301 (making similar finding with respect to Polymer Exemption); 75 Fed. Reg. at 4,298–99 (same).

Indeed, the case for excluding PFAS from the Byproducts Exemption has grown only stronger in the years since EPA excluded certain PFAS from the Polymer Exemption in 2010. Not only has the weight of the scientific evidence about PFAS confirmed what was expected in 2010, but the 2016 Lautenberg Amendments now require EPA's "will not present unreasonable risk" assessment for exemptions to consider risks to greater risk populations before approving new chemicals.[86] Studies highlighted earlier in this petition demonstrate that PFAS present greater risks to subpopulations such as firefighters, communities living in polar regions, infants, children, and developing fetuses.

Thus, EPA must initiate a rulemaking to prohibit future use of the Byproducts Exemption for new PFAS. That rulemaking should also prohibit the continued manufacture of any PFAS byproduct under the auspices of the Byproducts Exemption unless and until such PFAS has undergone a full PMN review and been approved by EPA, with a two-year window for manufacturers to receive such approval.

2. *EPA is required to make new PFAS ineligible for the LoREX and LVE exemptions because the agency has information demonstrating that PFAS manufactured, distributed, disposed of, or used under these exemptions may present an unreasonable risk.*

EPA must also exclude the manufacture of new PFAS from eligibility for the LVE and LoREX Exemptions because accumulating scientific evidence shows that contamination

[86] *See supra* Background & Legal Framework § A.

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expected from those exemption thresholds may present unreasonable risk, meaning they cannot meet the "will not present an unreasonable risk" criterion for PMN exemptions.

For example, under both the LVE and LoREX exemptions, EPA expects levels of contamination far in excess of what can be presumed safe for PFAS. This is a grave public health concern as 200 million people in the United States rely on surface water as a source of drinking water.[87] EPA estimates the LVE threshold of manufacturing 10,000 kilograms per year of a chemical substance will result in releases of the chemical substance that correspond to a range of concentrations from 500 to 5,200,000 parts per trillion (ppt) in surface water. 60 Fed. Reg. at 16,343. But concentrations in that range would correspond to levels of PFAS contamination in drinking water that are unsafe. Surface water concentrations at the lower end of that range translate to drinking water concentrations that could result in exposure levels that are 20 times higher than levels even ATSDR considers unsafe for PFOA, PFNA, and PFOS,[88] levels that have been criticized as not being health protective.[89] 60 Fed. Reg. at 16,338. The LoREX Exemption allows PFAS contamination levels in drinking water that could similarly result in exposures[90] that are significantly higher than EPA's own national drinking water health advisories for PFOA and PFOS, state health-based water guidance and contamination limits for

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[87] EPA, *FACTOIDS: Drinking Water and Ground Water Statistics for 2007* 4 (2008), https://nepis.epa.gov/Exe/ZyPDF.cgi/P100N2VG.PDF?Dockey=P100N2VG.PDF.

[88] ATSDR has set its minimum risk level dosage for PFOS and PFNA at 3 nanograms per kilogram bodyweight per day, and 2 ng/kg/day for PFOA. Using the agency's standard calculation at 80 kg bodyweight for adults, that level translates to 0.05 milligrams per year, or 20 times 1,000 ppt. See ATSDR *Toxicological Profile for Perfluoroalkyls*, *supra* note 11, at 15.

[89] *See* Letter from Anna Reade, Staff Scientist, Nat. Res. Def. Council, to ATSDR (Sept. 6, 2018), https://www.nrdc.org/sites/default/files/comments-on-atsdr-toxicological-profile-on-perfluoroalkyls-2018-draft_2018-08-21.pdf.

[90] The exemption allows up to 1 milligram PFAS in drinking water per year. 40 C.F.R. § 723.50(c)(2)(i), *see also* (iii). For ATSDR minimum risk levels corresponding to yearly exposure levels in drinking water, *see supra* note 88.

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various PFAS, and ATSDR's minimum risk level dosage for PFOA and PFOS in drinking water.[91]

The high level of expected surface and drinking water contamination that could be expected from PFAS that are approved through the LVE and LoREX exemptions puts infants and children—greater risk populations EPA must now take into account when assessing eligibility for a PMN exemption—at especially high risk. These subpopulations are at risk of harm from exposure to PFAS through drinking water at much lower concentrations than those that pose risk to healthy adults.[92] For example, in 2018, the ATSDR set minimum risk levels ("MRLs")[93] for PFAS and converted these values into drinking water concentrations for children at 21 ppt for PFOA and 14 ppt for PFOS compared to 78 ppt and 52 ppt, respectively, for adults.[94] Those concentration conversions, however, have been criticized for relying on calculations that underestimate exposures to infants.[95] Using EPA's drinking water assumptions and parameters specific to infants,[96] drinking water concentrations as low as 3 and 2 ppt for PFOA and PFOS, respectively, would pose health risks to infants.[97] While EPA has failed to adopt any enforceable drinking water limits for PFAS, several states have enacted protective

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[91] *See infra* p. 35.
[92] *Minimum Risk Levels (MRLs)*, ATSDR, https://www.atsdr.cdc.gov/minimalrisklevels/index.html (last updated June 4, 2018).
[93] ATSDR defines MRL as "an estimate of the amount of a chemical a person can eat, drink, or breathe each day without a detectable risk to health. MRLs are developed for health effects other than cancer." *See id.*
[94] ATSDR *Minimum Risk Levels*, *supra* note 92; *See* Letter from Anna Reade, *supra* note 89.
[95] Anna Reade et al., NRDC, *Scientific and Policy Assessment for Addressing Per- and Polyfluoroalkyl Substances (PFAS) in Drinking Water* 37, 77–81 (2019), https://www.nrdc.org/sites/default/files/assessment-for-addressing-pfas-chemicals-in-michigan-drinking-water.pdf.
[96] *See, e.g.*, Memorandum from Mark A. Levine, Comm'r, Vt. Dep't Health, to Emily Boedecker, Comm'r, Vt. Dep't Health 4 (July 10, 2018), https://www.healthvermont.gov/sites/default/files/documents/pdf/ENV_DW_PFAS_HealthAdvisory.pdf (using EPA-recommended body weight adjusted water intake rates and relative source contribution values specific to infants to calculate protective drinking water health advisory levels for four PFAS).
[97] Reade et al. *Scientific and Policy Assessment*, *supra* note 95, at 37, 77–81.

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drinking water limits for PFAS that account for risk to infants and children at levels considerably lower than those calculated by ATSDR.[98]

Thus, on the basis of risk of PFAS in water alone, EPA cannot conclude that new PFAS manufactured at the thresholds allowed by the LVE and LoREX exemptions "will not present an unreasonable risk," as required for PMN exemptions.[99] At the very least, "a closer examination of the conditions of manufacturing, processing, distribution, use, and disposal [of said chemical] during a full 90-day PMN review" is necessary. *See* 75 Fed. Reg. at 4,301.

An additional example of unsafe contamination that would result if EPA continued to make the LVE and LoREX Exemptions eligible for new PFAS relates to ambient air releases. The LoREX Exemption permits ambient air releases of chemicals from incineration in amounts up to "1 microgram per cubic meter maximum annual average concentration." 40 C.F.R. § 723.50(c)(2)(iv). It is likely, however, that 1 microgram per cubic meter maximum annual average concentration of PFAS would be too high a threshold to ensure that the chemical "will not present an unreasonable risk." Indeed, Michigan's Department of Air Quality recently developed health-based PFOA and PFOS air emissions screening levels to be protective of sensitive individuals, including children and the elderly, at 0.07 microgram per cubic meter with

[98] *See* Chart collecting state action levels, *Per- and Polyfluoroalkyl Substances (PFAS)*, Association of State Water Administrators, www.asdwa.org/pfas/ (last visited April 26, 2021).

[99] The majority of the health-based drinking water guidance and legal limits mentioned above were developed specifically to be protective of sensitive and more highly exposed subpopulations. S*ee, e.g.*, Helen M. Goeden et al., *A Transgenerational Toxicokinetic Model and its Use in Derivation of Minnesota PFOA Water Guidance*, 29 J. Exposure Sci. & Env't Epidemiology 183, https://www.nature.com/articles/s41370-018-0110-5. These are precisely the kinds of populations Congress had in mind when it instructed EPA, through revisions to 15 U.S.C. § 2604(h), to ensure that greater risk populations would be protected.

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a 24-hour averaging time,[100] more than 10 times lower than the ambient air release concentration allowed by the LoREX.

3. *EPA is required to make new PFAS ineligible for the LoREX and LVE Exemptions because the agency has insufficient information on which to conclude that PFAS manufactured, distributed, disposed of, or used under these exemptions will not present an unreasonable risk.*

EPA also has insufficient data to support a finding that new PFAS falling under the LVE and LoREX exemptions "will not present an unreasonable risk" from expected air emissions. In short, this is because EPA has no adequate method for assessing the safety of PFAS air emissions at the thresholds permitted by the two exemptions. Indeed, EPA's own publications suggest that the agency's air emission tests do not supply "sufficient information to" to establish that a new PFAS will not present an unreasonable risk. [101]

For example, under the LVE, EPA assumes that if a chemical is manufactured at the LVE threshold of 10,000 kilograms per year, expected air emissions will not present an unreasonable risk to human health or the environment. Specifically, the agency estimates that a facility that manufactures 10,000 kilograms of a chemical per year will release 300 to 2,000 kilograms per year of the substance into the air. 60 Fed. Reg. at 16,343. But the agency cannot draw inferences about the health effects of PFAS from these figures with the level of certainty required to approve a new chemical under 15 U.S.C. § 2604(h)(4). A complete LVE safety review would require an estimation of inhalation exposure based upon the concentration of PFAS in the air and the duration of exposure. EPA's release estimates do not offer that

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[100] *Michigan PFAS Action Response Team: Air Quality Related Issues*, Michigan.gov, https://www.michigan.gov/pfasresponse/0,9038,7-365-86704_94366---,00.html (select "What health-based screening levels exist for air?" drop down) (last visited Apr. 16, 2021).

[101] *See* Letter from Timothy Watkins, Dir., EPA Ctr. for Env't Measurement & Modeling, to Steven E. Flint, Dir. Div. Air Res., N.Y. Dep't Env't Conservation (Dec. 2, 2019), https://www.dec.ny.gov/docs/remediation_hudson_pdf/nysdecrept12219.pdf.

information. *See, e.g.*, 60 Fed. Reg. at 16,343. Thus, the agency has insufficient information to determine that PFAS air emissions permitted under the LVE will not present an unreasonable risk.

Similarly, EPA has admitted that it lacks the standardized and validated methodology to properly collect data on PFAS air emissions resulting from incineration, which the agency needs in order to adequately confirm whether a PFAS subject to a LoREX application can be incinerated in compliance with the exemption's 1 microgram per cubic meter maximum annual average ambient air release threshold for incineration.[102] *See* 40 C.F.R. § 723.50(c)(2)(iv). Without the ability to accurately measure whether or not a PFAS can be incinerated in compliance with the LoREX ambient air release threshold, EPA cannot determine that a PFAS for which a LoREX exemption is sought will not present an unreasonable risk.

That EPA has insufficient data to conclude that new PFAS that meet the LVE and LoREX Exemption non-risk criteria will not present an unreasonable risk provides an additional reason why EPA must exclude PFAS from the LVE and LoREX exemptions.

C. EPA Must also Make PFAS Ineligible for the LVE and LoREX Exemptions in Order to Faithfully Apply 40 C.F.R. § 723.50(d)

Approving PFAS under the LVE and LoREX exemptions would also violate 40 C.F.R. § 723.50(d). That provision states that chemicals cannot be approved under the LVE or LoREX exemptions when the substances[103] "*may* cause ...(1) Serious acute (lethal or sublethal) effects[;] (2) Serious chronic (including carcinogenic and teratogenic) effects[; or] (3) Significant

[102] *See, e.g.*, Interim Guidance on PFAS Destruction and Disposal at 45, Dkt. No. EPA-HQ-OLEM-2020-0527-0002 (Dec. 18, 2020), https://www.regulations.gov/document/EPA-HQ-OLEM-2020-0527-0002.

[103] The provision also applies to "any reasonably anticipated metabolites, environmental transformation products, or byproducts of the substance." 40 C.F.R. § 723.50(d). As a result, this statutory provision may create additional hurdles for the approval of long-chain PFAS, which have significant issues with transformation products.

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environmental effects." 40 C.F.R. § 723.50(d) (emphasis added). The inquiry into whether or not a chemical has lethal, carcinogenic, or teratogenic effects is purely evidence-based. The answer is based on existing data and studies, and leaves little to no room for administrative discretion. When making science-based decisions, EPA is required both to use "the best available science" and to make the decisions "based on the weight of the scientific evidence." 15 U.S.C. §§ 2625(h), (i). The weight of scientific evidence demonstrates that exposure to PFAS meeting the non-risk criteria for manufacture, release, and exposure permitted under these exemptions *may* cause the adverse health and environmental effects set forth in § 723.50(d). For example, they may cause cancer, liver damage, and immunosuppression, which constitute serious acute and/or chronic health effects. *See* 40 C.F.R. §§ 723.50(b)(6)–(8); *see also id.* § 720.30(b)(10); *id.* § 720.3.[104]

The weight of the scientific evidence also demonstrates that PFAS at the LVE and LoREX non-risk thresholds may also cause significant environmental effects, including growth impairment and lethality in aquatic organisms.[105] Indeed, growth impairment was observed in fish exposed to PFAS at concentrations nearly 10,000 times lower than the higher end of the allowable range under LVE.[106] PFAS also induced adverse effects in a species of salamander that is closely related to the endangered California Tiger Salamander. Given the bioaccumulative nature of many PFAS, these effects are likely to persist for long periods of time.

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[104] *See supra* Factual Background § B.

[105] Gerald T. Ankley et al., *Assessing the Ecological Risks of Per- and Polyfluoroalkyl Substances: Current State-of-the Science and a Proposed Path Forward*, 40 Env't Toxicology & Chemistry 564 (2020), https://setac.onlinelibrary.wiley.com/doi/10.1002/etc.4869; Georgia M. Sinclair et al., *What Are the Effects of PFAS Exposure at Environmentally Relevant Concentrations?*, 258 Chemosphere 127340 (2020), https://www.sciencedirect.com/science/article/pii/S0045653520315332#bib53.

[106] Susanne Keiter et al., *Long-term Effects of a Binary Mixture of Perfluorooctane Sulfonate (PFOS) and bisphenol A (BPA) in Zebrafish (Danio rerio)*, 118–119 Aquatic Toxicology 116 (2012), https://www.sciencedirect.com/science/article/pii/S0166445X12001300?via%3Dihub.

Thus, PFAS that meet the non-risk criteria for LVE and LoREX may cause significant environmental effects, as defined by EPA. *See* 40 C.F.R. § 723.50(b)(8).[107]

Thus, the faithful application of 40 C.F.R. § 723.50(d) requires any new PFAS to be made ineligible for the LoREX and LVE exemptions and EPA must formalize the blanket ineligibility of these substances through an explicit regulatory amendment. Such an amendment would provide clear notice to PFAS manufacturers that EPA will not approve new PFAS via exemptions to the PMN review process. The amendment would also alleviate the inefficiencies involved in EPA making individual determinations on applications to manufacture new PFAS via PMN exemptions given that no PFAS can meet the "will not present" standard.[108]

Put simply, PFAS simply cannot meet the "will not present an unreasonable risk" standard. When a category of chemicals cannot meet the statute's "will not present an unreasonable risk" standard, that category of chemicals must be excluded from eligibility for the exemption, and must go through the more detailed PMN review process. EPA must immediately stop accepting and approving LVE and LoREX notices for new PFAS and initiate a rulemaking to amend § 723.50 in order to codify this change.[109]

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[107] R. Wesley Flynn et al., *Dietary Exposure and Accumulation of Per- and Polyfluoroalkyl Substances Alters Growth and Reduces Body Condition of Post-Metamorphic Salamanders*, 765 Sci. Total Env't 142730 (2021), https://www.sciencedirect.com/science/article/abs/pii/S0048969720362598.

[108] It is also questionable whether EPA could make an individualized safety determination for new PFAS under 40 C.F.R. § 723.50(d) in the allotted 30 days. A manufacturer would need to submit test data demonstrating that a new PFAS is safe in order to overcome the weight of the scientific evidence on the risks that may be posed by PFAS. EPA itself has admitted that the agency "will generally be unable to conduct a thorough review of any submitted test data within the allotted review period" and that "manufacturers with submissions which involve extensive data reviews may, in some cases, be better served under a PMN review." 60 Fed. Reg. at 16,337.

[109] EPA has the authority to prohibit use of the LVE and LoREX exemptions for the reasons set forth in 40 C.F.R. § 723.50(d) for the entire category of PFAS. *See* 15 U.S.C. § 2625(c).

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II. EPA HAS PLACED COMMUNITIES AROUND THE COUNTRY IN HARM'S WAY BY FAILING TO REGULATE PFAS BYPRODUCTS AND ALLOWING MANUFACTURERS TO BRING PFAS TO MARKET UNDER THE LVE AND LOREX EXEMPTIONS

EPA is legally compelled to amend the Challenged Exemptions to ensure that PFAS will no longer be approved under these loopholes for the reasons stated above. But even if the Agency disagrees with the legal arguments above, it still has reason to grant this Petition.

15 U.S.C. § 2604(h)(4) provides EPA with discretion to create, modify, and revoke exemptions to the PMN process. EPA is not required to exercise its discretion to create an exemption, but when the agency does so it must act in accordance with the purposes of TSCA. Chief among these purposes is the prevention of "unreasonable risks of injury to health or the environment associated with the manufacture, processing, distribution in commerce, use, or disposal of chemical substances."[110] Unfortunately, as written, the Challenged Exemptions put the public at increased risk of exposure to PFAS substances in ways that are at odds with this fundamental purpose of TSCA.

The Challenged Exemptions are bad public policy. They prevent EPA from sufficiently reviewing and regulating PFAS before these chemicals are released into communities and nature. Inadequate review and regulation are compounded by the lack of robust disclosure requirements. Without adequate information about PFAS that slip through these exemptions, the public is unable to take steps to protect itself. Thus, EPA should exercise its discretion and amend the Challenged Exemptions as requested by Petitioners.

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[110] David Markell, *An Overview of TSCA, Its History and Key Underlying Assumptions, and Its Place in Environmental Regulation*, 32 Wash. Univ. J. L. & Pol'y 333 (2010) (quoting S. Rep. No. 94-698, at 1 (1976), *as reprinted in* 1976 U.S.C.C.A.N. 4491, 4491), https://openscholarship.wustl.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1084&context=law_journal_law_policy.

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A. PFAS Byproducts Are Subject to Virtually No TSCA Regulatory Oversight to the Detriment of Human Health and the Environment

Allowing PFAS manufacturers to take advantage of the Byproducts Exemption results in minimal, if any, EPA review and regulation of these chemicals. The Exemption does not require manufacturers to submit an application for approval of the byproduct to the agency. Rather, any premanufacture information EPA collects on the byproduct comes only from the PMN application for the parent chemical. And that application simply requires "[a] description of the byproducts resulting from the manufacture, processing, use, and disposal of the new chemical substance." 40 C.F.R. § 720.45(d). More specifically, a PMN applicant must submit the name of the byproduct; or "a class or range of structures (e.g., C_6 - C_{18} fatty acid salts or polychlorinated cyclic and acyclic hydrocarbons in the range C_5 - C_{12}); or the source (e.g., pyrolysis products of cellulose or coal tar residues)." [111]

As EPA has explained, test data on byproducts[112]—even if it is reasonably discoverable or within the manufacturer's possession—is *not* required as part of a manufacturers' PMN application for the parent chemical in which the byproduct is present. *See* Toxic Substances; Revisions of Premanufacture Notification Regulations, 51 Fed. Reg. 15,096, 15,100 (Apr. 22, 1986) (codified at 40 C.F.R. pt. 720). That EPA does not even require such data when it exists suggests that the agency does not assess risks associated with byproducts or take appropriate regulatory action to prevent harm they might cause to the public.

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[111] *See* EPA, Instruction Manual for Reporting Under the TSCA §5 New Chemicals Program 43 (2015), https://www.epa.gov/sites/production/files/2015-06/documents/instruction_manual_2015_5-26-2015.pdf.

[112] Such data includes "information concerning the objectives, experimental methods and materials, protocols, results, data analyses, recorded observations, monitoring data, measurements, and conclusions from a test or experiment." 40 C.F.R. § 720.3(ff).

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EPA cannot justify its failure to regulate PFAS byproducts. Real life circumstances have demonstrated that excluding PFAS byproducts from PMN review can be as dangerous to humans and the environment as failing to review and regulate PFAS that are used for a commercial purpose. As mentioned above, one of the key paths through which PFAS enter the environment is from the manufacturing, processing, use, and disposal of products that contain PFAS or generate PFAS as a waste byproduct.[113] PFAS precursors that are emitted or released into the environment via these pathways can biotransform into other PFAS, including long-chain PFAS like PFOA and PFOS.[114]

One vivid example of such contamination of the environment by PFAS byproducts and the attendant human consequences is the drinking water tragedy involving the Cape Fear River in North Carolina—a tragedy that might have been avoided through PMN review. In 2017, officials from Chemours admitted that one of their plants, formerly owned by DuPont, had been discharging GenX, a toxic shorter-chain PFAS, into Cape Fear River for close to 40 years.[115] EPA did not regulate under TSCA the GenX discharge into the river because the PFAS chemical was likely a byproduct of a vinyl ether process.[116] Levels of GenX in the drinking water of the Cape Fear Public Utility Authority average 631 ppt.[117] EPA's own drinking water exposure

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[113] Buck et al., *supra* note 3, at 518; Scheringer & Wang, *supra* note 25. *See also* Lindstrom et al., *supra* note 25; N.C. Dep't Env't Quality, *supra* note 25.
[114] Buck et al., *supra* note 3, at 518; Scheringer & Wang, *supra* note 25. *See also* Lindstrom et al., *supra* note 25.
[115] Adam Wagner & Tim Buckland, *Chemours: GenX Polluting the Cape Fear since 1980*, StarNews Online (June 15, 2017), https://www.starnewsonline.com/news/20170615/chemours-genx-polluting-cape-fear-since-1980#:~:text=WILMINGTON%20%2D%2D%20A%20former%20DuPont,from%20DuPont%2Dspinoff%20Chemours%20Co.
[116] *Id.*
[117] Sharon Lerner, *New Teflon Toxin Found in North Carolina Drinking Water*, The Intercept (June 17, 2017), .https://theintercept.com/2017/06/17/new-teflon-toxin-found-in-north-carolina-drinking-water/.

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limits for PFOA and PFOS suggest that GenX levels at 296 ppt would be hazardous to lactating mothers and 91 ppt in drinking water would be hazardous to infants, a greater risk population.[118]

The only reason researchers were even able to identify GenX as a chemical in the residents' drinking water was because more than a decade after DuPont began dumping the chemical as a byproduct into Cape Fear River, it decided to use GenX commercially in another context and thus submitted a PMN for it.[119] GenX, when produced commercially, was regulated in a consent order as a result of the PMN process; GenX as a byproduct, however, both before and after a PMN was submitted for its commercial use, was not. The consent order—a seemingly standard consent order by EPA—explicitly stated that it did not apply to GenX as a byproduct. Indeed, the high levels of toxic GenX contamination were discovered not because it was subject to EPA regulation, but only because an academic researcher decided to test the water from the river.[120]

The revelations about GenX discovered in the Cape Fear River raised alarm among residents of Wilmington, North Carolina, some of whom stopped drinking their GenX-contaminated tap water.[121] The revelations also led to more testing. Researchers found hydrolyzed GenX (hexafluoropropylene) in the urine of several Wilmington residents.[122] And compounding the problem, the researchers looking for GenX contamination in Wilmington

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[118] Anna Reade et al., *PFAS in Drinking Water 2019* 42, 85–86 (2019), https://www.nrdc.org/sites/default/files/media-uploads/nrdc_pfas_report.pdf.
[119] *See GenX Chemicals Studies*, EPA, https://www.epa.gov/pfas/genx-chemicals-studies (last updated Apr. 30, 2018).
[120] Sharon Lerner, *A Chemical Shell Game: How DuPont Concealed the Dangers of the New Teflon Toxin*, The Intercept (Mar. 3, 2016), https://theintercept.com/2016/03/03/how-dupont-concealed-the-dangers-of-the-new-teflon-toxin/.
[121] Cheryl Hogue, *The Hunt Is on for GenX Chemicals in People*, c&en (Apr. 7, 2019), https://cen.acs.org/environment/persistent-pollutants/hunt-GenX-chemicals-people/97/i14.
[122] *Id.*

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residents also discovered several other novel PFAS in blood samples.[123] These novel PFAS were all byproducts produced by Chemours.[124] Animal studies—conducted in response to this avoidable tragedy and not any sort of regulation of byproducts—have thus far linked at least one of those PFAS byproducts with harmful liver effects.[125]

B. Companies Regularly Circumvent the PMN Process for New PFAS Via the LVE and LoREX Exemptions

When proposing the LVE and LoREX exemptions, EPA explained that the exemption would not lead to unreasonable risk because, among other things, "the benefits to the public and the Agency from the Agency's enhanced ability to utilize its limited resources to focus on reviewing new chemical substances and uses of *higher risk and concern*." 60 Fed. Reg. at 16,345 (emphasis added). But PFAS are precisely the kinds of "higher risk and concern" substances that EPA should focus on. Indeed, EPA has repeatedly acknowledged both that "[m]any Americans are concerned about potential health impacts from exposure to [PFAS],"[126] and that "[a]ggressively addressing PFAS has been an active and ongoing priority" for EPA.[127] Yet, permitting new PFAS to enter commerce via the LVE and LoREX exemptions *undermines* EPA's goal of closely reviewing new chemical substances that are of higher risk and concern to both the public and the agency.

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[123] *Id.*
[124] *Id.*
[125] Hua Guo et al., *Comparative Hepatotoxicity of Novel PFOA Alternatives (Perfluoropolyether Carboxylic Acids) on Male Mice*, 53 Env't Sci. & Tech. 3929 (2019), https://pubs.acs.org/doi/abs/10.1021/acs.est.9b00148?source=cen.
[126] EPA *PFAS Action Plan*, *supra* note 59, at 8.
[127] Press Release, EPA, *Federal Partners Kick Off Workshop on Federal Government Human Health PFAS Research with the National Academies of Sciences, Engineering and Medicine* (Oct. 26, 2020), https://www.epa.gov/newsreleases/federal-partners-kick-workshop-federal-government-human-health-pfas-research-national; *see also* Press Release, EPA, *EPA Releases Testing Data Showing PFAS Contamination from Fluorinated Containers* (Mar. 5, 2021), https://www.epa.gov/newsreleases/epa-releases-testing-data-showing-pfas-contamination-fluorinated-containers ("As the U.S. Environmental Protection Agency (EPA) pursues its mission to protect human health and the environment, addressing risks related to PFAS is a priority.").

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The repercussions of this failure of adequate regulatory oversight are not hypothetical. To the contrary, chemical manufacturers use the LVE for new PFAS, thereby evading full PMN review for such chemicals, with tremendous frequency. EPA's own calculations show that from 2006-2016, companies sought approval for PFAS through the LVE far more often than through the PMN process.[128] This trend continued after the 2016 TSCA amendments.[129]

EPA also approves a high proportion of LVE exemption notices. Between the summer of 2016 and the March of 2021, EPA approved over 85 percent of all LVE applications.[130] The approval rate specifically for PFAS is just as high. Between 2006 and June 2016, EPA received 328 LVEs for PFAS and granted 272—equivalent to 83 percent—of them.[131] Thus, not only do the many individual, minimally assessed PFAS present dangers on their own, but the rapid and relatively easy approval of multiple new PFAS present additional concerns: simultaneous human exposure to multiple PFAS that can have compounding negative effects.[132]

Manufacturers—understandably for them, but alarmingly to the public—see the LVE option as a boon. Industry uses the LVE loophole to avoid precisely what Congress intended when amending the PMN provisions in 2016: a close review and regulation when necessary for toxic chemicals, with no approval by default.[133] As one law firm explained, the LVE is "an

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[128] Off. Pollution, Prevention, & Toxics, EPA, *Per- and Polyfluoroalkyl Substances (PFAS) Summary Report* 4-4 fig.4-5 (2018). Attached as Exhibit B.
[129] *See* Richard Denison, *Greasing the Skids: The Trump EPA is Green-Lighting Dozens of New PFAS under TSCA*, EDF (July 28, 2020), http://blogs.edf.org/health/2020/07/28/greasing-the-skids-the-trump-epa-is-green-lighting-dozens-of-new-pfas-under-tsca/.
[130] *Id.* - Richard Denison, *Greasing the Skids: The Trump EPA is Green-Lighting Dozens of New PFAS under TSCA*, EDF (July 28, 2020), http://blogs.edf.org/health/2020/07/28/greasing-the-skids-the-trump-epa-is-green-lighting-dozens-of-new-pfas-under-tsca/.
[131] Letter from Troy M. Lyons, Assoc. Adm'r, EPA, to Paul D. Tonko, Representative, U.S. H.R. (June 6, 2019). Attached as Exhibit C.
[132] *See infra* Reasons to Grant the Petition § II.C.
[133] EPA recently stated that it reviewed more than 300 LVE notices for PFAS substances since 2006, "most of which were granted based on restrictions/controls in the original or amended submissions." EPA *PFAS Action Plan*, *supra*

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attractive option for high-toxicity substances," noting that "[if] submitted as a PMN, the same substance might well wind up being regulated under section 5(e)."[134] While the LoREX Exemption is not presently used with the same frequency as the LVE, it is crucial that the agency closes both loopholes in the regulation of PFAS concurrently. If the LVE loophole is closed, the LoREX Exemption may become the new "attractive option for high-toxicity substances" to evade PMN review and appropriate regulation.

C. Exposure to Multiple PFAS Can Have Compounding Negative Health Effects that Are Not Taken into Account When PFAS Come to Market Through the Challenged Exemptions

EPA should also exclude PFAS from the Challenged Exemptions because exposure to multiple PFAS may present additional risks on top of those presented by one, yet none of the Challenged Exemptions require such risks to be taken into account before allowing PFAS to get to market through them. Simultaneous exposure to multiple PFAS—an example of cumulative exposure—has become increasingly prevalent as a result of environmental contamination, which can result in more frequent and higher exposures to multiple PFAS in humans over the same time period, and consequentially increase the potential for compounding adverse health effects. Because PFAS are persistent and many have bioaccumulative qualities, they can build up in the human body over time and linger in certain tissues for as long as decades before being excreted,

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note 59, at 18. Even if EPA's approvals of LVE applications for PFAS have sometimes been premised on restrictions or controls in the manufacturer's submission, it would not cure the fundamental problems outlined in this petition. Ad hoc regulation of PFAS under the LVE cannot justify upholding an otherwise invalid regulation that violates the letter and purpose of a statute. *See F.C.C. v. Fox Television Stations, Inc.*, 556 U.S. 502, 536 (2009) (citing 5 U.S.C. § 706(2)(C)) ("the agency action must not be 'in excess of statutory jurisdiction, authority, or limitations, or short of statutory right'").

[134] Keller and Heckman LLP, *The Constantly Pending PMN: Low Volume Exemption Applications Are Living Documents*, Martindale (Mar. 11, 2011), https://www.martindale.com/chemicals/article_Keller-Heckman-LLP_1255440.htm.

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extending the window of opportunity to adversely affect health.[135] This raises additional concerns; several studies have indicated that simultaneous exposure to multiple PFAS in humans and animals can have compounding negative effects.[136]

Yet the Challenged Exemptions do not take these potential cumulative risks into account. For example, the LoREX Exemption sets limits on a chemical's release, but only one chemical at a time. But assessing the potential adverse effects of these PFAS individually does not sufficiently protect the public. Each new PFAS released into the environment has the potential to compound the adverse effects of the last. Thus, the only way to mitigate the PFAS contamination crisis our country faces is to stop the manufacturing and release of new PFAS altogether; at the very least, EPA should ensure that any new PFAS go through a full PMN review that accounts for cumulative exposures and risks.

D. Because the Byproducts, LVE, and LoREX Exemptions Fail to Provide for Adequate Public Notification, Use of Such Exemptions for PFAS Places Communities Across the Country at Heightened Risk of Harm

The Challenged Exemptions allow manufacturers to place PFAS into commerce while making it difficult for communities to know about their existence or the risks they pose. Congress recognized that when a new chemical is brought to market, it is critical that the public—whose health and well-being could be at risk—be able to learn about it.[137] The public, particularly those residents living near chemical manufacturing facilities, has a pressing interest

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[135] Paul Jones et al., *Binding of Perfluorinated Fatty Acids to Serum Proteins*, 22 Env't Toxicology & Chemistry 2639 (2003); Suzanne Fenton et al., *Per- and Polyfluoroalkyl Substance Toxicity and Human Health Review: Current State of Knowledge and Strategies for Informing Future Research*, 40 Env't Toxicology & Chemistry 606 (2020), https://setac.onlinelibrary.wiley.com/doi/full/10.1002/etc.4890.

[136] *See, e.g.*, Caroline Carr et al., *Testing for Departures from Additivity in Mixtures of Perfluoroalkyl Acids (PFAAs)*, 306 Toxicology 169 (2013), https://pubmed.ncbi.nlm.nih.gov/23470359/; Guanghui Ding et al., *Combined Effects of PFOS and PFOA on Zebrafish (Danio rerio) Embryos*, 64 Archives Env't Contamination & Toxicology 668 (2013), https://pubmed.ncbi.nlm.nih.gov/23479250/.

[137] *See* H.R. Rep. No. 94-1679, at 67 (1976) (Conf. Rep.) (explaining that the public notice requirement in TSCA § 5(d)(2) was included "[i]n order that the public receive timely notification of any new chemical substance ...."); 162 Cong. Rec. S3,511–12 (2016) (statement of Sen. Mark Udall); 162 Cong. Rec. E785-02 (2016) (statement of Rep. Loretta Sanchez).

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both in knowing when manufacturers seek to market substances that could threaten public health or the environment, and in closely following decisions EPA makes about such requests. EPA has acknowledged as much, stating that "Congress intended informed citizen involvement in review of new chemical substances. . . Public participation cannot be effective unless meaningful information is made available to interested persons." Premanufacture Notification; Premanufacture Notice Requirements and Review Procedures, 48 Fed. Reg. 21,722, 21,737 (May 13, 1983).

The PMN process is designed to meet these goals. TSCA requires EPA to alert the public when a PMN has been submitted and to provide the public with access to information about the PMN chemical. 15 U.S.C. § 2604(d)(1). Within five business days of receiving a PMN application, EPA is required to publish in the Federal Register a notice of the chemical substance proposed to be manufactured, a list of the substance's uses as identified in the application, and a description of the tests performed on the substance and any information EPA required to submitter to develop. 15 U.S.C. § 2604(d)(2). It must make all PMNs and Significant New Use Notices (SNUNs) publicly available to any interested person, *id.* § 2604(d)(1), as well as all information submitted with the notices, *id.* § 2604(b)(3) and 40 C.F.R. § 720.95. EPA must also make the public files electronically available. 40 C.F.R. §§ 700.17(b)(1), 720.95. And although companies may request that certain confidential business information be redacted from public disclosure, TSCA explicitly forbids withholding health and safety studies or associated information. 15 U.S.C. § 2613(b)(2).[138]

[138] *See generally* 15 U.S.C. § 2613(d). Congress underscored its commitment to transparency in this domain through the 2016 Lautenberg amendments, which required upfront justification and EPA review of most claims of confidentiality of business information. Even information traditionally considered confidential must be disclosed if EPA determines that disclosure is necessary to protect against an unreasonable risk of injury to health or the environment, including to greater risk populations. *Id.* § 2613(d)(3).

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If EPA determines after the safety review that the reviewed substance "is not likely to present an unreasonable risk," EPA must make a public statement of such a finding, which is then required to be published in the Federal Register as soon as practicable. 15 U.S.C. § 2604(g). Unfortunately, the public has not been able to track PMN applications because EPA has not been faithfully implementing the public notice provisions of TSCA and EPA's own regulations.[139]

The Challenged Exemptions do not even offer the public much in the way of transparency on paper. Instead, the Challenged Exemptions deny the public access to much of the information required when new chemical approval is sought by means of a PMN. Unlike for PMNs, a notice of receipt of an exemption application does not need to be published in the Federal Register. If EPA allows a chemical falling under an exemption to come to market, it does not publish a decision-making document containing an assessment or finding that the chemical will not present an unreasonable risk public. *Cf.* 15 U.S.C. § 2604(g) (requiring public statement and publishing in Federal Register for a PMN-reviewed chemical that EPA determined was not likely to present an unreasonable risk). As described in Reasons to Grant the Petition § II.B, manufacturers that produce PFAS under the Byproducts Exemption are required to submit only a few sparse details on the chemicals. The only information EPA makes publicly accessible about PFAS submitted through the LVE and LoREX Exemption is that in EPA's TSCA Exemptions Table, and the table makes it impossible to know whether any of the substances

[139] *See, e.g.*, Erin Fitzgerald, *Report: Trump's EPA Sued for Concealing Health Studies, Violating Its Chemical Laws*, Earthjustice (Mar. 18, 2020), https://earthjustice.org/news/press/2020/report-trumps-epa-sued-for-concealing-health-studies-violating-its-chemical-laws; Richard Denison, *EPA Is Keeping the Public in the Dark on Premanufacture Notices for New Chemicals under TSCA*, EDF (Apr. 2, 2018), http://blogs.edf.org/health/2018/04/02/epa-is-keeping-the-public-in-the-dark-on-premanufacture-notices-for-new-chemicals-under-tsca/ (detailing the nonprofit Environmental Defense Fund's frustrated efforts to obtain information on PMNs).

listed on it are PFAS, as no chemical names are provided.[140] This table merely lists a case number, receipt date, focus meeting date, status, and effective date.

Using Cape Fear's tragedy as an example, one can see why approving new PFAS under the Challenged Exemptions hinders communities' ability to protect themselves. Had the PFAS byproducts undergone PMN review, information about their existence and the risks they presented to the public may have been disseminated prior to, rather than after, North Carolinians were exposed. EPA has itself recognized that communities expect the agency to "communicate effectively with the public and to be transparent in sharing what is known and unknown [about PFAS] in a timely manner" and that such information can help these communities engage in risk management.[141] Such communication and ability to engage in risk management is absent when new PFAS are permitted to circumvent the PMN process.

Requiring PFAS—toxic at low levels and ubiquitous in our lives—to proceed through the PMN process would bring assessment of new PFAS a step closer to fulfilling the mandate of Congress to make information about potentially dangerous chemicals available to the public and allow communities impacted by contamination to take steps to protect themselves.

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[140] *Reviewing New Chemicals Under the Toxic Substances Control Act (TSCA): Exemptions Table*, EPA, www.epa.gov/reviewing-new-chemicals-under-toxic-substances-control-act-tsca/exemptions-table (last updated Apr. 22, 2021). Limited information on PFAS submitted through the LVE and/or LoREX Exemption is available on US EPA's ChemView, but this information can be accessed only when searching by chemical name or other chemical identifiers (e.g., CAS number, etc.).

[141] EPA *PFAS Action Plan*, *supra* note 59, at 37–38.

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III. TSCA REQUIRES EPA TO ENSURE THAT ALL PFAS POLYMER ARE INELIGIBLE FOR THE POLYMER EXEMPTION

As mentioned earlier, EPA's current regulations make certain PFAS ineligible for approval under the Polymer Exemption. *See* 40 C.F.R. § 723.250(d). Specifically, a PFAS polymer is ineligible for the exemption only if it "contains as an integral part of its composition, except as impurities" the following specific perfluoroalkyl moieties: "Perfluoroalkyl sulfonates . . ., perfluoroalkyl carboxylates . . . , fluorotelomers, or perfluoroalkyl moieties that are covalently bound to either a carbon or sulfur atom where the carbon or sulfur atom is an integral part of the polymer molecule." *Id.*

This exemption carve-out hinges on whether the perfluoroalkyl moiety is bound to either a carbon or sulfur atom that is an integral part of the polymer molecule, which is unclear and not consistent with the most current scientific definition of PFAS. —As discussed at length throughout this petition, 15 U.S.C. § 2604(h)(4) requires EPA to make substances ineligible for EPA-created exemptions like the Polymer Exemption unless those substances *will not* present an unreasonable risk to human health and the environment. And as EPA itself has admitted, the agency is statutorily required to make PFAS containing polymers ineligible for the Polymer Exemption if the substances "may, or are expected to, share similar characteristics" with known hazardous PFAS. 75 Fed. Reg. at 4,298.

The weight of the scientific evidence demonstrates that a polymer of any chain length containing any perfluoroalkyl moiety may present an unreasonable risk, regardless of whether the perfluoroalkyl moiety is bound to either a carbon or sulfur atom that is an integral part of the polymer molecule. EPA therefore must notify manufacturers via a Federal Register notice that

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they should not use this exemption for any new PFAS polymers as defined in this Petition.[142] EPA must also initiate a rulemaking to amend the PFAS exception to the Polymer Exemption in 40 C.F.R. § 723.250(d)(6) to ensure that it includes all PFAS as defined in this Petition. That rulemaking should also establish a two-year window after which the continued manufacture of any PFAS polymer previously manufactured under the Polymer Exemption is prohibited unless such PFAS has undergone a full PMN review and been approved by EPA.

IV. WHEN NEW PFAS ARE SUBJECTED TO PMN REVIEW, EPA WILL BE UNABLE TO MAKE "NOT LIKELY TO PRESENT UNREASONABLE RISK" FINDINGS

This Petition explains why PFAS as a class cannot as a matter of law be eligible for certain exemptions to the PMN review process; rather, we argue, TSCA requires all proposed new PFAS to go through PMN review. This Petition further explains how EPA's increasingly frequent practice of approving PFAS via PMN exemptions rather than via the PMN review process has put communities and the environment at risk and deprived the public of information about proposed new PFAS that it would be entitled to during the PMN process. Nothing in these arguments should be read to suggest that Petitioners believe EPA could lawfully find that any proposed new PFAS "is not likely to present an unreasonable risk of injury to health or the environment," 15 U.S.C. § 2604(a)(3), the legal standard that must be met for manufacture to commence after submission of a PMN.

Rather, we submit that if EPA complies with the requirements of 15 U.S.C. § 2604 by ceasing to allow PFAS to enter commerce and/or the environment via PMN exemptions, and requiring manufacturers of proposed new PFAS to use the PMN process, the Agency will have

[142] EPA should use its inspection powers under 40 C.F.R. § 723.250(m) ensure that manufacturers do not bring any new PFAS polymers to market through the Polymer Exemption.

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more time and information[143] on which to make science-based determinations regarding whether the PFAS is "not likely" to present unreasonable risk (including to greater risk populations), and the public will have the opportunity, intended by Congress, to provide input into that determination. We further submit that if EPA follows the law and the science, it will cease approving PMNs for new PFAS.

[143] During a PMN review, EPA has the authority to request additional time to conduct a safety review. *See* 15 U.S.C. 2604(c); *see also supra* Background & Legal Framework § A. The agency may also require a manufacturer to provide additional information if the PMN notice is incomplete and/or order testing if test data supplied by the manufacturer is insufficient to conduct a safety review. *See* 40 C.F.R. § 720.65(c); 15 U.S.C. § 2604(e).

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REQUESTED AGENCY ACTION

Allowing manufacturers of PFAS to circumvent the PMN process and instead to seek approval of new PFAS via the Byproducts, LVE, LoREX, and/or Polymer exemptions threatens public health and contravenes the text and intent of TSCA. We therefore ask EPA to prohibit the use of these exemptions for PFAS as follows:

1. EPA must initiate a rulemaking to prohibit: a) future use of the Byproducts Exemption for new PFAS, and b) continued manufacture of any PFAS byproduct under the auspices of the Byproducts Exemption unless and until such PFAS has undergone a full PMN review and been approved by EPA, with a two-year window for manufacturers to receive such approval.
2. EPA should immediately stop permitting the use of the LVE, LoREX, and Polymer exemptions for any new PFAS.

EPA must codify these changes and should do so by making the following amendments and revisions to its regulations:

PART 720—[AMENDED]

1. Section 720.30 is amended by revising paragraphs (g) and (h)(2) to read as follows:

§ 720.30 Chemicals not subject to notification requirements.

...

> (g) Any byproduct <u>that does not contain one or more perfluoroalkyl moieties,</u> if its only commercial purpose is for use by public or private organizations that (1) burn it as a fuel, (2) dispose of it as a waste, including in a landfill or for enriching soil, or (3) extract component chemical substances from it for commercial purposes. (This exclusion only applies to the byproduct; it does not apply to the component substances extracted from the byproduct.) <u>Any byproduct that does contain one or more perfluoroalkyl moieties that has been manufactured previously under this section prior to [insert effective date of amendment] may no</u>

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longer be manufactured under this section after [insert two years after effective date of amendment].

…

(h) …

(2) Any byproduct which is not used for commercial purposes and which does not contain at least one perfluoroalkyl moiety. Any byproduct that does contain one or more perfluoroalkyl moieties that has been manufactured previously under this section prior to [insert effective date of this regulatory amendment] may no longer be manufactured under this section after [insert two years after effective date of this regulatory amendment].

PART 723—[AMENDED]

1. Section 723.250 is amended by revising paragraph (d)(6) to read as follows:

§ 723.250 Polymers. …

(d) …

(6) *Polymers which contain* ~~*certain*~~ *perfluoroalkyl moieties* ~~*consisting of a CF3- or longer chain length*~~. ~~Except as provided in paragraph (d)(6)(i), after February 26, 2010, a~~ A polymer cannot be manufactured under this section if the polymer contains ~~as an integral part of its composition, except as impurities,~~ one or more ~~of the following~~ perfluoroalkyl moieties ~~consisting of a CF3- or longer chain length: Perfluoroalkyl sulfonates (PFAS), perfluoroalkyl carboxylates (PFAC), fluorotelomers, or perfluoroalkyl moieties that are covalently bound to either a carbon or sulfur atom where the carbon or sulfur atom is an integral part of the polymer molecule~~.

(i) Any polymer that has been manufactured previously in full compliance with the requirements of this section prior to ~~February 26, 2010~~ [insert effective date of amendment] may no longer be manufactured under this section after ~~January 27, 2012~~ [insert two years after effective date of amendment].

2. Section 723.50 is amended by adding a new paragraph (o) to read as follows:

§ 723.50 Chemical substances manufactured in quantities of 10,000 kilograms or less per year, and chemical substances with low environmental releases and human exposures.

…

(o) *Chemical substances which contain perfluoroalkyl moieties.* A chemical substance cannot be manufactured under this section if the chemical substance contains one or more perfluoroalkyl moieties.

DATED: April 27, 2021

Respectfully Submitted,

EARTHJUSTICE*

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Submitted on behalf of Advance Carolina; Alaska Community Action on Toxics; BlueGreen Alliance; Buxmont Coalition for Safer Water; Clean Cape Fear; Defend Our Health; Delaware Riverkeeper Network; Democracy Green; Environmental Defense Fund; International Association of Fire Fighters; Merrimack Citizens for Clean Water; National PFAS Contamination Coalition; Natural Resources Defense Council; Safer Chemicals, Healthy Families; and Union of Concerned Scientists.

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* Earthjustice is grateful to Laura Dumais and Claire Huang, former Earthjustice employees, and Amy Chyao, former summer clerk, for their significant contributions to this Petition.
** Non-lawyer signatories contributed to the scientific, research, and/or factual portions of this document, and did not provide legal services or legal analysis.

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Appendix A

APPENDIX A: PETITIONER STATEMENTS OF INTEREST

Advance Carolina

Advance Carolina was formed to help advocate for Black and Brown North Carolina residents, who have historically been under attack. Advance Carolina reimagines and works to ensure the safety of these communities along several dimensions including, but not limited to: safety from multiple catastrophic hurricanes; safety from racist, state-sanctioned violence; and safety from voter intimidation.

One key focus of the group's work involves drawing attention to and working to reverse racial health disparities in North Carolina. The organization is committed to ensuring Black and Brown communities are safe from toxic pollutants released into communities by corporations and industry. To this end, Advance Carolina prioritizes the safety of Black and Brown North Carolina residents impacted by PFAS pollution in Cape Fear. This commitment has become pronounced in light of the coronavirus pandemic, the effects of which have been exacerbated by such pollutants. Thus, Advance Carolina has an interest in this petition, which seeks to limit PFAS contamination across the country.

Alaska Community Action on Toxics

Alaska Community Action on Toxics ("ACAT") was founded in 1997 to assist Alaskans coping with the consequences of environmental contaminants. ACAT's goals include protecting everyone's right to know about the health and environmental hazards of chemicals that are present in air, water, soil, and foods; and having chemicals that are persistent, bioaccumulative, and harmful to health—such as PFAS—phased out and replaced with safe alternatives. ACAT engages in research, policy advocacy, and education to further its goals. For example, in September 2019, ACAT published a report on pervasive PFAS contamination throughout Alaska to aid residents and state and federal policymakers in making informed decisions to protect current and future generations from continued exposure to PFAS.

ACAT has an interest in this petition because the introduction of new PFAS into Alaska's communities and environment would compound the crisis of PFAS contamination in the state. Alaskans have unique exposure to new potentially hazardous PFAS because PFAS can undergo a process known as "global distillation," or the "grasshopper effect." Through this phenomenon, PFAS emitted to the air or entering water from polluting sources in Europe, Asia, and North America are picked up by oceanic and atmospheric currents and deposited in colder climates, often in the polar regions including the Arctic and Alaska. Alaskan Indigenous Tribal Communities are especially vulnerable to PFAS exposure because once in the Arctic ecosystem, PFAS, together with other persistent pollutants, can accumulate in living organisms, reaching high concentrations in larger animals like marine mammals, including seals and whales, which serve as integral components of the traditional diets and cultures of Indigenous peoples of Alaska and the Arctic.

The BlueGreen Alliance

The BlueGreen Alliance unites labor unions and environmental organizations to solve today's environmental challenges in ways that create and maintain quality jobs and build a clean, thriving, and equitable economy. The organization is guided by the principle that there cannot be a choice between good jobs and a clean environment—that the actions taken to create quality jobs and to protect working people and the environment must go hand-in-hand, and that by working together it will be possible to build a clean, thriving, and fair economy. The organization's mission includes reducing the impact of hazardous toxics such as PFAS, and eliminating them altogether if at all possible. PFAS has deleterious health effects to individuals and the communities represented by the BlueGreen Alliance generally, but particularly those most vulnerable. As an organization committed to addressing unsafe workplaces and communities, the BlueGreen Alliance stands in solidarity with colleagues at various organizations to stop the approval of PFAS through PMN exemptions.

Buxmont Coalition for Safer Water

Petitioner Buxmont Coalition for Safer Water ("Buxmont") is a nonprofit formed by residents of Pennsylvania's Bucks and Montgomery counties in response to growing awareness of the risks posed and harms caused by the historical use of PFAS-laden firefighting foam at Naval Air Development Center in Warminster, PA and The Willow Grove Naval Air Base and Air Reserve Station in Horsham PA. Blood samples taken in 2018 from more than 200 residents who live near these military bases showed a troublingly high amount of PFAS exposure on average. These residents had twice as much PFOS and more than five and half times as much PFHxS in their blood samples as the national average, along with elevated levels of PFOA and other PFAS.

The organization advocates on behalf of the 85,000 residents of Pennsylvania's Bucks and Montgomery counties at risk of PFAS exposure to PFAS. The organization helps raise public awareness through avenues such as local and national media and its website. Buxmont also engages in legislative and administrative advocacy for the regulation of PFAS, including by testifying before the U.S. Congress and the Senate. Buxmont joins this Petition because the organization is concerned that the regulatory exemptions at issue place communities, including their own already burdened local community, at increased risk of even more exposure to PFAS. Buxmont is aware that at least two manufacturers with facilities in Bucks and Montgomery County, Gelest Inc. and Heraeus Precious Metals, brought two new PFAS to market through the Low Volume Exemption.

Clean Cape Fear

Clean Cape Fear is an organization based in the Wilmington, North Carolina area, with a mission to stop and remediate PFAS contamination. The organization formed after information came to light that a Chemours plant, formerly owned by DuPont, had been discharging PFAS into the Cape Fear River for nearly 40 years. This news raised alarm as the lower Cape Fear River serves as the primary source of drinking water for approximately 300,000 people in three counties. Community fears were substantiated by a number of revelations, including a 2018 study which found that Wilmington residents had two times as much PFOS and three times as much PFOA in their blood as the national average. Clean Cape Fear has attempted to mitigate this crisis through public awareness campaigns about PFAS contamination in the river and efforts to ensure that residents have access to contaminant-free water.

Clean Cape Fear has a particular interest in closing the exemptions that are the subject of the petition because manufacturers' use of at least one of the exemptions contributed to the contamination of the Cape Fear River. The PFAS GenX initially escaped regulatory review and was discharged into the Cape Fear River, likely as a byproduct of a vinyl ether process at the facility. Indeed, researchers were able to identify GenX as a chemical in the residents' drinking water decades after DuPont began dumping the substance only because DuPont eventually sought regulatory approval for it so that it could use GenX commercially. Researchers have since discovered several other previously unknown PFAS byproducts manufactured at the Chemours plant in blood samples of Wilmington residents.

Defend Our Health

Defend Our Health works to create a world where all people are thriving, with equal access to safe food and drinking water, healthy homes, and products that are toxic-free and climate-friendly. The organization has worked directly with communities impacted by PFAS in its home state of Maine, which has seen widespread contamination of land and drinking water as the result of land application of contaminated sludge. Defend Our Health is advancing efforts on a state and national level to control existing PFAS pollution, and thus the organization has an interest in the petition. The organization is particularly concerned that EPA is continuing to approve new sources of exposure through exemptions to the PMN process.

Delaware Riverkeeper Network

Petitioner Delaware Riverkeeper Network ("DRN") is a Pennsylvania non-profit organization whose mission is to protect and restore the Delaware River and its tributaries, habitats, and resources. It was established in 1988 and has approximately 25,000 members. DRN has been working on the problems posed by the presence of PFAS in the communities served by the organization since 2005, when its staff collected tap water samples containing PFOA from homes in the neighborhoods close to DuPont's Chambers Works facility in Deepwater, New

Jersey on the Delaware River. After this revelation, DRN began an advocacy campaign, which, over the years, has involved raising public awareness about PFAS contamination and the submission of technical information, scientific analysis, and policy analysis through comments, testimony, and correspondence to government agencies.

An ongoing matter of concern for DRN has been PFAS contamination from the Solvay Specialty Polymers USA, LLC manufacturing facility in Gloucester County, New Jersey. This facility has released PFAS compounds into New Jersey's water and air for decades and continues to do so. Perfluorononanoic acid (PFNA), a PFAS compound, was found near the facility at the highest reported water concentration in the world at the time through sampling of groundwater supplies by the New Jersey Department of Environmental Protection. DRN continues to be concerned about PFAS contamination in the Delaware River area and the lack of transparency about those chemicals and their potential risks. The New Jersey Department of Environmental Protection recently became aware of the release of "replacement" PFAS substances from Solvay into the environment. The agency, however, has been unable to ascertain the chemical identities of the majority of these potentially hazardous compounds. Making matters worse, Solvay has been unwilling to release important emissions and safety information and data on the replacement PFAS. DRN believes closing the regulatory loopholes described in this petition is one important step towards ensuring more oversight of PFAS and transparency about potential exposure to them.

Democracy Green

Democracy Green does work at the intersection of democracy and environmental justice and prioritizes community expertise to inform equitable solutions for Black and Brown communities in North Carolina. The organization was formed in response to the historic use of Black neighborhoods as dumping grounds, which has poisoned the air, water, and food of these frontline communities. The organization knows that environmental justice must be prioritized in democracy reform efforts, policy, and litigation.

To this end, Democracy Green has made PFAS contamination a priority. Black and Brown communities across the state, with a concentration along the Cape Fear Neuse River, have experienced cumulative impacts and layered exposure to this class of chemicals through groundwater contamination, fast food exposure in food-insecure areas, and contamination in confinement facilities. In particular, essential franchise and plant workers as well as renters in PFAS-contaminated infrastructure have been subject to troubling levels of exposure by these substances. To deal with this contamination crisis, Democracy Green demands corporate accountability, stricter permit enforcement, community resource support to remediate the harms of contamination, equitable testing of contamination levels, research into improving clinical guidelines, and policy shifts to address racial inequities in this area. The organization has an interest in this petition because it outlines a set of actions EPA could undertake to address a part of this crisis.

Environmental Defense Fund

Founded in 1967, EDF is a 501(c)(3) nonprofit organization, with more than 2.5 million members and activists located in all 50 states and the District of Columbia, that uses science, economics, and law to restore the quality of our air, water, and other natural resources. EDF's Health Program aims to reduce human health risks and disparities posed by exposure to industrial and commercial chemicals and chemicals in everyday products, food, and drinking water. To accomplish our mission, EDF advocates for appropriate implementation of the Toxic Substances Control Act. Our efforts rely on the Environmental Protection Agency conducting robust safety reviews and disclosing information about new chemicals, including chemicals such as PFAS that may present risks if allowed to enter commerce without adequate review and transparency. For years, EDF has repeatedly raised concerns over industry's use of exemptions from the full pre-manufacture review process, which result in curtailed safety reviews and are shrouded in secrecy. This petition seeks to address these concerns.

The International Association of Fire Fighters

The International Association of Fire Fighters (IAFF) represents more than 324,000 full-time professional fire fighters and paramedics in more than 3,500 affiliates in the United States and Canada. IAFF members protect more than 85 percent of the population in communities throughout the two countries.

Over the last 100 years, the IAFF has been the driving force behind nearly every advance in fire and emergency services in the 21st century and is the nation's leading voice on health and safety issues impacting the fire service. Fire fighters face significant exposures to PFAS on the job due to the vast quantity of such substances added to building materials, consumer products, firefighting foam, and the gear our members use every day. Scientific studies have linked PFAS to cancer, which is today the leading cause of death of firefighters. The IAFF joins this petition because the health and safety of fire fighters depends upon EPA actively safeguarding the public and the environment against the potential health hazards posed by new PFAS.

Merrimack Citizens for Clean Water

Merrimack Citizens for Clean Water was founded in 2016 by residents who had no choice but to become their own self-educated advocates about PFAS contamination in Merrimack, NH. Two of the town's six water wells and hundreds of private water wells in the greater Merrimack area have tested over the New Hampshire regulatory limit at that time for the combined PFOA/PFOS total of 70 ppt. The organization has since learned that air emissions and industry discharges from two significant users of PFAS, Saint Gobain Performance Plastics and TCI, have resulted in

the presence of 21 additional PFAS chemicals in the entire community's water supply as well as in the drinking water of six surrounding communities.

Merrimack Citizens for Clean Water has an interest in this petition because the town would benefit from more affirmative regulation of PFAS by the EPA. The organization would welcome regulatory action on PFAS in addition to PFOA and PFOS, as the residents of Merrimack have had to deal with contamination from an array of substances in this class, including unidentified PFAS suspected of being byproducts. This petition would help ensure that the agency would take measures to protect the residents of Merrimack before any new PFAS are introduced into their community.

The National PFAS Contamination

The National PFAS Contamination Coalition was formed in June 2017 by community leaders who were concerned about the PFAS drinking water contamination in their neighborhoods. The coalition seeks to better support local organizing for clean water and health protection by sharing local campaign stories and information and connecting to experts. The coalition also aims to build a bigger movement for national change on these issues by working on state and national campaigns together for solutions and building a collaborative and powerful force to take on big polluters. The coalition has grown to be 30 community groups in 17 states. The National PFAS Contamination Coalition has an interest in this petition because the manufacture, release, and distribution of new PFAS threaten the water and health of the communities the coalition was established to support.

Natural Resources Defense Council

Natural Resources Defense Council's ("NRDC") mission is to safeguard the Earth: its people, its plants and animals, and the natural systems on which all life depends. NRDC strives to advance the long-term welfare of present and future generations. NRDC's Health and Communities Program works to protect the public from exposure to toxic chemicals that pose a risk to human health. This includes work to eliminate exposures to toxic chemicals from drinking water, food, and household products, and to the pollution created by industrial production and disposal of products. As part of NRDC's mission to protect people from toxics, we regularly submit comments on agency rulemakings relating to industrial and household chemicals and advocate for vigorous implementation of the Toxic Substances Control Act (TSCA).

NRDC has an interest in this petition as an organization working extensively at both the state and federal level to address the ongoing PFAS crisis. This work has included advocacy in support of state laws imposing restrictions on specific uses of PFAS and setting strong health protective standards for drinking water in states such as California, Michigan, New York, and New Hampshire. NRDC has testified before House and Senate committees on the need for numerous pieces of legislation to regulate PFAS. NRDC has also commented to EPA in opposition to its

continued approval of new PFAS through the PMN program, and the need to adopt stronger protections from existing PFAS by strengthening and expanding the use of Significant New Use Rules. NRDC has also played a leading role in market-based campaigns to remove PFAS from consumer products, including rugs, carpets, and building materials. NRDC has also played a leadership role in developing scientific understanding of PFAS, including co-authoring papers on the need to regulate PFAS as a class and creating a database of more than 700 health studies of PFAS.

Safer Chemicals, Healthy Families

Safer Chemicals, Healthy Families fights for strong chemical policy, works with retailers to phase out hazardous chemicals, and educates the public about ways to protect our families from toxic chemicals. The organization advocates solutions to the PFAS crisis that "turn off the tap" on these "forever" chemicals by supporting strong federal and state policies to protect public health and the environment. Safer Chemicals Healthy Families is a program of Toxic Free Future.

Union of Concerned Scientists

The Union of Concerned Scientists is a national nonprofit organization working to ensure science informs decisions that affect our health, safety, and environment. As the Union of Concerned Scientists works to elevate the role of evidence in policymaking and the regulatory process, the organization has an interest in ensuring the process by which chemicals like PFAS are assessed for safety under the Toxic Substances Control Act relies on the best available science and is protective of overburdened and vulnerable populations.

Appendix B

APPENDIX B: SELECT RELEVANT STATUTES AND REGULATIONS

Pre-Manufacture Notice (PMN) Requirement: 15 U.S.C. § 2604(a)(1)(B)

A person may [manufacture a new chemical substance] if—

(i) such person submits to the Administrator, at least 90 days before such manufacture or processing, a notice . . . of such person's intention to manufacture or process such substance and . . .

(ii) the Administrator—

> (I) conducts a review of the notice; and
> (II) makes a determination under subparagraph (A), (B), or (C) of paragraph (3) and takes the actions required in association with that determination under such subparagraph within the applicable review period.

Permitted Exemptions from PMN Requirement When Substances Will Not Present Unreasonable Risk: 15 U.S.C. § 2604(h)(4)

The Administrator may, upon application and by rule, exempt the manufacturer of any new chemical substance from all or part of the requirements of this section if the Administrator determines that the manufacture, processing, distribution in commerce, use, or disposal of such chemical substance, or that any combination of such activities, will not present an unreasonable risk of injury to health or the environment, including an unreasonable risk to a potentially exposed or susceptible subpopulation identified by the Administrator under the conditions of use.

Byproducts Exemption to the PMN Requirement: 40 C.F.R. § 720.30(g), 40 C.F.R. § 720.30(h)(2) (emphases added)

The following substances are not subject to the notification requirements of this part:

> . . .
>
> (g) Any byproduct if its only commercial purpose is for *use* by public or private organizations that (1) burn it as a fuel, (2) dispose of it as a waste, including in a landfill or for enriching soil, or (3) extract component chemical substances from it for commercial purposes. (This exclusion only applies to the byproduct; it does not apply to the component substances extracted from the byproduct.)
>
> (h) The chemical substances described below: (Although they are manufactured *for commercial purposes* under the Act, they are not manufactured for distribution in

commerce as chemical substances per se and have no commercial purpose separate from the substance, mixture, or article of which they are a part.)

. . .

(2) Any byproduct which is not *used for* commercial purposes.

Low Volume Exemption to the PMN Requirement: 40 C.F.R. § 723.50(a)(1)(i)

(a) Purpose and scope.

(1) This section grants an exemption from the premanufacture notice requirements of section 5(a)(1)(A) of the Toxic Substances Control Act (15 U.S.C. 2604(a)(1)(A)) for the manufacture of:

(i) Chemical substances manufactured in quantities of 10,000 kilograms or less per year.[145]

Low Release and Exposure Exemption to the PMN Requirement: 40 C.F.R. § 723.50

(a) Purpose and scope.

(1) This section grants an exemption from the premanufacture notice requirements of section 5(a)(1)(A) of the Toxic Substances Control Act (15 U.S.C. 2604(a)(1)(A)) for the manufacture of: …

(ii) Chemical substances with low environmental releases and human exposures. …

(c) Exemption categories …

(2) Any manufacturer of a new chemical substance satisfying all of the following low environmental release and low human exposure eligibility criteria:

(i) Consumers and the general population. For exposure of consumers and the general population to the new chemical substance during all manufacturing, processing, distribution in commerce, use, and disposal of the substance: …

(C) Exposure in drinking water no greater than a 1 milligram per year (estimated average dosage resulting from drinking water exposure in streams from the maximum allowable concentration level from ambient surface water releases established under paragraph (c)(2)(iii) of this section or a higher concentration authorized by EPA under paragraph (c)(2)(iii) of this section). …

(iii) Ambient surface water. For ambient surface water releases, no releases resulting in surface water concentrations above 1 part per billion …

[145] 10,000 kilograms is equal to approximately 11.02 tons.

(iv) Incineration. For ambient air releases from incineration, no releases of the new chemical substance above 1 microgram per cubic meter maximum annual average concentration, calculated using the formula:

(kg/day of release after treatment) multiplied by (number of release days per year) multiplied by (9.68×10^{-6}) micrograms per cubic meter.

Polymer Exemption to the PMN Requirement: 40 C.F.R. § 723.250

(a) Purpose and scope.
(1) This section grants an exemption from certain of the premanufacture notice requirements of section 5(a)(1)(A) of the Toxic Substances Control Act (15 U.S.C. 2604(a)(1)(A)) for the manufacture of certain polymers…

(d) Polymers that cannot be manufactured under this section—…

(6) Polymers which contain certain perfluoroalkyl moieties consisting of a CF3- or longer chain length. Except as provided in paragraph (d)(6)(i), after February 26, 2010, a polymer cannot be manufactured under this section if the polymer contains as an integral part of its composition, except as impurities, one or more of the following perfluoroalkyl moieties consisting of a CF3- or longer chain length: Perfluoroalkyl sulfonates (PFAS), perfluoroalkyl carboxylates (PFAC), fluorotelomers, or perfluoroalkyl moieties that are covalently bound to either a carbon or sulfur atom where the carbon or sulfur atom is an integral part of the polymer molecule.

(i) Any polymer that has been manufactured previously in full compliance with the requirements of this section prior to February 26, 2010 may no longer be manufactured under this section after January 27, 2012. …

Exhibit A

PMN Page 1

Form Approved. O.M.B. No. 2070-0012. Approval Expires 12/31/2022

U.S. ENVIRONMENTAL PROTECTION AGENCY	AGENCY USE ONLY
EPA **PREMANUFACTURE NOTICE** FOR NEW CHEMICAL SUBSTANCES	Date of receipt:
When completed, send this form to: If sending by Courier: Office of Pollution Prevention and Toxics, Document Control Office (7407M), US EPA, 1201 Constitution Ave NW, WASHINGTON, D.C. 20460, Contact Numbers 202-564-8930/8940. If sending by US Mail: Office of Pollution Prevention and Toxics, Document Control Office (7407M), US EPA, 1200 Pennsylvania Ave NW, WASHINGTON, D.C. 20460	**Submission Report Number**

Total Number of Pages	TS Number
18	

GENERAL INSTRUCTIONS

- You must provide all information requested in this form to the extent that it is known to or reasonably ascertainable by you. Make reasonable estimates if you do not have actual data.
- Before you complete this form, you should read the "Instructions Manual for Premanufacture Notification" (the Instructions Manual is available from the Toxic Substances Control Act (TSCA) Information Service by calling 202-554-1404, or faxing 202-554-5603).
- If a fee has been remitted for this notice (40 CFR 700.45), indicate in the boxes above the TS fee identification number you have generated. Remember, your fee ID number must also appear on your corresponding fee remittance. For mailing address information see the Help instructions in the e-PMN tool.

Part I – GENERAL INFORMATION

You must provide the currently correct Chemical Abstracts (CA) Name of the new chemical substance, even if you claim the identity as confidential. You may authorize another person to submit chemical identity information for you, but your submission will not be complete and the review will not begin until EPA receives this information. A letter in support of your submission should reference your TS fee identification number. For all Section 5 Notice submissions (paper or electronic) you must submit an original notice including all test data; if you claimed any information as confidential, an original sanitized copy must also be submitted.

Part II – HUMAN EXPOSURE AND ENVIRONMENTAL RELEASE

If there are several manufacture, processing, or use operations to be described in Part II, sections A and B of this notice, reproduce the sections as needed.

Part III – LIST OF ATTACHMENTS

For paper submissions, attach additional sheets if there is not enough space to answer a question fully. Label each continuation sheet with the corresponding section heading. In Part III, list these attachments, any test data or other data and any optional information included in the notice.

OPTIONAL INFORMATION

You may include any information that you want EPA to consider in evaluating the new substance. On page 3 of this form, space has been provided for you to describe pollution prevention and recycling information you may have regarding the new substance. "Binding" boxes are included throughout this form for you to indicate your willingness to be bound to certain statements you make in this section, such as use, production volume, protective equipment . . . The intention is to reduce delays that routinely accompany the development of consent orders or Significant New Use Rules. Checking a "binding" box in a PMN does not by itself prohibit the submitter from later deviating from the information (except chemical identity) reported in the form; however, in the case of exemption applications (such as TMEA, LVE, LOREX) certain information provided in such notifications is binding on the submitter when the Agency approves the exemption application, especially if the production volume "binding" box is chosen in a LVE.

CONFIDENTIALITY CLAIMS

You may claim any information in this notice as confidential. To assert a claim on the form, mark (X) the confidential box next to the information that you claim as confidential. To assert a claim in an attachment, circle or bracket the information you claim as confidential. If you claim information in the notices as confidential, you must also provide a sanitized version of the notice, (including attachments). For additional instructions on claiming information as confidential, read the Instructions Manual.

TEST DATA AND OTHER DATA

You are required to submit all test data in your possession or control and to provide a description of all other data known to or reasonably ascertainable by you, if these data are related to the health and environmental effects on the manufacture, processing, distribution in commerce, use, or disposal of the new chemical substance. Standard literature citations may be submitted for data in the open scientific literature. Complete test data (written in English), not summaries of data, must be submitted if they do not appear in the open literature. You should clearly identify whether test data is on the substance or on an analog. Also, the chemical composition of the tested material should be characterized. Following are examples of test data and other data. Data should be submitted according to the requirements of §720.50 of the Premanufacture Notification Rule (40 CFR Part 720).

Test Data (Check Below any included in this notice)

- ☐ Environmental fate data
- ☐ Health effects data
- ☐ Environmental effects data
- ☐ Other Data
- ☐ Risk Assessments
- ☐ Structure/activity relationships
- ☐ Physical/Chemical Properties (A physical and chemical properties worksheet is located on the last page of this form.)
- ☐ Test data not in the possession or control of the submitter

TYPE OF NOTICE (Check Only One)

- ☐ **PMN** (Premanufacture Notice)
- ☐ **SNUN** (Significant New Use Notice)
- ☐ **TMEA** (Test Marketing Exemption Application)
- ☐ **LVE** (Low Volume Exemption) @ 40 CFR 723.50(c)(1)
- ☐ **LOREX** (Low Release/Low Exposure Exemption) @ 40 CFR 723.50(c)(2)
- ☐ **LVE** Modification
- ☐ **LOREX** Modification
- ☐ **Mock Submission**
- ☐ Mark (X) if pending Letter of Support

N — IS THIS A CONSOLIDATED PMN (Y/N)?

0 — # of chemicals or polymers (Prenotice Communication # required, enter # on p. 3)

☐ Mark (X) if any information in this notice is claimed as confidential.

Not for Submission

PMN Page 2

The public reporting and recordkeeping burden for this collection of information is estimated to average 93 hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed EPA Form 7710-25 to this address.

CERTIFICATION -- A printed copy of this signature page, with original signature, must be submitted with CD or paper submission.

I hereby certify to the best of my knowledge and belief that all information entered on this form is complete and accurate. I further certify that, pursuant to 15 U.S.C. § 2613(c), for all claims for protection for any confidential information made with this submission, all information submitted to substantiate such claims is true and correct, and that it is true and correct that the person submitting the claim has:

(i) taken reasonable measures to protect the confidentiality of the information;

(ii) determined that the information is not required to be disclosed or otherwise made available to the public under any other Federal law

(iii) a reasonable basis to conclude that disclosure of the information is likely to cause substantial harm to the competitive position of the person; and

(iv) a reasonable basis to believe that the information is not readily discoverable through reverse engineering.

Any knowing and willful misrepresentation is subject to criminal penalty pursuant to 18 U.S.C. § 1001.

Additional Certification Statements:

If you are submitting a PMN, SNUN, LoREX, LVE, or TMEA, check the following Fees Certification statement that applies:

- ☐ The Company named in Part I, Section A is a "small business concern" as defined under 40 CFR 700.43 and will remit the fee as specified in 40 CFR 700.45(c).
- ☐ The Company named in Part I, Section A will remit the fee as specified in 40 CFR 700.45(c).
- ☐ This joint submission includes at least one Company which is a "small business concern" and at least one Company which is not a "small business concern," as defined under 40 CFR 700.43. The fee will be remitted with the joint submission. Any remaining balance due for this joint submission is to be paid by the secondary submitter(s).
- ☐ The company named in Part I, Section A is submitting a sustainable futures TME. The company has graduated from EPA's Sustainable Futures program and is therefore exempt from fees for this sustainable futures TME.

If you are submitting a **Low Volume Exemption (LVE)** application in accordance with 40 CFR 723.50(c)(1) or a **Low Release and Low Exposure Exemption (LoRex)** application in accordance with 40 CFR 723.50(c)(2), check the following certification statements:

- ☐ The manufacturer submitting this notice intends to manufacture or import the new chemical substance for commercial purposes, other than in small quantities solely for research and development, under the terms of 40 CFR 723.50.
- ☐ The manufacturer is familiar with the terms of this section and will comply with those terms; and
- ☐ The new chemical substance for which the notice is submitted meets all applicable exemption conditions.
- ☐ If this application is for an LVE in accordance with 40 CFR 723.50(c)(1), the manufacturer intends to commence manufacture of the exempted substance for commercial purposes within 1 year of the date of the expiration of the 30 day review period.

				Confidential
Signature and title of Authorized Official (Original Signature Required)		Date		☐

Not for Submission

Part I – GENERAL INFORMATION

Section A – SUBMITTER IDENTIFICATION

Mark (X) the "Confidential" box next to any subsection you claim as confidential

1a.	Person Submitting Notice (in U.S.)					Confidential
Name of Authorized Official	(first)		(last)			☐
Position						
Company						
Mailing Address (number & street)						
City		State		Postal Code		
email						

b.	Agent (if Applicable)					Confidential
Name of Authorized Official	(first)		(last)			☐
Position						
Company						
Mailing Address (number & street)						
City		State		Postal Code		
e-mail			Telephone (include area code)			

c.	Joint Submitter (if applicable)					Confidential
If you are submitting this notice as part of a joint submission, mark (X)					☐	☐
Name of Authorized Official	(first)		(last)			
Position						
Company						
Mailing Address (number & street)						
City		State		Postal Code		
e-mail			Telephone (include area code)			

2.	Technical Contact (in U.S.)					Confidential
Name of Authorized Official	(first)		(last)			☐
Position						
Company						
Mailing Address (number & street)						
City		State		Postal Code		
e-mail			Telephone (include area code)			

			Mark (X) if none	Confidential
3.	If you have had a prenotice communication (PC) concerning this notice and EPA assigned a PC Number to the notice, enter the number.		☐	☐
4.	If you previously submitted an exemption application for the chemical substance covered by this notice, enter the exemption number assigned by EPA. If you previously submitted a PMN for this substance enter the PMN number assigned by EPA (i.e. withdrawn or incomplete).		☐	☐
5.	If you have submitted a notice of Bona fide intent to manufacture or import for the chemical substance covered by this notice, enter the notice number assigned by EPA.		☐	☐

6.	Type of Notice – Mark (X)					
1.	Manufacture Only ☐ Binding Option ☐	2.	Import Only ☐ Binding Option ☐	3.	Both ☐	

Not for Submission

Part I – GENERAL INFORMATION -- Continued

Section B – CHEMICAL IDENTITY INFORMATION: You must provide a currently correct Chemical Abstracts (CA) name of the substance based on current CA index nomenclature rules and conventions.

Mark (X) the "Confidential" box next to any item you claim as confidential

Complete either item 1 (Class 1 or 2 substances) or 2 (Polymers) as appropriate. Complete all other items.

If another person will submit chemical identity information for you (for either Item 1 or 2), mark (X) the box at the right. Identify the name, company, and address of that person in a continuation sheet. ☐

1. Class 1 or 2 chemical substances (for definitions of class 1 and class 2 substances, see the Instructions Manual)	Class 1	Class 2	CBI
a. Class of substance - Mark (X)	☐	☐	☐

b. Chemical name (Currently correct Chemical Abstracts (CA) Name that is consistent with TSCA Inventory listings for similar substances. For Class 1 substances a CA Index Name must be provided. For Class 2 substances either a CA Index Name or CA Preferred Name must be provided, which ever is appropriate based on current CA index nomenclature rules and conventions). ☐

CAS Registry Number (if a number already exists for the substance)

c. Please identify which method you used to develop or obtain the specified chemical identity information reported in this notice: (check one).

Method 1 (CAS Inventory Expert Service - a copy of the Identification report obtained from the CAS Inventory Expert Services must be submitted as an attachment to this notice) ☐	IES Order Number		**Method 2** (Other Source) ☐

Enter Attachment filename for Part I, Section B, 1. c. ☐

d. Molecular formula ☐

e. For a class 1 substance, provide a complete and correct chemical structure diagram. For a class 2 substance, provide a correct representative or partial chemical structure diagram, as complete as can be known, if one can be reasonably ascertained. ☐

Enter Attachment filename for Part I, Section B, 1. e. ☐

Not for Submission

PMN Page 4a

For a class 2 substance - (1) List the immediate precursor substances with their respective CAS Registry Numbers. (2) Describe the nature of the reaction or process. (3) Indicate the range of composition and the typical composition (where appropriate).	Confidential
e. (1) List the immediate precursor substance names with their respective CAS Registry Numbers.	☐
Enter Attachment filename for Part I, Section B, 1. e. (1)	☐
e. (2) Describe the nature of the reaction or process.	☐
Enter Attachment filename for Part I, Section B, 1. e. (2)	☐
e. (3) Indicate the range of composition and the typical composition (where appropriate).	☐
Enter Attachment filename for Part I, Section B, 1. e. (3)	☐

Not for Submission

Part I -- GENERAL INFORMATION -- Continued

Section B -- CHEMICAL IDENTITY INFORMATION -- Continued

2. Polymers (For a definition of polymer, see the Instructions Manual.)	Confidential
a. Indicate the number-average weight of the lowest molecular weight composition of the polymer you intend to manufacture. Indicate maximum weight percent of low molecular weight species (not including residual monomers, reactants, or solvents) below 500 and below 1,000 absolute molecular weight of that composition.	☐

Describe the methods of measurement or the basis for your estimates:

GPC ☐	Other (Specify Below) ☐	

Specify Other:

(i) lowest number average molecular weight:	(ii) maximum weight % below 500 molecular weight:	(iii) maximum weight % below 1000 molecular weight:

Enter Attachment filename for Part I, Section B, 2. a.	☐

b. You must make separate confidentiality claims for monomer or other reactant identity, composition information, and residual information. Mark (X) the "Confidential" box next to any item you claim as confidential

(1) - Provide the specific chemical name and CAS Registry Number (if a number exists) of each monomer or other reactant used in the manufacture of the polymer.
(2) - Mark (X) this column if entry in column (1) is confidential.
(3) - Indicate the typical weight percent of each monomer or other reactant in the polymer.
(4) - Choose "yes" from drop down menu if you want a monomer or other reactant used at two weight percent or less to be listed as part of the polymer description on the TSCA Chemical Substance Inventory.
(5) - Mark (X) this column if entries in columns (3) and (4) are confidential.
(6) - Indicate the maximum weight percent of each monomer or other reactant that may be present as a residual in the polymer as manufactured for commercial purposes.
(7) - Mark (X) this column if entry in column (6) is confidential.

