WHITE HOUSE ENVIRONMENTAL JUSTICE ADVISORY COUNCIL (WHEJAC)

MEETING SUMMARY

HYBRID PUBLIC MEETING
Renaissance Phoenix Downtown Hotel
100 North 1st Street
Phoenix, AZ 85004
Virtual Zoom

June 13 - 15, 2023

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PREFACE

The White House Environmental Justice Advisory Council is established by Executive Order 14008, titled "Tackling the Climate Crisis at Home and Abroad" (issued on January 27, 2021). As such, this is a non-discretionary committee and operates under the provisions of the Federal Advisory Committee Act (FACA), 5 U.S.C.App.2.

The WHEJAC will provide independent advice and recommendations to the Chair of the Council on Environmental Quality (CEQ) and to the White House Interagency Council on Environmental Justice (Interagency Council), on how to increase the Federal Government's efforts to address current and historic environmental injustice, including recommendations for updating Executive Order 12898. The WHEJAC will provide advice and recommendations about broad cross-cutting issues related, but not limited to, issues of environmental justice and pollution reduction, energy, climate change mitigation and resiliency, environmental health, and racial inequity. The WHEJAC's efforts will include a broad range of strategic scientific, technological, regulatory, community engagement, and economic issues related to environmental justice.

The duties of the WHEJAC are to provide advice and recommendations to the Interagency Council and the Chair of CEQ on a whole-of-government approach to environmental justice, including but not limited to environmental justice in the following areas:

- Climate change mitigation, resilience, and disaster management.
- Toxics, pesticides, and pollution reduction in overburdened communities.
- Equitable conservation and public lands use.
- Tribal and Indigenous issues.
- Clean energy transition.
- Sustainable infrastructure, including clean water, transportation, and the built environment.
- National Environmental Policy Act (NEPA) enforcement and civil rights.
- Increasing the Federal Government's efforts to address current and historic environmental injustice.

EPA's Office of Environmental Justice (OEJ) maintains summary reports of all WHEJAC meetings, which are available on the WHEJAC website at: https://www.epa.gov/environmentaljustice/white-house-environmental-justice-advisory-council. Copies of materials distributed during WHEJAC meetings are also available to the public upon request. Comments or questions can be directed via e-mail to whejac@epa.gov

Committee Members in Attendance

- Richard Moore, Co-Chair, Los Jardines Institute
- Peggy Shepard, Co-Chair, WE ACT for Environmental Justice
- Carletta Tilousi, Vice-Chair, Havasupai Tribal Council
- Angelo Logan, Moving Forward Network
- Rachel Morello-Frosch, PhD, UC Berkley
- Viola Waghiyi, Alaska Community Action on Toxins
- Miya Yoshitani, Asian Pacific Environmental Network
- Kim Havey, City of Minneapolis
- Tom Cormons, Appalachian Voices
- LaTricea Adams, Black Millennials for Flint
- Harold Mitchell, ReGenesis
- Beverly Wright, PhD, Deep South Center for Environmental Justice
- Susana Almanza, People Organized in Defense of Earth and Her Resources
- Jade Begay, NDN Collective
- Robert Bullard, PhD, Texas Southern University
- Juan Parras, Texas Environmental Justice Advocacy Services
- Jerome Foster II, Waic Up
- Maria Lopez-Nunez, Ironbound Community Corporation
- Michele Roberts, Environmental Justice and Health Alliance for Chemical Policy Reform
- Nicky Sheats, PhD, Kean University
- Ruth Santiago, Latino Climate Action Network

AGENDA

WHITE HOUSE ENVIRONMENTAL JUSTICE ADVISORY COUNCIL

PUBLIC MEETING
JUNE 13 – JUNE 15, 2023

Renaissance Phoenix Downtown Hotel, 100 North 1st Street, Phoenix, AZ 85004

NOTE: Please be advised that agenda times are approximate and are in Mountain Standard Time; when the discussion for one topic is completed, discussions for the next topic will begin. For further information, please contact the White House Environmental Justice Advisory Council's (WHEJAC) Designated Federal Officer for this meeting, Audrie Washington at washington.audrie@epa.gov. To register to present public comment to the WHEJAC or to listen to the other sessions of the WHEJAC public meeting, click here.

Tuesday, June 13, 2023	**[5:30 PM to 9:00 PM MST]**
5:30 PM – 6:00 PM	**Public Meeting Begins** **Welcome, Opening Remarks, and WHEJAC Roll Call** • **Audrie Washington**, Designated Federal Officer – Office of Environmental Justice and External Civil Rights, U.S. Environmental Protection Agency • **Richard Moore**, Co-Chair – Los Jardines Institute • **Peggy Shepard**, Co-Chair – WE ACT for Environmental Justice • **Carletta Tilousi**, Vice-Chair – Havasupai Tribal Council • **Catherine Coleman Flowers**, Vice-Chair – Center for Rural Enterprise and Environmental Justice
6:00 PM – 6:45 PM	**Federal Agency Updates on Topics of Public Interest** During the WHEJAC public meeting, federal agency staff will discuss a number of topics. This session is an opportunity to elevate additional federal agency updates. • **Dr. Jalonne L. White-Newsome**, Senior Director for Environmental Justice, White House Council on Environmental Quality (Moderator) • **Marianne Engelman-Lado**, Acting Principal Deputy Assistant Administrator, Office of Environmental Justice and External Civil Rights, U.S. Environmental Protection Agency • **Beattra Wilson**, (Virtual) Assistant Director for Urban & Community Forestry, U.S. Forest Service, U.S. Department of Agriculture • **Kristin Wood**, Transportation Policy Analyst / Justice40 Program Lead, Office of the Secretary, U.S. Department of Transportation

6:45 PM – 8:00 PM	**Public Comment Period**
8:00 PM – 8:15 PM	***BREAK***
8:15 PM – 9:00 PM	**Public Comment Period** Members of the public will be given three (3) minutes to present comments relevant to the following charges, topics, and questions related to the work of the WHEJAC: • Environmental Justice Activities • The Justice40 Initiative • The Climate and Economic Justice Screening Tool • The Environmental Justice Scorecard • Environmental Justice Resources and Tools that would be beneficial from federal agencies
9:00 PM	***Closing Remarks - Adjourn***

Wednesday, June 14, 2023	**[8:30 AM to 5:30 PM MST]**
8:30 AM – 9:30 AM	**Welcome, Opening Remarks, and WHEJAC Roll Call** • **Richard Moore**, Co-Chair – Los Jardines Institute • **Peggy Shepard**, Co-Chair – WE ACT for Environmental Justice • **Carletta Tilousi**, Vice-Chair – Havasupai Tribal Council • **Catherine Coleman Flowers**, Vice-Chair – Center for Rural Enterprise and Environmental Justice • **Audrie Washington**, Designated Federal Officer, Office of Environmental Justice and External Civil Rights, U.S. Environmental Protection Agency
9:30 AM – 9:50 AM	**Indigenous Peoples Acknowledgement** • **Jones Benally Family Dance Troupe** Navajo/Diné Traditional Dance – Black Mesa, Arizona
9:50 AM – 10:05 AM	**Welcome and Remarks – U.S. Environmental Protection Agency (EPA)** • **Martha Guzman**, Regional Administrator, Region 9, U.S. Environmental Protection Agency • **Marianne Engelman-Lado**, Acting Principal Deputy Assistant Administrator, Office of Environmental Justice and External Civil Rights, U.S. Environmental Protection Agency

10:05 AM – 10:45 AM	**Updates and Remarks – White House Council on Environmental Quality (CEQ)** • **Dr. Jalonne L. White-Newsome**, Senior Director for Environmental Justice, White House Council on Environmental Quality • **Brenda Mallory (pre-recorded)**, Chair, White House Council on Environmental Quality • **Richard Moore**, Co-Chair – Los Jardines Institute
10:45 AM – 11:15 AM	***BREAK and GROUP PHOTO***
11:15 AM – 12:45 PM	**Panel Presentation: Update on Biden-Harris Administration's Environmental Justice Priorities** During his first week in office, President Biden launched the most ambitious environmental justice agenda in our nation's history. To deliver on the President's bold and historic commitment to environmental justice, the White House Council on Environmental Quality (CEQ) is working to leverage the full force of the federal government. This panel will provide an overview of CEQ's work and how the values of environmental justice are being incorporated into the conservation and stewardship of public lands, advancement of chemical safety and plastic pollution prevention, implementation of the National Environmental Policy Act, and building climate resilience to meet the President's goals. • **Dr. Jalonne L. White-Newsome**, Senior Director for Environmental Justice, White House Council on Environmental Quality (Moderator) • **Jonathan Black**, Senior Director for Chemical Safety and Plastic Pollution Prevention, White House Council on Environmental Quality • **Dr. Miriam Goldstein (virtual)**, Director for Ocean Policy, White House Council on Environmental Quality • **Dr. Marccus Hendricks**, Senior Advisor for Climate and Community Resilience, White House Council on Environmental Quality • **Nausheen Iqbal (virtual)**, Deputy Director for Forests and Equity, White House Council on Environmental Quality • **Dr. Ana Unruh Cohen (virtual)**, Senior Director for NEPA, Clean Energy, and Infrastructure, White House Council on Environmental Quality
12:45 PM – 2:00 PM	***LUNCH***

2:00 PM – 3:15 PM	**Panel Presentation: Regional Environmental Justice Highlights** This panel will highlight priority environmental justice issues in EPA Region 9 where intersectional government and community collaboration is key to making progress. Examples of topics that may be discussed during this panel include: impacts from the goods movement industry, per-and polyfluoroalkyl substances (PFAS) contamination, abandoned uranium mines on the Navajo Nation, and the Urban Waters initiative. • **Martha Guzman**, Regional Administrator, EPA Region 9, U.S. Environmental Protection Agency (Moderator) • **Laura Cortez**, Co-Director, East Yard Communities for Environmental Justice • **Yolanda Herrera**, Unified Community Advisory Board, Community Co-Chair for the Tucson International Airport Area • **Eva Olivas**, Executive Director/CEO, Phoenix Revitalization Corporation • **Jonathan Perry**, Executive Director, Eastern Navajo Dine Against Uranium Mining *(tentative)*
3:15 PM – 3:30 PM	***BREAK***
3:30 PM – 5:00 PM	**Panel Presentation: Innovative Technical Assistance and Capacity Building** The purpose of this panel is to share examples of technical assistance and capacity building that are being offered by federal agencies to support communities working on environmental justice solutions. Federal agency representatives will provide a high-level overview of various Justice40 Initiative covered programs and corresponding technical assistance. • **Dr. Sharunda Buchanan**, Interim Director, Office of Environmental Justice, U.S. Department of Health and Human Services (Moderator) • **Teresa Acuña**, Senior Policy Advisor, Office of the Assistant Secretary for Policy and Deputy Director, Good Jobs Initiative, U.S. Department of Labor • **Marianne Engelman-Lado**, Acting Principal Deputy Assistant Administrator, Office of Environmental Justice and External Civil Rights, U.S. Environmental Protection Agency • **Lucia Petty, Policy Advisor**, Office of Fair Housing and Equal Opportunity, U.S. Department of Housing and Urban Development • **Dr. Matthew Tejada**, Deputy Assistant Administrator for Environmental Justice, Office of Environmental Justice and External Civil Rights, U.S. Environmental Protection Agency • **Dr. Eric Werwa**, Deputy Assistant Secretary for Policy and Environmental Management, U.S. Department of the Interior • **Mariia Zimmerman**, Strategic Advisor for Technical Assistance and Community Solutions, U.S. Department of Transportation
5:00 PM – 5:15 PM	**Live Demo: Grants.gov**
5:15 PM – 5:30 PM	***Closing Remarks - Adjourn***

Thursday, June 15, 2023	[8:30 AM to 6:30 PM MST]
8:30 AM – 9:00 AM	**Welcome, Opening Remarks, and WHEJAC Roll Call** • **Richard Moore**, WHEJAC Co-Chair – Los Jardines Institute • **Peggy Shepard**, WHEJAC Co-Chair – WE ACT for Environmental Justice • **Carletta Tilousi**, WHEJAC Vice-Chair – Havasupai Tribal Council • **Catherine Coleman Flowers**, WHEJAC Vice-Chair – Center for Rural Enterprise and Environmental Justice • **Audrie Washington**, Designated Federal Officer, Office of Environmental Justice and External Civil Rights, U.S. Environmental Protection Agency
9:00 AM – 10:15 AM	**Panel Presentation: Emerging Leaders' Perspectives on Environmental Justice and Legacy Pollution in Underserved Communities** Following in the legendary footsteps of the pioneers of the environmental justice movement, this panel features youth leaders from across the country who are working to uphold the 17 Principles of Environmental Justice, adopted at the historic environmental justice leadership summit in 1991, in their respective communities. The panel will highlight each leader's contributions and work to address environmental injustices in urban, rural, and Tribal and indigenous communities and the push for more intergenerational organizing at the State, Tribal, local, and federal levels. • **LaTricea Adams**, Black Millennials for Flint (Moderator) • **Shamyra Lavigne**, American Civil Liberties Union • **William Barber, III**, Rural Beacon Initiative • **Yadia Yashanti**, Poder Latinx
10:15 AM – 10:30 AM	***BREAK***
10:30 AM – 10:45 AM	**Remarks – Mayor Kate Gallego, City of Phoenix**
10:45 AM – 11:15 AM	**Presentation of Carbon Management Charge to WHEJAC** • **Dr. Jalonne L. White-Newsome**, Senior Director for Environmental Justice, White House Council on Environmental Quality
11:15 AM – 12:15 PM	**WHEJAC Climate Planning, Preparedness, Response, Recovery and Impacts Workgroup – WHEJAC Presentation of Draft Recommendations** • **Miya Yoshitani**, Workgroup Co-chair • **Maria López-Núñez**, Workgroup Co-chair
12:15 PM – 1:30 PM	***LUNCH***

1:30 PM – 2:15 PM	**National Ambient Air Quality Standards for Particulate Matter 2.5 and Ozone – WHEJAC Presentation of Recommendations** • **Tom Cormons, WHEJAC Member** • **Dr. Nicky Sheats, WHEJAC Member**
2:15 PM – 3:00 PM	**WHEJAC Indigenous Peoples and Tribal Nations Workgroup Update** • **Dr. Kyle Whyte**, Workgroup Co-chair • **Carletta Tilousi**, Workgroup Co-chair
3:00 PM – 3:45 PM	**WHEJAC Climate and Economic Justice Screening Tool Workgroup Update** • **Dr. Rachel Morello-Frosch**, Workgroup Co-chair • **Dr. Nicky Sheats**, Workgroup Co-chair
3:45 PM – 4:00 PM	***BREAK***
4:00 PM – 4:30 PM	**Presentation: Overview of the EPA's Proposed New Carbon Pollution Standards and Guidelines for Fossil Fuel-Fired Power Plants** On May 11, 2023, EPA announced proposed new carbon pollution standards for coal and natural gas-fired power plants that will protect public health, reduce harmful pollutants, and deliver up to $85 billion in climate and public health benefits over the next two decades. The proposals would set limits for new gas-fired combustion turbines, existing coal, oil and gas-fired steam generating units, and certain existing gas-fired combustion turbines. EPA will provide an overview of the proposed rules and information on how members of the public can effectively engage in the regulatory process. • **Tomás Carbonell**, Deputy Assistant Administrator for Stationary Sources, Office of Air and Radiation, U.S. Environmental Protection Agency
4:30 PM – 5:15 PM	**Federal Agency Presentation**
5:15 PM – 6:15 PM	**Business Session**
6:15 PM – 6:30 PM	***Closing Remarks - Adjourn***

WHITE HOUSE ENVIRONMENTAL JUSTICE ADVISORY COUNCIL (WHEJAC)
Hybrid Public Meeting
June 13 - 15, 2023

MEETING SUMMARY

The White House Environmental Justice Advisory Council (WHEJAC) convened via Zoom and in-person meetings on Tuesday, June 13 through Thursday, June 15, 2023. This synopsis covers WHEJAC members' deliberations during the three-day meeting. It also summarizes the issues raised during the public comment period.

1.0 WHEJAC Meeting

This section summarizes WHEJAC members' deliberations during the three-day meeting, including action items, requests, and recommendations.

1.1 Welcome, Opening Remarks, and WHEJAC Roll Call

On Tuesday, June 13, **Audrie Washington**, Designated Federal Officer (DFO), U.S. EPA, welcomed attendees to the first day of the public meeting and made announcements. She stated that everyone is in listen-and-view mode only, and public commenters are invited to speak later that afternoon and/or invited to submit written comments instead. She noted that Spanish translation and closed captioning are available. She turned the meeting over to the co-chairs and vice chair for opening remarks.

Richard Moore, Peggy Shepard, and **Carletta Tilousi** welcomed everyone.

DFO Washington took the roll call and informed the Council that the quorum was met.

1.2 Federal Agency Updates on Topics of Public Interest

1.2.1 Dr. Jalonne L. White-Newsome, Senior Director for Environmental Justice, White House Council on Environmental Quality (Moderator)

Jalonne White-Newsom, PhD, thanked everyone for inviting her. She stated that WHEJAC meetings have sparked partnership, collaboration and needed change in communities across the country. She stated that it has also given the federal government a chance to give updates on how they've addressed those EJ issues. She introduced the three speakers for these updates.

1.2.2 Marianne Engelman-Lado, Acting Principal Deputy Assistant Administrator, Office of Environmental Justice and External Civil Rights, U.S. Environmental Protection Agency

Marianne Engelman-Lado thanked her team and WHEJAC for their hard work. She also thanked the public for bringing the EJ issues to the forefront. She explained Administrator Regan's guidance to the EPA and the integration of EJ issues with the Equity Action Plan and the EPA Strategic Plan. She gave examples of the progress, including grant programs and assistance and the EPA's commitment to Title VI of the Civil Rights Act of 1964.

1.2.3 Kristin Wood, Transportation Policy Analyst / Justice40 Program Lead, Office of the Secretary, U.S. Department of Transportation

Kristin Wood explained DOT's updates regarding EJ issues, including an action and strategic plan. She gave examples of changes in their department, including the start of a national electric vehicle infrastructure guidance, reconnecting communities that were cut off because of transportation infrastructure, releasing a tool to monitor disadvantaged communities' transportation needs, implementing air pollution reduction standards and issuing the U.S. national blueprint for transportation decarbonization.

1.2.4 Beattra Wilson, Assistant Director for Urban & Community Forestry, U.S. Forest Service, U.S. Department of Agriculture

Beattra Wilson explained the Urban and Community Forestry Program and shared DOA's updates, including localized grants for restoring green spaces and green jobs in urban communities, match waivers for proposals from disadvantage communities using the CEJST tool, and using pass-through funding partners to alleviate application administrative burdens.

Dr. White-Newsome welcomed questions and comments from the Council.

Ruth Santiago asked, to what extent does EPA consider environmental justice issues in permitting? **Ms. Engelman-Lado** responded that EPA is involved in several ways. She stated that it's more commitment when a local, state or regional authority is involved. She added that it depends on statutory authority within each department (Energy, Transportation, et cetera) with an EJ filter coming more into play. **Ms. Santiago** asked how the Title V Clean Air Act applies to environmental justice. **Ms. Engelman-Lado** replied that she would inquire into the legalities of that question and respond to her with answers later.

Nicky Sheets, PhD asked if the authority to decide permits is a delegation from EPA to the states. **Ms. Engelman-Lado** responded yes. **Dr. Sheats** asked if requirements can be added to that delegation that states have to follow. **Ms. Engelman-Lado** responded yes, but it depends on statutory authority both explicitly and implicitly. **Dr. Sheats** clarified that a statute or authority from the Clean Water Act and the Clean Air Act may be different from each other. **Ms. Engelman-Lado** agreed.

Jerome Foster asked how the approach to permitting has changed within the creation of the OEJ ECR office and with Administrator Regan. **Ms. Engelman-Lado** responded that some statutes have the EJ evaluation explicitly stated and some statutes give the authority to make the changes.

Beverly Wright, PhD, commented that she has seen workforce development projects related to forestry. She asked, when the project is over, what skills do those workers have? She expressed concern that training people to just plant trees is not enough and further training should be available. **Ms. Wilson** replied that more comprehensive training programs are available. **Dr. Wright** responded that she had not seen that in her experience. **Ms. Wilson** replied that improving the expectations around recruiting is needed.

Harold Mitchell asked if the grants are a one-time thing, or if will they be available in 2024? **Ms. Wilson** replied that it depends on if there are any available funds left after these grant applications have been awarded. If funds are available, the grant application window would reopen.

Co-Chair Shepard asked, what are the top considerations with cumulative impacts and when will a policy be issued? **Michele Roberts** asked, what happens to the overly impacted communities where it's too late to help? She also asked about workforce sustainability regarding the Forest Service. **Robert Bullard, PhD,** asked, to what extent is EPA working with other agencies to try to reverse the dumping of hazardous materials into mostly disadvantaged communities? **Dr. White-Newsome** stated, in the interest of time, that the responses will be forwarded to the Council.

DFO Washington announced the break to be followed by the public comment period. **Co-Chair Moore** reminded the Council that a quorum is needed to start the public comment period.

1.3 Public Comment Period

On June 13, 2023, the WHEJAC held a public comment period to allow members of the public to discuss environmental justice concerns in their communities. A total of 29 individuals submitted verbal public comments to the WHEJAC. An additional 39 individuals had signed up to speak but were not in attendance. Each speaker was allotted three minutes.

Co-Chair Moore welcomed everyone back from the break, explained the procedures of the public comment period, and gave a brief reminder to public commenters to stay within the time allotted and state the issue and their recommendations.

1.3.1 Malikka Karteron - Global25 (New York)

Malikka Karteron: Good evening. Thank you for the opportunity to bring remarks this evening. My name is Malikka Karteron, and I am the president and CEO of Global 25 based in New York. I have enjoyed the presentations this evening, and they were very informative. The question I am addressing is what resources are needed? The resources that are needed are real-time updates on legislation that addresses environmental issues so we can be advocates and ambassadors of the new positive legislation. Two, information and all changes to address systemic legislation policies that have disproportionately affected communities of color and disenfranchised communities, i.e., the placement of toxic release inventory sites. And we also need more conferences like this one. Also, more opportunities for specific local roundtable discussions and formation of action steps to address/bring change as it relates to social justice, environmental justice, educational justice and economic justice because they are all interrelated. Additional workforce development for environmental jobs, and also funding to host forums and events to address hyperlocal concerns, i.e., air quality and flooding.

People need to see a correlation between legislation, policy and action steps that in turn foster positive changes in their communities and their environment. Please let me know how I can be of further assistance in these endeavors. Thank you for this opportunity. Have a great evening.

1.3.2 John Mueller - Retired public works engineer (Guthrie, Oklahoma)

John Mueller: My name is John Mueller, and I am a retired public works engineer and former water treatment professional. And I thank you, again, for this opportunity to continue my advocacy for ending the practice of artificial water fluoridation. This is my 11th or 12th WHEJAC public meeting, and the Justice40 Initiative is a clear and present solution to the environmental injustice of water fluoridation. Justice40 investment can and should be directed to shifting and reallocating grant funding from the CDC's community fluoridation program to more targeted programs in communities of need. These are communities that call out with children literally crying in pain in their epidemic of tooth decay and horribly poor oral health.

The environmental injustice indicators are readily available and have been submitted for previous WHEJAC public meetings that I and others have attended. One category of Justice40 investment, and I quote from the White House website, "remediation and reduction of legacy pollution and the development of critical clean water and wastewater infrastructure." Ending fluoridation will result in substantial utility savings by ending the damage to drinking water infrastructure due to the storage and handling of the extremely corrosive and harmful raw chemicals required to fluoridate the tap water and also adjust for pH.

I pray that you will agree that with the pending TSCA lawsuit and the NTP's reviews of the science, the fluoridation controversy has now reached critical mass and that the time for fluoridation reform is now, from President Biden's highest priority initiatives on environmental justice and listening to the science as spelled out in his multiple executive orders, including 13985, 13990, 14008, and further reiterating and promoting those in the more recent Executive Order, 14091. The Biden administration is telling us the time is now.

In summary, it is time to apply the precautionary principle and for a paradigm shift to more effective and technologically advanced dentistry where needed most, instead of a one-size-fits-all attempt to treat the childhood tooth decay epidemic in disadvantaged families and communities with everybody's tap water. This can be achieved most judiciously and with integrity by the EPA conceding in the TSCA lawsuit with coordination through the Interagency Council.

Just one more thing, Ms. Tilousi -- Carletta, if I may -- please know I have a special place in my heart for Supai and Havasu Canyon with the spectacular waterfalls. I have packed in twice and hiked up from the Colorado River once and spent inspiring days and nights taking in and savoring their awesome beauty. Thank you again for the special opportunity to help promote the public health and especially the brain trust of our great nation. Thank you.

1.3.3 Katia Aviles - Instituto para la Agroecologia (Puerto Rico)

Katia Aviles: Thank you, everyone. My name is Katia Aviles. I work with Agroecological Projects here in Puerto Rico, and one of the reasons that I'm participating was I was very excited about hearing the presentations today and reading some of the initiatives regarding, particularly, Justice40 Environmental Justice and how economic justice and employment opportunities are trying to be weaved into this issue of environmental justice and access. And speaking as a person living and having been born and raised in Puerto Rico, the first thing is that the

PROMESA Act is something that is a gross environmental injustice, and that has been exacerbated by the FEMA recovery funding that has not taken into consideration the cumulative effects of many of the projects.

In this particular case, I'm referring to solar farms at the industrial level that are being built at an amazing pace without environmental oversight. They're creating short, temporary, still low-paying jobs even though they're more than what the communities nearby have seen probably. But they're short-term jobs that have led to increasing flooding in nearby communities that are displacing farmers, that are increasing the rent and the living costs of the surrounding farmers or farming communities. So even though it is solar, we have local initiatives such as micro grids doing solar on roofs that would actually enhance, put technology in the hands of people, and improve economic viability and maintenance of the investment in the long run. Within an industrial project, it devastates and destroys completely hundreds and hundreds of acres of rural lands, and that is something that is a Caribbean island. And having been cut off like we already experienced through Maria, we need to have our own food on our soils, not solar panels with cement under them.

And the second one is the U.S. Army Corps of Engineers projects are also under the guise of generating employment and improving the economy, improving mobility. And the reality is that this behemoth of infrastructure that are cementing and straightening natural waterways are actually also resulting in flooding within the communities. They're displacing people, and they're creating an even bigger problem in the long term because, as we have seen, our government, because of PROMESA and many other economic limitations, does not have the capacity to provide maintenance. So I would very much like the committee to take this into consideration and to further research and even support in any way possible the continuing economic and environmental exploitation of the people of Puerto Rico. Thank you.

1.3.4 Dora Williams - Delaware Concerned Residents for Environmental Justice (Newcastle, Delaware)

Dora Williams: I'd like to thank you for this opportunity. My name is Dora Williams, and I am a facilitator of the Delaware Concerned Residence for Environmental Justice, who is an affiliate of EJHA. And our organization focuses on promoting equity in fenceline communities as low-income communities of color and ensuring that they have a voice and the decisions that are made about the air that they breathe and the water quality that they use.

Repeated studies have shown that people of color are disproportionately exposed to areas of chemical spills, toxic dumping, flooding and the like. I live in New Castle, Delaware, the home of Croda, which is an ethylene oxide plant. I have friends that live in Mossville, Louisiana and in Texas. And these places are just unbearable to live in, some more catastrophic than others. And I am here to urge the WHEJAC to please impress upon President Biden's administration and the CEQ that it is vitally important that the funds that come down -- especially the executive order that was signed -- are appropriated to where they need to go. Some will have to be relocated and some can get help to stay where they are, but each will get what they need in order to exist in this society. I thank you very much for this opportunity.

1.3.5 Carlos Pinon - PODER (Austin, Texas)

Carlos Pinon: Thank you. Good evening, everyone. My name is Carlos Pinon, and I'm a project coordinator at PODER, a nonprofit organization based in Austin, Texas.

Specifically, I support our director, Susana Almanza, a member of WHEJAC in connecting with community-based organizations around central Texas so that they'll remain informed about the Justice40 Initiative and have access to resources that facilitate the process of securing federal grant funding over the next year.

The main concerns I'd like to bring to you today regard the Climate and Economic Justice Screening Tool, or CEJST. In particular, I consider the 90th percentile threshold for most environmental categories of burden, as well as the 65th percentile threshold for the socioeconomic category of burden for low-income too high. It has become apparent to me that this will limit many communities from acquiring funding as part of Justice40, despite being the same communities that have historically been under-invested and neglected, even targeted, and would fall under a general definition of disadvantaged based on their lived experiences.

Likewise, if Justice40 funding is awarded based solely or primarily on the CEJST all-or-nothing approach, the federal government will surely exclude underserved communities, especially communities of color and low-income communities who continue to bear the brunt of environmental and public health hazards. We, for example, have seen a census track in Montopolis, a low-income predominant Latina neighborhood in southeast Austin that is at the 89th percentile for housing costs, just one count away from qualifying as disadvantaged. The stringency of this tool leaves the impression of arbitrariness.

Lastly, the CEJST cannot capture the full breadth of the needs and burdens that exist among communities following criteria set by the federal government whose knowledge of a community does not match that community itself. So much of what a community experiences is cumulative -- a product of history, geography, and when speaking particularly about environmental injustice, race, which is noticeably absent from the CEJST. A tool with its emphasis on the quantifiable is not enough.

I recommend that, overall, the WHEJAC push for one, a more dynamic way of determining what deems a community disadvantaged; two, far less restrictive percentile thresholds; and three, the incorporation of factors like race that are inextricably tied to environmental injustice, the very thing that the Justice40 Initiative seeks to address. Thank you very much for your time and consideration.

1.3.6 Mark Weintraub - Reserve Management Group

Mark Weintraub: Thank you very much. My name is Mark Weintrob. I'm general counsel for Reserve Management Group, and I appreciate the opportunity to speak this evening on behalf of the recycled materials industry.

Most consider recycling is only the items that we put in the buckets at the end of our driveway. However, that only represents approximately 15 to 20 percent of actual recycling, even though we hear about it the most. The other 80 to 85 percent of recycling involves the industrial

recycled materials industry. Much of the industry resides in areas designated as EJ communities and has been there for many years and decades. The recycled materials industry operates at both ends of the infrastructure spectrum, providing the raw materials for creating new steel, aluminum, copper, zinc, et cetera, used in building infrastructure projects and at the other end of the spectrum, by processing old infrastructure into those raw materials, all in place of mining for virgin materials.

The recycled materials industry applauds the Biden administration for addressing EJ. This is undoubtedly a vital issue facing the nation. That said, I'm speaking with regard to collaboration between EPA and industry. I believe that engagement with industry and community is the most critical component for EJ. In my view, the EPA has not followed through on its directive to engage with industry, even though it is often mentioned. The director has repeatedly engaged with activists and local citizens in certain circumstances despite industry outreach and has ignored engaging with industry directly. I know several specific circumstances where this occurred, and both much to his urging have become very hot, one-sided, politically driven and adversarial situations.

On one hand, the administration wants to re-shore manufacturing and build infrastructure; yet on the other hand, this behavior is attacking the fundamental industries that produce materials for infrastructure projects. The results of this behavior has put a chill on the regulated community as opposed to the predictability industry requires.

In one very specific situation, the director opposed an already constructed, technologically advanced facility that had obtained its state air permit and all but one city permit. In spite of the fact that two months later, the Agency's Office of Enforcement and Compliance Assurance issued an enforcement alert with recommendations almost exactly describing what had already been constructed. Had the EPA engaged with both community and industry, and acted as an intermediary emphasizing the community's EJ concerns, and on behalf of industry, explaining the science and accurate facts to the community members in a collaborative manner, the temperature of all involved would likely have lowered enough to create understanding between the parties. Actual engagement, not mere talk and facilitation of collaboration with all concerned communities and the regulated community undoubtedly would drive more positive outcomes and collaboration. Thank you very much.

1.3.7 Pamela Bingham - Self Employed (Virginia)

Pamela Bingham: Good afternoon, distinguished members of the WHEJAC and CEQ EPA management. Thank you for letting me speak before 11:00 PM Eastern Standard Time. My name is Pamela Bingham. I'm speaking as a native of Jackson, Mississippi. I live between working in Maryland and my parents' home in Virginia. I'm an environmental engineer.

I currently have a 10-year-old girl scout troop member, Kenya (phonetic), recovering from chemo for her leukemia. I understand the challenges of proving causality and cumulative factors. I had Jackson, Mississippi friends with leukemia exactly 50 years ago. I grew up in an EJ community. I want to keep Petersburg, Virginia and Jackson, Mississippi, and communities like them, in the forefront on all of these issues because in 2023, we still have disparities, disparities and more disparities. The East Coast was reminded last week that air is essential. I

developed adult-onset asthma after working in Mississippi and New Orleans post-Hurricane Katrina. Last week, the Canadian smoke affected me so acutely that I had to stay inside.

To the Interagency Council, where is the coordinated resilience planning from CDC, HHS, EPA, NOAA, FEMA, and the other alphabets for extreme heat and the impacts on air quality? I know many seniors, including my own family, who do not use air conditioning, so staying inside on an extreme heat day could kill them. I fear that more death awaits in extreme heat events.

Resilience funding for disenfranchised, frontline fenceline communities must be a Justice40 priority. Water is also essential. Yesterday was the 60th anniversary of the assassination of Mr. Medgar Evers in Jackson, Mississippi. And if you don't know this Freedom Fighter, you should ask someone. He was a powerful person as was his wife. My biology teacher was a feisty 91-year-old, college alumnus who saw him on the day he was murdered and taught me about the environment.

I know that Mr. Evers would be vocal about Justice40 and the how of the implementation. We all know that inequities and environmental injustices still persist in Jackson with the current water crisis and the people are being poisoned. Yes, poisoned. Justice40 is a wonderful concept and a long time coming, but the administration has not fully identified details about the how. I work on this reality as an engineer who provides technical assistance to communities.

How are communities going to follow the money and ensure local and state accountability? Where is the penalty for state and local governments who do not equitably comply with the executive order? There must be accountability. Is the administration going to tell local and state government, distribute the money equitably or lose all of your federal funding? How will you make Mississippi and Louisiana and Texas and red States accountable for millions of dollars?

Lastly, the CEJST tool is flawed without the inclusion of race, period. Disadvantaged communities will be missed, ignored and excluded without the inclusion of a race indicator, period. CEQ, please do not continue to ignore a defective CEJST at everyone's peril. Dr. Jacobi Wilson, David Paget, Robert Bullard and Beverly Wright have all, I'm sure, assessed and attested the failures of the present CEJST, period. Thank you for your consideration of my very serious concerns.

1.3.8 Amanda Carrillo - SANAR (Southeast Austin neighbors and residence) for community & environmental justice

Amanda Carrillo: My name is Amanda Carrillo. I am from Austin, Texas. I come to you in regards to funds for our state. I currently live off of McCall Lane in Austin, Texas, and my city of Austin has allowed the federal airlines to build a 6-million-gallon jet fuel tank farm 430 feet across from where I live, which is mainly a community of color.

We're asking that there has to be consequences. Somebody has to be liable for what is going on. This continues to happen, especially in Austin. This happened in the nineties, not that far from me. Another tank farm, an oil farm was -- a lot of people got sick, and now down three miles, six miles away, it's happening again to my community. Nobody ever looked into this. Nobody ever looked and notified us or anything. And it's mainly people of color. The people that lived

six miles away from me that it happened to in the nineties, it always happens to people of color, and it just continues to happen. And we're asking that you look into this, and we have continuous displacement and continuing environmental justice just all around us. And that's all I have to say for right now. Thank you.

1.3.9 Alejandria Lyons - NM No False Solutions (New Mexico)

Alejandria Lyons: Good afternoon. Thank you all for allowing public comment and providing an in-person option for many of us. My name is Alejandria Lyons. I am the coalition coordinator for a grassroots indigenous and youth frontline-led coalition called New Mexico No False Solutions.

I'm here today to let you know of our concerns of Justice40 funds potentially going to carbon capture, hydrogen, and other unproven climate technologies. This morning our coalition actually sent a letter to the Department of Energy outlining some of our concerns with the WISHH Hydrogen Hub, which is the Western Inter-State Hydrogen Hub. This goes through Colorado, New Mexico, Utah and Wyoming. And the reasons why we're concerned about this is because already our agencies do not have the tools to keep up with things such as classic wells, which are being proposed for carbon capture. We are very concerned about the public health crisis that this could cause.

One, hydrogen is highly unsafe via transportation in gas pipelines. It's six times more combustible than natural gas. One pipeline that is proposed in the NAPI project by a company is called Tallgrass. This is undisputed that hydrogen actually burns hotter and is corrosive to the pipelines for which it's being proposed to be transported in. Hydrogen is not necessarily clean; it's really not clean at all if you really look at it. Indirect greenhouse gas can extend the life of methane in the atmosphere and hydrogen leakage from WISHH and other production sites could contribute significantly to global warming. This is not clean energy and a silver bullet in the way that it is being touted at the national level.

What we are asking is that we do not want to see economic investment for federal funds that are intended for Justice40 environmental justice initiatives. Because what's going to happen is that states like New Mexico and other places in the west are gonna be left holding the bag. These are unproven technologies. The research that is out there is being funded by oil and gas production. We want real solutions that are backed by science from the grassroots level. We also don't want to see offsetting schemes that would allow good projects such as clean, actual community-owned renewables being used as offsetting schemes in this entire climate scam.

So we hope and we urge the Biden administration to promise us what they already have promised us, which is climate action now. And to declare a climate emergency by not using our dollars for environmental justice communities. Thank you all.

1.3.10 Ennedith Lopez - Youth United for Climate Crisis Action (New Mexico)

Ennedith Lopez: Good afternoon. My name is Ennedith Lopez, and I am the policy campaign manager at Youth United for Climate Crisis Action. We are also members of the No False Solutions Coalition. We are a youth-led, climate justice organization located in Northern New

Mexico. We work with approximately 200 youth members, coalition groups, frontline, and POC communities throughout the state. I am here today to speak on Justice40, a monumental initiative intended to protect and invest in our communities. Yet I want to run against false solutions such as hydrogen and carbon capture and sequestration, also known as CCS, as viable solutions to the climate crisis. This technology framed as clean energy does not belong in an already water-scarce state like New Mexico, as the technology will prolong our toxic dependence on fossil fuels further contaminating our land, air and water. The initiatives pursued by WISHH, the Department of Energy and other federal agencies counter the just and equitable action that must be taken.

The science has pointed time and time again to a rapid phase-out of oil and gas production by 2030. Hydrogen and CCS will continue to enforce this country's legacy of environmental racism by sacrificing our health, futures and the environment in the interest of oil and gas profit. The climate crisis is already here. People in New Mexico have been suffering through mega-droughts, enormous wildfires, displacement and extensive pollution because of systemic inaction. New Mexico youth are resisting the hydrogen and CCS projects that are actively undermining a path towards a just and equitable transition.

In a letter that the No False Solutions Coalition sent to the Department of Energy just today, we noted how in 2010, out of a $2.66 billion budget, nearly half was allocated for nine CCS demonstration projects. Whereas in 2017, only three projects remained active and cost the Department of Energy $615 million. While New Mexico has been exploited by the inconsistent economic cycles of the extractive economy, investments in false climate solutions will result in stranded assets that could have been directed to diversify our economy and fund locally owned wind and solar energy projects. The future of climate and New Mexican youth can no longer afford the systemic modification of our time, our environment and our future.

Our organization and communities envision a just transition towards a regenerative economy, investment into real solutions, like local solar and wind projects, energy democracy and better regulation and enforcement. WHEJAC has the power and capacity to relay these concerns to this administration. Let it be clear to the Biden administration that the youth of New Mexico do not support hydrogen carbon capture and other false solutions as it will put our communities and environment on the line. Let's choose a path towards prioritizing real solutions and an equitable just transition. Thank you.

1.3 11 Sofia Martinez - No False Solutions Coalition (New Mexico)

Sofia Martinez: Good evening, chairs and members of the Committee. Thank you for your work on moving EJ forward in this administration. My name is Sophia Martinez. I'm a community organizer in New Mexico and co-coordinator of the Los Martinez Institute. We're also members of the No False Solution Coalition here in New Mexico. So it's good to hear my colleagues on the air as well and presenting. I'll be addressing the Justice40 Initiative as well.

We're very disappointed and disheartened by the funding from this initiative that will redirect dollars to false solutions as a response to climate crisis, namely hydrogen, right. Justice40 funds are best spent for the areas and the entities for which it is set to benefit, not another under-researched process being sold to the public as safe and clean. Those in power and their experts

seek to develop hydrogen as a response to the climate crisis, promoting the idea that it is a clean alternative to fossil fuels.

Hydrogen is not a clean energy alternative. It needs more research and needs to be tested to capacity, et cetera. Hydrogen ensures the maintenance of the fossil fuel industry and the use of our precious water. It has been stated as highly flammable, corrosive, and will be transported through even more pipelines and railroads across this country, threatening our communities, workers and our natural resources.

The accident at Palestine and the many other accidents are clear examples of the danger of transporting hydrogen. New Mexico and its people cannot continue to be the testing ground for these dangerous under-researched technologies. We are rich in wind and solar, public and community. Solar and wind projects need to be supported and funded. Priority funding should also be directed to these renewables and developing the transmission capacity needed to promote these energy sources nationwide. We urge you to advise the administration against false solutions, including hydrogen, carbon capture and storage, and nuclear permitting.

Funding of these solutions should not be pushed on our communities. Historically, we have experienced poor permitting and less regulation and enforcement from contaminating and dangerous processes. This is environmental racism. Our communities do not see improvements in regulation and permitting, and we hope to see them soon. Rather, we have seen the Supreme Court setting back along protections. We know we can develop renewables with less harm to our earth and its people, and ask that you push these energy alternatives and funding to build the capacity to carry this energy forward and build the capacity of our communities because that is what one of the stated goals of Justice40 is.

I also want to address the issue with TCTACs. We hope that these institutions, many of which have never paid any attention to environmental justice, become knowledgeable and proficient in this field and conserve the duty that they have been directed to serve. So in conclusion, the climate crisis cannot be what constructs New Mexico as a national sacrifice state for nuclear research and testing and now hydrogen. This is climate racism and environmental and climate injustice. We say no to hydrogen of any color. This is a human and should be a civil right.

1.3.12 Soni Grant - No False Solutions Coalition and Center for Biological Diversity (New Mexico)

Soni Grant: Hi, my name is Soni Grant, and I'm a campaigner with the Center for Biological Diversity based in New Mexico. And I'm also a member of the No False Solutions Coalition. The No False Solutions Coalition is a member of the Climate Justice Alliance, and we're really grateful to be here today, so thank you.

I'm here to speak to the issue of Justice40. As you know, Justice40 is intended to spur investments in clean energy and environmental justice, but unfortunately, the Department of Energy and other federal agencies are intending to use these monies to invest in hydrogen carbon capture and other climate scams. These are not clean technologies. Ninety-nine percent of hydrogen produced today is made from fossil fuels in a process that emits carbon dioxide and health-harming pollutants. Industry is proposing to capture and sequester this carbon, but that

too proposes unacceptable risks of groundwater pollution, health harms and earthquakes. As you've heard already today, hydrogen is also incredibly dangerous to transport via pipeline because it's more explosive, more corrosive and burns hotter than gas. So I'm here today to urge WHEJAC to stand with the environmental justice movement to oppose climate scams like hydrogen and CCS. Justice40 monies should not be used to fund these technologies because they're not clean and they do not advance environmental justice.

The science is clear that to have a fighting chance of limiting planetary warming to 1.5 degrees Celsius, developed countries like the United States need to phase out fossil fuel extraction by 2030. Hydrogen is not the way to get us there. In many oil and gas-producing counties in New Mexico where I live and work, air quality is so poor that it exceeds federal health standards. A hydrogen and CSS economy will only exacerbate these burdens. The hydrogen hub being proposed by New Mexico and other western states would perpetuate our region's reliance on fossil fuels at a time when we need to rapidly change course. This hydrogen hub would continue the legacy of sacrifice zones in our state that Sophia just mentioned, which disproportionately harms indigenous peoples, people of color, low-income communities and youth in New Mexico.

Today our coalition sent a letter to the Department of Energy urging Secretary Granholm to reject the Western Inter-State Hydrogen Hub and all hydrogen hubs across the country. And we hope that you, WHEJAC, will join us on this call.

We are tired of false solutions that commodify life and divert valuable time and funds. Communities in New Mexico can't afford these distractions and frankly neither can the climate. So we're asking you to represent our communities and push the Biden administration away from CCS, hydrogen, and other carbon scams that are delaying transition towards proven and sustainable solutions and putting our lives on the line once again. The New Mexico No False Solutions Coalition has a vision of a just and regenerative economy that honors the earth and all sacred life powered by real solutions and energy democracy. Please help us achieve that just transition and vision. Thanks so much.

1.3.13 Jamiah Adams - The Climate Reality Project

Jamiah Adams: I cede my time to another commenter.

1.3.14 Roselyn Tovar - Communities for a Better Environment (Wilmington, California)

Roselyn Tovar: Hello, my name is Rosalyn Tovar, and I am the energy researcher at Communities for a Better Environment, a member of the Climate Justice Alliance. I currently work in Wilmington, California, in the harbor area of Los Angeles where community members face daily the impacts of climate and environmental racism due to the heavy presence of the fossil fuel industry. I'm here today to speak on the issue of carbon capture and storage, a core strategy in the proposal rule.

The U.N. called the CCUS sector unproven with unknown risk. Energy engineering-based removal activities are technologically and economically unproven, especially out of scale and pose unknown environmental and social risks. Transporting and storing CO2 involves a massive network of perilous pipelines connected to underground injection sites, each with their own set

of dangerous pipelines that can leak or rupture. Compressed CO2 is highly hazardous upon release and can result in the asphyxiation of humans and animals.
Underground storage poses additional risks such as potential leaks and contamination of drinking water. These hazards apply to all the current and proposed variants of CCS technologies. Most projects-use CCUS slated to be deployed are in black, brown, and indigenous or poor white communities. Carbon capture projects will lock in fossil fuel pollution and impact the communities while greenwashing the reputation of toxic corporations. A study in the European Union showed that adding carbon capture to power plants increased nitrogen oxides by 44 percent, particulate matter by 33 percent and ammonia by a whopping 30-fold increase. CCUS projects will exacerbate environmental disparities and lead to more environmental racism. CCUS means business as usual for polluters by design.

CCUS allows corporations to keep extracting and burning fossil fuels. It does nothing to address the devastating impacts of fossil fuel extraction. BP and oil company with billions in revenue has stated that CCS will enable the full use of fossil fuels across the energy transition and beyond. Black, indigenous and people of color will continue to carry the burdens of industry in the name of decarbonization. CCUS is not part of a just transition. It is dangerous to rely on the false promise of CCUS. For the deep cuts in emissions we need, we call on the EPA and the Biden administration to pivot away from carbon capture and storage as core greenhouse gas emission reduction strategy and support real community-led solutions. Thank you for your time.

1.3.15 Siqiniq Maupin - Sovereign Inupiat for A Living Arctic (Fairbanks, Alaska)

Siqiniq Maupin: Thank you. My name is Siqiniq Maupin. I'm the executive director of a small non-profit Sovereign Inupiat for A Living Arctic. We are based in Fairbanks, Alaska, and work to bring environmental justice to the forefront of conservation. I am Iñupiaq, and my people are from the Arctic Slope of Alaska. There is a public health crisis in the Arctic Slope because of extraction. We have rising cases of respiratory illnesses, cancer in children and young people in their twenties, early onset Alzheimer's and more in our tiny communities of 500 to 5,000 at most, an improbable statistic. Then the government blames us because of cigarette and vehicle exhaust.

On top of this, we are given dangerous experiments like Ice911 and the Arctic Ice Project. This is a false solution that treats indigenous peoples like test rats. There needs to be laws and policy implemented that allow government agencies to make decisions they know are best for the public and hold corporation leaders accountable with serious jail time instead of paying some fine. We need laws that state food security, clean air, and access to clean water must be met before any permits for extraction are permitted. There are no policies or laws in the Bureau of Land Management that prevent genocide from knowingly approving a project that will cause death in communities.

We invite all the people making laws, money and gains from oil and gas and false solutions to bring their children to our community and sacrifice their health, bury their brother, mourn their mother, cry for the sick suicide of someone younger than 20, walk the streets with no money, food or shelter because a wildfire took everything you have. We want you to feel what you would subject us to, but we know you will stay safely in your chair while we die.