Monomer or other reactant specific chemical name (1)	CBI (2)	Typical composition (3)	Include in identity (4)	CBI (5)	Max residual (6)	CBI (7)
CAS Registry Number (1)						
CAS Registry Number (1)						
CAS Registry Number (1)						
CAS Registry Number (1)						
CAS Registry Number (1)						

Mark (X) this box if the data continues on the next page. ☐

Not for Submission

PMN Page 5a

c. Please identify which method you used to develop or obtain the specified chemical identity information reported in this notice (check one).				CBI
Method 1 (CAS Inventory Expert Service - a copy of the identification report obtained from CAS Inventory Expert Service must be submitted as an attachment to this notice) ☐	IES Order Number		**Method 2** (other source) ☐	
Enter Attachment filename for Part I, Section B, 2. c.				☐

d. The currently correct Chemical Abstracts (CA) name for the polymer that is consistent with TSCA Inventory listings for similar polymers.	☐
CAS Registry Number (if a number already exists for the substance)	

e. Provide a correct representative or partial chemical structure diagram, as complete as can be known, if one can be reasonably ascertained.	☐
Enter Attachment filename for Part I, Section B, 2. e.	☐

Not for Submission

Part I -- GENERAL INFORMATION -- Continued

Section B -- CHEMICAL IDENTITY INFORMATION -- Continued

3. Impurities
   (a) - Identify each impurity that may be reasonably anticipated to be present in the chemical substance as manufactured for commercial purpose. Provide the CAS Registry Number if available. If there are unidentified impurities, enter "unidentified."
   (b) - Estimate the maximum weight % of each impurity. If there are unidentified impurities, estimate their total weight %.

Impurity (a)	CAS Registry Number (a)	Maximum Percent % (b)	Confi-dential

Mark (X) this box if the data continues on the next page. ☐

Enter Attachment filename for Part I, Section B, 3. ☐

4. Synonyms - Enter any chemical synonyms for the new chemical identified in subsection 1 or 2. ☐

Enter Attachment filename for Part I, Section B, ☐

5. Trade identification - List trade names for the new chemical substance identified in subsection 1 or 2. ☐

Enter Attachment filename for Part I, Section B, 5. ☐

6. Generic chemical name - If you claim chemical identity as confidential, you must provide a generic name for your substance that reveals the specific chemical identity of the new chemical substance to the maximum extent possible. Refer to the TSCA Chemical Substance Inventory, 1985 Edition, Appendix B for guidance on developing generic names.

Enter Attachment filename for Part I, Section B, 6.

7. Byproducts - Describe any byproducts resulting from the manufacture, processing, use, or disposal of the new chemical substance. Provide the CAS Registry Number if available.

Byproduct (1)	CAS Registry Number (2)	Confi-dential

Mark (X) this box if the data continues on the next page. ☐

Not for Submission

Part I -- GENERAL INFORMATION -- Continued

Section C -- PRODUCTION, IMPORT, AND USE INFORMATION:

The information on this page refers to consolidated chemical number(s): ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6

Mark (X) the "Confidential" box next to any item you claim as confidential.

1. **Production volume** -- Estimate the **maximum** production volume during the first 12 months of production. Also estimate the maximum production volume for any consecutive 12-month period during the first three years of production. Estimates should be on 100% new chemical substance basis. For a Low Volume Exemption application, if you choose to have your notice reviewed at a lower production volume than 10,000 kg/yr, specify the volume and mark (x) in the binding box. If granted, you are bound to this volume.

Maximum first 12-month production (kg/yr) (100% new chemical substance basis)	Maximum 12-month production (kg/yr) (100% new chemical substance basis)	Confidential	Binding Option Mark (X)
		☐	☐

Enter Attachment filename for Part I, Section C, 1.		CBI ☐

2. **Use Information** -- You must make separate confidentiality claims for the description of the category of use, the percent of production volume devoted to each category, the formulation of the new substance, and other use information. Mark (X) the "Confidential" Box next to any item you claim as confidential.
   a. (1) --Describe each intended category of use of the new chemical substance by function and application.
   (2) --Mark (X) this column if entry column (1) is confidential business information (CBI).
   (3) --Indicate your willingness to have the information provided in column (1) binding.
   (4) --Estimate the percent of total production for the first three years devoted to each category of use.
   (5) --Mark (X) this column if entry in column (4) is confidential business information (CBI).
   (6) --Estimate the percent of the new substance as formulated in mixtures, suspensions, emulsions, solutions, or gels as manufactured for commercial purposes at sites under your control associated with each category of use.
   (7) --Mark (X) this column if entry in column (6) is confidential business information (CBI).
   (8) --Indicate % of product volume expected for the listed "use" sectors. Mark more than one box if appropriate. Mark (X) to indicate your willingness to have the use type provided in (8) binding.
   (9) --Mark (X) this column if entry(ies) in column (8) is (are) confidential business information (CBI).

Category of use (1) (by function and application i.e. a dispersive dye for finishing polyester fibers)	CBI (2)	Binding Option Mark (X) (3)	Production % (4)	CBI (5)	% in Formulation (6)	CBI (7)	% of substance expected per use (8)					CBI (9)
							Site-limited	Consumer*	Industrial	Commercial	Binding Option	

* If you have identified a "consumer" use, please provide on a continuation sheet a detailed description of the use(s) of this chemical substance in consumer products. In addition include estimates of the concentration of the new chemical substance as expected in consumer products and describe the chemical reactions by which this substance loses its identity in the consumer product.

Mark (X) this box if the data continues on the next page. ☐

b. Generic use description — If you claim any category of use description in subsection 2a as confidential, enter a generic description of that category. Read the Instruction Manual for examples of generic use descriptions.

Enter Attachment filename for Part I, Section C, 2. b.		CBI ☐

3. **Hazard Information** -- Include in the notice a copy of reasonable facsimile of any hazard warning statement, label, material safety data sheet, or other information which will be provided to any person who is reasonably likely to be exposed to this substance regarding protective equipment or practices for the safe handing, transport, use, or disposal of the new substance. List in part III hazard information you include.

Mark (X) this box if you attach hazard information. ☐	Binding Option Mark (X) ☐

Not for Submission

Part II-- HUMAN EXPOSURE AND ENVIRONMENTAL RELEASE

Section A -- INDUSTRIAL SITES CONTROLLED BY THE SUBMITTER | Mark (X) the "Confidential" box next to any item you claim as confidential

The information on pages 8 and 8a refer to consolidated chemical number(s): ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6

Complete section A for each type of manufacture, processing, or use operation involving the new chemical substance at industrial sites you control. Importers do not have to complete this section for operations outside the U.S.; however, you may still have reporting requirements if there are further industrial processing or use operations after import. You must describe these operations. See instructions manual

1. Operation description
   a. Identity -- Enter the identity of the site at which the operation will occur.

				Confi-dential
Name				☐
Site address (number and street)				
City		County		
State		ZIP code		

If the same operation will occur at more than one site, enter the number of sites. Identify the additional sites on a continuation sheet, and if any of the sites have significantly different production rates or operations, include all the information requested in this section for those sites as attachments. → ☐

Mark (X) this box if the data continues on the next page. ☐

b. Type -- Mark (X) Manufacturing ☐ Processing ☐ Use ☐ ☐

c. Amount and Duration -- Complete 1 or 2 as appropriate

				Confi-dential
1. Batch	Maximum kg/batch (100% new chemical substance)	Hours/batch	Batches/year	☐
2. Continuous	Maximum kg/day (100% new chemical substance)	Hours/day	Days/year	☐

d. Process description | Mark (X) to indicate your willingness to have your process description binding. → ☐

(1) Diagram the major unit operation steps and chemical conversions. Include interim storage and transport containers (specify- e.g. 5 gallon pails, 55 gallon drum, rail car, tank truck, etc.).
(2) Provide the identity, the approximate weight (by kg/day or kg/batch on a 100% new chemical substance basis), and entry point of all starting materials and feedstocks (including reactants, solvents, catalysts, etc.), and of all products, recycle streams, and wastes. Include cleaning chemicals (note frequency if not used daily or per batch.).
(3) Identify by number the points of release, including small or intermittent releases, to the environment of the new chemical substance. If releasing to two media at the same step, assign a second release number for the second medium.

☐

Not for Submission

PMN Page 8a

Diagram of the major unit operation steps.	Confidential ☐

Not for Submission

Enter Attachment filename for Part II, Section A, 1. d.	☐

Part II-- HUMAN EXPOSURE AND ENVIRONMENTAL RELEASE -- Continued

Section A -- INDUSTRIAL SITES CONTROLLED BY THE SUBMITTER -- Continued

The information on pages 9 and 9a refer to consolidated chemical number(s): ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6

2. Occupational Exposure -- You must make separate confidentiality claims for the description of worker activity, physical form of the new chemical substance, number of workers exposed, and duration of activity. Mark (X) the "Confidential" box next to any item you claim as confidential.

(1) -- Describe the activities (i.e. bag dumping, tote filling, unloading drums, sampling, cleaning, etc.) in which workers may be exposed to the substance.
(2) -- Mark (X) this column if entry in column (1) is confidential business information (CBI).
(3) -- Describe any protective equipment and engineering controls used to protect workers.
(4) and (6) -- Indicate your willingness to have the information provided in column (3) or (5) binding.
(5) -- Indicate the physical form(s) of the new chemical substance (e.g., solid: crystal, granule, powder, or dust) and % new chemical substance (if part of a mixture) at the time of exposure.
(7) -- Mark (X) this column if entries in columns (3) and (5) are confidential business information (CBI).
(8) -- Estimate the maximum number of workers involved in each activity for all sites combined.
(9) -- Mark (X) this column if entry in column (8) is confidential business information (CBI).
(10) and (11) -- Estimate the maximum duration of the activity for any worker in hours per day and days per year.
(12) -- Mark (X) this column if entries in columns (10) and (11) are confidential business information (CBI).

Worker activity (i.e., bag dumping, filling drums) (1)	CBI (2)	Protective Equipment/ Engineering Controls (3)	Binding Option Mark (X) (4)	Physical form(s) & % new substance (5)	Binding Option Mark (X) (6)	CBI (7)	# of Workers Exposed (8)	CBI (9)	Maximum Duration		CBI (12)
									Hrs/Day (10)	Days/Yr (11)	

Mark (X) this box if the data continues on the next page. ☐

Enter Attachment filename for Part II, Section A on the bottom of page 9a. ☐

Not for Submission

PMN Page 9a

3. Environmental Release and Disposal -- You must make separate confidentiality claims for the release number and the amount of the new chemical substance released and other release and disposal information. Mark (X) the "Confidential" box next to each item you claim as confidential.

(1) -- Enter the number of each release point identified in the process description, part II, section A, subsection 1d(3).
(2) -- Estimate the amount of the new substance released (a) directly to the environment or (b) into control technology (in kg/day or kg/batch).
(3) -- Mark (X) this column if entries in columns (1) and (2) are confidential business information (CBI).
(4) -- Identify the media (stack air, fugitive air (optional-see Instruction Manual), surface water, on-site or off-site land or incineration, POTW, or other (specify)) to which the new substance will be released from that release point.
(5) -- a. Describe control technology, if any, and control efficiency that will be used to limit the release of the new substance to the environment. For releases disposed of on land, characterize the disposal method and state whether it is approved for disposal of RCRA hazardous waste. On a continuation sheet, for each site describe any additional disposal methods that will be used and whether the waste is subject to secondary or tertiary on-site treatment. b. Estimate the amount released to the environment after control technology (in kg/day).
(6) -- Mark (X) this column if entries in columns (4) and (5) are confidential business information (CBI).
(7) -- Identify the destination(s) of releases to water. Please supply NPDES (National Pollutant Discharge Elimination System) numbers for direct discharges or NPDES numbers of the POTW (Publicly Owned Treatment Works). Mark (X) if the POTW name or NPDES # is confidential business information (CBI).

Release Number	Amount of New Substance Released		CBI	Medium of release e.g. Stack air	Control technology and efficiency (you may wish to optionally attach efficiency data)			CBI
(1)	(2a)	(2b)	(3)	(4)	(5a)	Binding Mark (X)	(5b)	(6)
Mark (X) this box if the data continues on the next page.								☐

(7) Mark (X) the destination(s) of releases to water.		NPDES#	CBI
☐ POTW--provide name(s)			☐
☐ Navigable waterway-- provide name(s)			☐
☐ Other--Specify			☐
Enter Attachment filename for Part II, Section A.			☐

Not for Submission

Part II-- HUMAN EXPOSURE AND ENVIRONMENTAL RELEASE -- Continued

Section B -- INDUSTRIAL SITES CONTROLLED BY OTHERS

The information on pages 10 and 10a refer to consolidated chemical number(s): ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6

Complete section B for typical processing or use operations involving the new chemical substance at sites you do not control. Importers do not have to complete this section for operations outside the U.S.; however, you must report any processing or use activities after import. See the Instructions Manual. *Complete a separate section B for each type of processing, or use operation involving the new chemical substance.* If the same operation is performed at more than one site describe the typical operation common to these sites. Identify additional sites on a continuation sheet.

1(a). Operation Description -- To claim information in this section as confidential, bracket (e.g. {}) the specific information that you claim as confidential.

(1) -- Diagram the major unit operation steps and chemical conversions, including interim storage and transport containers (specify - e.g. 5 gallon pails, 55 gallon drums, rail cars, tank trucks, etc). On the diagram, identify by letter and briefly describe each worker activity.

(2) -- Either in the diagram or in the text field 1(b) below, provide the identity, the approximate weight (by kg/day or kg/batch, on an 100% new chemical substance basis), and entry point of all feedstocks (including reactants, solvents and catalysts, etc) and all products, recycle streams, and wastes. Include cleaning chemicals (note frequency if not used daily or per batch).

(3) -- Either in the diagram or in the text field 1(b) below, identify by number the points of release, including small or intermittent releases, to the environment of the new chemical substance.

(4) -- Please enter the # of sites (remember to identify the locations of these sites on a continuation sheet):

	Number of Sites		Confidential ☐

1(b). (Optional) This space is for a text description to clarify the diagram above. Confidential ☐

Enter Attachment filename for Part II, Section B on the bottom of page 10a.	☐

Not for Submission

PMN Page 10a

2. Worker Exposure/Environmental Release

(1) -- From the diagram above, provide the letter for each worker activity. Complete 2-8 for each worker activity described.
(2) -- Estimate the number of workers exposed for all sites combined.
(4) -- Estimate the typical duration of exposure per worker in (a) hours per day and (b) days per year.
(6) -- Describe physical form of exposure and % new chemical substance (if in mixture), and any protective equipment and engineering controls, if any, used to protect workers.
(7) -- Estimate the percent of the new substance as formulated when packaged or used as a final product.
(9) -- From the process diagram above, enter the number of each release point. Complete 9-13 for each release point identified.
(10) -- Estimate the amount of the new substance released (a) directly to the environment or (b) into control technology to the environment (in kg/day or kg/batch).
(12) -- Describe media of release i.e. stack air, fugitive air (optional-see Instructions Manual), surface water, on-site or off-site land or incineration, POTW, or other (specify) and control technology, if any, that will be used to limit the release of the new substance to the environment.
(14) -- Identify byproducts which may result from the operation.
(3), (5), (8), (11), (13) and (15) -- Mark (X) this column if any of the proceeding entries are confidential business information (CBI).

Letter of Activity	# of Workers Exposed	CBI	Duration of Exposure		CBI	Protective Equip./Engineering Controls/Physical Form	% new substance	% in Formulation	CBI
(1)	(2)	(3)	(4a)	(4b)	(5)	(6)	(7)	(7)	(8)

Release Number	Amount of New Substance Released		CBI	Media of Release & Control Technology	CBI
(9)	(10a)	(10b)	(11)	(12)	(13)

Mark (X) this box if the data continues on the next page. ☐

(14) Byproducts: **(15) CBI** ☐

Enter Attachment filename for Part II, Section B. ☐

Not for Submission

OPTIONAL POLLUTION PREVENTION INFORMATION

To claim information in the following section as confidential, bracket (e.g. {}) the specific information that you claim as confidential.

In this section you may provide information not reported elsewhere in this form regarding your efforts to reduce or minimize potential risks associated with activities surrounding manufacturing, processing, use and disposal of the PMN substance. Please include new information pertinent to pollution prevention, including source reduction, recycling activities and safer processes or products available due to the new chemical substance. Source reduction includes the reduction in the amount or toxicity of chemical wastes by technological modification, process and procedure modification, product reformulation, and/or raw materials substitution. Recycling refers to the reclamation of useful chemical components from wastes that would otherwise be treated or released as air emissions or water discharges, or land disposal. Quantitative or qualitative descriptions of pollution prevention, source reduction and recycling should emphasize potential risk reduction in addition to compliance with existing regulatory requirements. The EPA is interested in the information to assess overall net reductions in toxicity or environmental releases and exposures, not the shifting of risks to other media (e.g., air to water) or nonenvironmental areas (e.g., occupational or consumer exposure). To the extent known, information about the technology being replaced will assist EPA in its relative risk determination. In addition, information on the relative cost or performance characteristics of the PMN substance to potential alternatives may be provided.

Describe the expected net benefits, such as

(1) an overall reduction in risk to human health or the environment;
(2) a reduction in the generation of waste materials through recycling, source reduction or other means;
(3) a reduction in the use of hazardous starting materials, reagents, or feedstocks;
(4) a reduction in potential toxicity, human exposure and/or environmental release; or
(5) the extent to which the new chemical substance may be a substitute for an existing substance that poses greater overall risk to human health or the environment.

Information provided in this section will be taken into consideration during the review of this submission. See PMN Instructions Manual and Pollution Prevention Guidance manual for guidance and examples.

Not for Submission

Enter Attachment filename for Pollution Prevention Page 11.	

Part III -- LIST OF ATTACHMENTS

Attach continuation sheets for sections of the form, test data and other data (including physical/chemical properties and structure/activity information), and optional information after this page. Clearly identify the attachment and the section of the form to which it relates, if appropriate. Number consecutively the pages of any paper attachments. In the Number of Pages column below, enter the inclusive page numbers of each attachment for paper submissions or enter the total number of pages for each attachment for electronic submissions. Electronic attachments can be identified by filename.
Mark (X) the "Confidential" box next to any attachment name or filename you claim as confidential. Read the Instructions Manual for guidance on how to claim any information in an attachment as confidential. You must include with the sanitized copy of the notice form a sanitized version of any attachment in which you claim information as confidential.

#	Attachment Name	Attachment Filename	Number of Pages	Associated PMN Section Number	CBI

Mark (X) this box if the data continues on the next page. ☐

Not for Submission

PMN Page 13

PHYSICAL AND CHEMICAL PROPERTIES WORKSHEET

The information on this page refers to chemical number(s): ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6

To assist EPA's review of physical and chemical properties data, please complete the following worksheet for data you provide and include it in the notice. Identify the property measured, the value of the property, the units in which the property is measured (as necessary), and whether or not the property is claimed as confidential. Give the attachment number (found on page 12) in column (b). The physical state of the neat substance should be provided. These measured properties should be for the neat (100% pure) chemical substance. Properties that are measured for mixtures or formulations should be so noted (% PMN substance in ___). You are not required to submit this worksheet; however, EPA strongly recommends that you do so, as it will simplify the review and ensure that confidential information is properly protected. You should submit this worksheet as a supplement to your submission of test data. This worksheet is not a substitute for submission of test data.

Property (a)		Unit	Mark X if Provided	Attachment Number (b)	Value (c)			Measured or Estimate (M or E)	CBI Mark (X) (d)
Physical state of neat substance			☐		(solid) ☐	(liquid) ☐	(gas) ☐		
Vapor Pressure @ Temperature		°C	☐				Torr		
Density/relative density			☐				g/cm3		
Solubility									
@ Temperature		°C	☐				g/L		
Solvent									
Solubility in Water @ Temperature		°C	☐				g/L		
Melting Temperature			☐				°C		
Boiling / Sublimation temperature @		Torr	☐				°C		
Spectra			☐						
Dissociation constant			☐						
Octanol / water partition coefficient			☐						
Henry's Law constant			☐						
Volatilization from water			☐						
Volatilization from soil			☐						
pH@ concentration			☐						
Flammability			☐						
Explodability			☐						
Adsorption / Coefficient			☐						
Particle Size Distribution			☐						
Other -- Specify			☐						

Not for Submission

EPA FORM 7710-25 (Rev. 12-19)

Exhibit B

Per- and Polyfluoroalkyl Substances (PFAS) Summary Report

Final

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Economic and Policy Analysis Branch
Chemistry, Economics & Sustainable Strategies Division
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1. Introduction

Per- and polyfluoroalkyl substances (PFAS) are a group of manmade chemicals that includes perfluorooctanoic acid (PFOA), perfluorooctane sulfonate (PFOS), GenX, and many other chemicals. PFAS have been manufactured and used in a variety of industries around the globe, including in the United States since the 1940s. PFAS are found in a wide range of consumer products that people use daily such as cookware, pizza boxes, and stain repellants (U.S. Environmental Protection Agency (EPA) 2018b).

Most people have been exposed to PFAS. Certain PFAS, such as PFOA and PFOS, can accumulate and stay in the human body for long periods of time. There is evidence that exposure to PFAS can lead to adverse health outcomes in humans. PFOA and PFOS have been the most extensively produced and studied of these chemicals. Studies indicate that PFOA and PFOS can cause reproductive and developmental, liver and kidney, and immunological effects in laboratory animals. Both chemical groups have caused tumors in animals. The most consistent findings are increased cholesterol levels among exposed populations, with more limited findings related to

- low infant birth weights,
- effects on the immune system,
- cancer (for PFOA), and
- thyroid hormone disruption (for PFOS; EPA 2018b).

The purpose of this summary report is to provide information on all PFAS[1] in the Toxic Substances Control Act (TSCA) Chemicals Substances Inventory (hereafter referred to as the Inventory), rather than only on a subset such as PFOA or long-chain perfluoroalkyl carboxylic acids (PFCAs). Section 1 provides a definition of PFAS and describes how PFAS are classified in this report. Section 2 provides a brief overview of regulatory actions impacting PFAS manufacture and use. Section 3 describes PFAS manufacturing and import, and Section 4 presents an overview of PFAS uses and applications.

1.1 PFAS Definition and Classification

PFAS refer to a sub-group of per- and polyfluorinated chemicals (PFCs).[2,3] PFCs are organic compounds with fluorine replacing some or all of the chemical's hydrogen (OECD 2018b). Though EPA has historically used the term PFC to refer to fluorinated compounds more generally, the accepted terminology within the Agency has shifted to PFAS. The term includes chemicals such as PFOA and PFOS. EPA previously used the PFAS abbreviation for perfluoroalkyl sulfonic acid, which now is abbreviated as PFSA. For the purpose of this summary report, the term PFAS is used to describe the broader categories of chemicals.

Thousands of PFAS have been produced and used globally. The Organization for Economic Co-operation and Development (OECD) classifies the chemicals as shown in Figure 1-1.[4] The Figure presents commonly recognized categories of PFAS in OECD's Global Database. The classification is

[1] PFAS include per- and polyfluorinated substances of C2 and greater for the purpose of this report (and the underlying TSCA data utilized in it).

[2] PFCs has also been used to abbreviate a related group of fluorinated chemicals called perfluorocarbons.

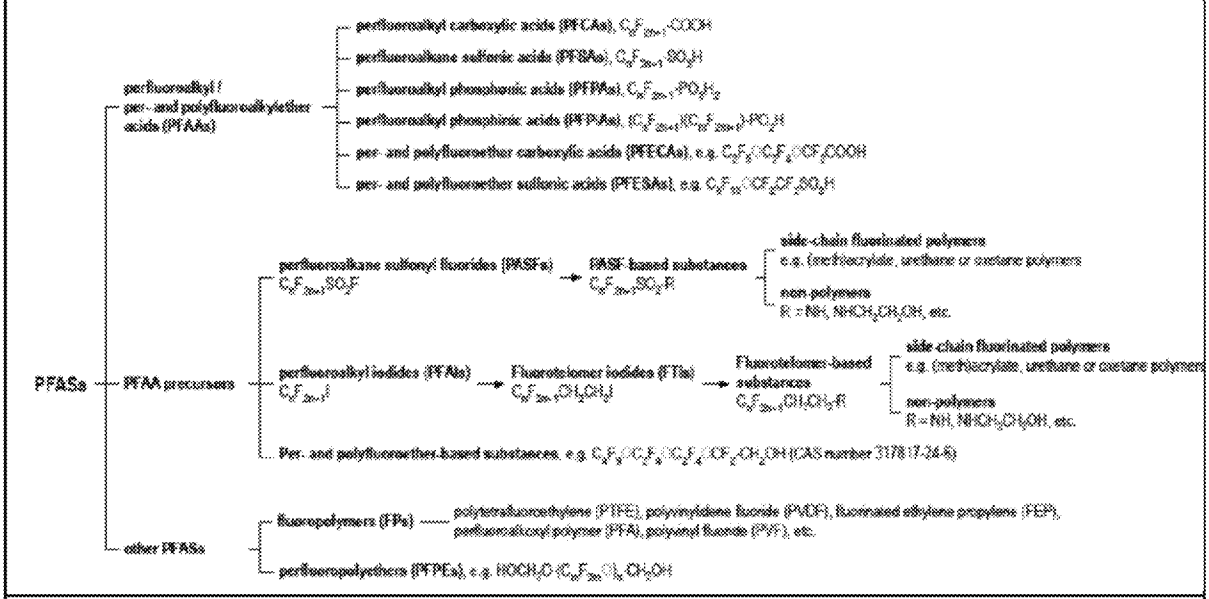
[3] See https://www.epa.gov/pfas/what-are-pfcs-and-how-do-they-relate-and-polyfluoroalkyl-substances-pfass

[4] The structural parameters that constitute PFAS can differ between countries and organizations.

being adopted in this market report to help facilitate the discussion. PFAS are broken into three major categories

1. perfluoroalkyl/per- and polyfluoroalkylether acids (PFAAs),
2. PFAA precursors,
3. and other PFAS.

Figure 1-1: General Classification of Per- and Polyfluoroalkyl Substances (PFAS)



Source(s):
OECD (2018b)

Historically, EPA was interested in two broad categories of PFAS within the PFAA group, long-chain perfluoroalkyl sulfonic acids (PFSAs), which include PFOS, and long-chain perfluoroalkyl carboxylic acids (PFCAs), which include PFOA. The focus of this report has expanded this traditional focus to include all PFAS, both short- and long-chain.

PFSAs and PFCAs are classified as either long-chain or short-chain depending on the number of perfluoroalkyl carbons or the number of total carbons. Definitions for long-chain versus short-chain PFAS vary. For example, long-chain PFSAs have been defined as chemicals with 6 or more perfluoroalkyl carbons (or 6 or more total carbons). Long-chain PFCAs have been defined as chemicals with 7 or more perfluoroalkyl carbons (or 8 or more total carbons). OECD only defines long-chain for PFSAs and PFCAs. However, Buck et al. (2011) considers other PFAS with 7 or more perfluoroalkyl carbons as long-chain. For the purposes of TSCA, definitions of short and long chain have also varied, particularly between PFAS sub-categories, for example, in the Significant New Use Rule (SNUR) amendment for long-chain perfluoroalkyl carboxylate (LCPFAC). For simplicity and illustration in this summary report, short-chain PFAS are defined as ($< 7\ CF_2$) and long chain as ($\geq 7\ CF_2$).

The first step in identifying chemicals within the PFAS universe was to search the Inventory for the presence of these chemicals. This was done by searching for the term poly- and perfluoro (with 2 or

greater carbons) in the chemicals names listed on the Inventory. The list of Chemical Abstracts Services (CAS) registry numbers that fit this description was provided by the Industrial Chemistry Branch (ICB) of the Environmental Protection Agency (EPA) and includes 1,220 PFAS. Of the 1,220 PFAS, 824 are non-CBI and 396 are CBI (see Table 1-1).

Table 1-1: Summary of PFAS in the Inventory

Parameter	Number of Chemicals
Total Number of PFAS	1,220
Non-CBI PFAS	824
CBI-PFAS	396

Table 1-2 presents the commercial status designation of the 1,220 PFAS chemicals on the Inventory. A total of 551 chemicals are of known active status. Active status indicates that the chemical was commercially active during the 10 years prior to June 22nd 2016 when TSCA was reauthorized. Chemical processors are still reporting to EPA regarding the chemicals they manufacture and import. The reporting period for processors closes on October 5, 2018, after which, all Inventory substances will be classified with either an active or inactive designation.

Table 1-2: Commercial Status Designation of PFAS in the Inventory

TSCA Chemicals	Total	Active
Non-CBI PFAS	**824**	322
CBI PFAS	**396**	229
Total	**1,220**	**551**

Table 1-3 presents the TSCA Inventory PFAS list according to eight major PFAS subcategories that are derived from the hierarchy provided in Figure 1-1. Chemical categories were applied by searching the OECD global database by the CAS number, and assigning the corresponding PFAS category to each chemical. The perfluoroalkane sulfonyl compounds (e.g., PFSAs) group comprised the largest number of PFAS with a total of 310 (68 active). This was followed by the fluorotelomer-related compounds (e.g. FTIs) group, which comprises a total of 212 PFAS (97 active). Table A-1 presents a more detailed description of the PFAS subcategories and respective chemical groups within each subcategory.

Table 1-3: Non-CBI TSCA Inventory PFAS by PFAS Category

PFAS Category	Total	Active
perfluoroalkyl carbonyl compounds (e.g., PFCA)	78	22
perfluoroalkane sulfonyl compounds (e.g., PFSA)	310	68
perfluoroalkyl phosphate compounds (e.g., PFPA)	2	2
fluorotelomer-related compounds (e.g., FTI)	212	97
per- and polyfluoroalkyl ether-based compounds (e.g. PFECA)	58	31
other PFAA precursors and related compounds - perfluoroalkyl ones	38	22
other PFAA precursors or related compounds – semi fluorinated (e.g., HFE)	15	13
fluoropolymers (e.g., PTFE)	54	40
Not Classified	57	27
Total	**824**	**322**

For the remainder of this report, only Active substances will be discussed. The next step was to determine the number of short- and long-chain PFAS. In this report, perfluoroalkyl carbon chain length thresholds for short- and long-chain PFAS are defined as less than 7 CF_2 for short-chain and greater than or equal to 7 CF_2 for long-chain. These definitions are based on Buck et al. (2011). Table 1-4 presents the number of active short-chain and long-chain PFAS. The chain lengths were extracted from the OECD global database. It is important to note that not all of the 322 Active Inventory chemicals could be categorized in the OECD database and the data presented in Table 1-4 reflect this limitation. A total of 254 PFAS (of the 322) could be classified as short- or long-chain, these are presented in Table 1-4.[5] A total of 68 PFAS were excluded from the table, 27 because they were not in the OECD global database and 41 because they have multiple perfluoroalkyl carbon chain lengths reported or have unclear chemical descriptions.[6,7] Of the 254 active PFAS summarized in Table 1-4, 111 are short-chain and 143 are long-chain PFAS.

Table 1-4: Perfluoroalkyl Carbon Chain Length of Active PFAS in the Inventory

PFAS Category	Total	Perfluoroalkyl Carbon Chain Length[1,2]	
		Short-chain (< 7 CF_2)	Long-chain (≥ 7 CF_2)
perfluoroalkyl carbonyl compounds (e.g., PFCA)	21	14	7
perfluoroalkane sulfonyl compounds (e.g., PFSA)	64	37	27
perfluoroalkyl phosphate compounds (e.g., PFPA)	0	0	0
fluorotelomer-related compounds (e.g., FTI)	65	27	38
per- and polyfluoroalkyl ether-based compounds (e.g. PFECA)	31	10	21
other PFAA precursors and related compounds - perfluoroalkyl ones	21	14	7
other PFAA precursors or related compounds – semi fluorinated (e.g., HFE)	12	9	3
fluoropolymers (e.g., PTFE)	40	0	40
Total	**254**	**111**	**143**

Note(s):

[1] Only PFAS in the OECD global database are categorized by perfluoroalkyl carbon chain length. Of the 322 Active PFAS, the 254 Active PFAS are summarized in this table. A total of 68 Active PFAS are excluded from the table, 27 because they were not in the OECD global database and 41 because they have variable or unclear perfluoroalkyl carbon chain lengths.

[2] Perfluoroalkyl carbon chain length thresholds presented in this table (short-chain, < 7; long-chain, $CF_2 \geq 7$ CF_2) are guideline thresholds appearing in Buck et al. (2011). Only PFSAs and PFCAs have thresholds defined by OECD. According to OECD, long-chain PFSAs refer to PFSAs with 6 or more perfluoroalkyl carbons and long-chain PFCAs refer to PFCAs with 7 or more perfluoroalkyl carbons.

Table 1-5 presents the number of PFAS reported in the Chemical Data Reporting (CDR) database from 2006 to 2016. The total number of PFAS (824) in the Inventory were cross-referenced with all of the chemicals reported in the 2006, 2012, and 2016 CDR by CAS number. A total of 161 were reported in 2016, of which 90 were listed as non-CBI PFAS. Note that three chemicals reported in the 2006 CDR are not active in the current Inventory. The largest category was FTI chemicals with 38 non-CBI reported in 2016.

[5] According to OECD, long chain PFSAs refer to PFSAs with 6 or more perfluoroalkyl carbons and long chain PFCAs refer to PFCAs with 7 or more perfluoroalkyl carbons.

[6] Many of the chemicals that have multiple chain lengths reported have unspecified or partially unspecified chemical formulas (OECD 2018a). For chemicals that have specified chemical formulas, it is unclear why each has multiple chain lengths reported.

[7] Unclear descriptions include chemicals described with ambiguous descriptions such as "reaction products", described with unclear terms, or registered with only trade names and general descriptions (OECD2018b).

Table 1-5: Number of PFAS Reported in the CDR

PFAS Category	2006 CDR	2012 CDR	2016 CDR
Non CBI			
perfluoroalkyl carbonyl compounds (e.g., PFCA)	4	4	4
perfluoroalkane sulfonyl compounds (e.g., PFSA)	3	5	8
perfluoroalkyl phosphate compounds (e.g., PFPA)	0	0	2
fluorotelomer-related compounds (e.g., FTI)	27	28	38
per- and polyfluoroalkyl ether-based compounds (e.g. PFECA)	8	13	12
other PFAA precursors and related compounds - perfluoroalkyl ones	5	4	8
other PFAA precursors or related compounds – semi fluorinated (e.g., HFE)	5	8	9
fluoropolymers (e.g., PTFE)	0	0	1
Not Classified	10	8	8
Total	**62**	**70**	**90**
CBI			
Total		**29**	**71**
Non-CBI and CBI			
Total		**99**	**161**

2. Regulatory Background

EPA has undertaken several key regulatory actions to address PFAS. Table 2-1 provides a chronological overview of some of these major efforts. In particular, EPA has published significant new use rules (SNURs) for PFAS, beginning in 2002, that require manufacturers to notify EPA at least 90 days before manufacturing, importing, or processing PFAS. Table 2-2 provides more details about those SNURs.

Table 2-1: EPA Actions to on PFAS

Title	EPA Office	Date	Summary
New Chemicals Program Review of Alternatives for PFOA and Related Chemicals	OPPT	Ongoing	EPA reviewed hundreds of new chemical substitutes for PFOA, PFOS, and other long-chain PFAS under EPA's New Chemicals Program since 2000. EPA reviews the new substances to identify whether the range of toxicity, fate and bioaccumulation issues that have caused past concerns with perfluorinated substances may be present, as well as any issues that may arise by new chemistries, to ensure that the new chemical may not present an unreasonable risk to health or the environment. One outcome of EPA's review of a PMN or MCAN for a new chemical substance or review of a SNUN for a significant new use is the issuance of an order under section 5(e) of TSCA. Most TSCA section 5(e) Orders issued by EPA are Consent Orders that are negotiated with the submitter of the notification.
Lifetime Health Advisories and Health Effects Support Documents for PFOA and PFOS	OW	May 16th 2016	EPA announced the release of lifetime health advisories (HAs) and health effects support documents for PFOA and PFOS. EPA's HAs, which identify the concentration of PFOA and PFOS in drinking water at or below which adverse health effects are not anticipated to occur over a lifetime of exposure, are: 70 parts per trillion (ppt) for PFOA and PFOS.
Significant New Use Rules (SNURs): Long-Chain Perfluoroalkyl Carboxylate and Perfluoroalkyl Sulfonate Chemical Substances Proposed Rule	OPPT	January 21st 2015	EPA proposed a SNUR for Long-Chain Perfluoroalkyl Carboxylate (LCPFAC) chemical substances that would require manufacturers (including importers) of PFOA and PFOA-related chemicals, including as part of articles, and processors of these chemicals to notify EPA at least 90 days before starting or resuming new uses of these chemicals in any products.
Significant New Use Rules: Perfluoroalkyl Sulfonates and Long-Chain Perfluoroalkyl Carboxylate Chemical Substances (Final)	OPPT	October 22nd 2013	EPA amended a SNUR to designate as a significant new use PFAS that have completed the new chemical review process under TSCA but have not yet commenced production or import and processing. EPA also finalized a SNUR to designate as a significant new use LCPFAC chemical substances used in manufacturing (including importing) and processing of carpets or for treating carpet.
Revisions to the Unregulated Contaminant Monitoring Rule for Public Water Systems	OW	May 2nd 2012	The UCMR3 required monitoring for 30 contaminants (28 chemicals and two viruses) between 2013 and 2015 using analytical methods developed by EPA, consensus organizations, or both. The purpose of UCMR3 was to collect occurrence data for contaminants suspected to be present in drinking water, but that do not have health-based standards set under the SDWA. Six perfluorinated compounds were included in the UCMR3: PFOS, PFOA, PFNA, PFHxS, PFBS, and perfluoroheptanoic acid (PFHpA). Of these 6 compounds, PFOA and PFOS were found in the greatest number of samples. However, less than one percent of the public water systems sampled had results that exceeded the reference dose (lifetime HA limit of 70 ppt or 0.07µg/L).
Premanufacture Notification Exemption for Polymers; Amendment of Polymer Exemption Rule to Exclude Certain Perfluorinated Polymers	OPPT	January 27th 2010	EPA published a final rule that amended the Polymer Exemption Rule to no longer exclude from eligibility polymers that include any one or more of the following: PFAS, PFAC, or perfluoroalkyl moieties that are covalently bound to either a carbon or sulfur atom where the carbon or sulfur atom is an integral part of the polymer molecule. Compliance date was January 27, 2012.

Table 2-1: EPA Actions to on PFAS

Title	EPA Office	Date	Summary
Provisional Health Advisories for PFOA and PFOS	OW	January 8th 2009	EPA conducted limited testing of agricultural sites in Alabama where sewage sludge was applied from a local wastewater treatment plant that receives wastewater from numerous industrial sources, including facilities that manufacture and use PFOA and other PFAS. The results of this limited testing showed elevated levels of PFAS in sludge and in soil that received the sludge.
Significant New Use Rule: Perfluoroalkyl Sulfonates	OPPT	October 9th 2007	EPA finalized a SNUR on 183 PFAS chemicals believed to be no longer manufactured, imported, or used in the U.S. The SNUR required manufacturers and importers to notify EPA at least 90 days before commencing the manufacture or import of the PFAS chemicals for the significant new uses described.
Significant New Use Rule: Perfluoroalkyl Sulfonates	OPPT	December 9th, 2002 (Origination Date)	EPA issued a SNUR for 75 PFAS, requiring manufacturers and importers to notify EPA at least 90 days before starting the manufacture or importation of these chemical substances for the significant new uses described.
Significant New Use Rule; Final Rule and Supplemental Proposed Rule: Perfluoroalkyl Sulfonates	OPPT	March 11th 2002 (Origination Date)	EPA published a SNUR to require notification to EPA before any future manufacture (including import) of 13 PFAS chemicals specifically included in the voluntary phaseout of PFOS by 3M that took place between 2000 and 2002.

Source(s):
EPA (2018a)

Significant New Use Rules (SNURs) have restricted the manufacture, import, and use of many PFAS. Table 2-2 presents the Significant New Use Rules (SNURs) for existing PFAS. The first SNUR was proposed in 2000 covering 90 long-chain PFSAs, more specifically, long-chain PFOSs. From 2002 to 2007, EPA identified a total of 270 PFSAs. In 2010, EPA amended the Polymer Exemption Rule to exclude from eligibility polymers containing as an integral part of their composition, except as impurities, certain perfluoroalkyl moieties consisting of a CF3- or longer chain length. Beginning in 2013, EPA shifted attention to long-chain PFCAs to limit uses in carpets and carpet treatment products.

Table 2-2: Significant New Use Rules for Existing PFAS
October 18, 2000 - Proposed SNUR on 90 perfluorooctyl sulfonyl (PFOS) long-chain chemicals (65 FR 62319)
March 11, 2002 - Final SNUR on 13 perfluoroalkyl sulfonate (PFAS) chemicals (67 FR 11008)
March 11, 2002 -Proposed SNUR on 74 PFAS chemicals, including PFOS (67 FR 11014)
December 9, 2002 - Final SNUR on 74 PFAS/PFOS chemicals (67 FR 72854)
October 9, 2007 - Final SNUR on 183 PFAS chemicals believed to no longer be manufactured (including imported) or used in the United States (72 FR 57222)
January 27, 2010 - Polymer Exemption Rule revoking exemption from full PMN reporting for new PFC polymers (75 FR 4295)
October 22, 2013 - Proposed SNUR amendment at 40 CFR 721.10536 for LCPFAC chemical substances by designating manufacturing (including importing) or processing of LCPFAC chemical substances listed in Table 1 of the Rule for any use that is no longer ongoing after December 31, 2015, as a significant new use; designating manufacturing (including importing) or processing of PFOA or its salts for any use as a significant new use; and designating manufacturing (including importing) or processing of all other LCPFAC chemical substances for any use not ongoing as of the date on which this proposed rule is published as a significant new use.
January 21, 2015 - Proposed SNUR on LCPFAC chemical substances to ensure that perfluorinated chemicals that have been phased out do not re-enter the marketplace without review (80 FR 2885)

In 2006, EPA invited eight major leading companies in PFAS industry to join in a global stewardship program (2010/2015 PFOA Stewardship Program) with two goals:

1. To commit to achieve, no later than 2010, a 95 percent reduction, measured from a year 2000 baseline, in both facility emissions to all media of PFOA, precursor chemicals that can break down to PFOA, and related higher homologue chemicals, and product content levels of these chemicals; and
2. To commit to working toward the elimination of these chemicals from emissions and products by 2015.

Participants in the Stewardship Program included

- Arkema
- Asahi Glass Company
- BASF Corporation (successor to Ciba Specialty Chemicals Corporation)
- Clariant

- Daikin
- 3M/Dyneon
- DuPont
- Solvay Solexis

At the time of initiation of the Stewardship Program, these companies represented the majors global manufacturers of long-chain PFCAs. All companies have met the PFOA Stewardship Program goals. Final progress reports are available on EPA's website.[8]

Table 2-3 present the number of active non-CBI and CBI PFAS in the Inventory with any associated regulatory flags. Table 2-3 also indicates if the CBI PFAS is provisional. The regulatory flags provide an indication of rulemakings that impact PFAS in the Inventory and reporting requirements for manufactured or imported PFAS. A total of 202 PFAS are identified in final SNURs, 145 non-CBI PFAS and 57 CBI PFAS (see Table 2-3).

Table 2-3: Regulatory Flags for Active TSCA Inventory PFAS[1]

PFAS Category	Total	PMN	5E	S	SP	XU	FRI
Non-CBI							
perfluoroalkyl carbonyl compounds (e.g., PFCA)	22	0	0	8	3	0	0
perfluoroalkane sulfonyl compounds (e.g., PFSA)	68	7	3	51	0	1	0
perfluoroalkyl phosphate compounds (e.g., PFPA)	2	0	0	2	0	0	0
fluorotelomer-related compounds (e.g., FTI)	97	30	3	67	17	3	0
per- and polyfluoroalkyl ether-based compounds (e.g. PFECA)	31	18	4	5	0	9	0
other PFAA precursors and related compounds - perfluoroalkyl ones	22	5	1	2	0	1	0
other PFAA precursors or related compounds – semi fluorinated (e.g., HFE)	13	12	0	5	0	0	0
fluoropolymers (e.g., PTFE)	40	25	13	2	0	26	1
Not Classified	27	13	0	3	0	6	0
Subtotal	**322**	**110**	**24**	**145**	**20**	**46**	**1**
CBI							
Provisional Status							
Yes	45	44	42	34	0	0	0
No	184	184	75	23	3	77	5
Subtotal	**229**	**228**	**117**	**57**	**3**	**77**	**5**
Non-CBI and CBI							
Total	**551**	**338**	**141**	**202**	**23**	**123**	**6**

Note(s):

[1] Regulatory Flags: PMN - indicates a commenced PMN substance; 5E - indicates a substance that is subject of a TSCA section 5(e) order; S - indicates a substance that is identified in a final Significant New use Rule; SP - indicates a substance that is identified in a proposed Significant New Use Rule; XU -indicates a substance exempt from reporting under the Chemical Data Reporting Rule, (40 CFR 711); FRI - indicates a polymeric substance containing no free-radical initiator in its Inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.

[8] https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/epas-non-cbi-summary-tables-2015-company-progress

3. Manufacturing and Import of PFAS

Manufacturers and Importers of PFAS chemicals were identified by searching the CDR and the Toxics Release Inventory (TRI). CDR was searched to identify PFAS parent companies that reported manufacturing and\or importing PFAS(s) in the non-CBI 2016 CDR. A total of 14 parent companies were identified and are presented in Table 3-1. Four of these 14 parent companies: 3M Company, AGC Chemicals America, Inc., Daikin America, Inc and Solvay Specialty Polymers USA, LLC took part in the PFOA Stewardship Program (see Chapter 2).

Table 3-2 presents the PFAS parent companies, their related manufacturing sites, and the number of PFAS reported at each site as reported in the 2016 CDR. A total of 31 sites reported 90 different PFAS. One site and at least one parent company are listed as CBI. The Chemours Company manufactured the largest number of PFAS (39 different PFAS). Appendix B, Table B-1 presents the combined manufacture and import volume as well as the national aggregate production volume for each PFAS reported in the 2016 CDR. The manufacturing and import volumes for all PFAS reported were withheld and only 18 of the 90 PFAS reported provide a range of national aggregate production volume (see Table B-1).

Table 3-1: Parent Companies Reporting PFAS in the 2016 CDR

Parent Company[1]
3M COMPANY
AGC CHEMICALS AMERICAS, INC.
ATOTECH USA, INC.
DAIKIN AMERICA, INC.
Dow Corning Corporation
FORD MOTOR COMPANY
HONEYWELL INTERNATIONAL INC
LANXESS CORPORATION
LINDE NORTH AMERICA, INC
PEACH STATE LABS INC
SOLVAY SPECIALTY POLYMERS USA, LLC
SUMITOMO CORPORATION OF AMERICAS
The Chemours Co
TYCO FIRE PRODUCTS LP

Note(s):
[1] Two parent companies were removed because they appeared to be duplicates with slightly different spellings.

Table 3-2: Number of PFAS Chemicals Manufactured by Parent Company and Site in the 2016 CDR

Parent Company	Manufacturing Site Name	Site State	Number of Chemicals Manufactured	
			Parent Company	Site
3M COMPANY	3M COMPANY	MN	4	3
3M COMPANY	3M COMPANY/3M CORDOVA	IL	4	1
AGC CHEMICALS AMERICAS, INC.	AGC CHEM AMER INC BUS & TECH CTR	PA	4	4
ATOTECH USA, INC.	ATOTECH USA	SC	2	2
CBI	3M COMPANY	AL	CBI	4
CBI	3M COMPANY/3M CORDOVA	IL	CBI	13
CBI	3M COTTAGE GROVE CENTER	MN	CBI	2
CBI	AIR PROD & CHEM HAMILTON BLVD FAC	PA	CBI	2
CBI	CBI	CBI	CBI	12
CBI	INNOVATIVE CHEMICAL TECHNOLOGIES INC	GA	CBI	4
CBI	INNOVATIVE CHEMICAL TECHNOLOGY AT ORTEC INC	SC	CBI	1
CBI	SOLENIS LLC	DE	CBI	1
CBI	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	CBI	10
DAIKIN AMERICA INC.	DAIKIN AMERICA INC.	NY	1	1
DAIKIN AMERICA, INC.	DAIKIN AMERICA, INC.	AL	8	8
Dow Corning Corporation	DOW CORNING CORP MIDLAND PLANT	MI	1	1
FORD MOTOR COMPANY	Ford Motor Company	MI	1	1
HONEYWELL INTERNATIONAL INC	HONEYWELL INTERNATIONAL INC - BATON ROUGE PLANT	LA	1	1
LANXESS CORPORATION	LANXESS CORP	PA	1	1
LINDE NORTH AMERICA, INC	LINDE ELECTRONICS AND SPECIALTY GASES	NJ	1	1
PEACH STATE LABS INC	PEACH STATE LABS INC COLUMBUS	GA	2	2
Peach State Labs LLC	PEACH STATE LABS, LLC	GA	4	4
SOLVAY SPECIALTY POLYMERS USA, LLC	SOLVAY SPECIALTY POLYMERS USA LLC	TX	2	1
SOLVAY SPECIALTY POLYMERS USA, LLC	SOLVAY SPECIALTY POLYMERS USA, LLC	GA	2	1
SUMITOMO CORPORATION OF AMERICAS	SUMITOMO CORPORATION OF AMERICAS	TX	1	1
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	39	21
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CORPUS CHRISTI)	TX	39	1
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	39	3
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (HEADQUARTERS)	DE	39	5
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (PASCAGOULA)	MS	39	2
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (WASHINGTON WORKS)	WV	39	7
TYCO FIRE PRODUCTS LP	CHEMGUARD INC	TX	8	8
Number of Unique Chemicals				**90**

The 2016 TRI List of Reportable Chemicals contained five of the 824 PFAS chemicals identified by EPA (see Table 3-3). Table 3-4 presents the facilities reporting PFAS in the 2016 TRI. Of the five TRI reportable PFAS chemicals, two were reported by nine facilities in the 2016 TRI. Four facilities produce the chemicals that they reported. PFAS as a category of chemicals are not reported to the Toxic Release Inventory. As for the five that are listed, those are among the many CFCs and HCFCs that EPA was petitioned to add during the 1990s.

Figure 3-1 provides a U.S. map illustrating the location of the importing and manufacturing sites as indicated in the 2016 CDR. The map also shows waterbodies of greater than 10 square miles in proximity to the sites.

Table 3-3: PFAS on the 2016 TRI List of Reportable Chemicals

CAS	Chemical	Reported in 2016 TRI
124-73-2	Dibromotetrafluoroethane (Halon 2402)	No
507-55-1	1,3-Dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb)	No
422-56-0	3,3-Dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca)	No
76-14-2	Dichlorotetrafluoroethane (CFC-114)	Yes
76-15-3	Monochloropentafluoroethane (CFC-115)	Yes

Table 3-4: Facilities Reporting PFAS in the 2016 TRI

Parent Company Name	Manufacturing Facility Name	Manufacturing Facility Address	CAS	Chemical Name	Produce	Import
A-GAS US HOLDINGS INC	A-GAS AMERICAS	1100 HASKINS RD WOOD, OH 43402	76142	DICHLOROTETRAFLUOROETHANE (CFC-114)	NO	NO
AIRGAS INC	AIRGAS REFRIGERANTS INC SMYRNA	5211 INDUSTRIAL CT SE COBB, GA 30080	76142	DICHLOROTETRAFLUOROETHANE (CFC-114)	NO	NO
HERITAGE-WTI LLC	HERITAGE THERMAL SERVICES	1250 ST GEORGE ST COLUMBIANA, OH 43920	76142	DICHLOROTETRAFLUOROETHANE (CFC-114)	NO	NO
HONEYWELL INTERNATIONAL INC	HONEYWELL INTERNATIONAL INC DANVILLE WORKS	209 BREWER RD VERMILION, IL 61834	76142	DICHLOROTETRAFLUOROETHANE (CFC-114)	NO	NO
HONEYWELL INTERNATIONAL INC	HONEYWELL INTERNATIONAL INC GEISMAR PLANT	5525 HWY 3115 ASCENSION PARISH, LA 70721	76142	DICHLOROTETRAFLUOROETHANE (CFC-114)	YES	NO
HONEYWELL INTERNATIONAL INC	HONEYWELL INTERNATIONAL INC GEISMAR PLANT	5525 HWY 3115 ASCENSION PARISH, LA 70721	76153	MONOCHLOROPENTAFLUOROETHANE	YES	NO
HONEYWELL INTERNATIONAL INC	HONEYWELL INTERNATIONAL INC-BATON ROUGE PLANT	CORNER OF LUPINE & ONTARIO STR EETS EAST BATON ROUGE PARISH, LA 70805	76142	DICHLOROTETRAFLUOROETHANE (CFC-114)	YES	NO
THE CHEMOURS CO	CHEMOURS WASHINGTON WORKS	8480 DUPONT RD BUILDING 1 WOOD, WV 26181	76142	DICHLOROTETRAFLUOROETHANE (CFC-114)	YES	NO
THE CHEMOURS CO FC LLC	THE CHEMOURS CO FC LLC	HWY 361 SAN PATRICIO, TX 78359	76142	DICHLOROTETRAFLUOROETHANE (CFC-114)	YES	NO
THE CHEMOURS CO FC LLC	THE CHEMOURS CO FC LLC	HWY 361 SAN PATRICIO, TX 78359	76153	MONOCHLOROPENTAFLUOROETHANE	YES	NO
US DEPARTMENT OF DEFENSE	US DEFENSE LOGISTICS AGENCY DEFENSE SUPPLY CENTER RICHMOND	8000 JEFFERSON DAVIS HWY CHESTERFIELD, VA 23297	76142	DICHLOROTETRAFLUOROETHANE (CFC-114)	NO	NO

Source(s):
EPA (2017)

Figure 3-1: Location of 2016 PFAS CDR Manufacturing and Importing Sites

Note(s):

[1] The source of the main water bodies and rivers and streams data is a 2014 U.S. Geological Survey (USGS) dataset that includes data on streams and water bodies and wetlands within the contiguous U.S. at a 1:1,000,000 scale.

[2] There are no PFAS sites outside of the contiguous U.S.

4. Uses of PFAS Chemicals

PFAS are a broad class of substances with differing structural features (e.g. varying carbon lengths, differing fluorine content and functional groups) that can impart special properties that have a variety of industrial applications. PFAS provide characteristics such as thermo-stability, ability to adapt to a variety of surface characteristics, high chemical stability, and other characteristics. Fluoropolymers, n particular, have properties that include fire resistance and oil, stain, grease, and water repellency. Fluorotelomers can be used in surface treatment products and impart the following properties: soil, stain, grease, and water resistance. Fluorotelomers can also be used as surfactants to help products flow more evenly (EPA 2009). Table 4-1 presents a list of broad use categories with examples for each use category.

Table 4-1: Summary of PFAS Uses and Applications

Use Category	Example(s)
Adhesive, paint, and coating additive	Nonstick coating in cookware
Chemical manufacturing	Chemical intermediate; polymerization aid
Component of a photoresist substance	Semiconductors
Component of electronic products	Cables and wiring; insulating tape; "solder sleeves"; smudge-resistant touch screens
Component of firefighting foams	Aqueous film-forming foams (AFFFs)
Component of rubber compounds	Hose, tubing, and piping; rubber and plumbing fluxing agents
Foam additive	Flame-retardant insulation in soft furnishings
Lubricant and lubricant additive	Automotive manufacturing
Specialized industrial chemical	Improved mold release for pneumatic tires; liquid crystal displays; wetting agents
Mechanical components	Conveyor belting; low-friction bearings and seals; coating/surfactant on semiconductors, wiring, tubing, seals, etc.
Clothing, footwear, and textiles	Protection against oil, water, and soil; wind and rain barrier; firefighting clothing
Scientific and medical instruments	Photographic film; x-ray film; artificial body parts; medical product packaging
Wetting agent	Floor polishes; metal plating

Source(s):
EPA (2013, 2016, 2018a); OECD (2013); FluoroCouncil (2018)

Table 4-2 presents the industrial sectors associated with PFAS reported in the 2016 CDR. The sectors with the largest number of chemicals included all other basic organic chemical manufacturing (19), all other chemical product and preparation manufacturing (19), plastic material and resin manufacturing (17), and computer and electronic product manufacturing (16). A total of 33 entries were blank and 15 reported as CBI. Table 4-3 provides the number of PFAS by chemical function as reported in the 2016 CDR. This includes the highest categories as intermediates (29), functional fluids (10), solvents (for cleaning and degreasing) (9), and firefighting foam agents (8). A total of 33 entries were blank and 15 reported as CBI. Appendix B, Table B-2 presents the combined use, function, and sector information for all PFAS reported in the 2016 CDR. However, little can be concluded without the production volumes corresponding to each use.

Table 4-4 presents the number of PFAS reported for product categories reported in the 2016 CDR, and whether the product is used in the consumer and/or commercial sector. The majority (76) had

blank entries. The largest number of chemicals were reported to firefighting foam agents (8), electrical and electronic components (5), and cleaning and furnishing care products (4).

Table 4-2: Number of PFAS Manufactured by Sector Reported in the 2016 CDR

Sector	Number of PFAS
(blank)	33
CBI	15
Adhesive manufacturing	2
All other basic inorganic chemical manufacturing	1
All other basic organic chemical manufacturing	19
All other chemical product and preparation manufacturing	19
Computer and electronic product manufacturing	16
Fabricated metal product manufacturing	2
Industrial gas manufacturing	2
Miscellaneous manufacturing	4
Not known or reasonably ascertainable	2
Oil and gas drilling, extraction, and support activities	1
Paint and coating manufacturing	4
Paper manufacturing	1
Pesticide, fertilizer, and other agricultural chemical manufacturing	2
Plastic material and resin manufacturing	17
Primary metal manufacturing	1
Printing ink manufacturing	1
resale of chemicals	1
Soap, cleaning compound, and toilet preparation manufacturing	3
Stored on site in rail cars, no commercial use	1
Textiles, apparel, and leather manufacturing	5
Wholesale and retail trade	1

Table 4-3: Number of PFAS Manufactured by Function Reported in the 2016 CDR

Function	Number of PFAS
(blank)	33
CBI	15
Finishing agents	2
Fire Extinguishing Medium	1
Firefighting foam agents	8
Functional fluids (closed systems)	10
Functional fluids (open systems)	3
Intermediates	29
Lubricants and lubricant additives	1
Not known or reasonably ascertainable	1
Paint additives and coating additives not described by other categories	1
Plating agents and surface treating agents	4
Processing aids, not otherwise listed	5
Processing aids, specific to petroleum production	1
Solvents (for cleaning and degreasing)	9
Solvents (which become part of product formulation or mixture)	1
Stored on site in rail cars, no commercial use	1
Surface active agents	7
Transfilling and purifying	1

Table 4-4: Number of PFAS by Use Category as Reported in the 2016 CDR

Product Category	Consumer/Commercial/Both	Number of PFAS
(blank)	(blank)	76
CBI	Commercial	2
Adhesives and sealants	Commercial	1
Automotive care products	Consumer	1
Cleaning and furnishing care products	Both	4
Electrical and electronic products	Commercial	5
Fabric, textile, and leather products not covered elsewhere	Both	1
Fire Extinguishing medium	Commercial	1
Firefighting foam agents	Commercial	8
Food packaging	Both	1
Ink, toner, and colorant products	Consumer	1
Metal products not covered elsewhere	Both	2
Paints and coatings	Both	1

To gain further perspective on recent uses of PFAS, Table 4-5 presents TSCA submission types (including LVEs, premanufacture notices (PMNs), SNUNS, LOREX and TMAs) between 2006 through 2016 and their related use categories and production volume. Thirteen major uses categories are noted. Lubricant and lubricant additive and component of rubber compounds uses categories represent the highest average annual production volume (229,100 kg and 212,200 kg, respectively).

Table 4-5: Categories of Use by Submission Type (FY 2006 to 2016)[1]

Use	LVE	PMN	SNUN	LOREX	TMEA	Average Annual Production Volume (kg/yr)[2]
Adhesive, paint, and coating additive	74	41	2	-	1	13,100
Chemical Intermediate	38	37	-	-	-	12,700
Component of a photoresist substance	99	4	-	1	-	1,600
Component of electronic products	7	5	-	-	-	20,400
Component of firefighting foams	-	10	-	-	-	52,800
Component of rubber compounds	5	5	-	-	-	212,200
Cross-linking agent	1	1	-	-	-	1,000
Finishing agents	64	144	2	-	-	48,100
Foam additive	3	4	-	-	-	15,600
Lubricant and Lubricant Additive	15	5	-	-	-	229,100
Polymerization Aid	7	8	-	-	-	8,000
Specialized Industrial Chemical	8	8	-	-	-	13,400
Tracer Chemical	27	-	-	-	-	400
Total	**348**	**272**	**4**	**1**	**1**	

Note(s):

[1] PMN - Premanufacture Notices; SNUN - Significant New Use Notices; LVE - Low Volume Exemptions; LM - Low Volume Exemption Modifications; LOREX - Low Exposure/Low Release Exemptions; XM - Low Exposure/Low Release Exemption Modifications; TMEA - Test Marketing Exemption Applications.

[2] Reflects average annual production volume for all notice types

[3] Due to the implementation of the PFOA Stewardship Program between the reported years, the average annual production volumes may not be an accurate indicator of the current PFAS use trends.

Appendix A: PFAS Categories

Table A-1: PFAS Categories[1]
perfluoroalkyl carbonyl compounds
perfluoroalkyl carbonyl halides
perfluoroalkyl carboxylic acids (PFCAs), their salts and esters
other perfluoroalkyl carbonyl-based nonpolymers
perfluoroalkyl carbonyl amides / amido ethanols and other alcohols
perfluoroalkyl carbonyl silanes
perfluoroalkyl carbonyl (meth)acrylate
other perfluoroalkyl carbonyl-based side-chain fluorinated polymers
perfluoroalkyl carbonyl (meth)acrylate polymers
perfluoroalkyl carbonyl dicarbonyl halides
perfluoroalkyl carbonyl dicarboxylic acids and non-polymers
1-H perfluoroalkyl carbonyl halides
1-H perfluoroalkyl carboxylic acids
1-H perfluoroalkyl carbonyl-based non-polymers
perfluoroalkane sulfonyl compounds
perfluoroalkane sulfonyl halides
perfluoroalkane sulfonic acids (PFSAs), their salts and esters
perfluoroalkane sulfonyl-based nonpolymers
perfluoroalkane sulfonyl amides/amido ethanols (xFASA/Es) and other alcohols
perfluoroalkane sulfonyl amido ethanols, phosphate esters (SAmPAPs)
perfluoroalkane sulfonyl (meth)acrylates
perfluoroalkane sulfonyl silanes
perfluoroalkane sulfonyl acetic acids & esters
perfluoroalkane sulfonyl-based side-chain fluorinated polymers
perfluoroalkane sulfonyl (meth)acrylate polymers
perfluoroalkane sulfonyl urethane polymers
perfluoroalkane sulfonyl siloxanes/silicon polymers
perfluoroalkane sulfinic acids
1-H perfluoroalkane sulfonic acids
1-H perfluoroalkane sulfonyl-based non-polymers
perfluoroalkane disulfonic acids
perfluoroalkane disulfonyl-based non-polymers
perfluoroalkyl phosphate compounds
perfluoroalkyl phosphate-related halides
bis(perfluoroalkyl) phosphinyl halides
perfluoroalkyl phosphorus halides
perfluoroalkyl phosphonic acids (PFPAs), their salts and esters
perfluoroalkyl phosphinic acids (PFPiAs), their salts and esters
bis(perfluoroalkyl) phosphinyl-based nonpolymers
bis(perfluoroalkyl) phosphinyl amids (PFPiAMs)
fluorotelomer-related compounds
perfluoroalkyl iodides (PFAIs)
n:2 fluorotelomer-based non-polymers
n:2 fluorotelomer iodides (n:2 FTIs)
n:2 fluorotelomer olefins (n:2 FTOs)
n:2 fluorotelomer alcohols (n:2 FTOHs) / thiols
n:2 fluorotelomer alcohol, phosphate esters (PAPs)
n:2 fluorotelomer-based silanes
n:2 fluorotelomer-based (meth)acrylate
n:2 fluorotelomer sulfonic acids (n:2 FTSAs)
n:2 fluorotelomer sulfonyl-based compounds
n:2 fluorotelomer phosphonic / phosphinic acids
n:2 FTOH ethoxylates
n:2 FT amine, amino & derivatives
n:2 FT-thiol derivatives

Table A-1: PFAS Categories[1]
n:2 fluorotelomer carboxylic acids (FTCAs)
n:3 acids
FTAL
n:2 fluorotelomer-based side-chain fluorinated polymers
n:2 fluorotelomer-based (meth)acrylate polymers
n:2 fluorotelomer-based urethane polymers
n:2 fluorotelomer-based siloxanes/silicon polymers
n:2 fluorotelomer-based sulfonyl (meth)acrylate polymers
n:1 fluorotelomer-based non-polymers
n:1 fluorotelomer alcohols
n:1 FT (meth)acrylate
n:1 PAPs
n:1 silanes
n:1 FT sulfonyl-based substances
n:1 FTAL
n:1 fluorotelomer-based side-chain fluorinated polymers
n:1 fluorotelomer-based (meth)acrylic polymers
fluorotelomer epoxides and derivatives
fluorotelomer epoxides
fluorotelomer epoxides derivatives
Hydrofluorotelomer non-polymers
hydrofluorotelomer-based side chain fluorinated polymers
perfluoroalkyl diiodides
1-H n:1 FT
per- and polyfluoroalkyl ether-based compounds
perfluoroalkyl ethers / alkanes + aromatics
perfluoroalkyl ethers / alkanes + aromatics – monoethers
perfluoroalkyl ethers / alkanes + aromatics – diethers
perfluoroalkyl ethers / alkanes + aromatics – triethers
perfluoroalkyl ethers / alkanes + aromatics - 4-10 ether linkages
perfluoroalkyl ethers / alkanes + aromatics - more than 10 ether linkages
per- and polyfluoroalkyl ether carboxylic acids (PFECAs), their salts and esters, as well as derivatives such as amides
PFECAs, salts and esters – monoethers
PFECAs, salts and esters – diethers
PFECAs, salts and esters – triethers
PFECAs, salts and esters - 4-10 ether linkages
PFECAs, salts and esters - more than 10 ether linkages
PFECA-related substances – monoethers
PFECA-related substances – diethers
PFECA-related substances – triethers
PFECA-related substances - 4-10 ether linkages
PFECA-related substances - more than 10 ether linkages
per- and polyfluoroalkyl ether sulfonic acids (PFESAs), their salts and esters, as well as derivatives
PFESAs, salts and esters – monoethers
PFESAs, salts and esters – diethers
PFESAs, salts and esters – triethers
PFESAs, salts and esters - 4-10 ether linkages
PFESAs, salts and esters - more than 10 ether linkages
PFESA-related substances – monoethers
PFESA-related substances – diethers
PFESA-related substances – triethers
PFESA-related substances - 4-10 ether linkages
PFESA-related substances - more than 10 ether linkages
perfluoroethers alkenes and derivatives
perfluoroethers alkenes and derivatives – monoethers
perfluoroethers alkenes and derivatives – diethers

Table A-1: PFAS Categories[1]
perfluoroethers alkenes and derivatives – triethers
perfluoroethers alkenes and derivatives - 4-10 ether linkages
perfluoroethers alkenes and derivatives - more than 10 ether linkages
per- and polyfluoroalkyl ether halides (except F)
per- and polyfluoroalkyl ether halides (except F) – monoethers
per- and polyfluoroalkyl ether halides (except F) – diethers
per- and polyfluoroalkyl ether halides (except F) – triethers
per- and polyfluoroalkyl ether halides (except F) - 4-10 ether linkages
per- and polyfluoroalkyl ether halides (except F) - more than 10 ether linkages
per - and polyfluoroalkyl ether + telomer-based substances
per - and polyfluoroalkyl ether + telomer-based substances - monoethers
per - and polyfluoroalkyl ether + telomer-based substances - diethers
per - and polyfluoroalkyl ether + telomer-based substances - triethers
per - and polyfluoroalkyl ether + telomer-based substances - 4-10 ether linkages
per - and polyfluoroalkyl ether + telomer-based substances - more than 10 ether linkages
other per- and polyfluoroalkyl ether-based compounds
other per- and polyfluoroalkyl ether-based compounds - monoethers
other per- and polyfluoroalkyl ether-based compounds - diethers
other per- and polyfluoroalkyl ether-based compounds - triethers
other per- and polyfluoroalkyl ether-based compounds - 4-10 ether linkages
other per- and polyfluoroalkyl ether-based compounds - more than 10 ether linkages
other PFAA precursors and related compounds - perfluoroalkyl ones
perfluoroalkyl silanes
perfluoroalkyl alcohols
perfluoroalkyl alcohol-based side-chain fluorinated polymers
perfluoroalkanes & aromatics
perfluoroalkenes & derivatives
perfluoroalkyl amines
perfluoroalkyl epoxides & derivatives
perfluoroalkyl ketones
perfluoroalkyl halides (other than iodides)
perfluoroalkyl radicals
perfluoroalkyl cyanide
perfluoroalkyl metal
perfluoroalkyl thiol and derivatives
perfluoroalkyl sulfide
other PFAA precursors or related compounds - semi fluorinated
hydrofluorocarbons (HFCs), semi fluorinated alkanes (SFAs) and their derivatives
HFCs and derivatives
SFAs and derivatives
hydrofluoroethers (HFEs) and derivatives
HFEs
HFE-based silanes
other HFE-based derivatives
hydrofluoroolefins (HFOs)
semi-fluorinated ketones
side-chain fluorinated aromatics
fluoropolymers
polytetrafluoroethylene (PTFE)
non-functionalized PTFE
functionalized PTFE
polyvinylidene fluoride (PVDF)
non-functionalized PVDF
functionalized PVDF
fluorinated ethylene propylene (FEP)
perfluoralkoxyl polymer (PFA)
polyvinyl fluoride (PVF)
Ethylene tetrafluoroethylene (ETFE)

Table A-1: PFAS Categories[1]
VDF-HFP
PCTFE
THV
oxetane polymer

Note(s):
[1] Categories as presented in OECD (2018a)

Appendix B: 2016 CDR PFAS Reporting

Table B-1: PFAS Manufacture and Import Reported in the 2016 CDR

Parent Company	Site Name	Site State	CAS	Chemical Name	Manufacture and Import	National Aggregate PV
3M COMPANY	3M COMPANY	MN	311-89-7	1-Butanamine, 1,1,2,2,3,3,4,4,4-nonafluoro-N,N-bis(1,1,2,2,3,3,4,4,4-nonafluorobutyl)-	Withheld	Withheld
3M COMPANY	3M COMPANY	MN	34454-97-2	1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-nonafluoro-N-(2-hydroxyethyl)-N-methyl-	Withheld	Withheld
3M COMPANY	3M COMPANY	MN	86508-42-1	Perfluoro compounds, C5-18	Withheld	Withheld
3M COMPANY	3M COMPANY/3M CORDOVA	IL	132182-92-4	Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-(trifluoromethyl)-	Withheld	Withheld
AGC CHEMICALS AMERICAS, INC.	AGC CHEM AMER INC BUS & TECH CTR	PA	2043-57-4	Octane, 1,1,1,2,2,3,3,4,4,5,5,6,6-tridecafluoro-8-iodo-	Withheld	1,000,000 - 10,000,000 lb
AGC CHEMICALS AMERICAS, INC.	AGC CHEM AMER INC BUS & TECH CTR	PA	355-43-1	Hexane, 1,1,1,2,2,3,3,4,4,5,5,6,6-tridecafluoro-6-iodo-	Withheld	1,000,000 - 10,000,000 lb
AGC CHEMICALS AMERICAS, INC.	AGC CHEM AMER INC BUS & TECH CTR	PA	422-56-0	Propane, 3,3-dichloro-1,1,1,2,2-pentafluoro-	Withheld	< 25,000 lb
AGC CHEMICALS AMERICAS, INC.	AGC CHEM AMER INC BUS & TECH CTR	PA	507-55-1	Propane, 1,3-dichloro-1,1,2,2,3-pentafluoro-	Withheld	< 25,000 lb
ATOTECH USA, INC.	ATOTECH USA	SC	27619-97-2	1-Octanesulfonic acid, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-	Withheld	Withheld
ATOTECH USA, INC.	ATOTECH USA	SC	56773-42-3	Ethanaminium, N,N,N-triethyl-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonate (1:1)	Withheld	< 25,000 lb
CBI	3M COMPANY	AL	212335-64-3	2-Propenoic acid, reaction products with N-[3-(dimethylamino)propyl]-1,1,2,2,3,3,4,4,4-nonafluoro-1-butanesulfonamide	Withheld	Withheld

Table B-1: PFAS Manufacture and Import Reported in the 2016 CDR

Parent Company	Site Name	Site State	CAS	Chemical Name	Manufacture and Import	National Aggregate PV
CBI	3M COMPANY	AL	332350-90-0	Phosphonium, tributyl(2-methoxypropyl)-, salt with 1,1,2,2,3,3,4,4,4-nonafluoro-N-methyl-1-butanesulfonamide (1:1)	Withheld	Withheld
CBI	3M COMPANY	AL	332350-93-3	Phosphonium, triphenyl(phenylmethyl)-, salt with 1,1,2,2,3,3,4,4,4-nonafluoro-N-methyl-1-butanesulfonamide (1:1)	Withheld	Withheld
CBI	3M COMPANY	AL	34454-97-2	1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-nonafluoro-N-(2-hydroxyethyl)-N-methyl-	Withheld	Withheld
CBI	3M COMPANY/3M CORDOVA	IL	163702-05-4	Butane, 1-ethoxy-1,1,2,2,3,3,4,4,4-nonafluoro-	Withheld	Withheld
CBI	3M COMPANY/3M CORDOVA	IL	163702-06-5	Propane, 2-(ethoxydifluoromethyl)-1,1,1,2,3,3,3-heptafluoro-	Withheld	Withheld
CBI	3M COMPANY/3M CORDOVA	IL	163702-07-6	Butane, 1,1,1,2,2,3,3,4,4-nonafluoro-4-methoxy-	Withheld	Withheld
CBI	3M COMPANY/3M CORDOVA	IL	163702-08-7	Propane, 2-(difluoromethoxymethyl)-1,1,1,2,3,3,3-heptafluoro-	Withheld	Withheld
CBI	3M COMPANY/3M CORDOVA	IL	297730-93-9	Hexane, 3-ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-(trifluoromethyl)-	Withheld	Withheld
CBI	3M COMPANY/3M CORDOVA	IL	335-42-2	Butanoyl fluoride, 2,2,3,3,4,4,4-heptafluoro-	Withheld	Withheld
CBI	3M COMPANY/3M CORDOVA	IL	375-03-1	Propane, 1,1,1,2,2,3,3-heptafluoro-3-methoxy-	Withheld	Withheld
CBI	3M COMPANY/3M CORDOVA	IL	375-72-4	1-Butanesulfonyl fluoride, 1,1,2,2,3,3,4,4,4-nonafluoro-	Withheld	Withheld
CBI	3M COMPANY/3M CORDOVA	IL	382-28-5	Morpholine, 2,2,3,3,5,5,6,6-octafluoro-4-(trifluoromethyl)-	Withheld	Withheld
CBI	3M COMPANY/3M CORDOVA	IL	756-13-8	3-Pentanone, 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-	Withheld	Withheld
CBI	3M COMPANY/3M CORDOVA	IL	76-19-7	Propane, 1,1,1,2,2,3,3,3-octafluoro-	Withheld	Withheld
CBI	3M COMPANY/3M CORDOVA	IL	813-45-6	3-Hexanone, 1,1,1,2,4,4,5,5,6,6,6-undecafluoro-2-(trifluoromethyl)-	Withheld	Withheld
CBI	3M COMPANY/3M CORDOVA	IL	86508-42-1	Perfluoro compounds, C5-18	Withheld	Withheld

Table B-1: PFAS Manufacture and Import Reported in the 2016 CDR

Parent Company	Site Name	Site State	CAS	Chemical Name	Manufacture and Import	National Aggregate PV
CBI	3M COTTAGE GROVE CENTER	MN	375-03-1	Propane, 1,1,1,2,2,3,3-heptafluoro-3-methoxy-	Withheld	Withheld
CBI	3M COTTAGE GROVE CENTER	MN	484024-67-1	1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-nonafluoro-N-(2-hydroxyethyl)-, ammonium salt (1:1)	Withheld	Withheld
CBI	AIR PROD & CHEM HAMILTON BLVD FAC	PA	559-40-0	Cyclopentene, 1,2,3,3,4,4,5,5-octafluoro-	Withheld	Withheld
CBI	AIR PROD & CHEM HAMILTON BLVD FAC	PA	76-16-4	Ethane, 1,1,1,2,2,2-hexafluoro-	Withheld	Withheld
CBI	CBI	CBI	2043-54-1	Dodecane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10-heneicosafluoro-12-iodo-	Withheld	Withheld
CBI	CBI	CBI	2043-57-4	Octane, 1,1,1,2,2,3,3,4,4,5,5,6,6-tridecafluoro-8-iodo-	Withheld	1,000,000 - 10,000,000 lb
CBI	CBI	CBI	27905-45-9	2-Propenoic acid, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl ester	Withheld	< 25,000 lb
CBI	CBI	CBI	422-61-7	Propanoyl fluoride, 2,2,3,3,3-pentafluoro-	Withheld	Withheld
CBI	CBI	CBI	647-42-7	1-Octanol, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-	Withheld	1,000,000 - 10,000,000 lb
CBI	CBI	CBI	67584-55-8	2-Propenoic acid, 2-[methyl[(1,1,2,2,3,3,4,4,4-nonafluorobutyl)sulfonyl]amino]ethyl ester	Withheld	Withheld
CBI	CBI	CBI	68140-18-1	Thiols, C4-10, .gamma.-.omega.-perfluoro	Withheld	Withheld
CBI	CBI	CBI	68140-20-5	Thiols, C6-12, .gamma.-.omega.-perfluoro	Withheld	Withheld
CBI	CBI	CBI	68187-47-3	1-Propanesulfonic acid, 2-methyl-, 2-[[1-oxo-3-[(.gamma.-.omega.-perfluoro-C4-16-alkyl)thio]propyl]amino] derivs., sodium salts	Withheld	Withheld
CBI	CBI	CBI	68391-08-2	Alcohols, C8-14, .gamma.-.omega.-perfluoro	Withheld	Withheld
CBI	CBI	CBI	70969-47-0	Thiols, C8-20, .gamma.-.omega.-perfluoro, telomers with acrylamide	Withheld	Withheld
CBI	CBI	CBI	70983-60-7	1-Propanaminium, 2-hydroxy-N,N,N-trimethyl-, 3-[(.gamma.-.omega.-perfluoro-C6-20-alkyl)thio] derivs., chlorides	Withheld	Withheld