We see the second wave of attempted genocide against the Iñupiaq peoples by poisoning our water, our air, our land, our food, causing food insecurity, sick and dying children, elders, caretakers, pillars in our community. The Willow Project mentioned suicide multiple times, and that project increases depression, anxiety and possibly death by suicide. Deb Haaland publicly stated this project is a gross human rights violation. Biden said no more drilling on public lands, but here we are. Will you stand up for what's right and fight for justice? Or will you delegate money towards false solutions that are going to kill people? Are you going to fight for what's right and justice or will you delegate money towards false solutions that will compromise the biodiversity of our planet, that will compromise the help and security and safety of all, and companies who hope indigenous people die so we can't protest their genocide? Thank you.

1.3.16 Sylvia Chi - Just Solutions Collective

Sylvia Chi: Thank you. My name is Sylvia Chi. I'm a policy analyst with Just Solutions Collective. I wanted to raise some issues about the implementation of Justice40 in three Inflation Reduction Act programs.

The first is the home energy rebates. As you may know, these rebates provide almost 9 billion in rebates for energy efficiency and electrification, which both the White House and Congressional Democrats have held up as an example of environmental justice wins in the IRA alongside several other organizations. We've asked DOE to require that the states that will implement these programs do so in line with the administration's Justice40 commitment and ensure that 40 percent of the rebates are reserved for residents and environmental justice communities. This is the flagship program within the IRA that individuals and households will interact with and benefit from directly. It could be the best way to show EJ community members that Justice40 can deliver meaningful benefits. I'm bringing this to your attention today to recommend that DOE require this 40 percent set aside for environmental justice communities within the home energy rebates.

The second program is the Greenhouse Gas Reduction Fund, which is the single largest program within IRA in terms of direct spending. This program has been designated a covered program under Justice40, but EPA has also expressed that the awardees will be responsible for ensuring compliance with Justice40. We are working in a coalition with other organizations to work with both EPA and potential applicants and partnering institutions to ensure that environmental justice is centered and community members are empowered within this program. And we've developed best practices for equity and governance pledge to operationalize this. At a high level, those best practices include prioritizing direct benefits to low-income and disadvantaged communities, requiring community engagement, providing accountability to local communities, operating with transparency and applying robust safeguards. So I'm asking WHEJAC to recommend to EPA to incorporate these best practices into their evaluation and selection process of applicants to the GGRF competitions and ultimately into the grant award agreements.

And finally, the third program is the tax credits, which as you may know, account for the vast majority of spending in the Inflation Reduction Act, totaling at least $270 billion with some estimates of over $1 trillion over the next decade. With respect to Justice40, the Treasury Department has not designated any of the tax credits as covered programs. So I urge WHEJAC to recommend to the Treasury that these clean energy tax credits are designated as covered

programs under Justice40, so we can ensure that the benefits from these investments flow to disadvantaged communities. Thank you.

1.3.17 Kiara Pereira - Urban Tilth (North Richmond, California)

Kiara Pereira: Hello, my name is Kiara Pereira. I'm a just transition organizer at Urban Tilth based in North Richmond, California. Here to speak on the issue of Justice40.

North Richmond is split into both unincorporated and incorporated communities, yet both are underserved and under-resourced. We are located next to the Chevron oil refinery and have suffered a long history of extraction from the fossil fuel industry. Recently, there has been an approved hydrogen project that will be built at a landfill currently located in North Richmond. After further research, it was discovered that Chevron is a major sponsor of this project. Chevron is one of the biggest contributors to air pollution in North Richmond in addition to freight transportation such as trains and trucks. North Richmond has asthma rates three times higher than the rest of the county, a result of cumulative impacts and of poor air quality.

Although this project is being praised for being "green hydrogen," it is in sponsorship with one of the primary polluters in my community. Hydrogen is being greenwashed despite its direct ties to fossil fuels. As for silencing frontline communities, the company behind this new hydrogen project has continued to ignore the predominantly black and brown community that it claims to respect. With most North Richmond residents speaking predominantly Spanish, they put in minimal effort to provide spaces where language justice was prioritized. This was only done after continuous pushback to do so.

North Richmond is not alone in this fight to be heard, which is why I'm here today in solidarity with the CJA and the many fenceline communities being turned into sacrifice zones. A just transition requires severing dependence on companies like Chevron and other untested technologies to supposedly solve the climate crisis. I am here today to state how an over-reliance on hydrogen projects by the Biden administration cannot continue as it leaves frontline communities vulnerable and silenced in the discussion of moving away from fossil fuels. Thank you for your time.

1.3.18 Linda Robles - Environmental Justice Task Force (Tucson, Arizona)

Linda Robles: Thank you for giving me the opportunity to be here today and speak to you in person. I'll be talking on the Justice40 Department of Justice Initiatives. My name is Linda Robles. I live in the Tucson, Arizona area. I am the owner and founder of the Environmental Justice Task Force, a grassroots, community- based organization, which gave birth in 2014. The Environmental Justice Task Force represents a Tucson Southside residence whose lives have been historically disproportionately impacted by a host of social, racial and environmental injustice issues in Tucson, Arizona.

I believe that all people deserve to live in a clean, safe, healthy and sustainable environment no matter what color or income they live under. Since the 1940s, the military industries have been dumping hazardous waste into Tucson's Southside community washes and landfills poisoning our land and our precious water. A 24-square-mile area in the Tucson Southside was designated

a federal Superfund site when EPA discovered TCE contamination in the drinking water in the 1980s, which included the Tucson International Airport and several military bases. But the EPA never cleaned it up. Later, the EPA detected 1-4 dioxane in the area. Later again after that, EPA detected high levels of PFAS in the area as well when our local community group demanded more testing.

PFAS are highly toxic, forever chemicals that cause a wide range of health problems such as damages to the liver, kidneys, decreases the immune system and increases the risk for cancer, endangers pregnant women and the unborn. PFAS are persistent in the environment and bioaccumulate in humans and wildlife. PFAS are also known as forever chemicals, meaning they will never break down naturally and they will continue to poison people. They must be removed.

TCE and dioxane are other dirty industrial chemicals that are carcinogenic. Thousands of Southside residents have been forced to drink, bathe and cook in water contaminated with high doses of carcinogenic cocktail mixtures of toxic chemicals causing many health problems in our community. These residents cannot afford to move away at the drop of a dime and are oppressed by the imbalances of social capital and political power. I personally lost a 19-year-old child to a rare form of cancer that I strongly believe was caused by water contamination.

The PFAS issues in our community only add to the already social, racial and socioeconomic issues that we have been suffering for decades. We need to clean them up but it has to be done in a safe way. We need to do it in a way that will not affect EJ communities. The 2007 death of my child, and the discovery of new carcinogens in our contaminated water, led me to establish the Environmental Justice Task Force and to join the national PFAS Contamination Coalition.

Communities near current and former DOD sites are at much greater risk for PFAS. Many communities like mine are now struggling with the daunting task of navigating complex and lengthy cleanup processes under CERCLA. Sites under EPA jurisdiction are providing technical assistance, but these services are not available for communities impacted by DOD sites that are not listed on EPA's national priorities list. President Biden's Executive Order 14008, tackling the climate crisis at home and abroad, pledged to provide 30 percent or more of the overall benefits flow to disadvantaged communities as well as legislation needed to achieve those 40 percent goals. The Justice40 starts today with us.

I recommend that the WHEJAC members report back to Congress and let them know to provide equal percentage of federal funding support for effected communities to hire independent, scientific, technical and health consultants so that they are able to meaningfully participate in the site assessments and cleanups through the justice initiatives. My time is up. Thank you, guys, so much.

1.3.19 Martina Dawley - Hualapai Tribe (Arizona)

Martina Dawley: Good evening. My name is Martina Dawley, and I am the Tribal Historic Preservation Officer for the Hualapai Tribe in Northwestern Arizona, which is along the Grand Canyon and Colorado Rivers. I'm here to talk about a lithium mining exploration project on Bureau of Land Management Land, also known as BLM, that is threatening the medicinal spring

of Ha ‘Kamwe.

The mining activity is proposed for the big Sandy River Valley, a sacred landscape to the tribe and surrounds tribal land on three sides. Ha ‘Kamwe is a sacred medicinal spring where native people have gone since the beginning of time, immemorial for healing and prayer. Our people have gone there to carry out ceremonies related to birth, young women's coming of age and other life transitions. Ha ‘Kamwe is recounted in our ceremonial song cycle called the Salt Song Trail.

BLM is currently considering approving a lithium mining exploration project on surrounding BLM land, titled the Big Sandy Valley Exploration Project, Phase three. This is on top of other exploration activities that have already damaged the land all around the spring. BLM issued the draft environmental assessment in spring of 2021. Prior to its issuance, BLM did not consult with the tribe and the EA had limited information and no analysis of the impact of the drilling on the spring. The tribe requested to become a cooperating agency pursuant to the National Environmental Policy Act. This request was repeatedly denied all the way up to the director of BLM. The agency reversed its position on this issue once the recent agency directives on cooperating agencies were released. The tribe also repeatedly requested that a thorough environmental impact statement be completed for the project so that BLM and the tribe can know and understand the impacts of drilling on the spring.

BLM has no baseline data for the spring and has required no groundwater modeling to show that temperatures and flow to the spring will not be impacted. BLM's EA analysis for Ha ‘Kamwe and the surrounding sacred landscape is woefully inadequate. We know that this administration values real meaningful tribal consultation, protecting sacred landscapes and tribal stewardship on federal lands. But we believe that this council could and should be doing more to address mining that is impacting frontline communities, particularly tribal communities. As the nation continues to transition to a clean energy economy, indigenous communities are poised to bear much of that burden.

A recent report found that many of the minerals, that are being sought to transition the economy to electrification, are located near indigenous communities. For example, 97 percent of nickel, 79 percent of lithium, 68 percent of cobalt and 89 percent of copper deposits are located within 35 miles of Native American reservations. The 1872 mining law continues to adversely impact the tribal frontline community without much input from the impact communities. I understand that the interagency working group on mining reform plans to issue the recommendation shortly.

I hope that the tribal mining provisions issued during the White House Tribal Nation Summit last year were not the only recommendations that we see regarding tribes. I hope that WHEJAC advocates for mining reform and recommendations that reduce environmental justice impacts on frontline communities, particularly tribal communities. I have one more paragraph here, but it's in writing, and I will submit that as well. Thank you so much for your time.

1.3.20 Ian Zabarte - Western Bands of the Shoshone Nation of Indians

Ian Zabarte: Good evening. I'll be brief for the record. I am Principal Man Ian Zabarte of the Western bands of the Shoshone Nation of Indians, secretary of state for the Western Shoshone

National Council and Secretary for the Native Community Action Council.

Our country stretches from the Mojave Desert in the south to the Snake River in the north, defined by the 1863 Treaty of Ruby Valley, the only ratified treaty in California and Nevada that is in full force and effect. We have made extensive comments to federal agencies, protested with tens of thousands of people, and brought lawsuits over many decades to address the abuse, hazards and threats posed by nuclear weapons, nuclear waste and uranium that both disproportionately and adversely affect the Shoshone people. We love our horses. The U.S. Department of the Interior, Bureau of Land Management blamed Western Shoshone livestock for the destruction of the land caused by nuclear weapons testing, then confiscated our livestock, destroying our livestock economy guaranteed by treaty as hunters and herdsmen.

Shoshone people bear an involuntary disproportionate burden of radiation exposure risk downwind from the Nevada National Security Site where the proposed Yucca Mountain high-level nuclear waste repository is located. We have the only ownership contention in Yucca Mountain Licensing at the Nuclear Regulatory Commission Docket 63-001. The Department of Energy secretly operates and uses Western Shoshone property yet cannot prove ownership required for licensing, according to 10 CFR 60.121, because Western Shoshone Indian title remains unextinguished.

There has been no explicit act of Congress to diminish or extinguish Indian title to 30 million acres owned by the Western bands of the Shoshone Nation of Indians. The treaty is the tool for justice. We need the president to create the Shoshone homeland under Article 6 of the Treaty of Ruby Valley, so we have a safe place to live, grow and develop. We need federally funded projects to prove ownership throughout our country, but in other places where other tribes exist.

In 1990, the Department of Energy created cultural triage employed to dismantle our living lifeways in relation to Yucca Mountain. Cultural triage is defined as the forced choice decision-making by an ethnic group to a development project. Cultural triage features are forced upon ethnic Native Americans for development or profit. The pattern and practice of the Department of Energy and coordinate agencies inflict conditions intended to bring about the destruction of the Western bans of the Shoshone Nation of Indians, violating peremptory norms in international law and the Proxmire Act of 1988, 18 U.S.C. 1091, and the 2009 Human Rights Enforcement Act.

Origin is important. Shoshone individuals must be followed for health consequences. We need federal agencies collaboration. We need research funding, monitoring, surveillance and registries for Shoshone downwinders. It's done in other parts of the world, but not here. We need to have that for our future. Andrews county, Texas, whole tech facility is licensed for high-level nuclear waste for commercial reactors. That waste sent to Texas will be stranded and abandoned there without robust environmental regulations because Yucca Mountain will not be licensed.
And we have constitutional protection under the Treaty of Ruby Valley to prevent that from happening.

Finally, nuclear weapons are illegal under international law, the treaty on the prohibition of nuclear weapons that was entered into force on January 22nd, 2021. We are part of making that

happen. We stopped the weapons testing, we stopped the high-level nuclear waste repository, and the waste is gonna remain at those reactors unless it's shipped to Texas where it is expanded and abandoned. We can protect our environment, our mother Earth, by ending our obsession with nuclear weapons of mass destruction and by joining the Treaty currently before Congress, the Treaty on the Prohibition of Nuclear Weapons, H.RES.77. Thank you.

1.3.21 Tupac Enrique - Tonatierra

Tupac Enrique: Good evening. Martin Luther King in ‘67, seemed to have emerged from the era of civil rights to the era of human rights, and he was assassinated in '68. Shortly after that in an interview with Harry Belafonte, he made the comment they always stuck with me. He said to Harry Belafonte, “I'm afraid they're integrating into a burning house.”

Today, in these times, not only climate crisis, climate chaos and a climate cancer. The minors here is suffering from a climate cancer. The climate cancer that we all endure and are suffering through are really being passed on to the next generation, is driven by the pathogen of the fossil fuel industry.

Relative today, my name is Tupac Enrique Acosta. We come to you with two very specific recommendations. These recommendations are encapsulated by the concepts of the right of free, prior and informed consent and the principle of environmental justice. This is what Martin Luther King was speaking of. Amendments of Justice are principles within the U.S. Civil Rights (inaudible). Free, Prior, and Informed Consent emerged at the international level as a norm as the standard, which is very significant for this morning more than it would've been before. Because it wasn't until 2007, with the United Nation Declaration on the rights of indigenous people, that this concept of free, prior and informed consent came to bear on the rights of indigenous people, and then now, three years ago, 2020, the US, Mexico-Canada Trade Agreement with a chapter on indigenous civil rights recommendation at the local level. When you flew into town today, and you came into Sky Harbor, you flew over a community that is no longer there except in the remnants of the original Mexican model that was relocated to make way for that airport.

Recommendation; we call upon the White House Environmental Justice Advisory Committee to recommend to the City of Phoenix the implementation of an effective policy of cultural competency in the planning department of the city as a necessary civil rights guarantee to ensure the realization of environmental justice in all public projects of the (inaudible) and (inaudible) going foward. The issue here is the connection being made between the International Center of free, prior and informed consent and the principle of environmental justice as they may apply at the local community level, without losing that linkage and systems of accountability at the international, for example.

Recommendations to the EPA, to the Environmental Justice Department; update the website. Last August at the United Nations, the last session of the Committee for Elimination of Racial Discrimination missed something from the hot issue. But if you go to the EPA website today, and I did, you don't have a current report on the discussion that took place with (inaudible) on this issue of racial discrimination in terms of environmental racism and environmental justice.

Therefore, what we are proposing now, at the international level, as a grassroots community made organization of indigenous peoples, is the (inaudible) organization that the international human rights standard of free, prior, and informed consent must not be linked concretely.

(Inaudible) the policy and mechanisms to be measured at the community level linked to the civil rights guarantees of the principle of environmental justice across the board of all U.S. jurisdictions. And that a second reporting mechanism must mirror to monitor these violations of human rights (inaudible). And the context of the obligations of international law that the U.S. must comply with as a signatory to the international convention of the elimination of all forms of racial discrimination. This advisory council, it behooves you to instruct the department to update their website and provide the community with the information that is required to make accountability for this racial discrimination which is still the fastest across the board for our communities and indigenous nation.

Having said all of that, you have it in our oral comment is complimentary to the written statement which will be submitted, And we ask of you one last question for advice to the Council, when the Motorola plant exported their production line from Phoenix to Guadalajara 30 years ago, the TCE chemical, trichloroethylene, the report on the uses of that chemical among pregnant women in Mexico was never part of any evaluation that was ever brought forward, in spite of the fact that question was asked. The question to you now, for the committee, the advisory committee, to bring us back that information, or if not advise us as to how that question of the history of TCE and Motorola and Mexico can finally be answered after more than 30 years. Thank you so much for your time and attention and patience. The written comments will be submitted. Thank you.

Co-Chair Moore reminded everyone of the long-standing contributions Tonatierra and other organizations have made in environmental justice with the Southwest.

1.3.22 Stuart Chavez - Havasupai Tribe (Arizona)

Stuart Chavez: Good evening, everyone. My name is Stuart Chavez. I am a member of the Havasupai Tribe. I am a former Havasupai tribal Council member, and I come from a small village called Supai. As many of you know, Carletta Tilousi is also from Supai.

I came today to speak to you all about uranium mining that has riddled us and threatened our tribe for many years. This battle that we've been fighting is an inherited battle from our elders. Many have gone and passed at this point, and unfortunately, we're still having to combat uranium mining up until today. We have a mine that's called Pinyon Plain Mine, formerly known as Canyon Mine, that currently lives next to the traditional cultural property of Red Butte Wii'i Gdwiisa -- that's the Mother Earth's lungs.

Our elders originally tried to combat the mine, but unfortunately it was grandfathered in. With it being grandfathered in with the 1872 mining law, it allowed the mine to continue to live on and destroy the Earth. Right now, it's currently destroying millions of gallons of water on a daily basis. Unfortunately, around 2017 or '16, the mine had pierced our aquifer, the Red Wall Moab aquifer, and there's hundreds to millions of gallons of water being wasted because of this mine.

As a former tribal leader, we've dealt with entities like the ADEQ EPA and, unfortunately, when we've dealt with these entities, we've always tried to ask who's in charge of enforcement. Who's monitoring these mines? Because the Arizona Department of Environmental Quality always told us it's the most highly monitored mine in the world. I beg to differ. Unfortunately, Arizona's Department of Environmental Quality did not. They were saying that they are only in the business of permitting.

And it's kind of ironic, actually. We had an individual that spoke from EPA that was talking about the authority of EPA on permitting. And recently they had just renewed the permit for the Pinyon Plain mine. And so it begs to differ whether or not these individuals are actually looking for environmental justice or if they're actually just doing it for the money.

For the Havasupai tribe, we've been attempting to close this mine down because this water resource to our aquifer leads right into our village. Our water is constantly at threat. Not only that, but we also have springs that are within the region that are threatened to be contaminated because of uranium mining. Previously having conversations with EPA and ADEQ, we had them in the same room, and they were pointing fingers at one another. Nobody knew who was supposed to be monitoring because Arizona's Department of Environmental Quality said they weren't going to do it. But EPA said that they delegated their authority to ADEQ. Where's the environmental justice in this? It doesn't make any sense, especially because there's water being destroyed on a continuous basis. It threatens many other tribes, the Colorado River, the Havasupai tribe and, in particular, the city here Phoenix benefits from the Colorado River. What sense does it make to destroy any other water that is benefiting many people in this region? It doesn't make sense.

So I asked for the WHEJAC to consider the environmental justice of protecting not only one of the natural seven wonders of the world, but also the natural resources that are within the Grand Canyon region. Thank you.

1.3.23 Jesse Giambra (Phoenix, Arizona)

Jesse Giambra: Hello, good evening, members of the Council and to the public and everyone present, thankful to be here. My name is Jesse Giambra. I'm a public school educator here in Phoenix, Arizona. And I want to recognize that all of us are here because at some point in our ancestral history, our ancestors were part of a community that had a relationship with the earth. And I know that all of us here are so passionate about the earth and for our future and about environmental justice.

I wanted to share one of the solutions that we're working on here in Arizona and recommend that there be a great federal, international and universal emphasis placed on the practice of gardens in schools. I'm a co-chair of the School Garden Community of Practice with the Arizona Department of Education here. And we are working on just building a movement of getting the children and their hands in the soil and getting them in touch with this source of life.

And I'll share. I was with my students today and we were outside and we were harvesting seeds. And this 12-year-old, he came up with the idea of infinite currency. And he said, money isn't the only currency, we have the seeds, we have the water. And so, the children came together around

the concept of infinite currency and that we have everything we need. And I just believe that this next generation is going to need the most advanced and sophisticated and highest level of tools and wisdom and knowledge and guidance and support in order to do the most insurmountable of tasks, which is that they need to balance the necessities of life with life itself. And I know that through support, they have the wisdom to guide us through it, through our intergenerational contract, and through all of us realizing there's no children here at the table today, but we're here, all of us, to speak on behalf of these needs.

And so, to put money and emphasis and support and energy and time into getting children with firsthand experience outside, because I've heard the term environmental justice community come up today. But just because we're not aware of it doesn't mean that we're not all one environmental justice community right now. Because from what I understand, 97 percent of the wild has been disrupted and only 3 percent of earth is actually in its wild state. So how are we going to create this solution?

The children first need to have that in-touch experience. They need to have a firsthand experience with nature. So if they have no access to nature, they won't even know what to fall in love with or how to guide us. If we can bring nature into schools, edible schoolyards, if we can use the EPA and their voice to have federal funding and efforts go towards school gardens, as well as shifting the $400 billion of global subsidies that are going toward junk food right now. But putting our energy and our time into schools, as every neighborhood has a school, every community does this. So this supports food justice and sustainability as well as empowering our children to be leaders of their generation. Thank you so much.

1.3.24 Shawn Mulford - Dine'

Shawn Mulford: Thank you for the invitation to speak on one of the issues that is affecting us as Dine' people. As you may know, in 2012 Navajo Nation versus U.S. Forest Service was litigated and the ninth Circuit had ruled in favor of the forestry, which allowed for the very first ski resort in North America to utilize a hundred percent reclaimed wastewater for snowmaking. And we've been objecting to this process from the very beginning. And one of the concerns that we had at that time was the legacy nutrients that are in the reclaimed wastewater, the high levels of nitrogen and phosphorus.

Now, what we've done -- and I heard a couple other speakers who talk about the finger-pointing between regulatory agencies, and I think we're in the same position. We have shown the U.S. forestry that that snowball is violating ADEQ prohibitions, allowing reclaimed wastewater to mix with storm water and be discharged beyond the permitted area. And they cannot control the flow of the water leaving the permitted area. And each regulatory agency, the responsible officials, so-called, continued to just turn a blind eye to all of this. We did document that that water not only was leaving the permitted area but was actually going into the waters of the U.S. unpermitted by the City of Flagstaff. And again, no resolve.

So, I think one of the things that would be a recommendation for this Committee is to really begin to elevate these situations that are very well documented. You know, we have our own knowledge, our own indigenous knowledge, that says these types of things are wrong. But when we start utilizing Western scientists and they begin to show it's wrong too and they continue to

be unheard, then we have a problem. And I think that the USDA needs to elevate sacred places, our holy grounds in this initiative. I noticed, I read through their document, they said farm production and conservation research, education and economics, rural development, so forth and so on. There's no mention of our sacred places. You know, they're contaminating our medicine. That's what we ingest when we make the medicine from those herbs up there. And so we're looking for some resolution.

Also, I think it's time that we sit down with President Biden, our spiritual people, sit down with him face to face because we're getting to that place, as I heard one gentleman, a few comments back, talk about that time of chaos. And we're getting to that time. And we need some serious discussion on these matters that can only be directed from the top. You know, back in 2009, we sat at the White House with the Council of Environmental Quality. Now here we are, 20-something year, you know, what is that? 14 years later and now we have a committee that is kind of the filter to us sitting down with that White House-level senior staff. And so, to me, we've taken a step back.

Obama sat with the spiritual people at the senior level at the White House, and I have not seen that attempt from President Biden. And I think that we need to work towards that FPIC, you know, free, prior and informed consent. The United States has not met its minimum international standard, and there's absolutely no reason why they should not have done it by this point. So we've got a lot to sit down and talk about, and in three minutes, it's not going to get resolved. But we do want to speak for nature, and we do want to support the young people. As the last speaker to talk, the young lady, we do support the 21 young people from our Children's Trust that are bringing suit to the U.S. government for climate change. And we've met with them and sat with them and we support them. And we hope the Biden administration doesn't push them off again. So we will provide written comments for tonight. Thank you.

1.3.25 Janine Yazi (phonetic) - Dine'

Janine Yazi: My first recommendation is don't do this too late again. My name is Janine Yazi. I'm a Dine' mother, longtime community organizer, and indigenous rights and human rights advocate. Environmental justice for us indigenous peoples can only be achieved when we are allowed to restore our relationship with the natural world, something that can only be achieved for us if there are systemic commitments across federal agencies to shift from an era of consultation to one of consent based on implementing and respecting the U.N. Declaration on the Rights of Indigenous Peoples. As such, my primary recommendation is to work with indigenous peoples to develop resources, tools and protocols that facilitate the free, prior and informed consent of indigenous peoples in all activities carried out by the federal government.

Let me elaborate on the importance of this. Although there are many examples, I will only refer to the most recent. I drove four and a half hours to be here today because I saw firsthand the chaos and confusion that is easily seeded in our communities in the absence of strong consent-centered protocols. This past Sunday, I was the first car stopped by a blockade made up of Navajo allottees preventing access to Chaco Canyon Visitor Center for Secretary Haaland's planned celebration of the Honoring Chaco Initiative, a hard-won Dine' and Pueblo victory that has established a ten- mile buffer zone and a 20-year moratorium on new oil and gas leases on federal lands within that protected area.

What I witnessed was heartbreaking. There was a genuine fear among allottees that these protections would lead to land loss and relocation. This misconception was shared among allottees that both supported and didn't support oil and gas development. They have been led to believe this because of targeted messaging from oil and gas lobbyists, right-wing extremists, media outlets and elected leaders that support them.

This is history repeating itself. The same thing was done to open up coal reserves by seeding the divide between Navajo and Hopi people in the Black Mesa region. Bad actors have played off real experiences of forced removal and the desperation created by poverty resulting from generations of economic bondage and seeding divide between tribal nations in order to weaken us by preventing strength and unity. These practices have deep roots in U.S. imperialism, white supremacy and settler colonization. If this Committee truly believes environmental justice is the fair treatment and meaningful involvement of all people, then it must be committed to addressing this and undoing the systemic practices that have established our traditional homelands and sacred sites as resource colonies by forcing upon our people's government structures and practices meant to facilitate the leasing of energy resources and other critical minerals, including water resources for the benefit of non-indigenous populations and municipalities, often hundreds of miles away.

These same practices are what made large areas of our territories national sacrifice zones. Had all levels of government had these protocols and resources in place, allottees would not have been so susceptible to oil and gas talking points and right-wing rhetoric meant to seed fear and divide with our Pueblo relatives through constant misinformation fed through radio programming. Consent-based practices the federal government must adopt include community involvement and decision-making processes, information delivered in tribal languages. I doubt any of the interpretations I'm slowing down for is in any of the local tribal languages of the people that call Arizona home from time immemorial.

We also need accessible meetings for impacted rights holders and use of appropriate media to reach largely rural communities such as radio. Above all, the federal government must be committed to naming and undoing the generations of harm and systemic injustices related to historic and ongoing acts of colonization. What I have recommended here is just the first necessary step toward that end, because upholding the self-determination of all indigenous peoples will lead to more sustainable and regenerative solutions that benefit all people and our mother Earth. Thank you for your time.

1.3.26 Susan Alzner (Arizona)

Susan Alzner: Hello everyone. It's an honor to be in everyone's company here. My name is Susan Alzner. I'm speaking tonight on the benefit of my experience as the former head of the United Nations Non-Governmental Liaison Service as someone who ran five years of global consultations on the U.N. Sustainable Development agenda, and in particular five years of consultations on the sustainable energy goal, also based on the experience of extensive collaboration for more than 25 years with many community organizers and justice advocates and policy advocates, and five and a half years of living in Arizona.

I'm beseeching, EPA and other government agencies to please, in concert with the Justice40 Funding Initiative, allow for a multi-stakeholder, comprehensive, inclusive and transparent exploration of the true carbon footprint of nuclear power, the true environmental justice impacts of nuclear power, and to help institute realistic monitoring and evaluation of the harmful effects of the entire fuel chain of this industry, everything from uranium mining all the way through processing, power plant construction, routine emissions, waste management and security insurance. I would beseech everyone as well to be aware that there is no such thing as waste storage. It is only waste management. And I'll get into more detail later.

I want to talk about the carbon footprint of nuclear power given the climate crisis and how extensively it is promoted as carbon-free. I have done extensive research on this. This is not my wish that carbon-free is a lie about nuclear power. It is really important that everyone look into the misinformation and lack of information about the entire fuel cycle of nuclear power. When people are talking about carbon-free, they're mostly looking at what happens in the electricity generation process. But if you look at the entire fuel cycle that goes everything from mining through to waste management, it is a very high carbon footprint, four times higher than solar on its best day, 12 to 13 times higher than wind, and it just should not be promoted anymore as carbon-free.

In addition, I just want to call attention to the egregious environmental duress put upon communities like the Havasupai Tribe, the Navajo Nation, with over a thousand open-pit uranium mines that have never been cleaned up, and the extensive efforts that have to go into even meetings like this and its carbon footprint to try to educate people consistently about the truth of this industry.

I know my time is almost up. I do really want to call in addition for honest public monitoring of all these different dimensions of this industry and, in particular, mining, please. Here in Arizona, it's so extensive and there is no real, I mean, honestly, meaningful monitoring of what's going on, especially in mining. So thank you for the time, and I hope we can all dig in on this together.

1.3.27 Alex Ross - Environmental Defense Fund - Defend Our Future

Alex Ross: Good evening, WHEJAC members. My name is Alex Ross. I serve as the community organizing project manager for Defend Our Future, which is a youth advocacy program of the Environmental Defense Fund.

Since I began my work in 2020, I've had the incredible opportunity to meet countless young environmental advocates and work with organizations and community leaders across this country. Our work primarily is with young people, 18 to 35, to educate and mobilize their peers around bold climate action, which we do through programs that build both individual leadership skills and collaborate with local community organizations to ensure that the most marginalized voices are heard. The Justice40 Initiative has been imperative in helping resources reach communities that are facing the most severe effects of climate change. We are glad to see this priority is thoughtfully considered during the implementation of both the Inflation Reduction Act and the Bipartisan Infrastructure Law.

New investments in programs like the USDA's Community and Urban Forestry Program are important steps in remedying the historical and systemic barriers that for too long have left communities behind. Here in Arizona, but quickly across the country, the increased temperatures are leaving our communities more vulnerable than ever. Expanding urban tree canopies is a smart and effective long-term strategy that, along with other solutions, will help us mitigate the impacts of extreme weather. Tools like the Climate and Economic Justice Screening Tool have been helpful in local community outreach and education efforts, though, as others have mentioned this evening, is in need of some serious improvements.

I want to thank the members of the Advisory Council for your efforts in promoting the necessity of environmental justice considerations at every level of government. I look forward to more guidance and resources that can help us achieve a thriving and equitable world for us all. Thank you.

1.3.28 Chloe Desir - Ironbound Community Corporation (New Jersey)

Chloe Desir: Hello and good evening. I'm definitely gonna try to enunciate a bit to keep myself and you awake, but definitely appreciate giving the space to speak and comment in front of you all at the WHEJAC today. My name's Chloe Desir, and I am a resident of an environmental justice community as well as work in an environmental justice community in New Jersey.

I am living in a city called Elizabeth, New Jersey, which is the resident of a very large seaport that is the largest seaport in the Eastern seaboard, actually. And it is also sharing that port with the City of Newark as well. And that is also something to consider when it's also the brunt of three power plants that are emitting multiple types of pollutants, such as PM2.5, which adds to a lot of respiratory illnesses as well and just an overall burden to the community that is a low-wealth income community and also a community that has a lot of foreign-born immigrants as well that are working-class citizens that deserve things as simple as clean air. It's also a community that has a statistic that has one in three kids, including myself, that have had asthma, which is three times higher the rate than most cities in the state of New Jersey, if not in the country, right?

I also want to stand in solidarity with the communities that are facing climate scams in the southeast and southwest around here and extend that solidarity to the indigenous people that have spoken here today, acknowledging the issues that they have gone through because of extractive colonialism.

I'm here to address the dangers of carbon capture storage and hydrogen projects as an effort to reduce emissions when it's shown itself to be a false answer when addressing the climate crisis. Fossil fuel promotes CCS as a strategy for climate mitigation. Yet it shows that it doesn't do that actually, it produces more emissions than it seems to be able to capture, not to mention the potential of the escape of carbon and potential pipeline leaks that come with it.

A real threat to environmental justice communities like the ones that I live in and work in, are fossil fuel industries giving false solutions like CCS, which is a prime example of what we call greenwashing. It's disguised as viable options when in reality they are not. And even in situations like being in this community that I live in, facilities have brought themselves up as

advertising themselves as companies that will recycle biosolids when in reality they're burning human waste and turning the burned ash into low carbon concrete, which is going to be another detriment to the communities that they're putting themselves in and targeting themselves to be in.

I live and work in these communities and, to me, the real efforts of reducing emissions are stronger pushes to consider cumulative impacts and invest in green infrastructure instead of projects that only exacerbate the issue and are marketed by industries that are part of the problem. I urge the WHEJAC to engage directly against the possible extension of fossil fuels through the use of CCUS, which actually prevents climate mitigation and emphasizes the need for viable and sustainable solutions. You have the power to do this, including through the carbon pollution plant rules. Facilities target communities like mine and further impact communities throughout the country. Thank you.

1.3.29 Ozawa Bineshi Albert - Climate Justice Alliance

Ozawa Bineshi Albert: My name is Ozawa Bineshi Albert, and I'm one of the executive directors of the Climate Justice Alliance. We're a membership organization made up of 89 local community-based organizations, as well as statewide, national and international organizations who are addressing climate change as it impacts them as frontline communities.

I'm here to speak about the Justice40 initiative. And while we recognize the commitments that the Biden administration has made to both protect and invest in our communities, these are important milestones for environmental justice. However, that commitment is to also address current harms in preventing future impacts or harms. To that end, we're here in solidarity with those of you who signed on to the statement by the environmental justice organizations at the recent National Symposium on Climate Justice and Carbon Management. We strongly affirm and echo that the Biden administration's over-reliance on CCUS and hydrogen projects to reduce emissions, coupled with the recent gutting of the National Environmental Policy Act, is undermining wins achieved at the local and state levels to transition away from fossil fuels and harmful coal pollutants, like particulate matter to adjust an equitable energy economy.

Recently, the Intergovernmental Panel on Climate Change, Chair Lee, recently stated, "Over-reliance on carbon capture and storage technology could lead the world to surpass climate tipping points." That statement worried me. But mostly, what it made me want to say is that we're tired of unproven methods and untested technology that is diverting valuable time and funds that we can no longer afford. We call on you as the WHEJAC and the Biden administration to listen to our communities, name the dangers, and end this effort to push CCS, CCUS and other carbon scams that are delaying the transition to proven and sustainable solutions and putting our communities' lives on the line once again.

A multi-agency strategy therefore must not include carbon markets, CCUS, hydrogen or any type of burning fuels. We recommend a multi-agency strategy of carbon management, that protects communities most impacted by polluting industries and more boldly and directly addresses the climate crisis, must include the following. First, an end to the permitting of new fossil fuel infrastructure and a rapid phase-out of current polluting infrastructure. Second incentives,

grantmaking and interagency coordination to support community-based, decentralized, renewable energy projects, energy efficiency initiatives and other climate-friendly policies and practices across issue areas.

We call on you as the WHEJAC to continue representing the concerns raised by black, indigenous and other communities of color in frontline communities and push the Biden administration away from the CCUS and other carbon scams. We, CJA, and its members are relying on you to help us achieve a just transition and a vision of a time when we can live whole, healthy lives without the threat of pollution. I want a healthy, whole community and land where my grandson can grow up and thrive. I have to believe that we want that and deserve that vision for all of us and all of our families and future generations. And I want to hold the Biden administration to ensure that for all of our families. Thank you.

1.4 Closing Remarks - Adjourn

Co-Chair Moore, Dr. White-Newsome, Co-Chair Shepard, and **Vice-Chair Tilousi** thanked everyone for their time and efforts in submitting their public comments. They also thanked the presenters, the staff and the Council for their time and attention. **Martha Guzman,** Regional Administrator, Region 9, U.S. Environmental Protection Agency, stated that she looks forward to following up with the concerns voiced. **Ms. Engelman-Lado** also thanked everyone for their public comments. **DFO Washington** adjourned the meeting for the day.

2.0 Welcome, Opening Remarks, and WHEJAC Roll Call

On Wednesday, June 14, **DFO Washington** welcomed everyone to the second day of the public meeting. She gave a few instructions and the overview of the day's agenda and then handed the meeting over to Co-Chair Moore. **Co-Chair Moore** gave his opening remarks and thanked everyone for the previous day's work. He reminded everyone that the WHEJAC can only make recommendations to CEQ based on the remarks heard at these meetings. **Co-Chair Shepard** and **Vice-Chair Tilousi** gave their opening remarks.

2.1 Indigenous Peoples Acknowledgement

Vice-Chair Tilousi introduced the Benally family for the next segment. She gave their background, which included that this three-generational, indigenous family has been displaced from their homeland and are now ambassadors who tell their story around the world.

2.1.1 Jones Benally Family Dance Troupe

The Benally Family explained the Navajo/Diné Traditional dances that were performed.

2.2 Updates and Remarks – White House Council on Environmental Quality (CEQ)

2.2.1 Dr. Jalonne L. White-Newsome, Senior Director for Environmental Justice, White House Council on Environmental Quality

Drs. White-Newsome thanked the Benally family for their performance and explained why

Phoenix is special to her. She expressed her gratitude for everyone's hard work. She reassured everyone that even though they don't have all the answers, CEQ is working very hard every day to advance the president's environmental justice vision and to make sure they are masterful in how they move resources, how relationships are managed and merge environmental justice into every facet of the federal government. She stated that CEQ's role is to coordinate the federal government's efforts to improve, preserve and protect our nation's public health and environment. She stated that her role is to help execute the president's ambitious agenda with the White House and across the federal government.

She focused her comments on three areas: CEQ's EJ team, taking action on priorities (Executive Order 14096, Environmental Justice Scorecard, the Justice40 initiative and the White House Campaign for Environmental Justice), and the White House Environmental Justice Interagency Advisory Council.

2.2.2 Brenda Mallory, Chair, White House Council on Environmental Quality

Brenda Mallory apologized for not being there in person. She thanked the WHEJAC chairs for their leadership, everyone who made the journey to Phoenix and those joining virtually, the meeting logistics partners and the CEQ team. She gave examples of progress, such as the new Executive Order 14096 - Revitalizing Our Nation's Commitment to Environmental Justice for All. She explained the details of the order.

Co-Chair Moore reminded everyone that recommendations from the EJ communities went into creating Executive Order 14096. He acknowledged the contributions of Dr. Cecilia Martinez in the formation of the WHEJAC.

2.3 Welcome and Remarks – U.S. Environmental Protection Agency (EPA)

Co-Chair Moore introduced the speakers for this portion.

2.3.1 Marianne Engelman-Lado, Acting Principal Deputy Assistant Administrator, Office of Environmental Justice and External Civil Rights, U.S. Environmental Protection Agency

Ms. Engelman-Lado spoke about the steps taken to get EO 14096 passed. She stated that their work will be measured by what kind of transformative change is happening in communities, not by scorecards. She gave examples of progress and work done so far with cumulative impacts and permitting.

2.3.2 Martha Guzman, Regional Administrator, Region 9, U.S. Environmental Protection Agency

Martha Guzman thanked everyone for their hard work. She replied to questions raised the previous day, especially with carbon capture and permitting. She stated that when communities raise concerns over permit applications with potential cumulative impacts, they are heard and will be a great consideration for permit approval. She reminded everyone that it's not just an EPA approval or denial, there are also state and local authorities who also give permits. She stated that proposed rulemakings are now going through an EJ lens with permits. She shared

that two TCTACs (Thriving Communities Technical Assistance Centers) were set up and are running in the region.

Co-Chair Moore reminded everyone that Regions 6 and 9 overlap because of the large population. He acknowledged the grassroots, immigrant farmworkers in Regions 6 and 9 who brought the EJ issues to light. **Dr. White-Newsome** acknowledged the ancestors who made it possible for WHEJAC to be here today and asked that everyone call out the names of their ancestors in acknowledgement of their presence. Many people called out the ancestors names. She announced that the Council members will receive a signed copy of the executive order.

2.4 Panel Presentation: Update on Biden-Harris Administration's Environmental Justice Priorities

2.4.1 Dr. Jalonne L. White-Newsome, Senior Director for Environmental Justice, White House Council on Environmental Quality (Moderator)

Dr. White-Newsome introduced the panel members.

2.4.2 Jonathan Black, Senior Director for Chemical Safety and Plastic Pollution Prevention, White House Council on Environmental Quality

Johnathan Black stated that he was hired to address plastic pollution signaling that this is a priority for the Biden-Harris administration. He stated that toxic chemicals and plastic pollution has been a disproportionate burden to EJ communities. He added that he is building a team to deal with that issue. He explained the principles by which his office is guided. He shared that the EPA released a draft national strategy to prevent plastic pollution, and CEQ supports the objectives of the draft. He spoke about recent studies that underscore the need for changes.

2.4.3 Dr. Miriam Goldstein, Director for Ocean Policy, White House Council on Environmental Quality

Miriam Goldstein, PhD, shared what her office has been working on, including the Biden Ocean Climate Commitment and the Ocean Climate Action Plan (OCAP). She explained the details of each.

2.4.4 Dr. Marccus Hendricks, Senior Advisor for Climate and Community Resilience, White House Council on Environmental Quality

Marccus Hendricks, PhD, acknowledged the leadership of the CEQ team. He gave a background for the need for climate change. He explained some of the notable initiatives to advance climate resilience, including new building codes and higher performance standards for new construction and renovation, the formation of climate resilience working groups, the formation of the federal flood risk management standard, the creation of adaptation plans in 20 states, outlining the steps each agency will take to ensure their facilities and operations adapt to and are increasingly resilient to climate change, and investments in the resiliency infrastructure in EJ communities.

2.4.5 Nausheen Iqbal, Deputy Director for Forests and Equity, White House Council on Environmental Quality

Nausheen Iqbal shared the initiatives and programs of her office, including access to and increasing more green and blue spaces through the Memorandum of Understanding on Promoting Equitable Access to Nature in Nature-Deprived Communities, relaunching the Federal Interagency Council on Outdoor Recreation, integrating indigenous knowledge into decision making, and protecting and adding more conservation areas.

2.4.6 Dr. Ana Unruh Cohen, Senior Director for NEPA, Clean Energy, and Infrastructure, White House Council on Environmental Quality

Ana Unruh Cohen, PhD, explained the work her office is doing, which includes updating the NEPA Implementing Regulations, releasing the Permitting Action Plan (ensures agencies provide opportunities for the public to meaningfully engage in decision-making), and contributing to the creation of EO 14096.

Dr. White-Newsome welcomed comments and questions from the Council. **Viola Waghiyi** stated that the U.S. is not a party to the Stockholm Convention, which agrees not to use certain chemicals. She reminded everyone that the Arctic is one of the most polluted areas on the planet. She recommended the U.S. join the Stockholm Convention to reduce plastics pollution. She asked which countries Dr. Goldstein met with. She reminded everyone to remember the health piece in environmental justice. **Mr. Black** responded that stories from that region are what drive his office to make changes. **Dr. Goldstein** thanked Ms. Waghiyi for raising her concerns and questions. She responded that the comment period is open for the Ocean Justice Strategy. She welcomed a line of communication with Ms. Waghiyi.

Maria Lopez-Nunez asked if the changes to NEPA were before or after the raising of the debt ceiling. She commented that NEPA hasn't been strong enough in the past to protect communities. She highlighted her concerns, such as the expansion of exemptions with protection from experimental technologies. She asked what protections are in place to protect communities from them, such as CCS or CCUS? **Dr. Cohen** responded that that concern is addressed in the Phase 2 portion of the update.

Mr. Foster asked how is the strategy changing to incentivize companies to use recycled plastic pellets instead of virgin plastic production? He also asked what measures of enforcement are there in penalizing organizations that don't have operational plans to use recycled plastics and any non-cleanup efforts? He asked how will the increase in funding in the National Park Service play out with hiring and workforce development? He also asked how will the Ocean Justice Strategy play out with animal wellbeing? **Mr. Black** responded that virgin plastic is so much cheaper to produce than using recycled plastic and, unfortunately, that forces many companies to go to single-use plastic. He stated that they're looking into ways to get companies to use recycled plastic and welcome anyone to submit comments or ideas. **Ms. Iqbal** responded that there are a lot of vacancies in NPS because of retirements. She added that they are trying to get people into the NPS workforce jet stream from the urban areas through AmeriCorps and other entities. She spoke about training people to work within their urban area as well as training elsewhere and then returning to their home community.

Dr. White-Newsome recommended (because of time) that the Council members ask their questions first and then a response will come later. **Ms. Roberts** asked how does the NPS also include hiring young rural, impoverished people? She also asked how can some of the money be appropriated to make sure young legacy-community people are made whole so they can pursue these NPS positions or other employment? She asked how are we going back to harmful chemicals and not prioritizing using safer chemicals? **Tom Cormons** stated that it hits home that these issues have been going on for many years and continues to be an issue. He added that the gains should be celebrated, but the passage of the debt reduction emphasized how exemptions can be made (with the pipeline approval) when we're up against a wall. He stated that that exemption wouldn't have happened if it were standing alone. He stated that that exemption contrasts with everything the Council is doing.

Ms. Santiago commented that the time allotted to ask questions and get responses is insufficient. She stated that in the meeting she's seeing two different worlds -- the stories from the public speakers and the updates being given from the presentations. She asked, what has been the outreach or efforts made by the Ocean Climate Action Plan regarding island communities and territories? She added that feedback from the communities is vital in that plan because it affects them. She noted that there are so many questions from the Council that there just isn't enough time to address them all. **Kim Havey** emphasized that mitigating after production is a false solution. He suggested there needs to be a phase-out of petroleum-based plastics and stop the constant infiltration of plastic into everyday life. He added that PFAS is becoming more prevalent and it needs to be phased out and eliminated.

Dr. Bullard agreed with everything said so far. He stated that it seems that a lot of work they do isn't being heard and when the government is paying attention to one issue, another one slips through the cracks. **Vice-Chair Tilousi** asked what the floodplain investments were that were mentioned earlier? She commented that the government needs to help tribes pay for flood monitoring stations. She added that with the flooding comes contamination, so soil testing is also needed and should be paid for by the government. She stated that communities that want recycling aren't getting the support to start or maintain the program. She asked who are the attendees in the indigenous workgroup mentioned earlier?

Angelo Logan recommended that the administration prioritize strengthening environmental justice tools, not weakening them. He added that the EJ tools should not be a bargaining tool. **Co-Chair Shepard** asked if the federal government is providing insurance since some of the insurance companies are backing off. **Dr. White-Newsome** agreed that more time is needed to address the questions raised during the meeting. She emphasized that the EJ work is important and will move forward in the right direction.

DFO Washington announced the lunch break.

2.5 Panel Presentation: Regional Environmental Justice Highlights

2.5.1 Martha Guzman, Regional Administrator, EPA Region 9, U.S. Environmental Protection Agency (Moderator)

Ms. Guzman introduced the panel members.

2.5.2 Laura Cortez, Co-Director, East Yard Communities for Environmental Justice

Laura Cortez gave her background. She explained the issues happening in her area, including cumulative impacts from refineries, factories, and other industries near her Los Angeles home; enforcement and accountability, and locomotive rules. She gave examples of industry mishaps causing fires, constant noise from locomotives and continual smoke and exhaust. She acknowledged that EPA has been more proactive in communicating with communities about projects.

2.5.3 Eva Olivas, Executive Director/CEO, Phoenix Revitalization Corporation

Eva Olivas gave PRC's background. She stated that relationships matter, resident-driven processes are the priority, individual and collective wisdom are important and dedication and respect should be practiced. She emphasized how including community residents made a huge difference in the process.

2.5.4 Yolanda Herrera, Unified Community Advisory Board, Community Co-Chair for the Tucson International Airport Area

Yolanda Herrera gave the group's background. She gave examples of different industries around Tucson and the environmental impacts of them.

Ms. Guzman asked how the federal government can help those communities. **Ms. Olivas** responded that some residents don't attend meetings because of the technical language. She suggested speaking in a way that the residents understand so there's more community awareness. **Ms. Cortez** suggested that more equity is needed in project decision-making and that the status quo is based on past racist practices and regulations. She also stated that there's a lot of finger-pointing about which agency is responsible for what. **Ms. Herrera** asked that when pollutants are discovered, why does it take years for action to happen? **Ms. Guzman** welcomed comments and questions from the Council.

Ms. Roberts asked why there aren't more fully funded air quality control districts. She gave an example of a major leak in her city. She added that the bridge (which was shut down) and a white community were notified but not the surrounding communities of color. **Mr. Logan** asked do you have specific requests from WHEJAC to make recommendations to the IAC or Chair Mallory? **Ms. Herrera** suggested asking for funding to track the health history of each community. **Ms. Cortez** requested commitment to timelines, create a cumulative impacts analysis, create and implement policies to regulate locomotive rules, regional enforcement of accountability, stop funding false solutions, clean areas surrounding facilities and expand sampling to adequately reflect impact zones. **Ms. Olivas** suggested having stability plans for staffing (less turnover) so there's more consistency in communication and adding old-fashioned checklists to projects to make sure all aspects are completed.

Ms. Waghiyi reminded the panel that the Arctic is where all toxics wind up drifting toward, so she offered her help to stop the pollution in the first place. **Ms. Herrera** invited everyone to

attend/watch the next UCAB quarterly meeting in July. **Ms. Lopez-Nunez** stated that she's excited about battery recycling, but there's a disconnect between what the communities see and what the government thinks is going on. She added that communities feel empowered when they are heard. **Ms. Cortez** stated that a polluting recycling facility in her area was shut down because of community action. She added that the issue was with irresponsible parties doing the recycling, not the recycling itself. She stated that there is funding for the cleanup, but since the money has been mismanaged, the cleanup hasn't occurred. **Ms. Lopez-Nunez** asked, how do the communities react when the government does that? **Ms. Olivas** responded that the community feels confused. **DFO Washington** stated that it was time for a break.

2.6 Panel Presentation: Innovative Technical Assistance and Capacity Building

Co-Chair Shepard introduced the next panel.

2.6.1 Dr. Sharunda Buchanan, Interim Director, Office of Environmental Justice, U.S. Department of Health and Human Services (Moderator)

Sharunda Buchanan, PhD, stated that the purpose of the panel is to share examples of technical assistance and capacity building that are being offered by federal agencies to support communities working on environmental justice solutions. She stated that environmental justice is linked to health equity. She gave examples of resources available, including a Low-Income Home Energy Assistance Program, the Low-Income Household Water Assistance Program, the Rural Community Development Program, the Federal Real Property Assistance Program and the Flint Lead Exposure Registry. She spoke about the Civil Rights Complaint Portal.

2.6.2 Marianne Engelman-Lado, Acting Principal Deputy Assistant Administrator, Office of Environmental Justice and External Civil Rights, U.S. Environmental Protection Agency

Ms. Engelman-Lado shared examples of technical assistance, including available grants, the TCTACs that have been set up in regions and project officers that are ready and available to help.

2.6.3 Dr. Matthew Tejada, Deputy Assistant Administrator for Environmental Justice, Office of Environmental Justice and External Civil Rights, U.S. Environmental Protection Agency

Matthew Tejada, PhD, explained the grant program resources, including TCTAC locations, funding available and advanced technical assistance.

2.6.4 Mariia Zimmerman, Strategic Advisor for Technical Assistance and Community Solutions, U.S. Department of Transportation

Mariia Zimmerman stated that they have funding for planning, construction, research funds and others. She stated that her office released the DOT Navigator, which is an online site to apply for grants and help navigate the DOT grant process. She added that it includes a database of the existing TA resources available and the link to the Bipartisan Infrastructure Law implementation work. She explained the recently launched DOT Discretionary Grants Dashboard, which allows

you to filter by different factors to identify suitable grants; the USDOT's ROUTES initiative, which supports rural communities, and the DOT Thriving Communities Program, which is a capacity-building program for EJ communities.

2.6.5 Teresa Acuna, Senior Policy Advisor, Office of the Assistant Secretary for Policy and Deputy Director, Good Jobs Initiative, U.S. Department of Labor

Teresa Acuna explained the Good Jobs Initiative, which focuses on worker empowerment, employer engagement and agency support. She explained provisions for job quality, equity builders used in BIL/CHIPS/IRA funding and tools for equity in IIA, which include labor-management partnerships, OFCCP Mega Construction Project Program and Project Labor Agreements (PLAs). She gave examples of each. She expanded upon the grant opportunities available to targeted populations.

2.6.6 Dr. Eric Werwa, Deputy Assistant Secretary for Policy and Environmental Management, U.S. Department of the Interior

Eric Werwa, PhD, explained different TA programs offered through DOI and NPS.

2.6.7 Lucia Petty, Policy Advisor, Office of Fair Housing and Equal Opportunity, U.S. Department of Housing and Urban Development

Lucia Petty informed everyone that fair housing complaints can be filed on the HUD website. She gave an example from Chicago. She explained her office's role and funding opportunities. She stated that there is a huge shortage of affordable housing units and that there are grant opportunities to further develop more housing. She stated other technical assistance is available in EJ communities.

Since there was a lot of information presented, **Dr. Buchanan** asked the panel members to submit a list of names and go-to's for their organization to CEQ and WHEJAC. She welcomed comments and questions from the Council. **Mr. Foster** asked how DOI's release of thousands of acres of land for development last year meshed with EJ. **Dr. Werwa** responded that the answer will be sent later. **Mr. Foster** suggested sending a recommendation to end all oil and gas leasing.

Ms. Roberts thanked Dr. Buchanan for the list. She shared that Urban Waters Program money spent for EJ communities is not reaching EJ communities. She hoped that there would be a plan to address that issue with that program. She asked Dr. Tejada, how many grants will be going out to communities. She also asked, once an entity receives planning grant money, does that entity have to apply for another grant to actually complete it? **Dr. Tejada** responded that they are not connected. He also stated that he doesn't know how much each grant will be and that it will depend on how many grants are awarded and the size of the project.

Susana Almanza asked Dr. Buchanan, regarding the energy burden impact on health, is there a report on how energy burden impacts people's health? She asked with low-income funding for water and energy funds that are channeled through the states, who are monitoring how states are disseminating and/or implementing these funds? She asked is funding being made available for

communities that went through and experienced the trauma of COVID and other climate disasters? She then asked Ms. Petty can a HUD-approved entity for housing services be contracted by private developers to relocate displaced low-income residents? She also asked how can HUD lower its 60-percent-median-family income levels for rentals and 80-percent-median-family income levels for ownership? **Dr. Buchanan** and **Ms. Petty** stated that they would get the answers back to her later.

Ms. Santiago asked how broad is the TA that can be covered to prepare communities to then submit applications for grants with EPA? **Dr. Tejada** responded that the TCTAC is supposed to receive that request, and then the TCTAC would help find resources to solve the issue, such as which grant maker could assist and which partnerships need to be created. **Ms. Engelman-Lado** added that the TCTAC can also help after the grants are awarded.

Mr. Cormons stated that he is impressed with what has been created so far in such large bureaucracies. He asked how close are they to reaching ground level in communities? **Dr. Bullard** asked Dr. Tejada, is priority be given to large projects that will do the most for EJ communities? **Dr. Tejada** responded that funding would be flexible depending on scoring, and sometimes EJ needs expand beyond just one department. **Co-Chair Shepard** asked if the grant seeker has to contact those multiple agencies. **Dr. Tejada** responded that the TCTACs could help with that.

Dr. Sheats asked Ms. Engelman-Lado if she had any thoughts about the improved NEPA process. **Ms. Engelman-Lado** answered that she is excited about the progress.

2.7 Live Demo: Grants.gov

2.7.1 Dr. Natasha DeJarnett, Deputy Director for Environmental Justice Data and Evaluation, White House Council on Environmental Quality

Natasha DeJarnett, PhD, introduced the panel.

2.7.2 Judy Ceresa - Senior Program Advisor, Health Resources and Services Administration, U.S. Department of Health and Human Services

Judy Ceresa explained how to find funding opportunities using the grant.gov website, including the status of the grants, narrowing the search for grants, forecast of the grant funding, synopsis of the grant, grant opportunity history, related documents of the grant, application package and contact information for the website.

2.7.3 David Johnson, Deputy Assistant Secretary for Health, Office of Regional Health Operations, U.S. Department of Health and Human Services

David Johnson made suggestions for obtaining status updates for grants and making an application stronger. He suggested contacting an award recipient to get advice, becoming a grant review panelist to see the process and actual applications and contacting the Small Business Administration for help.

2.8 Closing Remarks - Adjourn

DFO Washington made a few announcements and adjourned the meeting for the day.

3.0 Welcome, Opening Remarks, and WHEJAC Roll Call

On Thursday, June 15, **DFO Washington** welcomed everyone to the third day of the public meeting. She gave a few instructions and then handed the meeting to Co-Chair Moore. **Co-Chair Moore** thanked everyone behind the scenes and gave a few reminders. **Co-Chair Shepard** and **Vice-Chair Tilousi** gave a few remarks. **DFO Washington** took the roll call.

3.1 Panel Presentation: Emerging Leaders' Perspectives on Environmental Justice and Legacy Pollution in Underserved Communities

3.1.1 LaTricea Adams, Black Millennials for Flint (Moderator)

LaTricea Adams introduced the panel.

3.1.2 Shamyra Lavigne, American Civil Liberties Union and Rise St. James

Shamyra Lavigne described her background and the goals of her organization.

3.1.3 William Barber III, Founder and CEO, Rural Beacon Initiative

William Barber described his background and the goals of his organization.

3.1.4 Yadira Sanchez, Co-Founder and Executive Director, Poder Latinx

Yadira Sanchez described her organization's focus and her background.

Ms. Adams acknowledged the pioneers of the EJ movement when they adopted the 17 Principles of Environmental Justice in 1991. She asked each panelist to describe how those original principles align with their organization's work and the importance of intergenerational organizing. **Ms. Lavigne** stated that the 17 principles are their blueprint, and wisdom is passed intergenerationally. She stated that it's sad that this fight still exists today but also gives her hope that changes will be made some day. **Ms. Sanchez** stated that the principles and community members guide their work. She stated that the ancestors have the knowledge that we can learn from and we can transfer that knowledge to future solutions. **Mr. Barber** echoed the other panelists and described his deep foundation. He shared his vision of gaps and areas to be improved that could be remedied with increased community consent and federal funding assistance.

Ms. Adams asked the panelist to discuss why it's important for young people to be more visible in community organizing with boots-on-the-ground strategies that best reflect the work of our ancestors and pioneers and balance with modern approaches. **Ms. Lavigne** stated that it's important because she's seen young people make people listen. She gave an example from a parish council meeting. She added that that generation is who we are fighting for, and they are

taking notice of the injustices around them. **Mr. Barber** agreed with Ms. Lavigne and added that if that generation doesn't step up, then the fight will die. He stated that there needs to be a balance between traditional methods and modern approaches because one would not be possible without the other. **Ms. Sanchez** stated that young people are the future, but it doesn't replace in-person organizing. She added that social media, digital media and boots on the ground need to be balanced.

Ms. Adams asked the panel to discuss the challenges they face as a young EJ leader and asked, what does the Biden-Harris administration need to hear from a young adult perspective? **Ms. Lavigne** stated that her challenges include the toll on her mental health from running the organization, worrying about her family's health and the potential for chemical and natural disasters in her community, the disconnect and resistance she feels from older generations with how things are carried out, the racial laws and policies that are still in place, the feeling of helplessness that changes will not occur within her lifetime, the pushback from community industry supporters and nay-sayers and the fear from industry retaliation. She shared the history of her community deemed as "cancer alley" due to the factories and pollution the community endured. She described the shock she felt at college when her community termed "cancer alley" was referenced in a textbook. She stated that her hairs stood up to realize that this injustice was not a coincidence or just known to her community, but was actually known to many, including the government. She replied that the Biden-Harris administration needs to hear that the old racial laws and policies need to change, the older generation does not need to be dismissed and put in a box, there needs to be transparency between government officials and citizens, we need a clean, healthy, sustainable environment and future. She stated that reparations should be given for health issues and death as a result of past pollution and enforcement and fines ($1 million as a minimum) should be given to polluters. She stated to stop the expansion and growth of new or renew permits for existing industries, stop new industries from starting and expose and remove government officials who are in cahoots with industry.

Mr. Barber stated that his challenges include barriers to pathways of or to contact leadership, turnover rates of family or colleagues in leadership positions because of burnout, hopelessness or death, and colleagues conflating diversity, equity and inclusion as an automatic alternative to environmental climate and energy justice frameworks. He stated that leaders must be chosen who are aware of the history of academic advocacy and the three pillars of sustainability (equity, ecology, and economy) and how that history informs our decisions today. He added that the Biden-Harris administration needs to hear that systems-level changes must occur. He stated that systems are simply creatures of our creation, and they are responsive to human input. He said that the outcomes we see are a direct result of the decisions we make. He stated that if we face the urgency of now in which we must change the priorities of the society that claims to be the most powerful in human history technologically, economically, educationally, politically and militarily, then everyone is met with a moral obligation not to despair but to continue to work for and affect change if there is to be a future.

Ms. Sanchez stated that her challenges include unknown resources that more established organizations know about, the need for multi-year, larger grants that would allow them to continue their work without applying for more, the knowledge that needs are not equal among states and the lack of technical capabilities of citizens within communities. She added that the Biden-Harris administration needs to hear that they applaud the changes seen thus far but know

the needs are still great. She added that people need to hear about the changes and how to find those resources.

Co-Chair Moore thanked the panelists and gave a few examples of the 1991 summit accomplishments. He welcomed comments and questions from the Council. **Ms. Almanza** recognized their hard work and reminded the panel that the Council were once young adults too and were in their shoes. She reminded them not to rely only on social and digital media but to continue to engage in boots-on-the-ground advocacy as well, and don't give up on the fight. **Vice-Chair Tilousi** reminded the panel that they are not alone, and the Council members experienced the same pushbacks and challenges, past and present. **Ms. Santiago** thanked the panel members and empathized with their challenges. She asked Mr. Barber if he has considered or incorporated principles of energy democracy and community empowerment through the transformation to distributed, renewable energy.

Mr. Logan asked if the panel has specific recommendations that WHEJAC could forward to CEQ. **Ms. Roberts** acknowledged the panel's work and dedication. She asked Ms. Lavigne how far or how close is her community to Mossville. She also asked what the result was of the administrator's journey to justice. She reiterated the Council's support for their efforts. **Dr. Bullard** stated that he's proud to see the seeds that were planted many years ago. He reminded the panel and young people that they are the majority, and they need to continue the cause. **Mr. Foster** agreed with Ms. Lavigne that people do listen to young people. He gave a similar example. He asked Ms. Sanchez what recommendations she had for the administration.

Ms. Lavigne thanked the Council for their support and love. She would suggest recommending higher fines ($1 million as a minimum) for polluters. She added that the only thing that can get industry's attention is taking their money away. She stated that it needs to hurt. She recommended shutting down government agencies that aren't doing their job. Lastly, she recommended that no more new industries are built or expand existing facilities near their community. She replied that her community is about two and a half hours away from Mossville. She also replied that she felt heard when the administrator toured, and he told her later that the tour changed his life and his perspective. She has seen new rules and policies that have impacted her community and that gives her hope for changes.

Mr. Barber thanked the Council for their words of encouragement. He replied that he sees energy democracy as hand in hand related to the concept of self-determination. He stated that he knows that having a more distributed energy system is good both for energy security and community ownership. He stated that he hopes to do social engineering by establishing pilot projects that can prove what is possible in utility territories and rural electric cooperative territories to serve as a stepping stone into that conversation. He applauded the scorecard and recommended more cumulative impact testing and a national metric on the cost of carbon that states could follow. He also recommended looking into helping state DEQs in the face of hostile state legislatures that are attempting to defund and under-resource.

Ms. Sanchez replied that they are recruiting in schools. She recommended pushing for a simpler grant application process to put the burden on the agencies and not the applicants. She also recommended hiring more people to help with TA centers and ensure that intermediaries are trusted individuals. She thanked the Council for their encouragement and support.

Ms. Adams recommended creating a workgroup that focuses on the integration and involvement of youth and young adults.

3.2 Remarks – Mayor Kate Gallego, City of Phoenix

Kate Gallego introduced herself. She stated that her goal is to shade 75 percent of walkways. She thanked WHEJAC for all their hard work. She gave examples of EJ work happening around the city, including heating and cooling centers, work programs, more green spaces, transportation amenities, free tuition and daycare assistance, more green jobs and protecting native lands. She explained the indigenous history of the area. **Vice-Chair Tilousi** thanked the mayor. **Co-Chair Moore** announced a break.

3.3 Presentation of Carbon Management Charge to WHEJAC

3.3.1 Dr. Jalonne L. White-Newsome, Senior Director for Environmental Justice, White House Council on Environmental Quality

Dr. White-Newsome explained the context of the carbon management workgroup. She stated that the charge reads, what criteria should be applied to the evaluation and permitting of carbon management strategies and projects in ways that prevent harm, align with and advance environmental justice and protection for communities? **Ms. Adams** accepted the charge as written.

3.4 WHEJAC Climate Planning, Preparedness, Response, Recovery, and Impacts Workgroup – WHEJAC Presentation of Draft Recommendations

Ms. Lopez-Nunez read the charge of the workgroup and explained the workgroup name change. She read and explained the seven overarching recommendations, the seven federal disaster preparedness and relief recommendations, the six community climate planning recommendations, the six health impacts recommendations, the five housing recommendations, the seven clean energy recommendations and the seven relocation recommendations. See the presentation slides for the details. **Miya Yoshitani** welcomed comments and questions from the Council.

Mr. Havey recommended that the Treasury prioritize Justice40 communities in issuing tax credits with cash instead. He also recommended tracking where the benefits are going by zip code to understand exactly where funding is being used. He recommended not using tax credits for utilizing fossil or natural gas to create hydrogen. He added that that is a false solution. He recommended that the Department of Energy and the Treasury Department implement a tax credit that supports hydrogen created from non-fossil fuel sources only using 100 percent renewable electricity, sometimes referred to as green hydrogen. He added that this green hydrogen must have a third-party verification to verify the tax credits are generated only from hydrogen that is not coming from fossil fuels. He also recommended that hydrogen should not be considered a clean substitute for fossil fuels or natural gas and only be used for specific commercial and industrial use cases where electrification or other clean energy options are not available.

He added that there is also a carbon footprint to nuclear power. He recommended that the federal government stop supporting nuclear power through loan guarantees, tax credits, and other financial incentives and create plans to decommission all nuclear power plants at the end of their current license terms. He also recommended that a life-cycle carbon assessment be completed for all nuclear power plants to better understand their true carbon emissions resulting from their building and maintenance, mining of uranium and the long-time storage and management of spent nuclear fuel.

He stated that after disasters, more financial help and insurance are given to white households in similar situations than households of color. He recommended that FEMA ensure that public and private homeowners' insurance should be distributed equally across race and income, and they should be tracking the value of replacement and not just the value of the existing property. He stated that he will send the details in an email.

Ms. Waghiyi stated that relocating communities due to legacy military pollution should be completed to ensure that they are relocated to culturally appropriate areas and not climate-vulnerable locations. **Ms. Almanza** stated that strategic planning projects that would encourage funding engineers and experts to develop holistic plans rather than satellite plans need to be added to the community climate planning recommendation because communities always need that expertise. She added that military funding for disaster aid should be used to create and support new schools for students displaced by climate impacts, especially in EJ communities.

Dr. Bullard recommended that infrastructure funds should be used for climate preparation, including the installation of AC units and protection against floods. He added that priority should be given to schools in EJ and flood-prone areas. He recommended that FEMA should employ additional methods and tools to assess the resources that are needed in recovery funding, such as the CDC, social vulnerability index, the EJ index. He also recommended ensuring FEMA maximizes the value of the residents for them to build adequately protected property and ensure racial parity with surrounding zip codes. He went on to recommend ensuring FEMA does not discriminate in the use of managed retreats or voluntary buyouts. He noted that historically buyouts have been disproportionately biased toward middle- and upper-class homes. He recommended that HUD prioritize counteracting forces to address redlining and foster land and resource recovery. He also recommended that HUD should allow housing source vouchers to be portable and follow the recipient rather than having vouchers tied to the properties themselves.

Ms. Adams asked if FEMA could assist and add resources in areas that are not historically in flood zones but are experiencing new flooding due to climate change. She also requested that responses be timelier after unexpected disasters. **Dr. Bullard** added that flooding due to infrastructure new construction or failures be remedied by EPA, DOE, and the Department of Justice.

Jade Begay recommended adding agencies, such as HUD and DOI, to work with trusted intermediaries and contractors for relocation efforts and projects and climate migration projects. **Mr. Mitchell** recommended that replacing housing for migrant workers after a disaster be included in timely responses. **Ms. Roberts** suggested wordsmithing USDA should prioritize

small farmers over that of the monoculture big AG and provide financial incentives to farm climate-resilient crops and farming methods. **Mr. Foster** recommended that FEMA disaster shelters should not discriminate based on LGBTQI class. He also recommended that Treasury have more transparency of funding to EJ communities. He recommended that each office's OIG should enforce the completeness, timeliness, quality, accessibility, and accuracy of federal data and accessibility to communities.

Dr. Sheats recommended adding the words "if green hydrogen should be used at all" in the recommendations from Mr. Havey. **Mr. Havey** agreed. **Ms. Santiago** recommended adding incineration to the nuclear energy section and adding reimbursement for the replacement value of the property in the FEMA section. She agreed with the other recommendations mentioned. **Ms. Waghiyi** reminded everyone that the Arctic is warming four times faster than the rest of the planet, which leads to species reduction or extinction, increasing their food insecurity. **Ms. Lopez-Nunez** agreed to add HUD addressing ecological grief and mental health support in the recommendation. **Mr. Logan** recommended adding resources and workforce development training so that communities are prepared to protect and rebuild themselves to the preparedness section. **Mr. Foster** recommended HUD support research for climate anxiety and PTSD from natural disasters. **Co-Chair Moore** recommended adding economic recovery for crops and livestock. **Vice-Chair Tilousi** recommended adding "tribal" to section 17B. She stated that FEMA refused to help a remote tribal community after flooding because they didn't have an emergency plan in place and that needs to change.

DFO Washington asked that those recommendations be emailed to Ms. Lopez-Nunez so they can be added. **Dr. Sheats** asked if citations be added was well. **Juan Parras** asked if recommendations be translated into the language of the impacted community. **Co-Chair Shepard** moved to vote on the draft recommendations presented. The Council had 16 members in favor of and no abstentions or objections to finalizing these recommendations. She informed the Council that the recommendations would be forwarded to CEQ and announced the lunch break.

3.5 WHEJAC National Ambient Air Quality Standards for Particulate Matter 2.5 and Ozone Workgroup – WHEJAC Presentation of Recommendations

Co-Chair Shepard welcomed everyone back and introduced the next section.

Mr. Cormons gave a brief history of the needs and the timeline for revising the standards. He also showed the disparity of pollution between classes and community of color. **Dr. Sheats** added more background. He read and explained the seven recommendations. **Mr. Logan** gave more explanation. See the presentation slides for details. **Mr. Havey** emphasized that the current 24-hour 2.5 standard is recommended to be lowered. He suggested EPA set up its own more frequent air monitoring stations within higher-level zones and release that data to show cumulative effects in perpetual non-attainment zones. **Ms. Santiago** emphasized the need to reduce the PM 2.5 standard. She recommended promoting lowering the primary health standard to 60 parts per billion and the secondary standard to 7 parts per million. **Mr. Cormons** and **Mr. Logan** replied that the results of that study have not been released yet, so the workgroup didn't want to include it at this time. **Dr. Sheats** welcomed comments and questions from the Council.

Co-Chair Shepard asked, given the fact that more Latinos live in non-attainment areas than black residents, what is accounting for the increased mortality? **Dr. Sheats** replied that maybe it was because the monitoring is not granular enough down to that level or different access to healthcare or higher rates of disease in blacks due to levels of pollution and socioeconomic circumstances. **Co-Chair Shepard** asked if that was a research gap and, if so, should that be something worth monitoring? **Dr. Bullard** replied that if you disaggregate black children, there would still be a higher death rate, and there should be studies supporting that. **Dr. Sheats** noted that the orange haze from recent Canadian fires underscored the air pollution. **Ms. Lopez-Nunez** emphasized that the word "must" be in bold in the sentence "EPA must impose prescription measures..." because permits should be denied when in non-attainment. **Co-Chair Shepard** moved for a vote on the recommendations. The Council had 17 members in favor of and no abstentions or objections to finalizing these recommendations.

3.6 WHEJAC Tribal Nations and Indigenous Peoples Workgroup Update

Vice-Chair Tilousi acknowledged the team. She stated that the draft charge is still under review and waiting for pending approval from the White House. She read the charge. She gave a brief background. She explained different ways of addressing it, including properly consulting with sovereign nations about EJ projects in their communities. She gave examples of ignored consultation requests from tribal nations. **Ms. Almanza** stated that water quality, land use and protection of sacred sites are important. **Ms. Waghiyi** also gave examples of ignored consultation requests from tribal nations. **Ms. Begay** underscored strengthening tribal consultation and building transparency within the recommendations.

3.7 WHEJAC Climate and Economic Justice Screening Tool Workgroup Update

Dr. Sheats acknowledged the team and read the updated charge. He stated that the CEJST 1.0 has been released, and the workgroup is working on recommendations for future versions. **Mr. Foster** noted the guest speakers to assist with the recommendations. **Dr. Sheats** explained additional areas under consideration. **Mr. Foster** shared the CEJST timeline. **Dr. Sheats** shared other external expertise and information requested. **Ms. Adams** suggested adding maternal health and birth outcomes to the tool. **Dr. Sheats** welcomed comments and questions from the Council.

Co-Chair Shepard asked if funds or benefits with Justice40 would be traced through this tool. **Rachel Morello-Frosch** replied that there are plans to cross-reference CEJST and the scorecard. **Mr. Foster** asked if tracking funding and the community self-determining approach would be included in the information from CEQ. **Dr. White-Newsome** stated that it is still being discussed and will be included in the September briefing. She also responded that tracking benefits with Justice40 and connecting CEJST with the scorecard are still ongoing.

Dr. Bullard stated that maternal health, urban hotspot islands and PM 2.5 should be identified on CEJST, and resources be made available to remedy them. **Dr. White-Newsome** replied that the goal is to find a nationally consistent data set for maternal health for the tool. She also responded that if there was a proxy to use to track that data in CEJST, that would be helpful. **Dr. Sheats** asked if HHS or CDC presented that information already and if we can use that data. **Dr. Morello-Frosch** responded that the lack of maternal health data has been a challenge

because of how states report that data to CDC.

Mr. Logan stated that low birth weight is an important indicator to include in the tool. He asked if the data gaps should be addressed. **Dr. Morello-Frosch** responded that the data gaps have been discussed and still need to be fixed. **Dr. White-Newsome** responded that the new EJEO is working with the Office of Science and Technology Policy, and they are the audience for solving these data gaps. **Dr. Morello-Frosch** asked that a letter from WHEJAC be written to them concerning this issue. **Dr. White-Newsome** responded yes. **Ms. Roberts** proposed that a letter be written.

Mr. Foster asked if there is a way for organizations and nonprofits to contribute to nationally consistent datasets. **Dr. White-Newsome** replied that there needs to be a level of quality control so a level of scrutiny wouldn't allow that data to be included. She added that pressuring states to collect and report that data might solve these data gaps. **Co-Chair Shepard** suggested that maybe federal funding shouldn't go to states that don't collect and report the data. **Dr. White-Newsome** agreed. **Dr. Bullard** responded that some states don't want that data reported.

Co-Chair Moore suggested that, since the meeting is running ahead of schedule, we skip the break and ask questions to Dr. White-Newsome from the previous day. **Dr. White-Newsome** welcomed comments and questions from the Council. **Co-Chair Shepard** asked what thoughts she had regarding NEPA and the Debt Reduction Act. **Dr. White-Newsome** stated that concerns are shared regarding compromises that go against the president's agenda and EJ issues. She said that she hopes the next version of NEPA corrects those wrongs.

Ms. Lopez-Nunez applauded the formation of OEJ and CEQ with the new bills passed. **Dr. White-Newsome** responded that bringing on career hires leads to continuity and sustainability in the cause. **Mr. Logan** asked if the new NEPA provisions are going to delay the issuance of Phase II. **Dr. White-Newsome** replied that she didn't believe it would but would get confirmation. **Ms. Santiago** questioned the words "significant progress" that was referred to the previous day. She added that those words contrast with recent actions, specifically with recent shady permitting and weakening of NEPA and others. She gave examples from PR. She stated that FEMA should not be permitting projects in known floodplain areas. **Dr. White-Newsome** replied that her office provides an EJ filter to federal departments and that things would be worse if her office wasn't there. She added that they are trying their hardest to make a positive difference and sometimes things slip through. She encouraged WHEJAC and the public to keep pushing and speaking up to address the EJ issues. She invited Ms. Santiago to speak more.

Ms. Roberts asked how Dr. White-Newsome would be engaged in a deeper way with the IAC. She added that there seems to be a disconnect between EJ and the IAC. She asked how can the WHEJAC be an effective federal advisory body while simultaneously making noise from the outside? **Dr. White-Newsome** replied that being on the Council, she and Chair Mallory's vision is what they share at the IAC. She also stated that she doesn't see CEQ as being a liaison to the IAC but that they all work together. **Co-Chair Moore** stated that he sees progress (TCTACs in place and new hires), but there's a lot more still left to do (TCTACs in all states and more EJ staff in federal departments) and we're running out of time. **Dr. White-Newsome** agreed but said some resources are underutilized because people don't know they exist. She replied that more EJ hires are happening.

Dr. Sheats stated that this administration restored what was lost in NEPA with the last administration, but the Debt Reduction Act may set us back again. He added that CCS may set us back even further. **Dr. White-Newsome** replied that more information is coming.

Mr. Foster asked if WHEJAC can send recommendations before decisions are made. **Dr. White-Newsome** responded that she was not sure if that was permitted. **Mr. Logan** stated that WHEJAC needs to be strategic with what they send CEQ. **Dr. White-Newsome** replied that the more specific the request or the recommendation the better. **Co-Chair Moore** announced a break.

3.8 Presentation: Overview of the EPA's Proposed New Carbon Pollution Standards and Guidelines for Fossil Fuel-Fired Power Plants

3.8.1 Tomas Carbonell, Deputy Assistant Administrator for Stationary Sources, Office of Air and Radiation, U.S. Environmental Protection Agency

Tomas Carbonell gave an overview of the proposed standards. He explained the Clean Air Act, Section 111, the standards and timelines for new gas-fired stationary combustion turbines, the proposed emission guidelines and timelines for existing fossil fuel-fired sources and existing coal-, gas-, and oil-fired boilers, state planning process for existing sources, proposed standards and tribes, state plans for proposed emission guidelines, emission changes, benefits and costs, the environmental justice assessment, addressing concerns around CCS, existing regulatory framework related to carbon capture and sequestration projects, public hearing and feedback and tribal consultation. See the slide presentation for details.

3.9 Federal Agency Presentation - Inflation Reduction Act (IRA) Elective Pay

3.9.1 Seth Hanlon, Deputy Assistant Secretary for Tax and Climate Policy, U.S. Department of Treasury

Seth Hanlon gave a disclaimer before the presentation and then explained how to submit comments and questions to the Treasury and IRS. He gave an overview of the IRA and explained the clean energy provisions. He gave an overview of elective pay and explained the applicable entities, applicable tax credits for energy generation and carbon capture, fuels, vehicles and manufacturing, certain requirements and bonuses that may affect the value of applicable tax credits, the procedure for making a claim and receiving an elective payment, an example of a local project and special rules for grants and loans. See the slide presentation for details.

Co-Chair Moore welcomed comments and questions from the Council. **Ms. Santiago** asked what is the rationale behind offering tax credits for CCUS, hydrogen and experimental technology compared to tried-and-true technologies? **Mr. Hanlon** replied that it was a decision made by Congress, so he doesn't know the answer. **Ms. Lopez-Nunez** asked for rules on guidance with the broad categories. **Mr. Hanlon** replied that the proposal goes into more detail and this was just an overview. He added that comments are welcome for more clarity. **Ms. Santiago** asked how clean hydrogen is defined. **Mr. Hanlon** replied that they're working on the

provision and haven't defined it yet.

Mr. Logan stated that with the alternative vehicle refueling property tax credit, alternative fuels (ethanol, natural gas, and biodiesel) aren't considered to be clean fuels. **Mr. Hanlon** replied that those will be laid out in the statute. He added that that credit is limited to installations in low-income and non-urban areas. **Mr. Foster** asked how is the energycommunities.gov resource tool being used in accordance with CEJST? **Mr. Hanlon** replied that the website has its own statutory criteria.

3.10 Public Business Session

DFO Washington announced that it was a time to reflect on the meeting proceedings and public comment period, discuss and deliberate any action items, raise any concerns, finalize next steps and share any thoughts. **Ms. Waghiyi** stated that although she learned a lot about carbon capture and hydrogen, it sounds like false solutions. She stated that she's more concerned about cleaning up existing pollution than about experimental energy and storage. **Co-Chair Moore** mentioned that the Council had raised the idea of a carbon capture workgroup. **Karen Martin**, Director, Partnerships and Collaboration Division, Office of Environmental Justice and External Civil Rights, U.S. EPA, reminded the Council of the procedure for starting a new workgroup. **Ms. Waghiyi** moved to raise the topic at the next chairs' meeting. **Mr. Havey** recommended that the Carbon Management Workgroup take on this topic of CCS since it's a similar topic and it's already an active group. **Co-Chair Moore** seconded that the chairs would discuss the topic at the next chairs' meeting.

Ms. Santiago stated that these new ideas sounded like a justification for bringing in new methane gas-fired power plants, which contradicts meeting the president's renewable energy or decarbonization goals. **Ms. Lopez-Nunez** stated that she found it contradictory to talk about the issues in EJ communities and, at the same time, talk about tax credits for starting new CCS, CCUS and hydrogen plants. She stated that the WHEJAC needs to ring a huge alarm. She expressed concern that the next WHEJAC public meeting isn't until December, but there are so many things arising in the meantime that need to be addressed. **Ms. Santiago** asked if WHEJAC can receive notice from EPA or other agencies for the kinds of projects mentioned.

Mr. Havey mentioned ethanol production is a huge issue related to CCS. He added that it's a false promise just like plastic recycling was in the past. **Dr. Sheats** agreed with the Carbon Management Workgroup taking up power plant rules. He reminded the Council that members can comment on issues as their organization's leader and not WHEJAC.

Ms. Adams asked if their contractors can collect all the comments made at the meeting for the record. She asked if WHEJAC could write a letter to CEQ voicing the grievances. **Ms. Martin** stated that there are contractors to write draft recommendations and summaries of meetings. She added that those writings can be shared with the Council. She also stated that the Council can write a letter to CEQ, but it has to be finalized in a public meeting. She explained the planning involved if the Council wants to do that. **Mr. Logan** asked what level of detail needs to be voted on. **Ms. Martin** replied that it needs to be as close to final as possible, just like the procedure for making recommendations. **Ms. Adams** asked if the letter can be crafted within the Carbon Management Workgroup instead of going through all the steps. **Ms. Martin** replied that they could, but it still needs to follow the other steps.

Ms. Lopez-Nunez stated that waiting until December is too long. **Co-Chair Shepard** mentioned that there was a special meeting last year, and they could plan one for September if needed. **Ms. Martin** mentioned the idea of a focused, three-to-four-hour, one-afternoon meeting. **Mr. Logan** asked if CCS and hydrogen are considered for this idea or if are they separate. **Ms. Lopez-Nunez** replied that they all fall under carbon management. **Dr. Morello-Frosch** agreed that the Carbon Management Workgroup could take the lead on this letter. **Co-Chair Moore** moved to vote on a recommendation to write a letter to CEQ voicing their grievances. The Council had 16 members in favor of and no abstentions or objections to finalizing that recommendation. **Ms. Adams** asked the workgroup to work on logistics.

Mr. Foster asked for a recommendation for getting a notice when new CCS projects come online. **Dr. White-Newsome** replied yes. **Ms. Adams** reminded the Council that Ms. Shepard had recommended that at another meeting. **Co-Chair Shepard** replied that it was community benefits. **Mr. Logan** requested getting some research or background information on the hydrogen hubs and the legality of the NDAs given to folks in those conversations to help with writing the letter. **Co-Chair Shepard** suggested scheduling presentations on hydrogen hubs would also help. **Ms. Martin** stated that some of those hydrogen hub presentations are already scheduled, but other presentations to the whole Council would have to be in a closed business meeting. **Ms. Waghiyi** stated that the previous presentations are enough information to get the workgroup started.

Mr. Logan asked how often will the IAC be meeting with WHEJAC, and what is their role? **Mr. Foster** proposed having joint meetings occasionally with joint topics. **Dr. White-Newsome** suggested that they write a recommended strategy for the meetings and she can forward it to the IAC and get their feedback. **Mr. Logan** asked if they could decide on that today. **Dr. White-Newsome** asked Ms. Martin if it needed to be formal or not. **Ms. Martin** replied that it could be just a request. **Mr. Logan** recommended IAC meet concurrently with WHEJAC during in-person meetings. **Mr. Foster** suggested meeting quarterly. **Ms. Adams** asked if it's possible to meet with just the specific agency instead of the whole IAC. **Dr. White-Newsome** replied that particular agencies can meet with the workgroup. **Ms. Martin** confirmed. **Mr. Logan** stated that his idea stems from wanting the IAC to hear WHEJAC's conversations and public comments and having a direct dialogue with the different agencies. **Dr. White-Newsome** and **Ms. Martin** stated that they will check with FACA and let the Council know.

Mr. Foster recommended creating a youth working group in which they invite young people on streamlining initiatives, youth exposure to toxins and youth engagement and education strategies. **Co-Chair Shepard** asked what ages they consider as youth. **Mr. Foster** replied under 30. **Mr. Logan** asked if that included subject matter experts or if that was an internal workgroup only. **Ms. Martin** reminded the Council of the procedures for starting a new workgroup. She suggested that Ms. Adams and Mr. Foster send the chairs more details.

Co-Chair Shepard questioned the need for that workgroup. **Mr. Foster** replied that the workgroup would work on the civilian climate and workforce development in schools and work directly with the Department of Education on engagement. **Dr. Sheats** mentioned that NEJAC has a youth fellows' program. **Ms. Adams** knew about that program. **Mr. Foster** stated that he will send the recommendation ideas to the chairs.

Ms. Martin will share the summary of the public comments. **Mr. Logan** asked if the panelists' recommendations get included in the public comments. **DFO Washington** replied that they will be included in the meeting summary.

3.11 Closing Remarks - Adjourn

Dr. White-Newsome thanked everyone for their hard work and stated that it was a motivating week. **Co-Chair Shepard** stated that there was a lot of knowledge shared and there is a lot of work to do with workgroup meetings and getting the recommendations moving for the potential September meeting. **Co-Chair Moore** thanked everyone. **DFO Washington** thanked several people and adjourned the meeting.

[THE MEETING WAS ADJOURNED]

Good afternoon. On behalf of my Tribal Nation, the Reno-Sparks Indian Colony ("RSIC"), I respectfully request your attention to the attached correspondence's. The first PDF attachment is my correspondence addressed to you.

The second PDF attachment is a copy of a tribal resolution from the Walker River Paiute Tribe of Nevada and the third PDF attachment is a copy of a tribal resolution from the Bishop Paiute Tribe of California. In addition to the attached tribal resolutions, the "RSIC" has received similar resolutions from the Mono Lake Kudzadika' Tribe (California) and Big Pine Paiute Tribe of the Owens Valley (California). There are two Nevada Tribes that have recently passed these same tribal resolutions: the Elko Band of Temoake Tribe and the Yerington Paiute Tribe.

The "RSIC" seeks a conversation with officials in the White House, Department of Justice and Department of Interior about pausing mine construction in Thacker Pass, Nevada so that Tribes and Bureau of Land Management can discuss ways to mitigate the harms of the Thacker Pass Traditional Cultural District-an eligible property- of the National Register of Historic Places.

Thank you for your reply to this important matter.

Arlan D. Melendez

BISHOP TRIBAL COUNCIL

RESOLUTION T2023-014

SUBJECT: In support of the Reno-Sparks Indian Colony (RSIC), Summit Lake Paiute Tribe (SLPT) and Burns Paiute Tribe's (BPT) Protection of Peehee Mu'huh/Thacker Pass

WHEREAS, the Great Basin Tribal Nations, whose homelands encompass the states of Nevada, California, Utah, Idaho, Oregon, are all related through our waters, spiritual practices, languages, ancestry, and cultural traditions; and

WHEREAS, after the 19th century violence and colonization that the US Calvary, miners, settlers perpetrated on the Great Basin Native American people, tribes were forcibly and violently separated and individualized as part of the Indian Reorganization Act; and

WHEREAS, on September 12, 1865 the Nevada Calvary conducted a brutal massacre of between 31 and 70 Northern Paiute and Shoshone people at Thacker Pass -- Peehee Mu'huh -- where the ancestral human remains still lay and where the living was prohibited to return to the 1865 massacre site to bury their dead; and

WHEREAS, in dry climates where salt flats are found, like the Great Basin, water use is one of the major harms of lithium mining; up 500,000 gallons of water are needed to produce one ton of lithium; and

WHEREAS, the Dept. of Interior ("DOI") Bureau of Land Management ("BLM") Thacker Pass Lithium Mining Projects January 2021 Record of Decision ("ROD"), Memorandum of Agreement ("MOA") and Historic Properties Treatment Plan ("HPTP") is in violation of the National Historic Preservation Act ("NHPA"), the Archeological Resources Protection Act ("ARPA"), the Administrative Procedure Act ("APA"), the Native American Graves Protection and Repatriation Act ("NAGPRA"), and the National Environmental Policy Act ("NEPA"); and

WHEREAS, the DOI BLM failed to adequately follow the procedures outlined in the NHPA to evaluate the September 12, 1865 Thacker Pass Massacre; and therefore, the Reno-Sparks Indian Colony ("RSIC") and Summit Lake Paiute Tribe ("SLPT") took it upon themselves to author the Traditional Cultural Property Eligibility Statements for the Thacker Pass Traditional Cultural District and September 12, 1865 Thacker Pass Massacre Site titled: Thacker Pass/Peehee mu'huh: A living Monument to Numu History and Culture (February 3, 2023); and

WHEREAS, in addition to ancestral human remains, there are three eagle's nests at Thacker Pass and the US Fish and Wildlife Service has issued a 5-year Eagle Take Permit under the Bald and Golden Eagle Protection Act to Lithium Nevada Corporation to allow the mining company to disrupt the eagle's breeding cycles; and

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WHEREAS, the federal government claims that electric vehicles, powered by lithium minerals, will solve the 21st Century climate crisis but this transition to lithium battery-powered electric vehicles will deepen global environmental and social inequalities linked to extractive and harmful mining, which leads to the annihilation of critical habitats, ecosystems and continuation of cultural genocide to our homelands and globally; and

WHEREAS, there are currently 18,000 lithium claims in our Great Basin Tribal Nations traditional homelands; and

WHEREAS, the Bishop Paiute Tribe relative Tribal nations, RSIC, SLPT and Burns Paiute Tribe have filed Case No. 3:23-cv-00070-MMD-CLB (RSIC vs. DOI Deb Haaland, Anne-Marie Sharkey and Kathleen Rehberg, local officials of the Department of the Interior's Bureau of Land Management ("BLM") in their official capacities and Lithium Nevada Corporation) in US District Court District of Nevada; and

WHEREAS, the Bishop Paiute Tribe supports our relative tribes' efforts to protect the traditional homelands from extractive lithium mining practices

NOW THEREFORE, BE IT RESOLVED, that the Bishop Paiute Tribe call on the U.S. to uphold its trust and treaty obligations to Tribal Nations by engaging in robust and adequate tribal consultation on the Thacker Pass mine and any other proposed lithium mine to allow all Tribal Nations to participate consistent with the U.N. Declaration on the Rights of Indigenous Peoples' Free, Prior, and Informed Consent policy and U.S. President Biden's Consultation Policy.

CERTIFICATION

We the undersigned, as the Chairwoman and Secretary of the Bishop Paiute Tribal Council, hereby certify that at a duly called Tribal Council meeting, which convened on the 2 day of May 2023, approved the foregoing resolution at which a quorum of 4 members were present and voting 3 for, 0 opposed, 0 abstaining, motion carried.

Attest:

Meryl Picard, Chairwoman — Date: 5/2/23

Steven Orihuela, Secretary/Treasurer — Date: 5/2/23

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RENO-SPARKS INDIAN COLONY
★CHAIRMAN'S OFFICE
34 Reservation Road, Reno, NV 89502
Phone: (775) 329-2936 • Fax: (775) 954-9175

July 6, 2023

Dr. Robert Bullard, Member
White House Environmental Justice Advisory Council
1600 Pennsylvania Ave NW
Washington, DC 20500

Dear Mr. Bullard:

On behalf of my Tribal Nation, the Reno-Sparks Indian Colony ("RSIC"), I respectfully request your attention and action regarding the Bureau of Land Management's ("BLM") failure to offer RSIC and other Tribes meaningful consultation about the Thacker Pass Lithium Mine's effects on land sacred to Paiute and Shoshone people. BLM is currently allowing the Thacker Pass Traditional Cultural District ("the District") – a National Register of Historic Places-eligible property – to be destroyed before concluding consultation with Tribes about how to mitigate the mine's effects on the District.

Peehee Mu'huh (Thacker Pass) is a site of utmost sacredness for our Tribe's members, who are descendants of Paiute, Shoshone, and Washoe Peoples of the Great Basin. Our members possess direct cultural connection to Thacker Pass, and continue to practice ceremony, hunt, and gather in the area as our people have done since time immemorial. We continue to conduct traditional ceremonies at Peehee Mu'huh, including the Circle Dance, Rabbit Dance, Bear Dance, Eagle Dance, and Deer Dance.

On September 12 1865, members of the 1st Nevada Cavalry massacred at least 31 Paiute children, women, elders and men as they slept. At least eight eyewitness accounts and historical records describe the massacre. U.S. General Land Office records, eyewitness descriptions from a 1st Nevada Cavalry soldier and one of our ancestors who survived the massacre, and newspaper reports show that the remains of as many as 70 of our descendants lie strewn across the area, all of which is contained within the mining site.

We are not opposed to the transition to renewable energy. To the contrary, we support the transition and greatly understand the need for new technology that reduce our collective reliance on fossil fuels. We support this transition so long as it is pursued correctly, with basic respect for our human dignity and right to consultation. This transition cannot be carried on the backs of Native peoples through the destruction of our cultures. We are inextricably linked to the lands, waters, and animals of the Great Basin. We are inseparable

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from our ancestors and sacred sites. Green energy is not green when it destroys the ecosystems upon which we rely for our traditional medicines, foods, and materials. Clean energy is not clean when it necessitates the desecration of our ancestors' bones and resting places and our communities' sacred sites.

We seek to preserve our Nation-to-Nation relationship with the United States. We are attentive to this Administration's commitment to honoring our Nation-to-Nation relationship. President Biden's renewed pledge to meaningfully respect this centuries-old understanding is apparent in his January 26, 2021 memorandum on "Tribal Consultation and Strengthening Nation-to-Nation Relationships" and November 30, 2022 memorandum establishing "Uniform Standards for Tribal Consultation." President Biden's election and his early commitments to tribal consultation and strengthening our Nation-to-Nation relationship were a source of hope for our community and communities across Indian Country.