Table B-1: PFAS Manufacture and Import Reported in the 2016 CDR

Parent Company	Site Name	Site State	CAS	Chemical Name	Manufacture and Import	National Aggregate PV
CBI	INNOVATIVE CHEMICAL TECHNOLOGIES INC	GA	142636-88-2	2-Propenoic acid, 2-methyl-, octadecyl ester, polymer with 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,12-heneicosafluorododecyl 2-propenoate, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl 2-propenoate and 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,14-pentacosafluorotetradecyl 2-propenoate	Withheld	Withheld
CBI	INNOVATIVE CHEMICAL TECHNOLOGIES INC	GA	65545-80-4	Poly(oxy-1,2-ethanediyl), .alpha.-hydro-.omega.-hydroxy-, ether with .alpha.-fluoro-.omega.-(2-hydroxyethyl)poly(difluoromethylene) (1:1)	Withheld	25,000 - 100,000 lb
CBI	INNOVATIVE CHEMICAL TECHNOLOGIES INC	GA	68412-68-0	Phosphonic acid, perfluoro-C6-12-alkyl derivs.	Withheld	Withheld
CBI	INNOVATIVE CHEMICAL TECHNOLOGIES INC	GA	68412-69-1	Phosphinic acid, bis(perfluoro-C6-12-alkyl) derivs.	Withheld	Withheld
CBI	INNOVATIVE CHEMICAL TECHNOLOGY AT ORTEC INC	SC	142636-88-2	2-Propenoic acid, 2-methyl-, octadecyl ester, polymer with 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,12-heneicosafluorododecyl 2-propenoate, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl 2-propenoate and 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,14-pentacosafluorotetradecyl 2-propenoate	Withheld	Withheld
CBI	SOLENIS LLC	DE	355-43-1	Hexane, 1,1,1,2,2,3,3,4,4,5,5,6,6-tridecafluoro-6-iodo-	Withheld	1,000,000 - 10,000,000 lb
CBI	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	10493-43-3	Ethene, 1,1,2-trifluoro-2-(1,1,2,2,2-pentafluoroethoxy)-	Withheld	Withheld
CBI	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	13252-13-6	Propanoic acid, 2,3,3,3-tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-	Withheld	Withheld

Table B-1: PFAS Manufacture and Import Reported in the 2016 CDR

Parent Company	Site Name	Site State	CAS	Chemical Name	Manufacture and Import	National Aggregate PV
CBI	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	16090-14-5	Ethanesulfonyl fluoride, 2-[1-[difluoro[(1,2,2-trifluoroethenyl)oxy]methyl]-1,2,2,2-tetrafluoroethoxy]-1,1,2,2-tetrafluoro-	Withheld	Withheld
CBI	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	1623-05-8	Propane, 1,1,1,2,2,3,3-heptafluoro-3-[(1,2,2-trifluoroethenyl)oxy]-	Withheld	Withheld
CBI	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	2062-98-8	Propanoyl fluoride, 2,3,3,3-tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-	Withheld	Withheld
CBI	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	3330-14-1	Propane, 1-[1-[difluoro(1,2,2,2-tetrafluoroethoxy)methyl]-1,2,2,2-tetrafluoroethoxy]-1,1,2,2,3,3,3-heptafluoro-	Withheld	Withheld
CBI	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	3825-26-1	Octanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-, ammonium salt (1:1)	Withheld	Withheld
CBI	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	4089-58-1	Propanoyl fluoride, 2,3,3,3-tetrafluoro-2-[1,1,2,3,3,3-hexafluoro-2-[1,1,2,2-tetrafluoro-2-(fluorosulfonyl)ethoxy]propoxy]-	Withheld	Withheld
CBI	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	62037-80-3	Propanoic acid, 2,3,3,3-tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-, ammonium salt (1:1)	Withheld	Withheld
CBI	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	69116-73-0	Propanoic acid, 3-[1-[difluoro[1,2,2,2-tetrafluoro-1-(fluorocarbonyl)ethoxy]methyl]-1,2,2,2-tetrafluoroethoxy]-2,2,3,3-tetrafluoro-, methyl ester	Withheld	Withheld
DAIKIN AMERICA INC.	DAIKIN AMERICA INC.	NY	2043-57-4	Octane, 1,1,1,2,2,3,3,4,4,5,5,6,6-tridecafluoro-8-iodo-	Withheld	1,000,000 - 10,000,000 lb

Table B-1: PFAS Manufacture and Import Reported in the 2016 CDR

Parent Company	Site Name	Site State	CAS	Chemical Name	Manufacture and Import	National Aggregate PV
DAIKIN AMERICA, INC.	DAIKIN AMERICA, INC.	AL	115-25-3	Cyclobutane, 1,1,2,2,3,3,4,4-octafluoro-	Withheld	1,000,000 - 10,000,000 lb
DAIKIN AMERICA, INC.	DAIKIN AMERICA, INC.	AL	1547-26-8	1-Pentene, 2,3,3,4,4,5,5-heptafluoro-	Withheld	Withheld
DAIKIN AMERICA, INC.	DAIKIN AMERICA, INC.	AL	1623-05-8	Propane, 1,1,1,2,2,3,3-heptafluoro-3-[(1,2,2-trifluoroethenyl)oxy]-	Withheld	Withheld
DAIKIN AMERICA, INC.	DAIKIN AMERICA, INC.	AL	17527-29-6	2-Propenoic acid, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl ester	Withheld	1,000,000 - 10,000,000 lb
DAIKIN AMERICA, INC.	DAIKIN AMERICA, INC.	AL	17741-60-5	2-Propenoic acid, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,12-heneicosafluorododecyl ester	Withheld	Withheld
DAIKIN AMERICA, INC.	DAIKIN AMERICA, INC.	AL	2144-53-8	2-Propenoic acid, 2-methyl-, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl ester	Withheld	Withheld
DAIKIN AMERICA, INC.	DAIKIN AMERICA, INC.	AL	25291-17-2	1-Octene, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-	Withheld	Withheld
DAIKIN AMERICA, INC.	DAIKIN AMERICA, INC.	AL	27905-45-9	2-Propenoic acid, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl ester	Withheld	< 25,000 lb
Dow Corning Corporation	DOW CORNING CORP MIDLAND PLANT	MI	125476-71-3	Silicic acid (H4SiO4), sodium salt (1:2), reaction products with chlorotrimethylsilane and 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluoro-1-decanol	Withheld	Withheld
FORD MOTOR COMPANY	Ford Motor Company	MI	65545-80-4	Poly(oxy-1,2-ethanediyl), .alpha.-hydro-.omega.-hydroxy-, ether with .alpha.-fluoro-.omega.-(2-hydroxyethyl)poly(difluoromethylene) (1:1)	Withheld	25,000 - 100,000 lb
HONEYWELL INTERNATIONAL INC	HONEYWELL INTERNATIONAL INC - BATON ROUGE PLANT	LA	76-14-2	Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro-	Withheld	Withheld

Table B-1: PFAS Manufacture and Import Reported in the 2016 CDR

Parent Company	Site Name	Site State	CAS	Chemical Name	Manufacture and Import	National Aggregate PV
LANXESS CORPORATION	LANXESS CORP	PA	56773-42-3	Ethanaminium, N,N,N-triethyl-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonate (1:1)	Withheld	< 25,000 lb
LINDE NORTH AMERICA, INC	LINDE ELECTRONICS AND SPECIALTY GASES	NJ	115-25-3	Cyclobutane, 1,1,2,2,3,3,4,4-octafluoro-	Withheld	1,000,000 - 10,000,000 lb
PEACH STATE LABS INC	PEACH STATE LABS INC COLUMBUS	GA	647-42-7	1-Octanol, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-	Withheld	1,000,000 - 10,000,000 lb
PEACH STATE LABS INC	PEACH STATE LABS INC COLUMBUS	GA	68188-12-5	Alkyl iodides, C4-20, .gamma.-.omega.-perfluoro	Withheld	25,000 - 100,000 lb
Peach State Labs LLC	PEACH STATE LABS, LLC	GA	17527-29-6	2-Propenoic acid, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl ester	Withheld	1,000,000 - 10,000,000 lb
Peach State Labs LLC	PEACH STATE LABS, LLC	GA	2043-57-4	Octane, 1,1,1,2,2,3,3,4,4,5,5,6,6-tridecafluoro-8-iodo-	Withheld	1,000,000 - 10,000,000 lb
Peach State Labs LLC	PEACH STATE LABS, LLC	GA	647-42-7	1-Octanol, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-	Withheld	1,000,000 - 10,000,000 lb
Peach State Labs LLC	PEACH STATE LABS, LLC	GA	68188-12-5	Alkyl iodides, C4-20, .gamma.-.omega.-perfluoro	Withheld	25,000 - 100,000 lb
SOLVAY SPECIALTY POLYMERS USA, LLC	SOLVAY SPECIALTY POLYMERS USA LLC	TX	35397-13-8	Propane, 1,1,1,2,2,3,3-heptafluoro-3-[(1,2,2-trifluoroethenyl)oxy]-, polymer with 1-chloro-1,2,2-trifluoroethene and ethene	Withheld	Withheld
SOLVAY SPECIALTY POLYMERS USA, LLC	SOLVAY SPECIALTY POLYMERS USA, LLC	GA	200013-65-6	Diphosphoric acid, polymers with ethoxylated reduced Me esters of reduced polymd. oxidized tetrafluoroethylene	Withheld	Withheld
SUMITOMO CORPORATION OF AMERICAS	SUMITOMO CORPORATION OF AMERICAS	TX	17527-29-6	2-Propenoic acid, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl ester	Withheld	1,000,000 - 10,000,000 lb

Table B-1: PFAS Manufacture and Import Reported in the 2016 CDR						
Parent Company	Site Name	Site State	CAS	Chemical Name	Manufacture and Import	National Aggregate PV
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	1224429-82-6	Phosphoric acid, mixed esters with polyethylene glycol and 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-1-octanol, ammonium salts	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	124-73-2	Ethane, 1,2-dibromo-1,1,2,2-tetrafluoro-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	17527-29-6	2-Propenoic acid, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl ester	Withheld	1,000,000 - 10,000,000 lb
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	17741-60-5	2-Propenoic acid, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,12-heneicosafluorododecyl ester	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	19430-93-4	1-Hexene, 3,3,4,4,5,5,6,6,6-nonafluoro-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	2043-53-0	Decane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-iodo-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	2043-54-1	Dodecane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10-heneicosafluoro-12-iodo-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	2043-55-2	Hexane, 1,1,1,2,2,3,3,4,4-nonafluoro-6-iodo-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	2043-57-4	Octane, 1,1,1,2,2,3,3,4,4,5,5,6,6-tridecafluoro-8-iodo-	Withheld	1,000,000 - 10,000,000 lb

Table B-1: PFAS Manufacture and Import Reported in the 2016 CDR

Parent Company	Site Name	Site State	CAS	Chemical Name	Manufacture and Import	National Aggregate PV
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	2144-53-8	2-Propenoic acid, 2-methyl-, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl ester	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	27905-45-9	2-Propenoic acid, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl ester	Withheld	< 25,000 lb
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	30046-31-2	Tetradecane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12-pentacosafluoro-14-iodo-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	34362-49-7	2-Propenoic acid, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,15,15,16,16,16-nonacosafluorohexadecyl ester	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	34395-24-9	2-Propenoic acid, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,14-pentacosafluorotetradecyl ester	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	39239-77-5	1-Tetradecanol, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,14-pentacosafluoro-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	60699-51-6	1-Hexadecanol, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,15,15,16,16,16-nonacosafluoro-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	647-42-7	1-Octanol, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-	Withheld	1,000,000 - 10,000,000 lb
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	65510-55-6	Hexadecane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14-nonacosafluoro-16-iodo-	Withheld	Withheld

Table B-1: PFAS Manufacture and Import Reported in the 2016 CDR

Parent Company	Site Name	Site State	CAS	Chemical Name	Manufacture and Import	National Aggregate PV
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	678-39-7	1-Decanol, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluoro-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	76-16-4	Ethane, 1,1,1,2,2,2-hexafluoro-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CHAMBERS WORKS)	NJ	865-86-1	1-Dodecanol, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,12-heneicosafluoro-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (CORPUS CHRISTI)	TX	76-14-2	Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	2641-34-1	Propanoyl fluoride, 2,3,3,3-tetrafluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propoxy]-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	335-66-0	Octanoyl fluoride, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-	Withheld	< 25,000 lb
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (FAYETTEVILLE WORKS)	NC	335-67-1	Octanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (HEADQUARTERS)	DE	115-25-3	Cyclobutane, 1,1,2,2,3,3,4,4-octafluoro-	Withheld	1,000,000 - 10,000,000 lb
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (HEADQUARTERS)	DE	138495-42-8	Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (HEADQUARTERS)	DE	15290-77-4	Cyclopentane, 1,1,2,2,3,3,4-heptafluoro-	Withheld	Withheld

Table B-1: PFAS Manufacture and Import Reported in the 2016 CDR

Parent Company	Site Name	Site State	CAS	Chemical Name	Manufacture and Import	National Aggregate PV
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (HEADQUARTERS)	DE	507-63-1	Octane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-8-iodo-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (HEADQUARTERS)	DE	62037-80-3	Propanoic acid, 2,3,3,3-tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-, ammonium salt (1:1)	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (PASCAGOULA)	MS	27619-97-2	1-Octanesulfonic acid, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (PASCAGOULA)	MS	34455-29-3	1-Propanaminium, N-(carboxymethyl)-N,N-dimethyl-3-[[(3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl)sulfonyl]amino]-, inner salt	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (WASHINGTON WORKS)	WV	115-25-3	Cyclobutane, 1,1,2,2,3,3,4,4-octafluoro-	Withheld	1,000,000 - 10,000,000 lb
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (WASHINGTON WORKS)	WV	354-64-3	Ethane, 1,1,1,2,2-pentafluoro-2-iodo-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (WASHINGTON WORKS)	WV	355-42-0	Hexane, 1,1,1,2,2,3,3,4,4,5,5,6,6,6-tetradecafluoro-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (WASHINGTON WORKS)	WV	355-43-1	Hexane, 1,1,1,2,2,3,3,4,4,5,5,6,6-tridecafluoro-6-iodo-	Withheld	1,000,000 - 10,000,000 lb
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (WASHINGTON WORKS)	WV	423-39-2	Butane, 1,1,1,2,2,3,3,4,4-nonafluoro-4-iodo-	Withheld	Withheld
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (WASHINGTON WORKS)	WV	423-62-1	Decane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10-heneicosafluoro-10-iodo-	Withheld	Withheld

Table B-1: PFAS Manufacture and Import Reported in the 2016 CDR

Parent Company	Site Name	Site State	CAS	Chemical Name	Manufacture and Import	National Aggregate PV
The Chemours Co	THE CHEMOURS COMPANY FC, LLC (WASHINGTON WORKS)	WV	507-63-1	Octane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-8-iodo-	Withheld	Withheld
TYCO FIRE PRODUCTS LP	CHEMGUARD INC	TX	1078715-61-3	1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-[2-[(.gamma.-.omega.-perfluoro-C4-20-alkyl)thio]acetyl] derivs., inner salts	Withheld	25,000 - 100,000 lb
TYCO FIRE PRODUCTS LP	CHEMGUARD INC	TX	27619-89-2	1-Octanesulfonyl chloride, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-	Withheld	25,000 - 100,000 lb
TYCO FIRE PRODUCTS LP	CHEMGUARD INC	TX	34455-29-3	1-Propanaminium, N-(carboxymethyl)-N,N-dimethyl-3-[[(3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl)sulfonyl]amino]-, inner salt	Withheld	Withheld
TYCO FIRE PRODUCTS LP	CHEMGUARD INC	TX	65545-80-4	Poly(oxy-1,2-ethanediyl), .alpha.-hydro-.omega.-hydroxy-, ether with .alpha.-fluoro-.omega.-(2-hydroxyethyl)poly(difluoromethylene) (1:1)	Withheld	25,000 - 100,000 lb
TYCO FIRE PRODUCTS LP	CHEMGUARD INC	TX	68140-18-1	Thiols, C4-10, .gamma.-.omega.-perfluoro	Withheld	Withheld
TYCO FIRE PRODUCTS LP	CHEMGUARD INC	TX	68140-20-5	Thiols, C6-12, .gamma.-.omega.-perfluoro	Withheld	Withheld
TYCO FIRE PRODUCTS LP	CHEMGUARD INC	TX	68187-47-3	1-Propanesulfonic acid, 2-methyl-, 2-[[1-oxo-3-[(.gamma.-.omega.-perfluoro-C4-16-alkyl)thio]propyl]amino] derivs., sodium salts	Withheld	Withheld
TYCO FIRE PRODUCTS LP	CHEMGUARD INC	TX	70969-47-0	Thiols, C8-20, .gamma.-.omega.-perfluoro, telomers with acrylamide	Withheld	Withheld

Table B-2: Number of PFAS Manufactured by Use Reported in the 2016 CDR

Type/Process/Use	Sector	Function	Number of PFAS
(blank)	(blank)	(blank)	33
CBI	CBI	CBI	10
Processing as a reactant	Adhesive manufacturing	Intermediates	1
Processing as a reactant	All other basic organic chemical manufacturing	Intermediates	16
Processing as a reactant	All other basic organic chemical manufacturing	Processing aids, not otherwise listed	2
Processing as a reactant	Computer and electronic product manufacturing	Intermediates	1
Processing as a reactant	Industrial gas manufacturing	Intermediates	1
Processing as a reactant	Miscellaneous manufacturing	Intermediates	1
Processing as a reactant	Not known or reasonably ascertainable	Not known or reasonably ascertainable	1
Processing as a reactant	Paint and coating manufacturing	Intermediates	1
Processing as a reactant	Plastic material and resin manufacturing	Intermediates	13
Processing as a reactant	Textiles, apparel, and leather manufacturing	Intermediates	4
Processing—incorporation into article	Paint and coating manufacturing	Plating agents and surface treating agents	1
Processing—incorporation into article	Paper manufacturing	Finishing agents	1
Processing—incorporation into article	Textiles, apparel, and leather manufacturing	Finishing agents	1
Processing—incorporation into formulation, mixture, or reaction product	Adhesive manufacturing	Surface active agents	1
Processing—incorporation into formulation, mixture, or reaction product	All other basic inorganic chemical manufacturing	Surface active agents	1
Processing—incorporation into formulation, mixture, or reaction product	All other basic organic chemical manufacturing	Processing aids, not otherwise listed	1
Processing—incorporation into formulation, mixture, or reaction product	All other chemical product and preparation manufacturing	Firefighting foam agents	8
Processing—incorporation into formulation, mixture, or reaction product	All other chemical product and preparation manufacturing	Solvents (for cleaning and degreasing)	6
Processing—incorporation into formulation, mixture, or reaction product	All other chemical product and preparation manufacturing	Surface active agents	2
Processing—incorporation into formulation, mixture, or reaction product	CBI	CBI	2
Processing—incorporation into formulation, mixture, or reaction product	CBI	Surface active agents	1
Processing—incorporation into formulation, mixture, or reaction product	Computer and electronic product manufacturing	Functional fluids (closed systems)	1

Table B-2: Number of PFAS Manufactured by Use Reported in the 2016 CDR

Type/Process/Use	Sector	Function	Number of PFAS
Processing—incorporation into formulation, mixture, or reaction product	Computer and electronic product manufacturing	Solvents (which become part of product formulation or mixture)	1
Processing—incorporation into formulation, mixture, or reaction product	Computer and electronic product manufacturing	Surface active agents	1
Processing—incorporation into formulation, mixture, or reaction product	Miscellaneous manufacturing	Plating agents and surface treating agents	2
Processing—incorporation into formulation, mixture, or reaction product	Oil and gas drilling, extraction, and support activities	Surface active agents	1
Processing—incorporation into formulation, mixture, or reaction product	Paint and coating manufacturing	Paint additives and coating additives not described by other categories	1
Processing—incorporation into formulation, mixture, or reaction product	Paint and coating manufacturing	Surface active agents	1
Processing—incorporation into formulation, mixture, or reaction product	Pesticide, fertilizer, and other agricultural chemical manufacturing	Surface active agents	2
Processing—incorporation into formulation, mixture, or reaction product	Plastic material and resin manufacturing	Processing aids, specific to petroleum production	1
Processing—incorporation into formulation, mixture, or reaction product	Plastic material and resin manufacturing	Solvents (which become part of product formulation or mixture)	1
Processing—incorporation into formulation, mixture, or reaction product	Printing ink manufacturing	Processing aids, not otherwise listed	1
Processing—incorporation into formulation, mixture, or reaction product	resale of chemicals	Plating agents and surface treating agents	1
Processing—incorporation into formulation, mixture, or reaction product	Soap, cleaning compound, and toilet preparation manufacturing	Surface active agents	3
Processing—incorporation into formulation, mixture, or reaction product	Wholesale and retail trade	CBI	1
Processing—repackaging	All other chemical product and preparation manufacturing	Plating agents and surface treating agents	1
Processing—repackaging	All other chemical product and preparation manufacturing	Solvents (for cleaning and degreasing)	1
Processing—repackaging	Industrial gas manufacturing	transfilling and purifying	1
Processing—repackaging	Miscellaneous manufacturing	Solvents (for cleaning and degreasing)	1
Processing—repackaging	Paint and coating manufacturing	Paint additives and coating additives not described by other categories	1
Processing—repackaging	Plastic material and resin manufacturing	Intermediates	1

Table B-2: Number of PFAS Manufactured by Use Reported in the 2016 CDR

Type/Process/Use	Sector	Function	Number of PFAS
Processing—repackaging	Plastic material and resin manufacturing	Solvents (which become part of product formulation or mixture)	1
Use—non-incorporative activities	All other chemical product and preparation manufacturing	Fire Extinguishing Medium	1
Use—non-incorporative activities	All other chemical product and preparation manufacturing	Functional fluids (open systems)	1
Use—non-incorporative activities	CBI	CBI	2
Use—non-incorporative activities	CBI	Functional fluids (closed systems)	2
Use—non-incorporative activities	Computer and electronic product manufacturing	CBI	1
Use—non-incorporative activities	Computer and electronic product manufacturing	Functional fluids (closed systems)	9
Use—non-incorporative activities	Computer and electronic product manufacturing	Functional fluids (open systems)	1
Use—non-incorporative activities	Computer and electronic product manufacturing	Plating agents and surface treating agents	1
Use—non-incorporative activities	Computer and electronic product manufacturing	Solvents (for cleaning and degreasing)	7
Use—non-incorporative activities	Fabricated metal product manufacturing	Solvents (for cleaning and degreasing)	2
Use—non-incorporative activities	Miscellaneous manufacturing	Solvents (for cleaning and degreasing)	1
Use—non-incorporative activities	Not known or reasonably ascertainable	Lubricants and lubricant additives	1
Use—non-incorporative activities	Plastic material and resin manufacturing	Processing aids, not otherwise listed	2
Use—non-incorporative activities	Primary metal manufacturing	Functional fluids (open systems)	1
Use—non-incorporative activities	Stored on site in rail cars, no commercial use	Stored on site in rail cars, no commercial use	1

Appendix C: References

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Exhibit C

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

Ex. C

JUN 0 5 2019

OFFICE OF
CONGRESSIONAL AND
INTERGOVERNMENTAL
RELATIONS

The Honorable Paul D. Tonko
U.S. House of Representatives
Washington, DC 20515

Dear Congressman Tonko:

Thank you for the letter of December 7, 2018, to the Environmental Protection Agency (EPA) concerning per- and polyfluoroalkyl substances (PFAS).

The EPA's New Chemicals Review Program evaluates new chemicals to determine whether they may present unreasonable risk to human health or the environment. Once the EPA's review is complete, submitters may commercialize the chemical substance (subject to any restrictions the Agency may have placed on the manufacture, processing, distribution in commerce or use of the chemical substance) after having submitted a Notice of Commencement (NOC), indicating intent to commence manufacture or import of the chemical. However, it is often the case that submitters either delay or do not choose to commercialize chemicals that have undergone review. Hence, the responses below provide the number of notices for PFAS chemicals for which the EPA received an NOC, as this is the EPA's best indication of whether a PFAS chemical may have entered commerce. The numbers below are current as of early February 2019.

Since 2006, when the PFOA Stewardship Initiative began, the EPA received 148 NOCs for PFAS chemicals that underwent New Chemicals Program review. Of the PFAS chemicals for which EPA has received NOCs, 146 were received prior to June 22, 2016, and 2 after that date.

The Agency also receives exemption notices for chemical substances, which are exempt from full premanufacture notice (PMN) review under TSCA section 5, provided they meet the criteria and maintain certain conditions and controls throughout the duration of the exemption. One such exemption for chemical substances manufactured at 10,000 kg/year or less per year is the Low-Volume Exemption (LVE). Since 2006, the EPA received 528 LVEs for PFAS chemicals and granted 272 of them. Of those granted, 262 were granted prior to June 22, 2016, and 10 after that date.

Regarding new PFAS chemicals entering the market, between 2006 and April 2019, the EPA placed restrictions on new PFAS chemicals through the issuance of 171 orders and 178 significant new use rules (SNURs). As mentioned above, the new chemicals review program evaluates new chemicals and significant new uses of existing chemicals to determine whether

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they may present unreasonable risk to human health or the environment. When the EPA determines that a chemical substance may present an unreasonable risk, the EPA must issue an order under TSCA section 5(e). A section 5(e) order typically contains some of the following requirements: limits on specific conditions for manufacturing, processing, distribution or use of the chemical, limits on releases to water and air, toxicity testing, environmental fate testing, worker protection measures (e.g., exposure limits and personal protective equipment), hazard communication language and record-keeping.

The EPA notes that submitters sometimes decide to withdraw their PMN from review once they learn that the EPA has found that the substance may present unreasonable risk and the Agency intends to issue an order under section 5(e). Since 2006, 46 PFAS chemicals have been withdrawn (42 PMN and 2 LVE). Of those withdrawn, 44 were prior to June 22, 2016, and 2 after that date.

Regarding new PFAS chemicals subject to consent orders requiring the development of test data, since 2006, EPA has issued section 5(e) orders that have testing requirements[1] for 157 PFAS chemicals. Of these orders, 34 were issued prior to June 22, 2016, and 122 were issued after that date.

Again, thank you for your letter. If you have further questions, please contact me or our staff may contact Sven-Erik Kaiser in the EPA's Office of Congressional and Intergovernmental Relations at kaiser.sven-erik@epa.gov or at (202) 566-2753.

Sincerely,

Troy M. Lyons
Associate Administrator

[1] Although all orders generally describe testing requirements or potentially useful information, the Agency works with submitters of like chemicals to tailor testing requirements in order to avoid unnecessary vertebrate tests so the number of orders does not necessarily equal the number of test submissions.

Appointment

From: Hoffer, Melissa [Hoffer.Melissa@epa.gov]
Sent: 5/24/2021 11:25:03 PM
To: teamsvisitor:d5b0bc90c00d4a749710f6832015547c; Jon Devine [jdevine@nrdc.org]; teamsvisitor:abc60741c63742528a625ac70ca2960f; teamsvisitor:16c67220a8084b27bdae17ef244b508c; Lisa Perfetto [lperfetto@earthjustice.org]; teamsvisitor:9dc34b1c8b444b4789e56a9f9d004b7d; teamsvisitor:2a5abbeac26045f7b30955bd4a4dc18a; teamsvisitor:adc6c78f493e49449149857bb2dc63f0; Brett Hartl [BHartl@biologicaldiversity.org]; Mychal Ozaeta [mozaeta@earthjustice.org]; teamsvisitor:ed1bd930625b4d4494e45c145cbbd19b; Julian Gonzalez [jgonzalez@earthjustice.org]; +1914374[redacted] Garbow, Avi [Garbow.Avi@epa.gov]; Zomer, Jessica [Zomer.Jessica@epa.gov]; +1510282[redacted]; Neugeboren, Steven [Neugeboren.Steven@epa.gov]; Best-Wong, Benita [Best-Wong.Benita@epa.gov]; Nagle, Deborah [Nagle.Deborah@epa.gov]; Application 207a6836-d031-4764-a9d8-c1193f455f21; abel russ [aruss@environmentalintegrity.org]; Thomas Cmar [tcmar@earthjustice.org]; teamsvisitor:4dd5fe2a465145ebbb09e69a5fe308d4; Lauren Piette [lpiette@earthjustice.org]; teamsvisitor:63e71f85017d46b1b4e99e16ee429a19; Application 9e133cac-5238-4d1e-aaa0-d8ff4ca23f4e; Application b102ccd8-1925-448b-90a7-b083aba25074; Application ab5d1521-415b-4380-82e4-af803fb8bf2d; Levine, MaryEllen [levine.maryellen@epa.gov]; Application 556b15e7-452c-4773-b728-6313eaa47b77

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Recurrence: (none)

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Appointment

From: Lance, Kathleen [Lance.Kathleen@epa.gov]
Sent: 4/8/2021 10:16:16 PM
To: Walter Echo-Hawk [wechohawk@pawneenation.org]; Chad (Guest) [Chad@chadsmith.com]; teamsvisitor:43b03505366b464cbfdb941c9843b2f0; Application 9e133cac-5238-4d1e-aaa0-d8ff4ca23f4e; teamsvisitor:5ed97a2464bd4a5d90d6140ef5a22452; +1580916 (1); Tabitha Langston; +1580916 (2); +1580916 (3); +1580916 (4); +1580670 +1212748 Hoffer, Melissa [Hoffer.Melissa@epa.gov]; Serassio, Helen [Serassio.Helen@epa.gov]; +1580916 (5); Polk, Jonna [Polk.Jonna@epa.gov]; +1303717 +1405780 McGuire, James [McGuire.James@epa.gov]; Nishida, Jane [Nishida.Jane@epa.gov]; +1202457 Katims, Casey [Katims.Casey@epa.gov]; Gray, David [gray.david@epa.gov]; Garbow, Avi [Garbow.Avi@epa.gov]; +1918540 Berrios, Lisa [Berrios.Lisa@epa.gov]; Application 556b15e7-452c-4773-b728-6313eaa47b77; Alvarado, Tina [Alvarado.Tina@epa.gov]; Application 207a6836-d031-4764-a9d8-c1193f455f21; +1405508 Michael Freeman [mfreeman@earthjustice.org]; teamsvisitor:b7466561f4f846419341555ad4574ec5; teamsvisitor:9a87e186b3284cb998b95239a3dc144b; klaughlin@estoo.net; tbaker@choctawnation.com; Kara Berst [Kara.Berst@chickasaw.net]; Rumela Roy [rroy@earthjustice.org]; teamsvisitor:15ec9521cb3741f896dad7eaa9e70f0d; Chaudhuri, Jonodev O. (WDC x5635) [Jonodev.Chaudhuri@quarles.com]; teamsvisitor:28f371629215425dbb4f1c4a2b8f0f3b; Siegal, Tod [Siegal.Tod@epa.gov]; DCRoomWJCN3000A/Administrator [DCRoomWJCN3000AAdministrator@epa.gov]; teamsvisitor:392cc5914aac40a6a6a2324a92d24a79

Subject: Meeting (ScheduledMeeting)/Thread Id: Ex. 6 Personal Privacy (PP) d6a90a9b-6cf3-4584-845f-4146af45a4bf/Walter Echo-Hawk,Chad (Guest),teamsvisitor:43b03505366b464cbfdb941c9843b2f0,teamsvisitor:...

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End: 4/8/2021 2:54:54 PM
Show Time As: Busy

Recurrence: (none)

Required Attendees: Walter Echo-Hawk; Chad (Guest); teamsvisitor:43b03505366b464cbfdb941c9843b2f0; Application 9e133cac-5238-4d1e-aaa0-d8ff4ca23f4e; teamsvisitor:5ed97a2464bd4a5d90d6140ef5a22452; +1580916 (1); Tabitha Langston; +1580916 (2); +1580916 (3); +1580916 (4); +1580670 +1212748 Hoffer, Melissa; Serassio, Helen; +1580916 (5); Polk, Jonna; +1303717 +1405780 McGuire, James; Nishida, Jane; +120245 Katims, Casey; Gray, David; Garbow, Avi; +1918540 Berrios, Lisa; Application 556b15e7-452c-4773-b728-6313eaa47b77; Alvarado, Tina; Application 207a6836-d031-4764-a9d8-c1193f455f21; +1405508 Michael Freeman; teamsvisitor:b7466561f4f846419341555ad4574ec5; teamsvisitor:9a87e186b3284cb998b95239a3dc144b; klaughlin@estoo.net; tbaker@choctawnation.com; Kara Berst; Rumela Roy; teamsvisitor:15ec9521cb3741f896dad7eaa9e70f0d; Chaudhuri, Jonodev O. (WDC x5635); teamsvisitor:28f371629215425dbb4f1c4a2b8f0f3b; Siegal, Tod; DCRoomWJCN3000A/Administrator; teamsvisitor:392cc5914aac40a6a6a2324a92d24a79

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End Time (UTC): 4/8/2021 2:54:54 PM
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Appointment

From: Fox, Radhika [Fox.Radhika@epa.gov]
Sent: 5/7/2021 8:30:11 PM
To: Fox, Radhika [Fox.Radhika@epa.gov]; Pinkham, Jaime A SES USARMY HQDA ASA CW (USA) [jaime.a.pinkham.civ@mail.mil]; McKalip, Doug - APHIS [douglas.mckalip@usda.gov]; Goodin, John [Goodin.John@epa.gov]; Eisenberg, Mindy [Eisenberg.Mindy@epa.gov]; Stacey Jensen [stacey.m.jensen.civ@mail.mil]; Gloria.Montano@usda.gov; dwinters@fisheries.org; gbelan@americanrivers.org; tillston@americanrivers.org; gale@backcountryhunters.org; BHartl@biologicaldiversity.org; agrinberg@cleanwater.org; emeyers@conservationfund.org; jgonzalez@earthjustice.org; jrumpler@environmentamerica.org; amesnikoff@elpc.org; Jared Mott [jmott@iwla.org]; madeleine_foote@lcv.org; clord@npca.org; murphyj@nwf.org; ritterj@nwf.org; watkinsg@nwf.org; Jon Devine [jdevine@nrdc.org]; dalal.aboulhosn@sierraclub.org; Kelly Moser [kmoser@selcnc.org]; jsigaran@selcdc.org; james.hague@tnc.org; mkassen@trcp.org; steve.moyer@tu.org; kfoster@waterkeeper.org; jpeters@cleanwater.org; skuwayama@lcv.org; Chaudhary, Dimple [Chaudhary.Dimple@epa.gov]
CC: Sabater, Juan [Sabater.Juan@epa.gov]; Aguirre, Janita [Aguirre.Janita@epa.gov]; Tiago, Joseph [Tiago.Joseph@epa.gov]; Kaiser, Russell [Kaiser.Russell@epa.gov]; Christensen, Damaris [Christensen.Damaris@epa.gov]; Best-Wong, Benita [Best-Wong.Benita@epa.gov]; John Rumpler [john.rumpler@publicinterestnetwork.org]; Beck, Whitney [beck.whitney@epa.gov]

Subject: Quarterly Environmental and Conservation Leaders Stakeholder Meeting with Office of Water
Attachments: Enviro + Conservation Stakeholder Mtg Agenda_05192021.docx
Location: ZoomGov Meeting

Start: 5/19/2021 4:30:00 PM
End: 5/19/2021 5:45:00 PM
Show Time As: Busy

Required Attendees: Fox, Radhika; Pinkham, Jaime A SES USARMY HQDA ASA CW (USA); McKalip, Doug - APHIS; John Goodin (Goodin.John@epa.gov); Eisenberg, Mindy; Jensen, Stacey M CIV USARMY HQDA ASA CW (USA); Gloria.Montano@usda.gov; dwinters@fisheries.org; gbelan@americanrivers.org; tillston@americanrivers.org; gale@backcountryhunters.org; BHartl@biologicaldiversity.org; agrinberg@cleanwater.org; emeyers@conservationfund.org; jgonzalez@earthjustice.org; jrumpler@environmentamerica.org; amesnikoff@elpc.org; Jared Mott; madeleine_foote@lcv.org; clord@npca.org; murphyj@nwf.org; ritterj@nwf.org; watkinsg@nwf.org; jdevine@nrdc.org; dalal.aboulhosn@sierraclub.org; Kelly Moser; jsigaran@selcdc.org; james.hague@tnc.org; mkassen@trcp.org; steve.moyer@tu.org; kfoster@waterkeeper.org; jpeters@cleanwater.org; skuwayama@lcv.org; Chaudhary, Dimple
Optional Attendees: Sabater, Juan; Aguirre, Janita; Tiago, Joseph; Kaiser, Russell; Christensen, Damaris; Benita Best-Wong; John Rumpler; Beck, Whitney

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EPA Office of Water Attendees

- **Radhika Fox,** Principal Deputy Assistant Administrator
- **Benita Best-Wong,** Deputy Assistant Administrator
- **Janita Aguirre,** Chief of Staff
- **John Goodin,** Director, Office of Oceans, Wetlands, and Watersheds
- **Damaris Christensen,** Environmental Protection Specialist, Office of Oceans, Wetlands, and Watersheds
- **Mindy Eisenberg,** Associate Director, Oceans, Wetlands, and Communities Division
- **Russell Kaiser,** Acting Branch Chief of Program Development & Jurisdiction, Office of Oceans, Wetlands, and Watersheds
- **Juan Sabater,** Special Assistant

Federal Partner Attendees

- **Jaime A. Pinkham,** Acting Assistant Secretary of the Army for Civil Works
- **Stacey Jensen,** Assistant for Regulatory and Tribal Affairs, Office of the Assistant Secretary of the Army (Civil Works)
- **Gloria Montaño Greene**, Deputy Under Secretary for Farm Production and Conservation, USDA
- **Doug McKalip**, Senior Advisor to the Secretary, USDA

Stakeholders Attendees

- **Dalal Aboulhosn,** Sierra Club
- **Gary Belan,** American Rivers
- **Jon Devine,** Natural Resources Defense Council
- **Madeleine Foote,** League of Conservation Voters
- **John Gale,** Backcountry Hunters & Anglers
- **Julian Gonzalez,** Earth Justice
- **Andrew Grinberg,** Clean Water Action
- **Jimmy Hague,** The Nature Conservancy
- **Brett Hartl,** Center for Biological Diversity
- **Kelly Hunter Foster,** Waterkeepers Alliance
- **Ted Illiston,** American Rivers
- **Melinda Kassen,** Theodore Roosevelt Conservation Partnership
- **Chad Lord,** National Parks Conservation Association
- **Ann Mesnikoff,** Environmental Law and Policy Center
- **Erik Meyers,** Conservation Fund
- **Kelly Moser,** Southern Environmental Law Center
- **Jared Mott,** Izaak Walton League
- **Steve Moyer,** Trout Unlimited
- **Jim Murphy,** National Wildlife Federation
- **Jessie Ritter,** National Wildlife Federation

- **John Rumpler,** Environment America
- **Jamie Sigaran,** Southern Environmental Law Center
- **Glenn Watkins,** National Wildlife Federation
- **Drue Winters,** American Fisheries Society

Appointment

From: Goffman, Joseph [Goffman.Joseph@epa.gov]
Sent: 8/4/2021 8:16:03 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]; Branning, Amy [Branning.Amy@epa.gov]; Hogan, Stephanie [Hogan.Stephanie@epa.gov]; Mills, Derek [Mills.Derek@epa.gov]; Marks, Matthew [marks.matthew@epa.gov]; Srinivasan, Gautam [Srinivasan.Gautam@epa.gov]; Heather Gange [heather.gange@usdoj.gov]; morgan.costello@ag.ny.gov; michael.myers@ag.ny.gov; christopher.gore@ag.ny.gov; turner.smith@state.ma.us; Herzog, Megan (AGO) [megan.herzog@state.ma.us]; timothy.sullivan@dog.ca.gov; daniel.lucas@doj.ca.gov; caitlan.mcloon@doj.ca.gov; matt@donahuegoldberg.com; pzalzal@edf.org; Kim, Eunjung [Kim.Eun@epa.gov]; Culligan, Kevin [culligan.kevin@epa.gov]

Subject: Settlement of Oil and Gas 111(b) Unreasonable Delay Suit Plaintiffs
Attachments: 2021 External meeting requests Goffman OG Methane Settlement sent.docx
Location: Microsoft Teams Meeting

Start: 8/6/2021 7:00:00 PM
End: 8/6/2021 7:30:00 PM
Show Time As: Busy

Required Attendees: Branning, Amy; Hogan, Stephanie; Mills, Derek; Marks, Matthew; Srinivasan, Gautam; heather.gange@usdoj.gov; morgan.costello@ag.ny.gov; michael.myers@ag.ny.gov; christopher.gore@ag.ny.gov; turner.smith@state.ma.us; Herzog, Megan (AGO); timothy.sullivan@dog.ca.gov; daniel.lucas@doj.ca.gov; caitlan.mcloon@doj.ca.gov; matt@donahuegoldberg.com; pzalzal@edf.org; Kim, Eunjung; Culligan, Kevin

2021 External meeting requests...

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Ex. 6 Personal Privacy (PP)

Message

From: Carrie Apfel [capfel@earthjustice.org]
Sent: 7/19/2021 4:52:15 PM
To: Carbonell, Tomas [Carbonell.Tomas@epa.gov]
CC: plehner@earthjustice.org
Subject: Aggregate Compliance petition -- time to talk?
Attachments: [Amended] Aggregate Compliance Petition 1 18 19 FINAL.pdf

Flag: Follow up

Hi Tomas,
I hope this message finds you well and you are adjusting to the new (or not-so-new anymore) job!

I wanted to reach out to see whether we might be able to schedule at time to meet with you and/or others in your office to talk about our pending petition on the Renewable Fuel Standard's Aggregate Compliance approach to determining whether renewable biomass qualifies for use as renewable fuel (attached). In this petition, we asked EPA to eliminate use of the aggregate compliance approach to satisfy the land-use restrictions in the statute, and instead require individual compliance and proof that the land used to grow renewable biomass complies with the statutory requirements.

We originally filed the petition with your office on October 30, 2018, and then amended on January 18, 2019. We have not heard anything about the petition since that time. Given the passage of time since we filed, I thought it might make sense to try to meet with the relevant folks in your office to see if we can get some movement on this.
Please let me know whether your office is amenable to this, and if so, what timeframe might work. And if you're not the right person to reach out to, I'm happy to reach out to whoever you might suggest instead.
Thanks so much,
Carrie

AMENDED PETITION
TO THE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

TO AMEND ITS "AGGREGATE COMPLIANCE" APPROACH TO THE DEFINITION OF "RENEWABLE BIOMASS" UNDER THE RENEWABLE FUEL STANDARD IN ORDER TO PREVENT THE CONVERSION OF NATIVE GRASSLAND

SUBMITTED BY
EARTHJUSTICE AND CLEAN AIR TASK FORCE

ON BEHALF OF:

NATIONAL WILDLIFE FEDERATION
ACTIONAID USA
AMERICAN BIRD CONSERVANCY
ASSOCIATION OF NORTHWEST STEELHEADERS
CONSERVATION NORTHWEST
ENVIRONMENTAL WORKING GROUP
HEALTHY GULF (AKA GULF RESTORATION NETWORK)
HOOSIER ENVIRONMENTAL COUNCIL
ILLINOIS STEWARDSHIP ALLIANCE
MIGHTY EARTH
NATIONAL AUDUBON SOCIETY
POLLINATOR STEWARDSHIP COUNCIL
SIERRA CLUB
UNION OF CONCERNED SCIENTISTS
WILD IDEA BUFFALO

DATE: January 18, 2019

Via mail and e-mail

January 18, 2019

Acting Administrator Andrew Wheeler
& Office of the Science Advisor
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460

RE: Petition of National Wildlife Federation et al. to Amend EPA's "Aggregate Compliance" Approach to the Definition of "Renewable Biomass" Under the Renewable Fuel Standard Program in Order to Prevent Conversion of Native Grassland, 75 Fed. Reg. 14,670, March 26, 2010.

Dear Mr. Wheeler:

Earthjustice and Clean Air Task Force, on behalf of National Wildlife Federation, ActionAid USA, American Bird Conservancy, Association of Northwest Steelheaders, Conservation Northwest, Environmental Working Group, Healthy Gulf (aka Gulf Restoration Network), Hoosier Environmental Council, Illinois Stewardship Alliance, Mighty Earth, National Audubon Society, Pollinator Stewardship Alliance, Sierra Club, Union of Concerned Scientists, and Wild Idea Buffalo Co. (collectively, "Petitioners"), respectfully request that the Environmental Protection Agency ("EPA") amend its regulations regarding what land can permissibly be used to produce renewable biomass under the Energy Independence and Security Act ("EISA")'s Renewable Fuel Standard ("RFS"). Specifically, Petitioners request that EPA modify its RFS rule as follows:

First, EPA should eliminate aggregate compliance as a permissible approach to satisfying EISA's land-use restrictions. Instead, in order to comply with EISA, EPA should require biofuel producers to demonstrate ***individualized compliance*** with EISA's land-use restrictions by showing that each source of crop-based biomass used to meet the renewable fuel standard is

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grown on EISA-compliant land, i.e., land that was cleared or cultivated prior to 2007, and that was actively managed or fallow and nonforested in 2007.

Second, to further protect against the harms from land conversion resulting from increased corn and soy production, EPA should further require proof that only EISA-compliant land is used to grow crops displaced by renewable biomass production. Only by doing so can EPA ensure that production of renewable biomass on land that complies with EISA's land-use restrictions does not lead to indirect conversion whereby crops displaced by corn and soy are grown on non-EISA-compliant land.

This petition amends the October 30, 2018, petition submitted by a subset of these petitioners.

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Appendix A: State-level conversion of land uncultivated since the 1970's and overall non-cropland to cropland from 2008 to 2012
Exhibit 1: Native Sod Spreadsheet, Farm Services Agency, 2018
Exhibit 2: Declaration of Dr. Tyler Lark, Addendum to [Corrected] Environmental Petitioners' [Initial] Opening Brief, *Sierra Club and Gulf Restoration Network v. EPA*, No. 17-1258 (D.C. Cir. Aug. 2, 2018)

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SUMMARY

Under EISA, Congress sought to address – among other things – the growing threat of climate change by requiring transportation fuel to contain an increased volume of renewable biomass while at the same time restricting the type of land that could be used to produce the renewable fuel sources. These requirements were premised on the idea that burning renewable biomass releases far less net carbon into the atmosphere than burning fossil fuels. This is because growing biomass pulls carbon dioxide out of the atmosphere, while producing crops on previously cleared or cultivated lands avoids the oxygenation of carbon-rich soil – and thus the emission of carbon dioxide – that occurs when new land is cultivated. The overall objective was to reduce greenhouse gas emissions released into the environment, which itself would both lead to and accompany other environmental benefits as well as the protection of wildlife habitat and water quality.

To accomplish these goals, EISA defined the type of land that can be used for the production of renewable biomass as follows: "agricultural land cleared or cultivated at any time prior to the enactment of this sentence that is either actively managed or fallow, and nonforested."[1] Thus, Congress built into the statute fundamental protections against converting land not cultivated or in production in 2007 for the purpose of producing renewable biomass, ensuring that growing renewable fuel sources would not cause the release of harmful greenhouse gases into the atmosphere and undercut the very benefits the program sought to achieve.

Despite these important goals, EPA devised a regulatory scheme – aggregate compliance – that entirely undermines what Congress set out to accomplish under EISA. Under this approach, EPA turns a blind eye to whether crops used as renewable fuel sources are grown on

[1] EISA, Pub. L. No. 110-140, § 201(1)(I)(i), 121 Stat. 1492 (2007).

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previously cultivated land, despite the EISA mandate. Instead, EPA looks only at whether the ***aggregate*** amount of land in cultivation at any given time remains at or below the 2007 level. This scheme is inconsistent with the ***individual compliance*** approach that EPA initially proposed, an approach that would have restricted all land used to grow renewable biomass to land cleared or cultivated prior to the passage of EISA, ***as required by the statute***. In adopting this scheme, EPA ignored countless comments that emphasized the need for individual compliance and recordkeeping to protect against land conversion and the consequent harms to ecological systems and wildlife.

Rather than protecting climate and the environment by restricting land use, aggregate compliance permits conversion of land not cultivated or actively farmed in 2007. It ignores the reality that land use in the United States is not static and that agricultural land is frequently converted to other uses so that remaining below a cap does not at all indicate that grasslands, forests, or other previously uncultivated land has not been converted to agriculture. Indeed, numerous studies – including by EPA itself – indicate that even though the amount of land in cultivation since EISA's passage may have remained below the 2007 aggregate level, ***millions of acres of native land have been converted to cropland to grow corn for ethanol*** during this time, in contravention of both the text and purposes of EISA. Specifically, in a recent report, EPA concluded that since the passage of EISA, ***actively managed cropland has increased by roughly 4 - 7.8 million acres***, and that production of biofuels – corn for ethanol and soy for biodiesel – is responsible for much of this land conversion.[2] During this same time, ***corn acreage has gone up***

[2] EPA, *Biofuels and the Environment: Second Triennial Report to Congress* 44 (2018), https://cfpub.epa.gov/si/si_public_file_download.cfm?p_download_id=536328&Lab=IO ("EPA Triennial Report 2018").

by approximately 10 million acres, while acreage of soy has increased by between 7 and 13 million acres.[3]

Conversion of previously uncultivated grassland and forestland affects the climate and harms the environment by releasing tremendous amounts of greenhouse gases into the atmosphere. The process by which it does so is a matter of basic biology. Healthy soil contains large quantities of carbon. When land is cultivated, the carbon stored in the soil is exposed to oxygen, which then converts the organic carbon into carbon dioxide (CO_2). The CO_2 – a harmful greenhouse gas – is then released into the atmosphere, depleting the soil of the carbon that previously enriched it and polluting the air in the process.

Land conversion also requires clearing of vegetation to prepare the grassland for arable cropland use. This results in the burning or decomposition of existing vegetation, both of which emit CO_2 into the atmosphere. At the same time, elimination of grassland ecosystems modifies or destroys wildlife habitats for pollinators, birds, and other species. This includes crucial habitats for federally listed endangered and threatened species.

Also problematic, newly cultivated land requires greater fertilization. Fertilizers – especially those used for corn production – usually contain nitrogen. Excess nitrogen not absorbed by crops may be converted by bacteria in the soil into nitrous oxide (N_2O) gas, a very potent greenhouse gas, that rises to the atmosphere and harms air quality. Additionally, unabsorbed fertilizer compounds may runoff into surface water or leach into groundwater, causing significant harm to the water supply, the soil, and wildlife, including federally listed species.

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[3] *Id.* at 10-11.

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By abrogating its legal obligation to ensure that each fuel producer complies with EISA's land-use restrictions, EPA has allowed ***millions of acres of land not in cultivation or production in 2007 – between 4-7.8 million acres by EPA's own estimate[4] – to be converted to cropland***. This has had drastic environmental consequences. Specifically, the aggregate compliance approach has led to:

- The emission of at least 87 - 280 million tons of greenhouse gases into the atmosphere, equivalent to the annual emissions of 20-70 coal fired power plants;
- Increased use of a quarter billion to a billion pounds of nitrogen fertilizer, of which on average 25-35% runs off, impairing water quality;
- The need for perhaps 85 billion gallons of additional irrigation water, further straining already-depleting water supplies;
- Destruction and degradation of wildlife diversity and habitat, especially for waterfowl and aquatic life;
- Loss of agricultural bioservices worth at least many tens of millions of dollars and harm to the agricultural economy;
- Damage to and erosion of land that is marginal for agriculture and yet especially ecologically sensitive, such as wetlands and stream buffers; and
- Soil deterioration through loss of over 50% of original root mass and many soil nutrients after conversion.

Aggregate compliance thus unravels the critical climate and environmental protections that form the very fabric of EISA.

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[4] *Id.* at 37.

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Not only does the aggregate compliance approach harm both the climate and the environment, but it is also unlawful. It is contrary to the text and antithetical to the purposes of EISA in three primary ways:

- ***First***, this scheme violates the ***text*** of the statute by allowing for the conversion of land that was not in cultivation in 2007 for the production of renewable biomass, despite EISA's clear and unambiguous restriction on such land conversion.
- ***Second***, the scheme violates the ***climate purposes*** of the statute by leading to the release of tremendous volumes of greenhouse gases – volumes that far exceed and thus undermine any climate and environmental benefits achieved by meeting the renewable fuel standards.
- ***Third***, the conversion of land for renewable biomass production leads to water pollution, air pollution, loss of biodiversity, and other environmental harms, undermining EISA's fundamental ***environmental objectives***.

EPA should not use this approach to determine compliance with EISA's land-use mandates, but rather should require individualized determinations to ensure that the production of biomass used for renewable fuel does not lead to the use of land that was uncultivated in 2007.

Just as land conversion for the production of renewable biomass contravenes EISA's text and fundamental climate and environmental objectives, so too does indirect conversion resulting from the cultivation of crops displaced by the production of renewable biomass. This indirect conversion causes the very climate and environmental harms that EISA was designed to prevent. Though not contrary to a specific provision of the statutory text, this indirect conversion of land is antithetical to the purposes of the statute.

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EPA's authority to issue the RFS is not unlimited, but rather is rooted in EISA. *See, e.g., Lyng v. Payne*, 476 U.S. 926, 937 (1986) ("an agency's power is no greater than that delegated to it by Congress."). Accordingly, the RFS must be consistent with EISA's text and purpose, and cannot be arbitrary, capricious, an abuse of discretion, or otherwise not in compliance with EISA. *See* Administrative Procedure Act § 1, 5 U.S.C. § 706(2)(A); *see also Massachusetts v. EPA*, 549 U.S. 497, 534 (2007) ("EPA must ground its reasons for action or inaction in the statute," and failure to do so is "arbitrary, capricious, . . . or otherwise not in accordance with law" (internal citation omitted)). The aggregate compliance approach in the RFS is contrary to the text of the statute and undermines the climate and environmental goals. It is therefore arbitrary and capricious and not in compliance with EISA. As a result, EPA should grant this petition and modify the RFS to bring it in line with the governing law.

PARTIES

The National Wildlife Federation is America's largest conservation organization, made up of 51 state and territorial affiliates and representing more than 6 million members and supporters. The National Wildlife Federation's mission is to unite all Americans to ensure wildlife thrive in a rapidly changing world.

ActionAid USA stands in solidarity with people living in poverty and exclusion in 45 countries around the world. These are the people who know what is needed to change lives within their own communities and have the power to mobilize and inspire others. ActionAid supports communities around the world to challenge government policies and power imbalances that negatively affect their daily lives. When these communities claim their rights, including women's rights, the right to food, rights to natural resources, and the right to a sustainable livelihood, they help bring about lasting change locally and globally. As one of their areas of

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focus, ActionAid supports communities that are trying to cope with the disastrous effects of climate change and they are challenging world leaders to do something about it.

American Bird Conservancy is a not-for-profit membership organization whose mission is to conserve native birds and their habitats throughout the Americas. American Bird Conservancy acts by safeguarding the rarest species and preventing extinctions, conserving and restoring habitats, and reducing threats, while building capacity in the bird conservation movement.

Association of Northwest Steelheaders was founded in 1960 as an organization of anglers dedicated to enforcing and protecting fisheries and their habitats for today and tomorrow. Its vision is responsible and enjoyable sport angling with good access to healthy, abundant and sustainable fisheries in Northwest's healthy watersheds.

Conservation Northwest protects, connects and restores wildlands and wildlife from the Washington Coast to the British Columbia Rockies. Founded in Bellingham in 1989, the organization represents 4,000 members and engages more than ten thousand activists, supporters and online followers.

The Environmental Working Group's mission is to empower people to live healthier lives in a healthier environment. With breakthrough research and education, we drive consumer choice and civic action.

Plaintiff Healthy Gulf (aka Gulf Restoration Network) is a network of environmental, social justice, and citizens' groups and individuals whose purpose is protect and restore the natural resources of the Gulf of Mexico for future generations. Healthy Gulf's members live in the five Gulf states of Louisiana, Texas, Mississippi, Alabama, and Florida, and nationwide. Healthy Gulf has for 25 years been engaged in efforts to reduce pollution flowing

into the Gulf. Specifically it has long engaged in efforts to reduce the impact of nutrient pollution from agriculture that causes the Dead Zone (hypoxia) to form in the Gulf each year.

Founded thirty-five years ago, the Hoosier Environmental Council ("HEC") is the largest statewide environmental policy organization in Indiana. HEC aims to set a new path for Indiana, embracing practices and policies that dramatically reduce the footprint of transportation, industry, commerce, and agriculture on the environment.

Illinois Stewardship Alliance is a statewide nonprofit membership organization founded in 1974 and based in Springfield, Illinois. Its mission is to cultivate a local food and farm system that is economically viable, socially just and environmentally sustainable. The Alliance provides programs that drive consumer demand for local food; provide training and technical assistance for stewards of the land on soil health practices; and engage its members in policy to transform how we feed ourselves, how our land is cared for, and by whom.

Mighty Earth is a global environmental campaign that works to protect forests, conserve oceans, and address climate change. Mighty Earth works in Southeast Asia, Latin America, Africa, and North America to drive large-scale action towards environmentally responsible agriculture that protects native ecosystems, wildlife, and water, and respects local community rights.

Founded in 1905, National Audubon Society is a non-profit organization that protects birds and the places they need throughout the Americas using science, advocacy, education, and on-the-ground conservation. Audubon has 22 state offices, 41 nature centers and sanctuaries and over 450 local chapters and 1.4 million members. Working across all landscapes urban and rural, coasts, water and working lands, Audubon collaborates with landowners and managers,

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government agencies and private industry across the hemisphere to increase the quality of habitat on privately owned lands.

The Pollinator Stewardship Council's mission is to defend managed and native pollinators vital to a sustainable and affordable food supply from the adverse impact of pesticides. The Pollinator Stewardship Council works to: affect regulatory processes of pesticide risk assessment, label, and enforcement; provide advocacy, guidance and tools to document the detrimental effect of pesticides on pollinators; and raise awareness about the adverse impact of pesticides on pollinators critical to the supply of food and the ecosystem.

The Sierra Club is an organization that believes in the power of people working together to make change happen. As the largest and most influential grassroots environmental organization in the U.S., for more than 126 years, Sierra Club has helped shape the way people can participate in local, state, and national advocacy work, so that they can better protect the planet – and each other. Its over 3.5 million members and supporters have helped in advancing climate solutions, acting for justice, getting people outdoors, and protecting lands, air, water, and wildlife. Sierra Club still has a lot more change to make, because so much more is possible. Sierra Club works alongside other local and national groups because together, they are more powerful.

The Union of Concerned Scientists puts rigorous, independent science to work to solve our planet's most pressing problems. Joining with people across the country, it combines technical analysis and effective advocacy to create innovative, practical solutions for a healthy, safe, and sustainable future.

Wild Idea Buffalo Company is dedicated to preserving and restoring the Great Plains grasslands ecosystem by returning buffalo back to their native homeland. The organization was

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founded to pursue this mission and to offer an alternative to the industrialized food system. By returning bison to their native homeland, Wild Idea Buffalo is not only re-wilding a threatened ecosystem, but it is also keeping prairies intact, with carbon stored safely underground, while also producing the healthiest red meat on the planet.

I. LAND CONVERSION FOR CORN AND SOY PRODUCTION HAS INCREASED AND HAS HARMED THE CLIMATE AND THE ENVIRONMENT.

In the decade following the passage of EISA, there has been a measurable increase in the amount of land cultivated for corn and soy in the United States. Indeed, according to EPA, actively managed cropland resulting from both intensification and extensification has increased by between ***4 and 7.8 million acres*** during this time.[5] There are approximately ***10 million acres more of planted corn now than before EISA's enactment***: between 2000-2007, there were "roughly 80 million acres" while between 2007-2016, there were "roughly 90 million acres."[6] Soy cultivation also increased during this time, from 70-75 million planted acres between 2000-2007 to roughly 82-83 million acres between 2014-2016.[7] This increase in acreage reveals that the dramatic rise in corn and soy production cannot be explained by yield intensification alone, but rather has resulted in the cultivation to cropland of millions of acres of land that was not in cultivation in December 2007. Thus, despite EISA's aspirational goals of ameliorating the harms of global warming and its promises of a plethora of environmental protections, since the statute's implementation, the amount of land uncultivated as of December 2007 that has been converted to cropland to meet the renewable fuel standard has skyrocketed. This has led to a number of far-reaching and deleterious environmental consequences.

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[5] EPA Triennial Report 2018 at 37.
[6] *Id.* at 10.
[7] *Id.*

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Much of the increase in land conversion and the environmental impacts result from EPA's aggregate compliance approach to renewable biomass production. This approach allows the production of renewable biomass on ***whatever land is available*** – whether or not the land was in cultivation at the time of EISA's passage – as long as the cumulative amount of land in cultivation remains at or below the level as of December 2007.

A. Millions of Acres of Land Have Been Converted to Cropland Over the Last Ten Years.

Since the passage of EISA in 2007, millions of acres of uncultivated land have been converted to cropland despite the clear restrictions on land use contained in the statute.[8] Studies of satellite maps reveal that between 2008 and 2012 there was a gross increase of 7.34 million acres of cropland.[9] ***Over 75% of the new cropland (5.7 million acres) was converted from native grasslands, including at least 1.6 million acres of prairie that had remained untouched since the 1970's.***[10] *See infra* Figure 1. During this same time period, corn was grown as the first crop on at least 1.94 million acres (26%) of the newly converted cropland, and soy was first grown on approximately 1.48 million acres (20%) of the newly converted cropland.[11] More recent studies suggest that this expansion has continued.

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[8] Tyler J. Lark, J. Meghan Salmon & Holly K. Gibbs, *Cropland expansion outpaces agricultural and biofuel policies in the United States*, 10 Envtl. Res. Letters 1 (2015), http://iopscience.iop.org/article/10.1088/1748-9326/10/4/044003/pdf; Christopher K. Wright & Michael C. Wemberly, *Recent land use change in the Western Corn Belt threatens grasslands and wetlands*, 110 Proc. Nat'l Acad. Sci. 4134 (2013), http://www.pnas.org/content/pnas/110/10/4134.full.pdf; *see also* EPA Triennial Report 2018 at 111.
[9] Lark et al., *supra* note 8, at 5.
[10] *Id.*
[11] *Id.* at 6.

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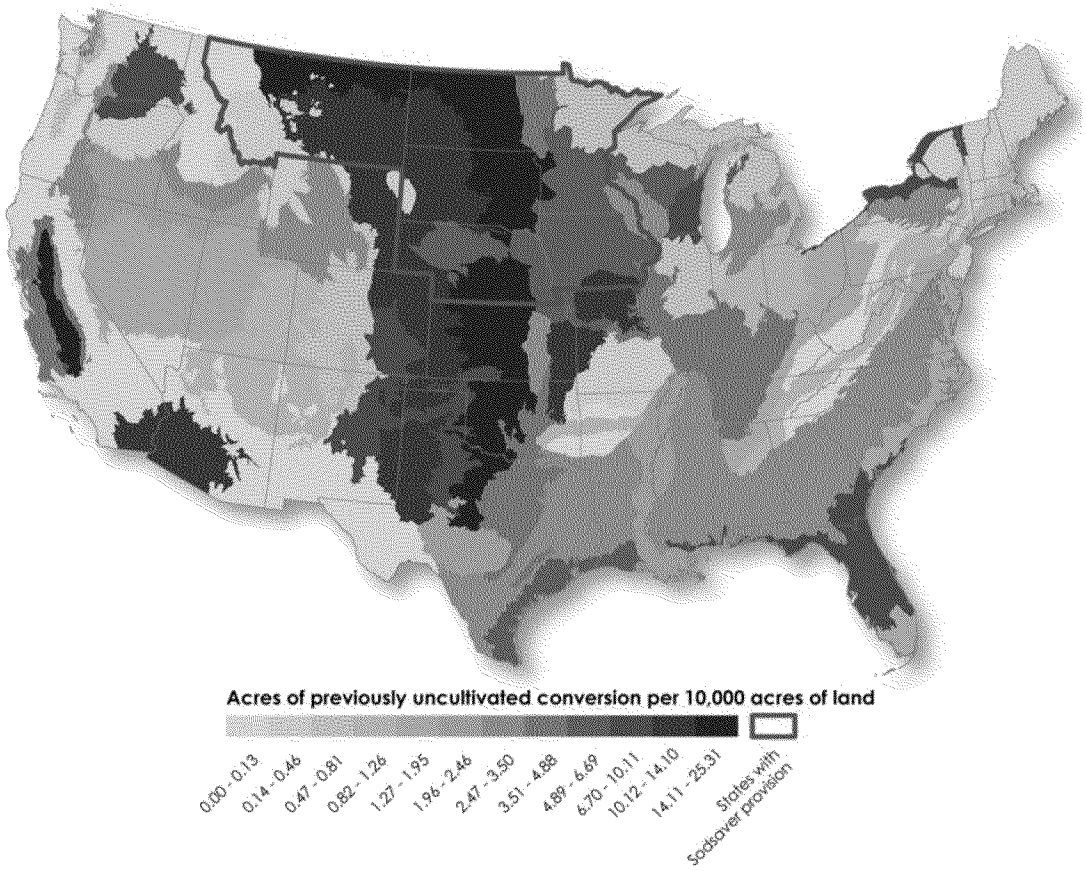

Figure 1. Conversion of uncultivated land as of December 2007 (confirmed back to the early 1970's) to cropland between 2008 and 2012. Display units represent average number of previously uncultivated acres converted per 10,000 acres of total land within each EPA Level III Ecoregion. *See* Lark et al., *supra* note 8, at 6 fig. 4.

EISA's requirement that industry increase its annual volume of renewable fuel has been a significant driver for observed conversions. EPA reports that "[f]rom 2007-2016 corn production ranged from a low of 10.8 billion bushels in 2012 to a high of 15.1 billion bushels in 2016," while during this same period, "soybean production ranged from a low of 2.7 billion bushels in 2007 to a high of 4.3 billion bushels in 2016."[12] Following EISA's passage, the ***acreage for planted corn increased by 10 million acres***, growing from roughly 80 million acres between 2000-2007 to roughly 90 million acres between 2007-2016, while the acreage for soy likewise saw a dramatic increase, from 70-75 million acres from 2000-2007 to roughly 82-83

[12] EPA Triennial Report 2018 at 11.

million acres between 2014-2016.[13] Corn grown for ethanol feedstock now comprises 40% of total corn production, as compared to only 23% in 2007.[14] And it has increased not just as a percentage of corn grown, but also in amount: "Corn used for ethanol production has increased since [the] enactment of EISA," increasing to "a high of 5.21 billion bushels of corn in 2016."[15] The number of corn ethanol refineries multiplied four-fold, from 49 plants in 2002 to 194 plants in 2012,[16] to 198 as of January 1, 2017.[17] Between 2008 and 2012, 2.7 million acres of arable grassland within 50 miles of a refinery were converted to corn production.[18] In fact, 77% of the nation's total corn cropland area was located within 50 miles of an ethanol refinery during this time.[19] Soybean production for biodiesel reveals a similar trend – in 2009, only 9% of soybean oil produced in the U.S. was used for biodiesel, compared to the 31% used for biodiesel in

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[13] *Id.* at 10.

[14] *Feed Grains Database,* U.S. Dep't of Agric. Econ. Res. Serv., https://www.ers.usda.gov/data-products/feed-grains-database/ (last updated Sept. 13, 2018) (figures drawn from running a query after selecting "corn" in "group" query field, then "alcohol for fuel use" in "data attribute" query field, then "annual" in "frequency" query field, then "all years" in "year" query field).

[15] EPA Triennial Report 2018 at 11.

[16] U.S. Energy Info. Admin., *U.S. Fuel Ethanol Plant Production Capacity Archives*, (May 30, 2012), https://www.eia.gov/petroleum/ethanolcapacity/archive/2012/index.php [https://perma.cc/74XL-6W83]; Yehushua Shay Fatal & Walter N. Thurman, *The Response of Corn Acreage to Ethanol Plant Siting*, 46 J. Agric. & Applied Econ. 157 (2014), https://ageconsearch.umn.edu/bitstream/168993/2/jaae575.pdf; Mesbah Motamed et al., *Corn Area Response to Local Ethanol Markets in the United States: A Grid Cell Level Analysis*, 98 Am. J. Agric. Econ., 726, 726-743 (2016), https://academic.oup.com/ajae/article/98/3/726/2195670.

[17] U.S. Energy Info. Admin., *U.S. Fuel Ethanol Plant Production Capacity Archives*, (July 30, 2018), https://www.eia.gov/petroleum/ethanolcapacity/archive/2017/index.php [https://perma.cc/NXY4-4VRT]

[18] Christopher K. Wright, Ben Larson, Tyler J. Lark & Holly K. Gibbs, *Recent Grassland Losses Are Concentrated Around US Ethanol Refineries*, 12 Envtl Res. Letters 044001, 5 (2017), http://iopscience.iop.org/article/10.1088/1748-9326/aa6446/pdf.

[19] Forty-nine percent of corn crop (by area) in 2008 was located less than 25 miles from a refinery, and 28% at 25-50 miles. *Id.* at 2.

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2018.[20] Today, biodiesel is produced in 93 plants across the country.[21] Higher rates of conversion from grassland to potential feedstock cropland near refinery plants suggest that biofuel production is directly driving the observed land conversion.[22]

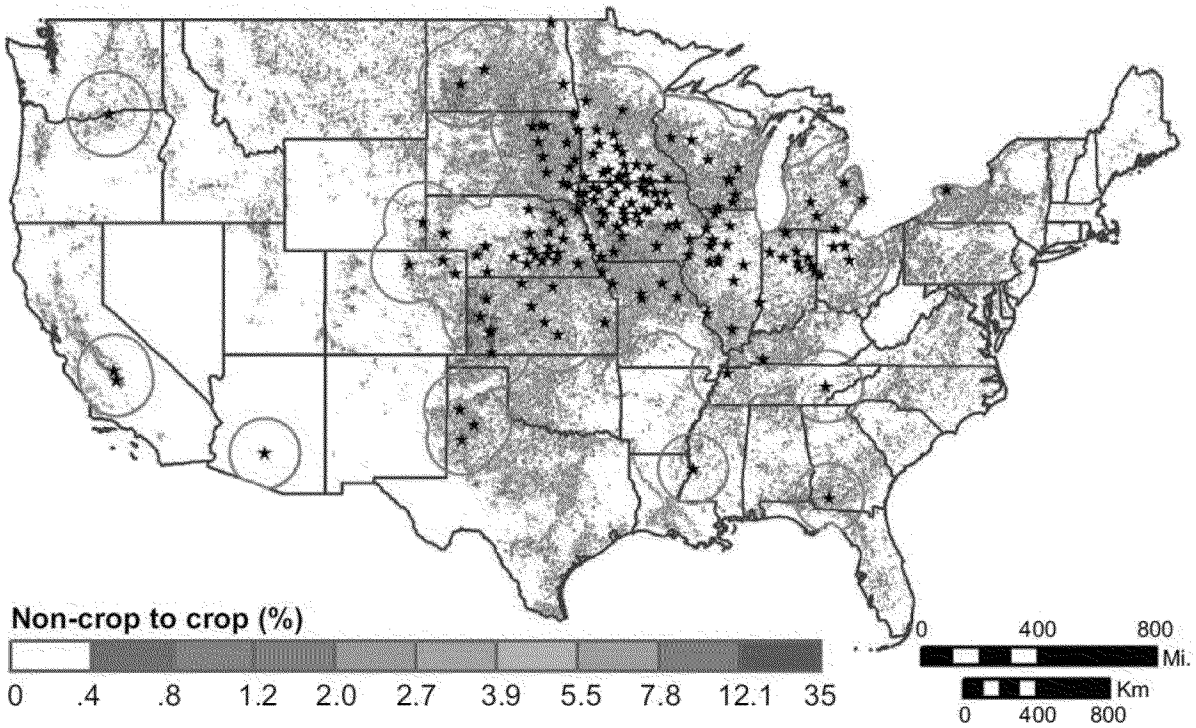

Figure 2. Relative conversion rates of non-cropland to cropland between 2008 and 2012. Stars indicate locations of active ethanol refineries; purple outline represents a 100-mile radius from the refineries. *See* Wright et al., *supra* note 18, at 8 fig.6.

A close look at the five states of the Western Corn Belt (North Dakota, South Dakota, Nebraska, Minnesota, and Iowa) highlights these land conversion trends. In this region, nearly two million acres of grassland were converted for corn and soybean cultivation between 2006

[20] *U.S. Bioenergy Statistics*, *Table 6. Soybean oil supply, disappearance, and share of biodiesel use*, U.S. Dep't of Agric. Econ. Res. Serv., https://www.ers.usda.gov/data-products/us-bioenergy-statistics/ (last updated Sept. 7, 2018).

[21] The number of biodiesel plants does not disaggregate feedstock source; some plants may produce biodiesel using other feedstocks such as canola oil, yellow grease, etc. U.S. Energy Info. Admin. Indep. Stat. & Analysis, *Monthly Biodiesel Production Report with data for June* (2018), https://www.eia.gov/biofuels/biodiesel/production/biodiesel.pdf.

[22] Motamed et al., *supra* note 16; Wright et al., *supra* note 8; *see supra* Figure 2.

and 2011.[23] The most intensive loss of grassland happened in the Prairie Pothole Region ("PPR") of North and South Dakota, which is a critical hotspot for wildlife biodiversity.[24] In Minnesota, the average annual rate of conversion between 2008 and 2012 was four times greater than the rates in the previous 15 years.[25] More than 80% of this conversion to cropland occurred in prairie areas designated by the Minnesota Prairie Plan Working Group (2011) as conservation priority zones.[26] Meanwhile, between 2008 and 2012, national land enrollment in the Conservation Reserve Program – which plays a critical role in prairie conservation – steadily declined by over five million acres, and resulted in up to three million acres of new croplands.[27] Recent United States Department of Agriculture ("USDA") Farm Service Agency data shows that loss of native prairie to crop expansion continues to this day in the Western Corn Belt states. Nearly 480,000 acres were tilled for crop production between 2014 and 2018.[28] For a state-by-state table of acres of land converted since EISA's passage, *see* Appendix A.

Originally, EPA anticipated that the increased demand for renewable fuel under the EISA RFS would be satisfied by yield intensification.[29] Under this assumption, efforts to comply with

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[23] Wright & Wimberly, *supra*, note 8, at 4136.
[24] *Id.*
[25] Tyler J Lark et al., *Accelerated Conversion of Native Prairie to Cropland in Minnesota,* Environmental Conservation 1, 3 (2018), https://www.cambridge.org/core/services/aop-cambridge-core/content/view/1CFE4984A38E544B4102904E5B554980/S0376892918000437a.pdf/accelerated_conversion_of_native_prairie_to_cropland_in_minnesota.pdf.
[26] *Id.*
[27] Lark et al., *supra* note 8, at 5.
[28] Native Sod Spreadsheet, Farm Services Agency, 2018 (produced in response to a FOIA request), attached as Exhibit 1 (showing state conversion of native sod in Iowa, Minnesota, Montana, Nebraska, North Dakota, and South Dakota, from 2014-2018).
[29] *See* Regulation of Fuels and Fuel Additives: Changes to Renewable Fuel Standard Program, 75 Fed. Reg. 14,670, 14,701 (Mar. 26, 2010) (to be codified at 40 C.F.R. pt. 80) ("EPA believes that existing economic factors for feedstock producers favor more efficient utilization practices of existing agricultural land rather than converting non-agricultural lands to crop production");

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the RFS would result in minimal carbon emissions from newly cleared land, and instead would come from increased corn production on already cultivated land.[30] New farming technology, substitution of less lucrative crops – such as wheat, small grains (like barley and oats), and cotton – for corn, and consecutive planting ("corn-on-corn") would help to enhance yields.[31] However, these assumptions have not been borne out by the facts. Instead, while mean yields for corn reflect a steady increasing trend between 1980 and today,[32] corn production for ethanol surged

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see also id. at 14,703 ("EPA expects that new lands are unlikely to be cleared for agricultural purposes" because "[c]rop yields are projected to increase, reducing the need for farmers to clear new land for agricultural purposes.").

[30] EPA, *Biofuels and the Environment: First Triennial Report to Congress* (2011), http://ofmpub.epa.gov/eims/eimscomm.getfile?p_download_id=506091 ("EPA Triennial Report 2011"); Randy Schnepf & Brent D. Yacobucci, *Renewable Fuel Standard (RFS): Overview and Issues* Cong. Res. Serv. (2013), https://fas.org/sgp/crs/misc/R40155.pdf.

[31] Meimei Lin & Mary C. Henry, *Grassland and Wheat Loss Affected by Corn and Soybean Expansion in the Midwest Corn Belt Region, 2006– 2013*, 8 Sustainability 1177 (2016), www.mdpi.com/2071- 1050/8/11/1177/pdf ; USDA, Econ. Res. Serv. *Background*, USDA https://www.ers.usda.gov/topics/crops/corn-and-other-feedgrains/background/ (last updated May 15, 2018); Barry K. Goodwin et al., *Is Yield Endogenous to Price? An Empirical Evaluation of Inter-and Intra-seasonal Corn Yield Response* (2012), https://ageconsearch.umn.edu/bitstream/124884/2/Goodwin_Marra_Piggott_Mueller.pdf; Ritvik Sahajpal et al., *Identifying representative crop rotation patterns and grassland loss in the US Western Corn Belt*, 108 Computers & Electronics Agric. 173-182 (2014), http://www.academia.edu/28534095/Identifying_representative_crop_rotation_patterns_and_grassland_loss_in_the_US_Western_Corn_Belt. Corn-on-corn production raises a separate set of environmental concerns, as it requires more herbicide and fertilizer and thus has a much greater impact than maintaining a regular crop rotation.
Laura F. Gentry, Matias L. Ruffo & Fred E. Below, *Identifying Factors Controlling the Continuous Corn Yield Penalty*, 105 Agronomy J. 295- 303 (2013), https://pdfs.semanticscholar.org/043c/f14d69a4c5c6966efc03dce6a72ffb4981c5.pdf.

[32] Note that corn yields dropped anomalously low in the year 2012 due to extreme temperature and drought conditions associated with La Niña. Paul C. Westcott & Michael Jewison, *Weather Effects on Expected Corn and Soybean Yields*, USDA, Econ. Res. Serv. (2013), http://usda.mannlib.cornell.edu/usda/ers/FDS/2010s/2013/FDS-07-26-2013.pdf; Bradley R. Rippey, *The U.S. Drought of 2012*, 10 Weather & Climate Extremes 57, 57-64 (2015), https://ac.els-cdn.com/S2212094715300360/1-s2.0-S2212094715300360-main.pdf?_tid=07a5174b-8bff-4c96-896d-4e445c3a1447&acdnat=1537980601_d06c4b4b9c4ba6cdc1a14d3571246f54; Scott Irwin, *Should We Be Surprised about the U.S. Average Yield of Corn and Soybeans in 2017?* farmdoc daily, Dep't Agric. Consumer Econ., U. Ill. (2017), https://farmdocdaily.illinois.edu/wp-

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exponentially in the years immediately following EISA.[33] *See infra* Figure 3. Thus, yield intensification alone cannot explain the increase in corn production, as it has not expanded enough to meet the growing demand for ethanol by itself. Instead, ***corn croplands are expanding onto previously uncultivated grasslands in order to meet the EISA volume mandate***. The result is disastrous for the environment.

A similar trend is seen in soybean yield and production of soybean oil for biodiesel purposes. *See infra* Figure 4. According to EPA's Regulatory Impact Analysis, "soy-based biodiesel production induced ***a large increase in harvested soybean acres***, largely due to the low yield of soy-based biodiesel in terms of gallons produced per acre."[34]

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content/uploads/2017/11/fdd011117.pdf; *see also* USDA, *Charts and Maps: Corn: Yield by Year*, US, https://www.nass.usda.gov/Charts_and_Maps/Field_Crops/cornyld.php (last visited Sept. 26, 2018).

[33] USDA Econ. Res. Serv., *supra* note 14. For data on historical corn yield, select "corn" in "group" query field, then "yield per harvested acre" in "data attribute" query field, then "United States" in "geography" query field, then "all years" in "year" query field, and run query. *See* Schnepf et al., *supra* note 28; *see infra* Figure 3.

[34] EPA, *Renewable Fuel Standard Program (RFS2) Regulatory Impact Analysis* 320 (2010), https://nepis.epa.gov/Exe/ZyPDF.cgi/P1006DXP.PDF?Dockey=P1006DXP.PDF (emphasis added) ("EPA Regulatory Impact Analysis").

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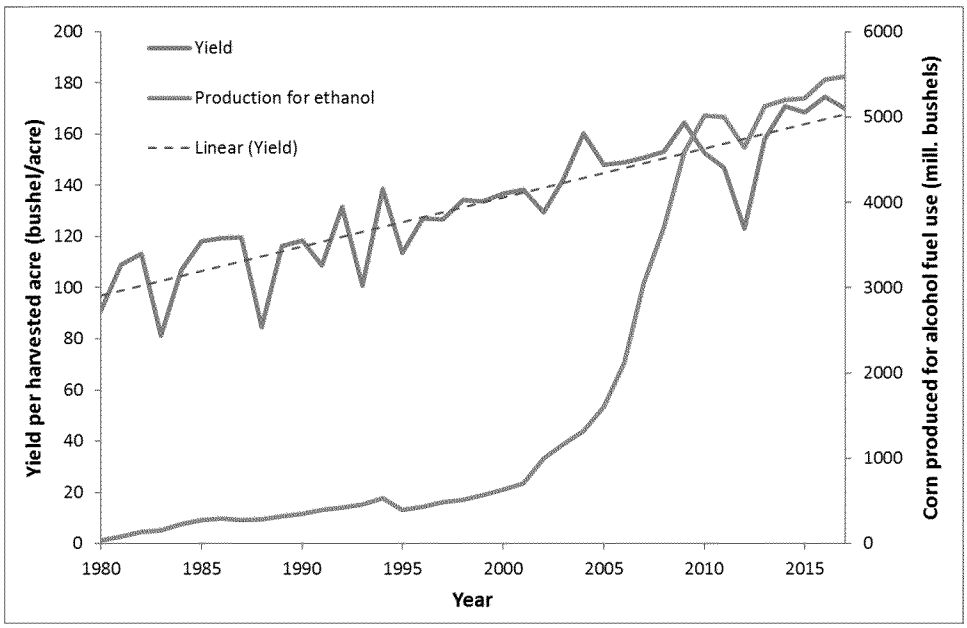

Figure 3. Growth in corn yield versus corn production for ethanol between 1980 and 2017. A linear regression trend line was fit for the yield data. Data derived from USDA's Feed Grains Database.

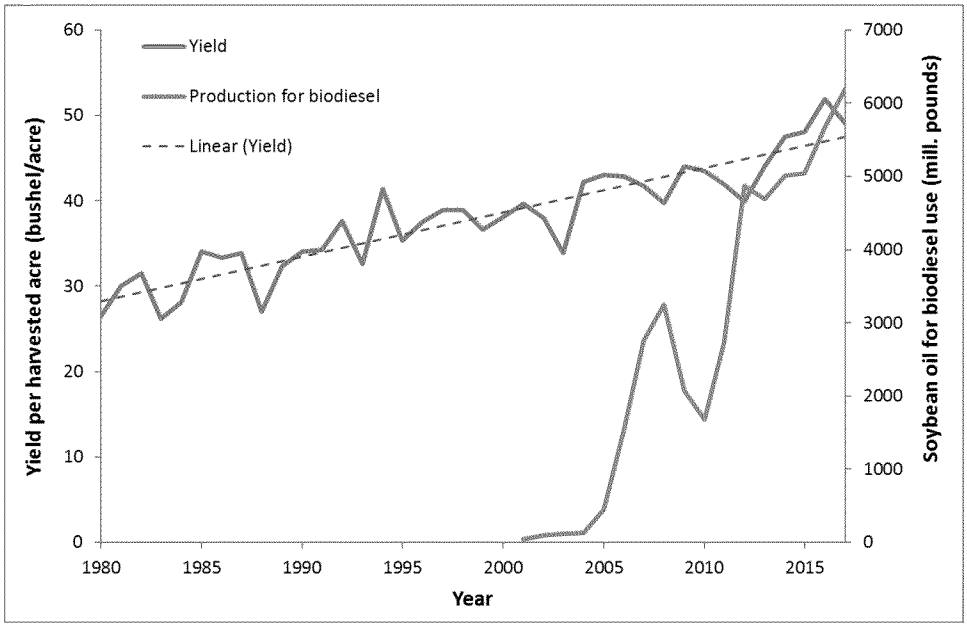

Figure 4. Growth in soybean yield versus soybean bean oil used for biodiesel between 1980 and 2017. A linear regression trend line was fit for the yield data. Data derived from USDA's Oil Crops Yearbook. USDA does not have data on soybean oil for biodiesel production prior to 2003. *See* USDA Econ. Res. Serv., https://www.ers.usda.gov/data-products/oil-crops-yearbook/oil-crops-yearbook/#Soy%20and%20Soybean%20Products (last updated Mar. 30, 2018). (In Excel Spreadsheet, see Tab 2 for yield and Tab 5 for biodiesel use).

B. Land Conversion Over the Past Decade Has Had Drastic Environmental Impacts.

The unanticipated increase in land conversion resulting from the production of corn and other renewable biomass under the aggregate compliance scheme has caused – and continues to cause – significant environmental harm. Indeed, our air, water, land, and wildlife are all suffering as a result.

1. Millions of Tons of Greenhouse Gases Have Been Emitted.

Aggregate compliance's land conversion consequences completely frustrate EISA's core purpose of reducing greenhouse gas emissions. Land conversion of previously uncultivated land releases into the atmosphere significant amounts of carbon dioxide (CO_2) and nitrous oxide (N_2O) that counteract the intended greenhouse gas reduction. EPA required that qualifying renewable fuels must have "lifecycle greenhouse gas emissions that are at least 20 percent less than baseline lifecycle greenhouse gas emissions[35] based on the theory that feedstock production would offset the greenhouse gas emissions from biofuel refinement and combustion, such that net emissions are less than those of fossil fuels.[36] However, even assuming that there is a climate benefit from renewable biomass production in terms of offsetting petroleum use – an assumption that many dispute[37] – this offset only works if grasslands and other uncultivated lands are not converted to grow the necessary corn and soy. If instead native soil is converted to cropland, this

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[35] 75 Fed. Feg. at 14,865.

[36] Not all subscribe to the theory that ethanol production is better for the climate. *See, e.g.*, David Pimentel, Tad Patzek & Gerald Cecil, *Ethanol Production: Energy, Economic, and Environmental Losses*, 189 Reviews Envtl. Contamination & Toxicology 25-41 (2007), https://pdfs.semanticscholar.org/5af6/1768587862f8201502c5dc8dbd2cb556a6a9.pdf.

[37] Some studies reveal that ethanol production may not reduce greenhouse gas emissions overall. Envtl. Working Group, *Ethanol's Broken Promise: Using Less Corn Ethanol Reduces Greenhouse Gas Emissions* (2014), https://static.ewg.org/reports/2014/ethanol_broken_promise/pdf/ethanol_broken_promise_ewg_2014.pdf?_ga=2.119196234.2101745258.1535661702-1011223048.1532525647. Even if production methods have improved and become more efficient, the weight of the evidence indicates that at best, use of renewable biomass is on par with or only slightly better than petroleum in terms of climate impact.

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creates a carbon deficit that will take years to overcome with any greenhouse gas emissions improvements resulting from the use of renewable biomass. Quantified estimates of this time lag, termed the "carbon debt," are described in greater depth below. While, according to the most optimistic models, ethanol produced from an acre of corn may reduce annual greenhouse gas emissions by 0.73 metric tons, emissions from grassland conversion release anywhere from 30 to 120 metric tons per acre upfront, rendering meaningless the reduction in greenhouse gas emissions from use of renewable fuel.[38] Unfortunately, that is precisely what has happened with the aggregate compliance approach under EISA.

Land conversion increases greenhouse gas emissions in two ways. ***First***, soil organic carbon ("SOC") is lost when land is converted to cropland. Soil stores large quantities of carbon, which it retains as long as the carbon is not exposed to oxygen. Globally, soil and plant biomass can store 3.3 times more carbon than the atmosphere.[39] When grassland and pastures are cleared and tilled, oxygen in the air combines with the carbon in the soil (a process called "oxidation"), and CO_2 is released.[40] Additionally, farmers often clear the new cropland by burning native vegetation or leaving the plants on the field to decompose, leading to chemical and microbial

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[38] Timothy Searchinger et al., *Use of U.S. Croplands for Biofuels Increases Greenhouse Gases Through Emissions from Land- Use Change*, 319 Science 1238 (2008), http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.337.4853&rep=rep1&type=pdf.

[39] R. Lal, *Soil Carbon Sequestration Impacts on Global Climate Change and Food Security,* 304 Sci. 1623 (2004), http://sites.unice.fr/coquillard/UE36/Science%20-%20R%20Lal%202004.pdf.

[40] A. Edward Johnston, Paul R. Poulton & Kevin Coleman, *Chapter 1 Soil Organic Matter: Its Importance in Sustainable Agriculture and Carbon Dioxide Fluxes*, *in* 101 Advances in Agronomy 1 (Donald L. Sparks 2009); Tristram O. West et al., *Carbon Management Response Curves: Estimates of Temporal Soil Carbon Dynamics*, 33 Envtl . Mgmt. 507-518 (2004), https://pdfs.semanticscholar.org/7b02/4af9719027d7cf2a39bf87dad7a3115fb820.pdf?_ga=2.18357881.1986925512.1537993308-2076078948.1537993308.

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processes that further contribute gaseous CO_2 emissions to the atmosphere.[41] At a carbon emission rate of 54 metric tons of CO_2 per acre,[42] ***conversion of 1.6 million acres of native grassland***[43] ***would release 87 million metric tons of CO_2, equivalent to annual emissions from 18 million cars on the road or 22 coal-fired power plants.***[44] And this is the most conservative estimate of converted land. Greater land conversion increases these figures across the board:

Table 1. Estimate of CO_2 emissions from land conversion[45]

Acres converted to cropland	Conversion CO_2 emissions rate[1] (Metric Tons ("Mg") CO_2 per acre)	Total Emissions (Mg CO_2)	Equivalent to: Number of Vehicles' Emissions	Equivalent to: Number of Coal-Fired Powerplants
1,600,000[2]	54.25101215	86,801,619	18.6 million	22
5,700,000[3]	38.21862348	217,846,154	46.6 million	54
7,340,000[4]	38.21862348	280,524,696	60 million	70

[1] Fargione et al., *supra* note 39; Ilya Gelfand et al., *supra* note 45; *see also* Lark et al., *supra* note 8 for detailed methodology.
[2] Amount of grasslands that was uncultivated for more than twenty years prior to the passage of EISA that was converted to crop production between 2008-2012.
[3] Amount of any type of grassland converted to crop production between 2008-2012.
[4] Amount of any land uncultivated since 2001 that was converted to crop production between 2008-2012.

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[41] Joseph Fargione et al., *Land Clearing and the Biofuel Carbon Debt*, 319 Science 1236 (2008), https://pdfs.semanticscholar.org/dc89/11f9e54f9b8b35a8303bd7960041eef6c742.pdf.
[42] Converted from reported emission factor of 134 Mg CO_2 per hectare for intact grasslands converted with conventional tillage. *Id.* at 1236.
[43] An estimate of 1.6 million acres of converted grassland is the most conservative estimate in the many studies on this issue. Several studies have suggested much higher estimates. Indeed, EPA itself estimates that there has been an "an increase in actively managed cropland in the U.S. since the passage of EISA by roughly 4-7.8 million acres, depending upon the source." EPA Triennial Report 2018 at 111.
[44] *Greenhouse Gas Equivalencies Calculator,* EPA (2018), https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator (last visited Sept. 26, 2018).
[45] This table uses estimates of land conversion acreage from *Cropland expansion outpaces agricultural and biofuel policies in the United States*. Lark et al., *supra* note 8.

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Unsurprisingly, soil carbon loss rates are most rapid in the year immediately after fields are cleared for planting.[46] In fact, in the first year after clearing, 15% of all potential CO_2 emissions from an acre of converted land will be released.[47] Future decomposition and forgone soil sequestration forms the majority (75%) of a converted acre's total CO_2 emissions.[48] Tilled converted lands release more carbon than no-till lands, as tilling exposes carbon to oxygen, which creates more CO_2, and likewise requires more on-farm energy. Thus, soil tillage practices can triple the length of time it takes for projected ethanol use to offset the greenhouse gas emissions, from 40 to 123 years.[49]

EPA itself recognizes that land conversion leads to the loss of soil organic carbon that in turn leads to increased greenhouse gas emissions. In its Regulatory Impact Analysis of the new RFS, it explained:

> GHG emissions could be released through time if new acres are needed to produce corn or other crops for biofuels. The GHG emissions associated with converting land into crop production would accumulate over time with the largest release occurring in the first few years due to clearing with fire or biomass decay. After the land is converted, moderate amounts of soil carbon would continue to be released for approximately 20 years. Furthermore, there would be foregone sequestration associated with the fact that the forest would have continued to sequester carbon had it not been cleared for approximately 80 years.[50]

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[46] Kristina J. Anderson-Teixeira et al., *Changes in Soil Organic Carbon Under Biofuel Crops,* 1 GCB Bioenergy 75 (2009), https://pdfs.semanticscholar.org/c1e6/52a11cbb96056180b3e62ca8829b65b66526.pdf.

[47] Ilya Gelfand et al., *Carbon Debt of Conservation Reserve Program (CRP) Grasslands Converted to Bioenergy Production,* 108 Proc. Nat'l Acad. Sci. 13864 (2011), http://lees.geo.msu.edu/pubs/Gelfand2011.pdf.

[48] *Id.*

[49] Hyungtae Kim, Seungdo Kim & Bruce E. Dale, *Biofuels, Land Use Change, and Greenhouse Gas Emissions: Some Unexplored Variables,* 43 Envtl. Sci. & Tech. 961 (2009); Gelfand et al., *supra* note 45.

[50] EPA Regulatory Impact Analysis at 422.

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Like forests, grasslands are also able to sequester carbon, a long-term service that will be lost if the grassland is tilled.[51]

Second, in addition to increasing CO_2 emission, land conversion also leads to significant emissions of nitrous oxide (N_2O), which has a warming potential that eclipses that of CO_2 by nearly 300 times.[52] N_2O emissions occur not from physical land-use change, but rather from use of nitrogen fertilizer on newly converted cropland.[53] Native grasslands naturally recycle soil nutrients without requiring additional nitrogen inputs. By contrast, biofuel row crops require fertilizer to replenish soil nutrients that are removed during harvest, and to maintain productive yields. However, the crop only takes up around 40 to 50% of the nitrogen fertilizer applied to soil.[54] The remaining 50 to 60% of nitrogen fertilizer remains in the soil, where it either runs off

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[51] M. B. Jones & Alison Donnelly, *Carbon Sequestration in Temperate Grassland Ecosystems and the Influence of Management, Climate and Elevated CO_2*, 164 New Phytologist 423, 423-439 (2004), http://www.southwestnrm.org.au/sites/default/files/uploads/ihub/jones-mb-donnelly-2004carbon-sequestration-temperate.pdf; Gelfand et al., *supra* note 45.

[52] Susan Solomon et al., *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (2007), https://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4_wg1_full_report.pdf.

[53] Paul J. Crutzen et al., *N2O release from agro-biofuel production negates global warming reduction by replacing fossil fuels,* 7 Atmospheric Chemistry and Physics Discussions 11191, 11191-11205 (2007), https://www.atmos-chem-phys.net/8/389/2008/acp-8-389-2008.pdf.

[54] United Nations Environment Programme ("UNEP"), *Drawing Down N2O to Protect Climate and the Ozone Layer: A UNEP Synthesis Report*, UNEP) 20, https://wedocs.unep.org/bitstream/handle/20.500.11822/8489/- Drawing%20down%20N2O%20to%20protect%20climate%20and%20the%20ozone%20layer_%20a%20UNEP%20synthesis%20report- 2013UNEPN2Oreport.pdf?amp%3BisAllowed=&sequence=3;*see also* Kenneth G. Cassman et al., *Agroecosystems, Nitrogen use, Efficiency, and, Nitrogen Management*, 31 Ambio, 132, 133 (2002), http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1356&context=agronomyfacpub; Vaclav Smil, *Nitrogen in Crop Production: An Account of Global lows*, 13 Global Biogeochemical Cycles 647, 653 (1999), http://vaclavsmil.com/uploads/smil- article- global- biogeochemical- cycles.1999.pdf; James N. Galloway & Ellis B. Cowling, *Reactive nitrogen and the world: 200 years of change*, 31 *Ambio* 64, 65- 66 (2002), https://www.researchgate.net/profile/James_Galloway/publication/11297112_Reactive_Nitrogen_and_The_World_200_Years_of_Change/links/00b7d5304e858afb66000000/Reactive-Nitrogen-and-The-World-200-Years-of-Change.pdf.

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with surface water or leaches into ground water, or is converted by soil bacteria into N_2O, which is then emitted into the atmosphere.[55] N_2O gas may also be emitted indirectly when excess nitrogen from fertilizer is lost to the environment via run-off or leaching, and is later converted to N_2O. And as discussed in more detail below, nitrogen from fertilizer not only impacts climate, but it also harms the environment. For example, run-off fertilizer in the form nitrate (NO_3^-) pollutes water supplies and leads to eutrophication, the process by which excessive nutrients in a body of water cause dense growth of plant life and death of animal life due to a lack of oxygen.

On average, the U.S. application rate of 140 pounds of nitrogen fertilizer per acre of corn[56] releases 1.3 pounds of N_2O per acre.[57] To further exacerbate the problem, the N_2O emission response to nitrogen input in agriculture is non-linear: higher rates of nitrogen fertilizer application on converted croplands will produce disproportionately large greenhouse gas impacts.[58]

The land conversion resulting from EISA's aggregate compliance approach has had a tremendous impact on the environment. For example, between 2008 and 2012, ***at least 1.6***

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[55] If the soil contains ample oxygen content, N_2O is generated as a byproduct when soil bacteria transform inorganic ammonium to nitrate (*nitrification*). If oxygen levels in the soil are too low, soil bacteria convert nitrate to dinitrogen (N_2), releasing N_2O gas in the process (*denitrification*).
[56] Soy does not require as much nitrogen fertilizer as corn because soy is a legume that is able to biologically fix most of its needed nitrogen.
[57] Iurri Shcherbak, et al., *Global metaanalysis of the nonlinear response of soil nitrous oxide (N_2O) emissions to fertilizer nitrogen*, 111 Proc. Nat'l Acad. Sci. 9199, 9202 (2014), http://www.pnas.org/content/pnas/111/25/9199.full.pdf.
[58] J.P. Hoben et al., *Nonlinear nitrous oxide (N_2O) response to nitrogen fertilizer in on-farm corn crops of the US Midwest,* 17 Global Change Biology 1140, 1140 (2011), https://pdfs.semanticscholar.org/22c0/ce0fa1d21a5ddb6dac284d78bfe2a550a062.pdf?_ga=2.132502793.661887377.1539277952-2076078948.1537993308; Dong-Gill Kim, et al., *Linear and nonlinear dependency of direct nitrous oxide emissions on fertilizer nitrogen input: A meta-analysis,* 168 Agric., Ecosystems & Env't 53 (2013); Iurii Shcherbak, et al., *supra* note 55, at 9199.

million acres of grassland were converted to potential feedstock cropland.[59] If this new cropland were used only to produce corn for ethanol, the conversion would have released ***an estimated 87 million metric tons of CO_2 from soil carbon loss and 62,000 metric tons of N_2O (the equivalent of 18 million metric tons of CO_2) from nitrogen fertilizer use.*** In total, emissions from land conversion and subsequent fertilizer use would be equivalent to the annual emissions from 27 coal-fired power plants or 22.5 million cars.

Table 2. Estimate of N_2O emissions from land conversion.[60]

Acres converted to cropland	N_2O Emission Rate[1] (Mg CO_2-eq per acre)	Total Emissions (Mg CO_2-eq)	Equivalent to: Number of Vehicles' Emissions	Equivalent to: Number of Coal-Fired Powerplants
1,600,000[2]	11.48	18,378,018	3.9 million	5
5,700,000[3]	11.48	65,471,688	14 million	16
7,340,000[4]	11.48	84,309,156	18 million	21

[1] Calculated using an average fertilizer application rate of 140 lbs nitrogen per acre, a N_2O-N emission rate of 1.5 kg N_2O-N per hectare at that application rate (Scherback et al., *supra* note 55), and a global warming potential of 298 (Intergovernmental Panel Climate Change).
[2] Amount of grasslands that was uncultivated for more than twenty years prior to the passage of EISA that was converted to crop production between 2008-2012.
[3] Amount of any type of grassland converted to crop production between 2008-2012.
[4] Amount of any land uncultivated since 2001 that was converted to crop production between 2008-2012.

The purported benefits gained from the ethanol and biodiesel substitution for petroleum[61] were effectively meaningless, as this conversion (not including fertilizer use) led to total

[59] Lark et al., *supra* note 8.
[60] Table 2 uses estimates from Lark et al., *supra* note 8, and assumes that corn was grown on all converted land.
[61] EPA estimates that annual GHG reduction benefits from replacing petroleum fuels with biofuels is on the scale of 150 million metric tons CO_2-eq (CO_2 equivalent) per year (p.469). Very optimistically, EPA predicts that the RFS2 projected level of biofuel production will reduce global mean surface temperatures and mean sea level rise (p.499). *See* EPA Regulatory Impact Analysis; *see also* Haixiao Huang et al., *Stacking low carbon policies on the renewable fuels standard: Economic and greenhouse gas implications*, 56 Energy Policy 5, 5-15(2013),

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greenhouse gas emissions equivalent to yearly emissions from ***over 18 million cars.***[62] And as recent studies indicate, these increased emissions affect more than just climate; they may also impact the quality of the food we eat and the nutrients we receive through our food.[63]

The concept of "carbon debt" is a useful tool to quantify the climate harm from ethanol-driven land conversion. It measures total greenhouse gases released from the first 50 years after a plot of land is converted. To repay or reduce the carbon debt, total biofuel emissions – including those incurred from land conversion – must be less than fossil fuel emissions.[64] Yet for the first 30 years, greenhouse gas emissions from biofuels sourced from converted lands will be twice the amount released by gasoline.[65] Thus, ***corn ethanol grown on converted central grasslands in the U.S. incurs at least a 93-year carbon debt***.[66] In other words, it will take at least 93 years for the total cumulative ethanol emissions to be less than the emissions from the replaced petroleum if the corn is grown on converted grassland.[67]

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https://bepress-attached-resources.s3.amazonaws.com/uploads/4d/d3/77/4dd377e9-a8c4-4436-8518-de938ecd8380/fulltext_stamped.pdf.

[62] *Greenhouse Gas Equivalencies Calculator,* Envtl. Protection Agency, https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator (last updated Sept. 2017).

[63] Samuel S. Myers et al., *Increasing CO2 threatens human nutrition*, 510 Nature 139, 139 (2014), http://www.environment.harvard.edu/sites/default/files/myers_2014_increasing_co2_threatens_human_nutrition_aop_version.pdf.

[64] Fargione et al., *supra* note 39, at 1236.

[65] Searchinger et al., *supra* note 36.

[66] Fargione et al., *supra* note 39, at 1237.

[67] This calculation approves corn ethanol use as having a positive impact on the environment, an assumption with which many disagree. *See supra* notes 34 and 35.

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2. Land Conversion for Corn Ethanol and Soy Biodiesel Has Increased Water Pollution.

i. Increased Land Conversion Results in Greater Nitrogen Run-off that Harms Water Quality.

Another consequence of land conversion is increased release of nitrogen into waters. Assuming that corn was grown on the converted 1.6 million acres of grassland – which is the most conservative estimate of land converted since EISA – this expansion could introduce at least 224 million pounds of new fertilizer onto the U.S. landscape of which much would flow into waterways.[68] If, instead, corn were grown on 5.7 million or 7.34 million acres of converted land, the amount of new fertilizer used could 789 or 1,027 million pounds:

Table 3. Estimate of increased fertilizer usage if corn were grown on land converted for crop production.

Acres converted to cropland	Average fertilizer application rate for corn (lbs N per acre)	Total fertilizer applied (lbs N)
1,600,000[1]	140	224,000,000
5,700,000[2]	140	798,000,000
7,340,000[3]	140	1,027,600,000

[1] Amount of grasslands that was uncultivated for more than twenty years prior to the passage of EISA that has been converted to crop production between 2008-2012.
[2] Amount of any type of grassland converted to crop production between 2008-2012.
[3] Amount of any land uncultivated since 2001 that was converted to crop production between 2008-2012.

[68] This figure is calculated using a U.S. average nitrogen fertilizer application rate of 140 lbs per acre for corn. *See* USDA Nat'l Agric. Stats. Serv., *Agricultural Chemical Usage*, http://www.nass.usda.gov/Surveys/Guide_to_NASS_Surveys/Chemical_Use/ (last updated Sept. 28, 2018); USDA Econ. Res. Serv., *Fertilizer Use and Price*, https://www.ers.usda.gov/data-products/fertilizer-use-and-price/fertilizer-use-and-price (last updated Feb. 21, 2018). EPA performed a similar calculation in its 2018 Triennial Report using a value of "1.28 million acres extensification . . . due to corn." *See* EPA Triennial Report 2018 at 70.

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According to EPA's FY2016-17 *National Water Program Guidance*, "nitrogen and phosphorus pollution is one of the most serious and pervasive water quality problems."[69] Between 25-35% of the nitrogen fertilizer applied to crops inevitably leaches into surface water due to runoff, poor tile drainage, and sediment transport.[70] The severe water quality injury caused by nitrogen enrichment in freshwater bodies has been widely studied and documented. The surplus nitrogen, often in reactive nitrate form (NO_3^-), stimulates excessive algae and microbe growth, which exhausts oxygen in the water column and breeds toxic algal blooms.[71] This results in eutrophication, which can lead to mass aquatic life mortality. Even in terrestrial systems, up to 25% of Great Plains plant species could be lost from receiving excess agricultural nitrogen enrichment.[72]

The many socioeconomic costs of eutrophication are huge. EPA analyzed the issue in the Hypoxia Task Force's 2017 Report to Congress and the 2015 *Cost of Nutrient Pollution*

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[69] EPA Office of Water, *FY2016-2017 National Water Program Guidance* 15 (2015), https://nepis.epa.gov/Exe/ZyPDF.cgi/P100MDWZ.PDF?Dockey=P100MDWZ.PDF.

[70] Susan E. Powers, *Nutrient loads to surface water from row crop production*, 12 Int'l J. Life Cycle Assessment 399, 399-407 (2007), https://link.springer.com/content/pdf/10.1065/lca2007.02.307.pdf; R. Dominguez-Faus et al., *The Water Footprint of Biofuels: A Drink or Drive Issue?,* 43 Envtl. Sci. & Tech. 3005, 3008 (2009), https://pubs.acs.org/doi/pdf/10.1021/es802162x.

[71] EPA Office of Water, *Preventing Eutrophication: Scientific Support for Dual Nutrient Criteria* (2015), https://www.epa.gov/sites/production/files/documents/nandpfactsheet.pdf; V.H. Smith et al., *Eutrophication: impacts of excess nutrient inputs on freshwater, marine, and terrestrial ecosystems,* 100 Envtl. Pollution 179, 187 (1999), https://pdfs.semanticscholar.org/80cd/d0a042482b590b01620192193d8c13107beb.pdf?_ga=2.65952937.661887377.1539277952-2076078948.1537993308.

[72] More specifically, species loss ranges from approximately 18% from shortgrass steppe in the Central Plains to approximately 25% from tallgrass prairie. Chris M. Clark et al., *Environmental and plant community determinants of species loss following nitrogen enrichment*, 10 Ecology Let ters 596, 600 (2007), http://collins.lternet.edu/sites/temperate.lternet.edu.collins/files/publications/Clark_etal_2007_EL_2.pdf.

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Report.[73] It concluded that nationally, the damages can range from $1.3 to $4.2 billion,[74] and include: commercial and recreational fishing losses ($189-$589 million), boating expenditures ($182-$567 million), depreciated property value ($0.3-$2.8 billion), additional species conservation spending ($44 million), and bottled water costs due to undrinkable public water supply ($813 million).[75] Affected areas additionally need to implement expensive water treatment techniques, such as aeration systems, aluminum sulfate, or dredging, costing on the magnitude of tens or hundreds of millions of dollars.[76]

Moreover, continued land conversion for corn and soy production for use as fuel will likely cause an increase in contaminated local drinking water through groundwater leaching, which in turn will result in higher levels of nitrogen and other toxic exposure and associated harms for agricultural communities. For example, in infants, direct nitrate consumption from water or food causes methemoglobinemia (or "blue baby syndrome").[77] For older children and adults, high intake of nitrates could affect thyroid function.[78]

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[73] EPA, *Mississippi River/Gulf of Mexico Watershed Nutrient Task Force: 2017 Report to Congress* 7 (2017), https://www.epa.gov/sites/production/files/2017- 11/documents/hypoxia_task_force_report_to_congress_2017_final.pdf; EPA Office of Water, *A Compilation of Cost Data Associated with the Impacts and Control of Nutrient Pollution* (2015), https://www.epa.gov/sites/production/files/2015-04/documents/nutrient-economics-report-2015.pdf.

[74] *See* Walter K. Dodds et al., *Eutrophication of U.S. Freshwaters: Analysis of Potential Economic Damages*, 43 Envtl. Sci. & Tech. 12 (2009), https://pubs.acs.org/doi/10.1021/es801217q.

[75] *Id.*

[76] EPA Office of Water, *supra* note 71, at 34-35.

[77] World Health Organization ("WHO"), *Nitrate and nitrite in drinking-water: background document for development of WHO Guidelines for Drinking-water Quality,* 11 (2016), http://www.who.int/water_sanitation_health/dwq/chemicals/nitrate-nitrite-background-jan17.pdf.

[78] *Id.*

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Land conversion likewise harms surface waters. The harmful algae blooms caused by eutrophication may also release a host of biological toxins into the water that harm public health. For example, in Toledo, Ohio, fertilizer run-off caused a devastating bloom in Lake Erie in 2014, compromising the drinking water supply of over 500,000 people.[79] EPA determined that drinking water contaminated with the bacterial toxins in Toledo waters could lead to "[a]bdominal pain, [h]eadache, [s]ore throat, [v]omiting and nausea, [d]ry cough, [d]iarrhea, [b]listering around the mouth, and [p]neumonia."[80] Lake Erie algae bloom continues to this day.

At the same time it increases nitrogen run-off into the water supply, conversion of and agricultural production on previously untilled lands increases soil erosion, which exacerbates the harms stemming from nitrogen loading.[81] Sedimentation increases nitrogen loss rates, as nitrogen compounds bound to soil particles are transported by wind or water along with the eroded soil. And little to nothing is being done to prevent this soil loss. Native prairie conversion shaves off crucial buffers between croplands and native ecosystems, facilitating nutrient transport into surrounding environments.[82] Grassland buffers intercept sediment flows and uptake excess nutrients from runoff crop fertilizer, reducing surface nitrogen loads by 10 to

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[79] Emma G. Fitzsimmons, *Tap water ban for Toledo residents*, N.Y. Times (Aug. 3, 2014), https://www.nytimes.com/2014/08/04/us/toledo-faces-second-day-of-water-ban.html?mtrref=undefined.

[80] *Health and Ecological Effects,* EPA, https://www.epa.gov/nutrient-policy-data/health-and-ecological-effects#what1 (last updated June 22, 2017).

[81] *See* USDA Nat. Res. Conservation Serv., *Model Simulation of Soil Loss, Nutrient Loss, and Change in Soil Organic Carbon Associated with Crop Production* 118 (June 2006), https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs143_012757.pdf.

[82] USDA Nat. Res. Conservation Serv., *Conservation Programs and Pesticides in Great Plains Depressional Wetlands—Texas to North Dakota* (2017), https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcseprd1329455.pdf.

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95%.[83] Yet recent land assessments show that ***over 80% of the converted grassland area in North and South Dakota was within 500 meters of adjacent wetlands***.[84] And USDA reported that from 2003 to 2006, only a small minority (less than 40%) of "highly erodible land" acreage in the Midwest utilized erosion prevention practices to control fertilizer runoff.[85] Thus, land conversion packs a double punch: it increases the release of nitrogen by increasing soil loss, at the same time it erodes critical barriers to nitrogen runoff.

The most evident water quality impact of biofuel-driven land conversion is linked to bottom water hypoxia in the Gulf of Mexico. *See infra* Figure 5. Hypoxia occurs when eutrophication and bacterial decomposition deplete dissolved oxygen levels in the lower water column, such that life cannot be sustained.[86] Every spring, the northern Gulf of Mexico dead zone swells to the size of Massachusetts, causing mass marine life mortality in the region.[87] In the summer of 2017, EPA recorded the largest ever dead zone at 22,720 km^2.[88] The EPA Hypoxia Task Force has set a goal to reduce nitrogen inputs in the Gulf by 45% in order to

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[83] EPA Office of Res. & Dev't, *Riparian Buffer Width, Vegetative Cover, and Nitrogen Removal Effectiveness: A Review of Current Science and Regulations* 4, 6 (2005), http://ccrm.vims.edu/education/seminarpresentations/fall2006/Workshop CD/Other References/Riparian Buffers & Nitrogen Removal.pdf.

[84] This reflects conversion between 2007 and 2011. Wright & Wimberly, *supra* note 8, at 4137; Sahajpal et al., *supra* note 29, at 179.

[85] USDA Nat. Res. Conservation Serv., *Effects of Conservation Practices on Nitrogen Loss from Farm Fields: A National Assessment Based on the 2003-2006 CEAP Survey and APEX Modeling Databases* 21 (2017), https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcseprd1365657.pdf.

[86] Hypoxic conditions are defined as dissolved oxygen levels below 2 parts per million ("ppm"). *Hypoxia Research Program*, Nat'l Center for Coastal Ocean Sci., https://coastalscience.noaa.gov/research/stressor-impacts-mitigation/habhrca/hypoxia-program/ (last visited Oct. 12, 2018).

[87] The five-year average size of the zone is 14,024 km^2; the actual size of hypoxic zone varies temporally. *See supra* note 71.

[88] *Northern Gulf of Mexico Hypoxic Zone*, EPA, https://www.epa.gov/ms-htf/northern-gulf-mexico-hypoxic-zone (last visited Oct. 12, 2018).

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shrink the dead zone to 5000 km^2, with an interim target of 20% reduction by 2025.[89] However, nitrogen runoff from projected corn ethanol production in the Mississippi-Atchafalaya River Basin ("MARB") alone will completely jeopardize EPA's reduction goals.[90] Currently, agriculture contributes 60% of total nitrogen loads to the MARB, polluting the Gulf with approximately ***840,000 tons of nitrogen each year***.[91] Field measurements confirm that fertilizer leached from corn crops is responsible for the large majority of agricultural nitrogen exports.[92] *See infra* Figure 6. Studies indicate that corn expansion and intensification to meet EISA targets contribute an increase of 10 to 18% in annual dissolved inorganic nitrogen flux in the MARB.[93]

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[89] *See supra* note 71.

[90] The Mississippi-Atchafalaya River Basin encompasses all Midwest Corn Belt states, where overall corn production and grassland conversion are concentrated. Simon D. Donner & Christopher J. Kucharik, *Corn-based ethanol production compromises goal of reducing nitrogen export by the Mississippi River*, 105 Proc. Nat'l Acad. Sci. 4513 (2008), http://www.pnas.org/content/pnas/105/11/4513.full.pdf. The cited study looks at the impact of increased corn production from intensification and extensification combined. Given that corn grown on newly converted land requires a greater amount of fertilizer, increasing land conversion would likely result in increased nitrogen runoff.

[91] This figure is calculated from 60% of the 5-year average annual nitrogen load (1.4 million tons) for 2010 to 2015. *See supra* note 71. Given that newly converted land requires greater amounts of nitrogen fertilizer, greater extensification would likely lead to greater increases in dissolved inorganic nitrogen flux.

[92] Sixty to 98% of excess leached nitrogen in MARB can be allocated to corn fertilizer, as opposed to soybean. Powers, *supra* note 68.

[93] Values based on 2008 model projections. *See* Donner & Kucharik, *supra* note 88. Similar results from price commodity model comparison to 1997 baseline. *See* Silvia Secchi et al., *Potential water quality changes due to corn expansion in the Upper Mississippi River Basin*, 21 Ecological Applications 1068, 1068-1084 (2011), https://opensiuc.lib.siu.edu/cgi/viewcontent.cgi?article=1002&context=agecon_articles. The studies looked at the conversion of Conservation Reserve Program grassland and soy crops to corn.

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Figure 5. Satellite image of Gulf of Mexico dead zone, with visible algal blooms and agricultural run-off. Image credit: Jeff Schmaltz (NASA Earth Observatory)

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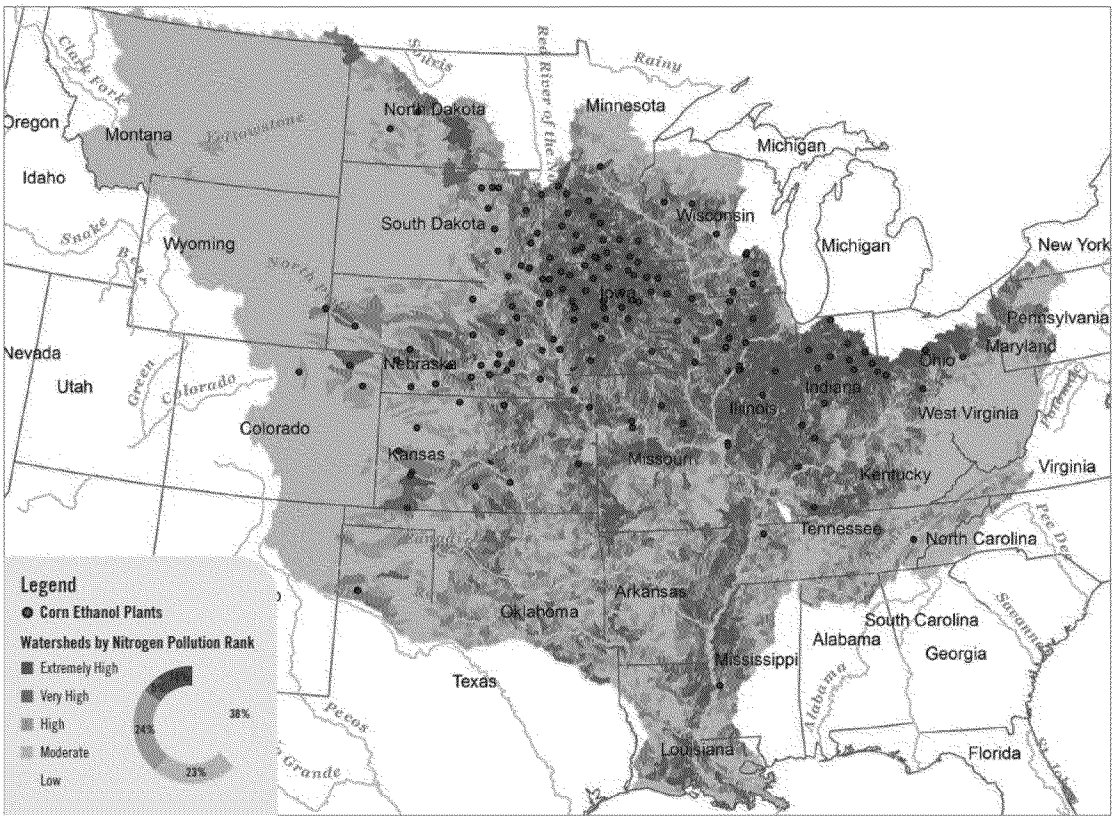

Figure 6. Corn ethanol refineries locations overlaid against watersheds in the Mississippi-Atchafalaya River Basin ranked by their relative contribution of agriculture-related nitrogen pollution to local waterways. Ethanol plants are likely sourcing corn feedstock from regions where agriculture-related nitrogen is a major contributor to water quality impairment. *See* Brooke Barton & Sarah Elizabeth Clark, *Water and Climate Risks Facing U.S. Corn Production*, Ceres 11 ex. ES6 (2014), http://www.indiaenvironmentportal.org.in/files/file/Water%20&%20Climate%20Risks%20Facing%20U.S.%20Corn%20Production.pdf.

ii. Increased Land Conversion Depletes Water Supplies.

In addition to impairing water quality, new cropland expansion will deplete freshwater resources by increasing demands for irrigation, and thus could lead to increased water scarcity in intensive agricultural areas. On average, each gallon of corn ethanol requires between 500 to 1,400 gallons of water for crop production alone.[94] On a per mile of travel basis, corn ethanol

[94] Data is based on irrigation rates in regions that require irrigation, at a weighted average of 566 gallons of water per gallon of ethanol. The water footprint depends on the irrigation rate where the corn is produced. For instance, water requirements range from: 367 gallons of water per gallon of ethanol for Iowa, to 742 gallons of water per gallon of ethanol in South Dakota, to 1,090 gallons of water per gallon of ethanol in Texas. Supplementary information from

requires nearly seven times as much surface water consumption than other transportation fuel sources.[95] Agriculture irrigation is the second largest consumer of freshwater in the U.S. after thermoelectric power, and corn comprises nearly a quarter of all irrigated acreage.[96] Though only 15% of total planted corn acreage is irrigated, annual water usage in Midwestern corn-dominated states ranges from 285,000 to 427,000 gallons of freshwater per acre of corn.[97] In fact, over 80% of irrigated corn is grown in regions predicted to experience high heat and water stress.[98] When this average irrigation rate is applied to 1.6 million acres of new potential feedstock crops, irrigation needs increase by ***85 billion gallons of water***.[99] This is equal to the

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Dominguez-Faus et al., *supra* note 68; *see also* Dominiguez-Faus et al., *Supporting Information for the Water Footprint of Biofuels: A Drink or Drive Issue?,* A- S6, https://pubs.acs.org/doi/suppl/10.1021/es802162x/suppl_file/es802162x_si_001.pdf.

[95] Corinne D. Scown, Arpad Horvath & Thomas E. McKone, *Water Footprint of U.S. Transportation Fuels*, Envtl. Sci. Tech. 2541, 3550 (2011), https://pubs.acs.org/doi/pdfplus/10.1021/es102633h.

[96] Molly A. Maupin et al., *Estimated Use of Water in the United States in 2010*, U.S. Dep't of the Interior, U.S. Geological Surv. Circular 1405 (2014), https://pubs.usgs.gov/circ/1405/pdf/circ1405.pdf. Value based on 2012 survey of irrigation acreage. *Background: Crops Produced with Irrigation,* USDA Econ. Res. Serv., https://www.ers.usda.gov/topics/farm-practices-management/irrigation-water-use/background.aspx (last visited on Jan. 11, 2017). One gallon of soy biodiesel, on the other hand, requires an average of 1,300 gallons of water from irrigation – however, only 8% of soy is irrigated, and the majority of soybean acreage expansion is non-irrigated. *See* Scott Irwin, Todd Hubbs & D. Good, *U.S. Soybean Yield Trends for Irrigated and Non-Irrigated Production*, farmdoc daily, Dep't Agric. Consumer Econ., U. Ill. (2017), https://farmdocdaily.illinois.edu/wp-content/uploads/2017/05/fdd030517.pdf.

[97] Calculated with 2003 values for Plains States: [2000 to 3000 gallons freshwater per bushel] x [142.2 bushels of corn per acre according to USDA ERS data] = 284,400 to 426,600 gallons per acre. *See* Scott Malcolm, Marcel Aillery & Marca Weinberg, *Ethanol and a Changing Agricultural Landscape* 33 USDA Econ. Res. Serv., ERR-86 2010, https://www.ers.usda.gov/webdocs/publications/46301/9205_err86.pdf?v=42262.

[98] Brooke Barton & Sarah Elizabeth Clark, *Water and Climate Risks Facing U.S. Corn Production,* Ceres 11 ex. ES6 (2014), http://www.indiaenvironmentportal.org.in/files/file/Water%20&%20Climate%20Risks%20Facing%20U.S.%20Corn%20Production.pdf.

[99] [356,000 gallons per acre] x [15% of 1.6 million acres] = 85 billion gallons. This calculation assumes 15% of corn acreage is irrigated, where in 2013 approximately 13.3 million acres out of 87.4 million total harvested acres of corn were irrigated. USDA, *Table 36. Specified Crops Harvested – Yield per Acre Irrigated and Nonirrigated*, US Census of Agriculture-Vol.1, Ch.1:

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water supply sufficient to support the annual water consumption of 2.3 million Americans.[100] Yet the irrigated corn from converted grasslands would only produce 81 million gallons of ethanol, merely a 5% dent in the country's total ethanol production capacity.[101]

3. Land Conversion Has Caused Destruction and Degradation of Wildlife Habitat and Diversity, Including for Endangered and Threatened Species.

In addition to the deleterious impacts land conversion has on air and water, it also harms wildlife habitat. Some of the species most affected by conversion of grassland to crops include birds and waterfowl, monarch butterflies, and pollinator insects.[102] Expanding biofuel croplands destroys shelter and breeding sites, and it reduces food availability for grassland-dependent wildlife species.[103] Any remaining grassland habitat in an area of agricultural expansion may not be large enough to support the number of remaining faunal individuals.[104] For example, migratory duck reproductive success in the PPR wetlands relies on the dense grassland cover for

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U.S. National Level Data (2012), https://www.nass.usda.gov/Publications/AgCensus/2012/Full_Report/Volume_1,_Chapter_1_US/st99_1_034_036.pdf. The 1.6 million acres of converted long-term grassland value is taken from Lark et al., *supra* note 8.

[100] *Water Questions & Answers: How much water does the average person use at home per day?*, U.S. Geological Surv., Water Sci. School, https://water.usgs.gov/edu/qa-home-percapita.html (last updated Dec. 2, 2016).

[101] Calculated based on conversion factors of 142.2 bushels per acre, and 2.8 gallons of ethanol produced per bushel. Total ethanol plant capacity is approximately 15.5 billion gallons per year. EIA, U.S. Energy Info. Admin., *US fuel ethanol production continues to grow in 2017* (July 21, 2017), https://www.eia.gov/todayinenergy/detail.php?id=32152

[102] David DeGennaro, *Fueling Destruction: The Unintended Consequences of the Renewable Fuel Standard on Land, Water and Wildlife*, Nat'l Wildlife Fed'n (2016), https://www.nwf.org/~/media/PDFs/Education-Advocacy/Fueling-Destruction_Final.ashx.

[103] Joseph E. Fargione et al., *Bioenergy and Wildlife: Threats and Opportunities for Grassland Conservation*, 59 BioScience 767, 770-772 (2009).

[104] James R. Herkert, *The Effects of Habitat Fragmentation on Midwestern Grassland Bird Communities*, 4 Ecological Applications 461, 464- 468 (1994), https://www.fws.gov/southwest/es/documents/R2ES/LitCited/LPC_2012/Herkert_1994.pdf.

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nest protection.[105] Conversion of grassland[106] to cropland in North and South Dakota destroys that protection and could thus displace over 1.8 million individual birds of just five species studied.[107] Diminishing landscape complexity by converting land to agricultural use also threatens plant biodiversity, which in turn threatens animal diversity.[108] Land used for biofuel

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[105] Scott E. Stephens et al., *Duck Nest Survival in the Missouri Coteau of North Dakota: Landscape Effects at Multiple Spatial Scales*, 15 Ecological Applications 2137, 2137-2149 (2005).

[106] Much of the grassland converted in this area is land exiting the Conservation Reserve Program ("CRP"), a program through which, in exchange for a yearly rental payment, farmers enroll environmentally sensitive, marginal land in 10-15 year contracts under which they remove the land from agricultural production and instead allow for the growth of plants that improve soil health and water quality and create wildlife habitat. Some believe that EPA should not allow land exiting the CRP to qualify as land available for the production of renewable biomass because of the climate and environmental impacts associated with the conversion of this land. *See, e.g.*, Christopher M. Clark et al, *Growing a sustainable biofuels industry: economics, environmental considerations, and the role of the Conservation Reserve Program*, 8 Envtl. Res. Letters 025016 (2013), http://iopscience.iop.org/article/10.1088/1748-9326/8/2/025016/pdf (concluding that "the combination of the environmental assessment and the simulations suggests that large-scale conversion of CRP to row crops would likely incur a significant environmental cost, without a large benefit in terms of biofuel production. Therefore, the current environmental benefits provided by CRP lands should be fully weighed in any full-cost accounting of their potential use."). In its recent Triennial Report, EPA acknowledges the environmental harms attributable to converting land exiting the CRP, noting that its 2011 report found that, "[i]n general, biofuel feedstock production was found to negatively impact biodiversity through loss of habitat, often in sensitive areas, and especially if idled lands in the Conservation Reserve Program (CRP) (with established conservation covers) were to be returned to crop production," a nd that "a decrease in CRP lands could lead to decreases in biodiversity and terrestrial ecosystem health," which "affects habitat availability as well as species diversity and abundance." EPA Triennial Report 2018 at 84, 91.

[107] Studied species include the sedge wren, grasshopper sparrow, dickcissel, bobolink, and Western meadowlark. Neal D. Niemuth et al., *Benefits of the Conservation Reserve Program to Grassland Bird Populations in the Prairie Pothole Region of North Dakota and South Dakota*, USDA Farm Serv. Agency 37 (2007), https://www.fsa.usda.gov/Internet/FSA_File/grassland_birds_fws.pdf.

[108] Non-agricultural prairie ecosystems in the northern Great Plains are home to up to a hundred grass, shrub, and flowering plant species. Tim G. Benton, Juliet A. Vickery & Jeremy D. Wilson, *Farmland biodiversity: is habitat heterogeneity the key?,* 18 Trends in Ecology & Evolution 182, 182-188 (2003); Fargione et al., *supra* note 101; Igl, L.D. et al., *The influence of local- and landscape-level factors on wetland breeding birds in the Prairie Pothole Region of North and South Dakota*, 2017–1096 U.S. Geological Survey Open-File Report, 65,

row crops supports 60% fewer animal species compared to an equal area of grassland.[109] The continual shift from diverse vegetative cover to corn and soy monoculture under EISA could endanger up to 65% of bird species across areas in the PPR.[110]

Also problematic, newly converted agricultural fields create physical barriers to the movement and dispersal of wildlife animals, causing habitat fragmentation. For example, some Midwest butterfly species have been observed to avoid crossing from their native prairie habitat into crop fields.[111] Threatened populations are especially sensitive to the habitat fragmentation and degradation caused by land conversion.[112] Indeed, one-third of all grassland-breeding bird species have been identified as species of conservation concern.[113] By converting suitable breeding or foraging habitat to cropland that is inhospitable to wildlife, already small populations become increasingly isolated. Further, wildlife communities that do survive on remaining

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https://pubs.usgs.gov/of/2017/1096/ofr20171096.pdf; Roy Robison, Donald White & Mary H. Meyers, *Plants in Prairie Communities*, Minn. Extension Ser., Univ. Minn. (1995), https://conservancy.umn.edu/bitstream/handle/11299/93930/3238.pdf?sequence=1&isAllowed=y; Fred B. Samson, Fritz L. Knopf & Wayne Ostlie, *Great Plains ecosystems: past, present, and future*, 32 Wildlife Society Bulletin 6, 6-15 (2004), https://pdfs.semanticscholar.org/d79c/19addc8ff79af6f5da54dc8026f89ddc346b.pdf.

[109] Diversity response ratio of biofuel to reference site is 0.4, translating to a 60% loss. Robert J. Fletcher et al., *Biodiversity conservation in the era of biofuels: risks and opportunities,* 9 Frontiers Ecology & Env't 161, 163, https://vtechworks.lib.vt.edu/bitstream/handle/10919/24366/090091.pdf;sequence=1.

[110] At least 20% of the PPR will experience between 7 to 65% decrease in bird species richness. Timothy D. Meehan, Allen H. Hurlbert & Claudio Gratton, *Bird communities in future bioenergy landscapes of the Upper Midwest,* 107 Proc. Nat'l Acad. Sci. 18533, 18536 (2010), http://www.pnas.org/content/pnas/107/43/18533.full.pdf.

[111] Leslie Ries & Diane M. Debinski, *Butterfly responses to habitat edges in the highly fragmented prairies of Central Iowa*, 70 J. Animal Ecology 840, 840-852 (2001), https://eurekamag.com/pdf/003/003374023.pdf.

[112] Fletcher et al., *supra* note 107; Meehan et al., *supra* note 108.

[113] State of the Birds, *State of North America's Birds 2016: Main Results,* http://www.stateoftheblrds.org/2016/overview/results-summary/ (last visited Oct. 15, 2018).

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grassland habitat may experience the downstream harms of fertilizer run-off or sedimentation from neighboring agricultural activity.

Grassland conversion also has serious implications for federally endangered and threatened species. The U.S. Fish and Wildlife Service has explicitly cited habitat loss due to agricultural expansion as a key risk for several listed species.[114] For example, in Minnesota, North Dakota, and South Dakota, grassland within close proximity to the designated critical habitat[115] for the endangered Poweshiek skipperling butterfly (*Oarisma poweshiek*) has been converted to corn or soybean cropland,[116] leading to habitat fragmentation. Replacing tallgrass prairie habitat with crop fields isolates already dwindling populations, as the Poweshiek skipperling is unable to fly over wide distances to seek suitable habitat,[117] and thus cannot recolonize areas where populations were previously extirpated. Another example of an endangered species further threatened by habitat loss due to biofuel-driven land conversion is the iconic whooping crane (*Grus Americana*). Whooping cranes are large, long-lived birds that rely

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[114] U.S. Fish & Wildlife Serv., *Recovery plan for the black-footed ferret (*Mustela nigripes*)*, 24-25 (2013), https://ecos.fws.gov/docs/recovery_plan/20131108%20BFF%202nd%20Rev.%20Final%20Recovery%20Plan.pdf.

[115] The Endangered Species Act ("ESA") defines "critical habitat" under section 3(5)(A) as (i) as the specific areas within the geographical area occupied by the species, at the time it is listed, on which are found those physical or biological features (1) essential to the conservation of the species and (2) which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed upon a determination by the Secretary that such areas are essential for the conservation of the species. *See* 16 U.S.C. 1532(5)(A).

[116] Lark et al., *supra* note 8; *see also* Declaration of Dr. Tyler Lark, Addendum to [Corrected] Environmental Petitioners' [Initial] Opening Brief, *Sierra Club and Gulf Restoration Network v. EPA*, No. 17-1258 (D.C. Cir. Aug. 2, 2018), at Exhibit A, attached as Exhibit 2 ("Tyler Lark Declaration").

[117] Clint D. Pogue et al., *Habitat suitability modeling of the federally endangered Poweshiek skipperling in Michigan*, 7 J. Fish & Wildlife Mgmt. 359, 359-368 (2016), http://fwspubs.org/doi/pdf/10.3996/052015-JFWM-049.

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on prairie and wetland habitat in the Great Plains region. However, significant conversion of land to corn or soy has occurred near the species' designated critical habitat in Kansas and on the Texas coast.[118] Trends of wetland drainage for agricultural expansion may further restrict the species' habitable range.[119]

Not only does conversion of grassland to cropland cause direct habitat destruction, but it also leads to nutrient pollution, eutrophication, and hypoxia, thereby impairing the habitats of endangered aquatic organisms. As of 2007, there were 139 fish, 70 mussels, 23 amphibians and 4 crayfish species listed as endangered or threatened in the U.S. At least 60 – a quarter – of these species were predicted to be imperiled by eutrophication.[120] Today, those numbers have risen to 165 fish, 91 mussels, 36 amphibians and 6 crayfish.[121] The Topeka Shiner (*Notropis topeka*), an endangered minnow that inhabits prairie streams and ponds in the Corn Belt states, provides an example of a locally impacted aquatic species.[122] Significant areas of land in Minnesota and Iowa have been converted to corn and soy cropland near its designated critical habitat,[123] and this expanding agriculture induces hydrological changes such as increased sedimentation, nitrogen loading and reduced stream flow, threatening the recovery of Topeka Shiner populations.[124] Fertilizer and pesticide run-off may lead to further declines of threatened filter-feeding shellfish

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[118] Lark et al., *supra* note 8; *see also* Tyler Lark Declaration, *supra* note 114.
[119] Lark et al., *supra* note 8; Wright & Wimberly, *supra* note 8.
[120] Walter K. Dodds et al., *Eutrophication of U.S. Freshwaters: Analysis of Potential Economic Damages*, 43 Envtl. Sci. & Tech. 12, 12-19 (2009), https://pubs.acs.org/doi/pdfplus/10.1021/es801217q.
[121] U.S. Fish & Wildlife Serv. ("USFWS") 2018 Environmental Conservation Online System, https://ecos.fws.gov/ecp0/reports/box-score-report.
[122] USFWS, *Topeka Shiner (Notropis topeka) 5-year Review: Summary and Evaluation*, USFWS, Kansas Ecological Servs. Field Office (2009), https://www.fws.gov/mountain-prairie/es/species/fish/shiner/TopekaShiner5YearReview01222010Final.pdf
[123] Lark et al., *supra* note 8; *see also* Tyler Lark Declaration, *supra* note 114.
[124] *See supra* note 120.

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species, either by direct toxicity or by promoting overgrowth of harmful algae.[125] For example, the Gulf of Mexico "dead zone" stems in part from biofuel-driven land conversion, which leads to increased nitrogen fertilizer runoff.[126] The effects of hypoxia in the Gulf, including low dissolved oxygen levels and harmful algae growth,[127] may harm critically endangered marine fauna like the Gulf sturgeon (*Acipenser oxyrhynchus desotoi*) and the loggerhead sea turtle (*Caretta caretta*).

4. Land Conversion Leads to a Loss of Agricultural Bioservices and Harms the Agricultural Economy.

Expansion of land conversion for corn ethanol and soy biodiesel production also compromises ecological services that benefit the agricultural economy. For example, intense grassland conversion rates in the PPR of the Dakotas have undermined habitat availability for commercial honey bees.[128] Globally, over a third of all agricultural produce relies on managed bee pollination, and U.S. commercial insect pollination services were valued at $27 billion in 2009.[129] Corn cropland expansion, however, increases lethal pesticide exposure for pollinators

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[125] S.B. Bricker et al., *Effects of nutrient enrichment in the nation's estuaries: a decade of change*, 8 Harmful Algae 21, 21-32 (2008), http://www.chesapeake.org/stac/downloads/habitat%20STAC/Bricker%20et%20al%20NEEA%20Key%20Findings%20&%20Summary.pdf.

[126] *See supra* Section I.B.2.i.

[127] Robert J. Diaz & Rutger Rosenberg, *Spreading Dead Zones and Consequences for Marine Ecosystems*, 321 Sci. 926, 926-929 (2008), https://pdfs.semanticscholar.org/fd24/459b08b635d12db8e1894228f728e5fda89e.pdf?_ga=2.124080458.1116472517.1539987208-2076078948.1537993308.

[128] Clint R.V. Otto et al., *Land-use change reduces habitat suitability for supporting managed honey bee colonies in the Northern Great Plains*, 113 Proc. Nat'l Acad. Sci. 10430, 10430-10435 (2016), http://www.pnas.org/content/pnas/113/37/10430.full.pdf.

[129] Alexandra-Maria Klein et al., *Importance of pollinators in changing landscapes for world crops,* 274 Proc. Royal Soc'y B 303 (2007). The $27 billion value is calculated as the sum of the value of directly dependent crops ($15.12 billion) and indirectly dependent crops ($11.80 billion). Nicholas W. Calderone, *Insect Pollinated Crops, Insect Pollinators and US Agriculture: Trend Analysis of Aggregate Data for the Period 1992-2009,* 7 PLoS ONE 1, 13 (2012), https://pdfs.semanticscholar.org/23dd/37b1d0a8a654e48b963e1c15e51bba503c27.pdf?_ga=2.89619035.1116472517.1539987208-2076078948.1537993308.

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and replaces native vegetation food sources, driving beekeepers out from former apiary sites.[130] Similarly, insect pest control services, worth over $4.5 billion for U.S. agriculture, decreased significantly with biofuel-driven land-use change in the Corn Belt.[131] For instance, new corn ethanol feedstock fields expel natural predators that suppress invasive soybean aphids, costing soybean farmers an estimated $60 million per year in reduced yield and additional pesticide application.[132] Combined biological services for other crops and pests will further increase these economic costs – not to mention an increase in the harms associated with pesticide use.

5. Expanding Land Conversion Harms Marginal and Sensitive Land.

Over the past decade, massive areas of marginal and sensitive land have been cleared for corn and soy cultivation. As biofuel demand continues to drive economic incentives to convert uncultivated land to cropland for corn and soy production, experts predict that farmers may choose to cultivate more "high-risk" lands.[133] Marginal lands are generally characterized by low productivity and serious limitations for agricultural use.[134] For example, the USDA National

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[130] Otto et al., *supra* note 126.

[131] Insects are responsible for 33% of natural pest suppression; other controls include natural pathogens or climatic conditions. John E. Losey & Mace Vaughan, *The Economic Value of Ecological Services Provided by Insects,* 56 BioScience 311, 319 (2006); Douglas A. Landis et al., *Increasing corn for biofuel production reduces biocontrol services in agricultural landscapes*, 105 Proc. Nat'l Acad. Sci. 20552 (2008), http://www.pnas.org/content/pnas/105/51/20552.full.pdf.

[132] $58 million refers to the value of biocontrol lost for integrated pest management sites, under projected corn expansion in Iowa, Michigan, Minnesota, and Wisconsin. Farms using biocontrol alone may lose up to $671 million. *Id.* at 20555.

[133] Roger Claassen et al., *Grassland to Cropland Conversion in the Northern Plains: The Role of Crop Insurance, Commodity, and Disaster Programs*, USDA Econ. Res. Serv. (June 2011), https://www.ers.usda.gov/webdocs/publications/44876/7105_err120_reportsummary.pdf?v=41056; Tong Wang et al., *Determinants of Motives for Land Use Decisions at the Margins of the Corn Belt*, 134 Ecological Econ. 227, 227-237 (2017), https://pdfs.semanticscholar.org/0005/af6b4a958293e85178b758016ca4da36afbc.pdf.

[134] *See* Shujiang Kang et al., *Marginal lands: concept, assessment and management*, 5 J. Agric. Sci. 129, 129-139 (2013), for detailed discussion on the concept and definitions of "marginal land." http://www.ccsenet.org/journal/index.php/jas/article/download/24515/16222.

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Resources Conservation Service classifies "prime" versus "marginal" land based on its capability to produce cultivated crops without deteriorating over the long term.[135] These criteria derive from soil characteristics: soils on marginal lands are "economically prohibitive" due to the steepness of slope, depth to bedrock, and other risks of damage if they are used for crops.[136] ***Half of all new cropland between 2008 and 2012 expanded onto land with these "severe cultivation limitations*.**"[137] Studies show evidence of recent westward agricultural expansion in the Corn Belt, where new corn crops are exposed to inhospitable conditions with high risk of drought.[138] Within the same timeframe, over 136,000 acres of wetlands habitat were drained for expansion of potential feedstock croplands in the Western Corn Belt.[139] Forty-two percent of these losses were concentrated in PPR wetlands, which are highly productive ecosystems that both sequester carbon and serve as critical migratory wildlife refuges.[140] Beyond the Corn Belt,

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[135] USDA's "land capability classes" ("LCC") range from "slight limitations that restrict [the lands'] use" to "very severe limitations that make [the lands] unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat." *National soil survey handbook*, U.S. Dep't of Agric., Nat. Res. Conservation Serv. 6222- A.2, https://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=41985.wba.

[136] USDA, Nat. Res. Conservation Serv., *Land Use/Land Cover*, https://www.nrcs.usda.gov/wps/portal/nrcs/ar/technical/landuse/.

[137] Lark et al., *supra* note 8, at 7.

[138] Wright & Wimberly, *supra* note 8, at 4136.

[139] The figure includes acreage from Iowa, Minnesota, Nebraska, North Dakota, and South Dakota. *See* Lark et al., *supra* note 8.

[140] EPA defines the Prairie Pothole Region as depressional wetlands found primarily in North Dakota, South Dakota, Wisconsin, and Minnesota. *Prairie Potholes,* EPA, https://www.epa.gov/wetlands/prairie-potholes (last updated July 26, 2018). Forty-two percent is calculated as the proportion of wetland acres converted in Minnesota, North Dakota and South Dakota (56,684 acres) to total converted wetlands acreage in the Western Corn Belt states (136,453 acres). *See* Lark et al., *supra* note 8; *see also* Carol A. Johnston, *Wetland Losses Due to Row Crop Expansion in the Dakota Prairie Pothole Region,* 33 Wetlands 175, 175-182 (2013), https://smarterfuelfuture.org/assets/content/Johnston_Wetlands_20131.pdf; William J. Mitsch & James G. Gosselink, *The Value of Wetlands: Importance of Scale and Landscape Setting,* 35 Ecological Econ. 25, 25-33 (2000), http://cescos.fau.edu/gawliklab/papers/MitschWJandJGGosselink2000.pdf.

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new marginal cropland areas surrounding the Appalachians, Ozarks, and the rapidly-depleting Ogallala aquifer nearly doubled in four years.[141] The trend of converting this marginal and sensitive land to crop land signals a step backward for environmental conservation, and it frustrates the environmental safeguards built into EISA.

One particularly harmful impact of tilling marginal lands is the risk of increased soil erosion.[142] The U.S. Midwest has already suffered a land degradation catastrophe – the 1930's Dust Bowl.[143] History may repeat itself if EPA does not actively monitor land-use changes under the RFS. Not surprisingly, soil loss rates increase dramatically when more erodible land is forced into production. Expansion of continuous corn systems will pose more severe sedimentation and erosion risks than other biofuel crops due to the greater fertilizer and tillage requirements.[144] Case studies in Iowa, for instance, show that nearly 60% of observed crop-rotation changes between 2007 and 2012 were driven by continuous corn plantings, and 40% of the changes shifted to continuous soybean production.[145]

6. Expanding Land Conversion Increases Soil Deterioration.

Physical conversion of native landscapes not only generates soil organic carbon emissions, but also causes soil conditions to deteriorate. Grasslands serve a valuable ecosystem

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[141] Lark et al., *supra* note 8, at 4.
[142] Silvia Secchi et al., *Corn-based ethanol production and environmental quality: a case of Iowa and the Conservation Reserve Program*, 44 Envtl. Mgmt. 732, 733 (2009).
[143] Benjamin I. Cook, Ron L. Miller & Richard Seager, *Amplification of the North American "Dust Bowl" drought through human-induced land degradation,* 106 Proc. Nat'l Acad. Sci. 4997, 4997-5001 (2009), http://www.pnas.org/content/pnas/106/13/4997.full.pdf.
[144] *Id.*
[145] Jie Ren, James B. Campbell & Yang Shao, *Spatial and temporal dimensions of agricultural land use changes, 2001-2012, East-Central Iowa*, Agric. Sys. 148, 149-158 (2016), https://vtechworks.lib.vt.edu/bitstream/handle/10919/81559/Ren_J_D_2016.pdf?sequence=1&isAllowed=y#page=13.

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function of maintaining soil structure and integrity.[146] Long-term plant biomass physically anchors and shields the soil from wind and water stress while retaining soil nutrients such as nitrogen and phosphorus.[147] Plowing grassland reduces soil organic matter by up to 17% in the first year of cultivation, stunting soil fertility.[148] Even conversion from perennial grassland to no-tillage systems destroys 57% of original root biomass.[149] Biofuel-related agricultural development on grasslands negates these natural benefits and undoubtedly exacerbates soil degradation from erosion.

Compounding these harms, increased erosion leads to higher rates of nutrient loss. The soil that is lost as a result of the land conversion contains up to three times more nutrients than what is left in the remaining soil.[150] An acre of land converted from grassland to corn or soy monoculture can lose up to ***27 pounds*** of soil nitrogen annually.[151] And decades of scientific literature has also linked erosion to lower plant/crop productivity, waterway and dam damage

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[146] William R. Gascoigne et al., *Valuing ecosystem and economic services across land-use scenarios in the Prairie Pothole Region of the Dakotas, USA,* 70 Ecological Econ. 1715, 1715-1725 (2011), https://esanalysis.colmex.mx/Sorted%20Papers/2011/2011%20USA%20-CS%20USA%20ND%20SD,%20BiodivCO2%20Econ.pdf.

[147] David Pimentel & Michael Burgess, *Soil Erosion Threatens Food Production*, 3 Agric. 443, 443-463 (2013), https://www.bmbf.de/files/agriculture-03-00443.pdf.

[148] H. Tiessen, J.W.B. Stewart & J.R. Bettany, *Cultivation Effects on the Amounts and Concentrations of Carbon, Nitrogen, and Phosphorus in Grassland Soils*, 74 Agronomy J. 831 (1982).

[149] S. Tianna DuPont et al., *No-tillage conversion of harvested perennial grassland to annual cropland reduces root biomass, decreases active carbon stocks, and impacts soil biota*, 137 Agric., Ecosystems & Env't 25, 25-32 (2010).

[150] David Pimentel & Nadia Kounang, *Ecology of Soil Erosion in Ecosystems*, 1 Ecosystems 416, 416-426 (1998), http://www.doc-developpement-durable.org/file/eau/lutte-contre-erosion_protection-sols/Ecology%20of%20Soil%20Erosion.pdf.

[151] According to USDA ERS data, the average price of corn from 2007 to 2012 is $196.70 per ton; this study models effects of crop expansion at $196.84 per ton of corn in Iowa. Secchi et al., *supra* note 140, at 741.

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from sediment clogging, and a higher risk of flooding.[152] In North and South Dakota, for instance, converting one million acres of native prairie to cropland will cost $6.4 million annually in soil loss related damages.[153]

II. CONGRESS ENACTED EISA TO CURB CLIMATE CHANGE AND ADVANCE OTHER ENVIRONMENTAL GOALS.

A. EISA's Primary Objective Is to Reduce Greenhouse Gas Emissions.

In 2007, in an effort to increase the production of renewable fuels and thereby reduce greenhouse gas emissions, as well as to move the United States toward greater energy independence, Congress passed the Energy Independence and Security Act ("EISA"). EISA adopted and amended measures Congress put in place under the 2005 Energy Policy Act.

Under the Energy Policy Act, gasoline sold in the United States had to contain a certain percentage of renewable fuel, defined as fuel produced from biomass, or natural gas produced from a biogas source, that is "used to replace or reduce the quantity of fossil fuel present in a mixture used to operate a motor vehicle."[154] It includes "cellulosic biomass ethanol and 'waste derived ethanol'; and biodiesel . . . and any blending components derived from renewable fuel (provided that only the renewable fuel portion of any such blending component shall be considered part of the applicable volume under the renewable fuel program)."[155] Under the Energy Policy Act, Congress established "applicable volume[s] of renewable fuel" through

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[152] Pimentel & Burgess, *supra* note 133; R. Lal, *Soil Erosion Impact on Agronomic Productivity and Environment Quality,* 17 Critical Rev. Plant Sci. 319, 319-348 (1998); Luise Kohl et al., *Agricultural practices indirectly influence plant productivity and ecosystem services through effects on soil biota*, 24 Ecological Applications 1842 (2014), https://dspace.library.uu.nl/bitstream/handle/1874/308320/1.pdf?sequence=1.
[153] Gascoigne et al., *supra* note 144 at 1722.
[154] Energy Policy Act, 119 Stat. 1068, § 1501(a).
[155] *Id.*

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2012.[156] For 2013 and beyond, the EPA Administrator, in coordination with the Secretaries of USDA and Energy Department, had to set applicable renewable fuel volumes based on a review of "the impact of the use of renewable fuels on the environment, air quality, energy security, job creation, and rural economic development," as well as "the expected annual rate of future production of renewable fuels, including cellulosic ethanol."[157]

To ameliorate the growing harms stemming from global climate change, EISA builds upon the renewable fuel foundation established by the Energy Policy Act. Toward that end, Congress included within EISA a new Renewable Fuel Standard ("RFS"), which, among other things, increases the volume and greenhouse gas performance of biofuel required to be used to qualify as renewable fuel and imposes restrictions on how land may be used to satisfy the standard.[158]

In adopting EISA, Congress tasked EPA with promulgating regulations to ensure "that transportation fuel sold on or introduced into commerce in the United States… on an annual average basis, contains at least the applicable volume" of one of four distinct biofuel categories.[159] EISA divides biofuels into four separate categories based in large part on each fuel's ability to achieve a certain percentage of greenhouse gas emissions reduction relative to traditional fuel: renewable fuel, advanced biofuel, cellulosic fuel, and biomass-based diesel.[160]

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[156] *Id.*
[157] *Id.*
[158] EISA Pub. L. No. 110-140, § 202(a)(1), 121 Stat. 1529 (2007); *see also* 42 U.S.C. §§7545(o)(1)(A), 7545(o)(1)(I)(i).
[159] EISA § 202(a)(2); *see also* 42 U.S.C. §7545(o)(2)(B).
[160] EISA § 202(a)(2). The categories are "nested" because the definition of "advanced biofuel" includes both "cellulosic biofuel" (which has a higher percentage of reduction in greenhouse gas emissions than the base definition of "advanced biofuel") and "biomass-based diesel" (which has the same or greater percentage reduction than "advanced biofuel"), *id.* § 7545(o)(1)(B), meaning that fuel can include a higher volume of either cellulosic biofuel or biomass-based diesel in order

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Specifically, EISA's RFS mandates that such fuel contain a minimum volume of "additional renewable fuel" as a percentage of the total fuel volume sold by each fuel producer.[161] It defines "additional renewable fuel" as "fuel that is produced from ***renewable biomass*** and that is used to replace or reduce the quantity of fossil fuel present in a transportation fuel."[162]

Under the statute, "renewable biomass" includes crop-based biomass,[163] which is defined as "[p]lanted crops and crop residue harvested from agricultural land ***cleared or cultivated at any time prior to the enactment of this sentence that is either actively managed or fallow, and nonforested.***"[164] Thus, for crops to count towards the renewable fuels volume mandate, the land on which they are grown must meet three criteria: it must have been (1) cleared or cultivated at any time prior to 2007, (2) actively managed or fallow in 2007, and (3) nonforested in 2007. These requirements prevent land that was not cultivated before 2007 or in cultivation as of the date of EISA's passage from being used to increase biofuel production, thereby reducing the release into the atmosphere of significant amounts of greenhouse gas emissions from the initial turning of the soil for cultivation as cropland, while avoiding the negative environmental impacts associated with this land conversion.

In addition to the land conversion limitations, EISA also drastically increases the biofuel requirements from levels set by prior legislation. Under the Energy Policy Act, the amount of renewable fuel in gasoline was required to increase in volume annually, from 4 billion gallons in

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to meet the required volume of advanced biofuel, thus theoretically increasing the overall reduction in greenhouse gas emissions relative to traditional fuel.

[161] EISA §202(a)(1). This RFS replaced a prior RFS framework set forth in the Energy Policy Act of 2005. *See* 42 U.S.C. §13201 et seq. (2005).

[162] EISA §201(1)(A) (emphasis added).

[163] In addition to crop-based biomass, the definition also includes biomass from trees, animal waste, slash, algae, and yard waste. EISA §201(1)(I).

[164] EISA §201(1)(I)(i) (emphasis added).

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2006 to 7.5 billion gallons in 2012.[165] EISA increases the annual volume mandate for renewable fuels and extends the timeline for implementation, requiring that the renewable fuel volume increase from 9 billion gallons in 2008 to 36 billion gallons by 2022.[166] It further requires that the renewable fuels comprising the EISA volume mandate achieve a minimum level reduction in greenhouse gas emissions as compared to traditional fuels.[167] By increasing the required volume of renewable fuel, EISA aims to further reduce greenhouse gas emissions.

The climate change goals and intended impact of EISA played a pivotal role during the legislative process. During floor debates, Representative Barbara Lee of California remarked that EISA "eliminates greenhouse gases equivalent to 28 million cars from our roads[,] . . . includes a renewable fuels standard that contains safeguards to reduce carbon emissions and protect our environment[, and] . . . takes the right steps forward to . . . fight global warming."[168] Representative Jim Moran of Virginia touted the bill as "a substantial commitment toward lower greenhouse gas emissions," and projected that the policies implemented under EISA – including but not limited to the RFS – would, by 2030, "achieve[ ] about 40 percent of the greenhouse gas emissions reductions most scientists have concluded are needed to avoid catastrophic global climate change."[169] Representative Rush Holt of New Jersey, who at that time was a member of the Committee on Natural Resources, said that the bill would "take the long-overdue first steps toward addressing global climate change," and that it would "drastically reduce our greenhouse

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[165] 42 U.S.C. §7545(o)(2)(B)(i) (2006), *amended by* 42 U.S.C. §7545(o)(2)(B)(i) (2007).
[166] EISA § 202(a)(2).
[167] *Id.* § 202(a)(1).
[168] 153 Cong. Rec. H14451-02, 2007 WL 4270020.
[169] 153 Cong. Rec. H14434-02, H14442, 2007 WL 4269999.