This mine was approved hastily, without any meaningful consultation process, by the previous administration. We understand that the prior administration did not hold regard for the Nation-to Nation relationship nor its duty to consult with Tribal Nations. Our understanding of the current administration has been that it both respects the Nation-to-Nation relationship and is dedicated to upholding its expressed duty to consult with Tribal Nations. However, as our requests for consultation go ignored, we have begun to worry that these commitments may be merely words left unsubstantiated by action.

The Thacker Pass Project also poses enormous environmental justice concerns. The impacts of this mine will adversely impact the **air quality, water availability and soils** tilled by Indigenous communities who rely on the Quinn River Valley and the wider Great Basin region for subsistence and cultural survival. Our community is not just a Tribal Nation, but a community of color. We recognize that the White House has indicated it takes threats to environmental justice issues seriously. The Thacker Pass Project poses a dire environmental threat to the health and wellbeing of our community.

Honoring our Nation-to-Nation relationship not only upholds this White House's pledge to fulfill its Federal trust responsibilities and duty of consultation to Tribal Nations, it would affirm the administration's commitment to environmental justice. **The Great Basin Tribes are gravely concerned about the indigenous sacrifice and destruction of our traditional homelands for the "green energy transition".**

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We humbly request that the White House uphold its duty of consultation to Tribal Nations. Until now, our pleas have been ignored. BLM is currently allowing sacred sites in Thacker Pass to be destroyed before BLM has committed to any mitigation measures for the destruction of these sites. We seek a conversation with officials in the White House, Department of Justice and Department of Interior about pausing mine construction in Thacker Pass so that Tribes and BLM can discuss ways to mitigate the harms this construction is causing to our sacred sites.

Sincerely,

Arlan D. Melendez
Tribal Chairman

Walker River Paiute Tribe

1022 Hospital Road • P.O. Box 220 • Schurz, Nevada 89427
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RESOLUTION OF THE GOVERNING BODY
OF THE
WALKER RIVER PAIUTE TRIBE
RESOLUTION WR-59-2023

BE IT RESOLVED BY THE TRIBAL COUNCIL OF THE WALKER RIVER PAIUTE TRIBE THAT:

WHEREAS, the governing body of the Walker River Paiute Tribe of Nevada (Tribe") is organized under the provisions of the Indian Reorganization Act of June 18, 1934 (48 Stat. 984) as amended, to exercise certain rights of home rule and be responsible for the promotion of the economic and social welfare of its members, and

WHEREAS, the Great Basin Tribal Nations, whose homelands encompass the states of Nevada, California, Utah, Idaho, Oregon, are all related through our waters, spiritual practices, languages, ancestry, and cultural traditions, and

WHEREAS, after the 19th century violence and colonization that the US Calvary, miners, settlers perpetrated on the Great Basin Native American people, tribes were forcibly and violently separated and individualized as part of the Indian Reorganization Act, and

WHEREAS, on September 12, 1865 the Nevada Calvary conducted a brutal massacre of between 31 and 70 Northern Paiute and Shoshone people at Thacker Pass-Peehee Mu'huh, where the ancestral human remains still lay and where those who remained alive, were prohibited to return to the 1865 massacre site to ' .y their dead, and

WHEREAS, in dry climates where salt flats are fo ..., like the Great Basin, water use is one of the major harms of lithium mining; up 500,000 gallons of water are needed to produce one ton of lithium, and

WHEREAS, the Dept. of Interior ("DOI") Bureau of Land Management ("BLM") Thacker Pass Lithium Mining Projects January 2021 Record of Decision ("ROD"), Memorandum of Agreement ("MOA") and Historic Properties Treatment Plan ("HPTP") is in violation of the National Historic Preservation Act ("NHPA"), the Archeological Resources Protection Act ("ARPA"), the Administrative Procedure Act ("APA"), the Native American Graves Protection and Repatriation Act ("NAGPRA"), and the National Environmental Policy Act ("NEPA"), and

WHEREAS, the DOI BLM failed to adequately follow the procedures outlined in the NHPA to evaluate the September 12, 1865 Thacker Pass Massacre; and therefore, the Reno-

Sparks Indian Colony ("RSIC") and Summit Lake Paiute Tribe ("SLPT") took it upon themselves to author the Traditional Cultural Property Eligibility Statements for the Thacker Pass Traditional Cultural District and September 12, 1865 Thacker Pass Massacre Site titled: Thacker Pass/Peehee Mu'Huh: A living Monument to Numu History and Culture (February 3, 2023), and

WHEREAS, in addition to ancestral human remains, there are three eagle's nests at Thacker Pass and the US Fish and Wildlife Service has issued a 5-year Eagle Take Permit under the Bald and Golden Eagle Protection Act to Lithium Nevada Corporation to allow the mining company to disrupt the eagle's breeding cycles, and

WHEREAS, the federal government claims that electric vehicles, powered by lithium minerals, will solve the 21st Century climate crisis but this transition to lithium battery-powered electric vehicles will deepen global environmental and social inequalities linked to extractive and harmful mining, which leads to the annihilation of critical habitats, ecosystems, and continuation of cultural genocide to our homelands and globally, and

WHEREAS, there are currently 18,000 lithium claims in our Great Basin Tribal Nations traditional homelands, and

WHEREAS, the Walker River Paiute Tribe, relative Tribal nations, RSIC, SLPT and Burns Paiute Tribe have filed Case No. 3:23-cv-00070-MMD-CLB (RSIC vs. DOI Deb Haaland, Anne-Marie Sharkey and Kathleen Rehberg, local officials of the Department of the Interior's Bureau of Land Management ("BLM") in their official capacities and Lithium Nevada Corporation) in US District Court District of Nevada, and

WHEREAS, the Walker River, Paiute Tribe supports our relative tribes' efforts to protect the traditional homelands from extractive lithium mining practices, and

NOW, THEREFORE, BE IT RESOLVED, that Walker River, Paiute Tribe calls on the U.S. to uphold its trust and treaty obligations to Tribal Nations by engaging in robust and adequate tribal consultation on the Thacker Pass mine and any other proposed lithium mine to allow all Tribal Nations to participate consistent with the U.N. Declaration on the Rights of Indigenous Peoples' Free, Prior, and Informed Consent policy and U.S. President Biden's Consultation Policy.

CERTIFICATION

It is hereby certified that the foregoing resolution of the Walker River Paiute Tribal Council composed of seven members of whom 7 constituting a quorum were present at a meeting held on the day 22nd day of June 2023, and that the foregoing resolution was adopted by the affirmative vote of 5-FOR, 0-AGAINST, and 0-ABSTAINED, pursuant to the authority contained in Article VI, Section 1(e), of the Constitution and By-Laws of the Walker River Paiute Tribe, approved March 26, 1937.

Gina L. Wachsmuth, Tribal Council Secretary
WALKER RIVER PAIUTE TRIBE

blatant corruption to move this meeting to arizona when it can be held without causing climate damage by trnasporting all these people to arizona, w hen t hey are already in washington dc for otyher reasons. this makes no sense and is simply an attempt to make taxpayers pay for your pvacation in phonenix. we would all like to go but having the taxpayers pay for your weeks vacation in pheonix is blatant corruption imo. it also bringson climate change for all t hese people to get on airplanes and travel for a meeting that can be held on virtulal

the fact is all americans then can join the meeting if you have it on virtual. it makes much mofre sense to have important meetings like t his on virtual internet. that is why we have internet today to avoid trabvel that does not have to take place. there is no reason that environmetnal issues have to be in vacation l and. this is blatantr corruption., we need to mae a real effort to have all meetings on virtual so that the american people can join them. shame shame on your looking for taxpayers to pay your gtransport and pay for youyr hotel meals, transport etc when yoiu can stay at homne and pay for those things yourself. this corruption is disguting in t hat it has a negative effect on trying to fight trsnaporet pollution, which is massive and extensive. this comment is for the public record please eceipt., B Ker

Full Name (First and Last): Barbara Halden

Name of Organization or Community: Arizona Farm to School Network, Healthful Schools Coalition Arizona, self

City and State: Phoenix, AZ

Brief description: Hello, Thank you for the opportunity to give input for your work. Schools and the natural environment around the brick and mortar buildings are one of the most important cells in our communities to achieve environmental justice. Public schools were started many years ago to teach children all necessary knowledge to survive in this world. At this point in time, most children grew up playing in nature (woods, fields, rivers, lakes). Through play and work on farms, they learned and experienced the laws of nature its cycles and how life is organized. What they had to learn was math, reading, writing. Today, most of our children are not connected to true nature anymore. They spend most of their time in homes, buildings and concrete jungles. If we want this next generation to be able to solve our climate crises and live healthy lives in healthy communities, we need to give our children access to true nature again. We can do this and so much more by creating natural, sustainable school environments with gardens and other hands-on spaces to explore, investigate, nurture and love. In these spaces not only the students will learn and grow, but the whole community will. To create sustainable, nature environments in our schools, we will need funding for professional development for our teachers and funding for garden/outdoor coordinator positions. Environmental justice means, that everyone has access and can learn from nature. We can do this! Thank you!

Hello,

My name is Ben Hunkler and I work with the Ohio River Valley Institute, an Appalachia-based research organization studying, among other things, the threat of carbon capture development in the Ohio River Valley. I'm reaching out to ask if a representative of WHEJAC might be interested in participating in an upcoming in-person workshop for journalists on carbon capture and hydrogen hub development in Appalachia.

The aim of the workshop is to correct industry misinformation in the media and promote fair, comprehensive reporting on the region's hydrogen hub proposals. To that end, we're envisioning a day-long event, to be held sometime in late summer in Pittsburgh, in which we bring together the region's leading journalists for a series of presentations and discussions on the public health, environmental, and economic ramifications of hydrogen and carbon capture development. The idea is also to facilitate conversation & connection between advocates and reporters. Here's a working event description with more details.

We were wondering if a WHEJAC representative like to join us, either virtually or in-person (we have funding to cover travel costs & provide an honorarium for your time) to share WHEJAC's perspective on environmental justice as it relates to hydrogen and carbon capture development. The event is prospectively scheduled for early September—if a representative of the council is interested, we'd be happy to work around their schedule.

Thanks so much for your consideration, and please feel free to reach out with any questions,

Ben Hunkler

Full Name (First and Last): Camille Moore
Name of Organization or Community: American Association of Blacks in Energy
City and State: Washington, D.C.
Brief description about your recommendation relevant to your selection above:
AABE would like to offer thematic, high-level, and focused recommendations on overall community outcomes of health and prosperity rather than prioritizing specific metrics, like GHG reductions, above all else within BIPOC and low-income households.

Full Name (First and Last): Carlos Pinon
Name of Organization or Community: PODER
City and State: Austin, Texas
Brief description about your recommendation relevant to your selection above: Presented during the public comment period of the WHEJAC meeting, June 13, 2023:

“Good evening, everyone. My name is Carlos Pinon, and I’m a Project Coordinator at PODER, a non-profit organization based in Austin, Texas. Specifically, I support our director, Susana Almanza, a member of WHEJAC, in connecting with community-based organizations around Central Texas so that they’ll remain informed about the Justice40 Initiative and have access to resources that facilitate the process of securing federal grant funding over the next year.

The main concerns I’d like to bring to you today regard the Climate and Economic Justice Screening Tool, or CEJST. In particular, I consider the 90th-percentile threshold for most environmental categories of burden, as well as the 65th-percentile threshold for the socioeconomic category of burden for low income, too high. It has become apparent to me that this will limit many communities from acquiring funding as part of Justice40—despite being the same communities that have historically been underinvested in, neglected, even targeted, and would fall under a general definition of disadvantaged based on their lived experiences.

Likewise, if Justice40 funding is awarded based solely or primarily on the CEJST’s all-or-nothing approach, the federal government will surely exclude underserved communities, especially communities of color and low-income communities, who continue to bear the brunt of environmental and public health hazards. We, for example, have seen a census tract in Montopolis, a low-income, predominantly Latine neighborhood in Southeast Austin, that is at the 89th percentile for housing cost, just one count away from qualifying as disadvantaged; the stringency of this tool leaves the impression of arbitrariness.

Lastly, the CEJST cannot capture the full breadth of needs and burdens that exist among communities following criteria set by the federal government, whose knowledge of a community does not match that of the community itself. So much of what communities experience is cumulative, a product of history, geography, and when speaking particularly about environmental injustice, race, which is noticeably absent from the CEJST. The tool, with its emphasis on the quantifiable, is not enough.

I recommend that, overall, the WHEJAC push for (1) a more dynamic way of determining what deems a community disadvantaged, (2) far less restrictive percentile thresholds, and (3) the incorporation of factors like race that are inextricably tied to environmental injustice, the very thing that the Justice40 Initiative seeks to address.

Thank you for your time and consideration.”

Guys,

A new PBS YouTube overviews a new study on this subject. It is now well done but the charts and conclusions are amazingly clear.

Climate Change puts more moisture into the air. As I recall 7% more moisture fit every 1 degree of ocean temp rise. So we should be greatly increasing the number of wet bulb days in more parts of the world.

You will see how many more in the graphs and world maps towards the end of this video.

The increase will kill a lot of folks in events like Jim referred to in France.

Do get ready or die. The amount of change by 2070 will have many in the move.

I'll send the link shortly in another forward.

Dave Carroll

I was only able to stay up until 11:30 PM when the Advisory Panel took a break with 21 commenters yet to share their perspectives. Will WHEJAC provide written access to all of the comments ? Some of the commenters spoke torpidly for all of their thought to be captured by the translators or closed captioning. I was pleasantly surprised at all of the Latina women who provided public comments. Some of the WHEJAC Advisory Council members asked questions which were not answered by the three presenters. Will these Agency answers be provided to the wider public ? One of the commenters mentioned PFAS chemical contamination. The Safe Drinking Water Act/Superfund cleanup at Joint Base Cape Cod has a lot of monitoring data and scientific research on this environmental challenge. The cleanup is being carried out by the Air Force Civil Engineer Center with oversite by the Massa. Environmental Protection Agency and EPA Region 1. The Fire Taring Area 1 plume underlies the Yearling Meadows where I live. Thanks, David Dow East Falmouth, Ma.

When I worked at the Northeast Fisheries Science Center -Woods Hole Lab, I participated in the EPA Headquarters Waquoit Bay Watershed Ecological Risk Assessment Project which determined that nutrients (Nitrogen in Waquoit Bay and Phosphorus in Ashumet Pond) were the major ecological stressors. The Cape Cod Commission uses the watershed approach to address solutions for excess Nutrient Loading from Septic Systems which creates water quality problems in local embayments and loss of habitat for aquatic species (i.e. loss of eelgrass beds has lead to the collapse of the bay scallop fishery). The Nutrient pollution effects on wild places, wild things is exacerbated by climate change. The Waquoit Bay Watershed also suffers from other environmental stressors which effects oldsters and our less affluent residents (see uuffm.org website under Challenges). This ecosystems-based management approach might provide a case study for TCTACs Resource Centers to develop a more Holistic Community-based approach for EJ populations that involve funding from multiple Federal Agencies and public/private partnerships between contractors and EJ communities to implement.

On Cape Cod, the Massa. Department of Environmental Protection has recommended two strategies to reduce “Nitrogen Loading from Septic Systems”. Sewering with construction of wastewater treatments plants with ocean outfalls for treated sewage effluent over 20 years or Innovative/Advanced Septic Systems installation in homes over 5 years. Both of these approaches will require significant resources (people and $) and require both technical support & Federal/State grants. Falmouth where I reside requires town residents to provide 1/3 of the funding for sewering/expansion of our wwtp with the residents of the developments covering the other 2/3 of the cost.

Falmouth faces PFAS challenges in our drinking water from PFAS precursors which get converted into the PFAS6 (sum of 6 high molecular weight PFAS chemicals can’t exceed 20 parts per trillion). The PFAS precursors can’t be removed by Granular Activated Carbon filters on public wells which will require homeowners to install Reverse Osmosis filters in their homes. We need to devote additional resources to implement the Barnstable County Climate Action Plan and the the state climate change legislation. Finish and shellfish in Ashumet and Johns Ponds are contaminated with the PFAS6; methyl mercury and cyanobacterial toxins at levels that pose health threats to sensitive populations (women of child bearing age and kids; oldsters with pre-existing health conditions and freshwater anglers who fish to put food on the table). We have an affordable housing crisis for service workers and oldsters where “affordable rent” in apartment complexes is $1500-2500 per month. We also face municipal solid waste recycling challenges and need to compost organic wastes.

After listening to public comments on Tuesday evening and public presentations today from residents of EJ communities, their situation is more dire than that here in Falmouth, Ma. Thus the $ 3 billion (?) in Inflation Reduction Act grants funds is a drop in the bucket. The Dept.of Defense has spent over $1.4 billion on the SDWA/CERCLA cleanup at Joint Base Cape Cod over the last 30 years. Thus I would recommend that TCTAC process help EJ communities prioritize their needs for grant funding over the next 20-30 years to address a multitude on environmental stressors and health challenges.. In Massachusetts, the State Legislature is considering a PFAS and Public Health Bill which would utilize funds from polluter lawsuits to fund PFSAS cleanup. The European Union has the "Precautionary Principle" and "Polluter Pays" programs to reduce PFAS contamination. Perhaps EPA and other Federal Agencies could use Ecological Economics approaches to help EJ communities get more bang for their buck in grant funds.Thanks for considering these comments Dr. David Dow East Falmouth, Ma.

I was impressed by this report by M. Lopez-Nunez and the recommendations from WHEJAC members which was overwhelming in the level of detail in a short amount of time. Will a copy of this be available in the final report from this June 2023 WHEJAC meeting ? It is unfortunate that many of the Panel discussions consume much of the time with only 10 minutes left for the WHEJAC members to make comments or ask questions. As a grassroots EJ activist residing on Cape Cod, I often learn more from the grass case studies on how the Federal grant money is used to make a difference in the lives of EJ populations. It remains to be seen how the TcTOC Technology Assistance Centers will be able to engage EJ communities in order to obtain grant funds from EPA's baseline budget after the Infrastructure Reduction Act funds expire. My sense from NEJAC meetings is that academic or NGO partners join EJ populations in obtaining grant funds and aiding in carrying out the funded projects. Most of the EJ population input comes from Advisory Panels that provide suggestions on how the funds are utilized, with community outreach meetings on the projects results I don't know how effective this approach is in overcoming political opposition at the grassroots level and entrenched industrial developers.

In the case of the Mashpee Wampanoag Tribal Council's efforts to restore river herring runs in three local watersheds, they are getting help from the Bioneers in moving this project forward. The tribe may also get support from local ENGOs and Communities of Faith to overcome local obstacles for implementation. Since river herring are used as bait in commercial and recreational fishing, there is a need of support from NOAA Fisheries and Massa. Division of Marine Fisheries to reduce "fishing mortality" on herring populations. A combination of climate change and nutrient pollution in local embayments increases "natural mortality" on river herring populations. This will require action by EPA Region1 and the Massa. Department of Environmental Protection. The Mass. Fish and Wildlife Agency will need to support the Tribe's Conservation Department in reducing river herring migration obstacles to their breeding regions (culverts under roads and dams at Cranberry bogs). This is a fairly simple problem to resolve involving local/state/Federal entities interacting with the Tribal Council.

Other real world EJ challenges are much more complex and will involve financial support and technical assistance over a period of years to make a difference, The climate change presentation was a good example of addressing this complexity and the required co-operation by multiple political and regulatory entities. Thanks for considering this comment. Dr. David Dow

Hello Matthew Tejada and others of the WHEJAC,

We sincerely appreciate having the opportunity to participate in providing written public comments for the June 2023AZ WHEJAC meeting. Please let me know these written comments were received today.

We appreciate the work of the WHEJAC and hope your efforts on behalf of Justice and Equity continue past September 2023. You are a critical piece of Hope for communities like ours.

Please know this is a Living Document, attached, subject to many more dynamic additions as we weave our way through this super traumatic post Catastrophic Fire in Northern NM and as we rebuild our lives also preparing for many more years of consequences for our local communities.

Any ideas on who you recommend we also discuss these dilemmas with would be appreciated.

Most Sincerely, Ellen Drew

June 28, 2023

White House Environmental Justice Advisory Council, Northern NM Living Document

Edrew Written Comments for WHEJAC Meeting June 13-15, 2023 in AZ, due to WHEJAC June 29, 2023

AFTER THE CATASTROPHIC HERMITS PEAK-CALF CANYON FIRES

RUN-OFF, FLOODING, SLUDGES AND DRINKING WATER CONCERNS, INCLUDING HOUSING AND ECONOMIC DEVELOPMENT

Mora and San Miguel Counties, New Mexico

On April 6th, 2022 our U.S. Forest Service started a prescriptive burn in northern NM on one of the windiest days with highest fire weather ingredients that we can remember. The fire quickly raged out of control in 5 counties burning 360,000 acres in a little over two months, primarily in San Miguel and Mora Counties. The largest catastrophic fire in NM history, to date. Dozens and dozens of homes were burned, thousands of people totally displaced where the consequences of this environmental injustice will be felt now for generations to come. The burning of toxic materials from homes such as computers, insulations and other man-made products is now, with the rains and sludges running into surface water, ground water and the toxic sludge from fire retardant and other pollutants contamination in this urban-wildland interface is something we are learning that no one in the U.S. seems to knows how to deal with very well. We have made contact with communities in CA and CO who have had this same type of catastrophic fire hoping they have some solutions. Mostly learning of few solutions. There is a need for a better model as catastrophic fires are becoming hotter and wilder and more devastating, particularly in the western U.S.

The USFS has apologized for their errors and Congress is/will be providing resources to the people, although it has already been a year and it could be 7+ years before locals are able to rebuild and begin to move home. Northern NM is home to a very diverse, primarily low income, people of color population whose indigenous and historical roots date back over 500 years, as a land-based peoples where they live off the land and water which is now toxic. Generations of families lived on the same lands as their ancestors. Now there is contaminated water, contaminated land; people moving away and this long slog of the government trying to act quickly but unable to basically.

Collaborative Visions, a non-profit in Mora County, has been on the front lines of this catastrophic event, helping, helping, helping. Below we are listing projects that we are seeking funding for in order to address safe drinking water, housing and other concerns that we might have some ability to actually set in motion a new model for inclusive community input and actions we can take now to begin minimizing the health and welfare concerns of citizens exposed to this ravaging type of catastrophic event. Each piece of our model includes economic development:

1. Identify projects in Mora and San Miguel Counties, New Mexico that are both short-term and long-term to best support, with resources, our small rural communities' abilities to help themselves. Plus, identify all shovel-ready projects that need support

now. Provide funding for projects to be supported by paid staff. Survey local populations for needs.

2. Articulate the current need for additional resources such as:
    - Full Funding at approx.. $60,000 per well to drill and provide X# of potentially much deeper wells for safe drinking water in areas impacted by the Run-offs, Flooding, Sludges and Drinking Waters contaminated with mixing pollutions from homes, computers, vehicles, insulations and other solvents creating a toxic soup.
    - We need to actively test for the wildlife-urban interface pollutions that were incinerated and then mixed into all the waters on the surfaces which can then impact groundwater.
    - We need funding for NMHU/Luna Vo-tech students and staff to train on water quality sampling and Mapping the surface and ground water including all related data through various non-profits, and local, state and federal data points. Mapping the cumulative data for the actual scars, plus all relative downstream areas either directly or indirectly impacted as a result of this catastrophe. We need much more water and air and soil testing equipment and training. Propose training students to begin to understand these complexities of water, soil, air pollutions, moving through the water. Include this curriculum in NMHU Forestry, Chemistry, Luna Nursing programs, and others.
    - Ongoing funding for repetitive water, soil and air testing to pinpoint multiple pollution sources, establish baselines and to be able to assess ongoing pollutions impacting local citizens, livestock, wildlife, food production, over time. This is critical testing for citizens and agencies to understand what the mixing of pollutants in the waters and sludges may be impacting the health and well being of citizens, wildlife, food production and livestock. This agrarian community needs to be able to know what pollutants are occurring and where. Then establish mechanisms for actively preventing further pollution, with funding for this mitigation support, over time. Extreme flooding and sludges are anticipated for at least 7-10 years after such a catastrophic fire.
    - Funding to purchase several thousand Berkey countertop carbon water filters (purchase 20 at a time?) with trained paid folks to help set up and work with the local public on keeping potable water available at the home by home level so that citizens are not using plastic bottled water.
    - Funding to drill several localized community drinking water wells that could be used by local people fearful of drinking their own water, for now and into the future as an emergency preparedness step… They could have a bar code or code or something with cumulative-use in gallons reflected. There are these types of water station examples, even in NM, as pilot programs, quite a number of years ago now. They have only gotten better. Could be manned in emergencies and operated automatically each day with someone assigned to the responsibility of

this, probably also sampling. Would need secure fencing for drinking water safety. People could fill up to say 500 gals at a time, as needed for drinking.
    - Funding to purchase good, bottled water, stored somewhere with a way to distribute as necessary, over time.
    - Plaza Nueva housing project – for returning citizens to come back to homelands. We need new housing that is aligned with historical cultural values and traditions. There is now an emerging plan for this housing. Possibly using 3-D printers, adobe, solar, water harvesting and many other housing attributes fashioned by northern NM locals assuring cultural and traditional integrity using a commons model, with a plaza, that is endemic to this population.
    - Elderly support in fire and flooding cleanup and summer preparation for winter. Hire local youth.
    - A Fund to purchase generators, solar, pumps, large vacuums for flooded homes and more, almost an Equipment rental and repair, a part of the Commons Concept with checkout, purchase and repair by paid staff.
    - Monitoring equipment: air, water and soil. Needed from now and into the future with testing funds available to clearly see the changing pollution as it occurs and moves downstream.
    - A fund to support health testing. A critical piece of the model. Needs to be done Now and into the far future. Every person in these counties should be health tested now and then periodically for a cumulative impacts assessment over time.
    - Telemedicine made easier for local clinics in need of equipment and staff.
    - Youth Programs such as Collins Lake Ranch, working with Mora Independent Schools and others to train students in many technical areas such as monitoring, climate resilience, pollution prevention and mitigation. Includes other academia such as NM Highlands University, Luna Vocational Technical Institute, NMSU and UNM.
3. Climate readiness built into our daily lives, resilience is
4. A team of locals and experts are needed to convene on the 'the Run-offs, Flooding, Sludges and Drinking Waters' contaminated with mixing pollutions from burned homes, computers, vehicles, insulations and other solvents with an intense incineration creating a toxic soup in the Hermits Peak-Calf Canyon Catastrophic Fires – What else can we be doing to fashion our Now and our Futures to Reflect Our Culture and Our Love of the Land and Each Other. Let's turn these horrible environmental injustices into a better future for all.
        - Invite:
            - Local Citizenry through many avenues
            - For San Miguel + Mora Counties + include Colfax, Taos and Santa Fe Counties
            - Academia: NMHU, Luna, Mora Independent Schools
            - 14 Water Associations just in Mora County, serving approx. 50% of the population
            - Acequias Leadership and Acequia Association

- Businesses
    - Invite all local businesses
    - Well drillers
    - Environmental Engineering firms
    - Ranchers
    - Entrepreneurs
    -
- Not for Profits
    - NMHU Forest Restoration Institute
    - Quivira Coalition
    - NMWild
    - 2-3-2 partnership
    - Neighbors Helping Neighbors
    - Collaborative Visions
    - Economic Development organizations
    - AWWA
    - RCAC/RCAP
    -
- Faith Communities
- Others such as: Las Vegas Peace and Justice
- Local, State and Federal people and agencies who offer resources. They will be present to listen to citizen concerns, share briefly about their programs, maybe 5 mins, and then available for meetings with individuals on specific needs, making private appointments, as needed.
    - USFS
    - USDA
    - USGS
    - NMED
    -
- Health expertise
- First responders
- Political bodies

Written by:
Ellen Drew
PO Box 2621 Las Vegas, NM 87701
505-652-9439
edrewnm@gmail.com

Full Name (First and Last): Emily Little,

Name of Organization or Community: Nurturely, Human Rights Watch, RH Impact

City and State: Eugene, OR

Brief description: Docket ID No. EPA-HQ-OEJECR-2023-0099-0009

RE: Written Submission to the White House Environmental Justice Advisory Committee Recommending Greater Government Action to Address Reproductive Justice in Environmental Justice

June 29, 2023

Dear WHEJAC members,

Thank you for your service to environmental justice in the US and for this opportunity to provide public comment on environmental justice activities, the Justice 40 Initiative, the Climate and Economic Justice Screening Tool, the Environmental Justice Scorecard and on environmental justice resources and tools that would be beneficial from federal agencies. We are a group of organizations working in different ways to address the maternal health crisis in the US. Because of historical and ongoing systemic racism in the US, preterm birth rates, rising over the past years, are twice as bad for Black women than for white women. We are concerned that action to protect maternal health against snowballing environmental crises in the US is insufficient and lags far behind the science. Failure to act not only risks the right to health of pregnant people, but also impacts newborn, lifelong, and intergenerational health. Epidemiological studies disaggregated by race show greater effects on Black pregnant people and a lack of action at the intersection of reproductive and environmental justice is driving inequities in who gets to have a healthy pregnancy and a healthy newborn in the US. Epidemiological literature shows exposure to extreme heat, hurricanes, wildfire smoke and other climate change impacts and climate change-related disasters is linked with preterm birth and other adverse birth outcomes. We ask that you continue to press the US government to ensure environmental justice policy includes maternal health and reproductive justice considerations in efforts to address environmental justice. We hope to see federal, state, and local government message on these problems, including by "calling in" the reproductive justice community and by ensuring community perinatal health workers and others working with the most marginalized pregnant people and families are properly resourced in the face of the climate crisis and other environmental crises. More specifically, we recommend: Resources to address environmental injustice, including those flowing from the Inflation Reduction Act, reach frontline perinatal community health workers and RJ activists. We ask you to recommend that the US government ensures midwives, doulas, and other non-traditional environmental justice actors/those excellently placed to work with pregnant people and newborns in environmental justice communities are also beneficiaries of the Inflation Reduction Act (IRA) and this administration's environmental justice promises. We want to see efforts to "call in" community organizations that work to support pregnant and newborn health to apply for IRA and other environmental justice/health funding as grantees or subgrantees, including for example doula or other perinatal community health workers. Community-based perinatal community health workers, like doulas, are often trusted in their communities, operate using justice principles, are experts at linking clients with other programming or services, and spend much more time with pregnant clients during their pregnancy than clinicians. Increasing public and provider knowledge of snowballing environmental harms to reproductive justice goals in the US and

moving this up on the policy agenda. We would like you to join us in recognizing EnviroNatal Equity Week annually from April 18-21. This new awareness opportunity and call-to-action bridges Black Maternal Health Week (April 11-17, recognized by the White House in 2021) with Earth Day (April 22). EnviroNatal (a combination of "environment" and "natal" or relating to birth) Equity Week combines the momentum from climate action with reproductive justice, connecting the dots between these two often siloed conversations.We recommend a multi-agency state of the science white paper on environmental harms to reproductive justice in the US, perhaps in coordination with the RJ community as well as the academics providing us with concerning science of climate, chemical and other environmental harms to sexual and reproductive health including undermining fertility, conditions like fibroids, harms to the developing fetus and maternal health during pregnancy. We have seen fetal harms addressed within the child health space (even though most pregnant people are not children), but fetal impacts are better positioned within a reproductive justice framework. We also understand that maternal health will be considered in several places in the upcoming National Climate Assessment 5 (November-December the EPA told us last week), and perhaps this will also have its own section within the Human Health chapter. Some of us are hoping to use this as an opportunity to draw attention. We also wanted to provide some advocacy documents that many of us or in some cases all of us have been involved in producing.

- We asked for the Climate and Economic Justice Screening Tool to include reproductive health indicators, like preterm birth rates. We want to continue to advocate for all US states to provide data about preterm birth, so this information is available for the tool. We would also hugely appreciate HHS and other relevant agencies explicitly including maternal and newborn health indicators/dimensions as they reach great results in the EJ Scorecard.

- We were some of 30 organizations that have been encouraging the EPA to establish a reproductive justice leader as they continue to staff up the new Office Justice and External Civil Rights. https://gcc02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.hrw.org%2Fsites%2Fdefault%2Ffiles%2Fmedia_2023%2F01%2FJoint%2520letter%2520to%2520the%2520Office%2520of%2520Environmental%2520Justice%2520and%2520External%2520Civil%2520Rights.pdf&data=05%7C01%7Cwhejac%40epa.gov%7C050be783531640e4035d08db78d18431%7C88b378b367484867acf976aacbeca6a7%7C0%7C0%7C638236613491234568%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=HIuqzaeCo6ijviGdvr3Ci%2B9XWZMsAvwei0tw7aTHmuE%3D&reserved=0 (Please also see attached).

We strongly support your efforts to promote an environmental justice approach to climate change-related and other disasters in the US and thank you for your many efforts already. Yours sincerely,

Emily Little

Full Name (First and Last): Erica Cirino

Name of Organization or Community: Plastic Pollution Coalition

City and State: Washington, DC

Brief description about your recommendation relevant to your selection above: Environmental injustices including those perpetuated by plastic and fossil fuel production and pollution, as well as the widespread distribution of lead pipes in underserved communities, are part of larger systems of racial and class oppression that affect the lives of millions of Americans. We commend the US Government (USG) for stating their commitment to the country's urgent environmental injustice crisis through its many newly established initiatives to usher forth justice for those individuals and communities most harmed.

However, these initiatives are falling far short of their full potential. As a broad coalition with members and partners on the front lines of environmental injustices, we hear that there is much room for improvement in federal programs meant to alleviate the harms of injustice and hopefully bring justice. For example, the processes of accessing grants and other resources tends to be quite time consuming, placing undue pressure on people already facing adversity and often from multiple angles spanning environmental injustice but also economic, health, social, and other stressors. These processes should be simplified, as to be more accessible to people who need help the most, and should be shaped with input by frontline communities affected by environmental injustice in order to best serve their needs.

We ask for transparent processes around the creation and use of scorecards and tools the USG has made so that the public can understand how they are (or are not) being utilized by policymakers and agencies to enact real-world change and tangible benefits for communities impacted by environmental injustices. Further, the USG must acknowledge the close links between government subsidization of fossil fuels, plastic pollution, and injustice in order to seriously address environmental injustices.

Solutions must be tangible but they also must be implemented as part of systemic change. That means incentivizing real solutions while disincentivizing problematic industries that continue to drive injustice and pollution. In order for solutions to environmental injustice to succeed, the USG must prioritize people over profits and industries that drive pollution and injustice.

Full Name (First and Last): Frances Craik

Name of Organization or Community: cultivating leaders

City and State: phoenix, az

Brief description: Oak Flat in Arizona is part of the ancestral homelands of the San Carlos Apache Tribe, the Western Apache tribes, the Yavapai, Hopi, Zuni, and many other Tribes in the Southwest – and it is now in danger of being completely destroyed by a joint venture of two foreign mining companies, known as Resolution Copper. Resolution Copper is set to acquire Oak Flat for mining purposes because of a federal land exchange – added at the last minute to a 2015 national defense bill. A final environmental impact statement of the mining project stated that it will create a crater that is nearly two miles wide and up to 1,000 feet deep. I'm urging you to defend religious freedom and protect the sacred Indigenous land of Chi'chil Bildagoteel – loosely translated as Oak Flat in English.

Audrie Washington

Somewhere, some unknown has wrangled he legal standard of Perjury into a forum, claiming a lie served upon less than a quorum is FALSE STATEMENT.

AS AN ENGINEER, WHATS MINE IS MINE AND WHATS YOURS IS MINE...MEANING, your errors, omissions and 'wrong doings" are upon us both.

Are we ok with that?

JAMES ROBERT WILSON

Full Name (First and Last): Jared Hanley

Name of Organization or Community: NatureQuant / University of Oregon

City and State: Eugene, OR

Comment is Related to: Environmental Justice Scorecar3

Brief description about your recommendation relevant to your selection above: The evidence supporting nature exposure/access as an environmental determinant of health is strong and growing. Further, there are large disparities in nature access (which is generally a "public good") among communities. I would encourage WHEJAC to consider adding some measurement of the blend of a built versus natural environment to the EJ Scorecard and screening tool. My organization can provide open-source data sets to support this effort.

Full Name (First and Last): Jerry Leonard
Name of Organization or Community: Melrose Place Against Nuisances
City and State: Baton Rouge, LA
Brief description about your recommendation relevant to your selection above:
Severe noise from abnormal environments can have tremendous health effects on the human body. My community & I, who represent Melrose Place Against Nuisances, in association with Quiet Communities, Inc. have experienced the effects personally. More funding for environmental justice would be a prudent step forward in the ESG environment that our country has found itself in nowadays.

ASSOCIATION OF METROPOLITAN WATER AGENCIES

LEADERS IN WATER

1620 I Street NW, Suite 500
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amwa.net

June 20, 2023

Audrie Washington
White House Environmental Justice Advisory Council (WHEJAC) Designated Federal Officer
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue NW
Washington, DC 20004

Re: Docket number EPA-HQ-OEJECR-2023-0099-0009

Submitted electronically

Dear White House Environmental Justice Advisory Council:

The Association of Metropolitan Water Agencies (AMWA) is pleased to have the opportunity to provide comments to the White House Environmental Justice Advisory Council (WHEJAC). AMWA is an organization of the largest publicly owned drinking water systems in the United States. Members serve over 100,000 customers and collectively provide clean drinking water to over 160 million people. As large public water agencies, AMWA utilities are focused on ensuring the long-term sustainability of their utilities by serving their diverse customer bases with clean, affordable drinking water. The Association supports the U.S. Environmental Protection Agency's (EPA) and other federal agencies' continuing emphasis on establishing environmental justice (EJ) priorities based on science and data and is pleased to provide the following feedback related to the WHEJAC's charge.

AMWA Comments on Environmental Justice Activities and What resources or tools would you find beneficial related to environmental justice from federal agencies?

The WHEJAC, EPA, and other federal entities must consider the greater concerns about water affordability in the United States. Despite the much appreciated $50 billion of federal investment in the water sector from recent legislation, American water infrastructure still requires billions more to maintain adequate infrastructure, prepare for climate change resilience, and protect public health. The American Society of Civil Engineers' (ASCE) Failure to Act

study[1] found that the US water sector in 2021 needed over $400 billion to meet engineering standards, and these costs will only increase with additional treatment, climate change, and inflation. The existing water system financing model assumes that most of the money for addressing local water supply issues, whether that issue is aging infrastructure, water quality, lead pipes, cybersecurity, or water supply reliability, can be dealt with largely with local resources (i.e., customer water rates). Given the large funding gap needed without considering upcoming regulations to address unregulated contaminants and infrastructure investments needed to prepare for climate change, it is essential that the EPA adequately assess costs in all proposed rules and regulations.

Specifically, EPA should recognize a proposed rule's impacts on water affordability, including how a proposed regulation will increase household water rates across the country and develop any rule proposals with the impact to households at front of mind. Nationally, many customers can already not afford their drinking water bills. A 2020 analysis by Circle of Blue[2] examined the amount of residential debt in 12 large U.S. cities. The analysis found that in some cities, the average resident with water debt owed on average over $600, and that in four cities over 30% of residents had water debt[2]. This report reflects that households across the US are struggling to pay their water bills already, so EPA should greatly consider how to prepare for any rate increases from any future proposed rulemakings

EPA's recent proposal to regulate six PFAS serves as an example of EPA's failure to examine the geographic distribution and environmental justice implications of a proposed regulation. For example, that proposal would increase rates at an unsustainable level for households served by smaller, rural water systems. To examine how this proposed rulemaking would increase household rates across the country, Black & Veatch researchers examined estimated costs by PWS size. The researchers found that customers in small systems, which are overwhelmingly in rural areas, may face significantly larger household costs of PFAS treatment than what households served by large utilities will see[3]. Another analysis by Policy Navigation Group (PNG) estimates that on an annualized basis, household costs will increase $110 to $10,000 depending on system size, which equates to a large percent of annual household incomes, particularly in rural areas (see Attachment 1). According to the latest annual Bankrate annual emergency savings survey, over 50% of Americans do not have the funds on hand to cover a $1000 emergency expense[4]. An increase of over $1,000 for water treatment, therefore, is

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[1] ASCE. (2021). Failure to Act: Economic Impacts of Status Quo Investment Across Infrastructure Systems. https://infrastructurereportcard.org/wp-content/uploads/2021/03/FTA_Econ_Impacts_Status_Quo.pdf

[2] Circle of Blue. (2020, October). *Customer Water Debt Data and 12 US Cities*. https://www.circleofblue.org/2020/world/chart-customer-water-debt-data-in-12-u-s-cities/

[3] AWWA. (2023 March 7). WITAF 56 Technical Memorandum. PFAS National Cost Model Report. https://www.awwa.org/Portals/0/AWWA/Government/2023030756BVFinalTechnicalMemoradum.pdf?ver=2023-03-14-102450-257

[4] Bankrate. (2023, February 23). Bankrate's annual emergency savings report. https://www.bankrate.com/banking/savings/emergency-savings-report/

unimaginable for many households. Without substantial and recurring federal government subsidies and EPA's honest examination and preparation, these geographic and PWS system size inequities in costs of PFAS treatment will perpetuate. AMWA urges WHEJAC and EPA to consider and put in place partnerships to prepare for these potential inequitable impacts.

To advance environmental equity, the federal government should provide more comprehensive support to ensure polluters – not the public – pay for the cost of treating and destroying contaminants out of the environment. AMWA supports the Agency's goal of fairly treating all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. However, in the PFAS NPDWR proposal, EPA failed to examine or plan for whether communities are treated fairly with regard to the costs required to implement the proposed regulation. A recent study by Liddie, Schaider, and Sunderland analyzed over 7,000 community water systems and found that CWSs "serving higher proportions of Hispanic/Latino and non-Hispanic Black residents had significantly increased odds of detecting several PFAS."[5] This finding indicates that communities of color may be more likely to be in an area with industrial or other sources of PFAS contamination; therefore, their community will likely have to treat more PFAS out of their local water supply, increasing the needs for additional capital and treatment, and increasing costs. In developing drinking water regulations and implementing them, AMWA encourages the WHEJAC, EPA, and all other federal agencies to consider how to partner with community water systems to ensure that communities are both equally protected from contaminants in drinking water and not disproportionately required to pay for contamination their communities did not create.

[5] Liddie, Schaider, and Sunderland. (15 May 2023). Sociodemographic Factors Are Associated with the Abundance of PFAS Sources and Detection in U.S. Community Water Systems. *Environmental Science & Technology.* DOI: 10.1021/acs.est.2c07255

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AMWA Comments on Environmental Justice 40 Initiative

AMWA appreciates the intent behind the Justice 40 initiative to assist disadvantaged communities with funding for critical infrastructure. AMWA would like to highlight the differences between CEQ Climate and Economic Justice Screening Tool, EPA's Bipartisan Infrastructure Law implementation memo, and state definitions of disadvantaged community. Below is a summary of the differences between definitions of disadvantaged communities from Justice40 and CEJST accounting, implications for AMWA members, and greater concerns about discrepancies in infrastructure funding for disadvantaged communities.

Background – drinking water and disadvantaged community definitions

Under the Safe Drinking Water Act, states have authority to define a disadvantaged community for purposes of distributing funds through the Drinking Water State Revolving Fund (DWSRF) programs. The Bipartisan Infrastructure Law, its requirements, and the Justice40 initiative prompted many states to evaluate their definitions of disadvantaged community. States vary in how they define disadvantaged communities, and their definitions of disadvantaged communities for DWSRF projects may differ from definitions of disadvantaged under the Clean Water Act State Revolving Fund (CWSRF) and other federal and states grant and loan programs. States define disadvantaged communities under the DWSRF through different regulatory mechanisms, which vary in the ease at which states may change them, and include statutes, regulations, policies, and Intended Use Plans (a state's plan outlining how it will distribute its SRF funds).

The Association of State Drinking Water Administrators (ASDWA) created a dashboard that compiles state disadvantaged community definitions under the DWSRF and identifies the definition's origin. ASDWA has also been conducting interviews with state SRF administrators to understand if they are changing their definitions generally or in response to the BIL or Justice40 initiatives. This tool tracks more recent definitions than a similar report EPA released this summer, "*DWSRF Disadvantaged Community Definitions: A Reference for States"* report.

Concerns over how these definitions will interact with Justice40 and the Climate and Economic Justice Screening Tool 1.0 (CJEST)

Chief among AMWA's concerns are the potential frustration and confusion from utilities that are applying for funds under the DWSRF as well as other federal funding programs. It is possible that a part of a utility's service area could be considered disadvantaged under the CEJST, while

their state's definition does not consider their service area disadvantaged. Utilities could be applying to any of the following programs that are Justice40 programs but have different state definitions of disadvantaged, including:

- Three different water programs that were part of six Justice40 pilot programs: the Drinking Water State Revolving Fund, Clean Water State Revolving Fund, Reducing Lead in Drinking Water.
- Addition EPA programs: Drinking Water State Revolving Fund Emerging Contaminants (including PFAS), Drinking Water State Revolving Fund Lead Service Lines Replacement, Drinking Water Infrastructure Resiliency and Sustainability Grant Program, Drinking Water State Revolving Fund Emerging Contaminants (including PFAS), Drinking Water State Revolving Fund Lead Service Lines Replacement

EPA and state definitions limit the ability of large, metropolitan water agencies access to additional subsidization under the BIL, which AMWA believes conflicts with the intention of Justice40. As approved by Congress last year, 49 percent of states' SRF funds delivered through the BIL must be provided to "eligible recipients" in the form of grants or principal forgiveness loans, with the intention that these dollars support projects in low-income communities. However, the BIL implementation memorandum released by EPA earlier this year specifies that these additionally subsidized DWSRF funds must be distributed only to state-defined "disadvantaged communities." To maximize considerations of equity and the provision of assistance to a wide range of low-income communities and ratepayers, AMWA believes the EPA should interpret 'eligible recipients' to be any community water system that is eligible to receive SRF aid, and which will use these grants or principal forgiveness loans on projects that will significantly benefit low-income populations in their service area.

Kansas City, Missouri is one example of where state definitions conflict with the CEJST/J40 measures. Many Census tracts in Kansas City (about half of the city's area) are disadvantaged according to CEJST. However, part of Missouri's definition includes a utility serving a population size of 3,300 or less as the first stipulation, meaning that Kansas City could not apply for any additional subsidization funds designated for disadvantaged communities under the DWSRF (i.e., grants or principal loan forgiveness), according to the BIL.

Conclusion

AMWA thanks WHEJAC for the opportunity to provide public comment and appreciates the Council's efforts toward advancing environmental justice. If you have questions, please contact Jessica Evans (evans@amwa.net), AMWA's Manager of Government Affairs and Sustainability Policy.

Sincerely,

Thomas Dobbins
Chief Executive Officer
Association of Metropolitan Water Agencies

Cc: Radhika Fox, EPA OW
Jennifer McLain, EPA OGWDW
Andrew Sawyers EPA OWM
Matthew Tejada, EPA OEJ
Brenda Mallory, CEQ
Matthew G. Lee-Ashley, CEQ
Sharmila L. Murthy, CEQ

Attachment 1

BENEFIT-COST ANALYSIS OF **EPA'S** PROPOSED PER- AND POLYFLUOROALKYL SUBSTANCES NATIONAL PRIMARY DRINKING WATER REGULATION

Prepared by:

Policy Navigation Group

May 2023

EXECUTIVE SUMMARY

The Association of Metropolitan Water Agencies (AMWA) and the American Water Works Association (AWWA) asked Policy Navigation Group (PNG) to prepare a social benefit-cost analysis of EPA's proposed rulemaking to set federal drinking water standards for certain per- and polyfluoroalkyl substances (PFAS). PNG also prepared an economic impact analysis of the proposal's effect on household income.

EVALUATION OF EPA'S BENEFIT-COST METHODOLOGY AGAINST BEST PRACTICES

The report first compares EPA's approach to estimate the social benefits and social costs with federal requirements for regulatory analysis and best practices in the field. EPA's methodology falls far short of best practices and these requirements. EPA failed to follow two important requirements of federal requirements for regulatory analysis by not considering all of the opportunity costs and by not conducting a formal uncertainty analysis. Omitting the effect of the rulemaking on the entire economy underestimates the rulemaking's social costs by over $1 billion. As EPA demonstrated in a recent rulemaking, EPA can – and must -- estimate the social costs of rulemaking throughout the economy.

Federal requirements for regulatory analysis require EPA to conduct a complete, mathematical, and transparent uncertainty analysis for regulatory actions with costs and benefits estimated to be greater than $1 billion. EPA failed to perform this analysis. The combined effect of these omissions is that EPA underestimates the social costs and fails to convey the full uncertainty of the social benefit estimates. By not presenting the full range of uncertainty in the estimate, EPA presents a misleadingly large benefit estimate.