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gas emissions."[170] And Representative Betty McCollum of Minnesota stated that the bill would "address the impending climate crisis."[171]

Signing the bill into law, President George W. Bush called the legislation "a major step" toward "confronting global climate change."[172] Estimating that "these initiatives could reduce projected CO_2 emissions by billions of metric tons," the President concluded that "[t]he legislation I'm signing today will lead to some of the largest CO_2 emission cuts in our nation's history."[173]

Thus, as evidenced by the text of EISA and its legislative history, the climate change objectives of the statute are part of the foundation upon which EISA was built. And these climate objectives are even more pressing today than at the time of EISA's passage. Since EISA was enacted in 2007, average global CO_2 concentration has risen from 383 parts per million ("ppm") to 408 ppm,[174] and average global temperature has risen by 0.26°C (0.47°F).[175] In 2016, there were 15 climate change-related extreme weather events in the United States that each had over $1 billion in losses, and in total resulted in $46 billion in direct costs.[176] It is crucial that EPA ensures that the RFS program does not further exacerbate the climate crisis.

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[170] 153 Cong. Rec. H14453-02 (Dec. 6, 2007).
[171] 153 Cong. Rec. E2661.
[172] *President Bush Statement at Signing, President Bush Signs H.R. 6, The Energy Independence and Security Act of 2007*, 2007 WL 4429070, at *1-2.
[173] *Id.*
[174] Reported carbon dioxide concentrations measured in January of 2007 and 2018 at the Mauna Loa Observatory, Hawaii. *See* NASA, *Carbon Dioxide*, https://climate.nasa.gov/vital-signs/carbon-dioxide/.
[175] Average global temperature change is calculated from the difference of anomalies (relative to 1951-1980 average temperatures) from 2007 to 2017. *See* NASA, *Global Temperature*, https://climate.nasa.gov/vital-signs/global-temperature/.
[176] Adam Smith, *2016: A historic year for billion-dollar weather and climate disasters*, NOAA 2017, https://www.climate.gov/news-features/blogs/beyond-data/2016-historic-year-billion-dollar-weather-and-climate-disasters-us.

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B. EISA Has Several Additional Environmental Objectives.

In addition to its focus on reducing greenhouse gas emissions, EISA also aims to address a number of other key environmental issues. Toward that end, the statute contains a requirement that every three years, EPA prepares and produces a report that examines the past and future impacts of the RFS program:[177]

> [T]he Administrator of the Environmental Protection Agency, in consultation with the Secretary of Agriculture and the Secretary of Energy, shall assess and report to Congress on the impacts to date and likely future impacts of the requirements of section 211(o) of the Clean Air Act on the following:
>
> (1) Environmental issues, including air quality, effects on hypoxia, pesticides, sediment, nutrient and pathogen levels in waters, acreage and function of waters, and soil environmental quality.
> (2) Resource conservation issues, including soil conservation, water availability, and ecosystem health and biodiversity, including impacts on forests, grasslands, and wetlands.
> (3) The growth and use of cultivated invasive or noxious plants and their impacts on the environment and agriculture.[178]

Similarly, EPA must consult with the Secretary of Agriculture and the Secretary of Energy to set future volumes of renewable fuels, taking into consideration the impact of renewable fuel use on, among other things, "the environment, including on air quality, climate change, conversion of wetlands, ecosystems, wildlife habitat, water quality, and water supply."[179] EISA amends Section 977 of the Energy Policy Act of 2005, 42 U.S.C. § 16317, to include the following language: "develop cellulosic and other feedstocks that are ***less resource and land intensive and that promote sustainable use of resources, including soil, water, energy, forests, and land, and***

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[177] EISA § 204(a).
[178] *Id.*
[179] *Id.* at §202(a)(2)(B).

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ensure protection of air, water, and soil quality."[180] And it amends Section 307(d) of the Biomass Research and Development Act of 2000, 7 U.S.C. § 8606(d), to add language focused on "the systematic evaluation of the impact of expanded biofuel production on the environment, including forest lands, and on the food supply for humans and animals."[181] These provisions demonstrate a commitment to environmental protections and resource conservation objectives that go beyond EISA's climate goals.

EISA's legislative history further reflects the statutory focus on environmental protection. During the floor debate, several members of Congress noted that they understood that EISA provided crucial environmental protections beyond the reduction in greenhouse gas emissions. Representative John Dingell of Michigan, who at the time was a senior member of the Committee on Energy and Commerce, stated in extended remarks to the House that the section of EISA defining renewable biomass "adds some important environmental safeguards to the RFS program, including ones that will help protect certain wildlife habitats and special eco-systems."[182] Representatives Steve Kagen of Wisconsin, Betty Sutton of Ohio, and Tom Udall of New Mexico each separately noted the critical environmental protections provided by EISA.[183] In signing EISA into law, President Bush stated that the "measures" in EISA would "help us improve our environment."[184]

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[180] *Id.* at §232(a)(2)(D) (emphasis added).
[181] *Id.* at §232(b)(3).
[182] 153 Cong. Rec. E2665-01, 2007 WL 4556844, at *E2666 (Dec. 18, 2007).
[183] 153 Cong. Rec. H14255-04, 2007 WL 4269986 (Dec. 6, 2007) (Kagen: EISA will "protect our environment"); 153 Cong. Rec. H14258 (Dec. 6, 2007) (Sutton: EISA will "implement necessary environmental protections"); 153 Cong. Rec. H14262 (Dec. 6, 2007) (Udall: EISA is "good for the environment").
[184] *President Bush Statement at Signing, President Bush Signs H.R. 6, The Energy Independence and Security Act of 2007*, 2007 WL 4429070, at *2.

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Thus, as the text and legislative history make clear, EISA offers a number of critical environmental safeguards. Not only does it aim to significantly reduce greenhouse gas emissions, but it also provides important environmental protections that extend far beyond climate change.

C. EPA Established a Regulatory Framework for Enacting EISA's Requirements.

To effectuate the purposes of EISA, in March, 2010, EPA issued a Final Rule for the new RFS under EISA.[185] The EISA rule reflected the higher renewable fuel volumes set in the new statute. It also largely incorporated the regulatory approach to renewable fuel tracking that EPA had previously established under the Energy Policy Act of 2005.[186] Under this regulatory framework, EPA must convert the mandated renewable fuel volumes into a percentage standard based on the estimated total amount of gasoline produced in or imported into the United States each year. Entities that "produce[] or import[] gasoline for consumption in the United States, including refiners, importers, and blenders" ("obligated parties") then determine their Renewable Volume Obligation ("RVO") – the volume of renewable fuel that party must use in the U.S. that year – by multiplying the percentage standard by the annual volume of gasoline the party individually produces or imports.[187] Renewable Identification Numbers ("RINs") are distributed for each gallon and each batch of renewable fuel used by a party.[188] To demonstrate compliance with its RVO at the end of each year, an obligated party must show that it has obtained a sufficient number of RINs to meet its RVO.[189]

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[185] 75 Fed. Reg. at 14,670 (March 26, 2010).
[186] 42 U.S.C. §13201 et seq. (2005).
[187] Regulation of Fuels and Additives: Renewable Fuel Standard, 72 Fed. Reg. 23,900, 23,908 (May 1, 2007); *Id.* at 23,908.
[188] *Id.*
[189] *Id.*

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Though the final rule left the RFS regulatory approach largely intact,[190] it implemented one important change. It introduced a new approach – aggregate compliance – for determining whether land was in cultivation prior to 2007 and thus for discerning whether the crops grown on the land can count toward the renewable fuel volume mandates.[191] In adopting this new approach, EPA disregarded its initial proposal that, in order to receive a RIN, each obligated party must prove that the land used to produce feedstock for its renewable fuel was in cultivation – actively managed or fallow – at the time of EISA's passage in 2007.[192]

Specifically, EPA initially proposed "restrict[ing] planted crops and crop residue" used for renewable biomass "to that harvested from existing agricultural land," and proposed to define "agricultural land" as "land that was cleared or cultivated prior to December 19, 2007, and that, since December 19, 2007, it has been continuously actively managed (as agricultural land) or fallow, and nonforested."[193] It detailed ***seven distinct methods to independently verify or certify compliance with EISA's land use restrictions to ensure that newly converted land was not used to produce renewable biomass***, for example, requiring producers to provide documentation of the origin of the feedstock.[194] Numerous commenters supported this approach, noting that

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[190] 75 Fed. Reg. at 14,721.
[191] *Id.* at 14,701.
[192] Regulation of Fuels and Fuel Additives: Changes to renewable Fuel Standard Program, 74 Fed. Reg. 24,904, 24,911 (proposed May 26, 2009) (to be codified at 40 C.F.R. pt. 80) ("[P]lanted crops and crop residue must be harvested from agricultural land cleared or cultivated at any time prior to December 19, 2007, that is actively managed or fallow and non-forested. Therefore, planted crops and crop residue derived from land that does not meet this definition cannot be used to produce renewable fuel for credit under" the RFS.).
[193] *Id.* at 24,931. By defining agricultural land in this way, EPA proposed to set the upper bound on acreage that qualifies for planted crop and crop residue production under" the RFS as "existing agricultural land – cropland, pastureland, or CRP land – as of December 19, 2007." *Id.* at 24,932.
[194] *Id.* at 24,938.

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individual compliance and recordkeeping were both necessary for program integrity and not unduly burdensome. These commenters emphasized the importance of avoiding the disruption of natural ecosystems and wildlife habitats due to land-use conversion.[195]

EPA's Final Rule differed fundamentally from its proposal. It disregarded its own suggested approaches and those of the commenters, and instead adopted the aggregate compliance approach, which is the focus of this Petition.

D. EPA Devised an Aggregate Compliance Approach to Measure Land Conversion.

Under EPA's new aggregate compliance scheme, EPA starts with a baseline determination of the total amount of "existing agricultural land" in the U.S. at the time of EISA's enactment, which it calculated to be 402 million acres.[196] EPA then monitors agricultural acreage and compares it to this 402 million acre figure.[197] If the number does not exceed this level, EPA will assume – without any kind of verification – that feedstocks derived from planted crops and crop residue were grown on agricultural land cultivated prior to EISA's enactment.[198] If the total agricultural land in use ever approaches or exceeds the 402 million acre baseline, EPA will consider requiring each grower to prove that its land was in cultivation prior to 2007.[199]

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[195] *See, e.g.*, Comments of the Environmental Working Group, EPA-HQ-OAR-2005-0161-2508 (September 25, 2009), at 2 ("EWG is very concerned about the potential for slippage under the land conversion prohibitions. . . . Some coordination between USDA base acreage accounting and EPA biofuel feedstock accounting needs to be developed to avoid this problem."); *see also* Comments from the Environmental Community, submitted by Friends of the Earth, EPA-HQ-OAR-2005-0161-2129 (September 25, 2009), at 2-3 ("The way in which 'Renewable Biomass' is defined could have an enormous impact on natural ecosystems and wildlife habitat globally," and thus "to prevent expansion of crop land in to grassland and the conversion of naturalized ecosystems," "land use and cropping history data will be needed to verify land eligibility," and noting that USDA can provide this data).
[196] 75 Fed. Reg. at 14,701.
[197] Aggregate compliance only applies to domestic crop producers. It does not apply to imported fuels or to fuels made from other things such as woody biomass. *Id.*
[198] *Id.* at 14,703.
[199] *Id.*

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The aggregate compliance approach essentially removes individual accountability from the equation. And it likewise largely removes EPA oversight from the process, relieving EPA of any responsibility to ensure that new land is not improperly converted in contravention of EISA's mandates.[200]

However, in its effort to cut corners for itself and for producers, EPA created a regulatory scheme that undermines what EISA set out to accomplish. While the total aggregate amount of cropland may have remained at or below 2007 levels, this has not prevented the conversion of land that was not in cultivation in December 2007. Indeed, during this time, millions of acres of agricultural land were taken out of production for urban or suburban development, thereby allowing for the cultivation of an equal amount of native grassland or wetlands without going over the regulatory cap. The result has been ***an astounding increase in the amount of uncultivated land in 2007 that has been converted to cropland***. This, in turn, has caused severe environmental damage, including increased greenhouse gas emissions, water pollution, destruction of wildlife habitat, loss of agricultural bioservices, and soil and land erosion. The aggregate compliance approach is thus antithetical to the purposes of EISA.

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[200] As part of the new aggregate compliance approach to calculating land use conversion, the new RFS rule also introduced several new terms and definitions relevant to determining compliance with EISA's land use restriction. For example, the rule defines "fallow" land as "agricultural land that is intentionally left idle to regenerate for future agricultural purposes, with no seeding or planting, harvesting, mowing, or treatment during the fallow period." *Id.* at 14,865. It defines "nonforested" land as all land that is not "forestland," and defines "forestland" as "generally undeveloped land covering a minimum area of one acre upon which the predominant vegetative cover is trees, including land that formerly had such tree cover and that will be regenerated." *Id.* And it explains that "the term 'actively managed' is best interpreted by reference to the type of material and practices that this provision addresses – namely crops and residue associated with growing crops." *Id.* at 14,692.

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III. AGGREGATE COMPLIANCE IS CONTRARY TO THE TEXT AND ANTITHETICAL TO THE PURPOSES OF EISA.

Congress enacted EISA with a clear environmental vision in mind. Both the text of the statute and the legislative history leave no doubt that EISA intended to reduce greenhouse gas emissions by increasing the use of renewable fuels. To harness the environmental benefits afforded by increased renewable fuel use, EISA put in place explicit provisions to limit the conversion of undeveloped land to cropland for purposes of growing crops to be used in renewable fuels. EPA's aggregate compliance scheme undermines these land use restrictions and in so doing, unravels the many crucial environmental protections upon which EISA is predicated.

A. Aggregate Compliance Fails to Meet EISA's Land Conversion Restrictions.

The aggregate compliance rule does not meet EISA's clear textual requirements and does not serve EISA's environmental purposes. Indeed, it undermines the unambiguous mandates of the statute, while causing far-reaching environmental harms that are antithetical to EISA's purposes. Given this fundamental incompatibility, EPA should implement a new compliance mechanism, one that serves – rather than undermines – the clear climate and other environmental objectives of EISA.

1. The Aggregate Compliance Rule Does Not Meet EISA's Explicit Land Conversion Requirements.

The aggregate compliance rule fails to ensure that the particular crops used for renewable fuels are grown on agricultural land that complies with EISA's statutory requirements. EISA unambiguously requires that the crops and crop residues used for renewable fuels be grown on land that was (1) cleared or cultivated at any time prior to the enactment of EISA, (2) actively managed or fallow on December 19, 2007 (when EISA went into effect), and (3) nonforested on

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December 19, 2007.[201] Despite this explicit requirement – which necessarily depends on individualized determinations about the land used to grow renewable fuel sources – the aggregate compliance rule turns a blind eye to reality, ignoring data that would demonstrate whether particular land qualifies under EISA's standard so long as the amount of land in use as cropland across the country remains below a threshold level. Though convenient and easy to administer, this method contravenes EISA's clear mandate, violating both the spirit and letter of the law.

Under the aggregate compliance scheme, land not in cultivation as of December 2007 may be used to produce crops for renewable fuel sources, the consequence of which is the harmful release of vast quantities of greenhouse gases into the atmosphere. Indeed, as noted above, the scenario is not only possible, but has, in fact, come to pass. ***Millions of acres of ineligible land have been converted for ethanol and biodiesel feedstock***. By allowing this outcome, EPA is unquestionably violating the law and undermining the statutory objectives. The text of the statute could not be more clear: it unambiguously identifies the land that can be used for renewable biomass production, limiting it to land cleared or cultivated prior to 2007, that is actively managed or fallow in 2007, and that is nonforested in 2007.[202] Aggregate compliance, in contrast, ignores these limitations and instead permits cultivation of land not in production in December 2007 provided the total land in cultivation remains constant.

Under this scheme, by EPA's own admission, ***there has been an increase of between 4-7.8 million acres of actively managed land*** since EISA's passage, in direct contravention of the

[201] EISA §201(1)(I)(i).
[202] *Id.*

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statute.[203] EPA's approach – allowing for unfettered land conversion as long as the total amount of agricultural land in use remains below a certain amount – is fundamentally at odds with the statutory requirements. Here, the language of the statute and the intent of Congress are clear and unambiguous,[204] and thus EPA's interpretation deserves no deference.[205] EPA's use of the aggregate compliance approach is therefore unlawful.

2. The Aggregate Compliance Rule Undermines EISA's Environmental Purposes.

The legislative history of EISA makes clear that EISA and its accompanying RFS aim to reduce greenhouse gas emissions and protect the environment from degradation to the water, air, wildlife habitat, and natural landscape. The aggregate compliance scheme undermines these environmental goals by allowing millions of acres of previously undeveloped land to be converted to agricultural use since EISA's enactment, resulting in increased greenhouse gas emissions and numerous harms to the water, air, wildlife habitat, and natural landscape.

As indicated above, converting native ecosystems, such as grassland and wetland habitat or other previously uncultivated land, to cropland releases large quantities of greenhouse gases and leads to water and air pollution, wildlife habitat destruction, and other environmental harms. For example, conversion of 1.6 million acres of native grassland– the most conservative calculation of the ineligible land converted to grow ethanol feedstock since EISA's enactment – releases ***87 million metric tons of CO_2***. *See* Table 1. Studies show that the conversion of land

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[203] EPA Triennial Report 2018 at 111. This figure includes some quantity of land that was previously cultivated at some point prior to December 2007, but that was not in cultivation as of that date. At least 1.6 million acres of this quantity consists of prairieland that had remained uncultivated since 1970. *See* Lark et al. *supra* note 8, at 5.
[204] *W. Virginia Univ. Hosps., Inc. v. Casey*, 499 U.S. 83, 84 (1991).
[205] *Chevron, U.S.A., Inc. v. Nat. Res. Def. Council, Inc.*, 467 U.S. 837, 842–43 (1984) ("[i]f the intent of Congress is clear, that is the end of the matter; for the court, as well as the agency, must give effect to the unambiguously expressed intent of Congress").

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from its natural state to cropland used to grow crops for renewable fuels results in a net increase in greenhouse gas emissions which takes an average of ***93 years*** to offset.[206] Thus, EISA's purpose of reducing greenhouse gas emissions is undermined when the renewable fuels that EISA promotes come from land that has been converted from non-agricultural land.

Not only does it release vast volumes of greenhouse gases, but, as discussed *supra*, converting land to cropland also has deleterious impacts on air and water quality, wildlife habitat and diversity, and natural landscape. These environmental harms run counter to EISA's goal of protecting the environment. EISA's implementing regulations, therefore, should aim to limit land conversion. EPA's aggregate compliance scheme does no such thing. By failing to restrict land conversion, the aggregate compliance approach contributes to these harms, undermining the protections EISA sought to implement. This is contrary to the statute, and is illegal.

B. EPA's Use of Aggregate Compliance is Unjustified.

Despite aggregate compliance's clear contravention of EISA and the failure of the rule to conform to EISA's textual mandate, EPA has defended this approach as consistent with the statute, stating in 2010 that it has "high confidence that the aggregate compliance approach for grown crops and crop residues meets the statutory obligation."[207] While EPA's stated rationales for the rule were unfounded and illogical in 2010, it is now clear after eight years in effect that those arguments are demonstrably wrong. They are directly contradicted by the facts. Even in its Second Triennial report, EPA never responds to the fact of conversion and the clear failure of the aggregate compliance approach to protect land that was uncultivated in December 2007.[208]

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[206] Fargione et al., *supra* note 39.
[207] 75 Fed. Reg. 14,670, 14,701.
[208] The closest it comes to this is its acknowledgment in the Second Triennial Report that there has been "an increase in actively managed cropland in the U.S. since the passage of EISA by roughly 4-7.8 million acres." EPA Triennial Report 2018 at 44.

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In its 2010 rulemaking, EPA set forth five factors as purported justification for the aggregate compliance approach. However, none of them justifies its approach to land conversion. Absent a method that in theory should and in practice does ensure ***particularized*** compliance with EISA's land conversion mandates – as EISA requires – EPA's confidence that aggregate compliance meets its statutory obligations is severely misplaced.

1. A "Representative Estimate" of Total Agricultural Lands is Irrelevant to what EISA Requires.

In defense of its aggregate compliance approach, EPA first claimed that it had access to data that allowed an "appropriately representative estimate" of agricultural lands available under EISA for the production of crops as feedstock for renewable fuel production.[209] Yet it did not identify to what data it is referring. And even if this were true, and even if EPA could have somehow perfectly and accurately calculated the amount of land that complied with EISA's terms – which it cannot[210] – a total national calculation of available land is simply irrelevant to the question of whether the particular crops used for renewable fuels are grown on land that complies with EISA's requirements. This justification is therefore meaningless.

2. A Decline in Total Agricultural Land Does Not Prove Compliance with EISA's Land Use Restrictions.

EPA next pointed to USDA data showing that overall agricultural land had contracted over time as support for its aggregate compliance approach.[211] Once again, EPA's justification is baseless. Even if it were true that the total quantity of agricultural land has declined over time,

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[209] 75 Fed. Reg. at 14,701.
[210] *See* EPA Triennial Report 2018 at 43 ("Biofuel feedstock production is responsible for some of the observed changes in land used for agriculture, but we cannot quantify with precision the amount of land with increased intensity of cultivation nor confidently estimate the portion of crop land expansion that is due to the market for biofuels.").
[211] 75 Fed. Reg. at 14,701.

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this provides no information as to whether or not crops and crop residues used for renewable fuels were produced on land in cultivation as of EISA's passage. A net decrease in total cropland does not mean that all land used for biofuel production is compliant with EISA's terms.

Indeed, despite EPA's contentions, much of the decrease in total agricultural land in the United States is the result of further urban and suburban development.[212] Between 1992 and 2012, roughly 21 million acres of agricultural land were converted for urban or other residential development.[213] Given that farmland is being taken out of production for other forms of development, it is more likely that new farmland will come from uncultivated land. The data upon which EPA relied undercuts its position, as it demonstrates growing land conversion to satisfy agricultural needs.

More importantly, the trend of contracting agricultural cropland no longer holds true. Research on land use since the passage of EISA reveals a dramatic increase in actively managed cropland. ***In its recent Second Triennial Report to Congress on EISA, EPA found that "[e]vidence from multiple sources demonstrates an increase in actively managed cropland in the U.S. since the passage of EISA by roughly 4 - 7.8 million acres, depending upon the source."***[214] ***And it further found that "[t]here is strong correlational evidence that biofuels are responsible for some of this observed land use change."***[215] Thus, the fact that there had been a decline in agricultural land at the time EPA developed its aggregate compliance approach in 2010 provided no justification then and provides even less now for an aggregate compliance approach that has contributed to a reversal of this trend over the past decade.

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[212] A. Ann Sorensen et. al., *Farms Under Threat: The State of America's Farmland*, 21 (May 9, 2018).
[213] *Id.*
[214] EPA Triennial Report 2018 at 44 (emphasis added).
[215] *Id.* (emphasis added).

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3. More Efficient Utilization of Existing Agricultural Land Has Not Prevented the Conversion of New Land for Agricultural Production.

EPA next asserted that existing economic factors for feedstock producers favor more efficient utilization of existing agricultural land to grow crops for renewable fuel sources over converting non-agricultural lands for crop production.[216] While utilization of existing agricultural land has gotten more efficient over time, this has not prevented the conversion of non-agricultural lands to cropland, as EPA's own report reveals.[217] Indeed, evidence reveals that millions of acres of land have been converted from non-agricultural lands to cropland despite these gains in efficiency. And "efficient" use in many circumstances has included using land like buffers and other protective strips of land, which is very ecologically harmful. Even if overall trends indicate increased productivity of cultivated land, it does not provide sufficient grounds to defy EISA's mandate that all crops and crop residue used for renewable fuels come from land that meets EISA's land use restrictions.

4. Having a Fall-back Plan Does Not Undo the Fundamental Failure of Aggregate Compliance to Enforce EISA's Clear Terms.

EPA included on its list of justifications two related factors. *First*, EPA stated that "[i]f, at any point, EPA finds that the total amount of land in use for the production of crops including for grazing and forage is equal or greater than 397 million acres (i.e., within 5 million acres of EPA's established 402 million acre baseline), EPA will conduct further investigations to evaluate whether the presumption built into the aggregate compliance approach remains valid."[218] *Second*, EPA stated that "in the event there are more than the baseline amount of acres of cropland, pastureland and CRP land in production, renewable fuel producers will be required to

[216] 75 Fed. Reg. 14,670, 14,701.
[217] EPA Triennial Report 2018 at 44, 111.
[218] 75 Fed. Reg. 14,670, 14,701.

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meet the same individual or consortium-based recordkeeping and reporting requirements applicable to RIN-generating renewable fuel producers using other feedstocks."[219] Neither of these assurances could then have justified EPA's failure to comply with EISA's unambiguous land conversion restrictions in the first instance. Instead, EPA was simply providing a mechanism to retreat from its unlawful approach to land conversion in the event its predictions about total crop acreage prove inaccurate. Proposing a plan to clean up its mess after the fact in no way justifies its making the mess in the first instance. The fact that significant conversion for ethanol and biodiesel feedstock production has occurred and that EPA has failed to change course in light of this conversion confirms that these after-the-fact proposed corrective measures are worthless.

Indeed, EPA itself acknowledged that its check on total land conversion under aggregate compliance

> [w]ould be difficult to enforce because data that could indicate that baseline production levels were exceeded in a given year would likely be delayed by many months, such that the recordkeeping requirements for renewable fuel producers would also be delayed. During the interim period, renewable fuel producers would have generated RINs for fuel that did not qualify for credit under the program, and any remedial steps to invalidate such RINs after the fact could be costly and burdensome to all parties in the supply chain.[220]

Yet despite this recognition, the final rule did nothing to ameliorate this fundamental problem.

5. EPA's Five Factors Do Not Cumulatively Justify EPA's Conclusion that Aggregate Compliance is Consistent with EISA's Terms.

The five listed factors neither individually nor cumulatively support EPA's "high confidence" that aggregate compliance will meet EISA's statutory requirements. They did not

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[219] *Id.*

[220] Regulation of Fuels and Fuel Additives: Changes to Renewable Fuel Standard Program, 74 Fed. Reg. 24,904, 24,940 (May 26, 2009).

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do so in 2010 and they even more clearly do not do so now. EPA's aggregate compliance approach has in no way shown that the particular crops and crop residues used for renewable fuels were grown on lands that comply with EISA's terms. Indeed, EPA's own report directly and expressly undermines these justifications, concluding that millions of acres of uncultivated land have been converted to cropland since EISA's enactment.[221]

Pursuant to EISA's mandate, EPA can assess whether a crop qualifies as renewable fuel by examining where the crops used for renewable fuels are grown and determining whether that land was cleared or cultivated or actively managed or fallow or nonforested prior to the passage of EISA. Documentation, tracking, and other sources of historical information can provide information necessary to make this determination, as evidenced by EPA's required documentation of imported fuels. Thus, there is no need, nor any authority or discretion, for EPA to rely instead on the abstract and inaccurate aggregate compliance scheme for determining compliance with EISA's land use restrictions.

IV. CONVERSION OF LAND TO PRODUCE CROPS DISPLACED BY RENEWABLE BIOMASS CULTIVATION UNDERMINES EISA'S CLIMATE AND ENVIRONMENTAL BENEFITS.

Not only has EPA's aggregate compliance approach caused a tremendous increase in ***direct*** land conversion for the production of renewable biomass, but it also has led to a rise in ***indirect*** land conversion. Indirect land conversion occurs when cultivation of renewable biomass displaces other crops, which are then grown on land that was not in cultivation in December 2007.[222] Though this indirect land conversion does not run counter to an explicit provision of EISA, it is also antithetical to EISA's underlying objectives to curb climate change and improve the environment.

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[221] EPA Triennial Report 2018 at 44, 111.
[222] EPA Triennial Report 2018 at 21.

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As discussed *supra*, land conversion of uncultivated land releases tremendous amounts of greenhouses gases and harms the environment. This is true whether the newly converted land is used to produce renewable biomass or crops displaced by renewable biomass. Thus, even if ***all*** production of renewable biomass occurred on EISA-compliant land – which right now it unquestionably does not – this production could nevertheless undermine EISA's purposes if it leads to the use of land not in cultivation or production in 2007 to grow displaced crops. EPA's pathway approval process has systematically underrepresented this indirect land use change and associated carbon emissions, which has become particularly clear in hindsight.

Accordingly, to comply with the fundamental goals of EISA, the RFS program must ensure that measures are in place to protect against ***any*** kind of land conversion resulting from the production of renewable biomass. This includes not just use for the direct production of renewable biomass, but also use that indirectly results from such production. Congress made clear its intent to protect a specific category of land from cultivation for purposes of renewable biomass production. EPA should close what is now a gaping loophole that would allow use of such land to grow displaced crops.

REQUESTED AGENCY ACTION

EPA's aggregate compliance approach to the RFS under EISA violates EISA's unambiguous land use restrictions. It fails to ensure that land not in cultivation or production in 2007 will not be converted for biofuel production, and as a result, millions of acres of uncultivated land have been converted to cropland since the adoption of this approach, with far-reaching deleterious environmental impacts. It also fails to prevent parallel indirect conversion. We therefore submit this petition asking EPA to modify its renewable fuel standards regulations to comply with EISA's expressed requirements and purposes.

ED_006073A_00000261-00071

1. EPA Should Require Biofuel Producers to Demonstrate that Each Source of Crop-Based Renewable Biomass Used to Meet the Renewable Fuel Standard was Grown on EISA-Compliant Lands to Qualify for a RIN

a. EPA Should Require Documentation Demonstrating that Biomass Was Grown on EISA-Compliant Land

Under the express terms of the statute, EISA requires that all crops used for RIN qualifying biofuels be grown on land that complies with its land use restrictions. To ensure compliance with this statutory mandate, EPA must revise its RFS regulations to require biofuel producers to demonstrate that the crops they use as renewable biomass sources were produced on land that complies with EISA's land use terms prior to being assigned a RIN. Requiring biofuel producers to submit valid documentation demonstrating that the biomass used was grown on EISA compliant lands – i.e., land that was cleared or cultivated prior to 2007, and that was actively managed or fallow and nonforested in 2007 – provides assurance that EISA's terms have been met and a RIN can properly be issued for that batch of biofuel. In fact, this is the only means by which EPA can faithfully ensure conformance with EISA's plain language.

b. Demonstrating Compliance for Each Source of Crop-Based Renewable Biomass is Feasible and Reasonable

A rule requiring biofuel producers to demonstrate compliance with EISA's land use restrictions for each source of crop-based renewable biomass is a reasonable and feasible method of accurately determining EISA compliance. Indeed, it is the only effective means of doing so.

EPA's RFS regulations provide available mechanisms for renewable fuel producers to verify that their feedstocks comply with EISA. For example, it describes "renewable biomass recordkeeping and reporting requirements by renewable fuel producers for their individual

ED_006073A_00000261-00072

facilities."[223] Thus, EPA itself contemplated individual reporting as a reasonable method for verifying compliance with the law.[224]

Proof of compliance poses no undue burden, as there are a variety of readily accessible documentation methods available to producers, including receipts for agricultural products, purchasing records, and lease information. For example, in the May 26, 2009, notice of proposed rulemaking, EPA contemplated using satellite and aerial imagery along with mapping tools to develop a Web site that would assist feedstock producers to identify where their crops were produced so that they could demonstrate EISA compliance.[225] This idea was dropped in favor of aggregate compliance in the final EPA regulation. Nevertheless, the RFS rule outlines the recordkeeping necessary to establish EISA compliance, including:

> [s]ales records for planted crops, crop residue, or livestock; purchasing records for land treatments such as fertilizer, weed control, or reseeding; a written management plan for agricultural purposes; documentation of participation in an agricultural program sponsored by a Federal, state or local government agency; or documentation of land management in accordance with an agricultural certification program.[226]

EPA thus believed it was feasible and reasonable to prove individual compliance with EISA's land use mandates. However, to date, EPA has not required submission of such documentation, but instead has relied upon its unlawful aggregate compliance approach.

2. EPA Should Require Documentation Showing that Production of Renewable Biomass Does Not Cause Land Conversion for Production of Displaced Crops

To protect against the climate and environmental harms resulting from land conversion – harms that are antithetical to the text and intent of EISA – EPA should require documentation

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[223] 75 Fed. Reg. at 14,681.
[224] The RFS creates the further options of consortium-based quality-assurance surveys and aggregate compliance for crops and crop residue grown in the U.S. *See Id.*
[225] 74 Fed. Reg. 24,904, 24,940.
[226] *Id.* at 24,933, 24,938.

ED_006073A_00000261-00073

showing that production of renewable biomass does not result in land conversion to produce displaced crops. Such a requirement is necessary to ensure that producers of corn for ethanol use or soy for biodiesel use do not undermine EISA's objectives by displacing crops on land in cultivation in December 2007 with renewable biomass production while converting land not in cultivation in 2007 to produce the displaced crops. Such tactics clearly violate the law's ***structure and intent*** and therefore should not be permitted. Accordingly, this added documentation is necessary to demonstrate overall compliance with EISA's land use restrictions.

3. EPA Should Adjust Renewable Volume Obligations for Total Renewable Fuel to Reflect the Amount that Can Be Produced From EISA-Compliant Land.

To assist in the enforcement of EISA's land-use restrictions and to ensure that renewable biomass is not grown on land that was not in cultivation prior to EISA's passage and that this same previously uncultivated land is not used to produce displaced crops, EPA should reassess the annual volume obligation for total renewable biofuel for a given year. Specifically, EPA should determine the amount of biofuel produced from feedstock grown on recently converted land or land not in production in 2007 – i.e., renewable biomass that does not comply with EISA's land-use requirements – and then adjust the annual volume obligation down to subtract out that volume of biofuel, capping the requirement at that level going forward.[227] By doing so, EPA could ensure that the total RFS volumetric mandate matches the supply of renewable fuel that can be produced without violating or otherwise undermining EISA's land-use restrictions. This would help to re-set demand for biofuels at a volume that corresponds to the supply of EISA-compliant renewable biomass, as Congress intended.

[227] The adjustment should be applied after EPA projects cellulosic biofuel production and makes corresponding changes to the volume obligations for cellulosic biofuels, advanced biofuel, and total renewable fuel, pursuant to the Clean Air Act §211(o)(7)(D)(i).

ED_006073A_00000261-00074

Respectfully submitted,

/s/ Carrie Apfel

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With assistance from:
LANCE BOWMAN
New York University Law School

MELISSA VERNE
DAN RESLER
Columbia Law School

ED_006073A_00000261-00075

Appointment

From: Hoffer, Melissa [Hoffer.Melissa@epa.gov]
Sent: 7/9/2021 4:47:44 AM
To: teamsvisitor:1e3b465dcffa4981995d2421e5fddf0d; Chaudhuri, Jonodev O. (WDC x5635) [Jonodev.Chaudhuri@quarles.com]; Rumela Roy [rroy@earthjustice.org]; teamsvisitor:47176d0a2ab54bb5b15c120995b63e1b; teamsvisitor:c622e0e5bc174e3681865563382eaa87; Hoffer, Melissa [Hoffer.Melissa@epa.gov]; Application ab5d1521-415b-4380-82e4-af803fb8bf2d; Application b102ccd8-1925-448b-90a7-b083aba25074; Application 9cd07db6-fab5-438c-8e34-44117fac7650; Holden, Allison [Holden.Allison@epa.gov]; Application d123a3e6-7f0a-4bbd-91f2-6d0ad1707297; teamsvisitor:e134625adc3b4ca78f67b861ff59e01c; Michael Freeman [mfreeman@earthjustice.org]; Walter Echo-Hawk [wechohawk@pawneenation.org]; teamsvisitor:dd97fbb8822d4c5889187866dc45903d; Serassio, Helen [Serassio.Helen@epa.gov]; Byrne, Andrew [Byrne.Andrew@epa.gov]; Chase, Joann [Chase.Joann@epa.gov]; Siegal, Tod [Siegal.Tod@epa.gov]

Subject: Meeting (ScheduledMeeting)/Thread Id:

Ex. 6 Personal Privacy (PP)

Start: 7/8/2021 6:56:12 PM
End: 7/8/2021 8:37:44 PM
Show Time As: Busy

Recurrence: (none)

Required Attendees: teamsvisitor:1e3b465dcffa4981995d2421e5fddf0d; Chaudhuri, Jonodev O. (WDC x5635); Rumela Roy; teamsvisitor:47176d0a2ab54bb5b15c120995b63e1b; teamsvisitor:c622e0e5bc174e3681865563382eaa87; Hoffer, Melissa; Application ab5d1521-415b-4380-82e4-af803fb8bf2d; Application b102ccd8-1925-448b-90a7-b083aba25074; Application 9cd07db6-fab5-438c-8e34-44117fac7650; Holden, Allison; Application d123a3e6-7f0a-4bbd-91f2-6d0ad1707297; teamsvisitor:e134625adc3b4ca78f67b861ff59e01c; Michael Freeman; Walter Echo-Hawk; teamsvisitor:dd97fbb8822d4c5889187866dc45903d; Serassio, Helen; Byrne, Andrew; Chase, Joann; Siegal, Tod

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Start Time (UTC): 7/8/2021 6:56:12 PM
End Time (UTC): 7/8/2021 8:37:44 PM
Duration: 01:41:32.4034699

[7/8/2021 6:56:20 PM (UTC)] teamsvisitor:1e3b465dcffa4981995d2421e5fddf0d joined.
[7/8/2021 8:31:54 PM (UTC)] teamsvisitor:1e3b465dcffa4981995d2421e5fddf0d left.
[7/8/2021 6:59:30 PM (UTC)] Jonodev.Chaudhuri@quarles.com joined.
[7/8/2021 8:03:44 PM (UTC)] Jonodev.Chaudhuri@quarles.com left.
[7/8/2021 7:00:55 PM (UTC)] rroy@earthjustice.org joined.
[7/8/2021 8:31:55 PM (UTC)] rroy@earthjustice.org left.
[7/8/2021 7:00:09 PM (UTC)] teamsvisitor:47176d0a2ab54bb5b15c120995b63e1b joined.
[7/8/2021 8:31:52 PM (UTC)] teamsvisitor:47176d0a2ab54bb5b15c120995b63e1b left.
[7/8/2021 7:00:47 PM (UTC)] teamsvisitor:c622e0e5bc174e3681865563382eaa87 joined.
[7/8/2021 8:32:01 PM (UTC)] teamsvisitor:c622e0e5bc174e3681865563382eaa87 left.
[7/8/2021 7:02:21 PM (UTC)] Hoffer.Melissa@epa.gov joined.
[7/8/2021 8:19:28 PM (UTC)] Hoffer.Melissa@epa.gov left.
[7/8/2021 7:02:43 PM (UTC)] Application ab5d1521-415b-4380-82e4-af803fb8bf2d joined.
[7/8/2021 8:32:01 PM (UTC)] Application ab5d1521-415b-4380-82e4-af803fb8bf2d left.
[7/8/2021 7:20:03 PM (UTC)] Application b102ccd8-1925-448b-90a7-b083aba25074 joined.
[7/8/2021 8:32:02 PM (UTC)] Application b102ccd8-1925-448b-90a7-b083aba25074 left.
[7/8/2021 7:04:16 PM (UTC)] Application 9cd07db6-fab5-438c-8e34-44117fac7650 joined.
[7/8/2021 8:32:01 PM (UTC)] Application 9cd07db6-fab5-438c-8e34-44117fac7650 left.
[7/8/2021 6:56:12 PM (UTC)] Holden.Allison@epa.gov joined.
[7/8/2021 8:31:56 PM (UTC)] Holden.Allison@epa.gov left.
[7/8/2021 7:19:45 PM (UTC)] Application d123a3e6-7f0a-4bbd-91f2-6d0ad1707297 joined.
[7/8/2021 8:32:01 PM (UTC)] Application d123a3e6-7f0a-4bbd-91f2-6d0ad1707297 left.
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[7/8/2021 8:32:43 PM (UTC)] Application ab5d1521-415b-4380-82e4-af803fb8bf2d left.
[7/8/2021 7:04:16 PM (UTC)] Application 9cd07db6-fab5-438c-8e34-44117fac7650 joined.
[7/8/2021 8:34:16 PM (UTC)] Application 9cd07db6-fab5-438c-8e34-44117fac7650 left.
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[7/8/2021 7:19:45 PM (UTC)] Application d123a3e6-7f0a-4bbd-91f2-6d0ad1707297 joined.
[7/8/2021 8:37:44 PM (UTC)] Application d123a3e6-7f0a-4bbd-91f2-6d0ad1707297 left.
[7/8/2021 6:58:09 PM (UTC)] teamsvisitor:e134625adc3b4ca78f67b861ff59e01c joined.
[7/8/2021 8:03:34 PM (UTC)] teamsvisitor:e134625adc3b4ca78f67b861ff59e01c left.
[7/8/2021 6:59:12 PM (UTC)] mfreeman@earthjustice.org joined.
[7/8/2021 8:31:54 PM (UTC)] mfreeman@earthjustice.org left.
[7/8/2021 7:03:19 PM (UTC)] wechohawk@pawneenation.org joined.
[7/8/2021 8:16:18 PM (UTC)] wechohawk@pawneenation.org left.
[7/8/2021 8:04:19 PM (UTC)] teamsvisitor:dd97fbb8822d4c5889187866dc45903d joined.
[7/8/2021 8:31:58 PM (UTC)] teamsvisitor:dd97fbb8822d4c5889187866dc45903d left.
[7/8/2021 6:58:58 PM (UTC)] Serassio.Helen@epa.gov joined.
[7/8/2021 8:31:54 PM (UTC)] Serassio.Helen@epa.gov left.
[7/8/2021 6:59:33 PM (UTC)] Byrne.Andrew@epa.gov joined.
[7/8/2021 8:31:55 PM (UTC)] Byrne.Andrew@epa.gov left.
[7/8/2021 7:20:03 PM (UTC)] Application b102ccd8-1925-448b-90a7-b083aba25074 joined.
[7/8/2021 8:37:02 PM (UTC)] Application b102ccd8-1925-448b-90a7-b083aba25074 left.
[7/8/2021 7:51:25 PM (UTC)] Chase.Joann@epa.gov joined.
[7/8/2021 8:31:54 PM (UTC)] Chase.Joann@epa.gov left.
[7/8/2021 6:59:11 PM (UTC)] Siegal.Tod@epa.gov joined.
[7/8/2021 8:31:57 PM (UTC)] Siegal.Tod@epa.gov left.

Message

From: Hoffer, Melissa [Hoffer.Melissa@epa.gov]
Sent: 7/2/2021 12:19:33 PM
To: Michael Freeman [mfreeman@earthjustice.org]
CC: Nishida, Jane [Nishida.Jane@epa.gov]; Gray, David [gray.david@epa.gov]; Chase, Joann [Chase.Joann@epa.gov]; jonodev@chaudhurilaw.com; chad@chadsmith.com; Ex. 6 PP; rroy@earthjustice.org; sheila.morago@oiga.org; dhill@mcn-nsn.gov; mmatlock@pawneenation.org; pbc@pawneenation.org; jwilliams@williamslaw-pllc.com; wechohawk@pawneenation.org; Serassio, Helen [Serassio.Helen@epa.gov]; Siegal, Tod [Siegal.Tod@epa.gov]
Subject: RE: Note from President Echo-Hawk regarding updates and next steps pertaining to consultation on EPA's October 1, 2020 SAFETEA decision

Thank you Mike—we will identify some additional windows and get back to you.

Best,
Melissa

From: Michael Freeman <mfreeman@earthjustice.org>
Sent: Friday, July 2, 2021 7:44 AM
To: Hoffer, Melissa <Hoffer.Melissa@epa.gov>
Cc: Nishida, Jane <Nishida.Jane@epa.gov>; Gray, David <gray.david@epa.gov>; Chase, Joann <Chase.Joann@epa.gov>; jonodev@chaudhurilaw.com; chad@chadsmith.com; Ex. 6 PP; rroy@earthjustice.org; sheila.morago@oiga.org; dhill@mcn-nsn.gov; mmatlock@pawneenation.org; pbc@pawneenation.org; jwilliams@williamslaw-pllc.com; wechohawk@pawneenation.org; Serassio, Helen <Serassio.Helen@epa.gov>; Siegal, Tod <Siegal.Tod@epa.gov>
Subject: RE: Note from President Echo-Hawk regarding updates and next steps pertaining to consultation on EPA's October 1, 2020 SAFETEA decision

Thanks, Melissa – I will check with our team on that time slot. But we may have a conflict then – would you mind suggesting a few additional windows that work for you?

I'll also check with President Echo-Hawk and our team about the meeting format you suggest and get back to you promptly.

Regards,
Mike

From: Hoffer, Melissa <hoffer.melissa@epa.gov>
Sent: Thursday, July 1, 2021 10:18 AM
To: Michael Freeman <mfreeman@earthjustice.org>
Cc: nishida.jane@epa.gov; gray.david@epa.gov; chase.joann@epa.gov; jonodev@chaudhurilaw.com; chad@chadsmith.com; Ex. 6 PP Rumela Roy <rroy@earthjustice.org>; sheila.morago@oiga.org; dhill@mcn-nsn.gov; mmatlock@pawneenation.org; pbc@pawneenation.org; jwilliams@williamslaw-pllc.com; wechohawk@pawneenation.org; serassio.helen@epa.gov; siegal.tod@epa.gov
Subject: RE: Note from President Echo-Hawk regarding updates and next steps pertaining to consultation on EPA's October 1, 2020 SAFETEA decision

Hi Michael,

EPA and DOJ are available July 6 from 3:30 to 5:00. If we need to look for a few more windows, please let me know.

I would also like to invite your and Walter's thoughts about the meeting format—we thought it might be useful to use the first portion to hear from you and Walter, any additional thoughts or points you may want to raise regarding the positions set forth in your letter, and then we can walk through our responses; we're open, please let us know what you think. I also wanted to confirm that our discussion, as before, would be in the nature of confidential settlement negotiations, so as to permit us all to speak freely.

Thanks and regards,
Melissa

From: Michael Freeman <mfreeman@earthjustice.org>
Sent: Thursday, June 24, 2021 2:59 PM
To: Hoffer, Melissa <Hoffer.Melissa@epa.gov>
Cc: Regan, Michael <Regan.Michael@epa.gov>; Nishida, Jane <Nishida.Jane@epa.gov>; Gray, David <gray.david@epa.gov>; Chase, Joann <Chase.Joann@epa.gov>; jonodev@chaudhurilaw.com; chad@chadsmith.com; Ex. 6 PP; rroy@earthjustice.org; sheila.morago@oiga.org; dhill@mcn-nsn.gov; mmatlock@pawneenation.org; pbc@pawneenation.org; jwilliams@williamslaw-pllc.com; wechohawk@pawneenation.org
Subject: RE: Note from President Echo-Hawk regarding updates and next steps pertaining to consultation on EPA's October 1, 2020 SAFETEA decision

Ms. Hoffer – President Echo-Hawk asked me to get back to you with dates for a follow-up call regarding our May 20 comment letter. If your team is available June 28 (particularly before noon ET), that would be ideal.

If June 28 won't work, July 5 or 6 might be an option, but we would need to follow up on specific times to confirm if the necessary people are available on our end.

Thanks again for your consideration here.

Regards,
Mike Freeman

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EARTHJUSTICE

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From: Walter Echo-Hawk <wechohawk@pawneenation.org>
Sent: Sunday, June 20, 2021 7:06 PM
To: hoffer.melissa@epa.gov

Cc: regan.michael@epa.gov; nishida.jane@epa.gov; gray.david@epa.gov; chase.joann@epa.gov; jonodev@chaudhurilaw.com; chad@chadsmith.com; [Ex. 6 PP]n; Michael Freeman <mfreeman@earthjustice.org>; Rumela Roy <rroy@earthjustice.org>; sheila.morago@oiga.org; dhill@mcn-nsn.gov; mmatlock@pawneenation.org; pbc@pawneenation.org
Subject: RE: Note from President Echo-Hawk regarding updates and next steps pertaining to consultation on EPA's October 1, 2020 SAFETEA decision

Thank you for your note, Melissa,

I will touch bases with my legal team and colleagues this week as to some proposed meeting dates on the May 20 memo, and get back in touch.

On Monday, we have scheduled a meeting with Randy Gee in Region Six to review the Pawnee Nation's consultation statute and determine whether we can hammer out a possible government to government consultation schedule and process under the statute. Hopefully, most of those details can be worked out tomorrow; and I will let you know if any particular aspects of that tribal law need further discussion.

Have a great weekend. We are taking Monday off to observe President Biden's new holiday.

Best wishes,

Walter Echo-Hawk

From: Hoffer, Melissa <Hoffer.Melissa@epa.gov>
Sent: Friday, June 18, 2021 4:59 PM
To: Walter Echo-Hawk <wechohawk@pawneenation.org>
Cc: Regan, Michael <Regan.Michael@epa.gov>; Nishida, Jane <Nishida.Jane@epa.gov>; Gray, David <gray.david@epa.gov>; Chase, Joann <Chase.Joann@epa.gov>; jonodev@chaudhurilaw.com; Chad <Chad@chadsmith.com>; [Ex. 6 PP]n; Michael Freeman <mfreeman@earthjustice.org>; Rumela Roy <rroy@earthjustice.org>; Sheila Morago <Sheila.morago@oiga.org>; Principal Chief David Hill <dhill@mcn-nsn.gov>; Monty Matlock <mmatlock@pawneenation.org>; Pawnee Business Council <PBC@pawneenation.org>
Subject: Re: Note from President Echo-Hawk regarding updates and next steps pertaining to consultation on EPA's October 1, 2020 SAFETEA decision

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Thank you, Walter—this is very much appreciated. I think our offices have been in touch about the consultation process this week and shifting the schedule as requested. As to further discussion on your May 20 memo, this note is indeed timely. We have reviewed the letter carefully and are prepared to discuss it with your team. If you would send a few windows with your availability the weeks of June 28 and July 5, we will coordinate on our end and set up a Teams meeting. Thanks as well for sending the recently enacted Consultation Statute. If there are any particular aspects you would like to discuss with us, we can do that as well when we meet.

Thank you and have a restful weekend,
Melissa

Sent from my iPhone

On Jun 16, 2021, at 9:41 AM, Walter Echo-Hawk <wechohawk@pawneenation.org> wrote:

Dear Melissa,

I hope you are doing well this summer. I wanted to get back in touch to provide some updates, and to inquire about next steps, relative to consultation on EPA's October 1, 2020 SAFETEA decision.

First, in response to your question about which Oklahoma tribes may be interested in government to government consultation with EPA, we recommend that EPA send formal notice of consultation to all 39 Oklahoma Tribal nations about this matter. We have asked Ms. Sheila Morago at the Oklahoma Indian Gaming Association (copied above) to inquire about other nations' interest. So far, thirteen tribes have confirmed to her their interest in consultation. These tribes are:

1. Chickasaw Nation
2. Muscogee (Creek) Nation
3. Choctaw Nation
4. Pawnee Nation
5. Wichita & Affiliated Tribes
6. Caddo Nation
7. Kaw Nation
8. Ottawa Tribe
9. Eastern Shawnee Tribe
10. Modoc Nation
11. Shawnee Tribe
12. Delaware Nation
13. Sac & Fox Nation

This is not a complete list of tribes who may be affected or interested, however. Since the Pawnee Nation cannot speak for any other tribe, of course, EPA should send notice to ensure that all Oklahoma tribes who may be affected have the opportunity to participate in consultation.

Second, I want to follow up on the May 20 comment letter that the Pawnee legal counsel Michael Freeman sent you regarding the legal flaws with the October 1 decision. We remain convinced that EPA has ample authority to withdraw or set that decision aside and/or hold it in abeyance pending consultation with affected tribes. Do you and your legal team have time in the next couple weeks to discuss our letter, and the path forward from here? We would appreciate another opportunity to connect.

Third, I wanted to make you aware that the Pawnee Nation has recently enacted a Pawnee Nation Government-to-Government Consultation Statute, which is attached hereto. The statute covers matters involving core legal rights and vital tribal interests of the Pawnee Nation and its citizens and establishes consultation protocols to ensure meaning consultation. EPA's upcoming consultation with the Pawnee Nation will fall within the ambit of this tribal law. The President of the Pawnee Business Council is the point of contact regarding consultations covered by the Statute; and I am happy to discuss the processes and requirements under this statute.

Thank you very much for your consideration. I look forward to hearing from you. As we have discussed, I hope our work will produce nothing but good things for EPA, Tribal Nation partners, and the environmental well-being of our country.

Best regards,

Walter Echo-Hawk
President, Pawnee Business Council
Office: (918) 762-3621 Ext. 113
email: wechohawk@pawneenation.org
www.pawneenation.org

Pawnee Nation of Oklahoma
881 Little Dee Drive
Pawnee, OK 74058

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<PBC - Pawnee Nation Government-to-Government Consultation Statute APPROVED 6-5-2021.pdf>

Message

From: Michael Freeman [mfreeman@earthjustice.org]
Sent: 7/29/2021 5:30:29 PM
To: Byrne, Andrew [Byrne.Andrew@epa.gov]
CC: Nishida, Jane [Nishida.Jane@epa.gov]; Chase, Joann [Chase.Joann@epa.gov]; Gray, David [gray.david@epa.gov]; Meghan Greenfield [Meghan.Greenfield@usdoj.gov]; wechohawk@pawneenation.org; wechohawk[redacted]; chad@chadsmith.com; rroy@earthjustice.org; Dieu, Martin [Dieu.Martin@epa.gov]
Subject: RE: Consultation with Pawnee Nation regarding State of Oklahoma SAFETEA request

Mr. Byrne – thanks for your message. We'll discuss these dates and get back to you shortly on scheduling.

We also appreciate EPA's providing a briefing paper. I do not expect that getting it next week will be a problem for the Pawnee Nation, but will confirm that with my client.

Regards,
Mike Freeman

From: Byrne, Andrew <byrne.andrew@epa.gov>
Sent: Thursday, July 29, 2021 9:23 AM
To: Michael Freeman <mfreeman@earthjustice.org>
Cc: nishida.jane@epa.gov; chase.joann@epa.gov; gray.david@epa.gov; meghan.greenfield@usdoj.gov; wechohawk@pawneenation.org; wechohawk[redacted]; chad@chadsmith.com; Rumela Roy <rroy@earthjustice.org>; dieu.martin@epa.gov
Subject: RE: Consultation with Pawnee Nation regarding State of Oklahoma SAFETEA request

Mr. Freeman,

Thank you again for your letter on behalf of the Pawnee Nation of Oklahoma requesting government-to-government consultation regarding EPA's October 1, 2020 decision approving the State of Oklahoma's SAFETEA request. The suggested timeline for the government-to-government consultation with the Pawnee Nation was very helpful and EPA would like to propose a few dates and times as possibilities for this consultation. The EPA would be represented by senior leadership from the Office of International and Tribal Affairs and Region 6.

All times CT:

- August 26, 1:00 – 3:00pm
- September 21, 1:00 – 3:00pm
- September 23, 1:00 – 2:30pm

The EPA would also like to acknowledge the request in the letter to have a briefing paper discussing the action at issue within 30 days of EPA's June 30th consultation notice, in accord with the Pawnee Nation's consultation statute. While that 30 day period would come up this week, we respectfully request until next week to provide this paper. Please let us know if you have any questions or concerns regarding this matter.

Please let the EPA if one of the above times works for the Pawnee Nation and whether you have any further questions regarding this consultation process.

All the best,

Andy Byrne
Senior Advisor, Policy & Partnerships Team
American Indian Environmental Office

Office of International and Tribal Affairs
U.S. Environmental Protection Agency
(202) 564-3836 (desk)
(202) 322-8607 (mobile)

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From: Michael Freeman <mfreeman@earthjustice.org>
Sent: Monday, July 19, 2021 7:37 PM
To: Byrne, Andrew <Byrne.Andrew@epa.gov>
Cc: Chase, Joann <Chase.Joann@epa.gov>; Gray, David <gray.david@epa.gov>; Meghan Greenfield <Meghan.Greenfield@usdoj.gov>; wechohawk@pawneenation.org; wechohawk Ex. 6 Personal Privacy (PP) chad@chadsmith.com; rroy@earthjustice.org
Subject: Consultation with Pawnee Nation regarding State of Oklahoma SAFETEA request

Dear Mr. Byrne – please see the attached letter regarding consultation and coordination on the State of Oklahoma's request under SAFETEA to administer federal environmental regulatory programs.

Regards,
Mike Freeman

Michael Freeman
Senior Attorney
Earthjustice Rocky Mountain Office
633 17th Street, Suite 1600
Denver, CO 80202
T: 303.996.9615
F: 720.550.5757
earthjustice.org

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Message

From: Michael Freeman [mfreeman@earthjustice.org]
Sent: 8/7/2021 4:17:09 PM
To: Byrne, Andrew [Byrne.Andrew@epa.gov]
CC: Nishida, Jane [Nishida.Jane@epa.gov]; Chase, Joann [Chase.Joann@epa.gov]; Gray, David [gray.david@epa.gov]; Meghan Greenfield [Meghan.Greenfield@usdoj.gov]; wechohawk@pawneenation.org; wechohawk Ex. 6 Personal Privacy (PP) chad@chadsmith.com; rroy@earthjustice.org; Dieu, Martin [Dieu.Martin@epa.gov]; Hackel, Angela [Hackel.Angela@epa.gov]
Subject: RE: Consultation with Pawnee Nation regarding State of Oklahoma SAFETEA request

Thanks, Mr. Byrne – we will calendar both dates, and look forward to meeting on September 23. We'll also circle back in advance of the tentative August. 26 date regarding whether a discussion would be useful.

We'll review the materials attached to your email message again, and plan to provide EPA with additional information in advance of our meetings. Thanks again for coordinating them.

Regards,
Mike Freeman

Michael Freeman
Senior Attorney
Earthjustice Rocky Mountain Office
633 17th Street, Suite 1600
Denver, CO 80202
T: 303.996.9615
F: 720.550.5757
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From: Byrne, Andrew <byrne.andrew@epa.gov>
Sent: Friday, August 6, 2021 2:33 PM
To: Michael Freeman <mfreeman@earthjustice.org>
Cc: nishida.jane@epa.gov; chase.joann@epa.gov; gray.david@epa.gov; meghan.greenfield@usdoj.gov; wechohawk@pawneenation.org; wechohawk Ex. 6 Personal Privacy (PP) chad@chadsmith.com; Rumela Roy <rroy@earthjustice.org>; dieu.martin@epa.gov; hackel.angela@epa.gov
Subject: RE: Consultation with Pawnee Nation regarding State of Oklahoma SAFETEA request

Mr. Freeman,

Thank you very much for confirming that the September dates work best for government-to-government consultation with the Pawnee Nation. The EPA would like to confirm Thursday, September 23 from 1:00 – 2:30pm CT as the consultation date and time. In addition, EPA is glad to tentatively hold a meeting from 1:00 – 2:00pm CT on August 26 in case an initial pre-consultation discussion is needed. JoAnn Chase will represent EPA for this potential pre-consultation

call, and additional management and staff from the Office of International and Tribal Affairs and EPA Region 6 will be ready to be on the line.

In preparation for our consultation EPA closely reviewed relevant documents, including the questions submitted by the Pawnee Nation in September 2020 prior to EPA's October 1, 2020 decision and the Pawnee Nation Government-to-Government Consultation Statute. As you know, in addition to the October 1, 2020 decision letter (attached again here for your convenience), EPA prepared a tribal consultation summary (also attached), which attempted to address questions received from the Pawnee Nation and other tribes. Those documents reflect EPA's rationale and responses in the context of developing and rendering the October 1, 2020 decision. Of course, EPA is now reviewing that decision and consulting with tribes to ensure a meaningful exchange of information and perspectives and an appropriate opportunity for tribal input. EPA hopes to focus our consultation discussion on issues relating to that review and has previously provided additional programmatic briefing materials (attached) to all of the tribes in Oklahoma as part of that process. An initial discussion on August 26 may be useful to help clarify any current or additional questions that the Pawnee Nation has for EPA and help the Agency prepare for the September 23 consultation. We look forward to continuing our dialogue on this important issue.

EPA will create Microsoft Teams meeting invitations in advance of the potential August 26 pre-consultation meeting and September 23 consultation and share it with the Pawnee Nation.

Please let me know if you have any questions, or you may contact JoAnn Chase at chase.joann@epa.gov.

Thank you!

Andy Byrne
Senior Advisor, Policy & Partnerships Team
American Indian Environmental Office
Office of International and Tribal Affairs
U.S. Environmental Protection Agency
(202) 564-3836 (desk)
(202) 322-8607 (mobile)

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From: Michael Freeman <mfreeman@earthjustice.org>
Sent: Monday, August 2, 2021 9:43 AM
To: Byrne, Andrew <Byrne.Andrew@epa.gov>
Cc: Nishida, Jane <Nishida.Jane@epa.gov>; Chase, Joann <Chase.Joann@epa.gov>; Gray, David <gray.david@epa.gov>; Meghan Greenfield <Meghan.Greenfield@usdoj.gov>; wechohawk@pawneenation.org; wechohawk Ex. 6 Personal Privacy (PP) chad@chadsmith.com; rroy@earthjustice.org; Dieu, Martin <Dieu.Martin@epa.gov>
Subject: RE: Consultation with Pawnee Nation regarding State of Oklahoma SAFETEA request

Mr. Byrne – thanks again for providing these dates. A consultation meeting on either September 21 or 23 would work for Pawnee Nation representatives. Just let us know which of those dates EPA would prefer.

In addition, we suggest tentatively scheduling a discussion for the August 26 slot. Depending on a number of factors, the parties may want to exchange more written information before such a meeting – and if so we can postpone the August 26 meeting. But it could be helpful to hold that date so EPA and the Pawnee Nation have an opportunity for direct discussions before late September. If that works for the EPA, we can hold the August 26 date as well.

Regards,
Mike

From: Byrne, Andrew <byrne.andrew@epa.gov>
Sent: Thursday, July 29, 2021 9:23 AM
To: Michael Freeman <mfreeman@earthjustice.org>
Cc: nishida.jane@epa.gov; chase.joann@epa.gov; gray.david@epa.gov; meghan.greenfield@usdoj.gov; wechohawk@pawneenation.org; wechohawk Ex. 6 Personal Privacy (PP) chad@chadsmith.com; Rumela Roy <rroy@earthjustice.org>; dieu.martin@epa.gov
Subject: RE: Consultation with Pawnee Nation regarding State of Oklahoma SAFETEA request

Mr. Freeman,

Thank you again for your letter on behalf of the Pawnee Nation of Oklahoma requesting government-to-government consultation regarding EPA's October 1, 2020 decision approving the State of Oklahoma's SAFETEA request. The suggested timeline for the government-to-government consultation with the Pawnee Nation was very helpful and EPA would like to propose a few dates and times as possibilities for this consultation. The EPA would be represented by senior leadership from the Office of International and Tribal Affairs and Region 6.

All times CT:

- August 26, 1:00 – 3:00pm
- September 21, 1:00 – 3:00pm
- September 23, 1:00 – 2:30pm

The EPA would also like to acknowledge the request in the letter to have a briefing paper discussing the action at issue within 30 days of EPA's June 30th consultation notice, in accord with the Pawnee Nation's consultation statute. While that 30 day period would come up this week, we respectfully request until next week to provide this paper. Please let us know if you have any questions or concerns regarding this matter.

Please let the EPA if one of the above times works for the Pawnee Nation and whether you have any further questions regarding this consultation process.

All the best,

Andy Byrne
Senior Advisor, Policy & Partnerships Team
American Indian Environmental Office
Office of International and Tribal Affairs
U.S. Environmental Protection Agency
(202) 564-3836 (desk)
(202) 322-8607 (mobile)

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From: Michael Freeman <mfreeman@earthjustice.org>
Sent: Monday, July 19, 2021 7:37 PM
To: Byrne, Andrew <Byrne.Andrew@epa.gov>
Cc: Chase, Joann <Chase.Joann@epa.gov>; Gray, David <gray.david@epa.gov>; Meghan Greenfield <Meghan.Greenfield@usdoj.gov>; wechohawk@pawneenation.org; wechohawk Ex. 6 Personal Privacy (PP) chad@chadsmith.com; rroy@earthjustice.org
Subject: Consultation with Pawnee Nation regarding State of Oklahoma SAFETEA request

Dear Mr. Byrne – please see the attached letter regarding consultation and coordination on the State of Oklahoma's request under SAFETEA to administer federal environmental regulatory programs.

Regards,
Mike Freeman

Michael Freeman
Senior Attorney
Earthjustice Rocky Mountain Office
633 17th Street, Suite 1600
Denver, CO 80202
T: 303.996.9615
F: 720.550.5757
earthjustice.org

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Message

From: Jonathan J. Smith [jjsmith@earthjustice.org]
Sent: 8/19/2021 6:42:53 PM
To: Regan, Michael [Regan.Michael@epa.gov]
CC: Goffman, Joseph [Goffman.Joseph@epa.gov]; Tsirigotis, Peter [Tsirigotis.Peter@epa.gov]; Hoffer, Melissa [Hoffer.Melissa@epa.gov]; jcrenshaw@earthjustice.org; aguerra@earthjustice.org
Subject: Notice of Citizen Suit Concerning Clean Air Act Deadlines for Large Municipal Waste
Attachments: 2021-08-19 Large Incinerator Standards Delay Notice of Intent to Sue.pdf

Dear Administrator Regan,

Please find attached a courtesy copy of a Notice of Intent to Sue for EPA's delay in reviewing and revising its emission standards for Large Municipal Waste Combustors, filed on behalf of East
Yard Communities for Environmental Justice, Ironbound Community Corporation, and Sierra Club. A hard copy of the notice is being sent by certified mail.

Thank you,
Jonathan Smith

Jonathan J. Smith (he/him/his)
Senior Attorney
Community Partnerships Program
Earthjustice
48 Wall Street, 19th Floor
New York, NY 10005
T: 212-845-7379 (direct)
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EARTHJUSTICE

VIA EMAIL AND CERTIFIED MAIL – RETURN RECEIPT REQUESTED

August 19, 2021

Michael S. Regan
Administrator
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Re: Notice of Citizen Suit Concerning Clean Air Act Deadlines for Large Municipal Waste Combustor Standards

Dear Administrator Regan,

This letter constitutes notice under 42 U.S.C. § 7604(b)(2) and 40 C.F.R. Part 54 that East Yard Communities for Environmental Justice, Ironbound Community Corporation, and Sierra Club intend to commence suit against the Administrator of the U.S. Environmental Protection Agency ("EPA") for EPA's failure to "review and revise" its performance standards and other requirements for solid waste incineration units with capacity greater than 250 tons per day combusting municipal waste ("large municipal waste combustors" or "large MWCs") by the deadline set forth in the Clean Air Act,[1] for EPA's failure to act on a related administrative petition, and for EPA's failure to act on a related reconsideration petition, as set forth below. These failures constitute "failure[s] of the Administrator to perform an[] act or duty under [the Clean Air Act] which is not discretionary with the Administrator" within the meaning of the Clean Air Act citizen suit provision.[2]

I. ORGANIZATIONS PROVIDING NOTICE.

The following organizations hereby provide notice of their intent to sue:

East Yard Communities for Environmental Justice
2317 South Atlantic Boulevard
Commerce, California 90040
(323) 263-2113

Ironbound Community Corporation
317 Elm Street
Newark, NJ 07105

---

[1] 42 U.S.C. § 7429(a)(5).
[2] *Id.* § 7604(a)(2).

(973) 465-0555

Sierra Club
2101 Webster St Suite 1300
Oakland, CA 94612
(415) 977-5500

For decades, these organizations have advocated to reduce the adverse impacts that large MWCs impose on environmental justice communities.[3] Their members and staff live, work, and recreate near some of the largest MWCs in the country. These groups are concerned about the large quantity of air emissions permitted by EPA's lax and outdated large MWC standards. Among all polluting facilities in their communities, large MWCs are some of if not *the* highest emitters of the pollutants regulated under EPA's standards, such as particulate matter, hydrogen chloride, oxides of nitrogen, lead, and mercury.[4]

II. CLEAN AIR ACT PROVISIONS REQUIRE EPA TO "REVIEW AND REVISE" LARGE MWC STANDARDS.

Clean Air Act Section 7429 requires EPA to establish "performance standards and other requirements pursuant to section 7411 of [the Clean Air Act] and this section" for new and existing solid waste incineration units by statutory deadlines that vary per each category of incinerator.[5] Once these standards are established, the Act then requires EPA to review and revise the standards at 5-year intervals, providing,

> Not later than 5 years following the initial promulgation of any performance standards and other requirements under this section and section 7411 of this title applicable to a category of solid waste incineration units, and at 5 year intervals thereafter, the

---

[3] *See* Ana Isabel Baptista & Adrienne Perovich, *U.S. Municipal Solid Waste Incinerators: An Industry in Decline* at 15 & App. E, Tishman Env't and Design Ctr. (May 2019), https://static1.squarespace.com/static/5d14dab43967cc000179f3d2/t/5d5c4bea0d59ad00012d220e/1566329840732/CR_GaiaReportFinal_05.21.pdf (noting that 79% of U.S. municipal solid waste incinerators are located in environmental justice communities, and that between 67% and 83% of the twelve incinerators that emit the most nitrogen oxides, sulfur dioxide, lead, mercury, particulate matter, and carbon monoxide are located in environmental justice communities, depending on the pollutant).

[4] 42 U.S.C. § 7429(a)(4); Earthjustice & Vermont Law School Environmental Advocacy Clinic, *New Jersey's Dirty Secret: The Injustice of Incinerators and Trash Energy in New Jersey's Frontline Communities* at 9, https://earthjustice.org/sites/default/files/files/nj-incinerator-report_earthjustice-2021-02.pdf (noting that the large MWCs in Newark and Camden, New Jersey, are the largest emitters of these five pollutants in their respective counties).

[5] 42 U.S.C. § 7429(a)(1).

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> Administrator shall review, and in accordance with this section and section 7411 of this title, revise such standards and requirements.[6]

The Act's deadline for EPA to promulgate its first performance standards and other requirements for large MWCs was November 15, 1991 – the earliest deadline among all categories of incinerators.[7] With review and revision no later than every 5 years, EPA should be conducting it sixth such review and revision of the large MWC standards by now. Nonetheless, as explained in the next section, EPA has reviewed the large MWC standards only once.

This requirement to review and revise applies to "any performance standards and other requirements under this section [7429] and section 7411" and must be conducted "in accordance with this section [7429] and section 7411."[8] Section 7429 specifies that, for new incinerator units, the emission reductions required under such standards "shall not be less stringent than the emissions control that is achieved in practice by the best controlled similar unit;" and that for existing incinerator units, the emission reductions "shall not be less stringent than the average emissions limitation achieved by the best performing 12 percent of units in the category."[9] These minimum requirements on the stringency of the emission standards are commonly known as "MACT floors."[10]

The distinct Clean Air Act rulemaking provisions of Section 7607(d) set forth that if the public raises relevant objections to a final rule whose grounds arose "after the period for public comment (but within the time specified for judicial review)," then "the Administrator shall convene a proceeding for reconsideration of the rule and provide the same procedural rights as would have been afforded had the information been available at the time the rule was proposed."[11] These provisions specifically apply to "the promulgation of any requirement for solid waste combustion under section 7429."[12]

In addition to these Clean Air Act provisions, the generally applicable provisions of the Administrative Procedure Act require "[e]ach agency [to] give an interested person the right to petition for the issuance, amendment, or repeal of a rule."[13] In addition, "each agency shall proceed to conclude a matter presented to it" "within a reasonable time."[14]

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[6] *Id.* § 7429(a)(5).
[7] 42 U.S.C. § 7429(a)(1)(B).
[8] *Id.* § 7429(a)(5).
[9] *Id.* § 7429(a)(2).
[10] *See* Standards of Performance for Municipal Waste Combustors, 60 Fed. Reg. 65,387, 65,391 (Dec. 19, 1995).
[11] 42 U.S.C. § 7607(d)(7)(B).
[12] *Id.* § 7607(d)(1)(D).
[13] 5 U.S.C. § 553(d).
[14] *Id.* § 555(b).

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III. EPA'S PROMULGATION OF 2006 LARGE MWC STANDARDS AND SUBSEQUENT PROCEEDINGS.

EPA established initial standards for large MWCs on December 19, 1995,[15] and has since reviewed and revised those standards only once, on May 10, 2006.[16] EPA's proposed rule for the 2006 large MWC standards did not propose a recalculation of the MACT floors that EPA had used in the 1995 standards.[17] During the public comment period, Earthjustice submitted an administrative petition that, among other points, sought that EPA redo these MACT floors because of D.C. Circuit rulings that the method that EPA used in 1995 to calculate the MACT floors was not permissible under the Clean Air Act.[18] Despite this petition, EPA finalized the 2006 large MWC standards without recalculating the MACT floors.

Sierra Club subsequently petitioned for review of these large MWC standards in the D.C. Circuit.[19] In that proceeding, EPA moved for voluntary remand, stating that after its "re-examin[ation]" of the administrative petition, the Agency concluded that the MACT floors it used in 1995 and 2006 are "not consistent" with the D.C. Circuit precedent.[20] Because of this, EPA stated that it "intends to grant th[e] [Earthjustice] administrative petition and initiate a rulemaking to re-analyze the floors in the 1995 rule."[21] Based on these representations, the D.C. Circuit granted EPA's request to voluntarily remand the 2006 large MWC standards so that the Agency could redo the standards.[22] The court noted that, in the event of EPA's delay in complying with the remand to redo the standards, "the appropriate remedy . . . is mandamus."[23] To date, EPA has neither revised its 2006 large MWC standards nor formally granted the administrative petition, despite its representations to the court that it would do both.

In addition to the D.C. Circuit proceeding, in 2006, Sierra Club submitted a petition under Clean Air Act section 7607(d)(7)(B) for EPA to reconsider four discrete aspects of the Final Rule that

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[15] Standards of Performance for Municipal Waste Combustors, 60 Fed. Reg. 65,387 (Dec. 19, 1995).
[16] Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Large Municipal Waste Combustors, 71 Fed. Reg. 27,324 (May 10, 2006).
[17] *See* Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Large Municipal Waste Combustors, 70 Fed. Reg. 75,348 (proposed Dec. 19, 2005).
[18] Earthjustice, Comment Letter on Proposed Rules for Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Stationary Sources: Large Municipal Waste Combustors (Feb. 2006) (attached to EPA Mot. for Voluntary Remand, *Sierra Club v. EPA*, No. 06-1250 (D.C. Cir. Nov. 9, 2007) (attached as Attachment 1)).
[19] *Sierra Club v. EPA*, No. 06-1250 (D.C. Cir.).
[20] EPA Mot. for Voluntary Remand, Att. 1 at 8; EPA Reply in Further Support of Its Motion for Voluntary Remand, *Sierra Club v. EPA*, No. 06-1250, at 3 (D.C. Cir. Dec. 6, 2007) (attached as Attachment 2).
[21] EPA Mot. for Voluntary Remand, Att. 1 at 8; EPA Reply in Further Support of Its Motion for Voluntary Remand, Att. 2 at 3.
[22] Order, *Sierra Club v. EPA*, No. 06-1250 (D.C. Cir. Feb. 15, 2008) (attached as Attachment 3).
[23] *Id.* (citing *Natural Resources Defense Council v. EPA*, 489 F.3d 1364, 1375 (D.C. Cir. 2007)).

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arose after the comment period.[24] EPA accepted the first three issues for reconsideration and issued a notice of reconsideration on March 20, 2007, asking for public comments on the three issues within 30 days.[25] EPA never finalized the reconsideration of these three points, nor did it ever indicate whether it accepted or rejected the fourth point (concerning emission limits for lead) for reconsideration.

IV. EPA'S VIOLATIONS OF THE CLEAN AIR ACT.

East Yard Communities for Environmental Justice, Ironbound Community Corporation, and Sierra Club hereby provide notice of their intent to commence suit for four distinct violations of the Clean Air Act.

First, EPA has failed to comply with the 5-year review and revision requirement of the Clean Air Act. EPA's most recent review and revision of its large MWC standards was completed on May 10, 2006, over 15 years ago.[26] EPA's review and revision of these standards is thus more than 10 years overdue, since EPA's deadline was May 10, 2011.[27] This is a violation of the "review and revise" provision of Clean Air Act,[28] and constitutes a "failure of the Administrator to perform an[] act or duty under [the Clean Air Act] which is not discretionary" within the meaning of the Clean Air Act citizen suit provision.[29]

Second, EPA has failed to update the MACT floors used in the 1995 and 2006 large MWC standards – floors that EPA admitted were inconsistent with the law over a decade ago. This is a violation of EPA's requirement to review and revise "any performance standards and other requirements under [section 7429] and section 7411 . . . in accordance with [section 7429] and 7411,"[30] and constitutes a "failure of the Administrator to perform an[] act or duty under [the Clean Air Act] which is not discretionary" and "agency action unreasonably delayed" within the meaning of the Clean Air Act citizen suit provision.[31]

Third, EPA has failed to respond to the Earthjustice administrative petition – despite the petition being before the Agency for over 15 years, and despite EPA's representations to the D.C. Circuit

---

[24] Sierra Club, Petition on Final Rule for Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Large Municipal Waste Combustors, (July 7, 2006) (attached as Attachment 4).
[25] Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Large Municipal Waste Combustors, 72 Fed. Reg. 13,016 (March 20, 2007).
[26] *See* Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Large Municipal Waste Combustors, 71 Fed. Reg. 27,324 (May 10, 2006).
[27] 42 U.S.C. § 7429(a)(5).
[28] *Id.* § 7429(a)(5).
[29] *Id.* § 7604(a)(2).
[30] *Id.* § 7429(a)(5).
[31] *Id.* § 7604(a).

ED_006073A_00001022-00005

in 2007 that it "intends to grant th[e] administrative petition."[32] This is a violation of EPA's duty to "conclude a matter presented to it,"[33] and constitutes a "failure of the Administrator to perform an[] act or duty under [the Clean Air Act] which is not discretionary" and "agency action unreasonably delayed" within the meaning of the Clean Air Act citizen suit provision.[34]

Fourth, EPA has failed to finalize its reconsideration of the issues raised in the Sierra Club petition for reconsideration under section 7607(d)(7)(B) – despite EPA having closed public comment on the reconsidered issues over 13 years ago. This is a violation of EPA's duty to "conclude a matter presented to it,"[35] and constitutes a "failure of the Administrator to perform an[] act or duty under [the Clean Air Act] which is not discretionary" and "agency action unreasonably delayed" within the meaning of the Clean Air Act citizen suit provision.[36]

East Yard Communities for Environmental Justice, Ironbound Community Corporation, and Sierra Club may commence a citizen suit to compel EPA to perform any or all of the above acts or duties at any time beginning 60 days from the postmark date of this letter.[37] In addition to the above violations, we also hereby notify EPA of our intent to file a petition for writ of mandamus in the D.C. Circuit for EPA's failure to finalize the reconsideration of the large MWC standards that EPA represented to the court it would undertake.[38]

East Yard Communities for Environmental Justice, Ironbound Community Corporation, and Sierra Club are willing to discuss effective remedies for the violations identified above that may avoid the need for further litigation. If you wish to pursue such discussion, please promptly contact counsel below so that negotiations may timely commence. Counsel will not delay filing a complaint in federal court if no such communication is received before the end of the notice period.