In addition, EPA's cost models substantially underestimate the installation costs of PFAS treatment systems as evidenced by actual cost data from water systems and by expert analysis by a water sector engineering firm. For smaller systems, the majority of the systems that EPA projects will require treatment, EPA underestimates the capital costs by a factor of five.

EPA also fails to account for other social costs such as additional costs from water rate increases and the non-market costs of greater greenhouse gas emissions. Since EPA has accounted for the social costs of regulation-induced greenhouse gas emissions in a recent rulemaking, the Agency should do so for this rulemaking.

ESTIMATES OF THE SOCIAL BENEFITS AND SOCIAL COSTS FROM EPA'S PROPOSED REGULATORY ACTION

Recognizing these flaws, this analysis provides a methodology to overcome many of them. The analysis uses the engineering firm's cost estimates to estimate the treatment costs, EPA's data for the occurrence and monitoring costs of the rule, and EPA's estimates for the

economy-wide social costs of the proposal. The analysis uses EPA data to estimate and to value the social costs of greenhouse gas emissions that would be caused by the proposed requirement. As shown in Table ES-1, the social costs are projected to be at least seven times greater than EPA's estimates.

EPA's benefit estimates for PFAS treatment place too much weight on a few possible adverse effects and too little weight on the range of potential adverse effects EPA describes in the supporting documents. Ultimately, EPA's quantified benefit estimates rest on scientific findings that other public health organizations do not support. By failing to account for the possibility that these adverse effects may not exist, EPA overstates the social benefits it quantifies.

Therefore, this analysis' objective is to identify the most comprehensive evaluation of possible biologic changes in response to PFOS exposure. An adverse effect should start with biologic change; if there is little change in response to PFOS exposure at a certain dose, the likelihood of an adverse effect at that dose is greatly diminished. The analysis estimates the social benefits by harnessing recent studies that carry out longstanding practices recommended by the National Academy of Sciences (NAS) to develop hazard assessments that use more of the available scientific information and are more compatible with benefit-cost analysis.

Rather than EPA's approach to quantify a few adverse effects, this analysis considers a wide range of cellular and genomic evidence, animal data, and human epidemiological studies. Based on published studies, the analysis considers 108 diseases that are associated with cellular and genomic responses in in vitro testing. Using the results of Bayesian mathematical evidence integration, the analysis identifies 108 diseases and estimates the probability of these diseases occurring in individuals at different levels of PFOS in drinking water.

Since these studies find that changes in biological activity are likely only to occur at the high end of the modeled drinking water exposure, the analysis develops a bounding estimate of the benefits of reducing PFOS in drinking water. The purpose of the bounding estimate is to establish an upper bound of the possible benefits for PFOS. The bounding estimate assumes conditions that clearly are not realistic and clearly overestimate the likelihood of an adverse effect for several reasons. First, the analysis assumes that a 10 percent genomic or cellular change leads to a person suffering the disease. This outcome is implausible since that change may not be large enough to be significant; since there is an additional 30-fold safety factor applied to this 10 percent change, and since the body has numerous repair mechanisms that respond when there is abnormal biological changes.

Second, the bounding estimate assumes that the current population's path towards these diseases is halted and is reversed by the drinking water standard. This assumption leads to 90 percent of the total benefits. A more realistic approach would be to assume, as EPA does in the EA, that reducing exposure today causes small changes to the baseline probabilities of contracting a disease. As an illustration, EPA may assume the MCL changes a 60-year old's odds of getting CVD in the future from 23 percent to 22.95 percent; the bounding estimate assumes that all of the exposed 60-year olds' probabilities of contracting CVD from PFOS exposure are eliminated.

Therefore, the bounding estimate shows that, even if all PFOS exposure above any level that shows some biological activity is certain to cause a disease, the benefits are still five times lower than the expected costs. The results of this bounding estimate are shown in Table ES-1. Even with many implausible assumptions to increase the social benefits, the results for PFOS are six times lower than the expected social costs. It is likely that the social benefits are at least ten times lower than this bounding estimate based on the scientific evidence.

Table ES-1: Comparison of Estimated National Annualized Benefits and Costs for EPA's Proposed Rule

	EPA's Estimates at Seven Percent Discount Rate	**PNG's Estimates at** Seven Percent Discount Rate
Benefits ($ M/year)	908	<1,200
Costs ($ M/year)	1,205	7,500

ECONOMIC IMPACTS

These social costs will fall heavily on low-income households and households served by small public water systems. Despite EPA's claims, recently enacted federal support for water utilities is insufficient to pay for even the capital costs of the proposal's requirements. As a result, ratepayers may pay a significant portion of the compliance costs of the rulemaking. Certain ratepayers are projected to pay hundreds of dollars per household per year due to this rulemaking.

CONCLUSIONS

Even if the benefits from the bounding estimate were doubled to account for PFOA and the other four PFAS, the benefits would still be below the costs. The social costs of EPA's proposal exceed the social benefits.

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ACRONYMS

AACE	Association for the Advancement of Cost Engineering
AMWA	American Metropolitan Water Agencies
ATSDR	Agency for Toxic Substances and Disease Registry
AUC	Area Under the Curve
AWWA	American Water Works Association
B	Billion
B&V	Black and Veatch
BMD	Benchmark Dose
DBP	Disinfection Byproduct
DWC	Drinking Water Concentration
DWIBW	Body-Weight-Adjusted Drinking Water Ingestion
CAPEX	Capital Expenditures
CCL	Contaminant Candidate List
CDC	Centers for Disease Control and Prevention
CVD	Cardiovascular Disease
CWS	Community Water System
DALY	Disability-Adjusted Life-Year
EA	Economic Analysis
EFH	Exposure Factors Handbook
EFSA	European Food Safety Agency
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPTDS	Entry Point to the Distribution System
ER	Endocrine Response
EWM	Economy Wide Modeling
GAC	Granular Activated Carbon
GE	General Equilibrium
GW	Groundwater
HBD	Human Body Dose
HC	Health Canada
HDL	High-Density Lipoprotein
HED	Human Equivalent Dose
HESD	Health Effects Support Document
HFPO-DA	Hexafluoropropylene Oxide-Dimer Acid
HH	Household
HHS	U.S. Department of Human Health Services
HRRCA	Health Risk Reduction and Cost Analysis
HI	Hazard Index
ICER	Institute for Clinical and Economic Review
IIJA	Infrastructure Investment and Jobs Act

IRIS	Integrated Risk Information System
IVIV	In Vitro-In Vivo
IX	Ionic Exchange
LDL	Low-Density Lipoprotein
M	Million
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MCMC	Markov chain Monte Carlo
MOE	Margin of Exposure
NAAQS	National Ambient Air Quality Standards
NAS	National Academies of Science
NCEE	National Center for Environmental Economics
ng/L	Nanograms per Liter
NHANES	National Health and Nutrition Examination Survey
NOAEL	No-Observed-Adverse-Effect-Level
NPDWR	National Primary Drinking Water Regulation
NPRM	Notice of Proposed Rulemaking
NPV	Net Present Value
NTNCWS	Non-transient Non-community Water Systems
NTP	National Toxicology Program
O&M	Operations and Maintenance
OLEM	EPA Office of Land and Emergency Management
OMB	U.S. Office of Management and Budget
PBPK	Physiologically-Based Pharmacokinetic
PFAA	Perfluorinated Alkyl Acids
PFAS	Per- and Polyfluoroalkyl Substances
PFBS	Perfluorobutanesulfonic Acid
PFHpA	Perfluoroheptanoic Acid
PFHxS	Perfluorohexanesulfonic Acid
PFNA	Perfluorononanoic Acid
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctane Sulfonate
PNG	Policy Navigation Group
POD	Point-of-Departure
POU	Point-of-Use
ppt	Parts Per Trillion
PWS	Public Water System
RCC	Renal Cell Carcinoma
RfC	Reference Concentration
RfD	Reference Dose
RO	Reverse Osmosis
SBREFA	Small Business Regulatory Enforcement Fairness Act

SC-CO_2	Social Cost of Carbon Dioxide
SDWA	Safe Drinking Water Act
SDWIS	Safe Drinking Water Information System
SEDAC	Socioeconomic Data and Applications Center
SOC	Synthetic Organic Compound
SW	Surface Water
TC	Total Cholesterol
TK	Toxicokinetic
UCMR	Unregulated Contaminant Monitoring Rule
µg/mL	Microgram per Milliliter
WBS	Work Breakdown Structure
WHO	World Health Organization
WTP	Willingness-to-Pay
WUC	Water Utility Council
VOC	Volatile Organic Compound
VSL	Value of a Statistical Life

I. INTRODUCTION

1. Overview of EPA's Proposed Rulemaking and Economic Analysis

Notice of Proposed Rulemaking (NPRM)

On March 29, 2023, the Environmental Protection Agency (EPA) published a Notice of Proposed Rulemaking (NPRM) in the *Federal Register* to propose a National Primary Drinking Water Regulation (NPDWR), Maximum Contaminant Level Goals (MCLGs), and Maximum Contaminant Levels (MCLs) for several per- and polyfluoroalkyl substances (PFAS).[1] The NPDWR are legally enforceable standards that require treatment in public water systems (PWSs) to ensure certain contaminants do not exceed specified levels in drinking water. The level is set by the enforceable MCL, which is the highest level of a contaminant that is allowed in drinking water. An MCLG is the non-enforceable level of a contaminant in drinking water under which there is no expected risk to human health. EPA issued a request for public comment on the following:

- The determination to set individual MCLs of four parts per trillion (ppt) or nanograms per liter (ng/L) for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS). EPA seeks comment on its evaluation of feasibility, treatment capabilities at CWSs, and costs;
- The preliminary determination to regulate four additional PFAS, including: perfluorohexane sulfonic acid (PFHxS), hexafluoropropylene oxide dimer acid (HFPO-DA) and its ammonium salt (also known as a GenX chemicals), perfluorononanoic acid (PFNA), perfluorobutane sulfonic acid (PFBS). EPA seeks comment on its evaluation of health information and occurrence data;
- The determination to set a MCL through a Hazard Index (HI) approach set at a unitless one for any mixture of one or more of the four additional PFAS (PFHxS, HFPO-DA, PFNA, and PFBS). EPA seeks comment on its HI approach;
- EPA's methodology used to estimate national costs for the proposed rule; and,
- EPA's approach to estimate the health impacts of exposure to PFAS covered by the proposed rule. EPA seeks comment on its assumptions and the magnitude of risks avoided by the proposed regulatory actions.

Economic Analysis (EA)

EPA is required to conduct an economic analysis (EA) for the proposed NPDWR in compliance with Executive Order (EO) 12866 and SDWA's requirements for a Health Risk Reduction and Cost Analysis (HRRCA).[2] In its EA, EPA provides its assessment of quantified and nonquantifiable health risk reduction benefits and compliance costs, including:

[1] U.S. Environmental Protection Agency, "PFAS National Primary Drinking Water Regulation Rulemaking," *Federal Register*, no. 88 FR 18638 (March 2023).

[2] "P.L. 104-182: The Safe Drinking Water Act" (1996).

- Health risk reduction benefits for which there is a factual basis in the rulemaking record to conclude that such benefits are likely to occur as the result of compliance with each treatment level;
- Benefits likely to occur from co-occurring contaminants reductions that may be attributed solely to compliance with the MCL;
- Costs likely to occur solely due to compliance with the MCL, including monitoring, treatment, and other costs;
- Incremental costs and benefits associated with each alternative MCL considered;
- Effects of the contaminant on the general population, including sub-population groups likely to be at greater risk of adverse health effects due to exposure to contaminants in drinking water;
- Any increased health risk that may occur as a result of compliance, including co-benefits and co-occurring contaminant risks; and,
- Other relevant factors, including the quality and extent of the information and uncertainties in the analysis.

EPA evaluated the benefits associated with several rule options, including its preferred option. The EA presents quantified health benefits from avoided cases of illnesses and deaths expected from reductions in PFAS exposures resulting from the NPRM. Quantified economic benefits are estimated as avoided morbidity and mortality due to cardiovascular disease (CVD), avoided low birthweight, and avoided cases of renal cell carcinoma (RCC).

In EPA's EA, the costs of the proposed NPDWR are the expenses incurred by PWS to monitor for PFAS, to notify consumers, to adopt treatment technologies, and to conduct subsequent record-keeping and monitoring requirements. EPA also includes the costs associated with primacy agency implementation. The EA estimates the number of water systems that must procure treatment technologies and incur administrative costs to comply with the rule. EPA's estimated annualized benefits are summarized in Table 1 and range between $908 million (M) to $1,233 M at seven percent and three percent discount rates, respectively. EPA estimates the annualized costs over 82 years between $772 M to $1,205 M at three and seven percent discount rates, respectively.

Table 1: EPA's Estimated National Annualized Benefits and Costs for the Proposed NPDWR

	Three Percent Discount Rate ($ M/year)	Seven Percent Discount Rate ($ M/year)
Benefits	1,233	908
Costs	772	1,205

2. Outline of the Report

The analysis spans six sections. This section provides an overview of EPA's proposed rule and its supporting EA. Section II discusses best practices in benefit-cost analyses and evaluates

EPA's EA against these best practices. The section identifies fundamental limitations in EPA's framework and methodology, analytical gaps that it is obligated under government directives to include in its estimates, and other implications from its assumptions.

Section III presents an alternative analysis of the social benefits of EPA's proposed rule. The section contains the methodological framework, data, and assumed values. The analysis provides a discussion of the results and limitations. Similarly, Section IV presents the social cost analysis by first outlining the approach and data sources and then by providing results for each component of the analysis. Section V provides a focused discussion on the economic impacts of EPA's rules on household income. The concluding section, Section VI, compares these estimates with EPA's estimates.

II. BENEFIT-COST ANALYSIS BEST PRACTICES

1. Summary of Circular A-4 and EPA's Economic Analysis Guidelines

Circular A-4

Since 1981, the U.S. Office of Management and Budget (OMB) has issued regulatory analysis guidance and directives to Executive branch agencies to promote best practices, to promote public transparency, and to ensure the different agency estimates are comparable. OMB's directive, Circular A-4 Regulatory Analysis, was last issued in 2003 and provides directives for the best practices to estimate the potential social benefits and social costs of a regulatory action using best economic principles.[3]

EPA failed to follow two important requirements of Circular A-4 by not considering all of the opportunity costs and by not conducting a formal uncertainty analysis. The combined effect of these omissions is that EPA underestimates the social costs and fails to convey the full uncertainty of the social benefit estimates. By not presenting the full range of uncertainty in the estimate, the EA presents a misleadingly large benefit estimate.

Opportunity Cost

One important principle in benefit-cost analysis – and in economics in general – is the opportunity cost of a resource:

> "Opportunity cost" is the appropriate concept for valuing both benefits and costs. The principle of "willingness-to-pay" (WTP) captures the notion of opportunity cost by measuring what individuals are willing to forgo to enjoy a particular benefit…. The use of any resource has an opportunity cost regardless of whether the resource is already owned or has to be purchased. That opportunity cost is equal to the net benefit the resource

[3] On April 6, 2023 OMB proposed revisions to Circular A-4. This analysis uses the 2003 Circular A-4 that is in place at the time of this report.

> would have provided in the absence of the requirement. For example, if regulation of an industrial plant affects the use of additional land or buildings within the existing plant boundary, the cost analysis should include the opportunity cost of using the additional land or facilities.[4]

EPA's EA only includes engineering cost estimates. While the prices of the goods and labor EPA includes in the engineering analysis generally reflects their opportunity costs, EPA does not include the opportunity costs that occur in other sectors in society.

Other sectors have opportunity costs when the price of drinking water increases in response to this rulemaking and when this rulemaking shifts capital and labor to the water sector for compliance. EPA's analysis shows that the required regulatory activities will shift capital and resource use substantially. EPA states that the maximum spending level would approach $10 billion in one year using its estimates.[5] EPA predicts household costs for drinking water will also rise by hundreds of dollars per year.[6] These costs will be borne not only by households, but also by businesses that purchase water for their operations. EPA's rule will therefore raise the costs of an input to almost all businesses. The price increase will have additional and substantial social costs. EPA has conducted extensive modeling of the economy-wide costs from regulations in the water sector but does not include these results in its analysis. In addition, as discussed in Section IV.2, EPA has recently conducted a regulatory economic analysis that accounts for opportunity costs and finds them significant.[7] Therefore, EPA has the methodologies, data, and experience to comply with Circular A-4 and present the more complete social costs of the rule.

Formal Uncertainty Analysis

EPA's benefit and cost models use data and mathematical relationships that are uncertain. Describing the uncertainty helps policy officials and the public understand the quality and the likelihood of the benefit and cost estimates. Uncertainty can be described in words, with some quantification, and with formal, statistical approaches that ensure all of the available information about the uncertainty is used. In Circular A-4, OMB discusses situations when agencies must conduct a formal, mathematical uncertainty analysis:

> For major rules involving annual economic effects of $1 billion or more, you should present a formal quantitative analysis of the relevant uncertainties about benefits and costs. In other words, you should try to provide some estimate of the probability distribution of regulatory

[4] U.S. Office of Management and Budget, "Circular A-4: Regulatory Analysis," September 17, 2003, 18.

[5] U.S. Environmental Protection Agency, "Economic Analysis for the Proposed Per- and Polyfluoroalkyl Substances National Primary Drinking Water Regulation," March 2023, 9-13.

[6] U.S. Environmental Protection Agency, 8-69.

[7] U.S. Environmental Protection Agency, "Regulatory Impact Analysis for the Proposed New Source Performance Standards for Greenhouse Gas Emissions from New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units," May 2023, app. B.

benefits and costs…For rules that exceed the $1 billion annual threshold, a formal quantitative analysis of uncertainty is required.[8]

Specific analytical approaches OMB recommends for formal uncertainty analyses include the following:

- Numerical sensitivity analysis. EPA must examine how the results vary with plausible changes in key assumptions, choices of data inputs, and alternative analytic approaches. "Sensitivity analysis is especially valuable when the information is lacking to carry out a formal probabilistic simulation. Sensitivity analysis can be used to find 'switch points' - critical parameter values at which estimated net benefits change sign or the low cost alternative switches;"[9]
- Probabilistic analysis of large, multiple uncertainties. EPA must formally simulate and examine identified uncertainties through expert judgment and, for example, Delphi methods. "Experts can be used to quantify the probability distributions of key parameters and relationships. These solicitations, combined with other sources of data, can be combined in Monte Carlo simulations to derive a probability distribution of benefits and costs;"[10]

In its EA, EPA only conducted a partial mathematical uncertainty analysis. Since EPA estimates that the effect of the rule is above $1 B in one year, EPA did not comply with the requirements of Circular A-4. The most significant omission is that EPA fails to model the quantitative effect of the uncertainty in EPA's causal determination that PFOA and PFOS are associated with certain health effects. As discussed in Appendix B, other public health agencies do not find a causal relationship between PFOS and PFOA exposure and key health effects that EPA quantifies as social benefits. This difference has several important implications. First, these findings show that EPA's methodology has significant uncertainty. Second, these findings show that EPA's quantified benefits are biased to be too high. If these other agencies are correct, there is no dose-response relationship and thus the benefits from reduced exposure for these adverse effects is zero. Instead of its qualitative discussion, EPA should present a distribution of benefit estimates including the probability that studies that show no relationship or an inverse relationship between PFAS and certain adverse effects are true.

Instead of a formal uncertainty analysis, EPA provides a list of limitations. The words in these lists do not modify EPA's social cost and benefit numbers, however. EPA's list of limitations is significant.[11] Table 33 in Appendix A gives the limitations EPA listed in the analysis. However, there are two problems with EPA's list. While EPA does list some limitations and uncertainties

[8] U.S. Office of Management and Budget, "Circular A-4: Regulatory Analysis," September 17, 2003, 40-41.

[9] U.S. Office of Management and Budget, 41.

[10] U.S. Office of Management and Budget, 41.

[11] U.S. Environmental Protection Agency, "Economic Analysis for the Proposed Per- and Polyfluoroalkyl Substances National Primary Drinking Water Regulation," 5-39 & 6-108.

with some directional information, EPA could – and must – incorporate these uncertainties into its display of quantified estimates.

Many of the limitations that EPA discloses could be quantified and incorporated into a formal uncertainty analysis. For example, EPA states that its value of statistical life (VSL) is the major value in its benefits estimate. However, EPA does not provide a distribution of potential values even though EPA acknowledges uncertainties in its VSL estimate. Other federal agencies, however, and researchers have put together distributions of potential VSL values.[12] EPA could easily incorporate uncertainty in the VSL value into its formal uncertainty analysis.

2. Evaluation of EPA's Benefit-Cost Methodologies

Costs

While there are numerous individual problems with EPA's cost models, the sum of these issues is more important than the laundry list of flaws. As the saying goes, "all models are wrong; some models are useful." The fundamental problem with EPA's model is that it is not useful – it fails to predict actual, installed treatment systems' costs by a substantial margin. EPA's models underestimate the costs of installed groundwater systems, surface water systems, granular activated carbon (GAC) systems, reverse osmosis, or ion-exchange systems. It does not come close to a comparable model by a major engineering firm that designs and installs PFAS treatment systems.

One principal reason that EPA's models may deviate from reality may be their vintage. As EPA states, the models were developed from 2006 to 2012.[13] Another reason could be the lack of adequate independent peer review. According to the background documents, EPA sought a three-person, letter peer review of the GAC model around 2006 and then made additional changes to the model that have not been peer reviewed.[14] EPA states that the IX model received even less of a comprehensive review since reviewers did not review a complete model – more than 10 years ago.[15]

The AMWA and the AWWA surveyed its members to obtain recent cost data on installed PFAS treatment systems at drinking water treatment plants. Figure 1 plots the ratio of capital costs per the treatment system capacity (in millions of gallons per day) reported by 60 systems. Figure 1 also provides EPA's estimated capital costs for the comparable treatment technique

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[12] See, for example, Banzhaf, H. (2022). The Value of Statistical Life: A Meta-Analysis of Meta-Analyses. Journal of Benefit-Cost Analysis, 13(2), 182-197. doi:10.1017/bca.2022.9

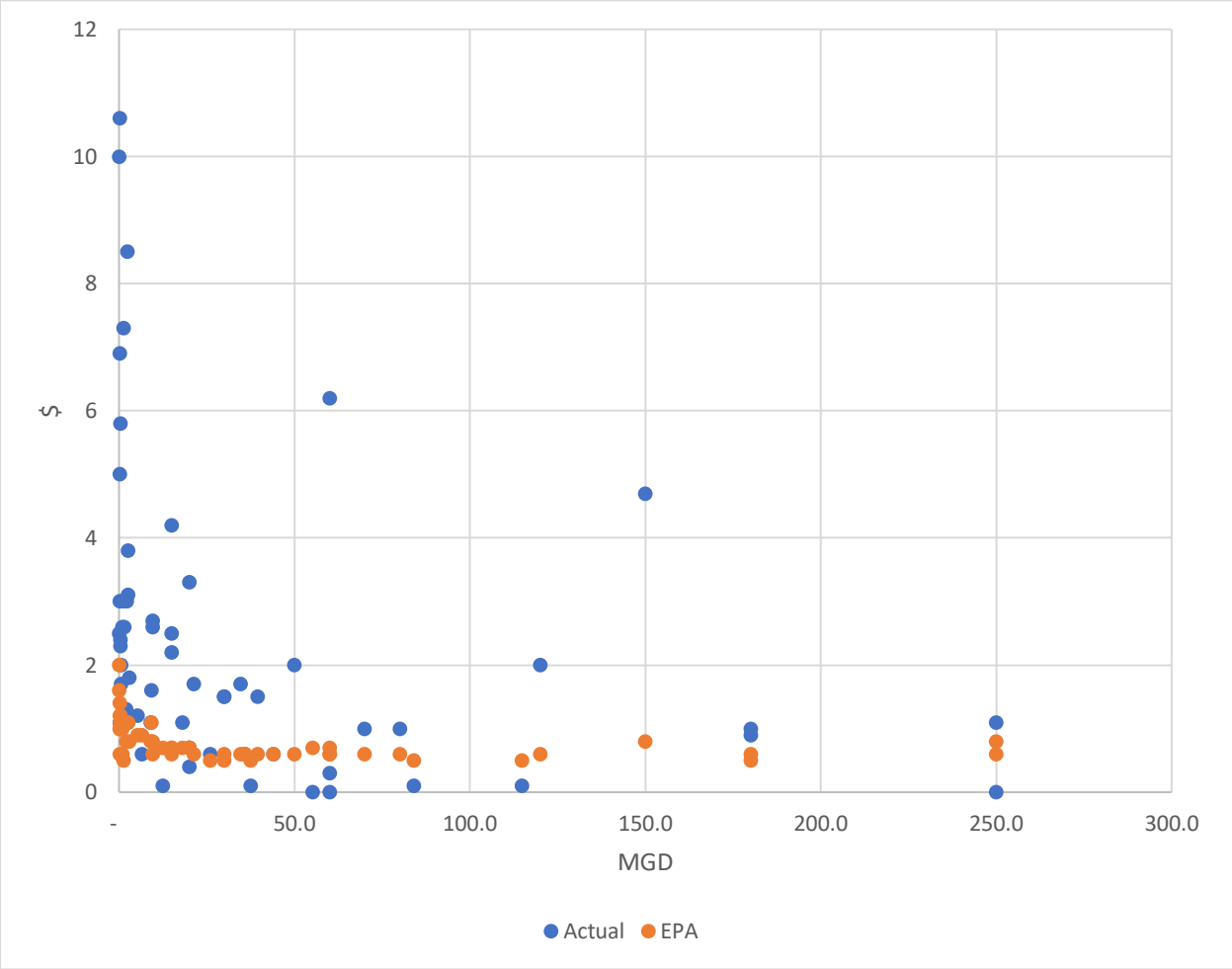
[13] U.S. Environmental Protection Agency, "Best Available Technologies and Small System Compliance Technologies for Per- and Polyfluoroalkyl Substances (PFAS) in Drinking Water," February 2023.

[14] U.S. Environmental Protection Agency, "Work Breakdown Structure-Based Cost Model for Granular Activated Carbon Drinking Water Treatment," February 2023.

[15] U.S. Environmental Protection Agency, "Work Breakdown Structure-Based Cost Model for Ion Exchange Treatment of Per- and Polyfluoroalkyl Substances (PFAS) in Drinking Water," February 2023.

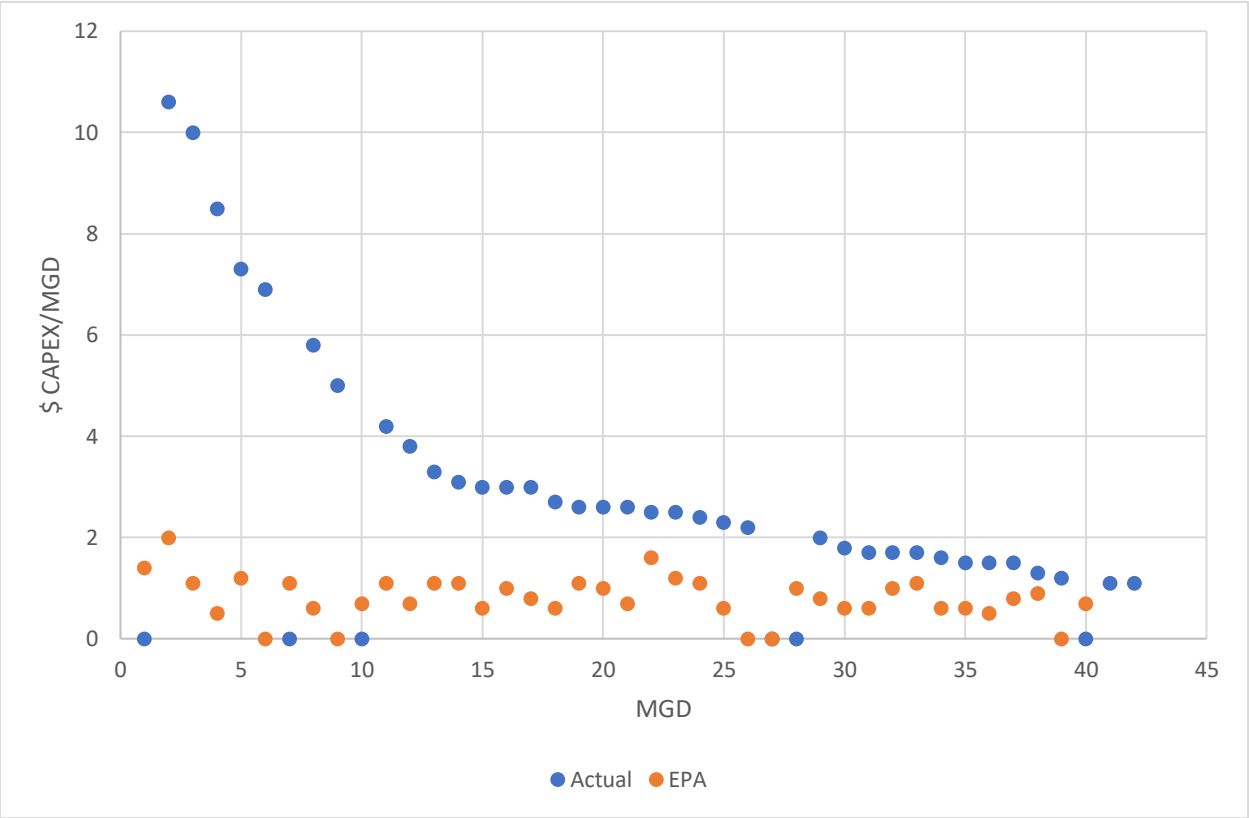
and system size. As shown, EPA's values are most often below reported capital costs. On average across the 60 systems, EPA's estimate is 2.9 times lower than reported values.

Figure 1: Comparison of the Capital Costs of Actual Installed Treatment Systems with EPA Model Results ($/MGD)



The discrepancy is greater for small treatment systems, the ones most likely to be installed due to this regulatory action. Figure 2 shows the detail of Figure 1 for systems below 50 MGD. For systems under 1 MGD, the average ratio between actual system capital expenditures and EPA's is 5.1. For systems under 2 MGD, EPA's models underestimate actual capital expenditures by a factor of 3.6.

Figure 2: Comparison of the Capital Costs of Actual Installed Treatment Systems with EPA Model Results for Systems Below 50 MGD ($/MGD)



EPA also omits other, non-market social costs. Consuming real resources like activated carbon, electricity, and transportation services have costs that are not captured in their market price. EPA strives to reduce the adverse human health and environmental effects of the non-market social costs of pollution. By requiring treatment for certain PFAS, EPA's rule will lead to increased pollution from transportation, electricity generation, and other construction and operations activity. While the social costs of this additional pollution may be justified by the rule's benefits, EPA must estimate these social costs to demonstrate this claim.

EPA's Quantified Incremental Adverse Effects

While the thousands of pages in the EA, appendices, and supporting information give the impression of substance, the Agency ultimately rests its artifice on a flawed foundation. The benefits estimate suffers both from claiming too much from little evidence and from too little application where the literature provides ample evidence. Some of the specific problems with EPA's approach are listed below.

EPA's analysis rests on an assumption of causality in which "exposure to these PFAS may cause adverse health effects" and "that PFOA and PFOS are likely to cause cancer."[16] However, there is substantial uncertainty as to whether those associations are causal. In this section, we compare EPA's analysis of the existing scientific literature with those of Health Canada (HC), the European Food Safety Agency (EFSA), and the World Health Organization (WHO). Specifically, we review findings and limitations for birthweight, cardiovascular disease (CVD) and cancer. Additional information on the findings, interpretations, and limitations from EPA, HC, WFSA, and WHO are outlined for each adverse effect in Appendix B.

Birthweight

Of the 32 studies that EPA used in its PFOA toxicity assessment, 21 reported some mean birthweight deficits in the overall population with limited evidence of exposure-response relationships.[17] Birthweight was found to have an inverse relation to PFOA concentration in a study of 293 infants at a mean PFOA concentration of 0.0016 micrograms per milliliters (µg/mL).[18] A 2012 study observed lower birthweights with increasing levels of maternal PFOA concentration (median concentration of 0.0037 µg/mL).[19]

Among the 21 studies showing some adverse associations in the overall population, there was a wide range of observed birthweight changes from -14 to -267 grams across both categorical and continuous exposure estimates.[20] Among those with continuous PFOA results in the overall population, 14 of 20 studies reported deficits from -27 to -82 grams with increasing PFOA exposures. EPA notes, however, that there is limited evidence of exposure-response relationships and potential bias due to hemodynamic differences:

> Three of the four smallest associations were based on earlier biomarker samples. Thus, some of these reported results may be related to pregnancy hemodynamic influences on the PFOA biomarkers during pregnancy. For example, 11 of the 12 largest mean BWT deficits (-48 grams or larger per unit change) in the overall population were detected among studies with either later pregnancy samples (i.e., maternal samples during trimesters 2, 3, or post-partum or umbilical cord samples).[21]

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[16] U.S. Environmental Protection Agency, "PFAS National Primary Drinking Water Regulation Rulemaking," 18638-39.

[17] U.S. Environmental Protection Agency, "Toxicity Assessment and Proposed Maximum Contaminant Level Goal for Perfluorooctanoic Acid (PFOA) in Drinking Water," March 2023, 3-205.

[18] U.S. Environmental Protection Agency, 3-192.

[19] U.S. Environmental Protection Agency, 3-192; Mildred Maisonet et al., "Maternal Concentrations of Polyfluoroalkyl Compounds during Pregnancy and Fetal and Postnatal Growth in British Girls," *Environmental Health Perspectives*, 2012.

[20] U.S. Environmental Protection Agency, "2023b," 3-201.

[21] U.S. Environmental Protection Agency, 3-201.

EPA's caveat is important. Researchers have raised concerns with confounding and with possible reverse causation in studies taken late in pregnancy.[22] Studies measuring concentrations in early pregnancy and prior to pregnancy do not show the same association.

For PFOS, one study found that birth weight, head circumference, and ponderal index were inversely associated with umbilical cord PFOS concentration in 293 infants.[23] Deficits in mean birth weight per one natural logarithm (ln) increase in PFOS concentration were found. Another study evaluated fetal growth outcomes in female births and found that increased maternal PFOS concentration (median concentration 0.0196 µg/mL) was associated with lower birth weights.[24] A prospective cohort study in Japan found that their "fully adjusted model showed no significant negative correlation between PFOA levels and birth weight. In contrast, a $\log_{10}$-unit increase in PFOS levels correlated with a decrease in mean birth weight of 148.8 g (95% CI, 297.0 to 0.5 g) for PFOS in the fully adjusted model."[25] Another study examined 429 mother-infant pairs from the Taiwan Birth Panel Study and found that umbilical cord blood PFOS concentration was inversely associated with gestational age, birth weight, and head circumference.[26]

However, studies conducted in Canada and Japan did not find a statistically significant association between birthweight and PFOS concentration in maternal blood.[27] Similarly, an examination of 429 mother-infant pairs from the Taiwan Birth Panel Study did not find a significant association between umbilical cord blood PFOS concentration and birthweight.[28]

A Canadian study of 252 pregnant women found no statistically significant association between birthweight or gestation length and PFOS concentration measured in maternal blood, although mean birthweight increased slightly by increasing PFOS levels.[29] In its Health Effects Support Document, EPA notes that low confidence studies are included for consistency in the

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[22] Steenland, Kylea; Barry, Vaughna; Savitz, Davidb. Serum Perfluorooctanoic Acid and Birthweight: An Updated Meta-analysis With Bias Analysis. Epidemiology 29(6):p 765-776, November 2018. | DOI: 10.1097/EDE.0000000000000903

[23] Benjamin Apelberg et al., "Cord Serum Concentrations of Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoate (PFOA) in Relation to Weight and Size at Birth," *Environmental Health Perspectives*, 2007.

[24] Maisonet et al., "Maternal Concentrations of Polyfluoroalkyl Compounds during Pregnancy and Fetal and Postnatal Growth in British Girls."

[25] Noriaki Washino et al., "Correlations between Prenatal Exposure to Perfluorinated Chemicals and Reduced Fetal Growth," *Environmental Health Perspectives*, 2009.

[26] Mei-Huei Chen et al., "Perfluorinated Compounds in Umbilical Cord Blood and Adverse Birth Outcomes," *PLOS One*, 2012.

[27] Michele Hamm et al., "Maternal Exposure to Perfluorinated Acids and Fetal Growth," *Journal of Exposure Science and Environmental Epidemiology*, 2010; Health Canada, "Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Perfluorooctane Sulfonate (PFOS)," December 2018.

[28] Mei-Huei Chen et al., "The Impact of Prenatal Perfluoroalkyl Substances Exposure on Neonatal and Child Growth," *Science of the Total Environment*, 2017.

[29] Hamm et al., "Maternal Exposure to Perfluorinated Acids and Fetal Growth."

direction of association.[30] As shown in Appendix B, agencies have recognized additional limitations in study data, including selection bias, small study sizes, and confounding. This is also true of other adverse effects included in EPA's assessment.

Health Canada explains that "more studies with better adjustments and follow-up in different populations would be needed to confirm the observed associations."[31] Similarly, for certain effects, EFSA mentions that more studies are needed to support causality. Specific to birthweight, EFSA said that while "a recent study seems to strengthen the causality, the decrease in birth weight after adjusting for confounders is not large and the potential longer term consequences of this decrease are unclear."[32] A Department of Health and Human Services toxicological profile cited by WHO concluded that "no studies found increases in the risk of low birth-weight infants" associated with maternal PFOS serum levels."[33]

CVD

In a study described in the 2016 Health Advisory (HA), no association with hypertension in 1,655 children aged 12–18 years from the NHANES was found.[34] An occupational study reported an inverse association for mortality from heart disease among all cohort members.

Since publication of EPA's 2016 PFOA health effect support document, EPA found 49 new epidemiological studies report on the association between PFOA and CVD, including outcomes such as hypertension, CAD, congestive heart failure, microvascular diseases, and mortality.

Of the ten studies that examined blood pressure as a continuous measure, six reported statistically significant positive associations.[35] EPA also points to two NHANES-based studies examining CVD that reported significant associations between PFOA and CVS.[36] However,

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[30] U.S. Environmental Protection Agency, "2023b," 3–195.

[31] Health Canada, "Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Perfluorooctanoic Acid (PFOA)," December 2018, 46.

[32] Dieter Schrenk et al., "Risk to Human Health Related to the Presence of Perfluoroalkyl Substances in Food" (European Food Safety Authority, September 2020), 7.

[33] Agency for Toxic Substances and Disease Registry, "Toxicological Profile for Perfluoroalkyls" (US Department of Health and Human Services, May 2021), 479; World Health Organization, "PFOS and PFOA in Drinking-Water: Background Document for Development of WHO Guidelines for Drinking-Water Quality," September 2022, 32, https://www.cmbg3.com/library/WHO-Draft-Drinking-Water-Document.pdf.

[34] Wen-Wen Bao et al., "Gender-Specific Associations between Serum Isomers of Perfluoroalkyl Substances and Blood Pressure among Chinese: Isomers of C8 Health Project in China," *Science of the Total Environment*, 2017.

[35] U.S. Environmental Protection Agency, "2023b," 3–151.

[36] Anoop Shankar, Jie Xiao, and Alan Ducatman, "Perfluorooctanoic Acid and Cardiovascular Disease in US Adults," *Archives of Internal Medicine*, October 2012.

another study using a larger NHANES dataset did not observe an association nor a positive trend between quartiles of exposure and CVD incidence.[37]

Some findings were mixed and inconsistent across studies. For those examining strokes, for example, one found a slight positive association,[38] while another observed a significant inverse association.[39]

Cancer

While EPA cites multiple lines of evidence to support its carcinogenic finding, this section compares different agencies' conclusions concerning the epidemiologic evidence. Two studies involving participants in the C8 Health Project showed a positive association between PFOA levels (mean at 24 ng/mL) and kidney and testicular cancers.[40] The C8 Science Panel concluded that a probable link existed between PFOA exposure and testicular and kidney cancer.[41]

In an occupational study in Italy, statistically significant increases in liver cancer mortality, malignant neoplasms of the lymphatic and hematopoietic tissue, and in all malignant neoplasms with cumulative serum PFOA exposure greater than 16,956 ng/mL-years. In another occupational study based on a West Virginia DuPont cohort, no significant associations with incidence of cancers of the bladder, colorectal, prostate, and melanoma were observed when compared to the general population.[42]

Fifteen epidemiological and one animal toxicological study that investigated the association between PFOS and cancer were identified. Although the epidemiological evidence found mixed results across tumor types, EPA says that the available study findings support a plausible correlation between PFOS exposure and carcinogenicity in humans.

PFOS was associated with an increased risk of kidney cancer in a medium confidence study.[43] A case-control study within the National Cancer Institute's Prostate, Lung, Colorectal, and

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[37] Mengmeng Huang et al., "Serum Polyfluoroalkyl Chemicals Are Associated with Risk of Cardiovascular Diseases in National US Population," *Environment International*, 2018.

[38] Huang et al.

[39] Robert Hutcheson, Kim Innes, and Baqiyyah Conway, "Perfluoroalkyl Substances and Likelihood of Stroke in Persons with and without Diabetes," *Diabetes and Vascular Disease Research*, 2020.

[40] Vaughn Barry, Andrea Winquist, and Kyle Steenland, "Perfluorooctanoic Acid (PFOA) Exposures and Incident Cancers among Adults Living near a Chemical Plant," *Environmental Health Perspectives*, 2013.

[41] C8 Science Panel, "C8 Probable Link Reports," 2012.

[42] Kyle Steenland and Susan Woskie, "Cohort Mortality Study of Workers Exposed to Perfluorooctanoic Acid," *American Journal of Epidemiology*, November 2012.

[43] Joseph Shearer et al., "Serum Concentrations of Per- and Polyfluoroalkyl Substances and Risk of Renal Cell Carcinoma," *Journal of the National Cancer Institute*, 2021.

Ovarian Screening Trial reported a statistically significant positive trend in risk of renal cell carcinoma with pre-diagnostic PFOS serum levels.

One study also observed statistically significant increased odds of ovarian cancer both per ng/mL increase in PFOS and in the two highest quartiles of exposure, although the association was significantly inverse for the second quartile of PFOS exposure.[44]

The evidence database for the carcinogenicity of PFOS is comprised of several epidemiological studies and a single chronic cancer. The available epidemiology studies report elevated risk of bladder, prostate, kidney, and breast cancers after chronic PFOS exposure. However, EPA notes that the study designs, analyses, and mixed results do not allow for a definitive conclusion on the relationship between PFOS exposure and cancer outcomes.

EPA explains that the low confidence sources are limited by selection bias, and confounders specific for cancer outcomes, including smoking and socioeconomic factors, were not addressed and behavioral risk factors could have differed. The EFSA, HC, and the WHO do not find the epidemiology evidence robust enough to support a causal link between PFOA exposure and cancer (see Table 38 and Table 39 in Appendix B).

In summary, since other competent public health agencies have reviewed the same scientific literature as EPA and have reached different conclusions on the existence and the strength of the associations between PFOS and PFOA exposure and disease, EPA must take this uncertainty into account. EPA must do so in a quantitative, reproducible uncertainty analysis as required by Circular A-4. Providing the range of potential benefits will also increase the public's understanding of the regulatory options.

Additional Assumptions in EPA's EA

Changes to Baseline Due to Voluntary Actions

EPA assumes that drinking water concentrations will remain constant in the absence of its proposed rule. As a result, EPA's assumption overstates the net benefits of the rule because other PFAS actions and regulations will likely decrease occurrence in drinking water.

In the absence of EPA's proposed rule, the baseline PFAS occurrence will likely decline due to increasing regulatory action at the state level and additional voluntary actions. Additionally, in September 2022, EPA published a NPRM designating PFOA and PFOS as CERCLA hazardous substances.[45] The designation, if finalized, will have far-reaching impacts as industries and utilities shift activity to prevent PFAS releases and litigation. Utilities may try to reduce PFOA

[44] Ogbedor Omoike et al., "Association between per and Polyfluoroalkyl Substances and Markers of Inflammation and Oxidative Stress," *Environmental Research*, May 2021.

[45] "Designation of Perfluorooctanoic Acid (PFOA) and Perfluorooctanesulfonic Acid (PFOS) as CERCLA Hazardous Substances," *Federal Register* 87, no. 171 (September 2022): 54415-42.

and PFOS concentrations to reduce their CERCLA liability with or without a federal drinking water standard.

Finally, there will be more voluntary PFAS treatment installations as a result of increased federal funding initiatives dedicated to reducing PFAS contamination levels. Of the $48 billion appropriated for drinking water and wastewater in the IIJA, $4 billion is set aside to address emerging contaminants in drinking water with a focus on PFAS and an additional $5 billion will be appropriated to help small and disadvantaged communities address emerging drinking water contaminants.[46] This funding can only be used to address capital costs.

Dollar Year

EPA uses 2020 prices as the data source for its projection of costs to 2026. Producer prices have shot up since 2021 due to supply shortages, disruption of trade due to the global pandemic, and financial assistance provide to individuals, businesses, and the economy during the pandemic. EPA chose as the baseline year for its analysis a year that is not representative of current conditions and the likely near-term future when most of the rule's expenditures will be made. Inflation appears to be likely to persist in the near-term. Moreover, the economic policies underway to reduce inflation – raising federal interest rates and reducing the money supply – are increasing the cost of capital, a major input factor into this proposal's costs. By selecting a baseline year for the analysis that had low interest rates and prices and that is not representative of the near-term's economic conditions, EPA is artificially lowering expected compliance costs.

Valuation

EPA uses Value of Statistical Life (VSL) estimates to estimate the economic value of avoided premature deaths.[47] EPA approximates VSL growth using a compound annual growth rate of projected values to obtain a VSL suitable for valuation of mortality risk reductions during the period of analysis (2023-2104). As a base value, EPA used a VSL estimate of $4.8 million ($1990, 1990 income year), which is the central tendency of the VSL distribution recommended for EPA's regulatory impact analyses. In the EA, this estimate is adjusted for inflation and income growth. Estimates used in the EA range from $10.7 million in 2023 to $17.7 million in 2104.

As discussed above, EPA did not model the uncertainty in its VSL estimate. More fundamentally, EPA did not include the effect of income growth on other opportunity costs in the rule. If consumers' willingness to pay to avoid mortality risk increases with income, then it is reasonable to assume that consumers' willingness to pay to avoid other economic

[46] U.S. Environmental Protection Agency, "Emerging Contaminants (EC) in Small or Disadvantaged Communities Grant (SDC)," n.d.

[47] U.S. Environmental Protection Agency, "Economic Analysis for the Proposed Per- and Polyfluoroalkyl Substances National Primary Drinking Water Regulation," 2-4.

displacements and adverse effects also increases with income. By including income growth in the valuation of benefits but not costs, EPA biases the results.

EPA used the cost of illness (COI) valuation approach to estimate the economic value of avoided morbidity (non-fatal heart attacks and ischemic strokes, birth weight decrements, and cancers). The COI-based values used in the EA reflect medical care expenditures and opportunity costs associated with condition management and treatment. COI metrics do not meet the requirements set out by Circular A-4 and other best practices to use consumers' willingness-to-pay (WTP) metrics.[48]

In conclusion, EPA's EA for the proposed rule departs from analysis required by Circular A-4. As a result, the EA portrays misleading estimates of the social benefits and the social costs and fails to describe the uncertainty in these estimates.

III. ESTIMATES OF THE SOCIAL BENEFITS FROM EPA'S PROPOSED REGULATORY ACTION

EPA posited numerous adverse effects in the MCLG documents for PFOA, PFOS, and the four PFAS that comprise the HI MCL.[49] However, EPA quantified the social benefits for only three of them, cardiovascular disease (CVD), avoided low birthweight, and avoided cases of renal cell carcinoma (RCC). Moreover, the biological mechanisms for adverse effects in the EA's quantified benefits are not established and the human study data is equivocal. EPA's limited approach raises questions as to the potential existence and the size of social benefits from avoiding the other adverse effects EPA claims could arise from PFAS exposure.

Given the significant social costs if EPA's proposal is promulgated, this analysis sought to evaluate a larger scope of potential health effects. To do so, the analysis employs genomic and cellular studies of human and animal genes to identify how PFOS exposure causes biological changes in cellular function and at the genetic level. If a dose does not alter this biological activity materially, many adverse effect pathways to disease can largely ruled out at levels occurring in drinking water.

The analysis rests on recent, peer-reviewed published studies that use best practices for evidence integration of different lines of toxicological evidence. These toxicology results fit well into benefit-cost analysis.

1. Rationale for the Approach

[48] U.S. Office of Management and Budget, "Circular A-4: Regulatory Analysis," September 2003.

[49] U.S. Environmental Protection Agency, "Economic Analysis for the Proposed Per- and Polyfluoroalkyl Substances National Primary Drinking Water Regulation," 6-1.

For over 60 years, toxicology has developed three principal types of evidence – epidemiological studies of human populations, controlled dose experiments in animals, and in vitro testing to measure responses to chemical exposure in cells, genes, and other biological systems. In the last 20 years, the amount and the breadth of in vitro information has soared as researchers have created new, fast, and low-cost techniques to measure cellular and genetic responses.[50] For example, inexpensive, high-throughput transcriptomics data generation platforms allow rapid observations of a constituent's interaction and activation of the full set of human genes. With the generation of this data arose the question: what to do with it and how to interpret it?

How to interpret and to integrate different lines of evidence has always been a challenge in toxicology. Concern arose in the 2000s with the transparency, decision criteria, and reproducibility of EPA's evidence integration in Integrated Risk Information System (IRIS) hazard assessments, for example.[51] In a major report, the National Academies of Science (NAS) recommended that EPA develop transparent, reproduceable mathematical approaches to integrate genomic, in vitro mechanistic data, animal experimental data, and data from human observations.[52] The NAS recommended EPA move toward a formal, mathematical approach to integrate lines of evidence using Bayesian statistics. In its findings, the NAS stated:

> Finding: Quantitative approaches to integrating evidence will be increasingly needed by and useful to EPA.
>
> Recommendation: EPA should expand its ability to perform quantitative modeling of evidence integration; in particular, it should develop the capacity to do Bayesian modeling of chemical hazards. That technique could be helpful in modeling assumptions about the relevance of a variety of animal models to each other and to humans, in incorporating mechanistic knowledge to model the relevance of animal models to humans and the relevance of human data for similar but distinct chemicals, and in providing a general framework within which to update scientific knowledge rationally as new data become available.[53]

EPA did not follow this recommendation in the EA. EPA continues the practice of picking certain studies for its quantitative assessments while ignoring and not including the data from other high-quality studies. While EPA states that data from animal studies and mechanistic studies are supportive, EPA does not support these claims in a transparent, reproducible manner. For example, for its estimate of the social benefits from the association between PFOA and PFOS exposure and lower birth weights, EPA selects one study for PFOA and used only the data from this study. EPA apparently re-analyzes the data in the selected study for

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[50] National Academies of Sciences, Engineering, and Medicine, "Using 21st Century Science to Improve Risk-Related Evaluations" (The National Academies Press, 2017).

[51] National Research Council, "Review of EPA's Integrated Risk Information System (IRIS) Process Review of EPA's Integrated Risk Information System (IRIS) Process."

[52] National Research Council, "Review of EPA's Integrated Risk Information System (IRIS) Process Review of EPA's Integrated Risk Information System (IRIS) Process."

[53] National Research Council, 105.

PFOS but apparently did not state if the Agency submitted this reanalysis to independent peer review.

After the 2014 NAS report, researchers continued to develop full human genomic test data and genomic dose-response modeling. The advent of these new tools -- and the information they provide -- has underscored this challenge of how to integrate genomic in vitro evidence into hazard assessments.

The National Academy of Sciences issued a major report on these New Approach Methods (NAM) in 2017.[54] The 2017 report recommended that agencies incorporate NAMs into chemical risk assessments since they could provide substantially more data and insight more quickly than traditional toxicity testing. As the National Toxicology Program (NTP) found, research groups in universities, private institutions, and government agencies expanded their use of NAMs in the peer-reviewed literature. In 2018, the NTP convened experts and published its approach to genomic dose-response modeling. NTP explained the advantages:

> NTP's approach to study design focuses on obtaining the best data to determine accurate estimates of biological potency using modeling. The use of a broad array of gene sets such as those curated by MSigDB is to ensure that all known biological signaling processes are covered, therefore ensuring that the most sensitive estimation of biological potency.[55]

In other words, rather than only toxicology experiments with a limited number of animal studies of potentially unclear biologic mechanisms of action, genomics data can measure changes in all human signaling processes. These genomics experiments can be replicated, can be conducted quickly at different dose levels, and can test the genomes and cells of many different individuals.

However, the NTP identified two major remaining issues: consistent study design of genomic studies and the biological interpretation of the findings.[56] While the NTP guidance (and comparable EPA guidance) provides a standard for study design, the remaining fundamental uncertainty – genes do not fully determine health outcomes – remained. It is essential for benefit-cost analysis that the genetic changes have direct links to adverse effects consumers understand and value. To interpret the genomic data, researchers have turned to in vitro-in vivo (IVIV) studies and modeling to develop mathematical relationships between the results of known animal studies and genomic response and signaling data. The IVIV techniques then link genomic data to measured adverse effects in whole organisms.[57] Thus, researchers are developing mathematical techniques to link genomic data to animal data. Recent studies are

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[54] National Academies of Sciences, Engineering, and Medicine, "Using 21st Century Science to Improve Risk-Related Evaluations."

[55] National Toxicology Program, "NTP Research Report on National Toxicology Program Approach to Genomic Dose-Response Modeling," April 2018, 4.

[56] National Toxicology Program, "NTP Research Report on National Toxicology Program Approach to Genomic Dose-Response Modeling."

[57] Very recent studies find that hazard values developed through genomic analysis are similar to value derived from animal assays. In general, the genomic values are more health-protective than values derived from animal studies.

confirming NTP's conclusion that these studies are more sensitive (i.e., more health protective) than results obtained from whole organism studies.[58]

Mathematical evidence integration also combines the risk of cancer and the risk of noncancer effects into the same hazard metric. As the NAS stated, Bayesian dose-response methods can be applied to different lines of evidence to create probabilistic estimates of risk for both cancer and noncancer effects. This capability is vital since EPA's current hazard metrics and -- study selection by judgement as in this EA – are incompatible with EPA's regulatory analysis requirements.

The mismatch between EPA's current toxicity metrics and benefit-cost analysis is well understood. Over 30 years ago, the NAS called for EPA to adopt probabilistic hazard assessment and to move away from single hazard values such as a reference dose. In its 2009 *Science and Decisions* report evaluating EPA's risk assessment practices, the NAS concluded: "The end products of noncancer (and nonlinear cancer) assessments in the current paradigm (exposure-effect quotients that qualitatively indicate potential risk—MOEs [Margin of Exposure], RfDs [Reference Doses], and RfCs [Reference Concentrations], Figure 5-1) are inadequate for benefit-cost analyses or for comparative risk analyses."[59] The NAS emphasized:

> Historically, dose-response assessments at EPA have been conducted differently for cancer and noncancer effects, and the methods have been criticized for not providing the most useful results. Consequently, noncancer effects have been underemphasized, especially in benefit-cost analyses. A consistent approach to risk assessment for cancer and noncancer effects is scientifically feasible and needs to be implemented.[60]

The 2009 *Science and Decisions* report also provided EPA with extensive recommendations concerning uncertainty analysis, value of information analysis, and risk characterization.

Mathematic evidence integration also enables formal uncertainty analysis to be conducted on the hazard assessment. The outputs of Bayesian modeling are probabilities of adverse effects that are related to the dose, allowing estimates of how these probabilities change with a change in dose. These incremental effects fit well into benefit-cost analysis. Benefit-cost analysis rests on estimating the value to society of incremental shifts in resources to different policy outcomes. Probabilistic risk assessment measures provide more information and fit into the incremental analysis framework of benefit-cost analysis.

EPA's benefit-cost analysis for the proposal rests on toxicity relationships that suffer from the same issues raised by the NAS in 2009 and 2014. The EA's benefit estimate selects just three critical effects even though EPA states that PFOS and PFOA are associated with many other effects. This analysis seeks to consider a greater range of potential biological mechanisms of action for PFOS and to quantify these effects following the NAS recommendations for hazard identification, evidence

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[58] National Toxicology Program, "NTP Research Report on National Toxicology Program Approach to Genomic Dose-Response Modeling," 4.

[59] National Research Council, "Science and Decisions: Advancing Risk Assessment" (Washington, DC: National Academies Press, 2009), 133.

[60] National Research Council, 8.

integration, and presentation of the maximum value of avoiding the probabilities of change through exposure in drinking water.

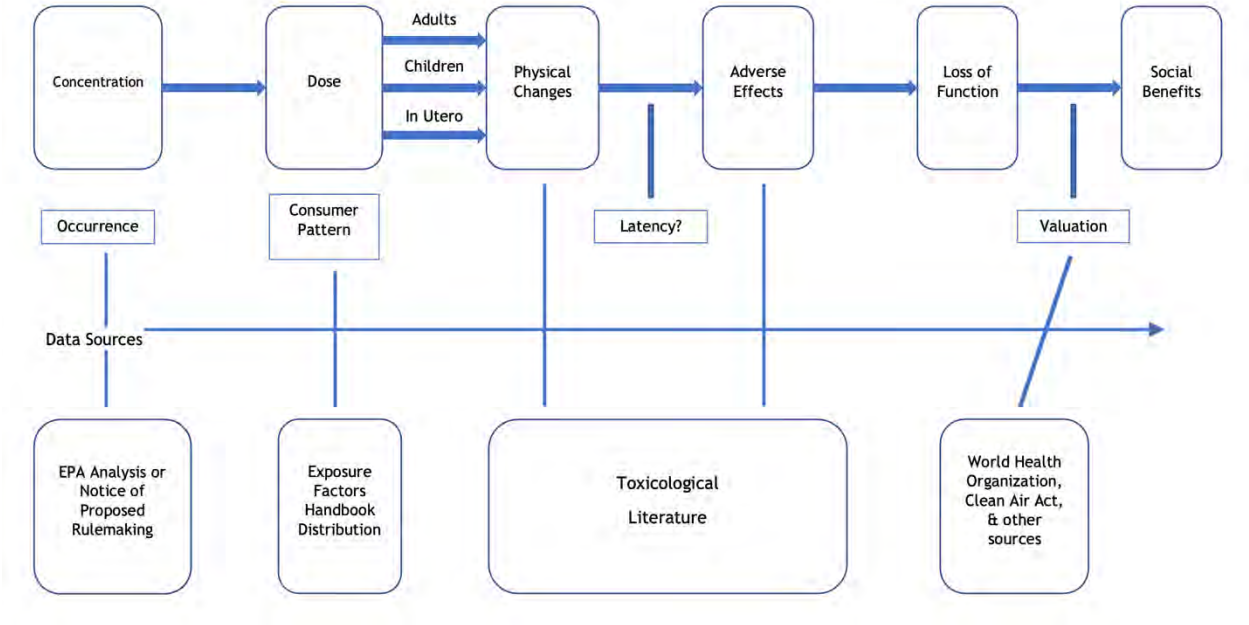
2. Summary of the Analytical Approach

This analysis attempts to overcome some of the limitations in EPA's approach which relies on only a few studies, evaluates only two possible PFOS adverse effects, and ignores relevant data and studies.

Figure 3 presents an overview of our methodological approach to the benefits analysis. The assessment is performed in the following sequential steps:

1. Concentration. The concentration of PFAS in drinking water is based on occurrence data from EPA's EA.
2. Dose from Drinking Water Exposure. Drinking water consumer patterns are based on EPA's Exposure Factors Handbook (EFH) and take into account age, sex, race, and body weight.
3. Physical Changes and Adverse Effects. The latest toxicological literature presents modeling of how PFOS concentration and dose estimates are likely to result in the probability of physiological changes and, subsequently, adverse effects.
4. Loss of Function and Valued Social Benefits. The analysis takes the loss of function (i.e. disease) from the modeled physical changes and adverse effects from the literature and applies quantification from the World Health Organization (WHO) and willingness-to-pay estimates to estimate total social benefits.

Figure 3: Overview of Benefits Methodological Framework



In summary, this approach has several major advantages over EPA's approach in the EA:

- Includes many more potential adverse effects from PFOS exposure in drinking water than analyzed in the EA;
- Includes potential incremental noncancer and cancer effects into the same hazard metric;
- Develops estimates of the probability of these adverse effects to construct a distribution of the potential population health benefits;
- Assigns values to the expected values of these adverse effects based on internationally-recognized metrics for morbidity and mortality; and,
- Values these effects with a WTP value consistent with Circular A-4 and best practices.

While our approach has significant advantages over EPA's methods, it has limitations. Some limitations are due to fundamental uncertainty; some could be fixed. Due to the limited time available for public comments, this analysis has limitations that could be addressed with additional analysis. Since this information is available in the literature, EPA could construct a more comprehensive and a more robust social benefit estimate using this approach.

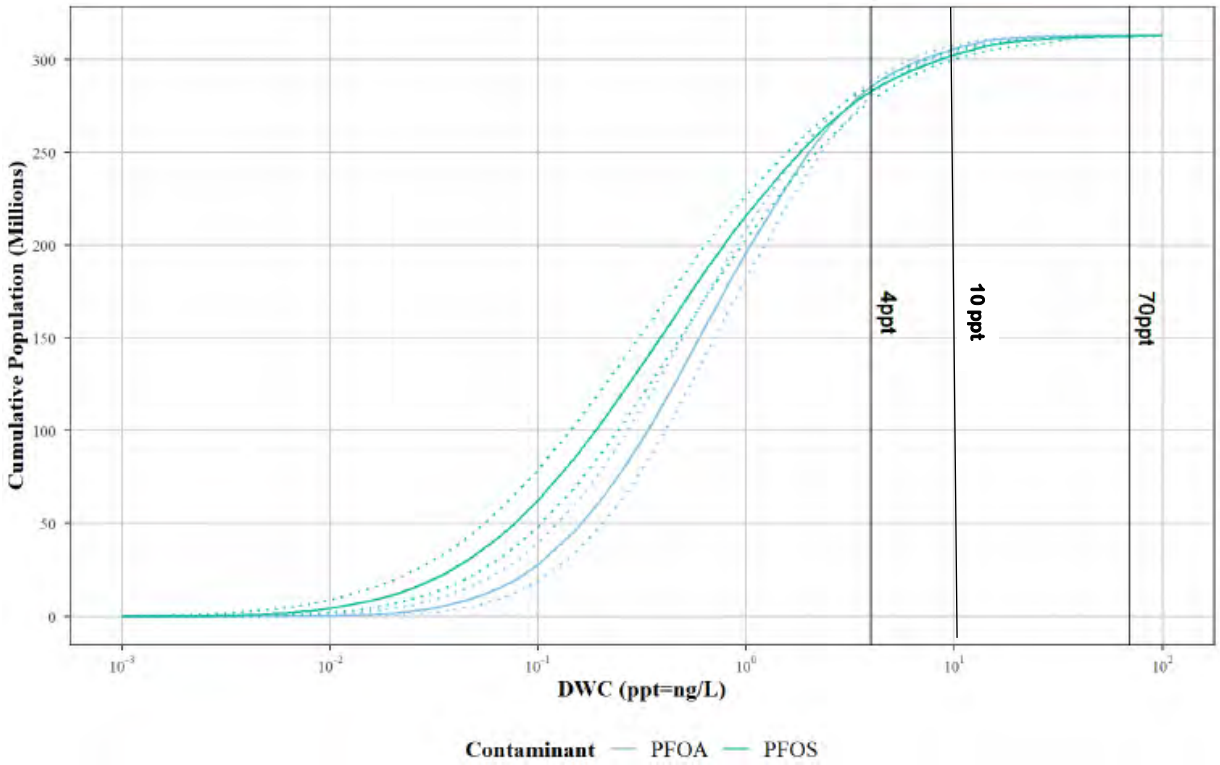
3. Data and Assumed Values

Occurrence in Drinking Water

The analysis uses EPA's projection of PFOA and PFOS occurrence data and population estimates for the benefit estimates. As done in the EA, the distribution of occurrence of the selected PFAS in PWS is estimated and then modified to account for existing state regulatory standards.

The analysis adopts the results of the modeling in Cadwallader et al that the EA uses.[61] The authors' approach efficiently uses available data and established Markov methods to project which systems are likely to have PFAS occurrence in the absence of sampling data. The analysis replicated the paper's results with mechanical and mathematical methods.[62] Data points were extracted from the Figure 4 of Cadwallader et al. through a digital tool that uses reverse engineering to plot underlying numerical data from data visualizations.[63] The chart was uploaded onto a canvas and the y- and x-axes were calibrated as linear and logarithmic information, respectively, to extract the data points. We then fit a curve to the points to allow assignment of simulated concentration levels to segments of the population. Figure 4 below gives the baseline simulated drinking water concentration distribution.

Figure 4: Cumulative Distribution of Estimated Population Exposed to PFOA and PFOS



[61] Adam Cadwallader et al., "A Bayesian Hierarchical Model for Estimating National PFAS Drinking Water Occurrence" (AWWA Water Science, May 25, 2022).

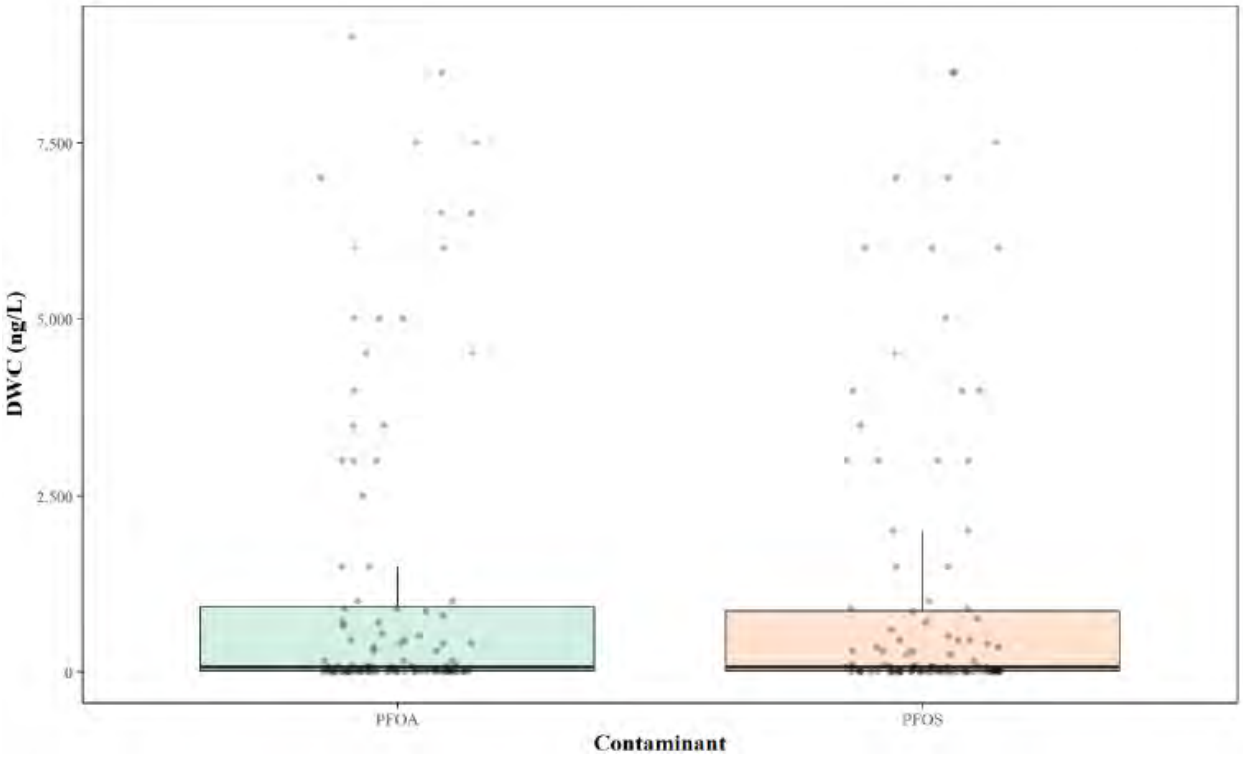
[62] IBID

[63] Ankit Rohatgi, "WebPlotDigitizer" (Pacifica, California, September 16, 2022), https://automeris.io/WebPlotDigitizer/.

The fitted curve overpredicts the total public drinking water population percentage by 12.5 percent at the high end of the distribution. As with any statistical estimation, there is more uncertainty at points further away from the central estimate. Since it is the high end of the distribution where the majority of the benefits will occur, the analysis trims the shape of the simulated curve by reducing the population amounts predicted by the curve by 12.5 percent so that the population in the analysis equals EPA's estimate of 277 million consumers of public drinking water.

Figure 2, the population distribution, was converted to the probability distribution and simulated drinking water concentration data were generated by randomly drawing drinking water concentration (DWC) from the probability distribution. The simulated DWC data are displayed in the boxplot in Figure 3:

Figure 5: Simulated Drinking Water Concentration of PFOA and PFOS Before the Proposed Rule



Baseline Population

Some states have promulgated drinking water MCLs for PFAS.[64] In its EA, EPA reviewed state websites and identified states with standards promulgated as of July 2022 for the PFAS compounds considered under the proposed rule (see Table 2).

[64] U.S. Environmental Protection Agency, "Economic Analysis for the Proposed Per- and Polyfluoroalkyl Substances National Primary Drinking Water Regulation," 4-22 & 4-23.

Table 2: State PFAS MCLs included in EPA's EA (ppt)

State	PFOA	PFOS	PFBS	PFHxA	PFHxS	PFNA	HFPO-DA	Sum[65]
New Jersey	14	13				13		
Vermont	*	*			*	*		20
New Hampshire	12	15			18	11		
Massachusetts	*	*			*	*		20
Michigan	8	16	420	400,000	51	6	370	
New York	10	10						

EPA assumed in its occurrence model that estimates exceeding state limits are equivalent to the state-enacted limit to estimate the benefits and costs of the proposed rule. EPA also assumed that the state MCL is the maximum baseline PFAS occurrence value for all entry points in the state.[66] This adjustment was made to the EPA's occurrence model PFAS estimates for PFOA, PFOS, and PFHxS. Systems in states with PFAS regulations are still expected to incur incremental costs to comply with the proposed rule since EPA's proposed standards are more stringent than current state drinking water standards. Similarly, EPA notes that "populations served by PWSs in the states with PFAS regulations are expected to benefit from further reductions in PFAS exposures."[67]

While EPA adjusts the occurrence data to account for promulgated MCLs, it assumes its baseline will remain constant in the future, excluding proposed regulations as well as changes in drinking water PFAS occurrence due to issued and future guidance and other regulatory actions. Several states have passed non-MCL regulations or will promulgate either new MCLs or other actions in the future that all impact PFAS occurrence levels in drinking water. To allow comparisons with EPA's estimates, the analysis does not reduce the assumed population by assuming other states will promulgate state standards before the federal MCL. However, pending state standards and voluntary actions are likely to reduce baseline exposure and thus the incremental benefits of this action.

[65] Asterisks indicate PFAS regulations at an overall threshold value indicated in the Sum column.

[66] U.S. Environmental Protection Agency, "Economic Analysis for the Proposed Per- and Polyfluoroalkyl Substances National Primary Drinking Water Regulation," 4-23.

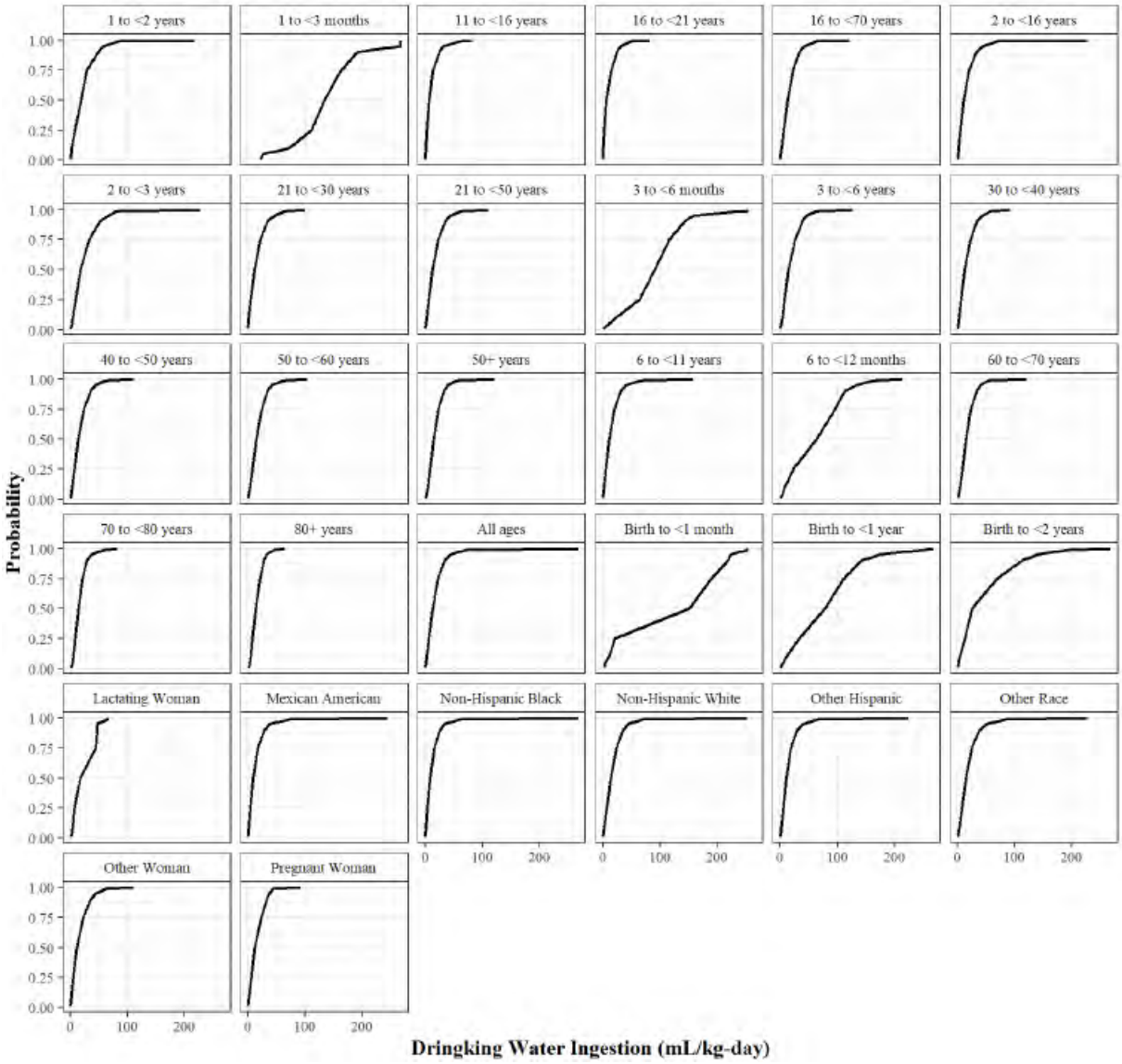
[67] U.S. Environmental Protection Agency, 4-23.

Drinking Water Intake/Body Weight Data

Consumption

For water ingestion and daily dose estimation, we use data distributions from EPA's Exposure Factors Handbook.[68] EPA revised the water ingestion information in 2019 in the Handbook to include more recent data. The analysis uses the consumers-only, direct and indirect drinking water intake values to construct an intake distribution for the U.S. population.

Figure 6: Probability Distribution of Drinking Water Ingestion Rate[69]



[68] U.S. Environmental Protection Agency, "Exposure Factors Handbook," 2011, https://www.epa.gov/expobox/about-exposure-factors-handbook.

[69] Figure 4 is a graphical description of data in EPA's Exposure Factors Handbook (EFH).

Figure 4 shows the probability distribution of direct and indirect public drinking water consumption by age group and other sensitive subgroups.

Population Distribution of PFOS Dose from Drinking Water Consumption

The Drinking Water Dose (DWD) is a translation of the drinking water intake to a dose metric. Values of DWD of PFOS before and after the proposed rule are determined so that they can be compared against the available toxicology information. It is calculated by multiplying a value taken from the drinking water concentration distribution and a value taken from the drinking water intake distributions.

Duration

The analysis assumes people consume drinking water from the same water source for their lifetimes, consistent with EPA's approach.

Human Equivalent Dose (HED) for Different Diseases

The analysis searched the scientific literature to find studies that employed approaches that encompass more potential adverse effects and that analyze this data in an approach consistent with benefit-cost analysis. A paper by Chen et al. that integrated human and animal cellular response data into a probabilistic risk assessment of PFOS is the primary source for the benefit estimate.[70]

In the paper, Chen et al extracted toxiogenomic dose-response data and other data from a public repository of in vivo animal and in vitro human high-throughput studies.[71] Studies of at least three different doses of PFOS were identified in mice, rats, and human cells. The results were filtered to identify the differentially expressed genes. These genetic responses were enriched by applying a disease ontology approach to cluster the genetic changes into disease pathways.

Applying a Bayesian dose-response model to this genetic data from animal studies and in vitro human cell data, the authors developed benchmark doses (BMDs). The authors selected a ten percent change as the benchmark response, the change significant enough to indicate that the PFOS concentration was altering cellular function. Finally, the authors used a physiological based pharmacokinetic (PBPK) model to convert the BMDs to human equivalent doses (HEDs). Each HED is a probability distribution of cellular response for that disease by dose. The paper and the supporting information contain more detailed information on the author's approach.

The Chen et al. drew on data from different concentrations of PFOS exposure to different cells and from different exposure durations.[72] The analysis selected the HEDs from the liver cells and derived from 14 days of exposure since (1) it yielded the most potential adverse

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[70] Qiran Chen, Wei-Chun Chou, and Zhoumeng Lin, "Integration of Toxicogenomics and Physiologically Based Pharmacokinetic Modeling in Human Health Risk Assessment of Perfluorooctane Sulfonate," *Environmental Science & Technology*, 2022.

[71] Chen, Chou, and Lin, 3624.

[72] Chen, Chou, and Lin, 3267.

effects; (2) studies show that the body tends to deposit longer chain PFAS in liver tissue; and, (3) the HEDs were lower than other results. This selection may overestimate the potential adverse effects and social benefits. Chen et al. identified 108 responses to disease pathways in the 14-day liver tissue results.[73] The disease ontology and disease groups are listed in Table 4.

Table 3: Human Equivalent Dose (HED) for Different Diseases (ng/kg-day)

Disease Ontology	Disease Group/ Pathway
colon cancer	Cancer
ovarian carcinoma	Cancer
ovarian cancer	Cancer
pharynx cancer	Cancer
renal carcinoma	Cancer
nasopharynx carcinoma	Cancer
female reproductive organ cancer	Cancer
breast carcinoma	Cancer
prostate cancer	Cancer
male reproductive organ cancer	Cancer
bone cancer	Cancer
bone marrow cancer	Cancer
colorectal cancer	Cancer
connective tissue cancer	Cancer
head and neck cancer	Cancer
intestinal cancer	Cancer
kidney cancer	Cancer
large intestine cancer	Cancer
lipomatous cancer	Cancer
musculoskeletal system cancer	Cancer
ocular cancer	Cancer
ovary epithelial cancer	Cancer
retinal cancer	Cancer
retinal cell cancer	Cancer
sensory system cancer	Cancer
smooth muscle cancer	Cancer
adenocarcinoma	Cancer
adenoma	Cancer
autonomic nervous system neoplasm	Cancer
breast adenocarcinoma	Cancer

[73] Chen, Chou, and Lin, 3626.

Disease Ontology	Disease Group/ Pathway
cell type benign neoplasm	Cancer
colon carcinoma	Cancer
head and neck carcinoma	Cancer
leiomyosarcoma	Cancer
liposarcoma	Cancer
lymphoblastic leukemia	Cancer
malignant glioma	Cancer
malignant ovarian surface epithelial-stromal neoplasm	Cancer
mammary Paget's disease	Cancer
myeloma	Cancer
neuroblastoma	Cancer
neuroendocrine carcinoma	Cancer
osteosarcoma	Cancer
peripheral nervous system neoplasm	Cancer
renal cell carcinoma	Cancer
retinoblastoma	Cancer
acute myocardial infarction	CVD
chronic obstructive pulmonary disease	CVD
thalassemia	CVD
liver cirrhosis	CVD
arteriosclerosis	CVD
myocardial infarction	CVD
fatty liver disease	CVD
amyloidosis	CVD
arteriosclerotic cardiovascular disease	CVD
atherosclerosis	CVD
cerebrovascular disease	CVD
coronary artery disease	CVD
familial hyperlipidemia	CVD
heart valve disease	CVD
hematopoietic system disease	CVD
ischemic bone disease	CVD
kidney disease	CVD
kidney failure	CVD
lipid metabolism disorder	CVD
lipid storage disease	CVD
mitral valve disease	CVD
nutrition disease	CVD

Disease Ontology	Disease Group/ Pathway
obesity	CVD
obstructive lung disease	CVD
cerebral infarction	CVD
endocrine system disease	ER
gestational diabetes	ER
pancreas disease	ER
osteoporosis	ER
polycystic ovary syndrome	ER
HELLP syndrome	ER
hyperandrogenism	ER
inherited metabolic disorder	ER
lysosomal storage disease	ER
overnutrition	ER
reproductive system disease	ER
sex differentiation disease	ER
anemia	ImmunoTox
autoimmune disease of gastrointestinal tract	ImmunoTox
hepatitis	ImmunoTox
bacterial infectious disease	ImmunoTox
primary bacterial infectious disease	ImmunoTox
autosomal recessive disease	ImmunoTox
parasitic infectious disease	ImmunoTox
autoimmune disease of urogenital tract	ImmunoTox
blood coagulation disease	ImmunoTox
bone remodeling disease	ImmunoTox
bone resorption disease	ImmunoTox
lung disease	ImmunoTox
malaria	ImmunoTox
primary biliary cirrhosis	ImmunoTox
urinary system disease	ImmunoTox
Alzheimer's disease	NeuroTox
amyotrophic lateral sclerosis	NeuroTox
Parkinson's disease	NeuroTox
brain disease	NeuroTox
brain infarction	NeuroTox
essential tremor	NeuroTox
motor neuron disease	NeuroTox
prion disease	NeuroTox

Disease Ontology	Disease Group/ Pathway
tauopathy	NeuroTox
toxic encephalopathy	NeuroTox

These 108 HEDs cover a wide range of possible health effects. For example, the analysis includes 46 different types of cancers and tumor formation.

The authors applied a 30-fold uncertainty factor to the HEDs derived from animal data to reflect animal-human extrapolation and human variability and a 10-fold uncertainty factor to human HEDs to reflect population variability.[74] As an additional safety factor, our analysis applies a uniform 30-fold uncertainty factor to all HEDs and divide the HEDs by this factor.

As shown in Table 4, the analysis groups the 108 HEDs into five disease groups: cancer, immunotoxicity, neurological, cardiovascular disease (CVD), and endocrine response (ER). Each HED is a probability distribution based on dose. Following the practice of fitting a distribution to a series of HED values shown in Figure 4 of Chou and Lin, a distribution is fitted on the HED data extracted the supporting information package of Chen et al. and is done so for each of the five disease types.[75]

[74] Chen, Chou, and Lin, "Integration of Toxicogenomics and Physiologically Based Pharmacokinetic Modeling in Human Health Risk Assessment of Perfluorooctane Sulfonate."

[75] Chen, Chou, and Lin; Wei-Chun Chou and Zhoumeng Lin, "Probabilistic Human Health Risk Assessment of Perfluorooctane Sulfonate (PFOS) by Integrating in Vitro, in Vivo Toxicity, and Human Epidemiological Studies Using a Bayesian-Based Dose-Response Assessment Coupled with Physiologically Based Pharmacokinetic (PBPK) Modeling Approach," *Environment International*, 2020.

Figure 7: Probability Distributions of HEDs by Disease and Disease Type

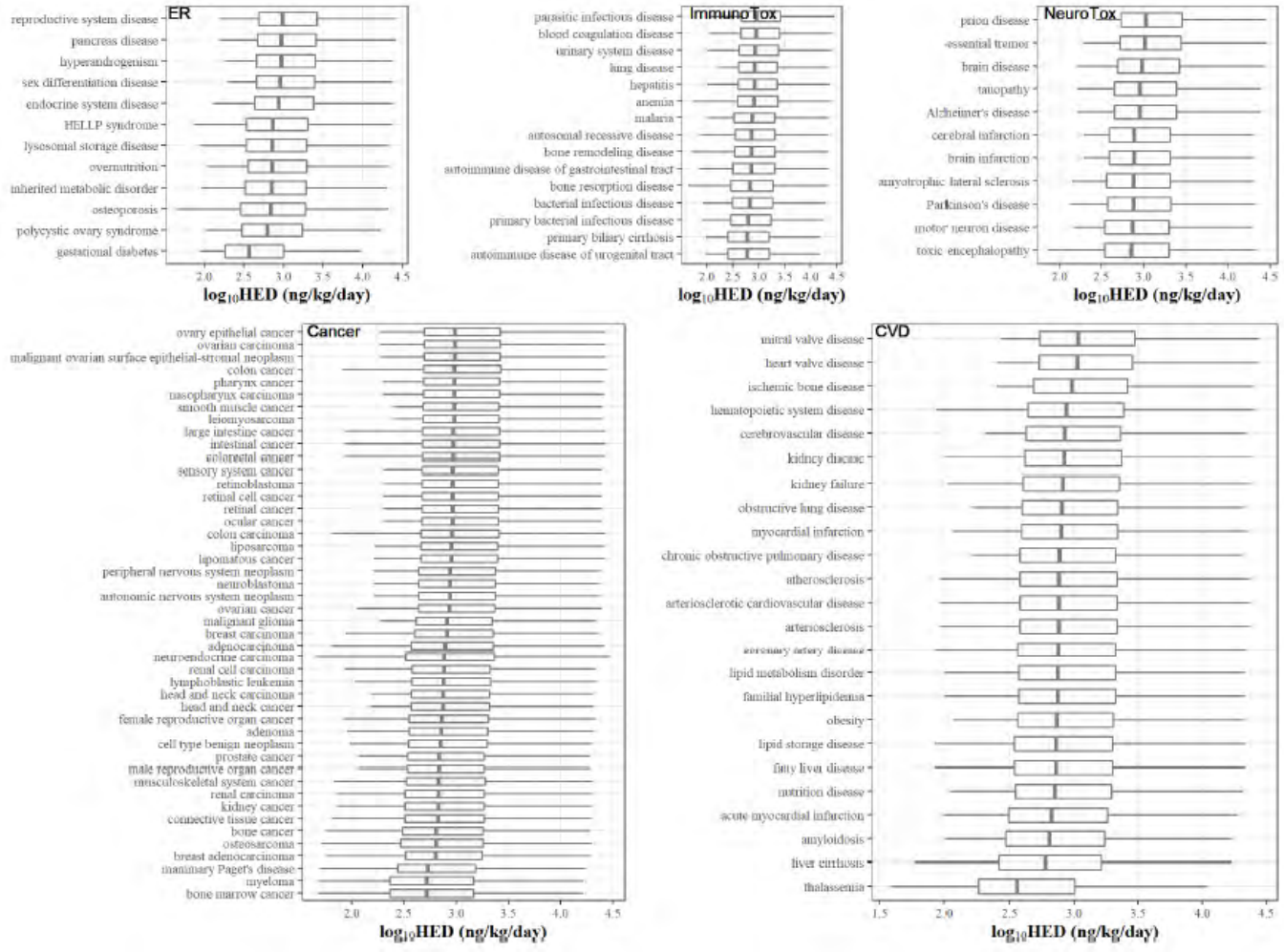
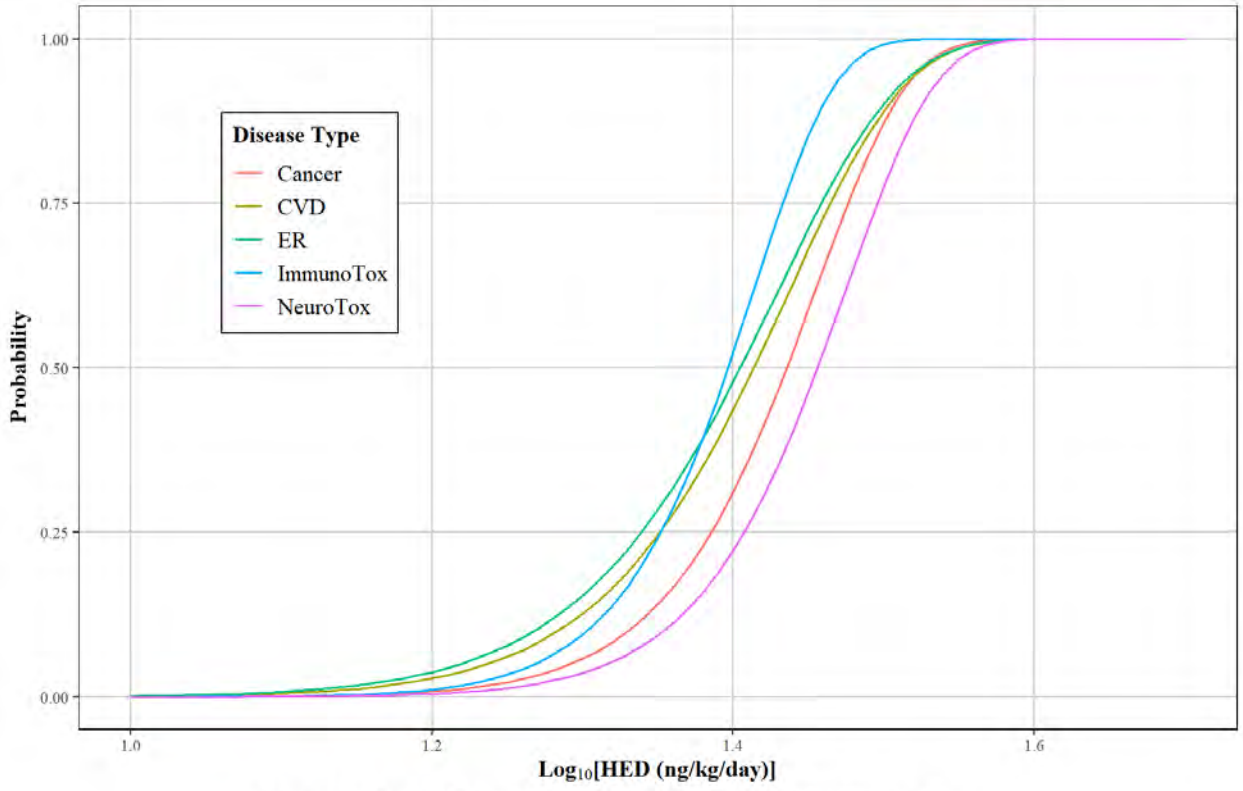


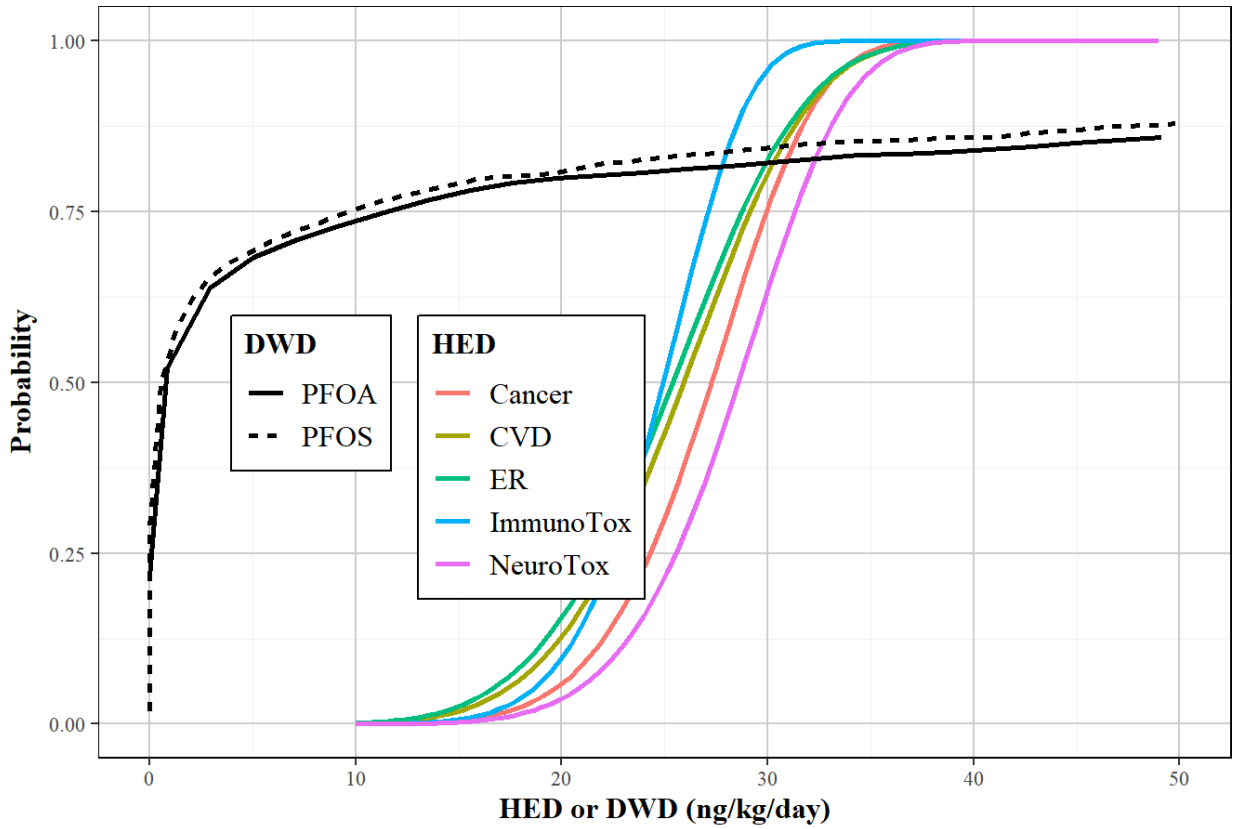
Figure 7 plots the probability distribution of the 108 diseases by HED levels. Each disease has a central tendency estimate and a range of probabilities that vary with dose. As with Chou et at., this analysis used a Weibull distribution to fit a curve to the log10(HED) data. Figure 8 is a simplification of Figure 7 since it plots median HED values of the distributions of all 108 diseases aggregated by disease type.

Figure 8: Probability Distribution of Log10(HED) by Disease Type



The analysis then overlays the distributions of the disease probabilities (HEDs) and the drinking water doses (DWDs) for both PFOS and PFOA in Figure 9. Several features become apparent. First, below a dose of 20 ng/kg/day, the probability of all diseases is effectively zero. Second, on the other end of the HED distribution, once the DWD exceeds 52 ng/kg/day, the probability is effectively one – or a certainty that this population would have a disease if the gene and cell response data are perfectly causal. Third, consumers with high end exposures are likely to generate the majority of the benefits. From the DWD curve, 81 percent of the population is expected to be below 20 ng/kg/day. Fourth, at the proposed MCL, there is no expected remaining risk. EPA's proposed action would reduce the expected risk to zero. Finally, reducing the level of current state PFOS MCL to EPA's proposed PFOS MCL is not expected to yield any health benefits.

Figure 9: Probability Distribution of HED by Disease Type for All Ages and Probability of Dose from Drinking Water for the Population



Confidence in the Chen et al work is extended when additional studies are considered. Chou and Lin took a similar approach to Chen et al.'s work and reached similar findings.[76] In this study, the researchers gathered data from high-throughput in vitro assays from EPA's ToxCast program, from six controlled dose animal studies, and four human epidemiology studies. The authors selected a range of assays related to the disease groups in Chen et al. As in that study, Chou and Lin considered in vitro data when at least one dose group had a ten percent change in response.[77] The authors also applied a Bayesian dose-response model to integrate the human, animal, and in vitro evidence. The authors calculated HEDs for all the studies. Table 3 of the paper lists the calculated HEDs. Even by applying an uncertainty factor of 30 to the HEDs in Chou and Lin, all of the in vitro and animal studies have estimated PFOS HEDs equal to or greater than those in Chen et al. While the human studies give lower HEDs, the authors explain that the uncertainty over the dose measurement in the epidemiolocal studies, the co-exposure to a mixture of PFAS, and other limitations suggest that the human HEDs are conservative. The Chou and Lin paper complements and reinforces the Chen et al. findings

[76] Chou and Lin, "Probabilistic Human Health Risk Assessment of Perfluorooctane Sulfonate (PFOS) by Integrating in Vitro, in Vivo Toxicity, and Human Epidemiological Studies Using a Bayesian-Based Dose-Response Assessment Coupled with Physiologically Based Pharmacokinetic (PBPK) Modeling Approach."