Date: August 19, 2021

Sincerely,

/s/ Jonathan J. Smith
JONATHAN J. SMITH
JASMINE CRENSHAW

---

[32] EPA Mot. for Voluntary Remand, Att. 1 at 8; EPA Reply in Further Support of Its Motion for Voluntary Remand, Att. 2 at 3.
[33] 5 U.S.C. § 555(b).
[34] 42 U.S.C. § 7604(a).
[35] 5 U.S.C. § 555(b).
[36] 42 U.S.C. § 7604(a).
[37] *Id.* § 7604(b); 40 C.F.R. § 54.2(d).
[38] *See* Order, Att. 3 at 1 ("the appropriate remedy for an agency's delay in issuing a final decision is mandamus.").

ED_006073A_00001022-00006

Earthjustice
48 Wall Street, 19th Floor
New York, NY 10005
(212) 845-7376
jjsmith@earthjustice.org
jcrenshaw@earthjustice.org

Counsel for East Yard Communities for Environmental Justice, Ironbound Community Corporation, and Sierra Club

CC: Melissa Hoffer, Acting General Counsel, Office of the General Counsel, EPA
Joseph Goffman, Acting Assistant Administrator, Office of Air and Radiation, EPA
Peter Tsirigotis, Director, Office of Air Quality Planning and Standards, EPA

ED_006073A_00001022-00007

Attachment 1

UNITED STATES COURT OF APPEALS
DISTRICT OF COLUMBIA CIRCUIT

SIERRA CLUB, Petitioner, v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY and STEPHEN L. JOHNSON, Administrator Respondents.	)	No. 06-1250

EPA'S MOTION FOR VOLUNTARY REMAND

Respondents United States Environmental Protection Agency and Stephen L. Johnson, Administrator (jointly, "EPA" or the "Agency"), hereby move for a voluntary remand of EPA's final action titled "Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Large Municipal Waste Combustors." 71 Fed. Reg. 27,324 (May 10, 2006) (the "LMWC Final Rule").

A primary focus of Petitioner's challenge to the LMWC Final Rule concerns the methodology EPA used to derive the new source performance standards and emission guidelines for Large Municipal Waste Combustors ("LMWCs") under Sections 111 and 129 of the Clean Air Act, 42 U.S.C. §§ 7411, 7429. In commenting on the proposed rule, Petitioner asserted, among other things, that the

standards and emission guidelines that EPA promulgated in 1995 pursuant to Clean Air Act Section 129(a)(2) were unlawful and contrary to subsequent D.C. Circuit case law. In addition to these comments, Petitioner included an administrative petition, asking EPA to revise the standards and emission guidelines in the 1995 rule consistent with the floor requirements of Section 129(a)(2) and D.C. Circuit precedent.[1]

EPA has decided to grant Petitioner's administrative petition to review the 1995 standards. Because the LMWC Final Rule comprises revisions to several standards of performance and emission guidelines initially established in the 1995 rule, and because the LMWC Final Rule supercedes relevant portions of the 1995 rule, reexamination of the 1995 rule would necessitate reexamining the LMWC Final Rule. Specifically, if any of the 1995 standards change as the result of EPA's re-analysis of the 1995 floors under Section 129(a)(2), EPA would need to re-evaluate its conclusions in the LMWC Final Rule because that rule involved a review and analysis of the standards and requirements of the 1995 rule. Accordingly, EPA requests that the Court remand the LMWC Final Rule so that EPA can make any changes to the LMWC Final Rule that may flow from EPA's

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[1] In developing standards of performance under Section 129(a)(2), EPA first establishes a "floor" and then determines whether additional reductions beyond the floor are appropriate, considering, among other things, the cost of such additional reductions. The floors represent the minimum level of stringency of the standards.

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reexamination of the 1995 floors. This Court recently granted a motion for a voluntary remand under similar circumstances. Natural Resources Defense Council v. EPA, 489 F.3d 1364 (D.C. Cir. 2007), and it should do so again here.

BACKGROUND

On December 19, 1995, EPA adopted standards of performance for new LMWCs and emission guidelines for existing LMWCs, pursuant to Sections 111 and 129 of the Clean Air Act, 42 U.S.C. §§ 7411, 7429. 60 Fed. Reg. 65,387. Section 129(a)(2) of the Clean Air Act provides that the standards for existing units "shall not be less stringent than the average emissions limitation achieved by the best performing 12 percent of units in the category."[2] 42 U.S.C. § 7429(a)(2). Section 129(a)(2) further provides that for new units, the standards "shall not be less stringent than the emissions control that is achieved in practice by the best controlled similar unit." Id. As noted above, these levels of minimum stringency are commonly referred to as "floors."

On December 19, 1995, EPA issued a final rule pursuant to Section 129, setting standards for new and existing LMWCs. 60 Fed. Reg. 65,387. In that rule, EPA based the floors for LMWCs on the emission limits established in state-issued air permits. By December 2000, the 1995 standards were fully implemented, and

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[2] The standards for existing units are expressed in the form of emission "guidelines." See 42 U.S.C. § 7429(b).

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those standards have resulted in substantial reductions in emissions of the pollutants regulated under Section 129. See 70 Fed. Reg. 75,348, 75,350 (Dec. 19, 2005) (stating that, relative to a 1990 baseline, the standards for existing sources reduced organic emissions by more than 99 percent, metal emissions by more than 93 percent, and acid gas emissions by more than 91 percent).

In 2004, in reviewing EPA's rule setting performance standards for Small Municipal Waste Combustors, this Court concluded that the floors for existing units that EPA had derived from state-issued permit limits did not fulfill the requirement in Section 129(a)(2) that floors reflect the performance of the best performing 12 percent of units. Northeast Maryland Waste Disposal Authority v. EPA, 358 F.3d 936 (D.C. Cir. 2004). Although the Court held that EPA could determine floors based on state permit data, it concluded that the record before it did not adequately explain whether the state permit levels reflected a reasonable estimate of the emission levels achieved by the best-performing 12 percent of existing units. In Northeast Maryland, the Court also focused on certain affirmative evidence in the record that called into question whether the floors in fact represented a reasonable estimate of the average level of reductions in emissions achieved by the best performing 12 percent of existing units. Id. at 953-54.

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Pursuant to Section 129(a)(5), EPA must "review and, in accordance with this section [Section 129] and section 7411 [Section 111], revise" standards of performance and other requirements, every five years. 42 U.S.C. § 7429(a)(5). On December 19, 2005, pursuant to section 129(a)(5), EPA proposed the LMWC Final Rule, which set forth the Agency's proposed revisions of the new source performance standards and emission guidelines for existing LMWCs. 70 Fed. Reg. 75,348. EPA did not perform a new "floor" analysis in connection with that proposal. Rather, the Agency relied on the 1995 rule as the foundation for its revisions. EPA's proposed rule contained revised emission limits for dioxin, cadmium, lead, mercury and particulate matter for existing LMWCs. EPA also proposed to revise emission limits for cadmium, lead, mercury, and particulate matter for new LMWCs.

In February 2006, Petitioner submitted comments on the proposed rule. While Petitioner noted improvements over the 1995 rule, including more stringent emission standards, it challenged various aspects of the rule. The central focus of Petitioner's comments concerned the methodology by which EPA developed the floors in 1995. Specifically, Petitioner argued that the 1995 floors were unlawful and contrary to subsequent D.C. Circuit precedent, citing Northeast Maryland, 358 F. 3d 936, and Cement Kiln Recycling Ass'n v. EPA, 255 F.3d 855, 861-63 (D.C. Cir.), and that EPA had a legal obligation under Section 129(a)(5) to recalculate

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the floors when it promulgated the LMWC Final Rule. (See Exhibit A, Comments of Earthjustice, at 3-4.)

In addition, Petitioner made an alternative argument and, on that basis, petitioned the agency to amend the 1995 regulations. Petitioner argued that, even if EPA has no obligation to re-examine the floors under Section 129(a)(5), the Agency should grant its administrative petition for rulemaking, re-open the 1995 rule under Section 129(a)(2), and revise the floors in the 1995 rule consistent with the statute and subsequent jurisprudence. Petitioner based this administrative petition on Kennecott Utah Copper Corp. v. Department of Interior, 88 F.3d 1191, 1213 (D.C. Cir. 1996) (holding that a petitioner may allege a claim, outside the statute of limitations period, that an agency action violated a statute, by filing a petition for amendment or rescission of the agency's regulations, and then challenging the denial of that petition). In its administrative petition, Petitioner asserted that EPA did not explain in the 1995 rule why the state permit limits reflect the actual performance of the best performing 12 percent of units. (Exhibit A, Comments of Earthjustice, at 3-4) (alleging that information in the record indicated that LMWCs were achieving emission levels better than their permit limits required).

On May 10, 2006, EPA issued the LMWC Final Rule under Clean Air Act Section 129(a)(5). The agency, among other things, disagreed with Petitioner's

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argument that EPA was obligated by Section 129(a)(5) to recalculate the floors in connection with its periodic review. 71 Fed. Reg. at 27,327-28. On July 7, 2006, Petitioner filed the instant petition for review and, pursuant to Section 307(d)(7)(B), 42 U.S.C. § 7607(d)(7)(B), also submitted to EPA an administrative petition asking EPA to reconsider four separate aspects of the LMWC Final Rule (the "Petition for Reconsideration"), none of which involved the recalculation of floors. After reviewing the Petition for Reconsideration, EPA determined that it was appropriate to initiate an administrative reconsideration process in response to the petition.

On October 31, 2006, this Court granted EPA's unopposed motion to hold this case in abeyance pending the Agency's evaluation of the Petition for Reconsideration. At the same time, the Court ordered EPA to file status reports at 90-day intervals. EPA has been submitting status reports consistent with this Court's order. On March 20, 2007, EPA issued a proposed notice of its reconsideration of the LMWC Final Rule in the Federal Register, 72 Fed. Reg. 13,016. EPA has not yet taken final action on the pending Petition for Reconsideration.

Since mid-March 2007, this Court has issued three decisions that are relevant to rules promulgated pursuant to Clean Air Act Sections 112 and 129. Sierra Club v. EPA, 479 F.3d 875 (D.C. Cir. Mar. 13, 2007) (vacating EPA's

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regulations setting national emission standards for brick and clay ceramics kilns under Section 112); Natural Resources Defense Council v. EPA, 489 F.3d 1250 (D.C. Cir. June 8, 2007) (vacating EPA regulations setting national emission standards under Section 112 for hazardous air pollutants from industrial, commercial, and institutional boilers and process heaters and EPA's regulations under Section 129 defining the term "commercial and industrial solid waste incineration unit"); and Natural Resources Defense Council v. EPA, 489 F.3d 1364 (D.C. Cir. June 19, 2007) (vacating portions of an EPA rule promulgated under Section 112 regulating hazardous air pollutants from the manufacture of plywood and composite wood products).

On July 16, 2007, in EPA's Third Status Report, EPA advised the Court that it was evaluating the effect of these three recent decisions on the LMWC Final Rule and that it intended to complete such evaluation by mid-September 2007, and take appropriate next steps. In conjunction with its review of these decisions, EPA also re-examined Petitioner's 2005 administrative petition seeking revision of the 1995 rule. EPA now intends to grant that administrative petition and initiate a rulemaking to re-analyze the floors in the 1995 rule, which EPA established pursuant to Section 129(a)(2). As part of that review, EPA will consider this Court's precedent on the issue of establishing floors under Sections 112 and 129,[3]

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[3] The floor requirements in sections 112 and 129 are essentially equivalent.

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including the Court's most recent decision on the issue, Sierra Club v. EPA, 479 F. 3d 875 (D.C. Cir. 2007) (the "Brick decision"). Among other things, the Brick decision holds that EPA cannot base its floors exclusively on technology, but rather must consider non-technology factors that affect Hazardous Air Pollutant emissions.

ARGUMENT

This Court possesses ample discretion to grant a voluntary remand in these circumstances. See, e.g., Ethyl Corp. v. Browner, 989 F.2d 522, 524 (D.C. Cir. 1993) ("We commonly grant such motions [for remand], preferring to allow agencies to cure their own mistakes rather than wasting the courts' and the parties' resources reviewing a record that both sides acknowledge to be incorrect or incomplete.").

In this case, EPA seeks a voluntary remand of the LMWC Final Rule so that it can revisit the floors from the 1995 rule and revise the LMWC Final Rule as necessary to comport with any revisions to the 1995 floors. A remand is clearly appropriate in this case. As explained above, the LMWC Final Rule revised several standards and guidelines established in the 1995 rule and superceded relevant portions of the 1995 rule. As a result, in order to re-examine the floors underlying the 1995 standards and make any changes to the 1995 standards necessitated by that reexamination, the Agency needs the court to remand the

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LMWC Rule to it. EPA intends to revisit the data and information used in the 1995 rule, as well as obtain additional data, to determine whether the 1995 floors need to be revised to comport with this Court's precedents. If any of the 1995 standards change as the result of EPA's re-analysis of the 1995 floors under Section 129(a)(2), EPA would need to re-evaluate its conclusions in the LMWC Final Rule because that rule involved a review of the standards and requirements in the 1995 rule. The Agency, therefore, seeks a remand of the LMWC Final Rule so that it can make any changes to the LMWC Final Rule that may flow from EPA's revisiting the 1995 floors.

Moreover, a re-evaluation of the floors in the 1995 rule may moot Petitioner's central challenge in this litigation. For example, in this case, Petitioner argues that the 1995 floors were not consistent with the floor requirements in Section 129(a)(2). By granting Petitioner's administrative petition, EPA will be conducting rulemaking to re-evaluate the 1995 floors. In addition, Petitioner challenges EPA's failure to consider pre-combustion controls, such as removing materials from the waste stream. (See Ptr.'s Nonbinding Statement of Issues 8/16/06 ¶¶ 1-9, 14; see also Exhibit A, Comments of Earthjustice, at 6.) To determine the floor for existing sources (i.e., the average emission limitation that is being achieved by the best performing 12 percent of LMWCs), the Agency must identify the best performing 12 percent of sources. Consistent with this Court's

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recent precedent, EPA intends to evaluate both technology and non-technology factors that affect Hazardous Air Pollutant emissions. Among other things, EPA will re-evaluate whether units with electrostatic precipitators, as opposed to fabric filters, are part of the top 12 percent of sources, which is another one of Petitioner's principal objections. EPA also will reexamine the emission standards for all of the pollutants identified in Section 129(a)(4), in connection with its review of Petitioner's administrative petition. If EPA revises the 1995 standards in response to the administrative petition, it may determine that additional changes, such as changes to monitoring requirements, would be appropriate in light of the revised standards. EPA requests that the Court remand the LMWC Final Rule so that the Agency can make any changes to the rule that may flow from EPA's reconsideration of the 1995 floors.

It would be inefficient for this case to proceed through briefing, argument, and decision -- at which point the Court might remand the rule -- when EPA desires such a remand now so that it may fully consider the implications of this Court's decisions regarding permissible bases for calculating floors under Section 129(a)(2). The most practical and efficient process is for this Court to remand the case and allow EPA to revisit the 1995 rule in light of the principles set forth by the Court in Northeast Maryland Waste Disposal Authority and subsequent

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precedent, including Sierra Club.[4] EPA can then reevaluate the LMWC Final Rule and make any changes to that rule that may flow from EPA's reexamination of the 1995 floors.

CONCLUSION

For the reasons set forth above, this Court should remand the LMWC Rule to EPA pursuant to Circuit Rule 42(b).

Dated: November 9, 2007

Respectfully submitted,

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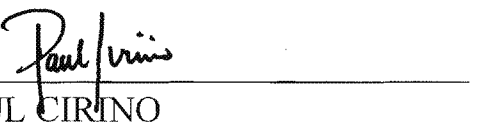

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[4] Remand without vacatur is appropriate here for three principal reasons. First, sources have been complying with the 1995 standards since December 19, 2000, see 70 Fed. Reg. 75,348, 75,350 (Dec. 19, 2005), and the controls that facilitate compliance with the 1995 standards are also expected to allow sources to comply with the revised standards established in the LMWC Final Rule. Second, existing sources are not currently required to comply with the revised standards and won't be required to do so for some time. Third, allowing the regulations to remain effective during EPA's reconsideration of the 1995 standards would be beneficial to the environment.

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CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing EPA's Motion for Voluntary Remand was today served, this 9th day of November, 2007, via first class mail, on the following counsel of record:

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Stationary Sources: Large Municipal Waste Combustors; Proposed Rule 69 Fed. Reg. 75348 (December 19, 2005)	)	Air and Radiation Docket No. OAR-2005-0117

COMMENTS OF EARTHJUSTICE

I. BACKGROUND.

Earthjustice appreciates the opportunity to comment on EPA's proposed revisions to its Clean Air Act regulations for large municipal waste combustors (MWC), 65 Fed. Reg. 75348 (December 19, 2005). Each year, by EPA's own estimates, large MWC continue to emit more than thirteen tons of mercury, forty-two grams of dioxins (TEQ), twenty-four tons of lead, and vast quantities of particulate matter and acid gases. *See* 60 Fed. Reg. 65387, 65403 (December 19, 1995) (citing (59 Fed. Reg. 48918, 48238 (September 30, 1994)). According to EPA, MWC also are a predominant source of polychlorinated biphenyls (PCBs) emissions in the United States and major emitters of other toxic organic pollutants. Because EPA's estimates do not account for emissions during startup, shutdown, malfunction, or other periods in which MWC exceed their emission limitations, it is likely that MWCs' actual emissions of all pollutants are significantly higher than the agency's estimates acknowledge.

EPA's proposal includes some improvements over the agency's 1995 regulations. These include:

- improving many of EPA's emissions standards;
- establishing an 8-hour block average for measuring activated carbon injection (ACI) rate, whereas EPA's existing standards apparently allow any averaging period to be used;
- considering a requirement to monitor pneumatic injection pressure at the location where the activated carbon is injected into the flue gas — a measure that would provide greater assurance that pollution control devices are working properly and that MWC are meeting their emission limits;
- requiring sources to meet mercury as well as dioxin criteria to qualify as "exceptionally well-operated" — a change that reduces a loophole in EPA's existing regulations; and
- improving the existing CEMs data collection requirement, giving permitting authorities and the public better information with which to evaluate MWCs' emissions and compliance with emission standards.

Unfortunately, EPA's proposal falls short of providing the public health and environmental protection that Congress intended. Most importantly, although many of the revised standards are somewhat more stringent than the existing standards, the agency itself states that they are not expected to yield any additional emission reductions. Indeed, EPA has expressed concern that because the revised standards still allow emission levels that are substantially worse than those actually being achieved by MWC, the new standards have the potential to allow significant "backsliding." Docket OAR-2005-0117, Item 0042 (Email of November 9 ,2005 from Walt Stevenson, EPA to Edmond Toy, OMB). Further, EPA has acknowledged that if just twenty-one large MWC improved their emission levels to those that the agency knows to be achievable through the use of control technology that is currently in place at the other 146 MWC, the nation would see substantial emission benefits. 70 Fed. Reg. at 75355. The premise for that observation is that these twenty-one units, which currently are equipped with electrostatic precipitators (ESPs), could improve their performance by switching to fabric filters (FF), yielding more than 130 tons per year of additional emission reductions each year. *Id.* Significantly, the ESP-equipped MWC already are subject to the same emission standards as the FF-equipped units, with respect to most of the pollutants regulated under § 129. Thus, if the 146 FF-equipped units also brought their emissions down to the level that EPA now acknowledges is actually being achieved through the use of FF, even greater emissions reductions would result. That EPA's proposal would — by EPA's own estimation — not yield any emission reductions makes plain that the agency's proposal is far less protective than it could be and should be. As shown below, it also is less protective than the Clean Air Act requires.

Also of great concern is EPA's failure to propose any pre-combustion requirements that would prevent or reduce the burning of batteries, switches, PVC plastics, and other wastes that increase emissions of highly toxic, persistent, and bioaccumulative pollutants. It is beyond dispute that requiring MWC to eliminate such substances from the waste they burn, or to reduce the amounts of such substances in the waste they burn, would yield significant reductions above and beyond those resulting from the use of combustion controls and end-of-stack control technology. Congress could not have indicated more clearly that it wanted EPA's incinerator standards to include pre-combustion pollution prevention measures such as materials separation, and the agency's own waste disposal hierarchy makes clear that recycling and pollution prevention are priorities. This rulemaking presents EPA with an opportunity to significantly reduce MWC's toxic emissions through pre-combustion measures. To ignore this opportunity — as EPA's proposal does — is both unlawful and misguided.

II. FAILURE TO REVISE THE FLOORS IN ACCORDANCE WITH § 129.

A. Section 129(a)(5) Requires EPA To Revise Its § 129 Standards To Ensure That They Reflect The Actual Performance Of The Best Performing Units.

The Clean Air Act provides "[n]ot later than 5 years following the initial promulgation of any performance standards and other requirements under this section and section 7411 of this title applicable to a category of solid waste incineration units, and at 5 year intervals thereafter, the Administrator shall review, and in accordance with this section and section 7411 of this title, revise such standards and requirements." 42 U.S.C. § 7429(a)(5). EPA initially promulgated emission standards for large municipal waste combustors (MWC) on December 19, 1995. 65

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Fed. Reg. 65387 (December 19, 2005). Thus, the agency had a nondiscretionary duty to complete its first review and revision of these regulations no later than December 19, 2000. 42 U.S.C. § 7429(a)(5). After EPA failed to meet that obligation, the agency was ordered to do so by the United States District Court for the District of Columbia. *Sierra Club v. Whitman*, D.D.C. No. 01-1537.

As noted above, Clean Air Act § 129(a)(5) requires EPA to revise its MWC standards "in accordance with" § 129. 42 U.S.C. § 7429(a)(5). To satisfy § 129(a)(5), therefore, EPA must conduct a new floor analysis to ensure that its revised standards are "in accordance with" § 129(a)(2)'s floor requirements. Specifically, EPA's revised standards for existing MWC must, at a minimum, reflect the average emission level that is currently being achieved by the best performing twelve percent of MWC. 42 U.S.C. § 7429(a)(2). Likewise, EPA's revised standards for new MWC must reflect the actual performance of the single best performing unit. *Id.*

EPA has not even attempted to comply with this requirement. Nothing in EPA's proposal indicates that EPA identified the relevant best performing sources or determined the average emission level that these sources are achieving. Although EPA revised some of its standards, the revised standards do not purport to reflect the actual performance of the relevant best performing sources. Rather, where EPA revised its standards at all, the new standards appear to reflect emission levels that the agency regarded as achievable for all units through the use of certain control technology. EPA does not claim that its new standards reflect the actual performance of the relevant best units. Further, even if EPA had made such a claim, it is well established that the agency cannot satisfy the Clean Air Act's floor requirements by setting standards at levels that it regards as achievable for all units through the use of chosen control technologies. *Cement Kiln Recycling Association v. EPA*, 255 F.3d 855, 861-863 (D.C. Cir. 2001) ("*CKRC*"). Therefore, EPA has not revised its standards in accordance with § 129(a)(2), as § 129(a)(5) requires.

B. Because EPA's 1995 Standards Were Unlawful, § 129(a)(5) Requires The Agency To Revise Them In Accordance With § 129(a)(2).

Even if § 129(a)(5) did not always require EPA to recalculate the floors for its § 129 standards, it would require the agency to do so here. Section 129 requires that the floors for existing units reflect the actual performance of the best performing twelve percent of units. 42 U.S.C. § 7429(a)(2). Likewise, floors for new units must reflect the actual performance of the single best-performing unit. *Id.* Where EPA seeks to estimate the relevant best units' performance, it must explain why its estimates are reasonable and must corroborate its assumptions "with substantial evidence — not mere assertions." *CKRC*, 255 F.3d 855 at 866. *See also Northeast Maryland Waste Disposal Authority v. EPA*, 358 F.3d 936, 954 (D.C. Cir. 2004) (remanding EPA's § 129 standards for small MWC where agency failed to provide "evidence that the permit levels reflect the emission levels of the best-performing 12 percent of existing MWCs").

Nonetheless, the floors the EPA established in its 1995 rulemaking did not even purport to reflect the emission levels achieved by the best performing MWC. EPA's floors for existing units reflected requirements in existing State air permits. 59 Fed. Reg. 48198, 48245 (September

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20, 1994); Docket A-90-45, Item IV-B-8 at 1-2. Indeed, EPA did not even claim that these permit limits reflected the actual performance of the relevant best units. Instead, the agency argued that it had discretion to interpret the Clean Air Act as requiring floors to be based on limits in State air permits regardless of whether such limits were representative of the best units' actual performance. Docket A-90-45, Item V-B-1 at 7-70 – 7-71.

The statutory interpretation on which EPA's 1995 regulations rested was flatly unlawful, and has been soundly and repeatedly rejected by the D.C. Circuit:

> In *Sierra Club v. EPA*, 167 F.3d 658, (D.C. Cir. 1999), the court rejected EPA's similar use of state permit limits to set the MACT floor for medical waste incinerators (MWIs). The court recognized that CAA § 129 may permissibly be construed "to permit the use of regulatory data" but only "if they allow EPA to make a reasonable estimate of the performance of the top 12 percent of units." 167 F.3d at 662. The court rejected the use of such data in that case because "[a]lthough EPA said that it believed the combination of regulatory and uncontrolled data gave an accurate picture of the relevant MWI's performance, it never adequately said why it believed this." EPA fares no better here.

Northeast Maryland Waste Disposal Authority, 358 F.3d at 953-954 (emphasis in original). Further, even if EPA had claimed that its floors reflected the best sources' performance — which it did not — the record contains no explanation or substantial evidence supporting any such assertion. Moreover, overwhelming record evidence shows that even before the 1995 regulations were issued, MWC were achieving emission levels considerably better than their permit limits required. For example, EPA admitted that the actual performance achieved by the Kent County, Michigan MWCs was .007 milligrams per dry standard cubic meter (mg/dscm) — i.e., more than 100 times better than .870 mg/dscm, the level that their State permits allowed. For these reasons, the floor approach that EPA adopted in promulgating the 1995 MWC regulations was unlawful and arbitrary and capricious.

Like its floors for existing units, EPA's floors for new units did not purport to reflect the actual performance of the relevant best units. Rather, they reflected EPA's views about what is achievable through the use of certain control technologies. 59 Fed. Reg. at 48215-48216. As the subsequent caselaw has confirmed, the Clean Air Act does not allow EPA to set floors based on what it regards as achievable through the use chosen technology rather than on the actual performance of the relevant best units. *Northeast Maryland Waste Disposal Authority*, 358 F.3d at 954-955; *CKRC*, 255 F.3d at 861. Thus, EPA's floors for new units also were unlawful and arbitrary and capricious.

To bring its standards into accordance with § 129, EPA must recalculate the floor for each of its standards and ensure that its final standards do — at a minimum — reflect the actual performance of the relevant best performing units. 42 U.S.C. § 7429(a)(5), (a)(2).

C. Petition To Amend Regulations In Accordance With § 129.

Assuming *arguendo* that § 129(a)(5) does not require EPA to revise its MWC regulations in accordance with the floor requirements in § 129(a)(2), Earthjustice hereby petitions the agency

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to do so under the authorities described in *Kennecott Utah Copper Corp. v. Department of Interior*, 88 F.3d 1191 (D.C. Cir. 1996).

Quoting earlier precedent, *Kennecott Utah Copper* holds "although a statutory review period permanently limits the time within which a petitioner may claim that an agency action was procedurally defective, a claim that agency action was violative of statute may be raised outside a statutory limitations period, by filing a petition for amendment or rescission of the agency's regulations, and challenging the denial of that petition." 88 F.3d at 1213 (emphasis added, citation and internal quotation marks omitted). It further holds that because this "circuitous process would be a waste of time and resources" "where an agency reiterates a rule or policy subject to renewed challenge on any substantive grounds, a coordinate challenge that such a rule or policy is contrary to law will not be held untimely because of a limited statutory review period." *Id.*, 88 F.3d at 1214. As explained above, EPA's 1995 MWC regulations violated the § 129's floor provisions. Under *Kennecott Utah Copper*, a petition is unnecessary because EPA's current proposal is "subject to renewed challenge" on substantive grounds. Nonetheless, as a precaution, Earthjustice petitions EPA to amend its 1995 MWC regulations to bring them into compliance with § 129's floor requirements.

III. FAILURE TO REVISE THE FINAL STANDARDS IN ACCORDANCE WITH § 129.

A. Section 129(a)(5) Requires EPA To Ensure That Its MWC Standards Require The Maximum Achievable Degree Of Reduction In Emissions.

Just as EPA has failed to ensure that its standards comply with the floor requirements in § 129(a)(2), it also has failed to ensure that its standards comply with that provision's "beyond-the-floor" requirements for final standards. Section 129(a)(2) provides "[s]tandards applicable to solid waste incineration units promulgated under section 7411 of this title and this section shall reflect the maximum degree of reduction in emissions of air pollutants listed under section (a)(4) that the Administrator taking into account the cost of achieving such reduction, and any non-air quality health and environmental impacts and energy requirements, determines is achievable for new or existing units in each category." 42 U.S.C. § 7429(a)(2) (emphasis added). Section 129(a)(3) then provides "[s]tandards under section 7411 of this title and this section applicable to solid waste incineration units shall be based on methods and technologies for removal or destruction of pollutants before, during, or after combustion, and shall incorporate for new units siting requirements that minimize, on a site-specific basis, to the maximum extent practicable, potential risks to public health or the environment." 42 U.S.C. § 7429(a)(3). Read together, as they must be, §§ 129(a)(2) and (3) require the maximum degree of reduction in emissions that can achieved through the application of, *inter alia*, the pre-combustion removal methods and technologies to which § 129(a)(3) refers.

EPA, however, has not even attempted to ensure that its proposal requires the maximum achievable degree of reduction in emissions through pre-combustion measures or any other measures. Indeed, the agency has not even determined the maximum achievable degree of reduction for any of the pollutants listed in § 129(a)(4). Rather, EPA has revised only some of its emission standards and the revised standards do not even purport to reflect the maximum

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achievable degree of reduction. By failing to revise its MWC standards to ensure that each such standard reflects the maximum achievable degree of reduction, as required by § 129(a)(2)-(3), EPA contravenes § 129(a)(5).

In particular, EPA's failure to set final MWC standards that require the maximum degree of reduction that can be achieved through methods and technologies for the removal of pollutants "before combustion" is unlawful. 42 U.S.C. 7429(a)(3), (5). Because § 129(a)(2) and (3) require the "maximum" achievable degree of reduction that is achievable through measures including pre-combustion measures, EPA must set final standards reflecting the use of pre-combustion measures, unless: (1) pre-combustion measures would not yield any additional reductions; or (2), standards including pre-combustion measures would not be achievable considering the factors set out in § 129(a)(2). 42 U.S.C. § 7429(a)(2)-(3). Otherwise, its standards will necessarily reflect a degree of reduction that is less than the "maximum" that is "achievable."

EPA's 1995 standards for existing MWC are either set at the permit-based floor, or are based solely on the alleged performance of combustion controls and end-of-stack control technology. Item V-B-1 at 7-18 – 7-20. EPA's 1995 standards for new MWC were based solely on the performance of combustion controls and end-of-stack control technology. 60 Fed. Reg. at 65395-65396 (1995 new unit standards). Completely left out of the standards were pre-combustion measures. To the extent EPA's proposal revises the MWC standards, the revisions reflect emission levels that EPA regards as achievable through the use of end-of-stack control technology. 69 Fed. Reg. at 75351-75352. Thus, none of the standards that EPA has set for MWC ever have reflected, either directly or indirectly, the effects of pre-combustion measures. For this reason alone, requiring pre-combustion measures will necessarily yield some additional reductions above and beyond those attributable to existing standards. For example, removing mercury from the waste stream will reduce mercury emissions, removing lead from the waste stream will reduce lead emissions, etc. Other reductions also will result from pre-combustion measures: removing chlorinated plastics from the waste stream will reduce emissions of chlorinated organic pollutants such as dioxins and PCBs and also will reduce emissions of hydrochloric acid. The D.C. Circuit recognized this self-evident truth in the medical waste incinerators case. *Sierra Club v. EPA*, 167 F.3d 558, 666 (D.C. Cir. 1999) ('The less mercury in, the less mercury out.") EPA itself has acknowledged it repeatedly in the record for this rulemaking. *E.g.* Docket A-89-08, Item II-A-8, Municipal Waste Combustion Study (1987) at 17 ("it is EPA's judgment, based on a review of available studies and other information, that removing specific components of the waste stream prior to incineration has beneficial effects on MWC stack emissions, above and beyond the benefits of stack controls."); Docket A-89-08, Item IV-J-348 (materials separation air benefits). In addition, EPA has received communications from States that have successfully implemented pre-combustion requirements, and these communications further confirm that such requirements yield additional reductions. *E.g.*, Letter of July 7, 1997 from Sullivan to Porter (Ex. A) hereto).

The record also amply demonstrates that pre-combustion measures are achievable. For example, in its memorandum entitled "Cost and Benefit Estimates for Materials Separation Requirements in MWC NSPS, EPA provided a model "offering complete coverage of the major factors determining the economic consequences of requiring materials separation." Docket A-

89-08, Items II-B-47, at 1. The agency concluded that "the overall costs of the materials separation requirements will be negligible." Docket A-89-08, Item IV-B-38. Further, although § 129(a)(2) does not impose a cost-benefit test, EPA expressly found that a materials separation requirement would pass "any imaginable" cost benefit test:

> the long-term national costs are negligible or negative, while benefits are positive. These benefits include extended disposal capacity due to reduced waste and ash landfilling; reduced combustor emissions of toxic metals, toxic organics, and acid gases; reduced volume and toxicity of ash; energy savings due to recycling energy benefits and diversion of combustibles from landfills; and reduced energy use and pollution associated with virgin materials extraction and use.

Docket A-89-08, Item IV-B-46, at 4. *See generally* Docket A-89-08, Item IV-B-38 ("the Agency believes that the overall national costs of the materials separation requirements will be negligible"); IV-B-44 (discussing benefits of materials separation requirement); IV-B-45 (discussing pollution reductions and energy savings that materials separation requirement would yield); IV-J-348 ("MWC: Materials Separation Air Benefits"). More recently, as noted above, pre-combustion measures have been implemented successfully in some jurisdictions.

Because pre-combustion measures would yield additional reductions and are achievable, § 129(a)(2) and (3) mandate that EPA's final MWC standards require them. Therefore, to revise its MWC standards "in accordance with" those provisions, as § 129(a)(5) requires, the agency must set standards that reflect the maximum degree of reduction that is achievable through the use of control measures including pre-combustion measures. The agency's failure to do so is unlawful.

B. Because EPA's 1995 Standards Were Unlawful, § 129(a)(5) Requires The Agency To Revise Them In Accordance With § 129(a)(2) and (3).

Even if § 129(a)(5) did not always require EPA to recalculate the maximum achievable degree of reduction for its § 129 standards, it would require the agency to do so here. Section 129(a)(2) and (3) require that EPA's standards reflect the maximum degree of reduction that is achievable through measures and technologies that include pre-combustion measures. 42 U.S.C. § 7429(a)(2)-(3). EPA's 1995 standards do not meet this requirement. Specifically, they do not reflect the maximum degree of reduction that can be achieved, but only a degree of reduction that can be achieved through post-combustion end-of-stack technologies. Most glaringly, they fail to reflect the additional degree of reduction that undisputedly could be achieved through pre-combustion measures.

To bring its standards into accordance with § 129, as mandated by § 129(a)(5), EPA must revise its MWC standards to ensure that these standards require the maximum degree of reduction that is achievable through measures including pre-combustion measures, as expressly required by § 129(a)(2)-(3).

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C. Petition To Amend Regulations In Accordance With § 129.

Assuming *arguendo* that § 129(a)(5) does not require EPA to revise its MWC regulations in accordance with the beyond-the-floor requirements in § 129(a)(2), Earthjustice hereby petitions the agency to do so under the authorities described in *Kennecott Utah Copper Corp. v. Department of Interior*, 88 F.3d 1191 (D.C. Cir. 1996). As explained above, EPA's 1995 MWC regulations violated § 129's mandate that final standards require the maximum degree of reduction that is achievable through methods and technologies including pre-combustion measures. Under *Kennecott Utah Copper*, a petition is unnecessary because EPA's current proposal is "subject to renewed challenge" on substantive grounds. Nonetheless, as a precaution, Earthjustice petitions EPA to amend its 1995 MWC regulations to bring them into compliance with § 129.

IV. EPA'S MUST SET REVISED DIOXIN STANDARDS THAT APPLY TO ALL EXISTING MWC.

A. Section 129(a)(5) Requires EPA To Revise Its § 129 Standards To Eliminate The Distinction Between Existing MWC That Are Equipped With Electrostatic Precipitators And Those Using Different Air Pollution Control Devices.

Section 129(a)(2) provides "the Administrator may distinguish among classes, types ... and sizes of units within a category" in establishing standards. 42 U.S.C. § 7429(a)(2) (emphasis added). It does not allow EPA to distinguish based on the type of air pollution control device that a unit uses. Indeed, EPA itself has recognized that it lacks authority to subcategorize on this basis. 69 Fed. Reg. 21198, 21214 (April 20, 1994). *See also* 69 Fed. Reg. 394, 403 (January 5, 2004). Therefore, EPA's decision to set different standards for existing MWC equipped with electrostatic precipitators (ESPs) and those not equipped with ESPs was unlawful. To bring its MWC standards into "accordance with" § 129 as § 129(a)(5) requires, EPA must eliminate the distinction between MWC equipped with ESPs and those not so equipped. EPA appears to be moving in this direction by proposing that after April 28, 2009 the emission limit for all existing large MWC is 21 ng/dscm. The agency should not wait another three years, however, to eliminate an unlawful distinction; it should require all existing MWC to meet the standard for non-ESP-equipped units now, and then meet — as expeditiously as practicable — more protective standards established in the present rulemaking under § 129(a)(5).

B. Petition To Amend Regulations In Accordance With § 129.

Assuming *arguendo* that § 129(a)(5) does not require EPA to eliminate its distinction between existing MWC equipped with ESPs and those not so equipped, Earthjustice hereby petitions the agency to do so under the authorities described in *Kennecott Utah Copper Corp. v. Department of Interior*, 88 F.3d 1191 (D.C. Cir. 1996). As explained above, the distinction exceeded EPA's authority under § 129(a)(2). Under *Kennecott Utah Copper*, a petition is unnecessary because EPA's current proposal is "subject to renewed challenge" on substantive grounds. Nonetheless, as a precaution, Earthjustice petitions EPA to amend its 1995 MWC regulations to bring them into compliance with § 129.

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V. TO COMPLY WITH § 112(c)(6), EPA MUST SET EMISSION STANDARDS FOR PCBS AND POM.

Clean Air Act § 112(c)(6) requires EPA to assure that source categories accounting for not less than ninety percent of the aggregate emissions of certain highly persistent and bioaccumulative hazardous air pollutants are subject to the Act's highly protective standards under § 112(d)(2) or (d)(4) with respect to such pollutants. 42 U.S.C. § 7412(c)(6). EPA has found that much of these emissions are attributable to categories of incinerators that must be regulated under § 129 rather than § 112. 63 Fed. Reg. 17838, 17849 (April 10, 1998). Therefore, the agency has interpreted the Clean Air Act as allowing it to meet the requirements of § 112(c)(6) by setting emission standards for incinerators' emissions of the § 112(c)(6) pollutants under § 129 instead of § 112(d). The agency asserts that § 129 standards are "substantively equivalent to those promulgated under section 112(d)." 70 Fed. Reg. at 75356.

Section 112(c)(6) requires EPA to set § 112(d) standards for each of the § 112(c)(6) pollutants. As EPA acknowledges, MWC account for a large portion of the aggregate emissions of both polychlorinated biphenyls (PCBs) and polycyclic organic matter (POM). Thus, to satisfy § 112(c)(6), EPA must exercise its discretionary authority under § 129(a)(4) to set emission standards for both of these pollutants.[1]

EPA now argues that because its existing standards for <u>other</u> pollutants coincidentally reduce MWCs' emissions of PCBs and POM, the agency does not have to set standards for PCBs and POM to satisfy its obligations under § 112(c)(6). 70 Fed. Reg. at 75356. According to EPA, the control measures needed to comply with its existing standards for other pollutants also reduce PCBs and POM "substantially" and "effectively." The Clean Air Act, however, does not give EPA discretion to decide standards set to control <u>other</u> pollutants are good enough to satisfy § 112(c)(6) if, in the agency's view, such standards reduce the § 112(c)(6) pollutants "substantially" or "effectively." Rather, both § 112 and § 129 require a highly specific degree of reduction of each pollutant. Each hazardous air pollutant enumerated in § 112(b) — and, *a fortiori*, the hazardous air pollutants singled out for special treatment under § 112(c)(6) — must be reduced by the degree set out specifically in §§ 112(d)(2)-(3) or the "substantially equivalent" provisions in § 129(a)(2). Specifically, EPA must ensure that each such pollutant is, at a minimum, reduced to the emission levels achieved by the relevant best performing sources. 42 U.S.C. § 7412(d)(3), § 7429(a)(2). Beyond, that EPA must ensure that each such pollutant is reduced to the "maximum" degree that is achievable considering cost and the other statutory factors. 42 U.S.C. § 7412(d)(2), § 7429(a)(2)-(3). Thus, EPA's declaration that its existing MWC standards reduce PCBs and POM "effectively" and "substantially" is not enough. To satisfy § 112(c)(6), EPA must set emission standards for these pollutants ensuring that that they are reduced by the amount that the Clean Air Act expressly requires in § 112(d) and § 129(a).

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[1] Because large MWC account for less than ninety percent of the aggregate emissions of PCBs and POM, setting PCBs and POM emission standards for the large MWC category alone will not fully satisfy EPA's obligations under § 112(c)(6). Because MWC account for more than ten percent of the aggregate emissions of PCBs and POM, however, EPA cannot possibly satisfy § 112(c)(6) unless it sets PCBs and POM emission standards for this category.

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EPA may in some circumstances use surrogates to set emission standards for hazardous air pollutants, but those circumstances are not applicable here. First, EPA does not even claim that any of its standards for other pollutants serve as surrogates for PCBs or POM, but only that these standards reduce PCBs and POM to some degree. Second, Congress expressly directed EPA to assure that ninety percent of aggregate PCBs and POM emissions are subject to standards with respect to these pollutants. 42 U.S.C. § 7412(c)(6). Accordingly, § 112(c)(6) requires direct numerical emission standards for PCBs and POM, and does not give EPA discretion to regulate them through surrogates. Third, assuming *arguendo* that EPA were claiming that its existing standards for other pollutants were surrogates for other pollutants and even if the agency ever could satisfy its obligations under § 112(c)(6) by using surrogate standards, the agency's discretion to use surrogates has been carefully defined by binding judicial precedent, which provides a three part test:

> In *National Lime*, this court established a three-part analysis for determining whether the use of PM as a surrogate for HAPs is reasonable: PM is a reasonable surrogate for HAPs if (1) "HAP metals are invariably present in ... PM;" (2) "PM control technology indiscriminately captures HAP metals along with other particulates;" and (3) "PM control is the only means by which facilities 'achieve' reductions in HAP metal emissions." If these criteria are satisfied and the PM emission standards reflect what the best sources achieve — complying with Section 7412(d)(3) — "EPA is under no obligation to achieve a particular numerical reduction in HAP metal emissions."

Sierra Club v. EPA, 353 F.3d 976, 984 (D.C. Cir. 2004) (quoting *National Lime Ass'n v. EPA*, 233 F.3d 625, 639 (D.C. Cir. 2000) (emphasis added). The standards that EPA has set for other pollutants fail the test set forth in *National Lime Ass'n* and *Sierra Club*, and therefore do not satisfy the agency's obligations under § 112(c)(6) to set standards for PCBs and POM.

Under the *Sierra Club* test, it is necessary but not sufficient that PCBs and POM are reduced by the same measures that MWC take to meet EPA's existing standards for other pollutants. The measures that MWC take to meet EPA's existing standards for other pollutants also must be the "only" means by which MWC achieve reductions in PCBs and POM. That is not the case. MWCs' emissions of PCBs and POM also are affected by the composition of the waste that they burn. Indeed, EPA has admitted that for hazardous waste combustors, "the major source of HWC PCB emissions is thought to be from PCBs in the waste (that are not destroyed in the combustion zone)." EPA, Technical Support Document for HWC MACT Standards (September 2005), v.3 at 3-9 (excerpts attached as Ex. B hereto). The same applies equally to MWC.

The governing caselaw uses the term "achieved" very deliberately. Section 129(a)(2), like § 112(d)(3), requires floors to reflect the average emission levels "achieved" by the best performing sources. 42 U.S.C. § 7429(a)(2), (c)(3). *See CKRC*, 255 F.3d at 865 ("Section 7412(d)(3) requires only that EPA set floors at the emission level achieved by the best-performing sources."). As the Court has made entirely clear, "[t]he Clean Air Act requires EPA to set MACT floors based upon the 'average emission level achieved,' 42 U.S.C. § 7412(d)(3); it nowhere suggests that this achievement must be the product of a specific intent." *National Lime Ass'n*, 233 F.3d at 640 (emphasis added). It is precisely the point of the § 129's floor

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requirements to assess units' performance as an end result — i.e., emission levels achieved — rather than the means by which those levels are achieved. Thus, reductions can be "achieved" through means that are not deliberate. In particular, MWC can achieve reductions in PCBs and POM emissions within the meaning of *Sierra Club* and *National Lime*, by burning waste that has less PCBs or POM present, whether or not the MWC operator is making any deliberate efforts to control the amount of PCBs or POM in the waste burned. Because MWCs' emissions of PCBs and POM are affected by the quantities of PCBs and POM in the waste they burn — and not just by the combustion controls and end-of-stack controls that MWC implement to meet the agency's existing standards — such controls are not the "only" means by which facilities "achieve" reductions in PCBs and POM. *Sierra Club*, 353 F.3d at 984. Therefore, EPA's existing standards for other pollutants cannot possibly provide a reasonable surrogate for these pollutants. *Sierra Club*, 353 at 984; *National Lime Ass'n*, 233 F.3d at 639-640.

Although the undeniable effect of PCBs and POM feedrate on PCBs and POM emissions is enough to doom any argument that EPA's existing standards for other pollutants provide a surrogate for PCBs and POM, it also is now well established that emissions of both PCBs and POM are affected by the amount of certain chlorinated compounds and other plastics in the waste feed. This fact further refutes any claim that EPA's existing standards for other pollutants provide a surrogate for PCBs and POM. *See. e.g.*, EPA, "Evaluation of Emissions From The Open Burning Of Household Waste In Barrels" (1998) (Ex. C hereto) Greenpeace, "PVC: A Primary Contributor To The U.S. Dioxin Burden (Ex. D hereto); Citizens Clearinghouse For Hazardous Waste, "How To Start To Stop Dioxin Exposure In Your Community" (Ex. E hereto); Center For Health, Environment And Justice, "PVC: The Poison Plastic, Health Hazards And The Looming Waste Crisis" (Ex. F hereto). Additional documents relevant to this point have been submitted to the docket by Jane Williams and are incorporated with there comments by reference.

Assuming *arguendo* that EPA could ever satisfy § 112(c)(6) by setting surrogate standards instead of direct standards for PCBs and POM, the agency could only doing so by passing the test set forth in *Sierra Club*: showing that the controls required by its existing MWC standards are the only means by which MWC "achieve" reductions in these pollutants. Because EPA cannot possibly make such a showing — given that some MWC also "achieve" reductions of these pollutants within the statutory meaning of that term by burning waste with lower levels of PCBs and POM — the agency must set floors and final standards for these pollutants. By doing so, the agency will: (1) necessarily determine which MWC are achieving the best emission levels for PCBs and POM; (2) ensure that all MWC match the levels achieved by the relevant best performing units; and (3) ultimately set standards that reflect the maximum degree of reduction in each of these pollutants. To do anything less would contravene the Clean Air Act and frustrate Congress's intent in enacting § 112(c)(6), § 112(d), and § 129(a).

VI. EPA'S NEW CO STANDARDS ARE UNLAWFUL AND ARBITRARY AND CAPRICIOUS.

EPA's proposal adds two new subcategories of MWC, and sets CO standards for them. 70 Fed. Reg. at 75352-75353. The agency states that it determined the stringency of these standards by "calculat[ing] a statistically achievable emission limit based on a 24-hour block average for each of the two MWC types." *Id.* at 75353.

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EPA's method for the setting the new CO standards does not satisfy § 129(a)(2) and, indeed, bears no relationship to the standard-setting process that provision sets out. Specifically, EPA did not determine which were the relevant best performing units in the two new subcategories, did not assess such units' performance, and did not set floors at the emission level such units achieved. Nor did EPA determine the maximum degree of reduction that was achievable for units in the two new subcategories.

In addition, EPA completely failed to set new standards for pollutants other than CO for the new subcategories. The agency apparently assumed that it only had to set standards for CO but, if the agency believes it is necessary to create new subcategories, it also is necessary to set standards for these new subcategories for each of the pollutants that § 129(a)(4) enumerates. Such standards must satisfy the stringency requirements in § 129(a)(2). EPA's proposal, which assumes that the agency can simply use the standards that it previously set for other subcategories, ignores the agency's obligations under § 129(a)(2) to ensure that each of the standards for its new subcategories reduces the relevant pollutants to degree required by that provision, and is arbitrary and capricious.

VII. USE OF CONTINUOUS EMISSION MONITORS.

A. Section 129(a)(5) Requires EPA To Revise Its Monitoring Requirements In Accordance With § 129(c).

Clean Air Act § 129(c) provides

> The Administrator shall, as part of each performance standard promulgated pursuant to subsection (a) of this section and section 7411 of this title, promulgate regulations requiring the owner of operator of each solid waste incineration unit —
>
> (1) to monitor emissions from the unit at the point at which such emissions are emitted into the ambient air (or within the stack, combustion chamber or pollution control equipment as necessary to protect public health and the environment;
>
> (2) to monitor such other parameters relating to the operation of the unit and its pollution control technology as the Administrator determines are appropriate; and
>
> (3) to report the results of such monitoring.

42 U.S.C. § 7429(c) (emphasis added). Thus, EPA's standards must require emissions monitoring, not just parameter monitoring, for "each" of its standards. To revise its MWC standards "in accordance with" § 129(c), as § 129(a)(5) requires, EPA must now establish emission monitoring requirements for each such standard.

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Recognizing that continuous emission monitors (CEMs) are now widely available for many of the pollutant that MWC emit, EPA has requested comment on the reasonableness of amending its regulations to allow for their use. 70 Fed. Reg. at 75354. Among the types of CEM that are available but not currently in widespread use on MWC in the United States are CEMs for HCl, mercury, metals, and dioxins. Because EPA's current standards do not include emission monitoring requirements for the majority of its standards, EPA must establish such requirements now. Accordingly, it is not enough for EPA merely to "allow" MWC to use the available CEMs to monitor their emissions, the agency must establish regulations requiring them to do so.

Section 129(c) also provides that EPA's regulations must be sufficient "to protect public health and the environment." 42 U.S.C. § 7429(c)(1). Accordingly, to satisfy § 129(a)(5), EPA must now determine what emissions monitoring requirements are necessary to protect public health and the environment and establish such requirements. CEMs monitoring requirements are not only the only available means to monitor emissions of the standards subject to EPA's standards, but the only requirements that can possibly provide data adequate to ensure compliance with emission standards and protection of public health and the environment.

B. Because EPA's 1995 Standards Were Unlawful, § 129(a)(5) Requires The Agency To Revise Them In Accordance With § 129(c).

Even if § 129(a)(5) did not automatically require EPA to establish emissions monitoring requirements in accordance with § 129(c), it would require that result here. In direct contravention of § 129(c)(1), EPA's 1995 regulations failed to establish emissions monitoring requirements for the majority of the performance standards they included. Instead, those regulations established only "parameter" monitoring requirements. The Clean Air Act unambiguously requires EPA to establish "emission" monitoring requirements for "each" standards <u>and</u> such "parameter" monitor requirements as the agency determines are appropriate. 42 U.S.C. § 7429(c). Accordingly, the agency lacked discretion to establish <u>only</u> parameter monitoring requirements for some standards. Now, to bring its MWC standards into accordance with § 129(c) as required by § 129(a)(5), the agency must establish emissions monitoring requirements for each standard that are sufficient to protect public health and the environment. CEMs are the only means to monitor "emissions" of the pollutants subject to EPA's standards. Further, even if there were other means of monitoring such emissions, CEMs provide the only means that provide sufficient information of sufficient accuracy to protect public health and the environment.

C. Petition To Amend Regulations In Accordance With § 129.

Assuming *arguendo* that § 129(a)(5) does not require EPA to revise its MWC regulations in accordance with the monitoring in § 129(c), Earthjustice hereby petitions the agency to do so under the authorities described in *Kennecott Utah Copper Corp. v. Department of Interior*, 88 F.3d 1191 (D.C. Cir. 1996). As explained above, EPA's 1995 MWC regulations violated § 129's mandate that, for "each" standard, EPA establish regulations to monitor "emissions" as necessary to protect public health and the environment. Under *Kennecott Utah Copper*, a petition is unnecessary because EPA's current proposal is "subject to renewed challenge" on

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substantive grounds. Nonetheless, as a precaution, Earthjustice petitions EPA to amend its 1995 MWC regulations to bring them into compliance with § 129.

VIII. EPA'S DECISION NOT TO REQUIRE ESP-EQUIPPED UNITS TO USE FFS WAS ARBITRARY AND CAPRICIOUS.

For the reasons given above, EPA must recalculate the floors and final standards for all MWC units. Even if that were not the case, however, the agency's decision not to require ESP-equipped units to replace their ESPs with FFs, was unlawful and arbitrary and capricious.

EPA acknowledges that the change would yield substantial reductions in emissions. 70 Fed. Reg. at 75355. In particular, the twenty-one units that would switch from ESP to FF would emit a total ninety grams less of dioxins each year (1.0E-4 tons), 1000 pounds less of mercury, 340 pounds less of cadmium, 4800 pounds less of lead, 130 tons less of particulate matter (PM) and sixteen tons less of fine particulate matter. *Id.* EPA's stated reason for declining to require the ESP-equipped units to switch to FF was that "the cost-reduction ratio for ESP replacement was excessive." *Id.* The Clean Air Act, however, does not condition EPA's obligation to require the "maximum" degree of reduction in emissions on the agency's views about whether the "cost-reduction ratio" is or is not "excessive." Rather, it requires the maximum degree of reduction that is "achievable" considering "the cost of achieving such emission reduction" and the other statutory factors. 42 U.S.C. § 7429(a)(2). Thus, the question for EPA is not whether it views cost-reduction ratio as excessive or appropriate but: (1) whether a measure would yield additional reductions; and (2) whether the measure is "achievable" considering cost. Standards are achievable if they can be achieved by "a predominant segment of the industry." *NRDC v. Thomas*, 805 F.2d 410, 423 (D.C. Cir. 1986). Here, EPA itself has concluded that "the economic impacts of a regulation that required ESP replacement is expected to be <u>insignificant</u>." Docket OAR-2005-0117, Item 0119, at 7 (emphasis added). Given this finding and the undisputed fact that ESP replacement would yield further reductions in emissions, EPA must require such replacement to ensure that its standards reflect the "maximum" achievable degree of reduction. Further, the agency's claim that it can refuse to require such a switch based on its views about whether the cost-reduction ratio is excessive — as opposed to a showing that the costs would render such a requirement unachievable — reflect a flatly unlawful interpretation of the Clean Air Act.

In addition, EPA's decision is arbitrary and capricious. EPA's stated reason for rejecting ESP replacement — that the "cost-reduction ration" was "excessive" — is directly at odds with uncontroverted record evidence that the economic impacts of requiring such replacement is "insignificant." Nowhere has EPA explained why it has adopted a decision at odds with its own findings in the record. Nor has EPA reconciled its conclusion that the "cost-reduction ratio" for ESP replacement would be "excessive" with its finding that the economic impact of requiring ESP replacement would be "insignificant."

Further, without any explanation, EPA chose to consider only the benefit of reducing PM. Specifically, EPA states that the cost effectiveness of switching from ESPs to FFs would be $100,000/ton of total particulate or $900,000/ton of fine particulate. 70 Fed. Reg. at 75355. The same investment in switching to FF, however, would yield reductions in <u>both</u> total and fine PM. Thus, for EPA to allocate the total cost of ESP replacement to just one artificially inflates the

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cost. Further, as EPA itself has acknowledged, ESP replacement also would yield substantial reductions in dioxins, cadmium, lead, and mercury. *Id.* The agency completely fails even acknowledge these benefits in its cost benefit analysis. For all of these reasons, EPA's decision to reject ESP replacement on cost-benefit grounds would be arbitrary and capricious even if it were not otherwise unlawful to engage in a cost-benefit analysis rather than determining whether ESP replacement is achievable considering cost.

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Attachment 2

UNITED STATES COURT OF APPEALS
DISTRICT OF COLUMBIA CIRCUIT

SIERRA CLUB, Petitioner, v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY and STEPHEN L. JOHNSON, Administrator Respondents.	)	No. 06-1250

EPA'S REPLY IN FURTHER SUPPORT OF
ITS MOTION FOR VOLUNTARY REMAND

EPA respectfully submits this reply in further support of its motion for a voluntary remand of this case pursuant to Circuit Rule 41(b).

Petitioner opposes the motion on the ground that EPA has not conceded that any portion of the LMWC Final Rule is defective. Petitioner states that, if EPA admits that the floor approach in the 1995 rule is unlawful, and the Court imposes a reasonable deadline for EPA to respond to the remand and requires "regular status reports," then Petitioner would not oppose this motion. (Pet'r Br. at 4.)

As an initial matter, EPA does not agree with Petitioner that an agency must admit that it acted unlawfully or arbitrarily in order for a court to remand a case to the agency for further consideration. This Court has held that a remand is

appropriate "to allow agencies to cure their mistakes." Ethyl Corp. v. Browner, 989 F.2d 522, 524 (D.C. Cir. 1993). Ethyl Corporation does not require an agency to confess legal error before granting the remand. In fact, that case involved the agency's discovery of test results that were completed after the agency's decision. Id. at 523. This Court granted EPA's motion for a remand of the record based on the "tradition of allowing agencies to reconsider their actions where events pending appeal draw their decision into question." Id. at 524. This Court and others have relied on the principles set forth in Ethyl Corporation to order remands of the case when a legal decision may affect the validity of the agency action. See, e.g., SKF USA Inc. v. United States, 254 F.3d 1022 (Fed. Cir. 2001) (citing Ethyl Corporation); National Fuel Gas Supply v. FERC, 899 F.2d 1244, 1245 (D.C. Cir. 1990) (per curiam) (remanding review of an FCC order so that the agency could reconsider its ruling in light of a D.C. Circuit decision). Petitioner does not cite any legal authority for its position that an agency must admit some mistake before a Court can remand the case.

As explained more fully in EPA's motion, Petitioner filed an administrative petition asking EPA to revise the standards and emission guidelines in the 1995 LMWC rule consistent with the floor requirements of Clean Air Act Section 129(a)(2) and this Court's rulings in Northeast Maryland Waste Disposal Authority v. EPA, 358 F.3d 936 (D.C. Cir. 2004), and Cement Kiln Recycling

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Ass'n v. EPA, 255 F.3d 855, 861-63 (D.C. Cir. 2001). EPA has decided to grant that administrative petition and initiate a rulemaking to re-analyze the floors in the 1995 rule, which EPA established pursuant to Section 129(a)(2).

The primary reason for granting that administrative petition is that the floors in the 1995 rule were calculated in a manner that is not consistent with the principles later set forth in Northeast Maryland. More specifically, like the floors for the Small Municipal Waste Combustors that were at issue in Northeast Maryland, the floors in the 1995 rule for LMWCs were derived from state-issued permit limits. This Court has held that EPA may base floors on state-issued permit data if it can demonstrate that the permit data represents a reasonable estimate of the performance of the top 12 percent of units. Northeast Maryland, 358 F.3d at 953-54. In Northeast Maryland, the Court identified certain affirmative evidence in the record that called into question whether the floors represented a reasonable estimate of the performance of the best performing 12 percent of existing units. Id. In reviewing the 1995 LMWC rule and the administrative petition to re-open that rulemaking, EPA recognized that the deficiency identified by the Court in Northeast Maryland is present in the 1995 LMWC rule. EPA therefore has decided to grant the administrative petition and initiate a rulemaking to re-evaluate the floors in the 1995 rule in light of Northeast Maryland and subsequent case law. Thus, while EPA disagrees with Petitioner's assertion that it must admit a legal

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error before it can request a remand, EPA acknowledges that the 1995 LMWC rule has a deficiency similar to that identified in Northeast Maryland, and that deficiency formed the basis of EPA's decision to grant the administrative petition.[1]

As explained in EPA's initial motion, if any of the 1995 standards change as the result of the agency's re-analysis of the 1995 floors under Clean Air Act Section 129(a)(2), EPA would need to re-evaluate its conclusions in the LMWC Final Rule because that rule involved a review of the standards and requirements in the 1995 rule. EPA respectfully requests that the Court remand the LMWC Final rule so that EPA can make any changes to that rule that may flow from EPA's re-evaluation of the floors in the 1995 rule.

Contrary to Petitioner's suggestion, this Court should not require EPA to complete its proceedings on remand by a specific deadline. This Court should follow its recent example of granting EPA's motions for voluntary remand to the agency in cases challenging EPA action under Section 112 without imposing a deadline for a final action. See Natural Resources Defense Council v. EPA, 489 F.3d 1364 (D.C. Cir. 2007) (vacating portions of an EPA rule promulgated under Section 112 regulating hazardous air pollutants from the manufacture of plywood

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[1] EPA disagrees with Petitioner's separate contention in this litigation that the floors must be recalculated under Clean Air Act Section 129(a)(5), 42 U.S.C. § 7429(a)(5).

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and composite wood products). In Natural Resources Defense Council, EPA requested a partial vacatur and remand so that it could re-evaluate and revise the Maximum Achievable Control Technology floor determination to conform to this Court's interpretation of the Clean Air Act in Sierra Club v. EPA, 479 F.3d 875 (D.C. Cir. 2007). The Court granted EPA's motion for partial vacatur and remand but imposed no deadlines with respect to EPA's determination on remand. Natural Resources Defense Council, 489 F.3d at 1375. The Court explained that the appropriate remedy in these circumstances is a mandamus action if the Agency, in the future, unduly delays in responding to the Court's remand. Id. ("We decline to set a two year limit on EPA's proceedings on remand as the NRDC requests; mandamus affords a remedy for undue delay.").

As in Natural Resources Defense Council, Petitioner here has the remedy of mandamus in the event the Agency unduly delays its final action upon remand. Moreover, Petitioner has not suggested any specific timetable other than a "reasonable" deadline. There is no point is this Court establishing a "reasonable" deadline, as Petitioner, if circumstances warrant, can assert a claim for undue delay.

Accordingly, it is neither necessary nor appropriate for this Court, in granting EPA's motion for a voluntary remand, to establish any deadlines or require periodic court filings concerning the Agency's progress.

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CONCLUSION

For the reasons set forth above and in EPA's motion, this Court should remand the case pursuant to Circuit Rule 41(b) and deny Petitioner's request to require the Agency to complete its proceedings upon remand by a deadline and/or to submit periodic status reports.

Dated: December 6, 2007

Respectfully submitted,

RONALD J. TENPAS
Acting Assistant Attorney General
Environment & Natural Resources Division

Paul Cirino by Pamela S

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OF COUNSEL:

RICHARD H. VETTER
U.S. Environmental Protection Agency
Research Triangle Park, North Carolina

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CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing EPA's Reply in Further Support of Its Motion for Voluntary Remand was today served, this 6th day of December, 2007, via first class mail, on the following counsel of record:

James S. Pew, Esquire
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Washington, DC 20005-3802

Pamela S. [illegible]

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Attachment 3

United States Court of Appeals
FOR THE DISTRICT OF COLUMBIA CIRCUIT

No. 06-1250 **September Term, 2007**

Filed On: February 15, 2008

[1099358]
Sierra Club,
Petitioner

v.

Environmental Protection Agency and Stephen L. Johnson, Administrator,
Respondents

York County Solid Waste and Refuse Authority and Integrated Waste Services Association,
Intervenors

BEFORE: Randolph, Tatel, and Garland, Circuit Judges

ORDER

Upon consideration of the motion for voluntary remand, the opposition thereto, and the reply, it is

ORDERED that the motion for voluntary remand be granted to allow the Environmental Protection Agency to review its "Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Large Municipal Waste Combustors." 71 Fed. Reg. 27,324. The agency is not required to admit legal error as a precondition for remand. See Ethyl Corp. v. Browner, 989 F.2d 522, 524 (D.C. Cir. 1993). Further, the appropriate remedy for an agency's delay in issuing a final decision is mandamus. See Natural Resources Defense Council v. EPA, 489 F.3d 1364, 1375 (D.C. Cir. 2007).

Pursuant to D.C. Circuit Rule 36, this disposition will not be published. The Clerk is directed to withhold issuance of the mandate herein until seven days after resolution of any timely petition for rehearing or petition for rehearing en banc. See Fed. R. App. P. 41(b); D.C. Cir. Rule 41.

Per Curiam

FOR THE COURT:
Mark J. Langer, Clerk

By:
Deputy Clerk

Attachment 4

EARTHJUSTICE
Because the earth needs a good lawyer

BOZEMAN, MONTANA DENVER, COLORADO HONOLULU, HAWAII
INTERNATIONAL JUNEAU, ALASKA OAKLAND, CALIFORNIA
SEATTLE, WASHINGTON TALLAHASSEE, FLORIDA WASHINGTON, D.C.

July 7, 2006

Stephen L. Johnson
Administrator,
Environmental Protection Agency
1101A EPA Headquarters
Ariel Rios Building
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460

BY FIRST CLASS MAIL, FAX, AND EMAIL

Dear Mr. Johnson:

This is a petition under Clean Air Act § 307(d)(7)(B), 42 U.S.C. § 7607(d)(7)(B). The party submitting this petition is Sierra Club, 85 Second Street, 2d Floor, San Francisco, California 94105 ((415) 977-5500). By this petition, Sierra Club requests that you reconsider certain aspects of the final action taken at 71 Fed. Reg. 27324, *et seq.* (May 10, 2006) and entitled "Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Large Municipal Waste Combustors; Final Rule."

I. EPA MUST RECONSIDER ITS DECISION TO ALLOW UNTRAINED EMPLOYEES TO PERFORM THE DUTIES OF A CERTIFIED CHIEF FACILITY OPERATOR OR CERTIFIED SHIFT OPERATOR.

A. Background.

The Clean Air Act required EPA to develop a program for "training and certification" of municipal waste combustor (MWC) operators. 42 U.S.C. § 7429(d). The Act further provides "it shall be unlawful to operate any unit in the category unless each person with control over processes affecting emissions from such unit has satisfactorily completed a training program meeting the requirements established by the Administrator under this subsection." 42 U.S.C. § 7429(d). Thus it is unlawful for any MWC to be operated unless a person who has not fully complied with the training and certification requirements established by EPA.

EPA's own training and certification requirements provide:

> (b) not later than the date six months after the date of startup of an affected facility or on December 19, 1996, whichever is later, each chief facility operator and shift supervisor shall have completed full certification or

> shall have scheduled a full certification exam with either the American Society of Mechanical Engineers … or a State certification program.
>
> (c) no owner of an affected facility shall allow the facility to be operated at any time unless one of the following persons is on duty and at the affected facility: a fully certified chief facility operator, a provisionally certified chief facility operator who is scheduled to take the full certification exam according to the schedule specified in paragraph (b) of this section, a fully certified shift supervisor, or a provisionally certified shift supervisor who is scheduled to take the full certification exam according to the schedule specified in paragraph (b) of this section.

40 C.F.R. § 60.54b(b), (c).

EPA's proposed MWC rule would have amended the existing regulations regarding when a "provisionally certified control room operator" can stand in for a certified operator. EPA described the change as follows: "A provisionally certified control room operator could stand in for up to 12 hours without notifying EPA; for up to two weeks if EPA is notified; and longer than 2 weeks if EPA is notified and the MWC owner demonstrates to EPA that a good faith effort is being made to ensure that a certified chief facility operator or certified shift supervisor is on site as soon as practicable." 70 Fed. Reg. 75348, 75350 (December 19, 2005).

Without any notice to the public, however, EPA issued a much broader exemption from the Clean Air Act's operator training requirements. The agency's final rule adds entirely new language allowing "a provisionally certified operator who is newly promoted or recently transferred to a shift supervisor position or a chief facility operator position at the municipal waste combustion unit [to] perform the duties of the certified chief facility operator or certified shift operator without notice to, or approval by, the Administrator for up to six months before taking the … certification exam." 40 C.F.R. § 60.54b(c)(3).

Section 307(d)(7)(B) of the Clean Air Act provides that if grounds for an objection to a rulemaking arise "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, the Administrator shall convene a proceeding for reconsideration of the rule and provide the same procedural rights as would have been afforded had the information been available at the time the rule was proposed." 42 U.S.C. § 7607(d)(7)(B). EPA's new provision allowing MWCs to be operated for up to six months at a time by people who have not completed the statutorily required training program meets the requirements of § 307(d)(7)(B). Accordingly, EPA must reconsider this aspect of its rule.

B. Grounds For Objection.

The Clean Air Act provides that "it shall be unlawful to operate any unit in the category unless each person with control over processes affecting emissions from such unit has satisfactorily <u>completed</u> a training program meeting the requirements established

by the Administrator under this subsection." 42 U.S.C. § 7429(d) (emphasis added). The "operator training" program mandated by § 129(d) and established by EPA pursuant to § 129(d) contains both "training" and "certification" requirements. 42 U.S.C. § 7429(d). *See* 40 C.F.R. § 60.54b(b), (c)(1)-(2). A person has not "completed" such training program until he is fully certified. Therefore, it is unlawful to operate a MWC unit unless each person with control over processes affecting emissions — and, at a minimum, each person performing the duty of a chief facility operator or shift supervisor — is fully certified.

A person who is only "provisionally" certified is not fully certified and thus has not "completed" the operator training requirements. By allowing MWC to operate for six months at a time with operators that are only "provisionally" certified, EPA contravenes § 129(d).

EPA also frustrates § 129(d)'s purpose. Congress enacted this provision to protect the public from the excess pollution and increased threat to health and the environment that occur when incinerators malfunction or are operated under suboptimal conditions as a result of operator error. Congress made clear that, to this end, it wanted the processes affecting incinerator emissions to be run only by people who had "completed" training and certification requirements, not — as EPA appears to believe — people who had made some limited progress toward completing such requirements and were therefore "provisionally" certified.

Finally, EPA does not and cannot explain how allowing MWC to be run for up to six months by people who by definition have not "completed" the training requirements implements § 129(d) and comports with its purpose. Does EPA believe that there is no significant difference between operation by personnel that are fully certified and those that are only "provisionally" certified? The agency does not make, far less explain, any such claim. Further, if that were the rationale EPA's new provision, why require full certification at all? Does EPA believe that it is somehow harmless to have MWC run by less qualified people for only six months out of the year? If so, where did the agency come up with this time period, and why does the agency believe that significant harm cannot be done in six months? EPA's failure to explain the rational basis for its new provision renders the MWC rule arbitrary and capricious.

II. EPA MUST RECONSIDER ITS CEMS DATA AVAILABILITY REQUIREMENTS.

A. Background.

EPA's proposed rule increased the continuous emissions monitoring systems (CEMS) data availability requirements from ninety percent of the operating days per calendar quarter to ninety-five percent of the operating days per calendar quarter. 70 Fed. Reg. at 75353. The agency explained that new data indicate that "well designed and operated CEMS reliably collect data at rates higher than require in current regulations." *Id.*

In its final rule, however, EPA required ninety-five percent CEMS data collection only for a calendar year and allowed sources to collect only ninety percent CEMS data per calendar quarter. 71 Fed. Reg. at 27329. Further, EPA eliminated the requirement that operators obtain CEMS data for seventy-five percent of the operating hours per day before the data is counted toward the CEMS data availability requirement.

Section 307(d)(7)(B) of the Clean Air Act provides that if grounds for an objection to a rulemaking arise "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, the Administrator shall convene a proceeding for reconsideration of the rule and provide the same procedural rights as would have been afforded had the information been available at the time the rule was proposed." 42 U.S.C. § 7607(d)(7)(B). EPA's new provision allowing MWC operators to collect CEMs data for only ninety percent of the operating hours per calendar quarter and to eliminate the requirement to collect data for seventy-five percent of the operating hours per day before counting such data toward the CEMS data availability requirement meets the requirements of § 307(d)(7)(B). Accordingly, EPA must reconsider this aspect of its rule.

B. Grounds For Objection.

The Clean Air Act mandates that EPA's emission standards must require compliance on a "continuous basis." 42 U.S.C. § 7602(k). EPA's rule, however, allows MWC to avoid compliance with emission standards significant portions of time. Specifically, it requires CEMS data availability for only ninety percent of the hours in a calendar quarter. There are approximately 2160 hours in a calendar quarter. Thus, EPA's rule allows MWC to not collect data for 216 hours — nine days — in a quarter. Further, EPA's regulations provide that compliance shall be measured on a twenty-four hour daily block average of CEMS data. Although EPA previously required sources to have data for seventy-five percent of the hours in a day before counting that day's hours toward the overall data availability requirement, the agency eliminated that requirement in its final rule. Thus, MWC operators could now claim to be in full compliance with emission standards for every day in a calendar quarter even if it had data for only fifty percent of the hours in eighteen days in that quarter.

Because EPA's rule allows MWC to operate out of compliance with emission standards for a substantial portion of the hours in each calendar quarter, it contravenes the Clean Air Act's mandate that emission standards require "continuous" compliance. 42 U.S.C. § 7602(k).

Further, EPA has not provided a rational explanation for its decision. The agency admits that its data indicate that CEMS can provide "more than 99 percent data availability for all calendar quarters for all parameters monitored." 70 Fed. Reg. at 75353. The agency does not provide any evidence refuting its prior assertion. All it offers are industry comments that some operators might install a backup CEMS to assure compliance — a result that EPA states it did not intend. 71 Fed. Reg. at 27329. EPA does not say why it concluded that backup CEMS would be necessary despite its own

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evidence showing otherwise. Nor does EPA explain why it concluded that the possibility of MWC operators having to install backup CEMS was worse, in its mind, than the possibility that MWC would exceed their emission limitations for a significant portion of their operating hours. Nowhere did EPA explain how it concluded that operating out of compliance with emission standards for a significant portion of a calendar quarter is acceptable, or how that result comports with the statutory mandate for continuous compliance. For these reasons, EPA's MWC rule is arbitrary and capricious.

III. EPA MUST RECONSIDER ITS OPERATING PARAMETER REQUIREMENTS.

A. Background.

EPA's proposed rule provided that "[d]uring the annual mercury performance test and the 2 weeks preceding the annual mercury performance test, no limit is applicable for average mass carbon feed rate." 40 C.F.R. 60.58b((m)(2)(i) (proposed) (emphasis added), 70 Fed. Reg. at 75367. Without providing any notice to the public or opportunity for comment, EPA issued a final rule that provides "[d]uring the annual dioxin/furan or mercury performance test and the 2 week period preceding the annual dioxin/furan or mercury performance test, no limit is applicable for average mass carbon feed rate." 40 C.F.R. § 60.58b(m)(2)(i). Thus, EPA's final rule now allows MWC to avoid meeting mass carbon feed rate limits for dioxin/furan testing as well as mercury testing, and increases to more than four weeks per year the total amount of time that MWC can avoid meeting mass carbon feed rate limits.

Section 307(d)(7)(B) of the Clean Air Act provides that if grounds for an objection to a rulemaking arise "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, the Administrator shall convene a proceeding for reconsideration of the rule and provide the same procedural rights as would have been afforded had the information been available at the time the rule was proposed." 42 U.S.C. § 7607(d)(7)(B). EPA's decision to exempt MWC operators from meeting mass carbon feed rate limits during dioxin/furan testing as well as mercury testing and to increase the potential time covered by its exemption to more than four weeks per year meets the requirements of § 307(d)(7)(B). Accordingly, EPA must reconsider this aspect of its rule.

B. Grounds For Objection.

The Clean Air Act requires "continuous" compliance with emission standards, not compliance for forty-eight weeks out of the year. 42 U.S.C. § 7602(k). By allowing MWC to avoid compliance with a key operating parameter requirement — the limits on mass carbon feed rates, which determine the effectiveness of activated carbon injection pollution controls — EPA's rule allows MWC to avoid compliance with emission standards for as much as four weeks every year. Therefore, it contravenes the Clean Air Act.

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Further, EPA has not provided a rational explanation — or indeed, any explanation at all — for the change. EPA states inaccurately in both the final and proposed rule that MWC already are allowed to avoid meeting carbon feed rate limits during the two weeks preceding dioxin/furan performance testing. 71 Fed. Reg. at 27326; 70 Fed. Reg. at 75350-75351. To the contrary, the regulations did not provide such an exemption until EPA inserted one for the first time in its final rule. The agency does not and cannot dispute that the exemption for dioxin/furan performance testing appears in the version of 40 C.F.R. § 60.58b(m)(2)(i) published in its final rule, but does not appear in the version of that same regulatory provision that appears in its proposed rule. EPA's complete failure to explain the change — and, more importantly, to explain how allowing sources to avoid compliance with a key operating parameter for more than four weeks each year implements the Clean Air Act's mandate for continuous compliance or serves the public interest — renders the agency's MWC rule arbitrary and capricious.

IV. EPA MUST RECONSIDER ITS LEAD STANDARD.

A. Background.

EPA's proposed lead standard for existing MWC was 250 micrograms per dry standard cubic meter (μg/dscm). 40 C.F.R. § 60.33b(a)(4) (proposed), 70 Fed. Reg. at 75360. EPA's final standard is 400 μg/dscm, and thus allows MWC to emit sixty percent more lead. 71 Fed. Reg. at 27333. Further, although EPA claimed to have based its 250 μg/dscm proposed standard on statistical analysis, the agency states that in the final rule, it "discounted both the EPA and industry statistical estimates, and based the final limit on a review of the year 2000-2005 test data and public comment, selecting a higher emission limit." 71 Fed. Reg. at 27328/3. Thus, EPA admits that in the final rule, it simply picked a number that it thought was appropriate.

Section 307(d)(7)(B) of the Clean Air Act provides that if grounds for an objection to a rulemaking arise "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, the Administrator shall convene a proceeding for reconsideration of the rule and provide the same procedural rights as would have been afforded had the information been available at the time the rule was proposed." 42 U.S.C. § 7607(d)(7)(B). EPA's final lead standard, and the approach on which that standard is based meet the requirements of § 307(d)(7)(B). Accordingly, EPA must reconsider this aspect of its rule.

B. Grounds For Objection.

The Clean Air Act provides that EPA must review and revise its MWC standards, including the lead standard for existing units, "in accordance with" the requirements of § 129. 42 U.S.C. § 7429(d). Thus, the agency must ensure that its standard is no less stringent than the lead emission level achieved by the best performing MWC. 42 U.S.C. § 7429(a)(2). Further, EPA must ensure that its lead standard reflects the "maximum" degree of reduction in lead emissions that is achievable, considering cost and other statutory factors, through the use of "methods and technologies for removal or

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destruction of pollutants before, during, or after combustion." 42 U.S.C. § 7429(a)(2)-(3).

As explained in detail in the comments that Earthjustice submitted regarding EPA's proposed rule for large MWC, EPA's proposed revisions to the large MWC standards contravened § 129's minimum stringency requirements as well as the requirement that final standards reflect the "maximum" degree of reduction that is achievable through the use of "methods and technologies for removal or destruction of pollutants before, during, or after combustion." Accordingly, they were not "in accordance with" § 129, as required by § 129(a)(5).

In its proposed rule, EPA claimed that it used "statistical analysis" to calculate an "actually achievable emission limit." 70 Fed. Reg. at 75352. That limit did not purport to reflect the emission level achieved by the relevant best units. Nor did it purport to reflect the "maximum" achievable degree of reduction. Whatever method there may have been in EPA's proposed rule, however, disappeared in the final rule. EPA now states that it "discounted" its own statistical estimates as well as those provided to it by industry after proposal, and "based the final limit on a review of the year 2000-2005 test data and public comment." 71 Fed. Reg. at 27328. EPA provides no indication of how its final standards are "based on" the test data or public comment or, indeed, what standard setting approach it used. Thus, it now appears that the agency simply picked 400 μg/dscm as the final lead standard without any discernible rationale at all.

As noted above, the Clean Air Act required EPA to review and revise the MWC standards in accordance with § 129. EPA's new approach to setting the lead standard is not "in accordance with" § 129. Further, EPA has completely failed to explain how it based the new standard on the test data and comments and how that approach implements the Clean Air Act. Accordingly, the agency's rule is arbitrary and capricious.

CONCLUSION

Pursuant to Clean Air Act, § 307(d)(7)(B), you must convene a proceeding for reconsideration of the issues raised above and "provide the same procedural rights as would have been afforded had the information been available at the time the rule was proposed." 42 U.S.C. § 7607(d)(7)(B).

If you have any questions, please do not hesitate to call me (202) 667-4500.

Sincerely,

James S. Pew
Attorney for Sierra Club

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Message

From: Jonathan J. Smith [jjsmith@earthjustice.org]
Sent: 8/24/2021 1:42:22 PM
To: Regan, Michael [Regan.Michael@epa.gov]
CC: steve.dickson@faa.gov; Goffman, Joseph [Goffman.Joseph@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]; Hoyer, Marion [hoyer.marion@epa.gov]; klester@earthjustice.org; egartner@earthjustice.org; stephanie.safdi [stephanie.safdi@cco.sccgov.org]; jerett.yan@cco.sccgov.org
Subject: Petition for Endangerment Finding for Lead in Aviation Gasoline
Attachments: 2021.08.23 - Leaded Avgas Petition Final with Exhibits.pdf; 2021.08.23 - Leaded Avgas Sign-On Letter Final.pdf

Administrator Regan,

Please find attached a petition from Alaska Community Action on Toxics, Center for Environmental Health, Friends of the Earth, Montgomery-Gibbs Environmental Coalition, Oregon Aviation Watch, and the County of Santa Clara seeking that EPA make an endangerment finding concerning the use of lead in aviation gasoline. Also attached is a letter from 39 additional organizations and individuals in support of the petition.

Thank you,

Jonathan Smith

Jonathan J. Smith (he/him/his)
Senior Attorney
Community Partnerships Program
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EARTHJUSTICE

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EARTHJUSTICE

August 24, 2021

Sent via Email

Administrator Michael Regan
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460
Regan.Michael@epa.gov

Dear Administrator Regan:

The undersigned organizations hereby petition the U.S. Environmental Protection Agency ("EPA"), pursuant to the Administrative Procedure Act, 5 U.S.C. §§ 551-559, 701-706,[1] and the Clean Air Act ("CAA"), 42 U.S.C. §§ 7401–7671q, to make an endangerment finding under section 231 of the CAA that leaded aviation gasoline ("avgas") contributes to air pollution that harms public health and welfare.[2] Despite knowing for years that lead exposure at any level is harmful to human health, and notwithstanding research linking the use of leaded avgas to elevated blood lead levels, EPA has thus far declined to regulate the largest remaining source of lead emissions to the environment. The undersigned organizations ask EPA to make a long-overdue endangerment finding for leaded avgas and begin the process of regulating this source of harmful lead emissions. Doing so is an important step in fulfilling the Biden-Harris Administration's commitments to protect children's health and promote environmental justice.[3]

Petitioner Alaska Community Action on Toxics ("ACAT") is a 501(c)(3) non-profit public interest environmental health and justice research and advocacy organization, incorporated and headquartered in Anchorage, Alaska. ACAT is guided by the belief that everyone has the right to clean air, clean water, and toxic-free food and, to that end, works with individuals and communities in Alaska to address toxic contamination, protect health, and achieve justice. Upon request, ACAT assists individuals, tribes, and communities to implement effective strategies to prevent or reduce their exposures to toxic substances, protect the ecosystems that sustain them, and hold accountable those responsible for the contamination of

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[1] *See* 5 U.S.C. § 553(e) ("Each agency shall give an interested person the right to petition for the issuance, amendment, or repeal of a rule.").

[2] 42 U.S.C. § 7571(a)(2) ("The Administrator [of the EPA] shall . . . issue proposed emission standards applicable to the emission of any air pollutant from any class or classes of aircraft engines which in his judgment causes, or contributes to, air pollution which may reasonably be anticipated to endanger public health or welfare.").

[3] *See* Ariel Wittenberg, *EPA: Biden Team Vows 'New Era' For Protecting Children's Health*, E&E News (May 12, 2021), https://www.eenews.net/greenwire/2021/05/12/stories/1063732361 ("Until every child can safely drink water from the faucet; inhale a full, clean breath of fresh air; and play outdoors, without risk of environmental hazard or harm, our work continues." (quoting Administrator Regan)); Exec. Order No. 14,008, 86 Fed. Reg. 7619 (Jan. 27, 2021), https://www.govinfo.gov/content/pkg/FR-2021-02-01/pdf/2021-02177.pdf (explaining the Biden-Harris Administration's policy "to secure environmental justice . . . for disadvantaged communities that have been historically marginalized and overburdened by pollution and underinvestment in housing, transportation, water and wastewater infrastructure, and health care.").

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their communities. Because existing remedies are so often inadequate to address Alaskans' concerns, ACAT also works to achieve systemic policy change at the marketplace, local, state, national, and international levels, including by advocating for, and engaging in, rulemaking efforts by EPA.

Petitioner Center for Environmental Health ("CEH") is a 501(c)(3) non-profit, national public interest organization with headquarters in Oakland, California. For 25 years, CEH has helped to lead the growing, nationwide effort to protect people from toxic chemicals that cause cancer, adverse reproductive effects, learning disabilities, and many other health problems, by working with communities, consumers, workers, government, and the private sector to demand and support business practices that are safe for public health and the environment. Leading with science and committed to inclusive, community-led solutions that address environmental injustices in communities of color and low-income communities, CEH uses a range of strategies to achieve this – from public education to legal action. CEH also works with state and federal policymakers to develop and protect laws and regulations that support safer chemicals and consumer products, and it fights to ensure that governments allocate sufficient resources to implement those laws and regulations in a health-protective manner.

Petitioner Friends of the Earth ("FoE") is a tax-exempt environmental advocacy organization founded in 1969 and incorporated in the District of Columbia, with offices in Washington, D.C. and Berkeley, California and staff located around the country. As of August 2021, FoE had more than 280,000 members across all fifty states in the United States and more than 4.5 million activists. FoE is part of Friends of the Earth International, a federation of grassroots groups working in seventy-four countries on today's most urgent environmental and social issues. FoE's mission is to defend the environment and champion a healthy and just world. To this end, one of FoE's key programs is the promotion of policies and actions that prevent air pollution and that minimize the negative impacts of pollution on human health. FoE relies on sound science and uses the law to create and advocate for innovative strategies to conserve natural resources and protect public health and the environment. A core element of FoE's mission is work to reduce air and water pollution throughout the United States. To these ends, FoE actively engages in rulemaking efforts before EPA and other regulatory agencies relating to the regulation of industrial sources of air and water pollution and in litigation to support these efforts.

Petitioner Montgomery-Gibbs Environmental Coalition ("MCEG") is a 501(c)(3) nonprofit community watchdog organization based in San Diego, California. MGEC is dedicated to educating and informing the public about general aviation environmental issues. MCEG advocates for clean air, aviation safety and less noise, along with tighter security measures to improve and ensure the health and wellbeing of its communities. Its mission is to improve the environmental quality of its neighborhoods by working together to create a better world for future generations.

Petitioner Oregon Aviation Watch ("OAW") is dedicated to research, education, and advocacy on behalf of the public interest and public welfare regarding aviation issues. OAW seeks to enhance and protect the quality of life for Oregon residents by eliminating the adverse impacts of aviation activity, as well as achieve a transparent, accountable, and sustainable aviation system that neither disregards nor diminishes the environment, livability, health, or well-being of current and future generations of Oregon residents. OAW provides information on

aviation policy in Oregon and nationally and shares its experiences dealing with these issues. OAW strives to reduce the sense of isolation and powerlessness people sometimes feel when confronted with the bureaucratic runaround and lack of democratic principles so often encountered when dealing with aviation issues. To further these goals, OAW has gathered and written numerous articles on the subject of lead pollution from piston-engine aircraft and has filed requests and motions with local airports to install monitoring equipment to further show the effects and dangers of leaded avgas. OAW also provides regular email updates to a broad base of local supporters, elected officials, and environmental organizations to keep the public apprised of current aviation issues. OAW is active at the local level in ensuring that decision-makers take into account the health and well-being of residents and communities negatively impacted by Oregon's airports.

Petitioner County of Santa Clara is one of the nation's most populous counties and home to approximately 1.9 million residents. The County owns and manages two general aviation airports—Reid-Hillview Airport, located in urban East San José, and San Martin Airport in more rural south Santa Clara County. Piston-engine aircraft also operate out of three additional airports in the county. Over 52,000 people reside within 1.5 miles of Reid-Hillview Airport, including nearly 13,000 children. There are also twenty-one schools and childcare centers in this radius. A County-commissioned study recently documented elevated blood lead levels among children residing or attending school or childcare facilities near this airport as a result of exposure to airborne lead emissions from piston-engine aircraft.[4] The County has invested significant resources in protecting members of its community from lead exposures, including by leading nearly twenty years of litigation against former manufacturers of lead paint to secure funds for a countywide lead paint abatement program. The County has a significant interest in protecting all residents from continuing lead exposures from general aviation operations and ensuring that access to important aeronautical resources is compatible with public health and safety.

I. BACKGROUND

A. Lead, which is used in fuel for general aviation, is harmful to human health at any level.

It is well established that airborne lead is harmful to human health;[5] as EPA has acknowledged, "any level of lead in the blood leads to adverse health effects."[6] For over forty

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[4] Mountain Data Group, *Leaded Aviation Gasoline Exposure Risk at Reid-Hillview Airport in Santa Clara County, California* 37–45 (2021), https://www.sccgov.org/sites/opa/newsroom/Documents/RHV-Airborne-Lead-Study-Report.pdf [hereinafter "RHV Lead Study"].

[5] *See* EESI, *Fact Sheet | A Brief History of Octane in Gasoline: From Lead to Ethanol* (2016), https://www.eesi.org/files/FactSheet_Octane_History_2016.pdf [hereinafter "EESI Fact Sheet"] ("[In] the 1960s, following extensive health research . . . the devastating health impacts of low-level lead exposure were established.").

[6] *A Cmty. Voice v. EPA*, 997 F.3d 983, 986 (9th Cir. 2021); *see also* EPA, EPA100-R-19-003, *Implementation Status Report for EPA Actions Under the December 2018 Federal Action Plan to Reduce Childhood Lead Exposures and Associated Health Impacts* 4 (2019), https://www.epa.gov/sites/production/files/2019-04/documents/leadimplementationbooklet_april2019.pdf [hereinafter "2019 Status Report"] ("The Centers for Disease Control and Prevention (CDC) has stated that no safe blood lead level in children has been identified . . . .").

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years, EPA has recognized that lead exposure, even at low levels, is associated with adverse health effects across multiple bodily systems,[7] including harm to the nervous, cardiovascular, immune, and reproductive systems, as well as to the kidneys.[8] Lead exposure can also cause anemia, increased blood pressure, and an increased risk of cancer; at high levels, exposure can lead to death.[9] Children are particularly susceptible to harm from low-level lead exposure as a result of both physiology and age-appropriate behaviors; this exposure can decrease physical growth and cause neurodevelopmental harm in children, leading to behavioral problems and learning deficits.[10] And as exposure to lead increases, so does the range and severity of adverse effects.[11] There is evidence that many of these deleterious effects are irreversible.[12]

To address the harm caused by lead exposure, EPA has spent almost five decades regulating lead, including its use in gasoline.[13] Though the use of leaded gasoline in most motor vehicles was banned twenty-five years ago, leaded fuel is still used in approximately 167,000 piston-engine aircraft across 20,000 domestic airports.[14] To date, EPA has failed to regulate this significant source of lead exposures, even though emissions from these aircraft collectively

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[7] *See* EPA, EPA-600/8-77-017, *Air Quality Criteria for Lead* 1-6 to -7 (1977), https://nepis.epa.gov/Exe/ZyPDF.cgi/20013GWR.PDF?Dockey=20013GWR.PDF; *see also Nat'l Res. Def. Council, Inc. v. Train*, 545 F.2d 320, 324 (2d Cir. 1976) ("The EPA concedes that lead . . . has an adverse effect on public health and welfare . . . .").

[8] Agency for Toxic Substances and Disease Registry, *Lead – ToxFAQs* (2020) https://www.atsdr.cdc.gov/toxfaqs/tfacts13.pdf [hereinafter "ToxFAQs"]; EPA, EPA/600/R-10/075F, *Integrated Science Assessment for Lead,* at lxxxii-vii, 1-14 to -37 (2013), https://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=255721 (click PDF cover on right) [hereinafter "Lead ISA"].

[9] *See* ToxFAQs, *supra* note 8.

[10] *Id.*; *see also* EESI Fact Sheet, *supra* note 5 ("Children's developing bodies are particularly sensitive to low-level, ambient exposures to lead. The health impacts of lead exposure in children include anemia, behavioral disorders, low IQ, reading and learning disabilities, and nerve damage."); Lead ISA, *supra* note 8, at 1-15 tbl. 1-2 (explaining that there is "[c]lear evidence of cognitive function decrements . . . in young children . . . with mean or group blood [lead] levels measured at various lifestages and time periods between 2 and 8 μg/dL").

[11] *Lead Poisoning and Health*, WHO (Aug. 23, 2019), https://www.who.int/news-room/fact-sheets/detail/lead-poisoning-and-health#:~:text=Lead%20also%20causes%20long%2Dterm,birth%20and%20low%20birth%20weight. Lead also accumulates in the body, including in bones, where it is stored and can reenter the blood over time. *Id.*

[12] CDC, *CDC Response to Advisory Committee on Childhood Lead Poisoning Prevention Recommendations in "Low Level Lead Exposure Harms Children: A Renewed Call of Primary Prevention"* 2 (2012), https://www.cdc.gov/nceh/lead/acclpp/cdc_response_lead_exposure_recs.pdf.

[13] *See* EESI Fact Sheet, *supra* note 5 (outlining timeline of EPA actions to phase out lead in gasoline from 1973 through 1996).

[14] *See Fact Sheet – Leaded Aviation Fuel and the Environment*, FAA (Nov. 20, 2019), https://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=14754; Advance Notice of Proposed Rulemaking on Lead Emissions from Piston-Engine Aircraft Using Leaded Aviation Gasoline, 75 Fed. Reg. 22,440, 22,442 (to be codified at 40 C.F.R. pt. 67) [hereinafter "2010 ANPR"].

represent the single largest source of air emissions of lead in the United States, accounting for about 70% of lead released domestically into the atmosphere.[15]

EPA's own analysis estimates that there are over five million people—including more than 360,000 children aged five or younger—living in very close proximity to at least one of the airports where piston-engine aircraft operate across the United States.[16] Over 160,000 children attend schools near these airports.[17] As explained in Part II.B, *infra*, research shows that children who live in close proximity to airports where piston-engine aircraft operate have higher blood lead levels relative to those who do not, putting them at a greater risk of harm from the adverse health effects associated with lead exposure.

Addressing emissions from leaded avgas will also help the Biden-Harris Administration realize its commitment to environmental justice. The majority of general aviation airports with the highest lead emissions are located in communities of color.[18] Communities of color are already disproportionately burdened by chemical exposures and, in particular, by exposures to lead. Black children have body burdens of lead that are higher, on average, than their white counterparts, both *in utero* and after they are born.[19] Lead emissions from activity at these general aviation airports contribute to this disparity.

In certain areas, the populations more likely to reside near airports are those of lower socioeconomic status.[20] EPA has acknowledged that "[c]hildhood lead exposure is especially prevalent in many communities that represent the lowest income and most diverse populations with significant cumulative environmental risk from pollution."[21] Given that the severity of health effects increases as lead exposure increases, children who live near airports and are also experiencing poverty—a condition that may make children both more susceptible to lead

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[15] Transp. Rsch. Bd. et al., *Options for Reducing Lead Emissions from Piston-Engine Aircraft* 35 (2021), https://www.nap.edu/read/26050/chapter/5 [hereinafter "NAS Report"].

[16] In 2020, EPA estimated that over five million people live within 500 meters of a runway and fifty meters of a helipad. *See* EPA, *National Analysis of the Populations Residing Near or Attending School Near U.S. Airports* 13 (2020), https://nepis.epa.gov/Exe/ZyPDF.cgi/P100YG4A.PDF?Dockey=P100YG4A.PDF. In 2010, EPA estimated that sixteen million people live within one kilometer of these airports. *See* 2010 ANPR, 75 Fed. Reg. at 22,460.

[17] *Id.*

[18] We conducted a demographic analysis of the areas around the fifty highest lead-emitting general aviation airports, according to the 2017 National Emissions Inventory. It revealed that 60% or more of these airports had populations living within one mile that consisted of a higher percentage of people of color than the national average.

[19] *See, e.g.*, Robert L. Jones et al., *Trends in Blood Lead Levels and Blood Lead Testing Among US Children Aged 1 to 5 Years, 1988–2004*, 123 Pediatrics e376 (2009) (finding that blood lead levels were higher in non-Hispanic Black children than in Mexican American and non-Hispanic white children over the studied time periods); Andrea E. Cassidy-Bushrow, et al., *Burden of Higher Lead Exposure in African-Americans Starts* In Utero *and Persists into Childhood*, 108 Env't Int'l 221 (2017).

[20] *See, e.g.*, Sammy Zahran et al., *The Effect of Leaded Aviation Gasoline on Blood Lead in Children*, 4 J. Ass'n Env't & Res. Economists 577 (2017) ("In Michigan, populations of lower socioeconomic status are more likely to reside near airports. Compared to more distant neighborhoods . . . neighborhoods within 2 km of an airport have significantly higher percentages of households receiving public assistance . . . and lower levels of educational attainment among adults . . . .").

[21] 2019 Status Report, *supra* note 6, at 4.

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absorption due to undernourishment and more exposed to lead by poor infrastructure and older homes—are at a particularly high risk of harm. EPA recently said that it "will always work to protect the most vulnerable communities and members of society, especially children;"[22] acknowledging that emissions from leaded avgas harms children is necessary to fulfill this commitment.

B. EPA has thus far failed to make an endangerment finding on lead emissions from piston-engine aircraft, despite repeated opportunities to do so.

Notwithstanding the harm caused by emissions from piston-engine aircraft that use leaded avgas, EPA has not yet made an endangerment finding for lead air pollution from this source, despite repeated requests to do so. In 2006, FoE petitioned EPA to make a finding under section 231(a)(2)(A) of the CAA that leaded avgas harms human health or the environment and to regulate such emissions from general aviation aircraft.[23] In 2007, EPA requested comment on the issues raised in the petition, and in 2010, EPA issued an Advance Notice of Proposed Rulemaking ("ANPR") on the issue of regulating leaded avgas. In the ANPR, EPA acknowledged that there is no identifiable safe level of lead exposure and that lead emitted from piston-engine aircraft operating on leaded avgas constitutes "the largest single source category for emissions of lead to air, comprising approximately half of the national inventory."[24] Despite issuing this ANPR, EPA did not formally respond to the petition until 2012, after FoE filed suit over EPA's unreasonable delay in answering the petition.

In its 2012 response to the 2006 Petition, EPA claimed that it needed more time to gather information to determine whether emissions of leaded avgas cause or contribute to harmful air pollution, and it stated that it would continue to work on the process for reaching a determination.[25] FoE petitioned EPA to reconsider its decision not to make an endangerment finding, pointing out the ample evidence that had already been published confirming that leaded avgas emissions contribute to air pollution that endangers human health or welfare.[26] In its response to the Petition for Reconsideration, EPA explained that it planned to issue a proposed endangerment finding for public comment in 2017 and a final endangerment finding in 2018.[27] While overall lead emissions have decreased in the decade since EPA issued the ANPR, leaded avgas' contribution to those emissions has increased, from 50% in 2005 to some 70% by 2017.[28]

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[22] *Statement by Administrator Regan on the President's FY 2022 Budget*, EPA (June 2, 2021), https://www.epa.gov/newsreleases/statement-administrator-regan-presidents-fy-2022-budget.

[23] Friends of the Earth, Pet. for Rulemaking & Collateral Relief (Oct. 3, 2006), https://www.epa.gov/sites/production/files/2016-09/documents/foe-20060929.pdf (attached as Exhibit 1).

[24] 2010 ANPR, 75 Fed. Reg. at 22,442.

[25] Letter and Memorandum from Gina McCarthy, Assistant Administrator, EPA, to Deborah Behles & Helen Kang, Env't L. & Just. Clinic, & Marianna Engelman Lado et al., Earthjustice (July 18, 2012), https://19january2021snapshot.epa.gov/sites/static/files/2016-09/documents/ltr-response-av-ld-petition.pdf (responding to Pet. for Rulemaking & Collateral Relief).

[26] Friends of the Earth, Pet. for Reconsideration of EPA's Denial (Apr. 21, 2014) (attached as Exhibit 2).

[27] Letter from Gina McCarthy, Administrator, EPA, to Deborah Behles, Clinical Staff Attorney, Env't L. & Just. Clinic, & Marianna Engelman Lado, Managing Attorney, Earthjustice (Jan. 23, 2015) (on file with EPA), https://www.epa.gov/sites/default/files/2016-09/documents/ltr-response-av-ld-foe-psr-oaw-2015-1-23.pdf (responding to Pet. for Reconsideration).

[28] *See* 2010 ANPR, 75 Fed. Reg. at 22,452 ("Currently, lead emitted by piston-engine aircraft operating on leaded avgas is the largest source of lead to the air, contributing about 50% of the National Emission

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Despite the increased contribution of avgas to lead emissions, EPA has still not proposed that endangerment finding.

II. LEADED AVGAS MEETS THE CRITERIA FOR AN ENDANGERMENT FINDING.

The CAA requires EPA to issue proposed emission standards when it determines that aircraft emissions "cause[], or contribute[] to, air pollution which may reasonably be anticipated to endanger public health or welfare."[29] This determination—often referred to as an endangerment finding—thus requires two showings: first, that lead air pollution as a whole may reasonably be anticipated to endanger public health or welfare; and second, that emissions from the use of leaded avgas in piston-engine aircraft cause or contribute to this harmful air pollution.[30] In evaluating whether there is a sufficient showing of each factor, EPA must rely on scientific judgment of the risks posed by pollution emissions, not on policy rationales.[31]

As explained below, studies conducted over the last half century demonstrate conclusively that both prongs of the endangerment finding test have been met. In recognition of this large body of evidence, and to protect public health and welfare, EPA must find that emissions from the use of leaded avgas in piston-engine aircraft contribute to harmful air pollution and propose standards to address this harm.

A. Lead air pollution is reasonably anticipated to endanger public health or welfare.

As EPA has recognized, the first prong of the endangerment finding is met whenever the air pollution at issue is reasonably anticipated to endanger public health or welfare, regardless of the source of that pollution.[32] EPA has already acknowledged—repeatedly—that lead air pollution has an adverse effect on public health or welfare,[33] and it has regulated lead emissions

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Inventory in 2005."); NAS Report, *supra* note 15, at 35 (noting that, in 2017, piston-engine general aviation aircraft accounted for "roughly 70 percent of total lead emissions to air in the United States.").

[29] 42 U.S.C. § 7571(a)(2)(A).

[30] *See* 2010 ANPR, 75 Fed. Reg. at 22,444–45 (explaining the two parts of the endangerment finding test); *cf. Coal. for Responsible Regul., Inc. v. EPA*, 684 F.3d 102, 117 (D.C. Cir. 2012) (explaining that an analogous provision of the CAA, § 202(a)(1), "requires EPA to answer only two questions: whether particular 'air pollution' . . . 'may reasonably be anticipated to endanger public health or welfare', and whether motor-vehicle emissions 'cause, or contribute to' that endangerment"), *aff'd in part, rev'd in part sub nom. Util. Air Regul. Grp. v. EPA*, 573 U.S. 302 (2014).

[31] *See Coal. for Responsible Regul.*, 684 F.3d at 117–18; *Massachusetts v. EPA*, 549 U.S. 497, 533–34 (2007).

[32] *See* Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496, 66,506 [hereinafter "GHG Endangerment Finding"] (interpreting parallel CAA provision relevant to motor vehicles to mean that "the Administrator is to consider the cumulative impact of [all] sources of a pollutant in assessing the risks from air pollution, and is not to look only at the risks attributable to a single source or class of sources"); *see also* 2010 ANPR, 75 Fed. Reg. at 22,444 (referring to recent EPA notices for greenhouse gases setting forth the analytical and legal framework for endangerment findings).

[33] *See* 2010 ANPR, 75 Fed. Reg. at 22,444 (explaining that, as part of the decision in 1976 to list lead as a criteria pollutant under the CAA, "EPA determined that lead was an air pollutant which, in the Administrator's judgment, has an adverse effect on public health or welfare").

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on this basis.[34] Because, as EPA has acknowledged, lead harms public health, it more than meets the more lenient standard of "*reasonably . . . anticipated* to endanger public health or welfare."[35] But even if EPA had not already acknowledged that lead pollution is reasonably anticipated to endanger public health or welfare, such a finding is warranted; research has long shown that there is a causal relationship between exposure to lead air pollution and adverse human health effects.[36]

Moreover, in making a determination as to whether a particular pollutant is reasonably anticipated to endanger public health or welfare, EPA has in the past considered whether "vulnerable subpopulations are especially at risk."[37] As noted above, children are generally more susceptible to adverse health effects from lead exposure, both because their bodies absorb lead much more easily than adults do[38] and because lead exposure affects the developmental processes they undergo.[39] Children also face increased exposures to lead that has been deposited on the ground from air emissions because of age-appropriate behaviors and activities, such as crawling and increased hand-to-mouth contact.[40] Though the well-established public-health harm from lead emissions, which is both severe and likely to occur, is sufficient for the purposes of satisfying the first prong of the endangerment-finding test, the fact that lead pollution affects children—a group EPA has described as a vulnerable group—makes it all the more important that EPA regulate the largest source of this pollution.

B. Lead emissions from piston-engine aircraft cause or contribute to harmful lead air pollution.

To meet the second prong of the endangerment finding, the Administrator "need not find that emissions from any one sector or group of sources are the sole or even the major part of an air pollution problem."[41] As EPA has explained, "Congress . . . authorized regulatory controls to address air pollution even if the air pollution problem results from a wide variety of sources."[42]

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[34] *See* 2010 ANPR, 75 Fed. Reg. at 22,445 ("EPA has long regulated emissions of lead air pollution due to their adverse impacts on public health . . . .").
[35] 42 U.S.C. § 7571(a)(2) (emphasis added).
[36] *See supra* Part I.A.; Lead ISA, *supra* note 8, at 1-15 to -19 (summarizing research showing causal relationships between lead exposure and negative nervous system, cardiovascular, hematologic, and reproductive and developmental effects and likely or suggestive causal relationships between lead exposure and renal and immune system effects and cancer).
[37] GHG Endangerment Finding, 74 Fed. Reg. at 66,506; Finding That Greenhouse Gas Emissions from Aircraft Cause or Contribute to Air Pollution That May Reasonably Be Anticipated To Endanger Health and Welfare, 81 Fed. Reg. 54,422, 54,435 (Aug. 15, 2016) (to be codified at 40 C.F.R. pts. 87, 1068) [hereinafter "Aircraft Cause or Contribute Finding"].
[38] *See Biomonitoring Summary, Lead*, CDC, https://www.cdc.gov/biomonitoring/Lead_BiomonitoringSummary.html (last updated Apr. 7, 2017) ("Absorption of ingested lead can be as much as five times greater in children than adults and even greater when intakes of dietary minerals are deficient.").
[39] *See* Lead ISA, *supra* note 8, at 4-127 ("[There is] well-characterized toxicological evidence for Pb exposure interfering with development of the brain and activity of neurochemical processes that mediate cognitive function . . . .").
[40] *See* Lead ISA, *supra* note 8, at 1-11, 1-78.
[41] GHG Endangerment Finding, 74 Fed. Reg. at 66,506; 2010 ANPR, 75 Fed. Reg. at 22,445.
[42] 2010 ANPR, 75 Fed. Reg. at 22,445.

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There is no need for the contribution to be "significant" for EPA to find that it contributes to pollution that is reasonably anticipated to endanger public health or welfare;[43] indeed, EPA has determined that air pollution emissions amounting to 1.2% of the total inventory of emissions of that pollutant "contributed" to harmful air pollution within the meaning of the CAA.[44]

Where, as here, a source to be regulated contributes roughly 70% of the emissions of lead—a pollutant that is unsafe at any level—to the air, the source more than "contributes" to harmful air pollution.[45] This contribution is not just theoretical. Research shows that lead levels are higher in the areas surrounding airports servicing piston-engine aircraft.[46] And multiple studies have demonstrated that children living in close proximity to airports where leaded avgas is used have higher blood lead levels than children who do not.[47] This is true even after

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[43] *See id.*; *Bluewater Network v. EPA*, 370 F.3d 1, 14 (D.C. Cir. 2004) (explaining that the fact that "contribute to" was not modified by the term "significantly" in one provision, as it was in other provisions in the CAA, "indicates that Congress did not intend to require a finding of 'significant contribution' for individual . . . categories").

[44] *See* 2010 ANPR, 75 Fed. Reg. at 22,445 (citing *Bluewater Network*, 370 F.3d at 15); *see also* Aircraft Cause or Contribute Finding, 81 Fed. Reg. at 54,472 (finding that "the collective GHG emissions from the classes of engines used in U.S. covered aircraft clearly contribute to endangering GHG pollution, whether the comparison is . . . to domestic GHG inventories . . . representing 2.8 percent of total U.S. emissions [or] to global GHG inventories . . . [representing] 0.4 percent of all global GHG emissions").

[45] Though EPA need not set "'a precise numerical value as part of' a contribution endangerment finding," nor "establish a minimum threshold of risk or harm before determining whether an air pollutant endangers," *Am. Lung Ass'n v. EPA*, 985 F.3d 914, 977 (D.C. Cir. 2021) (quoting *Coal. for Responsible Regul.*, 684 F.3d at 122–23), such a large proportion of pollution from one source counsels in favor of such a finding. *Cf. Am. Lung Ass'n*, 985 F.3d at 977 (upholding EPA's finding of *significant* contribution where a source category emitted one-third of relevant domestic emissions); *Massachusetts v. EPA*, 549 U.S. at 524–25 (2007) (noting that, even though the transportation sector represented less than a third of domestic carbon dioxide emissions, "[j]udged by any standard, U.S. motor-vehicle emissions make a meaningful contribution to greenhouse gas concentrations").

[46] *See* 2010 ANPR, 75 Fed. Reg. at 22,442; *see also* Letter and Memorandum from Gina McCarthy to Deborah Behles et al., *supra* note 25, at 7 ("For piston-engine aircraft using leaded avgas, our investigation to date indicates that the levels of lead in the air at and around general aviation airports increase with proximity to the airport.").

[47] *See* Marie Lynn Miranda et al., *A Geospatial Analysis of the Effects of Aviation Gasoline on Childhood Blood Lead Levels*, 119 Env't Health Perspectives 1513 (2011) (examining the relationship between proximity to airports in North Carolina where leaded aviation gas is used and blood lead levels in children and finding that "children living within 500 m, 1,000 m, or 1,500 m of an airport had average blood lead levels that were 4.4, 3.8, or 2.1% higher, respectively, than other children"); Zahran et al., *supra* note 20, at 575–610 (examining the blood lead levels of children living within 2 kilometers of airports in Michigan and finding that "the odds that a child's [blood lead levels] will eclipse CDC thresholds for concern increases dose-responsively in proximity to airports, declines measurably in neighborhoods proximate to airports in the months following 9/11" (when there was less air traffic), and "increases dose-responsively in the flow of [piston-engine aircraft] traffic"); RHV Lead Study, *supra* note 4, at 37–45 (explaining that "children proximate to [the general aviation airport] Reid-Hillview Airport present with systematically higher [blood lead levels], net of other measured sources of lead exposure risk, child demographic characteristics, and observed and unobserved neighborhood conditions," that children who live downwind of the airport had higher blood lead levels than those who did not, and that the blood lead levels "of sampled children increase with exposure to piston-engine aircraft operations at [the airport], net of all other factors" and ultimately "suggesting that child [blood lead levels] increase dose-responsively with

accounting for other sources of lead exposure, indicating that the use of leaded avgas causes elevated blood lead levels in children.[48] Indeed, one recent study showed that living downwind of Reid-Hillview Airport was associated with childhood blood lead level increases comparable to those from the Flint water crisis and that children living within half a mile of the airport during periods of maximum piston-engine aircraft traffic had blood lead level increases nearly twice the amount that occurred during the Flint crisis.[49]

Given that there is no safe level of lead, that lead is present in higher amounts surrounding airports using leaded avgas, and that studies show a causal relationship between the use of leaded avgas and elevated blood lead levels in children, there is ample evidence that leaded avgas contributes to harmful air pollution.

* * *

EPA has long recognized that lead is harmful to public health. And EPA's own analysis shows that the largest source of airborne lead emissions in the United States exposes millions of people across the country to a harmful pollutant for which there is no safe level of exposure. The research is clear—as it has been for years—that this exposure puts those who live, work, and attend school near airports where leaded avgas is used at a heightened risk of harm from one of the many adverse health effects associated with lead exposure. Lead emissions from piston-engine aircraft using leaded avgas therefore contribute to air pollution which may reasonably be anticipated to endanger public health or welfare. EPA must take long-overdue action to formally recognize this risk of harm and make an endangerment finding for leaded avgas, thereby beginning the process for regulating this source of dangerous air pollution.

Respectfully submitted,

s/ Jonathan J. Smith
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[piston-engine aircraft] traffic"); *cf.* Won-Ju Park et al., *Blood Lead Level and Types of Aviation Fuel in Aircraft Maintenance Crew*, 84 Aviation, Space, & Env't Med. 1087 (2013) (analyzing the blood lead levels of aircraft-maintenance workers in the Republic of Korea, finding higher blood lead levels among maintenance workers that are based in airports that service propeller-driven aircraft and use leaded aviation gas relative to maintenance workers that are based in airports that service jets (which do not use leaded avgas), and concluding that leaded avgas emissions "could increase the [blood lead levels] of aircraft maintenance crews").

[48] *See* Miranda et al. *supra* note 47, at 1,515 (finding relationship persisted even after accounting for individual- and group-level confounders, including the proportion of Black and Hispanic residents in a relevant census block, the percent of census-block population receiving public assistance, median household income of census block, and the season during which an individual child was screened for blood lead); Zahran et al, *supra* note 20, at 581 (controlling for confounding factors including housing stock age, location of industrial point sources emitting lead, percentage of households receiving public-assistance income, percentage of adult population with a high school education or greater, median home prices in a neighborhood, and population density (to account for accumulated lead in roads and soils from use of leaded automobile gasoline)).

[49] *See* RHV Lead Study, *supra* note 4, at xv, xvi.

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ED_006073A_00001025-00011

Exhibit 1

BEFORE THE ADMINISTRATOR OF THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

PETITION FOR RULEMAKING & COLLATERAL RELIEF

FRIENDS OF THE EARTH
Petitioner
1717 Massachusetts Avenue, NW, 600
Washington, DC 20036-2002

PETITION FOR RULEMAKING SEEKING THE REGULATION OF LEAD EMISSIONS FROM GENERAL AVIATION AIRCRAFT UNDER § 231 OF THE CLEAN AIR ACT

October 3, 2006

Pursuant to the Right to Petition Government Clause contained in the First Amendment of the United States Constitution, the Administrative Procedure Act, and the Clean Air Act, petitioner files this petition for Rulemaking and Collateral Relief with the Administrator and respectfully requests him to undertake the following duties:

(1) Make a finding that lead emissions from general aviation aircraft endanger public health and welfare and issue a proposed emissions standard for lead from general aviation aircraft under § 231 (a) (2) (A) of the Clean Air Act; alternatively,

(2) If the Administrator believes that insufficient information exists to make such a finding, commence a study and investigation of the health and environmental impacts of lead emissions from general aviation aircraft, including impacts to humans, animals and ecosystems, under § 231 (a) (2) of the Clean Air Act, and issue a public report on the findings of the study and investigation.

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BACKGROUND

On September 30, 2003, the Environmental Protection Agency ("EPA") published a Notice of Proposed Rulemaking (NPRM) for proposed amendments to existing emission standards for oxides of nitrogen (NOx) for newly certified commercial aircraft gas turbine engines with rated thrust greater than 26.7 kilonewtons (kN). 68 Fed. Reg. 56, 226. On December 12, 2003, on behalf of Bluewater Network, (currently a division of Friends of the Earth), the Golden Gate University Environmental Law and Justice Clinic commented on the proposed rule, as well as on the lack of regulation of lead emissions from general aviation aircraft. Regarding the latter issue, Bluewater argued that the combination of the lack of a threshold for safe lead exposure and the relatively high proportion of air lead pollution from general aviation aircraft should trigger the EPA's duties under Clean Air Act §231 to determine that lead emissions from this source endanger the public health and welfare.[1] Bluewater also noted that subpopulations living in the vicinity of general aviation airports, as well as aircraft workers and passengers, may be at particular risk for lead exposure.[2]

In November 2005, the EPA issued a response. The EPA claimed that there is insufficient information to enable the agency to determine that aircraft lead emissions may reasonably be anticipated to endanger public health and welfare.[3] The EPA further maintained that since a suitable, safe, unleaded aviation fuel has not been developed, regulating leaded aviation fuel would ground all general aviation aircraft, resulting in severe economic repercussions to the businesses that use the craft.[4]

Despite the volumes of studies pointing to the hazards of lead, the extent of the EPA's actions to address this problem have been to merely encourage the Federal Aviation Administration (FAA) to develop an unleaded aviation gasoline and to pursue voluntary initiatives to reduce the use of lead in aviation gasoline, while collecting information when possible.[5] The EPA is reluctant to take a more assertive stance on the problem of lead emissions from general aviation aircraft. Further reluctance is no longer appropriate, given the facts below.

PETITIONER

Petitioner FRIENDS OF THE EARTH is an environmental advocacy organization founded in 1969, with approximately 30,000 members across the nation. It's mission is to protect the planet from environmental degradation, including protecting clean air and healthy communities. BLUEWATER NETWORK is a non-profit organization founded in 1996 that works to protect air and water quality from harm caused by the transportation sector. Bluewater Network works to end environmental damage from cars, crafts, vessels, and to protect human

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[1] Letter from Golden Gate University Environmental Law and Justice Clinic, on behalf of Bluewater Network, to the U.S. EPA (December 12, 2003).
[2] *Id.*
[3] Emission Standards and Test Procedures for Aircraft and Aircraft Engines: Summary and Analysis of Comments, US EPA (November 2005) [EPA Comments] at 45.
[4] *Id.* at 42.
[5] *Id.* at 43.

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health and the planet by reducing dependence on fossil fuels. In March, 2005, Friends of the Earth merged with Bluewater Network. As a result of the merger, Bluewater Network is now a division of Friends.

STATEMENT OF LAW

On behalf of Friends of the Earth, the Environmental Law and Justice Clinic submits this petition to the EPA under the authority granted by the Administrative Procedure Act, 5 U.S.C. § 553.

In 1970, Congress gave the EPA authority through Section 231(a)(2)(A) of the Clean Air Act, 42 U.S.C. § 7571, to issue proposed emission standards when it determines that aircraft emissions from any class of aircraft engines "may reasonably be anticipated to endanger public health or welfare." Indeed, the EPA itself has confirmed that it has the authority to do so.[6] EPA must consult with the FAA regarding these standards. Section 231(a)(2)(B)(i). Pursuant to 49 U.S.C. § 44714, the FAA shall prescribe fuel standards to control or eliminate aircraft emissions that the EPA decides under section 231 endanger the public health or welfare. Only if the consultation determines that the proposed changes "would significantly increase noise and adversely affect safety," shall the changes not take effect. Section 231(a)(2)(B)(ii).

ARGUMENT

EPA action regarding lead in general aviation aircraft is long overdue. Studies increasingly show that lead in any quantity threatens the public welfare. Lead emissions from general aviation aircraft constitute a substantial proportion of all current lead air emissions. Congress gave EPA the authority through Section 231(a)(2)(A) to issue proposed emission standards when it determines that aircraft emissions "endanger public health or welfare." Based on the facts presented below, the petitioner contends that sufficient data exists to conclude that lead emissions from general aviation aircraft endanger the public heath and welfare, thus creating a duty for the EPA to propose emission standards. In the alternative, sufficient data regarding the dangers of airborne lead exist to commence a study concerning the extent of the health and environmental effects of general aviation lead emissions. Failure to do so in either instance would constitute arbitrary and capricious action under the APA, 5 U.S.C. § 706.

I. LEAD EXPOSURE IS HAZARDOUS TO HUMAN HEALTH

The EPA has repeatedly concluded that "lead is a very toxic element, causing a variety of effects at low dose levels."[7] Numerous federal agencies, including the EPA, the Occupational Safety and Health Administration, the Food and Drug Administration, and the Department of Health and Urban Development, have implemented regulations controlling lead content and use.[8]

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[6] *Id.* at 5.

[7] Lead Compounds Hazard Summary, U.S. EPA (April 1992, modified January 2000), available at http://www.epa.gov/ttn/atw/hlthef/lead.html

[8] Toxicological Profile for Lead, U.S. Department of Health and Human Services (September 2005) [Toxicological Profile] at 14-17, available at http://www.atsdr.cdc.gov/toxprofiles/tp13.pdf

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Acute high lead exposure can cause grave physiological consequences, including death and brain damage.[9] The severity of lead exposure differs according to time and levels of exposure, and is usually measured by blood lead levels.[10] However, blood lead levels reflect only recent exposure to lead.[11] Of the lead that is retained in the human body, most is ultimately deposited in the bones.[12] The inert lead deposited in bones can later reenter the blood stream in periods of physiological stress, pregnancy, lactation, chronic disease, and old age.[13] This reentry is exacerbated by calcium deficiency, because lead can inhibit or mimic the actions of calcium. [14] Hence, lead can affect an organism long after initial exposure.

According to the Agency for Toxic Substances and Disease Registry (ATSDR), "lead could potentially affect any system or organs in the body."[15] Common targets for lead toxicity are the cardiovascular, renal, and nervous systems.[16] The most common cardiovascular effect is increased blood pressure.[17] At the same time, lead exposure may compromise the renal system, especially by depressing the kidneys' glomerular filtration rate.[18] However, the most sensitive target for lead toxicity is the nervous system, resulting in malaise, forgetfulness, irritability, weakness, headache, and impaired concentration.[19]

The pervasive and multi-faceted hazards of lead are well documented. Therefore, as the Agency for Toxic Substances states, it is important to interdict all lead exposures.[20]

II. STUDIES INCREASINGLY SHOW THAT NO LEVEL OF LEAD IS SAFE.

The health hazards of lead are especially worrisome because studies increasingly show that no exposure to lead is safe. The levels at which adverse health effects are believed to occur have been revised downward several times in recent regulatory history.[21] For example, in 1972, the blood level considered safe for children was 40 mcg/dL.[22] More recently, the EPA defined the blood level of 10 mcg/dL as the "concentration of concern," but emphasized that this standard is not a threshold below which safety may be assured since scientific studies do not indicate any clear toxicity threshold for lead.[23]

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[9] Lead Toxicity Environmental Alert, U.S. Agency for Toxic Substances and Disease Registry (October 1992, revised October 2000) [ATSDR Report] at 16, available at http://www.atsdr.cdc.gov/HEC/CSEM/lead/docs/lead.pdf
[10] *Id.*
[11] *Id.* at 14.
[12] *Id.*
[13] *Id.* at 15.
[14] *Id.*
[15] Toxicological Profile at 21.
[16] *Id.* at 8, 21.
[17] *Id.* at 27.
[18] *Id.* at 28.
[19] ATSDR Report at 17.
[20] *Id.*
[21] *Id.*
[22] Preventing Lead Poisoning in Young Children: A Statement by the Centers for Disease Control and Prevention (October 1991), available at http://www.cdc.gov/nceh/lead/publications/books/plpyc/contents.html.
[23] Identification of Dangerous Levels of Lead, Final Rule, U.S. EPA (January 5, 2001), 66 Fed. Reg. 1206.

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Indeed, recent studies show that lead blood levels well below 10 mcg/dL are associated with increases in serious health effects in both children and adults.[24] For example, increases in chronic kidney disease have been observed in hypertensive adults at blood lead levels of between 2.5 to 3.8 μg/dL.[25]

Children have generally been shown to absorb a larger fraction than adults of both inhaled and ingested lead,[26] and are more sensitive to lead induced toxicity than adults,[27] especially in relation to the nervous system. At lower levels of exposure, lead may compromise cognitive development and cause learning disabilities and lower IQ levels.[28] For example, Lanphear et. al. estimated a decline of 6.2 points in full scale IQ for an increase in blood lead levels from <1 to 10 μg/dL.[29] Low-level exposure has also been associated with neurological effects such as hearing impairment and peripheral nerve dysfunction.[30]

New data increasingly shows that health effects occur in both children and adults at low levels of lead exposure. Therefore, to protect the health and welfare of the public, especially of children, the EPA should strive to eliminate every source of lead to which the public could be exposed.

III. LEAD EMISSIONS FROM GENERAL AVIATION AIRCRAFT POSE HUMAN HEALTH AND ECOLOGICAL CONCERNS.

The use of leaded aviation gasoline results in the emission of both organic and inorganic lead-containing compounds. Organic alkyl lead compounds such as tetraethyl lead ("TEL") are emitted into the air mostly from fueling operations. TEL decomposes fairly quickly to inorganic forms of lead once dispersed into the air, water, or soil. For example, the half-life of TEL in summer atmospheres is approximately 2 hours and is on the order of several days in winter atmospheres.[31]

Inorganic forms of lead enter the environment from the decomposition of organic alkyl lead compounds, and more significantly, as tailpipe emissions from the gasoline combustion process. Inorganic forms of lead are highly persistent in the environment. Wet or dry deposition removes lead particles from the atmosphere and deposits them on soil and water surfaces.[32] Lead emitted as particles may remain airborne for up to ten days and may thus be transported far from the original source.[33]

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[24] ATSDR Report at 17.
[25] Muntner, P.; He, J.; Vupputuri, S.; Coresh, J.; Batuman, V. (2003) Blood lead and chronic kidney disease in the general United States population: results from NHANES III. Kidney Int. 63: 1044-1050.
[26] ATSDR Report at 9.
[27] Toxicological Profile at 9.
[28] Toxicological Profile at 25.
[29] Lanphear, B. P. (2005) Childhood lead poisoning prevention: too little, too late. JAMA J. Am. Med. Assoc. 293: 2274-2276.
[30] ATSDR Report at 17.
[31] PBT National Action Plan for Alkyl-Lead, U.S. EPA Persistent, Bioaccumulative, and Toxic Pollutants (PBT) Program (June 2002) [PBT Action Plan] at 13.
[32] *Id.*
[33] *Id.*

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As a result of the use of leaded aviation gasoline, humans and ecological receptors at or near general aviation airports may be exposed to elevated levels of lead. The main routes of human exposure to lead compounds at or near general aviation airports in urban areas include: (i) inhalation of airborne organic and inorganic lead, (ii) ingestion of lead-contaminated dusts formed via deposition of airborne lead, and (iii) ingestion of contaminated home-grown fruits and vegetables (also via particulate deposition). In farming areas, additional exposure could result from the contamination of food-animals via lead deposition onto soils, forage areas, and farm ponds.

Inhalation and ingestion exposures are likely to occur to workers, pilots, passengers and other individuals at general aviation airports. Inhalation, ingestion, garden-produce and other indirect exposures are likely to occur to residents and others located on the periphery of general aviation airports.

In addition, lead emissions from general aviation airports may also accumulate in local and regional surface waters:

> Transport of lead to surface waters can occur through direct deposition from the atmosphere, via industrial waste water discharge, or as runoff (e.g., lead associated with suspended solids in the erosional process) [...] Inorganic lead may bioconcentrate in some aquatic animals, especially benthic organisms such as bottom feeding fish and shellfish such as mussels....[34]

In this way, lead from general aviation airports is likely to contaminate sources of drinking water and fishing resources, and could also cause various adverse ecological impacts.

While the greatest source of lead air emissions comes from stationary sources like lead smelters, general aviation is the one major mobile source, constituting at least 13% all lead air emissions.[35] Other mobile sources of airborne lead emissions are recreational marine vehicles and racing automobiles.[36] The latter of these lead sources is being phased out. The National Association of Stock Car Auto Racing (NASCAR) has announced that by 2008, NASCAR will switch to unleaded gasoline.[37] This is the result of the EPA's 2002 Persistent, Bioaccumulative, and Toxic Pollutants (PBT) Action Plan, in which it identified the removal of lead from NASCAR vehicle fuel as its key priority over the next five years.[38] The EPA has not made the removal of lead from general aviation fuel a similar priority even though, in 1996, U.S. refineries produced over 3,000 times as many gallons of aviation gasoline as NASCAR fuel used in 1998.[39]

EPA's concern with removing lead from NASCAR fuel indicates the importance of removing mobile source lead emissions, and yet EPA has not acted to address lead fuel use in general aviation fuel. General aviation constitutes a substantially higher percentage of lead air

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[34] *Id.*
[35] National Air Quality and Emission Trends Report, U.S. EPA (2003).
[36] PBT Action Plan at 7.
[37] Viv Bernstein, *NASCAR Plans to Switch to Unleaded Fuel in '08*, New York Times, January 20, 2006, at 2.
[38] PBT Action Plan at 3.
[39] *Id.* at 25.

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emissions than auto racing. In 2002, general aviation comprised 125.5 annual tons, or about 88% of lead from all mobile sources.[40] This percentage will increase with NASCAR adopting unleaded fuel. Now that leaded gasoline use in NASCAR has been addressed, it is time for the EPA to focus on the more important task of removing lead from general aviation fuel.

IV. SAFE UNLEADED ALTERNATIVES TO AVIATION GASOLINE EXIST AND SHOULD BE BETTER UTILIZED.

As described below, contrary to the EPA's assertions,[41] safe unleaded alternatives to aviation gasoline do exist. Since 1999, the research and development process has produced unleaded fuels that have received approval from the FAA for current use. Tens of thousands of low-performance aircraft have received supplemental type certificates allowing them to run on unleaded automobile gasoline (commonly referred to as "mogas" in the aviation community). Additionally, a mogas alternative, 82UL, has been developed for use by some low-performance planes. The combination of these two fuels can be utilized by nearly seventy percent of all piston-driven aircraft. Additionally, the FAA allows a select number of planes to run on an ethanol based aviation fuel (AGE85); the remaining thirty percent of general aviation planes can potentially use this unleaded gasoline.

A. A LARGE PORTION OF GENERAL AVIATION AIRCRAFT CAN CURRENTLY USE UNLEADED AUTOMOBILE GASOLINE SAFELY ONCE ISSUED A SUPPLEMENTAL TYPE CERTIFICATE BY THE FAA.

Seventy percent of general aviation aircraft are capable of running on mogas upon being issued a supplemental type certificate (STC).[42]

To ensure the production of safe aircraft, the FAA puts all planes through a certification process. Once the FAA determines that an aircraft meets the prescribed safety standards, it shows its approval by issuing a "type certificate." 49 U.S.C.S. § 44704(a)(1). For alterations to an airplane or its engine, each applicant must show that the changes comply with the aforementioned safety standards. 14 C.F.R. § 21.115 (2006). When the FAA confirms compliance, they issue a "supplemental type certificate." 49 U.S.C.S. § 44704(b)(1). Since changes in fuel usage involve the plane's engine, approval to begin using automotive gasoline (mogas) rather than aviation gasoline (avgas) requires the applicant to obtain an STC. Indeed, the FAA has issued STCs for airplanes and engines using mogas since 1982,[43] including over 40,000 through the Experimental Aircraft Association (EAA).[44]

As long as pilots use mogas in accordance with their STC, safety is no more an issue than with avgas. The FAA first issued a STC approving the use of mogas twenty-four years ago.

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[40] National Emissions Inventory for Lead, U.S. EPA (2002).
[41] EPA Comments at p.42.
[42] Michael A. Dornheim, *100LL Demise Expected Over Next Decade*, Aviation Week & Space Technology, July 23, 2001, at 51.
[43] *Id.*
[44] Experimental Aircraft Association, http://www.eaa.org/education/fuel/index.html (last visited March 13, 2006).

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Since then, the FAA has determined that aircraft using mogas are as safe as those running on avgas:

> Autogas[45] use has been extensively compared, tested, and analyzed. Autogas has been shown to be an acceptable alternative to avgas for airplanes and engines approved for such use. Airplanes and engines approved for autogas have met the FAA certification requirements for engine detonation, engine cooling, fuel flow, hot fuel testing, fuel system compatibility, vapor lock, and performance....In summary, there are numerous studies and technical reports available comparing autogas to avgas for use in certified airplanes and engines. The service history for airplanes and engines using autogas has been good and is comparable to avgas.[46]

A plane's mogas STC specifies which grade of mogas it can use. Many of these STCs allow the use of regular grade unleaded mogas in place of Grade 80/87 avgas.[47] However, some allow premium grade mogas, usually for planes that would otherwise run on 91/96 or 100LL avgas.[48] Given these specifications, the FAA,[49] Experimental Aircraft Association,[50] and other aviation commentators[51] emphasize that pilots should strictly adhere to the terms of their STCs. Nonetheless, since STCs allow the use of a variety of grades of mogas to replace multiple grades of avgas, the number of general aviation aircraft able to run on mogas is greatly increased.

In 2000, the FAA Small Airplane and Engine and Propeller Directorate approved the use of another unleaded fuel, 82Unleaded (82UL) gasoline, as an alternative to mogas.[52] 82UL is a variation of mogas designed specifically for piston-driven aircraft, produced from the same fuel stocks but with fewer of the additives found in automobile gasoline.[53] Planes can use it with STCs that approve the use of mogas with an octane rating of 82 or less. While 82UL is not yet commercially available, it has already completed the FAA's rigorous approval process. Given its certification, 82UL could be phased into production if needed.

From a cost standpoint, increased utilization of mogas would lead to significant savings for general aviation pilots. Nationally, 100LL avgas averages $3.72 per gallon with the price exceeding six dollars in several areas.[54] By comparison, mogas pumped at airports averages just $2.77 per gallon with a high of four dollars in only one region.[55] Gasoline pumped from the neighborhood station costs even less: the national average is $2.36 per gallon with the price

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[45] In aviation circles, "Autogas" and "Mogas" are used interchangeably.
[46] Letter from Michael Gallagher, Manager of the FAA Small Airplane Directorate, to Earl Lawrence, Executive Director of the Experimental Aviation Association (June 4, 1998), *available at* http://www.eaa.org/education/fuel/letter.pdf
[47] FAA Revised Special Airworthiness Information Bulletin, April 5, 2000, available at http://www.faa.gov/aircraft/safety/alerts/saib/media/CE-00-19R1.htm (last visited March 15, 2006).
[48] *Id.*
[49] *Supra* note 46.
[50] *Supra* note 44.
[51] John Ruley, *Avgas vs. Autogas*, May 5, 2004, http://www.avweb.com/news/maint/187232-1.html.
[52] *Supra* note 47.
[53] *Id.*
[54] AirNav, http://www.airnav.com/fuel/report.html (last visited March 13, 2006).
[55] *Id.*

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falling between $2.05 and $2.93.[56] Based on the average prices, a pilot would save ninety-five dollars for every one hundred gallons of fuel bought at the airport; the savings increases to $141.00 when purchased at a gas station.

Increasing the use of mogas in aircraft would prove highly beneficial to the public generally and to general aviation pilots specifically. If all seventy percent of those planes able to use mogas did so, it would result in a thirty percent reduction of overall avgas use.[57] Such a decrease would result in the removal of more than thirty-seven tons of lead emissions from the air and a significant overall diminution of lead exposure to the American people.[58] Similarly, less avgas use would reduce the more direct lead exposure experienced by residential communities adjacent to airports as well as pilots and airport personnel, in addition to reducing the cost of operating general aviation aircraft. With the FAA already deeming mogas use safe through its certification program, an exercise of the EPA's section 231 authority would prompt the FAA to expand a program already in existence. Increased issuance of mogas STCs would have a positive impact on the general aviation community and the public at large.

B. HIGH-PERFORMANCE AIRCRAFT WITH PROPER CERTIFICATION CAN SAFELY RUN ON ETHANOL BASED FUEL.

In April 1999, the FAA issued STCs for aircraft and engines to use Aviation Grade Ethanol 85 (AGE85).[59] AGE85 is an unleaded, "'high-performance, high-octane fuel -- just what newer, high-performance, high-compression aircraft engines need [--]'" designed specifically to replace 100LL fuel.[60]

While high-performance aircraft comprise only thirty percent of general aviation planes, they consume nearly seventy percent of the total avgas due to the increased energy needs of their 200+ horsepower engines. Though AGE85 is not widely available at present, current and continued expansion of commercial ethanol production facilities[61] could potentially cover the fuel needs of most high-performance engines, resulting in the removal of nearly eighty-eight tons

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[56] GasWatch, http://www.gaswatch.info/ (last visited March 13, 2006).

[57] *Supra* note 42. Generally speaking, approximately 70% of general aviation aircraft are considered "low-performance." According to 14 C.F.R. § 61.31(f) (2006), planes with engines of greater than 200 Horsepower are classified as "high-performance" and require additional pilot training. Only 30% of general aviation aircraft are high-performance; however they use nearly 70% of consumed avgas.

[58] 2002 National Emissions Inventory for Lead, U.S. EPA (General Aviation emitted 125.5 tons of lead in 2002).

[59] STCs are available for the Cessna 180 and 182s as well as the O-470 and UTS engines. Additionally, dual-fuel STCs are available for the same aircraft and engines. STCs for the Lycoming IO-360 and Pratt and Whitney R-1340 are in progress. *See* http://www.age85.org/STCs.htm (last visited March 15, 2006).

[60] At Last, A Low-Cost Aviation Gasoline That Gets The Lead Out, Science Daily, July 20, 1999, available at http://www.sciencedaily.com/releases/1999/07/990720083151.htm (last visited March 15, 2006).

[61] At the end of 2005, construction of new refineries and ongoing expansions were expected to add as much as 1.5 billion gallons of annual ethanol production capacity in the United States. Since 2001, U.S. ethanol production has increased by 126%. Renewable Fuels Association, From Niche to Nation: Ethanol Industry Outlook 2006, at 2, available at http://www.ethanolrfa.org/objects/pdf/outlook/outlook_2006.pdf (last checked April 5, 2006). Also, Richard Branson, owner of Virgin Atlantic, recently announced plans to invest $400 million in ethanol fuel factories for use in his planes and trains; $30- $40 million of the initial investment will be made in the United States as soon as this year. Jason Niss, *Branson to put $400 million into making 'green' fuel*, London Independent, April 2, 2006, News at 1.

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of lead emissions. Additionally, since dual-fuel STCs are also available,[62] blends of AGE85 with 100LL, while not as substantial as exclusive AGE85 use, could still result in significant lead emission decreases. As 100LL availability decreases and AGE85 availability increases, blending of the two offers a viable solution for a transition from one fuel to the other.

As with mogas, AGE85 offers significant cost-benefits to general aviation pilots. Nationally, 100LL avgas averages $3.72 per gallon.[63] When the FAA first approved AGE85 in 2000, pure ethanol cost $0.95 per gallon and AGE85 was expected to sell for $1.10 per gallon; a 16% increase over the initial price.[64] Today, ethanol averages $2.39 per gallon in the Midwest[65] and $2.45 nationally.[66] Calculating the price as a 16% increase over the averages, AGE85 would cost from $2.77 to $2.84. That amounts to a cost-savings of $88 to $95 for every one-hundred gallons of fuel.

Recently, a Brazilian aircraft company, Embraer, developed and received type certification (from the Brazilian equivalent of the FAA) for the ethanol fueled Ipanema cropduster. This plane is the first "series production aircraft in the world coming out of the factory certified for flying with ethanol."[67] In addition to running exclusively on ethanol fuel, the new engine provides a five percent boost in power, improving takeoff, climbing rate, speed, and maximum altitude.[68] The reception of the Ipanema has been overwhelmingly positive: Scientific American named it one of the top-50 worldwide inventions of 2005.[69]

While the Ipanema is not yet approved for use in the United States, it is important to note that the plane's engine is an altered version of the American made Lycoming motor,[70] suggesting that it would be either relatively easy to develop an American version or quickly adopt the Brazilian one for use in the United States. Furthermore, the French company Aero-Alcohol has developed a kit to convert non-ethanol Ipanema planes for ethanol use. This development has attracted the attention of the American Society for Testing and Materials (ASTM) which hopes to consolidate international ethanol standards using the Ipanema's specifications as a starting point.[71]

AGE85 has already received approval for use by the FAA as a safe and viable fuel even though it is not yet available nationwide. With aviation-related ethanol fuel research on the rise at the FAA Hughes Technical Center, in Brazil, and elsewhere, and with American ethanol

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[62] *Supra* note 59.
[63] *Supra* note 54.
[64] Perspectives: A newsletter covering the research, demonstration and education projects of the Iowa Energy Center, January/February 2000, available at http://www.energy.iastate.edu/news/newsletters/perspectives/JanFeb2000.pdf (last visited March 31, 2006).
[65] State average fuel ethanol rack prices, available at http://ethanolmarket.com/fuelethanol.html (last visited March 31, 2006).
[66] Fuel ethanol terminal market price history – 18 months, available at http://www.energy.ca.gov/gasoline/graphs/ethanol_18-month.html (last visited March 31, 2006).
[67] http://www.greencarcongress.com/2004/10/embraerrsquos_e.html (last visited March 15, 2006).
[68] *Id.*
[69] James E. Hardwick, *The Ethanol-Fueled, Brazilian-Built Ipanema Agricultural Aircraft*, Business & Commercial Aviation, February 1, 2006.
[70] E-mail from a Brazilian Diplomat (March 14, 2006) (on file with author).
[71] *Id.*

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production increasing and President Bush's 2006 State of the Union address encouraging the industry's growth, use of AGE85 should increase in the near future. This will provide unleaded aviation fuel for high-performance aircraft of a similar quality to avgas.

Finally, European development of a diesel-cycle jet fuel general aviation engine offers yet another possible solution: jet fuel is unleaded and readily available at airports in Europe.[72]

CONCLUSION

As described above, nearly seventy percent of general aviation aircraft can safely use either standard unleaded automobile gas or 82UL gas. Switching to these alternatives would reduce lead emissions from general aviation aircraft by almost 38 tons. Likewise, the ethanol-based AGE85, which has received FAA approval, has the potential to be used by the remaining thirty percent of planes, eliminating an additional 87.85 tons of lead emissions.

These are just some of the current alternatives to leaded avgas. As energy independence becomes a more prevalent societal and economic issue, alternative fuel research is increasing and bound to produce even more choices. In such a dynamic environment, the EPA has the opportunity to adopt rules forcing this technology -- authority the EPA agrees it has under section 231.[73] Indeed, since mogas, 82UL, and AGE85, are already in existence and have the approval of the FAA, the EPA does not even need to force technology development: it only needs to encourage its present utilization.

WHEREFORE, petitioners request that the Administrator:

(1) Make a finding that lead emissions from general aviation aircraft endanger public health and welfare and issue a proposed emissions standard for lead from general aviation aircraft under § 231 (a) (2) (A) of the Clean Air Act; or, in the alternative,

(2) Commence a study and investigation of the health and environmental impacts of lead emissions from general aviation aircraft, including impacts to humans, animals and ecosystems, under § 231 (a) (2) of the Clean Air Act, and issue a public report on the findings of the study and investigation.

As required by law, the EPA is required to give this petition prompt consideration. Additionally, under the Administrative Procedure Act, agency action includes a failure to act. Therefore, petitioners request a substantive response to this petition within 180 calendar days.[74]

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[72] Michael A. Taverna, *SMA Diesel Revs Up*, Aviation Week & Space Technology, May 24, 2004, at 68.
[73] *Supra* note 3 at 4 (EPA conclusion that section 231 does not preclude a technology forcing standard).
[74] 42 U.S.C. § 7604(a) (requiring notice of 180 days prior to commencing an action for unreasonable delay).

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Respectfully submitted,

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Exhibit 2

BEFORE THE ADMINISTRATOR OF THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

PETITION FOR RECONSIDERATION

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PETITION FOR RECONSIDERATION OF EPA'S DENIAL OF FRIENDS OF THE EARTH'S OCTOBER 3, 2006 PETITION FOR RULEMAKING SEEKING THE REGULATION OF LEAD EMISSIONS FROM GENERAL AVIATION AIRCRAFT UNDER § 231 OF THE CLEAN AIR ACT AND PETITION FOR RULEMAKING SEEKING THE REGULATION OF LEAD EMISSIONS FROM GENERAL AVIATION AIRCRAFT UNDER § 231 OF THE CLEAN AIR

April 21, 2014

INTRODUCTION AND SUMMARY OF PETITION

On October 3, 2006, Friends of the Earth ("FoE") submitted a Petition for Rulemaking (the "Petition") with the Administrator of the U.S. Environmental Protection Agency ("EPA"). In the Petition, FoE asked EPA to find that lead emissions from aviation aircraft using leaded aviation gasoline ("avgas") contribute to lead air pollution that may endanger public health or welfare. On July 18, 2012, nearly six years after the Petition was filed, EPA denied FoE's

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request for an endangerment finding.[1] This Petition seeks reconsideration of that denial and affirmatively requests that EPA make an endangerment finding.

The basis of this Petition is simple and straightforward. The only showing required for a finding of endangerment is that lead emissions from aircraft engines fueled by leaded aviation gasoline cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare. In this case, both prongs of that test have been met. By categorizing lead as a criteria pollutant and promulgating National Ambient Air Quality Standards ("NAAQS") for lead, EPA has already determined conclusively that lead is a pollutant that may reasonably be anticipated to endanger public health or welfare. EPA also has determined that lead emissions from aircraft engines fueled by leaded aviation gasoline constitute the largest single contributing source to overall airborne lead pollution. In so doing, EPA has established that emissions from aircraft using leaded aviation gasoline cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare. There is no need for further study. EPA has all of the evidence it needs to make an endangerment finding.[2]

PETITION

Pursuant to the Right to Petition Government Clause contained in the First Amendment of the United States Constitution, the Administrative Procedure Act, and the Clean Air Act ("CAA"), petitioners file this Petition for Reconsideration with the Administrator and respectfully request the following:

(1) That the Administrator reconsider the denial of FoE's October 3, 2006 Petition;

(2) That the Administrator find that lead emissions from general aviation aircraft cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare; and

(3) That after the Administrator makes an endangerment finding, the Administrator commence the rulemaking process and issue proposed emission standards for lead from general aviation aircraft under §231(a)(2)(A) of the CAA.

PETITIONERS

Friends of the Earth

Petitioner FoE is a tax-exempt environmental advocacy organization founded in 1969 and incorporated in the District of Columbia, with offices in Washington, DC and Berkeley,

[1] Memorandum from EPA Administrator in Response to Petition Regarding Lead Emissions from General Aviation Aircraft Piston-Engines (Jul. 18, 2012), *available at* http://www.epa.gov/otaq/regs/nonroad/aviation/ltr-response-av-ld-petition.pdf [hereinafter "EPA's Response"].

[2] As discussed below, after EPA finds endangerment, it should take immediate steps to start phasing out the use of leaded aviation gasoline.

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California. As of April 2014, FoE had more than 23,600 members across all 50 states in the United States and more than 235,000 activists. FoE is part of Friends of the Earth International, a federation of grassroots groups working in 74 countries on today's most urgent environmental and social issues.

FoE's mission is to defend the environment and champion a healthy and just world. To this end, one of FoE's key programs is the promotion of policies and actions that prevent air pollution and that minimize the negative impacts of pollution on human health. FoE relies on sound science and uses the law to create and advocate for innovative strategies to conserve natural resources and protect public health and the environment. A core element of FoE's mission is work to reduce air and water pollution throughout the United States. To these ends, FoE actively engages in rulemaking efforts before EPA and other regulatory agencies relating to the regulation of industrial sources of air and water pollution and in litigation to support these efforts.

Physicians for Social Responsibility

Physicians for Social Responsibility ("PSR") is the largest physician-led nonprofit organization in the U.S. working to slow, stop and reverse global warming and toxic degradation of the environment. Founded in 1961, PSR has a national network of 50,000 health professionals and concerned citizen members and e-activists, twenty-five PSR chapters in nineteen states, and roughly thirty student PSR chapters at medical and public health schools. In 1992, recognizing that new dangers threaten our communities, PSR expanded its mission to include environmental health. Since then, PSR has brought the medical and public health perspective to protect today's and future generations from the health effects of global warming and toxic degradation of the environment. PSR strives to educate and activate the medical and broader health community, and the public, through research, analysis, collaboration, and targeted communications. PSR advocates for government and societal change at the local, state, and national level. PSR has been active in identifying and combating the effects of lead exposure, particularly the effects on children, through its research, advocacy, and educational activities. PSR played a key role in the passage of the National Housing Bill of 1992, which significantly reduced the amount of lead in drinking water in the United States. More recently PSR's Los Angeles chapter co-sponsored The Childhood Lead Poisoning Prevention Act of 2007, which sought to increase the number of children tested for lead poisoning by utilizing the state's immunization program.

Oregon Aviation Watch

Oregon Aviation Watch ("OAW") is a non-profit organization dedicated to research, education and advocacy on behalf of the public interest and public welfare regarding aviation issues. OAW seeks to enhance and protect the quality of life for Oregon residents by eliminating the adverse impacts of aviation activity, as well as achieve a transparent, accountable, and sustainable aviation system that neither disregards nor diminishes the environment, livability, health, or well-being of current and future generations of Oregon residents. OAW provides information on aviation policy in Oregon and nationally, and shares its experiences dealing with these issues. OAW strives to reduce the sense of isolation and powerlessness people sometimes feel when confronted with the bureaucratic runaround and lack of democratic principles so often

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encountered when dealing with aviation issues. To further these goals OAW has gathered and written numerous articles on the subject of lead pollution from piston craft airplanes, and has filed requests and motions with local airports to install monitoring equipment to further show the effects and dangers of leaded avgas. OAW also provides regular email updates to a broad base of local supporters, elected officials and environmental organizations to keep the public apprised of current aviation issues. OAW is active at the local level in ensuring decision-makers take into account the health and well-being of communities who live near airports throughout Oregon.

PETITION HISTORY

Over ten years ago, FoE brought the issue of lead emissions from general aviation aircraft to the attention of EPA in a letter requesting that the Agency make an endangerment finding regarding such emissions.[3] Two years later EPA responded, stating that there was insufficient evidence for EPA to make a determination that aircraft lead emissions could be reasonably anticipated to endanger public health or welfare.[4]

On October 3, 2006, FoE submitted a Petition for Rulemaking with EPA (the "2006 Petition"). In the 2006 Petition, FoE again asked EPA to find that lead emissions from general aviation aircraft endanger public health or welfare. FoE also requested that EPA issue a proposed emissions standard for lead from general aviation aircraft. On November 16, 2007, EPA requested public comment on the 2006 Petition.[5] FoE submitted comments to EPA on March 18, 2008.

On April 28, 2010, EPA issued an Advanced Notice of Proposed Rulemaking ("ANPR").[6] In the ANPR, EPA acknowledged the serious health effects associated with exposure to lead at much lower levels than previously identified.[7] The ANPR also confirmed that aircraft fueled by leaded aviation gasoline constitute "the largest single source category for emissions of lead to air, comprising approximately half of the national inventory."[8] The ANPR further noted that communities living near airports, children attending schools near airports, and airline pilots are all at risk of exposure to lead from these aircraft.[9] Nevertheless, the ANPR sought further public input regarding the 2006 Petition.[10]

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[3] Letter from Golden Gate Univ. to EPA Administrator (Dec. 12, 2003), *available at* http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2002-0030-0106 (In 2003, FoE was known as the Bluewater Network).

[4] EPA, Emissions Standards and Test Procedures for Aircraft and Aircraft Engines: Summary and Analysis of Comments 40-43 (Nov. 2005).

[5] Petition Requesting Rulemaking to Limit Lead Emissions from General Aviation Aircraft; Request for Comments, 72 Fed. Reg. 64,570 (proposed Nov. 16, 2007).

[6] Advance Notice of Proposed Rulemaking on Lead Emissions From Piston-Engine Aircraft Using Leaded Aviation Gasoline, 75 Fed. Reg. 22,439 (proposed Apr. 28, 2010) [hereinafter "ANPR"].

[7] *See id.* The ANPR also admitted that EPA's review of lead air quality standards in 2008 did not identify a safe level of lead emissions.

[8] *Id.* at 22,442.

[9] *Id.* at 22,459-463.

[10] *Id.* at 22,441.

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On July 18, 2012, nearly six years after the 2006 Petition was filed, EPA issued its Memorandum in Response to Petition Regarding Lead Emissions from General Aviation Aircraft Piston-Engines denying FoE's request for an endangerment finding.[11] EPA suggested that more data regarding demographics and air lead levels at and around airports would allow EPA to make a judgment on whether lead emissions from aircraft fueled by leaded aviation gasoline are a danger to public health.[12] EPA also suggested that additional studies were necessary "since previous airport modeling studies had not focused on identifying near-field gradients in lead concentrations from piston-engine aircraft, or attempted to differentiate aircraft lead emissions from other sources of ambient air lead (e.g., roadways)."[13] EPA estimated that it would take up to three years in order to make a judgment on whether lead emission from general aviation aircraft piston engines cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare.[14]

FACTUAL BACKGROUND

1. EPA's Recognition of the Health Impacts of Airborne Lead.

More than forty years ago, in 1973, EPA concluded that airborne lead was a danger to public health including "a significant risk of harm to the health of urban population groups, especially in children" and required a phase out of lead used in motor vehicle gasoline.[15] Three years later, in 1976, EPA listed lead as a pollutant that "cause[s] or contribute[s] to air pollution which may reasonably be anticipated to endanger public health or welfare" and is emitted "from numerous or diverse mobile or stationary sources."[16]

In 1978, EPA stated that "it remains the Agency's belief that airborne lead directly and indirectly contributes to the risk of adverse health consequences and that sufficient clinical and epidemiological evidence is available to form a judgment as to the extent of this contribution."[17] EPA further found that an increase in airborne lead produces increases in blood lead levels that cause human health risks such as "permanent, severe, neurological damage or death."[18]

A few years later, in 1982, EPA restated that increased use of lead in gasoline should be avoided out of "concern over the impact of total environmental loadings of lead, including exposures that may result from contaminated soil, dust, water," and foodstuffs.[19] Then, in 1986, EPA revised its "Air Quality Criteria" for lead, recognizing that lead is more dangerous than

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[11] *See* EPA's Response.

[12] *Id.* at 5.

[13] *Id.* at 8.

[14] *Id.* at 15.

[15] ANPR at 22,446.

[16] Addition of Lead to List of Air Pollutants, 41 Fed. Reg. 14,921, 14,921 (Apr. 8, 1976); 42 U.S.C. § 7408(a)(1)(A), (a)(1)(B).

[17] National Primary and Secondary Ambient Air Quality Standards for Lead, 43 Fed. Reg. 46,246, 46,250 (Oct. 5, 1978).

[18] *See id.* at 46,247.

[19] Regulation of Fuels and Fuel Additives, 47 Fed. Reg. 38,070, 38,076 (Aug. 27, 1982).

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EPA had previously found.[20] EPA concluded that reducing lead air pollution would "result in significant widespread reductions in levels of lead in human blood."[21] EPA also again recognized that children have a greater risk for experiencing lead induced health effects.[22]

In 2001, EPA admitted that "there is no known threshold for lead."[23] Then, in 2008, EPA again tightened air quality standards for lead due to increased evidence that demonstrates adverse health effects occurring at lower lead levels than previously thought.[24] EPA further recognized that airborne lead emissions can continue to harm human health for years: "[o]nce deposited out of the air, [lead] can subsequently be resuspended into the ambient air and, because of the persistence of [lead], [lead] emissions contribute to media concentrations for some years into the future."[25] In 2010 and 2011, EPA designated many areas of the country as not meeting the air quality standards it set for airborne lead concentrations.[26]

EPA continued to find a wide array of serious negative health effects – due to lead exposure – at lower and lower levels in adults and especially in children.[27] EPA acknowledged that "the neurotoxic effects of Pb are not generally reversible."[28] As EPA also noted, more than 6,000 studies on lead's health effects have come out since 1990 showing that "[e]xposures to low levels of lead early in life have been linked to effects on IQ, learning, memory, and behavior."[29] EPA has also continued to acknowledge that the health effects from airborne lead exposure are known to occur at much lower levels than experts originally believed.[30] In particular, EPA has explicitly stated that, "the epidemiologic and toxicological study findings show that progressively lower blood [lead] levels or [lead] exposures are associated with cognitive deficits in children."[31]

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[20] *See* EPA, Air Quality Criteria for Lead 1-159 (June 1986), *available at* http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2007-0294-0178.

[21] *Id.*

[22] *Id.*; *see also* National Ambient Air Quality Standards for Lead, 73 Fed. Reg. 66,964, 66,968 (Nov. 12, 2008) (characterizing lead poisoning as the "number one environmental threat to the health of children in the United States").

[23] Lead: Identification of Dangerous Lead Levels, 66 Fed. Reg. 1206, 1215 (Jan. 5, 2001); *see also* National Ambient Air Quality Standards for Lead, 73 Fed. Reg. 66,964 at 66,968 (acknowledging that "there is now no recognized safe level of [lead] in children's blood").

[24] National Ambient Air Quality Standards for Lead, 73 Fed. Reg. 66,964.

[25] *Id.* at 66,971.

[26] *See* Air Quality Designations for the 2008 Lead (Pb) National Ambient Air Quality Standards, 75 Fed. Reg. 71,033 (Nov. 22, 2010) (codified at 40 C.F.R. Part 81); *see also* Air Quality Designations for 2008 Lead (Pb) National Ambient Air Quality Standards, 76 Fed. Reg. 72,097 (Nov. 22, 2011) (codified at 40 C.F.R. Part 81) (identifying additional areas that fail to meet national ambient air quality standards for lead).

[27] 73 Fed. Reg. at 66,975-76.

[28] EPA, Integrated Science Assessment for Lead 1-76 (June 2013).

[29] *See* EPA's Response at 11.