[77] Chou and Lin.

that there is little significant biological activity at doses below 20 ng/kg/day as measured through a wide range of in vitro assays and through animal experimental data.

4. Expected Disease Probabilities from Current Drinking Water Intake

The analysis then randomly samples from the PFOS intake from drinking water and compares the dose to the HED disease group probabilities. This comparison is carried out through several steps.

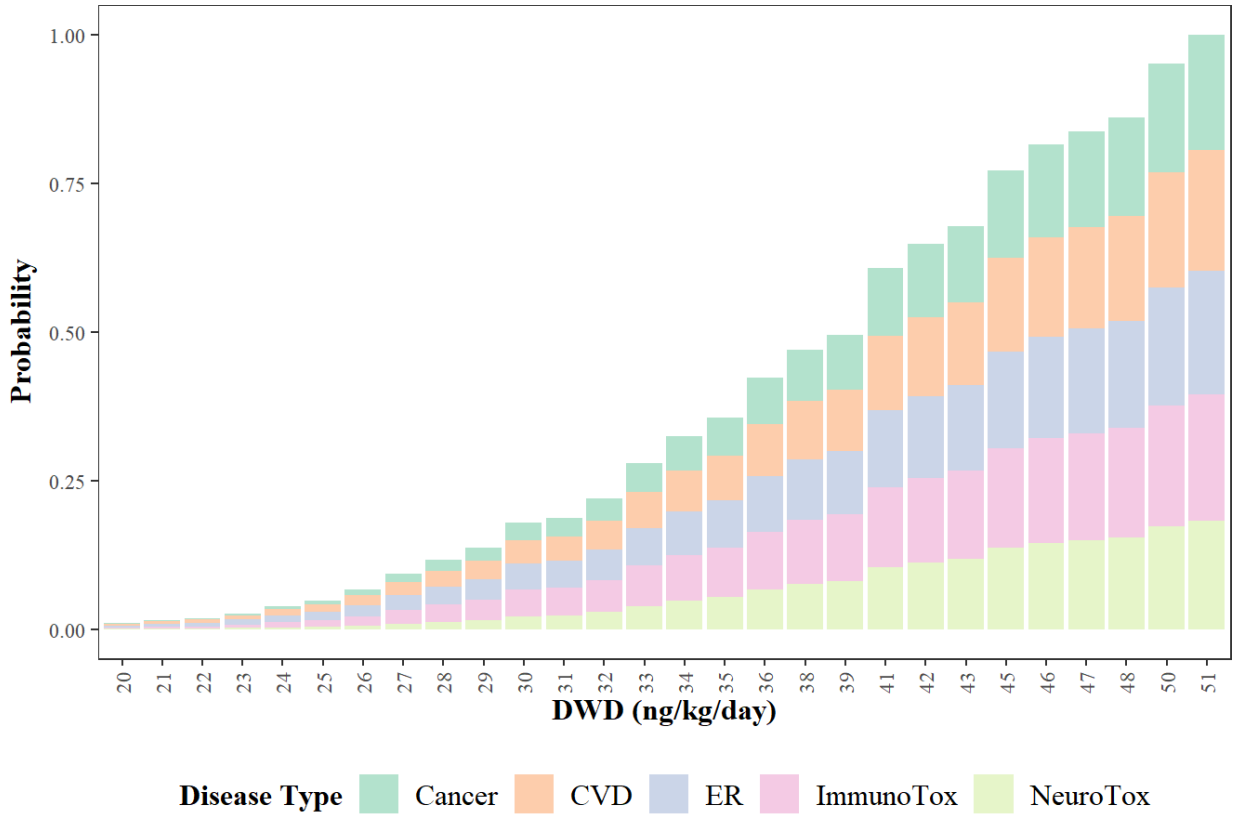
Calculate the Probability of a Disease Group

As shown in Figure 8, for the same dose, a person could be at risk of contracting a disease in multiple disease groups. Each person is only subject to the risk from a single disease in the analysis. To assign the sample population to a disease group, the area under the curve (AUC) of each disease curve for different HED doses in Figure 5 is estimated. The probability of being in each disease group is equal to the proportion of the area under each cumulative distribution curve (see Figure 7).

Probability of Disease Type

We utilize a Monte Carlo simulation by taking 1,000 random samples from the DWD curves for PFOA and for PFOS in Figure 9 and calculating the AUC for each disease group. If the drinking water dose is above 20 ng/kg/day, then there is a positive probability of each of the five diseases. Figure 10 below shows the results of this calculation for PFOS.

Figure 10: Probability of Disease Group for All Ages for PFOS



This figure shows both the absolute probability of having a disease and the relative probability of each disease type for a given drinking water dose. In Figure 10, at a dose of approximately 38 ng/kg/day, the probability of having a disease is approximately 50 percent. The colors in the stacked bar at that dose show that this 50 percent risk is the sum of the risks for each of the five disease groups. Once the dose reaches and exceeds 52 ng/kg/day, the estimate is that the probability is certain and the proportions among the disease groups do not change as dose increases.

5. Bounding Estimate of Benefits

Since it appears unlikely that much of the current population exposed to PFOS in public drinking water will garner significant benefits, the analysis creates a bounding estimate of benefits to compare with the social costs. The objective is to map out an extreme upper bound on the possible benefits from the proposed MCLs. The bounding estimate rests on assumptions that overstate the potential benefits:

- Causality. The analysis assumes that a probability of disease predicted by the genomic data will in fact occur. Intervening biological repair mechanisms are assumed not to be effective or exist. This assumption clearly overstates the probability and the severity

of potential disease from PFOS exposure in drinking water. Due to the many environmental, diet, and random events that perturb the body's functions, the body contains many repair mechanisms. Other studies support that this bounding estimate will overstate the potential benefits substantially:
    - In a recent study of PFOA, a HED generated from liver cell cultures was found to predict response levels 40-60 times less than actual responses observed in a human clinical trial with controlled PFOA doses.[78]
    - Another study compared 43 chemicals' "safe" dose from both genomics data and traditional toxicity testing. The genomics "safe" value was on average almost 6-fold less than the values derived from controlled animal experiments.[79]
- A 10 Percent Change in Response Causes Disease. In addition to the causality assumption, the bounding estimate further assumes that the BMD change of a 10 percent response is sufficient to overcome the body's defenses and to cause a disease. In reality, a larger response or disruption could be necessary to cause disease.
- Existing Population will Gain the Full Benefits. The analysis assumes that the population that straddles the rule's effective date will gain all the potential reductions in the probability of adverse effects. In reality, lower future exposure may lessen probabilities of future harm, but not eliminate them. Past exposure may have created an enduring increase in lifetime risk. Since 96 percent of the benefits in this bounding estimate accrue to current members of the population, reducing the existing population's assumed benefits would substantially lower the benefits.
- HEDs with Large Potential Benefits as Surrogates for All HEDs in a Disease Group. Some of the HEDs in the five disease groups have limited occurrence in the U.S. population or have very low adverse health impacts. The analysis transfers the estimated benefit of some of the HEDs with larger benefits to all HEDs with likely small impacts.

Therefore, these assumptions imply that a more realistic estimate of the social benefits is at least 10 times lower than those in this bounding estimate. However, the purpose is to explore whether the social benefits can exceed the costs even with these unrealistic assumptions – and with a more comprehensive consideration of potential benefits.

While the analysis constructed a full uncertainty analysis for the variables with uncertainty, the analysis presents the central tendency estimates for simplicity.

[78] Styliani Fragki et al., "New Approach Methodologies: A Quantitative in Vitro to in Vivo Extrapolation Case Study with PFASs," *Food and Chemical Toxicology* 172 (2023).

[79] Byron Kuo et al., "Comprehensive Interpretation of in Vitro Micronucleus Test Results for 292 Chemicals: From Hazard Identification to Risk Assessment Application," *Archives of Toxicology* 96 (2022).

Population Cohorts

The analysis estimates the population that is expected to have a dose from drinking water consumption above 20 ng/kg/day. There are two populations that will benefit from this rule: the population at the time of the rule's effective date and future population that are born in the United States or come to the United States after the rule is effective. The analysis uses the term "new population" as the term for this latter group. The benefit methodology for each group is different.

Existing Population

We apply the following steps to estimate the proportion of the current population that could benefit from the proposed drinking water standard:

Adjust Population to Existing Residents that Consume Public Water in States without Standards

Our analysis assumes that the water systems are in compliance with the rule in 2026. The analysis assumes that the changes eliminate the risk to the 2026 population drinking public water. The present value of the benefits to the current population are assumed to occur over three years, corresponding to roughly the half-life of PFOS. This approach overestimates benefits for several reasons. First, adverse effects from exposure prior to the rule may be irreversible. Second, since the half-life is estimated to be greater than three years, after three years, the average U.S. consumer will still have more than half of their baseline PFOS concentration due to past drinking water consumption. Third, consumers may shift their consumption habits away from public drinking water sources in response to the final rule and in response to lag between public notification and PFAS treatment.

We adjust the population by EPA's proportion of U.S. residents that consumer public water. We further reduce this population to public water consumers in states that are likely not to have a state drinking water standard in place by 2026.

New Population

As stated above, the new population includes people born in the years after the effective date and new residents of the United States. New residences are assumed to have the same age profile and disease incidence as the existing population. The analysis uses Census Department decanal projections for new residents and new births.[80] For births, yearly values are created by assuming a linear relationship between the Census' estimates for each decade from 2020 to 2060. We assume the U.S. will enjoy approximately 1.1 million new residents and 4.1 million new births annually during the study period. For the bounding estimate, the analysis assumes that all newborns grow and live a full life to enjoy the benefits, that there is

[80] U.S. Census Bureau, "2017 National Population Projections Tables: Main Series," 2017, https://www.census.gov/data/tables/2017/demo/popproj/2017-summary-tables.html.

no emigration, that health care innovations do not reduce the adverse effects from the HED diseases.

The study period includes the annual population additions from 2027 to 2056.

Determine Disease Incidence and Individuals Expected to Suffer Diseases

Estimating the number of avoided cases of diseases from this regulatory action has three steps. First, the existing population and new populations are multiplied by the DWD distribution to determine the number of people expected to have a dose above 20 ng/kg/day from drinking water. This population is broken into unit increments of dose.

Second, for each dose, the corresponding population is divided into one of the five disease groups based on the proportions in Figure 7. Each population in these disease group/dose categories is then multiplied by the probability of having the disease from Figure 6 for that dose.

Finally, this resulting product is multiplied by the percentage of the population incidence of the disease. The analysis assumes that the existing population has consumed PFOS at current levels for some time. Therefore, if the diseases predicted by the HEDs are caused by current PFOS exposure, the current number of cancer cases in the U.S. population include the cases caused by PFOS exposure through drinking water. Therefore, if the genomic data predicts a reduction in the probability of disease, the number of existing U.S. cancer cases will be reduced by this regulatory action. The benefits will be therefore a reduction in the overall population cancer incidence.

The analysis thus requires the incidence in the existing U.S. population of the HEDs. We employ different approaches for each of the five disease groups based on data availability.

Cancer

Data on age-adjusted cancer incidence for specific cancers for the current U.S. population is obtained.[81] The analysis uses the major cancers in the HEDs. The analysis did not estimate the risk reduction from rarer cancers such as bone and ocular cancers.

CVD

The analysis gathered specific incidence information on COPD, stroke, fatty liver disease, liver cirrhosis, and acute myocardial infarction (AMI). Some of the HEDs were precursors to these diseases or are captured in the mortality and morbidity estimates for the specific diseases listed. The benefits for COPD are reduced to 30 percent of estimated values since 70

[81] U.S. Census Bureau.

percent of COPD is estimated to be caused by smoking.[82] For the other HEDs in the CVD disease group, the analysis applies a uniform valuation discussed below.

Neurological

The analysis gathers the population incidence rate for Alzheimer's and Parkinson's Disease. The remaining HED represent relatively rare diseases or categories in which Alzheimer's, Parkinson's are the most common specific disease. For the other HEDs in the Neurotologic disease group, the analysis applies a uniform valuation discussed below.

Immunotoxicity and Endocrine Disruption

As with the neurological disease group, the expected values are not likely to be significant in the total bounding estimate. The analysis applies a uniform value for each unique adverse effect in these categories.

Valuation of Disease Cases

The same valuation approach is used for existing and new populations. For each of the five disease groups, information on the burden of the major diseases and of their latency periods is taken from the literature.[83] The analysis calculates a net present value of the value of avoiding the disease in 2023 dollars by placing the value of avoiding the disease in the time of its average latency and then discount the future benefit.

The 108 HEDs span a range of potential effects, some clearly adverse like cancer and some only potentially adverse such as neoplasms. To quantify these adverse effects with the same metric, the analysis uses the disability-adjusted life-year (DALY) methodology. This metric combines the lost value from a disease's reduction in life span and from its reduction in abilities. The WHO employs DALYs as part of its Global Burden of Diseases project to standardize disease burdens across countries.[84] To allow comparisons, researchers have measured DALYs for many other diseases that are not part of the WHO project.

This analysis first links any of the HEDs to diseases the WHO valued for the United States in its 2019 Global Disease Burden analysis. The DALY per case of the disease in the United States is estimated by dividing the WHO's DALYs in the United States by the incidence rate of the disease in the United States. For the remainder of the HEDs, the scientific literature is searched to find DALY estimates and incident rates for the United States. Some of the HEDs

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[82] World Health Organization, "Chronic Obstructive Pulmonary Disease (COPD)," March 16, 2023, https://www.who.int/news-room/fact-sheets/detail/chronic-obstructive-pulmonary-disease-(copd).

[83] Marcia R Weaver et al., "Health Care Spending Effectiveness: Estimates Suggest That Spending Improved US Health from 1996 to 2016," *Health Aff (Millwood)* 41, no. 7 (2022): 994–1004.

[84] World Health Organization, "Global Health Estimates: Leading Causes of DALYs," n.d., https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates/global-health-estimates-leading-causes-of-dalys.

are precursors and did not have DALY estimates. Others were effects that may lead to the same adverse outcome, such as breast cancer and breast neoplasms. Table 4 shows some of the DALY estimates for the major HED diseases.

Table 4: DALY Estimates for Major HED Diseases

Disease Ontology	Disease Group/ Pathway	DALY
colon cancer	Cancer	11
ovarian carcinoma	Cancer	9.9
ovarian cancer	Cancer	9.7
pharynx cancer	Cancer	6.7
renal carcinoma	Cancer	6.7
nasopharynx carcinoma	Cancer	5.4
female reproductive organ cancer	Cancer	5
breast carcinoma	Cancer	2.9
prostate cancer	Cancer	1.9
male reproductive organ cancer	Cancer	1
adenocarcinoma	Cancer	18
neuroblastoma	Cancer	22
acute myocardial infarction	CVD	0.85
chronic obstructive pulmonary disease	CVD	10.6
thalassemia	CVD	5.9
liver cirrhosis	CVD	4.6
arteriosclerosis	CVD	0.85
myocardial infarction	CVD	0.85
fatty liver disease	CVD	0.49
kidney disease	CVD	0.042
cerebral infarction	CVD	26
gestational diabetes	ER	8.4
pancreas disease	ER	3.9
osteoporosis	ER	0.96
polycystic ovary syndrome	ER	0.24
autoimmune disease of gastrointestinal tract	ImmunoTox	22
hepatitis	ImmunoTox	7.8
bacterial infectious disease	ImmunoTox	2.9
primary bacterial infectious disease	ImmunoTox	2.9
autosomal recessive disease	ImmunoTox	0.75
parasitic infectious disease	ImmunoTox	0.08
malaria	ImmunoTox	0
Alzheimer's disease	NeuroTox	29
amyotrophic lateral sclerosis	NeuroTox	6

Disease Ontology	Disease Group/ Pathway	DALY
Parkinson's disease	NeuroTox	0.51

Valuation of Each Disease

The Department of Human Health Services' (HHS) economic analysis guidelines use a WTP estimate of approximately $800,000 per DALY.[85] This value is a transformation of the VSL to a life-year metric. This valuation is used in this analysis since it is consistent with Circular A-4's directive to use WTP values to estimate social benefits.[86]

Latency and Commencement of Benefits

The proposed regulation would reduce PFOS exposure in drinking water over time. As in EPA's analysis in the RIA, this analysis must determine the lag between the reduction in PFOS exposure and the change in disease occurrence. We first gather data on the latency between initiation and the manifestation of a disease. The HEDs span diseases with latency periods of a few days to several decades. To standardize each disease with a valuation, we discount the value of the disease to an equivalent current value by its latency period at a seven percent discount rate. For example, if a disease has a DALY loss of $400,000 when it occurs five years in the future, the value today is $285,000 (rounded). For the new population, many diseases are not expected to occur until the person reaches his/her 50s or 60s. Therefore, the valuation of avoiding the adverse effects in the future must be discounted to current dollars.

Discount Rates

Circular A-4 recommends providing estimates of net benefits using both 3 percent and 7 percent discount rates. OMB also outlines the rationale for discounting:[87]

- Resources that are invested will normally earn a positive return, so current consumption is more expensive than future consumption, since you are giving up that expected return on investment when you consume today.
- Postponed benefits also have a cost because people generally prefer present to future consumption. They are said to have positive time preference.
- Also, if consumption continues to increase over time, as it has for most of U.S. history, an increment of consumption will be less valuable in the future than it would be

[85] U.S. Department of Health and Human Services, "Guidelines for Regulatory Impact Analysis," 2016.

[86] U.S. Office of Management and Budget, "Circular A-4: Regulatory Analysis," September 2003.

[87] U.S. Office of Management and Budget, 32.

today, because the principle of diminishing marginal utility implies that as total consumption increases, the value of a marginal unit of consumption tends to decline.

OMB's basic guidance on discount rates is provided in Circular A-94, which explains that a real discount rate of 7 percent should be used as a base-case.[88] This rate is an estimate of the average before-tax rate of return to private capital in the economy. "It is a broad measure that reflects the returns to real estate and small business capital as well as corporate capital. It approximates the opportunity cost of capital, and it is the appropriate discount rate whenever the main effect of a regulation is to displace or alter the use of capital in the private sector."

However, when regulation primarily and directly affects private consumption (e.g., through higher consumer prices for goods and services), a lower discount rate is appropriate. The alternative most often used is sometimes called the "social rate of time preference," meaning the rate at which society discounts future consumption flows to their present value. If the rate that the average saver uses to discount future consumption is taken as a measure of the social rate of time preference, then the real rate of return on long-term government debt may provide a fair approximation. OMB explains that this rate has averaged around three percent in real terms on a pre-tax basis.

Valuation of Avoided Disease Cases

Table 5 gives the valuation per case of avoided disease for the major HEDs.

Table 5: Valuation of Avoided Disease Cases by Major HEDs

Existing Population HEDs	Avoided Costs		Future Population	
	NPV at 3 percent	NPV at 7 percent	NPV at 3 percent	NPV at 7 percent
Cancer[89]	($mil)	($mil)	($mil)	($mil)
colon cancer[90]	7.2	5.5	1.5	0.2
ovarian cancer[91]	4.8	2.5	1.4	0.1
pharynx cancer[92]	3.1	1.6	0.9	0.08
renal carcinoma	2.6	1.1	0.8	0.1

[88] U.S. Office of Management and Budget, 33; U.S. Office of Management and Budget, "Circular A-94," n.d.

[89] National Institutes of Health, National Cancer Institute, "SEER*Explorer: An Interactive Website for SEER Cancer Statistics," April 19, 2023, https://seer.cancer.gov/statistics-network/explorer/.

[90] Rebecca Siegel et al., "Colorectal Cancer Statistics, 2023," *CA: A Cancer Journal for Clinicians* 73, no. 3 (2023).

[91] New York State Cancer Registry, "Ovarian Cancer Incidence and Mortality by Age Group, New York City, 2016-2020," February 2023.

[92] National Institute of Dental and Craniofacial Research, "Oral Cancer Incidence (New Cases) by Age, Race, and Gender," April 2023.

Existing Population HEDs	Avoided Costs		Future Population	
	NPV at 3 percent	NPV at 7 percent	NPV at 3 percent	NPV at 7 percent
female reproductive organ cancer	4.9	1.5	0.6	0.1
breast carcinoma	1.7	1.1	0.53	0.08
prostate cancer	0.9	0.5	0.2	0.02
male reproductive organ cancer	0.5	0.3	0.3	0.1
Esophageal[93]	9.6	5.4	2	0.1
Brain[94]	14.5	11.1	3.4	0.4
CVD				
chronic obstructive pulmonary disease[95]	3.6	1.2	2	0.3
arteriosclerosis[96]	0.4	0.3	0.3	0.1
myocardial infarction	0.4	0.3	0.3	0.1
acute myocardial infarction[97]	0.5	0.3	0.1	0.01
fatty liver disease[98]	0.4	0.3	0.2	0.04
cerebral infarction[99]	8.7	2.9	2.7	0.2
thalassemia	4.4	4.1	4.4	4.1

[93] Nicolas Patel and Bikramjit Benipal, "Incidence of Esophageal Cancer in the United States from 2001-2015: A United States Cancer Statistics Analysis of 50 States," *Cureus Journal of Medical Science* 10, no. 12 (2018); GBD 2017 Oesophageal Cancer Collaborators, "The Global, Regional, and National Burden of Oesophageal Cancer and Its Attributable Risk Factors in 195 Countries and Territories, 1990-2017: A Systematic Analysis for the Global Burden of Disease Study 2017" 5 (2020).

[94] Roswell Park Comprehensive Cancer Center, "Understanding Brain Tumors: The Basics," February 12, 2018; Kimberly Miller et al., "Brain and Other Central Nervous System Tumor Statistics, 2021," *CA: A Cancer Journal for Clinicians* 71, no. 5 (2021).

[95] U.S. Centers for Disease Control and Prevention, "Chronic Disease Indicators (CDI)," 2023, https://nccd.cdc.gov/cdi.

[96] U.S. Centers for Disease Control and Prevention, "QuickStats: Percentage of Adults Aged ≥18 Years with Diagnosed Heart Disease, by Urbanization Level and Age Group — National Health Interview Survey, United States, 2020," *Morbidity and Mortality Weekly Report* 71, no. 778 (2022), http://dx.doi.org/10.15585/mmwr.mm7123a4.

[97] Kristi Reynolds et al., "Trends in Incidence of Hospitalized Acute Myocardial Infarction in the Cardiovascular Research Network (CVRN)," *American Journal of Medicine* 130, no. 3 (2017): 317-27.

[98] Youn Huh, Yoon Jeong Cho, and Ga Eun Nam, "Recent Epidemiology and Risk Factors of Nonalcoholic Fatty Liver Disease," *Journal of Obesity & Metabolic Syndrome* 31, no. 1 (2022): 17-27.

[99] U.S. Centers for Disease Control and Prevention, "Stroke Facts," 2023, https://www.cdc.gov/stroke/facts.htm#:~:text=The%20death%20rate%20for%20stroke,41.1%20per%20100%2C000%20in%202021.

Existing Population HEDs	Avoided Costs		Future Population	
	NPV at 3 percent	NPV at 7 percent	NPV at 3 percent	NPV at 7 percent
liver cirrhosis[100]	3.3	2.8	1.2	0.3
Neuro				
Alzheimer's disease	11.5	4.6	3.5	0.3

For some of the common immunotox and endocrine disruptor diseases, the net present value benefits are less than $100 million. There are 17 HEDs remaining that are unique diseases. As a bounding estimate, we assign each one an avoided cost present value of $100 million to generate the bounding estimate in Table 5.

Incremental Effect of the Proposed Regulatory Action

As stated above, in this bounding estimate the rulemaking is assumed to eliminate the incremental probability of harm from current PFOS concentrations in drinking water to the existing population and to future populations from 2027 to 2056.

6. Results

PFOS

Table 7 gives the results of this bounding exercise. The annualized social benefits for the proposed PFOS drinking water standard are approximately $1.4 billion per year at a seven percent discount rate. This estimate arises from consideration of 108 possible disease states that arise from observed changes in biological function. It would appear that it is implausible that other adverse effects that do not rely on biological function changes could be large enough to exceed this bounding estimate.

As discussed in the next section, this benefit estimate is more than five times less than the estimated social costs. Since a more likely estimate of the social benefits are more than ten times lower than this bounding estimate, the social costs of EPA's proposed regulatory action exceed the potential social benefits by a large margin.

[100] Yuan-Bin Liu and Ming-Kai Chen, "Epidemiology of Liver Cirrhosis and Associated Complications: Current Knowledge and Future Directions," *World Journal of Gastroenterology* 28, no. 41 (2022): 5910-30.

Table 6: NPV of Estimated Annualized Benefits ($ M)

	NPV	Annualized
	(2026-2056 at 7% Discount Rate)	7% Discount Rate
All Cancers	1,100	86
CVD	11,000	760
Alzheimer's	1,700	140
Stroke	210	17
Fatty Acid Liver Disease	130	10
Liver Cirrhosis	97	8
All Others	1,700	140
Total	16,000	$1,200

PFOA

As the occurrence data and EPA's population estimates show, there is extensive overlap between the populations that would benefit from a PFOS standard and a PFOA standard. There does not appear to be comparable studies to Chen et al. and Chou and Lin in the literature for PFOA. In EPA's MCLG documents, EPA finds that PFOA and PFOS share many of the same adverse effects at roughly the same dose levels. The estimated occurrence in drinking water is roughly the same as shown in Figure 4.

Even doubling or trebling the benefits from the PFOS bounding estimate to account for the social benefits of PFOA, however, does give benefits close to the social costs.

Table 7: NPV of Estimated Annualized Benefits ($ M)

	NPV	Annualized
	(2026-2056 at 7 percent)	at 7 percent
Colon Cancer	1,000	81
Ovarian Cancer	94	8
Oral Cancer	210	17
Renal	240	19
Cervix	51	4
Breast	920	74
Prostate	370	30
Testis	11	1
Esophageal	300	24

	NPV	Annualized
Brain	790	63
COPD	540	43
Fatty Acid Liver Disease	24	2
Liver Cirrhosis	21	2
Stroke	30	2
Heart Attack	340	27
Alzheimer's	11,000	900
All Others	1,700	140
Total	18,000	1,400

IV. ESTIMATES OF THE SOCIAL COSTS FROM EPA'S REGULATORY ACTION

EPA's proposed rule will cause a range of social costs above and beyond those included in EPA's EA. The direct costs to society, as EPA discusses, are primarily the treatment and engineering costs non-compliant water systems will incur to comply. These social costs include the capital resources required for PFAS treatment, the O&M costs associated with installation and implementation of treatment strategies, and the 0other monitoring and administrative costs to maintain compliance.

Additional market costs that EPA does not quantify include the near-term additional costs water systems face due to scarcity in the labor force and supply chain constraints; the opportunity costs associated with periods of time required to install treatment technologies; and the economy-wide general equilibrium (GE) effects as the regulation shifts resources from consumption of other goods and services to very specific capital investments.

There are other non-market social costs associated with the proposed rule, as well. Treatment systems require electricity and, as water systems' energy consumption rises, society will carry the social costs of increased carbon dioxide emissions.

1. Likely Compliance Strategies

To comply with EPA's proposed rule, drinking water systems that have PFAS detections exceeding one or more of the proposed MCLs will install limited or total system treatment technologies. Today's effective PFAS treatment systems include the following:

- Ionic exchange (IX). IX involves selective ion exchange in solution with ions bound to a resin matrix.[101] IX resins have a limited capacity for adsorption and are affected by contaminant concentrations and flow rates, similar to GAC. However, IX resins are highly selective toward PFAS removal, with minimal removal of other contaminants. The overall efficacy of IX for PFAS removal is specific to the water matrix, treatment goals, and system design.
- Granular activated carbon (GAC).[102] GAC systems use carbon-based materials (e.g. coal) that, once activated, produce absorbent media with pores that organic compounds attach to and become absorbed onto. GAC has a finite capacity for compound adsorption and contaminants compete for adsorption sites. Disposal and reuse are considerations with this method, as reactivating GAC media contaminated with PFAS is expected to be more limited in drinking water applications.
- Reverse osmosis (RO) systems. RO is a membrane-based treatment process in which a semi-permeable barrier removes dissolved contaminants.[103] These treatment systems are more expensive than GAC or IX systems but are most viable when the GAC/IX replacement frequency requirements are cost-prohibitive due to high influent PFAS concentrations. Membrane elements are mounted into pressure vessels arranged in stages, banks, or arrays, the number of which depends on the specified recovery level.

Each treatment technology carries specific capital investment costs as well as operation and maintenance (O&M). Furthermore, installing treatment systems takes time. Temporarily shutting off a well while installation is completed means that a system will incur the opportunity cost associated with a decreased water supply capacity. With promulgation of EPA's final MCLs, hundreds of systems nationwide will be in non-compliance and require treatment. This sudden increase in demand will place a strain on supply chains and the labor force to meet the increased demand for equipment and labor. Water systems will bear near-term additional costs due to a scarcity in the labor force and in capital equipment.

Some systems that require treatment will also consider additional or alternative compliance strategies such as permanently shutting off a groundwater well and, subsequently, interconnecting raw water sources within the system. As with temporary well shut offs, these systems will incur opportunity costs of decreased water supplies. While shutting off wells will likely be one compliance strategy for some systems, we limit our analysis to the assumption that all systems will install treatment and, as a result, incur the following direct costs:

- Capital investment costs;
- O&M and labor costs;
- Near-term additional costs due to labor and capital equipment scarcity; and,
- Administrative costs such as reporting, permitting, and taxes.

[101] Black & Veatch, "PFAS National Cost Model Report" (American Water Works Association, March 7, 2023), 6.

[102] Black & Veatch, 3.

[103] Black & Veatch, 9.

In addition to costs with prices that can be measured in goods and services markets ("Market Costs"), EPA's rulemaking has costs that are not trade in markets ("Non-market Costs"). The analysis estimates the major market and non-market costs.

2. Market Costs

Approach

Affected Systems and Service Population

To estimate the number of affected groundwater (GW) and surface water (SW) systems by system size, the total inventory of community water systems (CWSs) by size of service population is multiplied by the average population per system.[104] The CWS are broken out by size and by water source. Then, for both small and large systems, the analysis estimates the percentage of the population by system size.[105] For example, of the 53 million (M) in total population served by small systems, 29 M (or 55 percent) are served by systems within the 3,301-10,000 person service population size category. CWSs serving between 100,000-1 M people represent 41 percent of the total population served by large systems.

Table 8: Total CWSs and Service Population by System Size and Source

	Total CWSs (1,000)		Avg. Population per CWS (1,000)		Total Service Population by CWS size (1,000)				Pct of Population by System Size (%)	
CWS Size	GW	SW	GW	SW	GW	SW	Total - Small	Total - Large	Small	Large
< 100	11	0.74	0.06	0.06	650	45	690		1.3	
101 to 500	13	2	0.25	0.03	3,300	580	3,800		7.2	
501 to 1,000	4.1	1.2	0.73	0.75	3,000	880	3,900		7.4	
1,001 to 3,300	5.5	2.5	1.9	2	10,000	4,900	15,000		29	
3,301 to 10,000	2.8	2.2	5.7	6.1	16,000	14,000	29,000		55	

[104] U.S. Environmental Protection Agency, "Economic Analysis for the Proposed Per- and Polyfluoroalkyl Substances National Primary Drinking Water Regulation," 4-7; U.S. Environmental Protection Agency, "SDWIS Federal Reporting Services Fourth Quarter 2021 Dataset," 2021, https://www.epa.gov/ground-water-and-drinking-water/safe-drinking-water-information-system-sdwis-federal-reporting.

[105] "Small systems" serve less than or equal to 10,000 people, while "large systems" serve populations greater than 10,000.

	Total CWSs (1,000)		Avg. Population per CWS (1,000)		Total Service Population by CWS size (1,000)				Pct of Population by System Size (%)	
10,001 to 50,000	1.4	2.0	21	23	28,000	46,000		75,000		31
50,001 to 100,000	0.16	0.42	67	70	1,100	29,000		40,000		16
100,001 to 1,000,000	0.074	0.35	200	240	15,000	85,000		100,000		41
> 1M	0.002	0.023	1,200	1,200	2,400	28,000		30,000		12
Total	38	11			90,000	210,000	53,000	240,000	100	100

The analysis then applies these percentages to total populations affected by the proposed rule for small and large systems, which EPA estimates at 3.7 M and 60.6 M, respectively.[106] This assumption gives total affected population by system size, which then is divided by the average population by system size to arrive at an estimated number of systems that will be required to treat.

Table 9: Total and Impacted Population at Small and Large PWSs

		Small Systems			Large Systems		
Total Affected Population				3,752,014			60,630,000
CWS Size	Ave Population by Size	Pct of Small Systems (%)	Est. population (1,000)	Est. Number of Systems	Pct of Large Systems (%)	Est. population (1,000)	Est. Number of Systems
< 100	0.061	1.3	49	800			
101 to 500	0.25	7.2	270	1,100			
501 to 1,000	0.73	7.4	280	380			
1,001 to 3,300	1.9	29	1,100	580			
3,301 to 10,000	5.7	55	2,100	370			
10,001 to 50,000	21				31	19,000	896
50,001 to 100,000	67				16	10,000	148
100,001 to 1,000,000	200				41	25,000	121

[106] U.S. Environmental Protection Agency, "Economic Analysis for the Proposed Per- and Polyfluoroalkyl Substances National Primary Drinking Water Regulation," tbls. 4-26.

	Small Systems				Large Systems		
> 1M	1,200				12	7,400	6
Total		100	3,800	3,200	100	61,000	1,172

To estimate how these totals are distributed by water source type, the estimated number of systems per CWS size is multiplied by ratios from the CWS inventory. For example, as shown in Table 8, 650 of the 690 CWSs serving populations under 100 persons rely on ground water (GW). Thus, 94 percent of the approximately 800 number of affected systems in Table 9 for this system size are assumed to use ground water sources.

Table 10: Total Systems by Water Source

	Est. number of affected systems	GW	SW
< 100	810	750	52
101 to 500	1,100	940	150
501 to 1,000	380	290	84
1,001 to 3,300	580	400	180
3,301 to 10,000	370	200	160
10,001 to 50,000	900	360	530
50,001 to 100,000	150	41	110
100,001 to 1,000,000	120	21	100
> 1M	6		6

Cost Estimates

EPA Cost Estimates

The analysis then analyzes EPA's cost estimates at system size levels. To estimate a combined annualized cost per CWS estimate across both water source types, the following approach is employed. First, using the CWS inventory values by water source and system size, the analysis estimates, for each system size category, the percentage of total systems that rely on GW and those that rely on SW (see Table 11). These percentages are applied to EPA's estimated mean annualized cost per CWS and water source.

Table 11: CWS ratios

CWS Size	Total CWSs (1,000)[107]			Percentage (%)			**EPA's Mean Annualized** Cost per CWS[108] ($1,000)			Combined Annualized Cost per CWS ($1,000)
	GW	SW	Sum	GW	SW	Sum	GW	SW	Sum	
< 100	11	0.074	11	94	6.5	100	$15	$22	$38	$16
101 to 500	13	2	15	86	14	100	$25	$33	$59	$26
501 to 1,000	4.1	1.2	5.3	78	22	100	$35	$49	$85	$39
1,001 to 3,300	5.5	2.5	8.0	69	31	100	$56	$72	$130	$61
3,301 to 10,000	2.8	2.2	5.0	56	44	100	$123	$140	$270	$130
10,001 to 50,000	1.4	2.0	3.4	41	59	100	$280	$380	$660	$340
50,001 to 100,000	0.16	0.42	0.58	28	72	100	$640	$580	$1,200	$600
100,001 to 1,000,000	0.074	0.35	0.42	18	82	100	$900	$3,700	$4,600	$3,200
> 1M[109]	0.002	0.023	0.025	8.0	92	100				

Black and Veatch Cost Estimates

Black and Veatch (B&V) recently developed a national cost estimate for water systems to remove PFOA and PFOS from drinking water and comply with a proposed NPDWR using cost data and design methodology to capture accurate system-level cost estimates for drinking water treatment.[110]

[107] U.S. Environmental Protection Agency, 4-7; U.S. Environmental Protection Agency, "SDWIS Federal Reporting Services Fourth Quarter 2021 Dataset."

[108] U.S. Environmental Protection Agency, "Economic Analysis for the Proposed Per- and Polyfluoroalkyl Substances National Primary Drinking Water Regulation Appendices," March 2023, tbl. C-9.

[109] EPA does not present average or specific costs for systems >1 M. EPA identified 25 PWSs serving >1M people based on SDWIS/Fed estimates. Rather than model treatment costs using the MCMC model PFAS values, UCMR3 data & system consumer confidence reports are used to obtain entry point PFAS values.

U.S. Environmental Protection Agency, app. N.1.

[110] Black & Veatch, "PFAS National Cost Model Report."

Relying on B&V's cost estimates for systems presents two main advantages. First, it relies on recent data inputs, overcoming the dollar year limitation of EPA's EA discussed earlier in the report. Producer prices have risen as a result of supply shortages, global trade disruptions, and financial stimulus for the economy during the pandemic. Thus, B&V's analysis is more consistent with current conditions. The second advantage to using B&V's cost estimates is that the inputs and results are based on more recent engineering experience with building and designing treatment systems:

> The spreadsheet tool developed to perform this task accepts inputs for individual or combined target effluent levels for the six PFAS compounds represented in the database. After both occurrence data and potential regulatory levels are input, Visual Basic scripts within Excel may be initiated by a user to run a Monte Carlo analysis and generate a 10th percentile, 90th percentile, and most probable costs for the capital, operations and maintenance (O&M), and life-cycle costs for a typical entry point to the distribution system (EPTDS) for each PWS in the database. For each system, the tool selects the treatment technology with the lowest life-cycle cost.[111]

Moreover, the capital costs for a CWS are based on the design flow per entry point to the distribution system (EPTDS).[112] The design flow was used for capital cost estimates since equipment should be sized for peak treatment flow rates. Costs were independently calculated for IX, GAC vessels, GAC basins, and reverse osmosis (RO). Capital costs generated for individual systems represent a Class 5 Association for the Advancement of Cost Engineering (AACE) estimate, at approximately one to two percent maturity level of deliverable definition.

As shown by the expert analysis by a water sector engineering firm, EPA's cost models substantially underestimate the installation and operating costs of PFAS treatment systems. While EPA's cost estimates range from $16,000 to $3.2 M, B&V's estimates are between $250,000 and $11 million.[113] As shown in Table 12, B&V's estimates are between four and 16 times larger than EPA's estimates for the same system size.

These ratio differences are stark. Assuming 100 gallons of water used daily per person and based on average population served by CWS size, we estimate total annual gallons per CWS. We compare this to the annualized cost per CWS using both EPA and B&V estimates and include the results in Table 12. For the smallest systems serving populations <100 people, the additional annual cost per thousand gallons of water as a result of EPA's proposed rule is approximately $110 based on B&V's cost estimates, compared to $7.1/1,000 gallons/year based on EPA's cost estimates.

[111] Black & Veatch, 14.

[112] Black & Veatch, 20.

[113] U.S. Environmental Protection Agency, "Economic Analysis for the Proposed Per- and Polyfluoroalkyl Substances National Primary Drinking Water Regulation Appendices," tbl. C-9; Black & Veatch, "PFAS National Cost Model Report," tbl. A-1.

Table 12: Annualized Cost per CWSs that Treat or Change Water Source: Comparison between EPA's and B&V's Estimates

CWS Size	EPA Annualized Cost ($/CWS/yr)	B&V Annualized Cost ($/CWS/yr)	Ratio	Gallons used per CWS per year (1,000 gal/yr)	EPA Cost per Thousand Gallons ($/1,000 gal/yr)	B&V Cost per Thousand Gallons ($/1,000 gal/yr)
< 100	16,000	250,000	16	2,200	7.1	110
101 to 500	26,000	380,000	14	9,100	2.9	42
501 to 1,000	39,000	500,000	13	27,000	1.4	19
1,001 to 3,300	61,000	580,000	9	68,000	0.89	8.5
3,301 to 10,000	130,000	1,200,000	9	210,000	0.64	5.7
10,001 to 50,000	340,000	2,700,000	8	760,000	0.45	3.6
50,001 to 100,000	600,000	4,800,000	8	2,500,000	0.24	2.0
100,001 to 1,000,000	3,200,000	11,000,000	4	7,400,000	0.43	1.5
>1M		51,000,000		44,000,000		1.2

Annualized Treatment Costs

To calculate total annual treatment cost for the proposed rule, the analysis multiplies the cost estimates from B&V by the estimated number of systems requiring treatment from EPA's affected population estimate. Table 13 summarizes the estimated annualized treatment costs by CWS size for systems that will have to install treatment under EPA's proposed rule. Treatment costs are greatest for systems serving between 10,000 and 50,000 people ($2.4 billion) and those serving between 100,000 and 1 million people ($1.4 billion). Nationally, across all 4,400 estimated affected systems, costs are estimated at $6.4 billion each year.

Table 13: National Annual Treatment Cost by CWS Size for Affected Systems

CWS Size	Estimated Systems	B&V Annualized Cost ($)	Cost ($M)
< 100	810	250,000	200
101 to 500	1,100	380,000	410
501 to 1,000	380	500,000	190
1,001 to 3,300	580	580,000	330
3,301 to 10,000	370	1,200,000	430

CWS Size	Estimated Systems	B&V Annualized Cost ($)	Cost ($M)
10,001 to 50,000	900	2,700,000	2,400
50,001 to 100,000	150	4,800,000	700
100,001 to 1,000,000	120	11,000,000	1,400
> 1M	6	51,000,000	306
Total	4,400		6,400

Monitoring and Administrative Costs

In its EA, EPA estimates startup, sampling, and treatment administration cost elements that are applied to this estimate of systems per ETPSs for each CWS size.[114] The tables below display each of these cost breakdowns. Implementation startup costs account for labor and costs per system, along with average hours per system to read and adopt the rule and average hours per system to attend one-time trainings provided by primary agencies. Total costs range from $460,000 to $3,600,000. Laboratory analysis costs, labor rate, and the number of samples are used to estimate monitoring and sampling costs per location. Quarterly sampling costs per location are $5,200 for small systems and $5,300 for large systems, while triennial costs are between $710 and $1,500 per location (Table 15).

Multiplying the hourly labor rate by the number of hours per entry point for a system to notify, to consult, and to submit a permit request for treatment installation gives an estimate of the cost per system. Multiplying these figures by the total number of ground water and surface water EPTDSs that exceed one or more MCLs gives the total cost for each system size. This same methodology is used to determine costs per entry point for source water changes or alternative method permitting requests.

Table 14: Implementation Startup Costs

CWS Size	Estimated Systems	Labor Rate ($/ hour)	Avg. Hours per System to Read and Adopt Rule	Cost per CWS ($/one year)	Total Cost to System Class ($/one year)	Avg. Hours per System to Attend One-Time Training	Cost per System ($/one year)	Total Cost to System Class ($/one year)
< 100	810	35	4	140	110,000	16	570	460,000

[114] U.S. Environmental Protection Agency, "Economic Analysis for the Proposed Per- and Polyfluoroalkyl Substances National Primary Drinking Water Regulation Appendices," tbl. C-9; Black & Veatch, "PFAS National Cost Model Report," tbl. A-1.

CWS Size	Estimated Systems	Labor Rate ($/ hour)	Avg. Hours per System to Read and Adopt Rule	Cost per CWS ($/one year)	Total Cost to System Class ($/one year)	Avg. Hours per System to Attend One-Time Training	Cost per System ($/one year)	Total Cost to System Class ($/one year)
101 to 500	1,100	35	4	140	150,000	16	570	620,000
501 to 1,000	380	35	4	140	54,000	16	570	210,000
1,001 to 3,300	580	35	4	140	82,000	16	570	330,000
3,301 to 10,000	370	38	4	150	56,000	32	1,200	440,000
10,001 to 50,000	900	40	4	160	140,000	32	1,300	1,100,000
50,001 to 100,000	150	42	4	170	25,000	32	1,300	200,000
100,001 to 1,000,000	120	49	4	190	24,000	32	1,600	190,000
> 1M	6	49	4	190	1,200	32	1,600	9,400
Total	4,400				650,000			3,600,000

Table 15: Sampling Costs

CWS Size	Est. Systems	Est. EPTDSs That Exceed One or More MCLs - GW	Est. EPTDSs That Exceed One or More MCLs - SW	Labor Rate/ Hour for Systems	GW Systems ≤10,000	All Other Systems	Quarterly Samples	Triennial Samples	Hrs/ Sample	Lab Analysis Cost/ Sample for EPA Method 533	Lab Analysis Cost/ Sample for EPA Method 537.1	Lab Analysis Cost/ Sample [115]	Lab Analysis Cost/ Sample [116]	Initial 12-Month Monitoring Period Labor Costs/ Sampled Location - GW	Initial 12-Month Monitoring Period Labor Costs/ Sampled Location (All Other Systems)	Total Cost to System of Initial Period per Sampled Location	Cost of Quarterly Samples/ Location	Cost of Triennial Sampling/ Location
< 100	810	1,000	72	35	2	4	4	1	1	$380	$300	$330	$270	$71	$140	$84,000	$5,200	$710
101 to 500	1,100	1,300	200	35	2	4	4	1	1	$380	$300	$330	$270	$71	$140	$120,000	$5,200	$710
501 to 1,000	380	400	120	35	2	4	4	1	1	$380	$300	$330	$270	$71	$140	$45,000	$5,200	$710
1,001 to 3,300	580	540	240	35	2	4	4	1	1	$380	$300	$330	$270	$71	$140	$72,000	$5,200	$710
3,301 to 10,000	370	270	220	38	2	4	4	2	1	$380	$300	$330	$270	$76	$150	$53,000	$5,200	$1,400
10,001 to 50,000	900	1,000	1,500	40		4	4	2	1	$380	$300	$330	$270		$160	$250,000	$5,200	$1,400
50,001 to 100,000	150	120	320	42		4	4	2	1	$380	$300	$330	$270		$170	$53,000	$5,300	$1,400
100,001 to 1,000,000	120	56	260	49		4	4	2	1	$380	$300	$330	$270		$190	$51,000	$5,300	$1,500
> 1M	6	2	17	49		4	4	2	1	$380	$300	$330	$270		$190	$3,400	$5,300	$1,500
Total	4,400															$730,000	$47,000	$10,000

[115] Lab analysis cost per sample for the field reagent blank under EPA Method 533.

[116] Lab analysis cost per sample for the field reagent blank under EPA Method 537.1

Table 16: Treatment Administration Costs

CWS Size	Est.CWSs	Est. EPTDSs	Labor Rate/ Hour	Hour per EPTDSs to Notify, Consult, & Submit Permit Request for Treatment Installation	Cost/ System per EPTDS	Total Cost ($)
< 100	810	1,107	$35	3	$110	$120,000
101 to 500	1,100	1,466	$35	5	$180	$260,000
501 to 1,000	380	517	$35	7	$250	$130,000
1,001 to 3,300	580	775	$35	12	$430	$330,000
3,301 to 10,000	370	488	$38	22	$830	$410,000
10,001 to 50,000	900	2,580	$40	22	$900	$2,300,000
50,001 to 100,000	150	438	$42	42	$1,800	$770,000
100,001 to 1,000,000	120	319	$49	42	$2,000	$650,000
> 1M	6	19	$49	42	$2,000	$39,000
Total	4,400	7710				$5,000,000

Economy-Wide Effects

The social costs extend beyond the water sector. EPA's proposed rule increases the price of a fundamental good. Businesses and households consume water and will pay price increases for the same good. Therefore, society will incur additional costs of the proposed rule as business and household costs rise. These effects are characterized as additional (or reduced) spending by other industries and households as a result of the activities of the water sector. To provide an example, the food and beverage industry uses large quantities of water; the demand for water will remain constant as the price increases under the proposed regulation. As the food industry spends more on water, it must spend less on other equipment and inputs. These shifts in spending are part of the economy-wide effects of a rulemaking. The more a regulation affects the price and the quantity of a good used as a factor of production, the greater the economy-wide effects across other sectors. In addition, the more a regulation affects demand for a good (like capital goods in this regulatory action) whose market is distorted by tax or other government policies, the greater the economy-wide effects.

This section describes existing methods for quantifying these effects and presents an estimate of the economy-wide social costs for EPA's proposed rule.

Economy-Wide Modeling (EWM)

The social costs are greater than the direct resource costs to achieve compliance. To be complete, an estimate of social cost should include both the opportunity cost of current consumption that will be foregone due to regulation, and the loss that may result if the regulation reduces capital investment and thus future consumption. To provide an example, the capital that will go to build PFAS treatment systems will no longer be available to build computers. The forgone productivity gains and economic growth given up because society invests in PFAS treatment rather than computers, for example, is the opportunity cost.