[30] *See* EPA, Integrated Science Assessment for Lead lxxi-lxxiv

[31] *Id.* at 1-73.

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2. EPA's Longstanding Knowledge of Lead Emissions from Aircraft

The 1970 Clean Air Act required EPA to conduct a study about the impact that pollutants from aircraft emissions have on air quality.[32] In April 1972, EPA issued the study and recognized that general aviation aircraft emitted lead.[33] Modeling in the study indicated that lead pollutant concentrations would increase due to the use of leaded aviation gasoline.[34] In that report, EPA acknowledged that a switch to "low-lead or lead-free fuel" was required to address airborne lead emissions.[35]

In 2002, in the National Emissions Inventory ("NEI"), EPA found that lead emissions from avgas were the largest source category.[36]

In June 2002, EPA released an Action Plan to address the dangers to human health from exposure to alkyl-lead compounds including leaded avgas.[37] In the plan, EPA stated that "[r]esearch has clearly shown that exposure to alkyl-lead can cause serious toxic effects to the nervous system of humans, with the potential to cause neurological disorders."[38] EPA further explained that exposure to alkyl-lead "may still pose a threat to certain populations."[39] To address this threat, EPA says that it will continue to dialogue with the FAA on the use of leaded avgas "and the possibilities of reducing the lead content and/or replacing leaded gasoline with unleaded gasoline."[40]

In 2006 and 2007, EPA studied lead emissions from the Santa Monica Airport in California.[41] EPA reported that "ambient lead increased with increasing proximity to the airport."[42] The data from this study "suggest that piston-engine activity can increase ambient lead concentrations in downwind neighborhood sites, resulting in levels that are four to five times higher than background levels and maximum impact site concentrations that are up to 25 times higher than background lead levels."[43]

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[32] 42 U.S.C. §7571.

[33] EPA, Aircraft Emissions: Impact on Air Quality and Feasibility of Control 8 (Apr. 1972).

[34] *Id.* at 8, 32 (EPA modeling projecting that lead emissions from aircraft were expected to increase at five of the six airports within the study).

[35] *Id.* at 48 (Table 19 recommending engine modifications to control emissions).

[36] Petition Requesting Rulemaking to Limit Lead Emissions from General Aviation Aircraft; Request for Comments, 72 Fed. Reg. at 64,571.

[37] EPA, Persistent Bioaccumulative and Toxic Pollutants Program National Action Plan For Alkyl-lead 2 (June 2002), *available at* http://www.epa.gov/pbt/pubs/Alkyl_lead_action_plan_final.pdf (Alkyl-leads are man-made compounds commonly used as fuel additives "to reduce 'knock' in combustion engines" and "to help lubricate internal engine components").

[38] *Id.*

[39] *Id.* at 3.

[40] *Id.*at 4.

[41] ANPR at 22,458.

[42] *Id.*

[43] *Id.*

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In the 2010 ANPR, EPA estimated that lead from general aviation aircraft engines is released at approximately 20,000 airports throughout the country.[44] EPA also estimated that there were 16 million people[45] and three million children residing and attending school in close proximity to airports that service general aviation aircraft operating on leaded avgas.[46] EPA further acknowledged that lead from aircraft was "the largest single source category for emissions of lead to air" and comprises "approximately half of the national inventory [of lead emissions]."[47] EPA then recognized that lead monitoring studies conducted near airports described in the ANPR "indicate that lead levels in ambient air on and near airports servicing piston-engine aircraft are higher than lead levels in areas not directly influenced by a lead source."[48]

In June 2013, EPA released some data from its air quality monitoring studies from airports around the country.[49] The data from two airports in California revealed exceedances of the NAAQS for lead.[50] The McClellan-Palomar Airport in San Diego[51] and the San Carlos Airport in San Carlos both exceeded the maximum three-month average standard for lead.[52]

Also in June 2013, EPA's Integrated Science Assessment again recognized that "[d]irect emissions of Pb into the atmosphere primarily come from piston-engine aircraft…"[53] EPA further admitted that higher emitting airports are likely to be closer to highly populated areas:

> Pb emissions from piston-engine aircraft operating on leaded fuel are estimated to occur at approximately 20,000 airports across the U.S. Many of the more active airports are more numerous in highly populated metropolitan regions, which suggests that emissions from piston-engine aircraft may be higher in these locations compared with rural areas.[54]

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[44] *Id.* at 22,442.

[45] *Id.* at 22,460,

[46] *Id.* at 22,461.

[47] *Id.* at 22,442.

[48] *Id.*

[49] EPA, Program Update: Airport Lead Monitoring (June 2013), *available at* http://www.epa.gov/otaq/regs/nonroad/aviation/420f13032.pdf.

[50] *Id.* at 2.

[51] EPA, Monitoring The Air for Lead Near the McClellan-Palomar Airport and Gillespie Field 2 (June 2013), *available at* http://www.epa.gov/region9/air/airport-lead/sandiego-lead-factsheet.pdf.

[52] EPA, Monitoring the Air for Lead Near the San Carlos Airport 1 (June 2013), *available at* http://www.epa.gov/region9/air/airport-lead/sancarlos-lead-factsheet.pdf.

[53] EPA, Integrated Science Assessment For Lead 2-4 (June 2013), *available at* http://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=255721#Download.

[54] *Id.* at 2-5.

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BASIS OF PETITION FOR RECONSIDERATION

This Petition for Reconsideration is based on the following:

1. EPA improperly applied the law governing endangerment findings, and ignored its own prior interpretation of that law, by conflating the two prongs of the test for finding endangerment;

2. EPA has long known that lead air pollution presents serious risks to human health and that lead emissions from general aviation aircraft contribute to overall lead air pollution; and

3. Scientific developments that have occurred since the Petition was filed and since EPA's Response further emphasize the need for urgent action by EPA. Studies show that children in particular suffer irreversible neurological and cognitive damage as a result of exposure even to very small amounts of airborne lead, damage that continues to be inflicted as EPA fails to act.

SECTION 231 OF THE CLEAN AIR ACT AND EPA'S INTERPRETATION OF THE TWO-PART TEST FOR ENDANGERMENT FINDINGS

Section 231(a)(2)(A) of the CAA requires that the EPA Administrator "shall, from time to time, issue proposed emission standards applicable to the emission of any air pollutant from any class or classes of aircraft engines which in [her] judgment causes, or contributes to, air pollution which may reasonably be anticipated to endanger public health or welfare."[55] The exercise of the Administrator's judgment—commonly referred to as an endangerment and cause or contribute finding or simply an endangerment finding—entails a two-part inquiry:[56]

1. Whether the specific type air pollution at issue, when considered cumulatively, "may reasonably be anticipated to endanger public health or welfare;"[57] and, if so

2. Whether emissions of the pollutant from a class of aircraft engines cause or contribute to the cumulative air pollution.[58]

When both prongs are met, the Agency must issue proposed emission standards for the source category in question.

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[55] 42 U.S.C. § 7571(a)(2)(A).

[56] *See* Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act,-74 Fed. Reg. 18,886, 18,890 (Apr. 24, 2009).

[57] *Id.*

[58] *See* Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496, 66,506 (Dec. 15, 2009) [hereinafter "GHG Endangerment Finding"] (interpreting the parallel endangerment finding standard for motor vehicles, the EPA stated that "the Administrator is to consider the cumulative impact of sources of a pollutant in assessing the risks from air pollution, and is not to look only at the risks attributable to a single source or class of sources" and that the Administrator "need not find that emissions from any one sector or group of sources are the sole or even the major part of an air pollution problem").

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EPA's Response states that the Agency intends to follow a general approach similar to that used to make an endangerment finding regarding greenhouse gas emissions from motor vehicles under CAA Section 202(a), which contains the same two-prong endangerment standard as Section 231.[59] In this case, however, the reasoning behind EPA's endangerment and cause or contribute findings for greenhouse gases, in particular the strong emphasis on the preventive or precautionary nature of the CAA and the predominate value of protecting public health,[60] argues for an immediate endangerment finding rather than for additional studies. Recognizing the two-part test of Section 202(a), former Administrator Jackson interpreted her obligations regarding endangerment findings as follows:

1. "[T]he Administrator is required to protect public health and welfare, but she is not asked to wait until harm has occurred."[61]

2. "[T]he Administrator is to exercise judgment by weighing risks, assessing potential harms, and making reasonable projections of future trends and possibilities."[62]

3. "[T]he Administrator is to consider the cumulative impact of sources of a pollutant in assessing the risks from air pollution, and is not to look only at the risks attributable to a single source or class of sources."[63]

4. "[T]he Administrator is to consider the risks to all parts of our population, including those who are at greater risk for reasons such as increased susceptibility to adverse health effects. If vulnerable subpopulations are especially at risk, the Administrator is entitled to take that point into account in deciding the question of endangerment."[64]

5. The Administrator "need not find that emissions from any one sector or group of sources are the sole or even the major part of an air pollution problem. The use of the term 'contribute' clearly indicates a lower threshold than the sole or major cause. Moreover, the statutory language in CAA section 202(a) does not contain a modifier on its use of the term contribute. Unlike other CAA provisions, it does not require 'significant' contribution."[65]

This articulation of the Administrator's responsibilities is consistent with the recent D.C. Circuit decision that held that EPA need not provide "rigorous step-by-step proof of cause and effect" to make an endangerment finding.[66] "'Awaiting certainty will often allow for only

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[59] EPA's Response at 5.

[60] GHG Endangerment Finding at 66,506–07.

[61] *Id.* at 66,505.

[62] *Id.*

[63] *Id.* at 66,506.

[64] *Id.*

[65] *Id.*

[66] *Coal. for Responsible Regulation v. EPA*, 684 F.3d 102, 121 (D.C. Cir. 2012) (quoting *Ethyl Corp. v. EPA*, 541 F.2d 1, 28 (D.C. Cir. 1976)).

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reactive, not preventive, regulation.'"[67] Rather, regulatory action may be taken before the threatened harm occurs; "indeed, the very existence of such precautionary legislation would seem to demand that regulatory action precede, and, optimally, prevent, the perceived threat." [68]

ARGUMENT

A. UNDER EPA'S OWN INTERPRETATION OF THE CAA, LEAD EMISSIONS FROM GENERAL AVIATION AIRCRAFT ENGINES CONTRIBUTE TO LEAD AIR POLLUTION WHICH MAY REASONABLY BE ANTICIPATED TO ENDANGER PUBLIC HEALTH OR WELFARE.

EPA has refused to find that lead emissions from general aviation aircraft engines "cause[], or contribute[] to, air pollution which may reasonably be anticipated to endanger public health or welfare."[69] However, under the standards followed by the EPA in its endangerment finding for greenhouse gases, there is no reasonable basis for this refusal. EPA cannot deny that airborne lead is a pollutant which may reasonably be anticipated to endanger public health or welfare—EPA has determined that fact conclusively. Nor is there a basis for denying that lead emissions from general aviation aircraft contribute to overall airborne lead pollution—EPA has already established that the largest single source of such pollution is aircraft engines fueled by leaded gasoline. The purported justifications given by EPA for denying an endangerment finding are simply an exercise in avoidance of these two facts, which are the only two facts EPA need consider before finding endangerment. EPA's contention that further study is required is simply incorrect.

1. Lead Air Pollution May Reasonably Be Anticipated to Endanger Public Health or Welfare.

Section 231 does not require a showing that lead emissions for avgas-fueled aircraft endanger public health, only that lead air pollution—on the whole—may be reasonably anticipated to endanger public health or welfare.[70] By focusing on whether exceedances of the NAAQS exist near general aviation airports that service planes fueled by leaded avgas, EPA improperly conflates the "reasonably anticipated to endanger" prong with the "causes or contributes to air pollution" prong.

EPA's Response failed to address the two parts of the endangerment test separately. Rather, it treated the issue as if the pertinent question is whether leaded avgas, by itself, causes harm to public health or welfare. EPA's own interpretation of the law, however, makes clear that the two prongs are separate inquiries. The first prong requires only a determination whether the specific type of air pollution at issue, when considered cumulatively, "may reasonably be anticipated to endanger public health or welfare." EPA need only have a *reasonable anticipation*

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[67] *Id.*

[68] *Ethyl Corp.*, 541 F.2d at 13.

[69] 42 U.S.C. § 7571(a)(2)(A).

[70] *Id.*; *see also* GHG Endangerment Finding at 66,506.

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that the pollution in question will endanger public health or welfare in order to make an endangerment finding; it need not possess proof of actual harm.[71] Undeniably, "[a] statute allowing for regulation in the face of danger is, necessarily, a precautionary statute. Regulatory action may be taken before the threatened harm occurs; indeed, the very existence of such precautionary legislation would seem to demand that regulatory action precede, and, optimally, prevent, the perceived threat."[72]

EPA has recognized that no safe threshold for lead exists, and that lower and lower levels of lead exposure are associated with adverse health effects. As part of its most recent review of the NAAQS for lead, EPA acknowledged that with each successive assessment to-date, "the epidemiologic and toxicological study findings show that progressively lower blood Pb levels or Pb exposures are associated with cognitive deficits."[73] EPA has found a positive causal relationship between exposure to lead and negative effects to human health, including nervous system effects, cardiovascular effects, renal effects, immune system effects, reproductive and developmental effects, and effects on heme synthesis and red blood cell function, and considers a causal relationship between lead exposure and cancer likely.[74]

In reality, this is not a case where reasonable anticipation is even in question. As detailed above, as well as in FoE's notice letter and complaint, EPA has long possessed evidence of the severity of the effects of lead air pollution on human health.[75] Indeed, EPA already has determined conclusively that lead air pollution "may reasonably be anticipated to endanger public health or welfare."[76] Having made the determination that airborne lead is a pollutant that may reasonably be anticipated to endanger public health or welfare, EPA cannot now argue to the contrary. Thus, the first prong of the endangerment test is met as a matter of law.

2. Lead Emissions from General Aviation Aircraft Engines Contribute to Overall Lead Air Pollution.

Under Section 231, the Administrator "need not find that emissions from any one sector or group of sources are the sole or even the major part of an air pollution problem" in order to find a contribution to air pollution.[77] "[T]he cause or contribute test is designed to authorize

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[71] 42 U.S.C. § 7571(a)(2)(A); *see also Ethyl Corp.*, 541 F.2d at 13–20.

[72] *Ethyl Corp.,* 541 F.2d. at 13.

[73] EPA, Integrated Science Assessment for Lead 1-73

[74] *See id.* at lxxxii-lxxxviii.

[75] *See* ANPR at 22,449 ("Lead has been demonstrated to exert 'a broad array of deleterious effects on multiple organ systems via widely diverse mechanisms of action'" and "has been classified as a probable human carcinogen."); *see also Ethyl Corp.*, 541 F.2d at 19 ("Undoubtedly, the harm caused by lead poisoning is severe.").

[76] As of November 2011, EPA had identified 21 different areas of the United States where the revised NAAQS for airborne lead emissions were not being achieved. *See* Air Quality Designations for the 2008 Lead (Pb) National Ambient Air Quality Standards, 75 Fed. Reg. 71,033 (Nov. 22, 2010) (codified at 40 C.F.R. 81) (identifying 16 non-attainment areas). The increase of such nonattainment areas provides further evidence that lead air pollution may reasonably be anticipated to endanger public health or welfare. Moreover, every county that failed to meet NAAQS for airborne lead contains or is in close proximity to an airport where planes are fueled by leaded aviation gasoline.

[77] *See* ANPR at 22,445; *see also* GHG Endangerment Finding at 66,506 ("The use of the term 'contribute' clearly indicates a lower threshold than the sole or major cause. Moreover, the statutory language in CAA section 202(a)

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EPA to identify and then address what may well be many different sectors or groups of sources that are each part of…the problem," and the contribution need not be deemed significant.[78] By way of contrast, other CAA provisions require "significant" contribution.[79] Indeed, EPA's position that it must complete monitoring at general aviation airports to determine whether NAAQS for lead are being exceeded appears more aligned with Section 213—CAA provisions governing emissions from non-road engines and vehicles—which calls for a determination of whether emissions of certain pollutants are "significant contributors" to pollution concentrations in nonattainment areas.[80]

As EPA readily admits, aircraft engines that burn leaded avgas constitute the largest single source category for airborne lead pollution in the nation.[81] These aircraft are responsible for approximately fifty percent of the lead emissions in the U.S.[82] For other pollution sources, EPA has found contribution for far smaller percentages.[83] For example, EPA's 2005 rule regulating nitrogen oxide ("NOx") emissions from aircraft was based on amounts that constituted only 0.7% of all NOx emissions in the country.[84] Similarly, EPA's endangerment finding for greenhouse gases was based on source categories responsible for about four percent of total global greenhouse gas emissions and for just over twenty-three percent of total U.S. greenhouse gas emissions.[85]

In defense of its refusal to make an endangerment finding and as justification for its proposal to conduct additional air modeling and monitoring, EPA claims a need to characterize the levels of lead in the ambient air at and around individual airports: "The levels of lead in the environment at and around airports is expected to vary significantly based on [a variety of factors]. In light of this, EPA faces a quite intensive investigation to understand the range of lead concentrations to which people are exposed from this source."[86] EPA's focus on whether emissions near airports cause lead NAAQS to be approached or exceeded is misplaced. Neither section 231 nor EPA's prior interpretation of the "endangerment and cause or contribute standard" requires the Agency to find emissions from or near a particular airport approach or

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does not contain a modifier on its use of the term contribute. Unlike other CAA provisions it does not require 'significant' contribution.").

[78] GHG Endangerment Finding at 66,506.

[79] *See, e.g.*, 45 U.S.C. § 7411(b); 45 U.S.C. §7547(a)(2), (4).

[80] *See* 42 U.S.C. § 7547(a)(2).

[81] ANPR at 22,442.

[82] *Id.*

[83] *Compare, e.g.*, 74 Fed. Reg. at 18,892 (noting that EPA found contribution for a source which was only 1.2 percent of the total inventory).

[84] Control of Air Pollution From Aircraft and Aircraft Engines; Emissions Standards and Test Procedures, 70 Fed. Reg. 69,664 at 69,668, 69,670 (Nov. 17, 2005) (codified at 40 C.F.R. 87)(EPA nonetheless (and correctly) justified the regulation because reducing 0.7% of all NOx emissions would "also help reduce levels of nitrogen dioxide (NO2), for which NAAQS have been established").

[85] *See* GHG Endangerment Finding at 66,537.

[86] EPA's Response at 5.

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exceed the lead NAAQS in order for the EPA to make an endangerment finding.[87] Variation from airport to airport has no bearing on the basic fact that lead emissions from avgas contributes to airborne lead pollution. EPA's description of its investigation suggests an attempt to determine whether lead emissions specifically from avgas-fueled aircraft alone endanger human health, rather than whether they contribute to an overall pollution problem that the Agency already has determined may endanger health.

Moreover, as the "may reasonably be anticipated" language of section 231 affirms, the Clean Air Act is a precautionary statute under which proof of actual harm is not required. Congress directed that the regulatory action taken pursuant to an endangerment finding would be designed to "precede, and, optimally, prevent, the perceived threat."[88] EPA is not required to document "proof of actual harm" as a prerequisite to regulation; rather, EPA is supposed to act where there is "a significant risk of harm."[89] As the Court of Appeals for the District of Columbia emphasized:

> Sometimes, of course, relatively certain proof of danger or harm from such modifications can be readily found. But, more commonly, "reasonable medical concerns" and theory long precede certainty. Yet the statutes and common sense demand regulatory action to prevent harm, even if the regulator is less than certain that harm is otherwise inevitable.[90]

Simply put, further studies are not required and needlessly delay an endangerment finding that should be immediately issued.

3. Delaying an Endangerment Finding for Unnecessary Studies Is Causing Irreparable Harm to Children Now.

Children are a sub-population subject to disproportionate risks from airborne lead pollution. Airborne lead causes increased blood lead levels in children, which in turn causes cognitive impairment and IQ loss.[91] EPA concluded in 2006 that the latest evidence indicates adverse health effects, most notably among children, are occurring at much lower levels than previously considered.[92] EPA's current knowledge and the information available to it demand rapid action, not another round of studies. Federal policy requires EPA to prioritize the elimination of such hazards to children.[93] Rather than do so, EPA has chosen to conduct

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[87] Nevertheless, EPA's testing results for the Santa Monica Airport in 2008 showed raised air lead levels 900 meters downwind of runways and documented the potential for three-month averages that exceed the lead NAAQS.

[88] *Ethyl Corp.*, 541 F.2d 1, 13.

[89] *Id.* at 12-13.

[90] *Id.* at 25; *see also Massachusetts v. EPA*, 549 U.S. 497, 506 n. 7 (2007) (citing *Ethyl Corp.*).

[91] L.L. Brink, et al., *Do US Ambient Air Lead Levels Have a Significant Impact on Childhood Blood Levels: Results of a National Study*, J. Envtl. & Pub. Health (Aug. 2013), *available at* http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3747402/.

[92] ANPR, at 22,441.

[93] Exec. Order No. 13,045, 62 Fed. Reg. 19,885 (Apr. 21, 1997); *see also* EPA, Guide to Considering Children's Health When Developing EPA Actions: Implementing Executive Order 13045 and EPA's Policy on Evaluating Health Risks to Children 5 (Oct. 2006) [hereinafter "Children's Health"], *available at*

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unnecessary studies while children and infants continue to be harmed by the largest single source of airborne lead pollution.

Studies since EPA's 2006 ANPR continue to affirm the disproportionate impact of airborne lead on children. A recent 2013 study by the University of Pittsburgh determined that a significant relationship exists between ambient air lead and childhood blood lead levels in excess of 10 μg/dL.[94] That study determined that the proportion of children three years and younger with blood lead levels in excess of 10 μg/dL was 3.4 times higher in U.S. counties with the highest ambient lead levels than in those counties with low ambient air lead levels.[95] The study also stated that the percent change in the relative risk of total numbers of children with blood lead levels in excess of 10 μg/dL increases 36% for every 0.01 $\mu g/m^3$ increase in air lead value as established by EPA's National Air Toxics Assessment.[96]

Lead emissions from general aviation aircraft, in particular, have been associated with elevated blood lead levels in children, even in areas with lower levels of ambient air lead. A recent study by the Nicholas School of the Environment at Duke University ("the Miranda Study") examined the question of whether there is a relationship between aircraft lead emissions and the blood lead levels of children living in six counties in North Carolina.[97] The six counties contained a total of 66 general aviation airports with estimated lead emissions 2.634 tons per year collectively. None of the counties studied were in an area in which ambient air lead levels exceeded the NAAQS. None of the counties had an airport that required monitoring for lead under current EPA rules.

The Miranda Study determined that there is a significant association between potential exposure to lead emissions from avgas and blood levels in children.[98] The study concluded that children living within 1000 meters of an airport that served aircraft fueled by leaded aviation gasoline had elevated blood lead levels, with the largest impact evident on children living within 500 meters of such airports.[99]

It is increasingly clear that even slight elevations in blood lead levels do damage to children in the form of cognitive impairment and reduced IQ levels.[100] There is no "safe" level

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http://yosemite.epa.gov/ochp/ochpweb.nsf/content/ADPguide.htm/$File/EPA_ADP_Guide_508.pdf; *see generally* Devon Payne-Sturges & Debra Kemp, *Ten Years of Addressing Children's Health Through Regulatory Policy at the U.S. Environmental Protection Agency*, 116 Envtl. Health Perspectives 1720 (Dec. 2008); *see generally* U.S. Gen. Accounting Office, Environmental Health: EPA Has Made Substantial Progress but Could Improve Process for Considering Children's Health, 58-60 (Aug. 2013), *available at* http://www.gao.gov/assets/660/656922.pdf.

[94] Brink, et al., *supra,* at 6

[95] *Id.* at 7.

[96] *Id.* (noting also that "NATA lead estimates are known t be an underestimation of air lead levels").

[97] Marie Lynn Miranda,et al., *A Geospatial Analysis of the Effects of Aviation Gasoline on Childhood Blood Lead Levels*, 119 Envtl. Health Perpectives, 1513 (July 2011), *available at* http://ehp.niehs.nih.gov/1003231/.

[98] *Id.*

[99] *See id.*

[100] *See, e.g.,* Joel T. Nigg, et al., *Confirmation and Extension of Association of Blood Lead with Attention-Deficit/Hyperactivity Disorder (ADHD) and ADHD Symptom Domains at Population-Typical Exposure Levels*, The J. of Child Psychol. and Psychiatry, Jan. 2010 (linking ADHD to increases in blood lead levels).

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of blood lead, or exposure to lead, especially for children.[101] The U.S. Center for Disease Control and Prevention ("CDC") and its predecessor agencies for many years have used blood lead level as a metric for identifying children at risk of adverse health effects and for specifying particular public health recommendations. The definition of "low level" lead exposure has been revised progressively downward as tools and study designs for evaluating neurodevelopment have evolved. Hints of health effects and intellectual impairment in children with blood lead levels below 10 μg/dL had already emerged by 1991, when CDC established 10 μg/dL as a level of concern.[102] A large body of recent research demonstrates negative health effects, including learning disabilities and behavioral disorders, associated with lead exposure levels well below the CDC action level.[103] Multiple studies suggest that early childhood blood lead levels as low as 2 μg/dL can have significant impacts on academic performance as measured by end-of-grade test scores.[104]

In June 2012 CDC concluded that it should eliminate the use of the term "blood lead level of concern" altogether, based on compelling evidence that even low blood lead levels are associated with IQ deficits, attention-related behaviors, and poor academic achievement.[105] The CDC concluded that because it could not identify a blood lead level that did not cause deleterious effects, combined with the evidence that these effects appear to be irreversible, it is critically important to prevent lead exposure rather than responding after the exposure has taken place.[106]

More recently, in 2013, EPA's monitoring at airports revealed that two airports in California were not meeting air quality standards for lead.[107] Both of these airports are located in urban areas, and thus expose those urban populations, which include children, to unsafe levels of lead.

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[101] 73 Fed. Reg. at 66,972.

[102] Steven G. Gilbert and Bernard Weiss, *A rationale for lowering the blood lead action level from 10 to 2 μg/dL,* Neurotoxicology, Sept. 2006, at 3, *available at* http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2212280/.

[103] Miranda, et al., *Geospatial Analysis supra*; *see* Marie Lynn Miranda et al., *Early Childhood Lead Exposure and Exceptionality Designations for Students*, Int'l J. of Child Health and Hum. Dev. (2010); Marie Lynn Miranda et al., *Environmental contributors to the achievement gap*, 30 Neurotoxicology 1019 (Nov. 2009); *see also* Marie Lynn Miranda, et al., *The Relationship between Early Childhood Blood Lead Levels and Performance on End-of-Grade* Tests, 115 Envtl. Health Persp. 1242 (2007) (available via *http://dx.doi.org/)*; *see also* Richard L. Canfield, et al., *Intellectual Impairment in Children with Blood Lead Concentrations below 10 μg per Deciliter*, 348 New Eng. J.Med. 1517 (2003).

[104] *See, e.g.*, Miranda,et al., *Geospatial Analysis*, *supra*; Miranda, et al., *Early Childhood Lead Exposure, supra*; Miranda, et al., *Environmental contributors*, *supra*; Miranda, et al., *The Relationship between Early Childhood Blood Lead Levels and Performance on End-of-Grade Tests*, *supra.*; *see also* Canfield, et al., *Intellectual Impairment, supra.*

[105] CDC, *CDC Response to Advisory Committee on Childhood Lead Poisoning Prevention Recommendations in Low Level Lead Exposure Harms Children: A Renewed Call of Primary Prevention*, 1 June 2012.

[106] The CDC adopted a reference value based on the 97.5th percentile of the blood lead level distribution among children 1–5 years old in the United States (currently 5 μg/dL) to identify children with elevated BLLs. Approximately 450,000 children in the United States already have blood lead levels higher than this reference value. *See id.*

[107] EPA, Monitoring The Air for Lead Near the McClellan-Palomar Airport and Gillespie Field 1-2 (June 2013), *available at* http://www.epa.gov/region9/air/airport-lead/sandiego-lead-factsheet.pdf; EPA, Monitoring the Air for Lead Near the San Carlos Airport 1 (June 2013), *available at* http://www.epa.gov/region9/air/airport-lead/sancarlos-lead-factsheet.pdf.

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EPA acknowledges that there is no 'safe' threshold" for lead.[108] EPA has acknowledged that "the current evidence indicates the need for a standard level that is substantially lower than the current level to provide increased public health protection, especially for at-risk groups, including most notably children."[109] EPA also acknowledges that "with each successive [assessment to-date], the epidemiologic and toxicological study findings show that progressively lower blood Pb levels or Pb exposures are associated with cognitive deficits and behavioral impairments."[110]

The evidence that children are disproportionately at risk for harm from airborne lead pollution is overwhelming. The evidence that piston engine aircraft using leaded fuel constitute the single largest source contributor to lead air pollution is indisputable. There is no need for further study in order to find endangerment. Despite this clear evidence, EPA has chosen to conduct additional unnecessary studies. While EPA has delayed, another generation of children has been exposed to increased risk of cognitive deficits and behavioral impairment. Further delay and further damage to children is unwarranted.

4. EPA's Development of Emission Standards Does Not Justify Refusal to Make an Endangerment Finding for Lead from Aircraft.

EPA also appears to have confused its role in determining endangerment with its later role in determining how to regulate lead emissions from aircraft. EPA's Response stated:

> It is important to emphasize that EPA's technical work has very significant potential future implications. The aviation enterprise is unique and very different from any other transportation source. In the U.S. alone, there are literally millions of piston-engine aircraft operations each year from air taxis and general aviation which fly passenger and cargo over routes of various lengths, at different altitudes and with various payloads. *Understanding piston-engine aircraft operations and how many of the flight-specific variables affects lead emissions through models and other investigations is essential to a successful national regulatory program.* . . . An understanding of how all of the various aircraft and aircraft engine design (for piston-engine aircraft), and aircraft fuel factors interact to affect general aviation performance and lead *emissions is essential to the development of a well constructed program that achieves the desired public health and environmental consequences.*[111]

Irrespective of the eventual utility of understanding aircraft operations, the Clean Air Act does not require an investigation of such operations as part of EPA's undertaking an endangerment finding. As EPA noted in the greenhouse gas matter, Congress explicitly

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[108] 73 Fed. Reg. at 66,964, 66,972.

[109] *Id.* at 66,985.

[110] EPA, Integrated Science Assessment for Lead, *supra,* at 1-73.

[111] EPA's Response at 16 (emphasis added).

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separated two different decisions to be made and provided different criteria for each. The first decision involves the questions whether the air pollution may reasonably be anticipated to endanger public health or welfare, and the contribution to the air pollution by the sources. If affirmative endangerment and contribution findings are made, the second decision involves regulating the sources to control the emissions.[112] EPA's judgment in making the endangerment and contribution findings is constrained by the statute.[113] "'The statutory question is whether sufficient information exists to make an endangerment finding.' The effectiveness of a potential future control strategy is not relevant to deciding whether air pollution levels in the atmosphere endanger."[114]

When the issue of endangerment is considered under these statutory constraints, and particularly when considered in light of the scientific evidence that has become available since the 2006 Petition was filed, the answer is clear. Lead emissions from general aviation aircraft engines using leaded aviation gasoline contribute to airborne lead pollution, a criteria pollutant that is found in excess of EPA's ambient air quality standards in 21 different regions in the United States and that may reasonably be anticipated to endanger human health.

B. AFTER EPA MAKES AN AFFIRMATIVE ENDANGERMENT FINDING, IT SHOULD COMMENCE THE RULEMAKING PROCESS IMMEDIATELY AND BEGIN TO PHASE OUT LEADED AVGAS.

In EPA's Response to the Petition, EPA confirmed that once an endangerment finding is made, EPA will commence the rulemaking process.[115] After finding endangerment, EPA should immediately begin the rulemaking process.

Once the Administrator proposes emission standards, the Clean Air Act establishes a discrete set of steps the Administrator must take before finalizing the standards:

> (B)(i) The Administrator shall consult with the Administrator of the Federal Aviation Administration on aircraft engine emission standards.
>
> (ii) The Administrator shall not change the aircraft engine emission standards if such change would significantly increase noise and adversely affect safety.
>
> (3) The Administrator shall hold public hearings with respect to such proposed standards. Such hearings shall, to the extent practicable, be held in air quality control regions which are most seriously affected by aircraft emissions. Within 90 days after the issuance of such proposed regulations, he shall issue such regulations with such modifications as he deems appropriate. Such regulations may be revised from time to time.[116]

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[112] 74 Fed. Reg. at 66,506-07.

[113] *Massachusetts v. EPA*, 549 U.S. at 532.

[114] 74 Fed. Reg. 66,508, *quoting Massachusetts v. EPA*, 549 U.S. at 534.

[115] *See* EPA's Response at 18 (If EPA does find endangerment, "EPA would pursue the development of standards and potentially other requirements regulating lead emissions from general aviation piston-engine aircraft").

[116] 42 U.S.C. § 7571(a)(2).

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EPA appears to be delaying rulemaking based on issues related to the nature of the industry, fuel supply, noise, or fuel safety.[117] This delay is inappropriate. Pursuant to Section 231 of the Clean Air Act, EPA considers noise and safety concerns in consultation with the FAA *after* proposing regulations, not before.[118] However, it is worth noting that much work has been done to prepare the way for rulemaking. New unleaded fuels are in development,[119] and 75% to 80% of piston engine aircraft no longer require leaded fuel at all.[120] When it finds endangerment, EPA can and should encourage the immediate use of unleaded fuels to start reducing the lead emissions from aviation gasoline as soon as possible.

CONCLUSION

For the reasons discussed above, lead emissions from general aviation aircraft contribute to air pollution which may reasonably be anticipated to endanger public health or welfare. Therefore, EPA should reconsider its refusal to make an endangerment finding and should initiate rulemaking procedures to establish standards for the emission of lead from aircraft engines.

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[117] *See* ANPR at 22,444 (noting that the comments EPA received in the last round of comments related mostly to fuel and industry issues and that no new information regarding health or exposure issues was supplied).

[118] 42 U.S.C. § 7571(a).

[119] As California House Representative Henry Waxman pointed out in a letter to FAA, "high octane unleaded auto and biodiesel fuels for piston engines have been safely and successfully used in Europe for many years, but adoption in the United States has been slow." Letter from Rep. Waxman Calls to Michael P. Huerta, Acting FAA Administrator (Oct. 23, 2012), *available at* http://waxman.house.gov/rep-waxman-calls-faa-reduce-lead-emissions-expanding-use-unleaded-fuel.Hjelmco's unleaded AVGAS 91/96 UL is approved for use by the major aircraft engine manufacturers Textron Lycoming, Teledyne Continental and Rotax. *See* Avgas 91/96 UL Overview, Hjelmco Oil, http://www.hjelmco.com/pages.asp?r_id=13395. Moreover, Shell Aviation has announced that it will be submitting its own unleaded avgas to FAA soon. *See* Press Release, Shell Aviation, Shell removes lead from light aircraft fuel(Dec. 3, 2013), *available at*, http://www.shell.com/global/products-services/solutions-for-businesses/aviation/news-and-library/press-releases/2013/press-release12032013.html.

[120] Rebecca Kessler, *Sunset for Leaded Aviation Gasoline?*, 121 Envtl. Health Persp. A54, A57 (Feb. 2013), *available at* http://ehp.niehs.nih.gov/pdf-files/2013/Feb/ehp.121-a54_508.pdf.

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ED_006073A_00001025-00045

August 24, 2021

Sent via Email

Administrator Michael Regan
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Dear Administrator Regan:

The undersigned organizations and individuals submit this letter in support of the petition submitted on August 24, 2021, by Earthjustice, on behalf of Alaska Community Action on Toxics, Center for Environmental Health, Friends of the Earth, Montgomery-Gibbs Environmental Coalition, and Oregon Aviation Watch, and by the County of Santa Clara petitioning the U.S. Environmental Protection Agency ("EPA") to make an endangerment finding under section 231 of the Clean Air Act that leaded aviation gasoline ("avgas") contributes to air pollution that harms public health and welfare.[1]

Emissions from leaded avgas, used by many piston-engine aircraft, make up over 70% of the lead that is released domestically into the atmosphere. These lead emissions put the millions of people, including hundreds of thousands of young children, that live near general aviation airports at an increased risk of harm from lead. Indeed, multiple studies have shown that children who live near general aviation airports where lead is used have blood lead levels that are significantly higher than children who do not. This is particularly troubling because there is no safe level of lead, and childhood exposures to lead can lead to a host of adverse health effects, including interference with brain development. Leaded avgas emissions also exacerbate environmental injustice: most of the fifty general aviation airports with the highest lead emissions are located in communities of color, and children of color are already disproportionately burdened by chemical exposures, including by exposures to lead.

Even though EPA has known for years that the use of leaded avgas by piston-engine aircraft increases the blood lead levels of children who live near general aviation airports, increasing their risk of learning disabilities and neurodevelopmental disorders, EPA has thus far declined to regulate this largest remaining source of lead in the air. The undersigned organizations and individuals ask EPA to grant the August 24, 2021 petition, make a long-overdue endangerment finding for leaded avgas, and begin the process of regulating this source of harmful lead emissions. Doing so is an important step in fulfilling the Biden-Harris Administration's commitments to protect children's health and promote environmental justice.

[1] 42 U.S.C. § 7571(a)(2) ("The Administrator [of the EPA] shall . . . issue proposed emission standards applicable to the emission of any air pollutant from any class or classes of aircraft engines which in his judgment causes, or contributes to, air pollution which may reasonably be anticipated to endanger public health or welfare.").

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Sincerely,

Organizational Signatories:

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Benton Harbor Community Water Council

Jose Barrera
California League of United Latin American Citizens (LULAC)

Sandy Flores
Capitol Park Goss Dobern NA

Citizens for Airpark Safety
Citizens for Airpark Safety - Montgomery County Airpark

Amit Rosner
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Taylor Thomas
East Yard Communities for Environmental Justice

Laura Weinberg
Great Neck Breast Cancer Coalition

Indra N. Frank, MD, MPH
Hoosier Environmental Council

Tracy Gregoire
Learning Disabilities Association of America

Miriam Rotkin-Ellman
Natural Resources Defense Council

Danny Garza
Plata Arroyo Neighborhood Association and Eastgate N.A.C.

Lisa Arkin
Beyond Toxics

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Message

From: Michael Martinez [mmartinez@democracyforward.org]
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To: Jean.Williams@usdoj.gov; bruce.gelber@usdoj.gov; Tom.Mariani@usdoj.gov; justin.smith@usdoj.gov; Regan, Michael [Regan.Michael@epa.gov]; Hoffer, Melissa [Hoffer.Melissa@epa.gov]
CC: Samara Spence [sspence@democracyforward.org]; Sophie Steinman-Gordon [ssteinmangordon@democracyforward.org]; Meg Uzzell [muzzell@democracyforward.org]
Subject: DOJ/ENRD Petition for Rulemaking - Supplemental Environmental Projects
Attachments: Petition for Rulemaking - SEPs.pdf

All,

Please find Democracy Forward's petition for rulemaking regarding the DOJ's use of supplemental environmental projects, submitted on behalf of Sierra Club, Conservation Law Foundation, and Surfrider Foundation. We also mailed the petition to you today. If you have any questions, please feel free to contact me.

Best regards,

--
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PETITION FOR RULEMAKING REGARDING DEPARTMENTAL USE OF SUPPLEMENTAL ENVIRONMENTAL PROJECTS

SUBMITTED TO
THE UNITED STATES DEPARTMENT OF JUSTICE
ENVIRONMENT AND NATURAL RESOURCES DIVISION

June 14, 2021

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On Behalf of:

Conservation Law Foundation, Surfrider Foundation, and Sierra Club

ED_006073A_00001498-00001

STATEMENT OF PETITION

Petitioners (Conservation Law Foundation, Surfrider Foundation, and Sierra Club) hereby petition the Department of Justice ("Department" or "DOJ"), Environment and Natural Resources Division ("ENRD") pursuant to the Administrative Procedure Act, 5 U.S.C. § 553(e), to initiate a rulemaking proceeding to clarify that the Department can use Supplemental Environmental Projects ("SEPs") when settling civil enforcement actions brought under environmental statutes.

SUMMARY OF PETITION

The Department of Justice has long used Supplemental Environmental Projects to address the consequences of environmental harm when settling cases involving violations of environmental statutes. SEPs are tangible, real-world projects in communities, often low-income and communities of color, that would otherwise be left to grapple with the consequences of pollution on their own. In addition to facilitating settlements, SEPs serve an essential environmental justice function.

After decades of use by the Department, SEPs came under attack by the Trump Administration, which sought to eliminate SEPs through both internal policy memoranda and regulation. These abrupt moves confused regulated entities and the general public and highlighted the vulnerability of basing SEPs solely on policy statements and norms. Although the Biden Administration has attempted to re-introduce SEPs by withdrawing certain anti-SEP policies, confusion still exists as a result of a Trump-era rule, 28 C.F.R. § 50.28, which appears to prohibit the use of SEPs in ENRD settlements in some circumstances by treating them as "third party payments." The history of inconsistent policy documents and regulations limits the current administration and has led to widespread uncertainty among the public as to what the policy on SEPs actually is. While ENRD has revoked the prior administration's March 2020 memorandum prohibiting the use of SEPs, the Department of Justice must go further to withdraw the anti-SEP rule and replace it with one that will establish clear standards for the future use of SEPs.

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We recommend that the Department of Justice (1) revoke 28 C.F.R. § 50.28 at least insofar as it applies to SEPs[1] and (2) initiate notice-and-comment rulemaking procedures[2] to formalize long-standing Department policy concerning the use of SEPs in a manner that is consistent with the Miscellaneous Receipts Act, 31 U.S.C. § 3302(b). These actions would also comply with President Biden's Executive Order 13,990, Protecting Public Health and the Environment and Restoring Science To Tackle the Climate Crisis, which instructs agencies to "immediately review and . . . take actions to address" regulations or agency actions that conflict with "important national objectives," such as improving public health and protecting the environment; ensuring access to clean air and water; holding polluters accountable, including those that disproportionately harm communities of color and low-income communities; reducing greenhouse gas emissions; and prioritizing environmental justice.[3] *See* 86 Fed. Reg. 7037 (Jan. 25, 2021). A clear policy that permits SEPs will provide the Environmental Protection Agency ("EPA") and ENRD flexibility to consider SEPs both in enforcement actions involving greenhouse gases, such as methane, and to consider possible co-benefits of SEPs in other enforcement actions. These steps would also align with President Biden's Executive Order 14,008, Tackling the Climate Crisis at Home and Abroad, which tasked DOJ with "develop[ing] a comprehensive environmental justice enforcement strategy, which shall seek to provide timely remedies for systemic environmental violations and contaminations and . . . ensur[ing] comprehensive attention to environmental justice throughout the Department [.]" 86 Fed. Reg.

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[1] This petition does not address or take any position on the portions of 28 C.F.R. § 50.28 that do not implicate SEPs.

[2] An agency must generally follow the same procedure when repealing a rule as when issuing it. *See* 5 U.S.C. § 551(5); *Perez v. Mortg. Bankers Ass'n*, 575 U.S. 92, 101 (2015). As a general matter, notice-and-comment procedures are required for legislative rules unless an exception applies. 5 U.S.C. § 553. However, notice-and-comment procedures are not required to rescind 28 C.F.R. § 50.28 or any portion of that rule because it was issued not as a legislative rule but as a "matter of agency management or personnel and is a rule of agency organization, procedure, or practice" that was exempt. 85 Fed. Reg. 81,409, 81,410 (Dec. 16, 2020). While the Department could likewise forgo notice-and-comment procedures to issue a new rule formalizing its SEPs policy, we recommend that the Department nonetheless accept comments to improve the quality of the rule with public input.

[3] The Fact Sheet published with Executive Order 13,990 expressly lists the rulemaking containing 28 C.F.R. § 50.28 in the list of agency actions that should be reviewed. White House, *Fact Sheet: List of Agency Actions for Review* (Jan. 20, 2021), *available at* https://www.whitehouse.gov/briefing-room/statements-releases/2021/01/20/fact-sheet-list-of-agency-actions-for-review/ (listing ENRD's prohibition on third party payments).

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7619 (Jan. 25, 2021). As SEPs often provide a direct benefit to the very same communities harmed by environmental violations, they play an obvious environmental justice role.

STATEMENT OF INTEREST

Conservation Law Foundation ("CLF") is headquartered in Boston, Massachusetts. CLF has over 4,000 members, and the organization's mission is to protect New England's environment for the benefit of all people. CLF uses the law, science, and the market to create solutions that preserve New England's natural resources, build healthy communities, and sustain a vibrant economy. In particular, CLF regularly brings lawsuits to enforce clean water and clean air laws, including by using the citizen suit provisions of the Clean Air Act and Clean Water Act. CLF typically seeks to include payments to SEPs in citizen lawsuit settlement agreements or in court orders following a legal victory. To date, CLF's environmental enforcement work has generated more than $2,000,000 in funding for local environmental protection and restoration projects.

The Surfrider Foundation ("Surfrider") is a non-profit corporation with its principal office in San Clemente, California. Surfrider is a national grassroots organization with more than 350,000 supporters and members, 79 local chapters, and 92 school clubs in the United States. Surfrider's mission is the protection and enjoyment of the world's oceans, waves, and beaches, for all people, through a powerful activist network. Through its membership network, Surfrider advocates for clean water and ocean protection, coastal preservation, public beach access, and the prevention of marine plastic pollution. Surfrider's vision is to keep beaches open to everyone, promote smart coastal development that avoids coastal impacts, ensure that water is clean for coastal recreation including surfing and swimming, keep beaches free of plastic litter, and protect special ocean and coastal places when and before they are threatened. Surfrider's Clean Water Initiative seeks to protect water resources and prevent pollution along coasts and waterways by engaging communities, testing water, planting ocean-friendly landscapes, and advocating for holistic clean water solutions.

Sierra Club is the nation's oldest and largest grassroots environmental organization. The Sierra Club is a national nonprofit organization with over 800,000 members dedicated to exploring, enjoying, and protecting the wild places of Earth; to practicing and promoting the responsible use of the Earth's ecosystems and resources; to educating and enlisting humanity to

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protect and restore the quality of the natural and human environment, and to using all lawful means to carry out these objectives. The Sierra Club's concerns encompass the protection of clean air and clean water. Sierra Club frequently avails itself of the citizen suit provisions of the Clean Air Act, Clean Water Act, and other environmental statutes to secure such protections. Sierra Club has resolved many of its citizen enforcement suits by entering into consent decrees or other forms of settlement agreement that require defendants to fund SEPs to benefit impacted communities, and Sierra Club hopes and intends to continue this practice.

FACTUAL BACKGROUND

I. DOJ Has a Long History of Using Supplemental Environmental Projects in Settlements

In the 1980s, alleged violators of federal environmental statutes began settling civil enforcement actions by entering into administrative settlements and consent decrees that included SEPs. DOJ and EPA both entered into settlements requiring SEPs. DOJ did so in consent decrees, and EPA did so in administrative settlements. As early as 1984, EPA observed that "[o]ccasions have arisen in enforcement actions where violators have *offered* to make expenditures for environmentally beneficial purposes *above and beyond* expenditures made to comply with *all existing legal requirements*." U.S. EPA, Civil Penalty Policy (July 8, 1984) at 15 (emphasis added).

While SEPs initially drew a small group of critics, the Department of Justice regularly approved SEPs following a 1980 opinion from the Office of Legal Counsel ("OLC") finding that they do not violate the Miscellaneous Receipts Act[4] and subsequent court rulings allowing their use as fair, reasonable, and in the public interest.[5]

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[4] *See Effect of 31 U.S.C. § 484 on the Settlement Authority of the Attorney General*, 4B Op. O.L.C. 684, 688 (1980). This OLC opinion is discussed in more detail below. *See infra* 13-14.

[5] *See, e.g.*, *Sierra Club, Inc. v. Elec. Controls Design, Inc.*, 909 F.2d 1350, 1355 (9th Cir. 1990) ("While it is clear that a court cannot order a defendant in a citizens' suit to make payments to an organization other than the U.S. treasury, this prohibition does not extend to a settlement agreement whereby the defendant does not admit liability and the court is not ordering non-consensual monetary relief."); *Pa. Envtl. Def. Found. v. Bellefonte Borough*, 718 F. Supp. 431, 436 (M.D. Pa. 1989) (declining to "disapprove a proposed consent decree solely for the reason

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DOJ and EPA's SEPs policies have historically been intertwined. EPA, with assistance from the Department of Justice, adopted and refined its policies for SEPs, culminating in a key SEPs guidance in 2015. That Guidance defines SEPs as "environmentally beneficial projects which a defendant agrees to undertake in settlement of an enforcement action, but which the defendant, or any other third party, is not otherwise legally required to perform." U.S. EPA Suppl. Envtl. Projects Policy 2015 Update at 6 (hereinafter "2015 Guidance"). DOJ-approved SEPs have, in turn, generally been consistent with EPA's Guidance.

The 2015 Guidance sets forth guidelines for use of SEPs and explicitly encourages defendants in EPA enforcement actions to "consider SEPs in communities where there are [environmental justice] concerns." The Guidance explains that "SEPs can help ensure that residents who spend significant portions of their time in, or depend on food and water sources located near the areas affected by violations will be protected," and situates environmental justice as one of the six criteria used to evaluate SEPs and, separately, civil penalties applied alongside SEPs. 2015 Guidance at 4. *See generally* Patrice L. Simms, *Leveraging Supplemental Environmental Projects: Toward an Integrated Strategy for Empowering Environmental Justice Communities*, 47 Envtl. L. Rep. News & Analysis 10511 (2017). For instance:

- Between the late 1990s and the early 2000s, EPA found over 6,000 violations of opacity, visible air pollutant, limits and accompanying monitoring and reporting requirements at the Mystic Station Power Plant in Everett, Massachusetts. *United States v. Exelon Mystic, LLC*, No. 4-cv-10213, 1 (D. Mass. filed Jan. 28, 2004). Exelon Mystic entered into a consent decree requiring it to complete five SEPs, three of which directly contributed to reducing particulate matter and other air pollutants within the Greater Boston Metropolitan Area, which includes Everett. It installed oxidation catalysts in commuter rail trains (to reduce particulates) and supplied the trains with lower-sulfur diesel fuel. It retrofitted 500 Boston school buses with particulate matter filters. The company also spent $250,000 to build

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because [sic] it does not contain a provision requiring the Defendant to pay a civil penalty to the United States").

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two bike paths providing bike access to the subway station in Mystic in order to encourage cleaner methods of transportation.[6]

- Between 2001 and 2008, EPA entered into fifteen agreements requiring electric power companies to perform SEPs worth roughly $225 million, prompting significant new renewable energy generation and pollution control and mitigation by the very same power plants that produced significant pollution. By December of 2011, EPA had entered into seven more such settlements worth nearly $400 million in SEPs. Among the most important beneficiaries of these SEPs are low-income and minority communities that disproportionately bear the worst effects of pollution. 2015 Guidance at 3-4.
- DOJ charged Shintech, Inc. with violating environmental statutes for failing to repair or retire leaking refrigeration equipment and improperly disposing of, treating, or storing hazardous waste. *United States v. Shintech, Inc.*, 08-cv-3519 (S.D. Tex. filed Dec. 1, 2008). This activity caused ozone-depleting substances ("HCFC") to leak into the atmosphere and hazardous waste to seep into ground water.[7] The consent decree in that case included three SEPs, one of which instructed Shintech to create a residential appliance recycling program for Houston, Texas to properly dispose of at least 6,400 appliances containing ozone-depleting chemicals. This program reduced the amount of HCFC in the area, leading to a decline in CO_2. Shintech, Inc. also agreed to improve its vinyl chloride monomer stripping process, leading to a decrease in emissions, and voluntarily reduce their legal emissions limit by 70%.[8]
- After EPA found Clean Air Act violations at three U.S. Steel manufacturing plants in the Midwest, the company agreed to a 2017 consent decree requiring it to complete SEPs focused on "protect[ing] human health and the environment in

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[6] EPA, *Civil Enforcement Case Report: Sithe New England*, https://echo.epa.gov/enforcement-case-report?id=01-2002-0184 (last visited May 12, 2021).

[7] News Release, EPA, PVC Manufacturers Agree to Reduce Air Pollutants and Strengthen Control of Hazardous Wastes (Dec. 1, 2008).

[8] EPA, *Civil Enforcement Case Report: Shintech, Inc.*, https://echo.epa.gov/enforcement-case-report?id=06-2006-0920 (last visited May 12, 2021).

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the communities affected by [its] pollution."[9] This included planting roadside vegetative particulate emissions buffers in Detroit, Michigan and purchasing a $260,000 street sweeper with enhanced particulate collection capability for Granite City, Illinois. U.S. Steel also spent $1 million replacing lighting ballasts that were thought to contain polychlorinated biphenyls (PCBs) in public schools in the areas surrounding its factories.[10]

- In 2017, EPA consent decrees included SEPs designed to reduce lead exposure in low-income communities in Lima, Ohio, and to install lead-filtering systems in public schools in East Chicago, Indiana.[11]

As these examples demonstrate, in many cases over several decades, SEPs have directly mitigated the harms resulting from violations of environmental statutes and are widely popular among settling parties. Without SEPs, it would be more much more difficult for communities affected by such unlawful behavior to receive environmental remedies. As noted, the resources that SEPs provide are especially important because many of the areas impacted by environmental harm are disproportionately low-income and communities of color, making SEPs a crucial instrument in achieving environmental justice. 2015 Guidance at 3-4. SEPs are also attractive to alleged violators of environmental statutes because they provide an opportunity to more directly correct the harm caused.[12] Perhaps most importantly, SEPs have had a direct effect on the environment; their implementation has "prevented significant amounts of pollution and restored contaminated water, wetlands, land, and air."[13]

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[9] News Release, DOJ, U.S. Steel Corporation Agrees to End Litigation, Improve Environmental Compliance at Its Three Midwest Facilities, Pay Civil Penalty of $2.2 Million and Perform Projects to Aid Communities Affected by U.S. Steel's Pollution (Nov. 22, 2016).

[10] EPA, *Civil Enforcement Case Report: U.S. Steel - CD*, https://echo.epa.gov/enforcement-case-report?id=05-2008-6620 (last visited May 12, 2021).

[11] U.S. EPA, Annual Environmental Justice Progress Report, 15-16 (2018), https://www.epa.gov/sites/production/files/2019-08/documents/ejprogress_report_fy2018-11.pdf.

[12] Thomas O. McGarity, *Supplemental Environmental Projects in Complex Litigation*, 28 Tex. L. Rev. 1405, 1407 (2020). *See also* Laurie Droughton, *Supplemental Environmental Projects: A Bargain for the Environment*, 12 Pace Envtl. L. Rev. 789, 809-10 (1995).

[13] Kenneth T. Kristl, *Making A Good Idea Even Better: Rethinking the Limits on Supplemental Environmental Projects*, 31 Vt. L. Rev. 217, 218-19 (2007).

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II. The Trump Administration Sought to Eliminate the Use of SEPs

Former Assistant Attorney General for ENRD, Jeffrey Bossert Clark, broke with established practice and sought to eliminate the use of SEPs by DOJ and EPA when he opined that EPA's SEP policy violated the Miscellaneous Receipts Act. *See* Mem. from Jeffrey Clark, Assistant Att'y Gen., to ENRD Deputy Assistant Att'y Gens. and Section Chiefs re: Supplemental Environmental Projects ("SEPs") in Civil Settlements with Private Defendants at 7 (Mar. 12, 2020) (hereinafter "Clark Memorandum"). Although DOJ guidance documents and rules do not apply to other Executive agencies, they nonetheless greatly influence EPA's SEPs policy. The EPA under the Trump Administration halted its use of SEPs in administrative enforcement settlements after the Clark Memorandum was published.

Purporting to "exercise appropriate prosecutorial discretion," the Clark Memorandum categorically commanded that "attorneys negotiating consent decrees or compromise settlements in EPA cases should not include SEPs in those settlements." Clark Memorandum at 18. It permitted no exceptions to this policy. *Id.* at 19.

The Clark Memorandum included a series of criticisms of SEPs. According to Clark, one downside of SEPs was that the projects gave insufficient weight to "centuries of [pre-revolutionary] struggle between the [British] Crown and Parliament" over state finances. *Id.* at 17. And in what the Memorandum described as "*Federalist Paper 10* terms," it "confidently" concluded (in a footnote) that "SEPs are likely to foment the evil of [political] factions" in the United States. *Id.* at 17 n.20. The Assistant Attorney General also opined that SEPs make bad policy because they award a windfall to their beneficiaries. In the Memorandum's parlance, these communities—including poor and minority communities disproportionately burdened by pollution—are "vested interest[s]" that are "fortunate enough to be blessed . . . [with] SEP monies." *Id.* at 16.

The Clark Memorandum's main legal rationale was its determination that SEPs run afoul of the Miscellaneous Receipts Act. *See, e.g.*, *id.* at 2 (it "is inescapable that SEPs violate the Miscellaneous Receipts Act"); *id.* at 11 ("SEPs violate . . . the Miscellaneous Receipts Act, which is intended to protect Congress' constitutional power of the purse"); *id.* at 19 ("I do not have discretion to make exceptions to what is a sound construction of both statutory and constitutional law."). In reaching that conclusion, the Memorandum omitted any discussion of

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why, for two decades, an OLC opinion, DOJ policy, and hundreds of district courts blessed SEPs as consistent with law and appropriate in settlements as fair, reasonable, and in the public interest.[14]

DOJ went even beyond the Clark Memorandum by promulgating a rule against third party payments that may also limit the use of SEPs. *See* Prohibition on Settlement Payments to Non-governmental Third Parties, 85 Fed. Reg. 81,410 (Dec. 16, 2020); 28 C.F.R. § 50.28. This rule extends guidance set out in a 2017 memo from then-Attorney General Jeff Sessions banning the use of third-party payments in most settlements. Mem. from Atty Gen. re: Prohibition on Settlement Payments to Third Parties (June 5, 2017). The Sessions memo specified that the limitation against third-party payments did not apply in circumstances in which such a payment would "directly remed[y] the harm that is sought to be repressed, including, for example, harm to the environment[.]" *Id.* However, 28 C.F.R. § 50.28 instructs Department attorneys that "in no case shall any [] agreements require defendants in environmental cases, in lieu of payment to the Federal Government, to expend funds to provide goods or services to third parties for Supplemental Environmental Projects," suggesting that, in at least some cases, DOJ may view SEPs as third-party payments that are impermissible under the rule.

III. The Department of Justice Should Fully Recommit to the Use of SEPs and Clarify the Standards for Their Use Going Forward

In February 2021, DOJ withdrew several ENRD guidance documents, including the Clark Memorandum and others that had been critical of SEPs. Mem. to ENRD Section Chiefs and Deputy Section Chiefs re: Withdrawal of Memoranda and Policy Documents (Feb. 4, 2021). These reversals followed President Biden's Executive Order 13,990, Protecting Public Health and the Environment and Restoring Science To Tackle the Climate Crisis, which instructed agencies to "immediately review and . . . take actions to address" regulations or agency actions "that conflict with [] important national objectives, and to immediately commence work to confront the climate crisis." 83 Fed. Reg. at 7037. The documents withdrawn, including the Clark Memorandum, were "inconsistent with longstanding Division policy and practice" and

[14] SEPs permissibility under the Miscellaneous Receipts Act is discussed *infra* at 13-15.

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posed possible "imped[iments to] the full exercise of enforcement discretion in [ENRD]'s cases." Mem. re: Withdrawal of Memoranda and Policy Documents at 2.

Although DOJ has now rescinded the Clark Memorandum, its SEPs policy, and EPA's related policy, remains in limbo because 28 C.F.R. § 50.28, the Trump Administration-era prohibition on settlement payments to non-governmental third parties, remains in effect. For instance, in April 2021, EPA issued a memo encouraging staff to use "the full array of policy and legal tools available" in civil enforcement settlements. Mem. to Regional Counsels and Deputies, Enf't and Compliance Assurance Division Dirs. and Deputies, OECA Office Dirs. and Deputies re: Using All Appropriate Injunctive Relief Tools in Civil Enforcement Settlements, 1 (April 26, 2001). EPA's list of available tools includes SEPs but explains that the inclusion of SEPs in judicial settlements is "severely limited" by 28 C.F.R. § 50.28. Mem. at 3 n.3. Hamstrung by this rule, EPA advised that SEPs should only be included in settlements involving diesel emission reductions until further guidance is issued. *Id.* Career ENRD officials have also reportedly described frustrations over their inability to incorporate SEPs into consent decrees "in over four years" and their confusion when "Trump-era officials rolled out" 28 C.F.R. § 50.28, seeking to cement a SEPs ban, at the "eleventh-hour."[15]

Leaving 28 C.F.R. § 50.28 in place would continue to create confusion. Although the 2017 Sessions memo treated SEPs and third-party payments differently, *see supra* at 9-10, this rule appears to categorize SEPs as third-party payments ("[I]n no case shall any [settlement] agreements require defendants in environmental cases, in lieu of payment to the Federal Government, to expend funds to provide goods or services to third parties for Supplemental Environmental Projects[.]" 28 C.F.R. § 50.28(c)(1)). This apparent conflation is impacting DOJ's ability to use SEPs, which is reason enough for its removal. At the very least, even if ENRD reads 28 C.F.R. § 50.28 to still permit SEPs in some fashion, it creates confusion as to when they may be used and forces DOJ to continue determining their use through policy memos, leaving the public in a continual position of uncertainty.

The Department thus ought to *both* withdraw 28 C.F.R. § 50.28 at least insofar as it applies to SEPs *and* promulgate a SEPs *rule* laying out the legal rationale and standards for their

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[15] *See* Ellen M. Gilmer, *Late Trump DOJ Rule Surprised Environment Team, Official Says*, Bloomberg Law (June 3, 2021), https://news.bloomberglaw.com/environment-and-energy/late-trump-doj-rule-surprised-environment-team-official-says.

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use. These two actions in tandem will formalize DOJ's SEPs policy in a manner that is lasting and sensible. Without clear rules, the reasoning behind DOJ's settlement practices will only become more difficult for the public to understand and will continue to be subject to frequent change.

LEGAL AUTHORITY TO PROMULGATE

I. DOJ's Legal Authority

The Attorney General may "formulate and publish" regulations pertaining to the Department of Justice and the exercise of its prescribed authority. *Georgia v. United States*, 411 U.S. 526, 536 (1973), *rev'd on other grounds by Shelby Cty. v. Holder*, 570 U.S. 529 (2013); 5 U.S.C. § 301 ("[T]he head of an Executive department or military department may prescribe regulations for the government of his department.").

Federal enforcement of environmental statutes[16] generally occurs through administrative actions (brought by EPA) or through civil actions (brought by DOJ, on behalf of client agencies like EPA, generally upon referral).[17] DOJ, on behalf of EPA, can also intervene as a matter of right in citizen suits brought under environmental statutes like the Clean Water Act (*see* 33 U.S.C. § 1365(c)(2)) and Clean Air Act (*see* 42 U.S.C. § 7604(b)(1)(B)), if the government is not already joined as a party. The Attorney General is charged with conducting and supervising all litigation to which the United States, or its departments or agencies, is a party. 28 U.S.C. §§ 515-519. *See also* The Att'y Gen.'s Role as Chief Litigator for the U.S., 6 Op. O.L.C. 47, 48 (1982). The Attorney General has delegated civil enforcement of the environmental laws to

[16] These laws include the Clean Air Act (42 U.S.C. §§ 7401-7431), the Clean Water Act (33 U.S.C. §§ 1251-1275), the Oil Pollution Act (33 U.S.C. §§ 2701-2720), the Safe Drinking Water Act (42 U.S.C. §§ 300f-300j-27), the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. §§ 136-136y), the Toxic Substances Control Act (15 U.S.C. §§ 2601-2629), the Resource Conservation and Recovery Act ("RCRA") (42 U.S.C. §§ 6901-6908a), the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA") (42 U.S.C. §§ 9601-9675), and the Emergency Planning and Community Right-to-Know Act (42 U.S.C. §§ 11001-11050).

[17] *See* U.S. EPA, General Enforcement Policy Compendium (Dec. 1994), https://nepis.epa.gov/Exe/ZyPDF.cgi/9100TIBO.PDF?Dockey=9100TIBO.PDF.

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ENRD's Assistant Attorney General. 28 C.F.R. § 0.65; U.S. Att'ys' Manual 5-1.100, 5-1.300 (updated 2018).

Federal environmental statutes provide for civil judicial enforcement to secure injunctive relief, civil penalties, recovery of government response costs, enforcement of administrative orders, or other relief.[18] For some violations, particularly those calling for greater deterrent impact, statutory limitations on administrative authorities compel agencies to refer alleged violations to DOJ for civil enforcement.[19] If a civil complaint is filed, ENRD typically will seek an order that the defendant pay an appropriate civil penalty for the violation, as well as injunctive relief to remedy the violation and harm.

Most enforcement actions the EPA refers to the DOJ are resolved through settlement agreements or consent decrees. The Attorney General has "broad and plenary settlement authority as to any matter referred to the Department of Justice," Exec. Order No. 6,166 § 5 (June 10, 1933); 38 Op. Att'y Gen. 98 (1934), and that authority has been further delegated to the Deputy Attorney General, the Associate Attorney General, or the Deputy Assistant Attorney General depending on the size of the settlement.[20] Courts require that the consent decree "comes within the general scope of the case made by the pleadings, furthers the objectives upon which the law is based, and does not violate the statute upon which the complaint was based." *Elec. Controls Design*, 909 F.2d at 1355 (quoting *Local No. 93, Int'l Ass'n of Firefighters, AFL–CIO v. City of Cleveland*, 478 U.S. 501, 525-26 (1986) and *Pacific R.R. v. Ketchum*, 101 U.S. 289, 297 (1879)) (internal quotations omitted). As explained above, consent decrees that include SEPs have been approved and entered by courts.

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[18] *See, e.g.*, 42 U.S.C. § 7414 (Clean Air Act), 33 U.S.C. §§ 1319(b), 1321 (Clean Water Act); 42 U.S.C. § 300g-3(b) (Safe Drinking Water Act); 33 U.S.C. § 2702 (Oil Pollution Act); 42 U.S.C. §§ 6928(a), 6973 (RCRA); 42 U.S.C. §§ 9606, 9607 (Comprehensive Environmental Response, Compensation, and Liability Act).

[19] For example, some statutes impose caps on the amount of civil penalties that can be assessed administratively. *See, e.g.*, 42 U.S.C. § 7413(d) (Clean Air Act) ($200,000 limit, unless waived by DOJ); 33 U.S.C. § 1319(g)(2)(B) (Clean Water Act) ($125,000 limit for class II penalties); 42 U.S.C. § 300g-3(g)(3) (Safe Drinking Water Act) ($25,000 limit).

[20] 28 C.F.R. § 0.161; ENRD Directive No. 2016-04, § II(A) (Dec. 20, 2016).

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II. The Miscellaneous Receipts Act

As DOJ and EPA have previously—and correctly—concluded, and as various courts have confirmed, SEPs do not run afoul of the Miscellaneous Receipts Act as the now-withdrawn Clark Memo opined. The Act implements the Constitution's requirement that "[n]o money shall be drawn from the treasury, but in consequence of appropriations made by law." Art. I § 9. To prevent the executive branch from augmenting its appropriated budget by diverting funds *before* they ever reach the Treasury, the Miscellaneous Receipts Act requires that "an official or agent of the Government *receiving money* for the Government from any source shall deposit the money in the Treasury as soon as practicable without deduction for any charge or claim." 31 U.S.C. § 3302(b) (emphasis added). *See generally* Todd Peterson, *Protecting the Appropriations Power: Why Congress Should Care About Settlements at the Department of Justice*, 2009 BYU L. Rev. 327, 340 (2009).

Since at least 1980, OLC has concluded that the government only constructively "receives" money intended for the Treasury—and therefore violates the Miscellaneous Receipts Act—when it directs funds *otherwise destined* to the Treasury to non-federal accounts. *Effect of 31 U.S.C. § 484 on the Settlement Authority of the Attorney General*, 4B Op. O.L.C. 684, 688 (1980). Thus, OLC has determined that the United States may not settle environmental enforcement actions by *directing* the violator to fund a non-governmental organization dedicated to wildlife preservation *in lieu of* accepting civil penalties. *Id.* at 688. According to OLC, "the fact that no cash actually touches the palm of a federal official is irrelevant for purposes of [the Miscellaneous Receipt Act], if a federal agency [1] could have accepted possession [of the funds] and [2] retains discretion to direct the use of the money[.]" *Id.*

OLC has "consistently advised" that settlements *do not* violate the Miscellaneous Receipts Act so long as: (1) the settlement is executed before an admission or finding of liability in favor of the United States; and (2) the United States does not retain post-settlement control over the disposition or management of the funds or any projects carried out under the settlement, except for ensuring that the parties comply with the settlement. *Application of the Gov't Corp. Control Act and the Misc. Receipts Act to the Can. Softwood Lumber Settlement Agreement,* 30 Op. O.L.C. 111, 119 (2006) (citing Mem. for the Files, from Rebecca Arbogast, Attorney-Adviser, O.L.C., *Misc. Receipts Act and Criminal Settlements* (Nov. 18, 1996)). "If these two

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criteria are met, then the governmental control over settlement funds is so attenuated that the Government cannot be said to be receiving money for the Government." *Id.* at 119 (citation omitted).

Under these standards, SEPs do not violate the Miscellaneous Receipts Act:

First, SEPs are entirely independent from monies paid to the United States Treasury, such as civil penalties. In environmental enforcement actions, civil penalties both deter future violations and ensure a level playing field for the regulated community. 2015 Guidance at 1. The government calculates an appropriate penalty based on several considerations, including "the economic benefit associated with the violations, the gravity or seriousness of the violations[,] and the violator's prior history of noncompliance." *Id.* at 21. The 2015 Guidance states that "SEPs are not penalties, nor are they accepted in lieu of a penalty." *Id.*

To the contrary, "[s]ettlements that include a SEP must always include a settlement penalty that recoups the economic benefit a violator gained from noncompliance with the law, as well as an appropriate gravity [of violation]-based penalty reflecting the environmental and regulatory harm caused by the violation(s)." *Id. See also id.* at 22 (specifying formula for minimum civil penalties in settlements including SEPs). Like other enforcement considerations, the inclusion of a SEP in a settlement *may* influence a final stipulated penalty: "a violator's commitment to perform a SEP is a relevant factor for the EPA to consider in establishing an appropriate settlement penalty." *Id.* at 21. But the Guidance is clear that SEPs are in no way substitutes for penalties, and there is no mathematical link between SEPs and the quantum of civil penalties.

Specifically, the 2015 Guidance provides that "EPA will consider a variety of factors in determining the amount of penalty mitigation including, but not limited to, the evaluation criteria described in . . . [the] Policy," and that "[p]enalty mitigation in light of a SEP is within the EPA's discretion; there is no presumption as to the correct amount of mitigation." *Id.* at 24. At most, the "amount of penalty mitigation given for a SEP should be equivalent to *a* percentage of the estimated cost to implement the SEP and should [generally] not *exceed* eighty percent (80%) of that estimated cost." *Id.* (emphasis added). This is an upper bound of a SEP's potential impact on the assessment of an appropriate civil penalty, not a conversion rate.

Second, SEPs are independent from monies already appropriated from the United States Treasury, i.e., they do not "augment" any federal budgets beyond what Congress has

appropriated. The most important of EPA's anti-augmentation devices is its requirement that SEPs possess a "nexus" to the underlying statutory violation, tethering the projects to EPA's statutorily prescribed enforcement authority under the Clean Air Act and other statutes. As EPA explains, "[n]exus ensures the proper exercise of the EPA's prosecutorial discretion and enables appropriate penalty mitigation for including the SEP in the settlement." *Id.* at 7. To satisfy the nexus requirement, the SEP must, *inter alia*, (1) "advance at least one of the objectives of the environmental statutes that are the basis of the enforcement action"; and (2) reduce the impacts of the alleged violation or the chance that it will occur again. *Id.* at 7-8.

III. Review of DOJ's Current SEPs Policy is Required Under Executive Order 13,990

The Department of Justice should withdraw 28 C.F.R. § 50.28, at least insofar as it applies to SEPs. As the Department initially issued this rule as a "matter of agency management or personnel and is a rule of agency organization, procedure, or practice" that was exempt from notice and comment rulemaking, 85 Fed. Reg. at 81,410, DOJ may revoke this rule without notice-and-comment proceedings. *See* 5 U.S.C. §§ 551(5); 553 (a)(2), (b), and (d). However, DOJ should follow the requirements of *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 515 (2009), by acknowledging "that it is changing position" and explaining that the new policy is "permissible," "there are good reasons for the new policy," and DOJ "believes it to be better."

DOJ should also draft a SEPs rule to help clarify and solidify key Department policy for this and future administrations. Such a rule would be a Department "general statement[] of policy" exempt from notice and comment requirements. *See* 5 U.S.C. §§ 551(5); 553 (b)(3)(A). However, we recommend that the Department nonetheless seek public comment in its discretion to understand the full range of public concerns about SEPs and thus strengthen the resulting rule. Consistent with *Fox*, DOJ should also acknowledge the extent to which the new rule changes policy from the previous administration and explain the many benefits of formalizing DOJ's prior policy. *See Fox*, 556 U.S. at 515.

These actions would comport with President Biden's Executive Orders 13,990 and 14,008. Executive Order 13,990 lays out broad commitments to combatting climate change and striving for environmental justice, highlighting "improv[ing] public health . . . ensur[ing] access to clean air and water; limit[ing] exposure to dangerous chemicals and pesticides; [and] hold[ing]

polluters accountable, including those who disproportionately harm communities of color and low-income communities." 83 Fed. Reg. 7037, 7037. It instructs all agencies to "immediately review and . . . *take action to address* the promulgation of Federal regulations and other actions during the last 4 years that conflict with these important national objectives, and to immediately commence work to confront the climate crisis." *Id.* (emphasis added). Finally, the Order directs that "[h]eads of agencies shall . . . consider whether to take any additional agency actions to fully enforce the policy set forth in section 1 of this order." *Id.* at 7038. Executive Order 14,008 instructs DOJ to "develop a comprehensive environmental justice strategy" that includes procedures for "provid[ing] timely remedies for systemic environmental violations." 86 Fed. Reg. 7619 (Jan. 25, 2021). SEPs are tools particularly well suited to this task—they are designed to provide tangible resources to communities harmed by environmental violations.

The Department of Justice has begun following these Executive Orders, as evidenced by its withdrawal of ENRD guidance documents that prohibited SEPs, such as the Clark Memorandum. But to "fully enforce the policy set forth," the Department of Justice must revoke 28 C.F.R. § 50.28, insofar as it applies to SEPs, and promulgate a clear rule formalizing its position on SEPs.

CONCLUSION

For the reasons set forth above, petitioners respectfully request that the Attorney General initiate a rulemaking proceeding pursuant to the Administrative Procedures Act, 5 U.S.C. § 553(e), to revoke 28 C.F.R. § 50.28 and issue a rule authorizing the use of SEPs when settling civil enforcement actions brought under environmental statutes. If you would like to discuss this petition, please contact Michael Martinez and Samara Spence.

June 14, 2021

Respectfully submitted,

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ED_006073A_00001498-00017

On behalf of
Conservation Law Foundation
The Surfrider Foundation
Sierra Club

ED_006073A_00001498-00018

Appointment

From: Michael Freeman [mfreeman@earthjustice.org]
Sent: 7/30/2021 2:30:15 AM
To: Hoffer, Melissa [Hoffer.Melissa@epa.gov]

Subject: Accepted: SAFETEA Call

Start: 8/3/2021 8:00:00 PM
End: 8/3/2021 8:45:00 PM
Show Time As: Busy

Recurrence: (none)

Appointment

From: Hoffer, Melissa [Hoffer.Melissa@epa.gov]
Sent: 7/29/2021 10:45:14 PM
To: mfreeman@earthjustice.org; wechohawk[Ex. 6 Personal Privacy (PP)]; Serassio, Helen [Serassio.Helen@epa.gov]; Siegal, Tod [Siegal.Tod@epa.gov]; Meghan Greenfield [Meghan.Greenfield@usdoj.gov]

Subject: SAFETEA Call

Start: 8/3/2021 8:00:00 PM
End: 8/3/2021 8:45:00 PM
Show Time As: Tentative

Recurrence: (none)

Required Attendees: mfreeman@earthjustice.org; wechohawk[Ex. 6 Personal Privacy (PP)]; Serassio, Helen; Siegal, Tod; Meghan Greenfield

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Appointment

From: Hoffer, Melissa [Hoffer.Melissa@epa.gov]
Sent: 7/29/2021 10:45:14 PM
To: mfreeman@earthjustice.org; wechohawk[redacted]; Serassio, Helen [Serassio.Helen@epa.gov]; Siegal, Tod [Siegal.Tod@epa.gov]; Meghan Greenfield [Meghan.Greenfield@usdoj.gov]

Subject: SAFETEA Call

Start: 8/3/2021 8:00:00 PM
End: 8/3/2021 8:45:00 PM
Show Time As: Busy

Recurrence: (none)

Required Attendees: mfreeman@earthjustice.org; wechohawk[redacted] Serassio, Helen; Siegal, Tod; Meghan Greenfield

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Appointment

From: Hoffer, Melissa [Hoffer.Melissa@epa.gov]
Sent: 8/4/2021 5:00:36 AM
To: Hoffer, Melissa [Hoffer.Melissa@epa.gov]; Michael Freeman [mfreeman@earthjustice.org]; teamsvisitor:3e56d629e5eb4249899a5d27b5cbff38; Serassio, Helen [Serassio.Helen@epa.gov]; Siegal, Tod [Siegal.Tod@epa.gov]

Subject: Meeting (ScheduledMeeting)/Thread Id:

Ex. 6 Personal Privacy (PP)

Start: 8/3/2021 7:59:38 PM
End: 8/3/2021 8:46:56 PM
Show Time As: Busy

Recurrence: (none)

Required Attendees: Hoffer, Melissa; Michael Freeman; teamsvisitor:3e56d629e5eb4249899a5d27b5cbff38; Serassio, Helen; Siegal, Tod

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Start Time (UTC): 8/3/2021 7:59:38 PM
End Time (UTC): 8/3/2021 8:46:56 PM
Duration: 00:47:17.2260438

[8/3/2021 8:01:28 PM (UTC)] Hoffer.Melissa@epa.gov joined.
[8/3/2021 8:46:30 PM (UTC)] Hoffer.Melissa@epa.gov left.
[8/3/2021 8:00:21 PM (UTC)] mfreeman@earthjustice.org joined.
[8/3/2021 8:46:56 PM (UTC)] mfreeman@earthjustice.org left.
[8/3/2021 8:00:46 PM (UTC)] teamsvisitor:3e56d629e5eb4249899a5d27b5cbff38 joined.
[8/3/2021 8:46:28 PM (UTC)] teamsvisitor:3e56d629e5eb4249899a5d27b5cbff38 left.
[8/3/2021 7:59:38 PM (UTC)] Serassio.Helen@epa.gov joined.
[8/3/2021 8:46:28 PM (UTC)] Serassio.Helen@epa.gov left.
[8/3/2021 8:00:09 PM (UTC)] Siegal.Tod@epa.gov joined.
[8/3/2021 8:46:35 PM (UTC)] Siegal.Tod@epa.gov left.
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