EPA asked its Science Advisory Board in 2015 as to the relevance and the use of economy-wide modeling (or "general equilibrium [GE]") for regulatory analysis. The SAB in its 2017 report endorsed EPA's use of these models since they "offer a more comprehensive assessment of the benefits and costs."[117] EPA sought the SAB's advice on the proper times to conduct such an analysis. "The SAB panel's advice was that a GE analysis is most likely to add value when the cross-price effects and pre-existing distortions (e.g., taxes, market power, other regulations) are significant."[118] EPA sought to investigate those conditions when shifting capital and labor to regulatory compliance and when existing market distortions increased the social costs. EPA concluded:

> We find that even for small regulations both the output substitution and tax interaction effects are significant, and ex ante compliance cost estimates tend to substantially underestimate the social cost of regulation independent of the sector subject to regulation or the composition of inputs required for compliance. This result is robust across a large number of regulatory scenarios and a series of sensitivity analyses over parametric and structural assumptions.[119]

EPA's National Center for Environmental Economics (NCEE) has recognized that social costs include the effect when consumption and investment shifts due to large-scale environmental regulations.[120] The total market costs of a regulatory action equals the sum of all opportunity costs incurred as defined by "the lost value of all goods and services that will not be produced and consumed as resources are moved away from production and consumption activities" toward treatment.[121] Using an inter-temporal computable general equilibrium model of the

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[117] U.S. Environmental Protection Agency Science Advisory Board, "SAB Advice on the Use of Economy-Wide Models in Evaluating the Social Costs, Benefits, and Economic Impacts of Air Regulations," September 2017, iv.

[118] Alex Marten, Richard Garbaccio, and Ann Wolverton, "Exploring the General Equilibrium Costs of Sector-Specific Environmental Regulations" (U.S. Environmental Protection Agency National Center for Environmental Economics, April 2019), 2.

[119] Marten, Garbaccio, and Wolverton, 2.

[120] Marten, Garbaccio, and Wolverton, 1.

[121] Marten, Garbaccio, and Wolverton, 2.

U.S. economy known as SAGE, EPA measures the relationship between these broader social costs and ex ante engineering compliance costs. These additional costs are also known as the general equilibrium effects that capture the supply and demand impacts across other sectors and markets.

EPA modeled the GE effects of a $100 million regulation in different sectors of the economy to measure how higher prices and capital shifts affected the entire economy. For the water sector, the report found the economy-wide reduction in consumption is 15 to 18 percent. In other words, the social costs of a regulation in the water sector are expected to be 15 to 18 percent higher than the engineering costs.

In the recently signed proposed rule for greenhouse gas standards for new and existing fossil fuel-fired electricity generating units (EGU), EPA applied SAGE in its proposed economic analysis.[122] EPA found that social costs including economy-wide effects are 35 percent greater than its engineering cost estimates. EPA's annualized engineering costs for the EGU proposal ($900 million) are comparable to EPA's annualized engineering costs for proposed MCLs. Therefore, the economy-wide costs of this regulatory action are also likely to be significant.

The analysis applies this range of additional social costs from NCEE's runs of EPA's SAGE model for the water sector to the estimated economic cost of the proposal. The annual GE effects amount to $1.1 B per year. Ultimately, consumers pay this cost through higher prices for goods and services and less income from lower economic growth.

3. Non-Market Social Costs

Social Costs from Electricity/Energy Use of Treatment Systems

Complying with the proposed MCL will increase demand for electricity and other energy sources. Since some sources of electricity emit greenhouse gases (GHGs), increasing demand for electricity through this proposed regulatory action will incrementally increase total GHG emissions. EPA recently acknowledged this social cost of a proposed regulation in the Hazardous Organic NESHAP proposed rule and quantified the social costs.[123] This analysis applies a similar methodology to estimate the social costs from increased GHG emissions due to this proposed rule.

The social cost of carbon dioxide (SC-CO_2) is defined as the discounted stream of damages caused by releasing one ton of CO_2 today. EPA's models track the long-term damages from global warming to 2300. Since CO_2 persists in the atmosphere, the value of avoiding a release

[122] U.S. Environmental Protection Agency, "Regulatory Impact Analysis for the Proposed New Source Performance Standards for Greenhouse Gas Emissions from New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units," app. B.

[123] U.S. Environmental Protection Agency, "New Source Performance Standards for the Synthetic Organic Chemical Manufacturing Industry and National Emission Standards for Hazardous Air Pollutants for the Synthetic Organic Chemical Manufacturing Industry and Group I & II Polymers and Resins Industry," Proposed Rule (Federal Register, April 2023), 25197.

today requires tracking the future damages caused by that ton over the next few centuries. Therefore, the SCC value for a given year is the discounted present value of the estimated stream of damages from today to 2300.

EPA's *Report on the Social Cost of Greenhouse Gases*, published as part of its regulatory impact analysis for Docket EPA-HQ-OAR-2021-0317, includes the cost of greenhouse gases by discount rate per year.[124] Costs per metric ton range from $130 to $370 at 2.5 and 1.5 percent discount rates, respectively, in 2026; and $190 to $460 at 2.5 and 1.5 percent discount rates, respectively, in 2046.[125]

EPA's estimation process generates separate distributions of estimates based on different damage modules and near-term target discount rates of the social cost of each gas in each emissions year.[126] Table 16 gives EPA's values.

Table 17: SC-CO_2 by Discount Rate and Emission Year ($/mt)

Emission Year	2.5 percent discount rate	2.0 percent discount rate	1.5 percent discount rate
2026	130	220	370
2027	140	220	370
2028	140	220	380
2029	140	230	380
2030	140	230	380
2031	150	230	390
2032	150	240	390
2033	150	240	400
2034	160	250	400
2035	160	250	410
2036	160	250	410

[124] U.S. Environmental Protection Agency, "Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances," September 2022, 120–21.

[125] The SC- CO_2 is the discounted stream of damages caused by releasing one ton of CO_2. EPA's models track the long-term damages to 2300. Since CO_2 persists in the atmosphere, the value of avoiding a release today requires tracking the future damages caused by that ton over the next few centuries. Therefore, the SC- CO_2 value for a given year is the discounted present value of that stream of damages from today to 2300.

[126] U.S. Environmental Protection Agency, "Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances," 2.

Emission Year	2.5 percent discount rate	2.0 percent discount rate	1.5 percent discount rate
2037	160	260	420
2038	170	260	420
2039	170	260	430
2040	170	270	430
2041	180	270	440
2042	180	280	440
2043	180	280	450
2044	190	280	450
2045	190	290	460
2046	190	290	460

Energy Consumption Data Sources

In one of EPA's background document for this rulemaking, EPA provides electricity consumption data per system size for three GAC and IX system sizes:

Table 18: Breakdown of Energy Costs in GAC and IX Systems[127]

Category	Annual Cost ($)
GAC, design 0.500 mgd, ave. 0.162 mgd GW	
Energy for backwash pumps (0 Mwh/yr @ $0.1052/kWh)	13
Energy for residuals pumps (0 Mwh/yr @ $0.1052/kwh)	23
Energy for lighting (0 Mwh/yr @ $0.1052/kwh)	8
Energy for ventilation (0 Mwh/yr @ $0.1052/kwh)	40
GAC, design 5.809 mgd, ave. 2.455 mgd	
Energy for backwash pumps (2 Mwh/yr @ $0.1052/kWh)	165
Energy for residuals pumps (3 Mwh/yr @ $0.1052/kwh)	288
Energy for lighting (15 Mwh/yr @ $0.1052/kwh)	1,547

[127] U.S. Environmental Protection Agency, "Technologies and Costs for Removing Per- and Polyfluoroalkyl Substances (PFAS) from Drinking Water," February 2023.

Category	Annual Cost ($)
Energy for ventilation (9 Mwh/yr @ $0.1052/kwh)	955
GAC, design 56.271 mgd, ave. 24.863 mgd	
Energy for booster pumps (1672 Mwh/yr @ $0.1052/kwh)	175,945
Energy for backwash pumps (11 Mwh/yr @ $0.1052/kWh)	1,146
Energy for residuals pumps (19 Mwh/yr @ $0.1052/kwh)	2,003
Energy for lighting (380 Mwh/yr @ $0.1052/kwh)	39,973
IX, design 0.500 mgd, average 0.162 mgd	
Energy for backwash/rinse pumps (0 Mwh/yr @ $0.1052/kwh)	0
Energy for lighting (0 Mwh/yr @ $0.1052/kwh)	2
Energy for ventilation (0 Mwh/yr @ $0.1052/kwh)	9
IX, design 5.809 mgd, average 2.455 mgd	
Energy for backwash/rinse pumps (0 Mwh/yr @ $0.1052/kwh)	0
Energy for lighting (3 Mwh/yr @ $0.1052/kwh)	352
Energy for ventilation (3 Mwh/yr @ $0.1052/kwh)	343
IX, design 56.271 mgd, ave. 24.863 mgd	
Energy for backwash/rinse pumps (0 Mwh/yr @ $0.1052/kwh)	2
Energy for lighting (167 Mwh/yr @ $0.1052/kwh)	17,554
Energy for ventilation (26 Mwh/yr @ $0.1052/kwh)	2,749

Affected Entry Points to System (EPTDSs) and Average Flow

EPA provides an estimate of total entry points to distribution systems (EPTDS) that will be affected by the proposed NPDWR (see Table 19). The analysis extends EPA's estimate further to distribute these EPTDSs by system size categories.

Table 19: Total EPTDSs Impacted

CWS Size	National EPTDSs that Exceed One or More MCL[128]
Small Systems (<10,000)	4,354
Large Systems (>10,000)	3,356

The analysis distributes the EPTDS by CWS size and source water type by applying ratios derived from the CWS inventory (see discussion preceding Table 10). The estimated number of affected EPTDSs by CWS size is summarized in the following table.

Table 20: Total Estimated EPTDSs that Exceed One or More MCL by CWS Size

CWS Size	GW	SW
< 100	1,000	72
101 to 500	1,300	200
501 to 1,000	400	120
1,001 to 3,300	540	240
3,301 to 10,000	270	220
10,001 to 50,000	1,000	1,500
50,001 to 100,000	120	320
100,001 to 1,000,000	56	260
> 1M	2	17

Next, the average flow is calculated by dividing the average flow per CWS by the design flow per CWS. Flow increases with system size, with the largest CWSs having an average flow of 22 MGD for each entry point. Average daily production flow and design flow per system are based on regression equations from EPA's *Geometries and Characteristics of Public Water Supplies* report.[129] The average daily flow and design flow are functions of the population served, with different equations for source water type.

[128] U.S. Environmental Protection Agency, "Economic Analysis for the Proposed Per- and Polyfluoroalkyl Substances National Primary Drinking Water Regulation," tbls. 4-22.

[129] U.S. Environmental Protection Agency, 4-14.

Table 21: Average Flow (MGD per EPTDS)

CWS Size	GW	SW
< 100	0.006	0.006
101 to 500	0.019	0.028
501 to 1,000	0.047	0.063
1,001 to 3,300	0.11	0.15
3,301 to 10,000	0.26	0.36
10,001 to 50,000	0.49	0.69
50,001 to 100,000	0.94	1.3
100,001 to 1,000,000	1.7	3.5
> 1M		22

Estimated Electricity Consumption

Electricity consumption increases with CWS size and is slightly higher for surface water compared to ground water in larger systems. Table 22 summarizes the estimated electricity consumption per EPTDS.

Table 22: GAC and IX Energy Consumption per EPTDS (MWhr/yr)

CWS Size	GAC		IX	
	GW	SW	GW	SW
< 100	3.1	3.1	0.98	0.98
101 to 500	3.1	3.1	0.98	0.98
501 to 1,000	3.1	3.1	0.98	0.98
1,001 to 3,300	3.1	3.1	0.98	0.99
3,301 to 10,000	3.2	3.2	1.0	1.0
10,001 to 50,000	3.3	3.4	1.0	1.1
50,001 to 100,000	3.5	3.6	1.1	1.1

Science Applications International Corporation and The Cadmus Group, "Geometries and Characteristics of Public Water Systems" (U.S. Environmental Protection Agency, December 2000).

CWS Size	GAC		IX	
	GW	SW	GW	SW
100,001 to 1,000,000	3.8	4.7	1.2	1.4
Average (<1M)	3.3	3.4	1.0	1.1

Multiplying the averages from Table 22 by the number of entry points that exceed one or more MCLs gives the total energy consumption across all system entry points. To further break this down by treatment method, the analysis assumes 50 percent use GAC and 50 percent use IX. The total estimated electricity consumption for both GAC and IX ranges from 710 MWhr/year for systems serving 100,001-1M people to 26,000 MWhr/year for very large systems serving >1M people.

Table 23: GAC and IX Energy Consumption for All Entry Points that Exceed MCLs (MWhr/year)

CWS Size	GAC		IX		GAC & IX
	GW	SW	GW	SW	GW & SW
< 100	1,700	120	530	39	2,400
101 to 500	2,000	340	650	110	3,200
501 to 1,000	660	200	200	62	1,100
1,001 to 3,300	870	410	270	130	1,700
3,301 to 10,000	440	370	140	120	1,100
10,001 to 50,000	1,700	2,600	530	820	5,700
50,001 to 100,000	200	540	62	170	970
100,001 to 1,000,000	91	450	28	140	710
> 1M	22	23,000	17	3,100	26,000
Total	7,700	28,000	2,400	4,700	43,000

Using EPA's emissions rate estimate of 0.000433 metric tons (Mt) of CO_2/kWh, the analysis calculates the annual carbon dioxide emissions produced from both treatment methods. As shown in Table 24, the proposed rule is estimated to induce an additional 19,000 Mt of CO_2 emissions annually.

Table 24: Total Estimated Additional CO_2 Emissions from GAC and IX as a Result of EPA's Proposed Rule

CWS Size	GAC		IX		GAC & IX
	GW	SW	GW	SW	GW & SW
Total consumption for all entry points and CWSs (MWhr/year)	7,700	28,000	2,400	4,700	43,000
Emissions (Mt CO_2/year)	3,300	12,000	1,100	2,000	19,000

Results

The discounted SC- CO_2 annual figures from Table 17 are multiplied by the annual CO_2 emissions from treatment methods. The resulting costs range from $2.5M to $6.8M at 2.5 and 1.5 percent discount rates, respectively, in 2026; and $3.6M to $8.6M at 2.5 and 1.5 percent discount rates, respectively, in 2046. EPA uses the lower discount rates shown in Table 25 to discount future damages from GHG emissions.

Table 25: Total Estimated Annual Emissions Cost from the Proposed Rule ($ M)

Emission Year	2.5 percent discount rate	2.0 percent discount rate	1.5 percent discount rate
2026	2.5	4.0	6.8
2027	2.5	4.1	6.9
2028	2.6	4.2	7.0
2029	2.6	4.2	7.1
2030	2.7	4.3	7.1
2031	2.7	4.4	7.2
2032	2.8	4.4	7.3
2033	2.8	4.5	7.4
2034	2.9	4.6	7.5
2035	2.9	4.6	7.6
2036	3.0	4.7	7.7
2037	3.1	4.8	7.8
2038	3.1	4.8	7.9
2039	3.2	4.9	7.9
2040	3.2	5.0	8.0

Emission Year	2.5 percent discount rate	2.0 percent discount rate	1.5 percent discount rate
2041	3.3	5.0	8.1
2042	3.3	5.1	8.2
2043	3.4	5.2	8.3
2044	3.5	5.3	8.4
2045	3.5	5.3	8.5
2046	3.6	5.4	8.6

These estimates likely underestimate this social cost since, as with EPA's engineering estimates, they likely understate electricity consumption for necessary buildings and for treatment operations. These estimates also do not include the GHG impacts of mining and using activated carbon and the carbon dioxide emissions of activating the carbon for use. The regulatory action will also require non-electricity energy consumption such as heavy truck transport and disposal of media.

4. Results

As shown in Table 26, the sum of all the annual social costs amounts to approximately $7,500 M.

Table 26: Summary of Annual Estimated Costs

Cost Category	National Annualized Estimate ($ M/ yr)
Treatment Costs	6,400
Administrative/Monitoring Costs (1st year)	9.9
General Equilibrium	1,100
SC-CO_2	4.7*
Total Annual	7,500

**EPA uses a lower discount rate for the social costs of GHG emissions. Therefore, the SC- CO_2 is in different units of value than the other social costs.*

V. ECONOMIC IMPACTS

EPA estimates the average cost per household from the proposed MCLs. EPA uses the cost estimates from its models which underestimate current PFAS treatment costs. This analysis presents revised household cost estimates using the updated treatment cost data.

EPA also found that the severe household impact would be lessened by increased federal spending to water systems to address emerging chemicals such as PFAS. Since federal funds are largely limited to capital expenditures and since the likely costs are much higher than EPA's estimates, this report compares the level of increased federal funding to water systems' compliance needs.

1. Household (HH) Impact

Multiplying the number of systems by the average population by CWS size determines the total population served by system size. Dividing these totals by the average household size [130] gives an estimate the number of households per CWS size. Dividing B&V's annualized costs by the number of households results in total cost per household from treatment costs alone. Household costs range from $110 annually for large systems serving over 1 million people to $10,000 per household for the smallest systems serving less than 100 people (see Table 27). For the largest size categories – CWSs serving between 100,000 to 1 M people – 12 M, households are expected to see a $120 annual increase in drinking water expenses.

Table 28 summarizes these costs as percentages of the annual household income for different income groups. For the lowest quintile income,[131] costs average 15 percent and 0.75 percent of annual income for small and large CWSs respectively. For households at the national median household income ($70,784)[132] costs reach 15 percent of annual income for the smallest systems. For households with income at 200 percent of the poverty level, costs range from 0.2 percent of annual income for large systems to 20 percent for small systems. With households of four, costs are a higher percentage of annual income, averaging 13 percent for small systems and 0.67 percent for large systems. Cost estimates for single households reach up to 81 percent of their annual income at the small CWSs.

[130] U.S. Census Bureau, "Table HH-4. Households by Size: 1960 to Present," November 2022, https://www.census.gov/data/tables/time-series/demo/families/households.html.

[131] A quintile is one of five equal groups (20 percent of all HHs each) ranked by income from lowest to highest. The lowest quintile income used in this analysis is $23,584.

[132] U.S. Census Bureau, "Income in the United States: 2021," September 2022, https://www.census.gov/library/publications/2022/demo/p60-276.html.

Table 27: Annualized Cost per Household (HH) from Treatment Costs

CWS Size	Total Cost for CWS Size ($)	Total Est. HHs	Annual Cost per HH ($/year)
< 100	204,000,000	19,000	10,000
101 to 500	410,000,000	110,000	3,900
501 to 1,000	190,000,000	110,000	1,700
1,001 to 3,300	330,000,000	420,000	780
3,301 to 10,000	430,000,000	820,000	520
10,001 to 50,000	2,400,000,000	8,000,000	300
50,001 to 100,000	7102,000,000	4,100,000	170
100,001 to 1,000,000	1,400,000,000	12,000,000	120
> 1M	310,000,000	2,800,000	110
All affected CWSs	6,400,000,000	28,000,000	230

Table 28: Annualized HH Cost from Treatment Costs as a Percentage of Annual Income

CWS Size	Percent of Median HH Income	Percent of 200% Poverty Line HH Income	Percent of Poverty Line HH-of-4 Income	Percent of Lowest Quintile Income	Percent of Poverty Line Single-HH Income
< 100	15%	20%	40%	44%	81%
101 to 500	5.4%	7.3%	15%	16%	30%
501 to 1,000	2.4%	3.3%	6.6%	7.3%	13%
1,001 to 3,300	1.1%	1.5%	3.0%	3.3%	6.1%
3,301 to 10,000	0.74%	1.00%	2.0%	2.2%	4.1%
10,001 to 50,000	0.42%	0.57%	1.1%	1.3%	2.3%
50,001 to 100,000	0.24%	0.33%	0.70%	0.73%	1.3%
100,001 to 1,000,000	0.17%	0.22%	0.45%	0.50%	0.91%
> 1M	0.15%	0.20%	0.41%	0.46%	0.83%

Due to the initial year that includes up-front administrative startup costs, treatment administration costs, and 12-month monitoring costs, households in the initial year could bear additional economic impacts above those resulting from annualized costs. The following table presents the impacts on households from these administrative costs and includes an estimation of how the lowest quintile of households are impacted.

Table 29: Additional HH Impacts from Administrative Costs

CWS Size	Total Est. HHs	Administrative Cost per HH ($/first year)	Percent of Lowest Quintile Income in First Year from Administrative Costs	Percent of Lowest Quintile Income in First Year from Administrative and Treatment Costs
< 100	19,000	150	0.62%	45%
101 to 500	110,000	120	0.50%	17%
501 to 1,000	110,000	120	0.52%	7.8%
1,001 to 3,300	420,000	130	0.54%	3.9%
3,301 to 10,000	820,000	150	0.62%	2.8%
10,001 to 50,000	8,000,000	270	1.2%	2.4%
50,001 to 100,000	4,100,000	360	1.5%	2.2%
100,001 to 1,000,000	12,000,000	420	1.8%	2.3%
> 1M	2,800,000	570	2.4%	2.9%

2. Federal Funding Analysis

The Drinking Water State Revolving Fund (DWSRF) is a federal-state program that provides funding and financing to CWSs drinking water infrastructure projects.[133] The Infrastructure Investment and Jobs Act (IIJA) provides $4 billion in funding to address emerging contaminants over five years (FY22- FY26). Eligible recipients include public and private community water systems serving at least 15 service connections used by year-round residents or regularly serving at least 25 year-round residents. Nonprofit non-community water systems including schools, publicly owned campgrounds, parks, and churches are also able to receive funding. Comparing the annual treatment cost to available federal funding is important because, while IIJA provides historic investment in PFAS treatment, the proposed rule's estimated costs far exceed this funding.

[133] U.S. Environmental Protection Agency, "Clean Water and Drinking Water State Revolving Funds and the Bipartisan Infrastructure Law," n.d.

The B&V report provides estimated capital expenditure (CAPEX). The analysis subtracts the average O&M costs per system from the annualized per-system cost and multiplies the remainder by the estimated number of systems.[134] Capital cost is lowest among smaller systems, ranging between $150 and $370 million per year, and highest among systems serving 10,000 to 50,000 and 100,000 to 1,000,000 people ($290 million to $2.1 million).

Table 30: Annual Treatment Cost by CWS Size for Affected Systems ($M)

CWS Size	Average CAPEX/PWS	Average O&M/PWS	Annualized PWS Cost	Annualized - O&M	Estimated Systems	Capital Cost
< 100	$1.9	$0.072	$0.25	$0.18	800	$150
101 to 500	$3.4	$0.060	$0.38	$0.32	1,100	$350
501 to 1,000	$4.6	$0.063	$0.50	$0.44	380	$160
1,001 to 3,300	$5.5	$0.057	$0.58	$0.52	580	$300
3,301 to 10,000	$11	$0.18	$1.2	$1.0	370	$370
10,001 to 50,000	$24	$0.37	$2.7	$2.3	900	$2,100
50,001 to 100,000	$46	$0.51	$4.8	$4.3	150	$640
100,001 to 1,000,000	$110	$0.89	$11	$10	120	$1,300
> 1M	$507	$3.0	$51	$48	6	$290

Table 31 below shows funding made available from the IIJA for the Emerging Contaminants Drinking Water State Revolving Fund in FY23 ($764 million) compared to the estimated annualized treatment costs for small and large CWSs.[135] National annualized CAPEX costs equate to 180 percent of the funding made available from the IIJA for small systems treatment and 750 percent for all systems. Even with the substantial increase in federal funding and even if the total amount was allocated to PFAS treatment, water systems and rate payers must pay six times more than the federal funding to purchase treatment systems. Rate payers are also responsible for all of the O&M costs to operate their systems. Therefore, while the federal funding provides some relief, the majority of the severe household effects still are expected to occur.

[134] Black & Veatch, "PFAS National Cost Model Report," tbls. 6-3.

[135] Black & Veatch, "WITAF 56 Technical Memorandum: PFAS National Cost Model Report," tbls. 6-3.

Table 31: Annual Treatment Costs as a Percentage of IIJA Funding for Emerging Contaminants in Drinking Water

	Annualized Cost ($M)	Percentage of IIJA Funding
Small Systems (<10,000)	$1,300	180%
All Systems	$5,600	750%

VI. CONCLUSIONS

This report assessed EPA's approach to estimate the social benefits and costs of its proposed rule to federal requirements for regulatory analysis and best practices in the field. We determine that EPA's cost models substantially underestimate the installation and O&M costs of PFAS treatment systems. We provide data from experts in the water sector engineering field to show how substantial the costs of EPA's proposed rule will actually be. We also provide evidence from actual cost data from AMWA members to show the extent of EPA's underestimation. EPA also fails to account for other social costs such as additional costs from water rate increases and the non-market costs of greater greenhouse gas emissions.

EPA's benefit estimates assume a few possible adverse effects based on scientific findings that other public health organizations do not support. By failing to account for the possibility that these adverse effects may not exist, EPA overstates the social benefits.

We conduct a benefit-cost analysis to produce more accurate estimates. We rely on established NAS recommendations to develop hazard assessments based on recent available scientific information. Rather than EPA's approach to quantify a few adverse effects, this analysis considers a wide range of possible cellular and genomic evidence, animal data, and human epidemiological studies. Since these studies find that biological activity is likely only to occur at the high end of the modeled drinking water exposure, we develop a bounding estimate of the benefits of reducing PFOS in drinking water.

The results of this bounding estimates are shown in Table 32. We show that, whereas EPA estimated, at a seven percent discount rate, the annualized costs and benefits of the proposed rule to be $1,205 M and $908 M, respectively, we estimate them to be $7,500 M and $1,200 M, respectively. Thus, even with many assumptions to increase the social benefits, the results for PFOS are six times lower than the expected social costs. Even if these benefits are doubled to account for reductions in PFOA exposure, the social benefits are well below the social costs.

Table 32: Comparison of Estimated National Annualized Benefits and Costs for EPA's Proposed Rule ($ M)[136]

	EPA's Estimates at Seven Percent Discount Rate	**PNG's Estimates at** Seven Percent Discount Rate
Benefits ($ M/year)	908	<1,200[137]
Costs ($ M/year)	1,205	7,500

These social costs will fall heavily on rural and low-income households. Despite EPA's claims, recently-enacted federal support for water utilities is insufficient to pay for even the capital costs of the proposal's requirements. As a result, ratepayers may pay a significant portion of the rulemaking until other resources are secured. Ratepayer may pay hundreds of dollars per household.

[136] U.S. Environmental Protection Agency, "Economic Analysis for the Proposed Per- and Polyfluoroalkyl Substances National Primary Drinking Water Regulation," 1-1.

[137] Even if these benefits are doubled to $2,400 M/year to account for reductions in PFOA exposure, the social benefits would still be well below the social costs.

REFERENCES

Aassve, Arnstein, Nicolo Cavalli, Letizia Mencarini, Samuel Plach, and Seth Sanders. "Early Assessment of the Relationship between the COVID-19 Pandemic and Births in High-Income Countries" 118, no. 36 (2021).

Agency for Toxic Substances and Disease Registry. "Toxicological Profile for Perfluoroalkyls." US Department of Health and Human Services, May 2021.

Apelberg, Benjamin, Frank Witter, Julie Herbstman, Antonia Calafat, Rolf Halden, Larry Needham, and Lynn Goldman. "Cord Serum Concentrations of Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoate (PFOA) in Relation to Weight and Size at Birth." *Environmental Health Perspectives*, 2007.

Aquafina. "Aquafina FAQ," 2022. https://www.aquafina.com/en-US/faq.html#:~:text=Aquafina%20originates%20from%20public%20water,can%20affect%20a%20water's%20taste.

Bao, Wen-Wen, Zhengmin Qian, Sarah Dee Geiger, and Echu Liu. "Gender-Specific Associations between Serum Isomers of Perfluoroalkyl Substances and Blood Pressure among Chinese: Isomers of C8 Health Project in China." *Science of the Total Environment*, 2017.

Barry, Vaughn, Andrea Winquist, and Kyle Steenland. "Perfluorooctanoic Acid (PFOA) Exposures and Incident Cancers among Adults Living near a Chemical Plant." *Environmental Health Perspectives*, 2013.

Black & Veatch. "PFAS National Cost Model Report." American Water Works Association, March 7, 2023.

C8 Science Panel. "C8 Probable Link Reports," 2012.

Cadwallader, Adam, Ashley Greene, Hannah Holsinger, Alexis Lan, Michael Messner, Melissa Simic, and Ryan Albert. "A Bayesian Hierarchical Model for Estimating National PFAS Drinking Water Occurrence." AWWA Water Science, May 25, 2022.

Chen, Mei-Huei, Eun-Hee Ha, Ting-Wen Wen, Yi-Ning Su, Guang-Wen Lien, Chia-Yang Chen, Pau-Chung Chen, and Wu-Shiun Hsieh. "Perfluorinated Compounds in Umbilical Cord Blood and Adverse Birth Outcomes." *PLOS One*, 2012.

Chen, Mei-Huei, Sharon Ng, Chia-Jung Hsieh, and Pau-Chung Chen. "The Impact of Prenatal Perfluoroalkyl Substances Exposure on Neonatal and Child Growth." *Science of the Total Environment*, 2017.

Chen, Qiran, Wei-Chun Chou, and Zhoumeng Lin. "Integration of Toxicogenomics and Physiologically Based Pharmacokinetic Modeling in Human Health Risk Assessment of Perfluorooctane Sulfonate." *Environmental Science & Technology*, 2022.

Chou, Wei-Chun, and Zhoumeng Lin. "Probabilistic Human Health Risk Assessment of Perfluorooctane Sulfonate (PFOS) by Integrating in Vitro, in Vivo Toxicity, and Human Epidemiological Studies Using a Bayesian-Based Dose-Response Assessment Coupled with Physiologically Based Pharmacokinetic (PBPK) Modeling Approach." *Environment International*, 2020.

Darrow, Lyndsey, Cheryl Stein, and Kyle Steenland. "Serum Perfluorooctanoic Acid and Perfluorooctane Sulfonate Concentrations in Relation to Birth Outcomes in the Mid-Ohio Valley, 2005-2010." *Environmental Health Perspectives*, 2013.

"Designation of Perfluorooctanoic Acid (PFOA) and Perfluorooctanesulfonic Acid (PFOS) as CERCLA Hazardous Substances." *Federal Register* 87, no. 171 (September 2022): 54415–42.

Fragki, Styliani, Jochem Louisse, Bas Bokkers, Mirjam Luijten, Ad Peijnenburg, Deborah Rijkers, Aldert Piersma, and Marco Zeilmaker. "New Approach Methodologies: A Quantitative in Vitro to in Vivo Extrapolation Case Study with PFASs." *Food and Chemical Toxicology* 172 (2023).

GBD 2017 Oesophageal Cancer Collaborators. "The Global, Regional, and National Burden of Oesophageal Cancer and Its Attributable Risk Factors in 195 Countries and Territories, 1990-2017: A Systematic Analysis for the Global Burden of Disease Study 2017" 5 (2020).

Hamm, Michele, Nicola Cherry, Emily Chan, Jonathan Martin, and Igor Burstyn. "Maternal Exposure to Perfluorinated Acids and Fetal Growth." *Journal of Exposure Science and Environmental Epidemiology*, 2010.

Health Canada. "Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Perfluorooctane Sulfonate (PFOS)," December 2018.

———. "Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Perfluorooctanoic Acid (PFOA)," December 2018.

Hu, Zhihua, Lois Wright Morton, and Robert Mahler. "Bottled Water: United States Consumers and Their Perceptions of Water Quality." *International Journal of Environmental Research and Public Health*, 2011.

Huang, Mengmeng, Jingjing Jiao, Pan Zhuang, Jun Wang, and Yu Zhang. "Serum Polyfluoroalkyl Chemicals Are Associated with Risk of Cardiovascular Diseases in National US Population." *Environment International*, 2018.

Huh, Youn, Yoon Jeong Cho, and Ga Eun Nam. "Recent Epidemiology and Risk Factors of Nonalcoholic Fatty Liver Disease." *Journal of Obesity & Metabolic Syndrome* 31, no. 1 (2022): 17–27.

Hutcheson, Robert, Kim Innes, and Baqiyyah Conway. "Perfluoroalkyl Substances and Likelihood of Stroke in Persons with and without Diabetes." *Diabetes and Vascular Disease Research*, 2020.

Kuo, Byron, Marc Beal, John Wills, Paul White, Francesco Marchetti, Andy Nong, Tara Barton-Maclaren, Keith Houck, and Carole Yauk. "Comprehensive Interpretation of in Vitro Micronucleus Test Results for 292 Chemicals: From Hazard Identification to Risk Assessment Application." *Archives of Toxicology* 96 (2022).

Liu, Yuan-Bin, and Ming-Kai Chen. "Epidemiology of Liver Cirrhosis and Associated Complications: Current Knowledge and Future Directions." *World Journal of Gastroenterology* 28, no. 41 (2022): 5910–30.

Maisonet, Mildred, Metrecia Terrell, Michael McGeehin, Krista Christensen, Adrianne Holmes, Antonia Calafat, and Michele Marcus. "Maternal Concentrations of Polyfluoroalkyl Compounds during Pregnancy and Fetal and Postnatal Growth in British Girls." *Environmental Health Perspectives*, 2012.

Marten, Alex, Richard Garbaccio, and Ann Wolverton. "Exploring the General Equilibrium Costs of Sector-Specific Environmental Regulations." U.S. Environmental Protection Agency National Center for Environmental Economics, April 2019.

Miller, Kimberly, Quinn Ostrom, Carol Kruchko, Nirav Patil, Tarik Tihan, Gino Cioffi, Hannah Fuchs, et al. "Brain and Other Central Nervous System Tumor Statistics, 2021." *CA: A Cancer Journal for Clinicians* 71, no. 5 (2021).

National Academies of Sciences, Engineering, and Medicine. "Using 21st Century Science to Improve Risk-Related Evaluations." The National Academies Press, 2017.

National Institute of Dental and Craniofacial Research. "Oral Cancer Incidence (New Cases) by Age, Race, and Gender," April 2023.

National Institutes of Health, National Cancer Institute. "SEER*Explorer: An Interactive Website for SEER Cancer Statistics," April 19, 2023. https://seer.cancer.gov/statistics-network/explorer/.

National Research Council. "Review of EPA's Integrated Risk Information System (IRIS) Process Review of EPA's Integrated Risk Information System (IRIS) Process." National Academies Press, 2014.

———. "Science and Decisions: Advancing Risk Assessment." Washington, DC: National Academies Press, 2009.

National Toxicology Program. "NTP Research Report on National Toxicology Program Approach to Genomic Dose-Response Modeling," April 2018.

New York State Cancer Registry. "Ovarian Cancer Incidence and Mortality by Age Group, New York City, 2016-2020," February 2023.

Omoike, Ogbedor, Robert Pack, Hadii Mamudu, Ying Liu, Sheryl Strasser, Shimin Zheng, Joy Okoro, and Liang Wang. "Association between per and Polyfluoroalkyl Substances and Markers of Inflammation and Oxidative Stress." *Environmental Research*, May 2021.

Patel, Nicolas, and Bikramjit Benipal. "Incidence of Esophageal Cancer in the United States from 2001-2015: A United States Cancer Statistics Analysis of 50 States." *Cureus Journal of Medical Science* 10, no. 12 (2018).

P.L. 104-182: The Safe Drinking Water Act (1996).

Regli, Stig, Jimmy Chen, Michael Messner, Michael Elovitz, Frank Letkiewicz, Rex Pegram, TJ Pepping, Susan Richardson, and J. Michael Wright. "Estimating Potential Increased Bladder Cancer Risk Due to Increased Bromide Concentrations in Sources of Disinfected Drinking Waters." American Chemical Society, October 21, 2015.

Reynolds, Kristi, Alan Go, Thomas Leong, Denise Boudreau, Andrea Cassidy-Bushrow, Stephen Fortmann, Robert Goldberg, et al. "Trends in Incidence of Hospitalized Acute Myocardial Infarction in the Cardiovascular Research Network (CVRN)." *American Journal of Medicine* 130, no. 3 (2017): 317–27.

Rohatgi, Ankit. "WebPlotDigitizer." Pacifica, California, September 16, 2022. https://automeris.io/WebPlotDigitizer/.

Rosinger, Asher, Kirsten Herrick, Amber Wutich, Jonathan Yoder, and Cynthia Ogden. "Disparities in Plain, Tap and Bottled Water Consumption among US Adults: National Health and Nutrition Examination Survey (NHANES) 2007–2014." *Public Health Nutrition* 21, no. 8 (2018).

Roswell Park Comprehensive Cancer Center. "Understanding Brain Tumors: The Basics," February 12, 2018.

Schrenk, Dieter, Margherita Bignami, Laurent Bodin, Kevin Chipman, and Jesus del Mazo. "Risk to Human Health Related to the Presence of Perfluoroalkyl Substances in Food." European Food Safety Authority, September 2020.

Science Applications International Corporation, and The Cadmus Group. "Geometries and Characteristics of Public Water Systems." U.S. Environmental Protection Agency, December 2000.

Shankar, Anoop, Jie Xiao, and Alan Ducatman. "Perfluorooctanoic Acid and Cardiovascular Disease in US Adults." *Archives of Internal Medicine*, October 2012.

Shearer, Joseph, Catherine Callahan, Antonia Calafat, Wen-Yi Huang, Rena Jones, Venkata Sabbisetti, Neal Freedman, et al. "Serum Concentrations of Per- and Polyfluoroalkyl Substances and Risk of Renal Cell Carcinoma." *Journal of the National Cancer Institute*, 2021.

Siegel, Rebecca, Nikita Wagle, Andrea Cercek, Robert Smith, and Ahmedin Jemal. "Colorectal Cancer Statistics, 2023." *CA: A Cancer Journal for Clinicians* 73, no. 3 (2023).

Steenland, Kyle, and Susan Woskie. "Cohort Mortality Study of Workers Exposed to Perfluorooctanoic Acid." *American Journal of Epidemiology*, November 2012.

Ullah, Asad, Abu Tayab Moin, Yusha Araf, Atiqur Rahman Bhuiyan, and Mark Griffiths. "Potential Effects of the COVID-19 Pandemic on Future Birth Rate." *Frontiers in Public Health* 8 (2020).

U.S. Census Bureau. "2017 National Population Projections Tables: Main Series," 2017. https://www.census.gov/data/tables/2017/demo/popproj/2017-summary-tables.html.

———. "Income in the United States: 2021," September 2022. https://www.census.gov/library/publications/2022/demo/p60-276.html.

———. “Table HH-4. Households by Size: 1960 to Present,” November 2022. https://www.census.gov/data/tables/time-series/demo/families/households.html.

U.S. Centers for Disease Control and Prevention. “Chronic Disease Indicators (CDI),” 2023. https://nccd.cdc.gov/cdi.

———. “QuickStats: Percentage of Adults Aged ≥18 Years with Diagnosed Heart Disease, by Urbanization Level and Age Group — National Health Interview Survey, United States, 2020.” *Morbidity and Mortality Weekly Report* 71, no. 778 (2022). http://dx.doi.org/10.15585/mmwr.mm7123a4.

———. “Stroke Facts,” 2023. https://www.cdc.gov/stroke/facts.htm#:~:text=The%20death%20rate%20for%20stroke,41.1%20per%20100%2C000%20in%202021.

U.S. Department of Health and Human Services. “Guidelines for Regulatory Impact Analysis,” 2016.

U.S. Environmental Protection Agency. “Best Available Technologies and Small System Compliance Technologies for Per- and Polyfluoroalkyl Substances (PFAS) in Drinking Water,” February 2023.

———. “Clean Water and Drinking Water State Revolving Funds and the Bipartisan Infrastructure Law,” n.d.

———. “Economic Analysis for the Proposed Per- and Polyfluoroalkyl Substances National Primary Drinking Water Regulation,” March 2023.

———. “Economic Analysis for the Proposed Per- and Polyfluoroalkyl Substances National Primary Drinking Water Regulation Appendices,” March 2023.

———. “Emerging Contaminants (EC) in Small or Disadvantaged Communities Grant (SDC),” n.d.

———. “Exposure Factors Handbook,” 2011. https://www.epa.gov/expobox/about-exposure-factors-handbook.

———. “FY23 DWSRF Allotment Memo and Attachments,” April 2023.

———. “New Source Performance Standards for the Synthetic Organic Chemical Manufacturing Industry and National Emission Standards for Hazardous Air Pollutants for the Synthetic Organic Chemical Manufacturing Industry and Group I & II Polymers and Resins Industry.” Proposed Rule. Federal Register, April 2023.

———. “PFAS National Primary Drinking Water Regulation Rulemaking.” *Federal Register*, no. 88 FR 18638 (March 2023).

———. “Regulatory Impact Analysis for the Proposed New Source Performance Standards for Greenhouse Gas Emissions from New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units,” May 2023.

———. “Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances,” September 2022.

———. “SDWIS Federal Reporting Services Fourth Quarter 2021 Dataset,” 2021. https://www.epa.gov/ground-water-and-drinking-water/safe-drinking-water-information-system-sdwis-federal-reporting.

———. “Technologies and Costs for Removing Per- and Polyfluoroalkyl Substances (PFAS) from Drinking Water,” February 2023.

———. “Toxicity Assessment and Proposed Maximum Contaminant Level Goal for Perfluorooctane Sulfonic Acid (PFOS) in Drinking Water,” March 2023.

———. “Toxicity Assessment and Proposed Maximum Contaminant Level Goal for Perfluorooctanoic Acid (PFOA) in Drinking Water,” March 2023.

———. “Work Breakdown Structure-Based Cost Model for Granular Activated Carbon Drinking Water Treatment,” February 2023.

———. “Work Breakdown Structure-Based Cost Model for Ion Exchange Treatment of Per- and Polyfluoroalkyl Substances (PFAS) in Drinking Water,” February 2023.

U.S. Environmental Protection Agency Science Advisory Board. “SAB Advice on the Use of Economy-Wide Models in Evaluating the Social Costs, Benefits, and Economic Impacts of Air Regulations,” September 2017.

U.S. Food and Drug Administration. “Bottled Water Everywhere: Keeping It Safe,” April 22, 2022. https://www.fda.gov/consumers/consumer-updates/bottled-water-everywhere-keeping-it-safe.

U.S. Office of Management and Budget. “Circular A-4: Regulatory Analysis,” September 2003.

———. “Circular A-4: Regulatory Analysis,” September 17, 2003.

———. “Circular A-94,” n.d.

Vieux, Florent, Matthieu Maillot, Colin Rehm, Pamela Barrios, and Adam Drewnowski. “Trends in Tap and Bottled Water Consumption among Children and Adults in the United States: Analyses of NHANES 2011–16 Data.” *Nutrition Journal* 10 (2020).

Washino, Noriaki, Yasuaki Saijo, Seiko Sasaki, Shizue Kato, Susumu Ban, Kanae Konishi, Rie Ito, et al. “Correlations between Prenatal Exposure to Perfluorinated Chemicals and Reduced Fetal Growth.” *Environmental Health Perspectives*, 2009.

Weaver, Marcia R, Jonah Joffe, Michael Ciarametaro, Robert W Dubois, Abe Dunn, Arjun Singh, Gianna W Sparks, Lauryn Stafford, Christopher J L Murray, and Joseph L Dieleman. “Health Care Spending Effectiveness: Estimates Suggest That Spending Improved US Health from 1996 to 2016.” *Health Aff (Millwood)* 41, no. 7 (2022): 994–1004.

Weisman, Richard, Austin Heinrich, Frank Letkiewicz, Michael Messner, Kirsten Studer, Lili Wang, and Stig Regli. “Estimating National Exposures and Potential Bladder Cancer Cases Associated with Chlorination DBPs in U.S. Drinking Water.” *Environmental Health Perspectives* 130, no. 8 (2022).

Wikstrom, Sverre, Ping-I Lin, Christian Lindh, Huan Shu, and Carl-Gustaf Bornehag. “Maternal Serum Levels of Perfluoroalkyl Substances in Early Pregnancy and Offspring Birth Weight.” *Pediatric Research*, 2020.

Woods & Poole Economics Inc. “Complete Demographic Database,” 2021. https://www.woodsandpoole.com/our-databases/united-states/all-geographies/.

World Health Organization. “Chronic Obstructive Pulmonary Disease (COPD),” March 16, 2023. https://www.who.int/news-room/fact-sheets/detail/chronic-obstructive-pulmonary-disease-(copd).

———. “Global Health Estimates: Leading Causes of DALYs,” n.d. https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates/global-health-estimates-leading-causes-of-dalys.

———. “PFOS and PFOA in Drinking-Water: Background Document for Development of WHO Guidelines for Drinking-Water Quality,” September 2022. https://www.cmbg3.com/library/WHO-Draft-Drinking-Water-Document.pdf.

Table 33: EPA's List of Uncertainties

Uncertainty	EPA's Notes
The analysis does not include the impacts of COVID-19 on future population health and economic growth.	Impacts of the COVID-19 pandemic have had resulting effects on conception, pregnancy, and birth rates.[138] Some studies suggest that the economic recession caused by the COVID-19 pandemic may impose long-term impacts on fertility.[139] Such impacts are not accounted for in EPA's benefits analysis.
For PWSs with multiple entry points, the analysis assumes a uniform population distribution across the entry points.	Data on the populations served by each entry point are not available and EPA therefore uniformly distributes system population across entry points. Effects of the regulatory alternative may be greater or smaller than estimated, depending on actual populations served by affected entry points. For one large system serving more than one million customers EPA has sufficient data on entry point flow to proportionally assign effected populations.
Valuation of mortality risk reductions assumes that per capita income will grow at the constant rate.	EPA uses Value of Statistical Life (VSL) adjusted for income growth to estimate economic value of the premature mortality avoided in the future. Per capita income growth projections were available through 2050. EPA estimated the compound annual growth rate in per capita income during 2023-2050 and applied it to project VSL over the analysis period 2023-2104.
EPA does not characterize uncertainty associated with the VSL reference value or VSL elasticity.	EPA did not quantitatively characterize the uncertainty for the VSL reference value and income elasticity. Because the economic value of avoided premature mortality comprises the majority of the overall benefits estimate, not considering uncertainty surrounding the VSL is a limitation.

[138] Arnstein Aassve et al., "Early Assessment of the Relationship between the COVID-19 Pandemic and Births in High-Income Countries" 118, no. 36 (2021).

[139] Asad Ullah et al., "Potential Effects of the COVID-19 Pandemic on Future Birth Rate," *Frontiers in Public Health* 8 (2020).

Uncertainty	EPA's Notes
The analysis does not explicitly consider changes in PFOA/PFOS and THM4 concentrations for systems that purchase their drinking water from other PWSs.	Many PWSs purchase their primary source water from PWSs that are likely to implement treatment under the rule. The SDWIS/Fed inventory of PWSs includes these systems with their retail populations instead of allocating those populations to the wholesale systems. The MCMC occurrence analysis outputs for the wholesale system and purchasing system may vary from one another, resulting in either an under- or over-estimate of affected population in any iteration. The net effect on total benefits is uncertain.
The analysis does not account for populations that consume bottled water as their primary drinking water source.	Studies indicate that between 13 percent and 33 percent of the U.S. population consumes bottled water as their primary drinking water source.[140] The benefits models do not consider these populations. This could result in an overestimate of avoided cases of health effects and associated benefits. However, bottled water consumers can also be CWS customers and may still be exposed to PFAS by using water for cooking etc., therefore, would benefit from PFAS removal.[141] Finally, the benefits may also be underestimated because those using bottled water as a primary drinking water source may switch to CWS supply as a result of the proposed rule; EPA did not model this behavioral response and hence the benefits do not account for the potential cost savings to those consuming bottled water at baseline.
EPA assumes that the effects of PFOA and PFOS exposures are independent.	The exposure-response functions used in benefits analyses assume that the effects of serum PFOA/PFOS on the health outcomes considered are independent and therefore additive. Due to limited evidence, EPA does not consider synergies or antagonisms in PFOA/PFOS exposure-response.

[140] Zhihua Hu, Lois Wright Morton, and Robert Mahler, "Bottled Water: United States Consumers and Their Perceptions of Water Quality," *International Journal of Environmental Research and Public Health*, 2011; Asher Rosinger et al., "Disparities in Plain, Tap and Bottled Water Consumption among US Adults: National Health and Nutrition Examination Survey (NHANES) 2007–2014," *Public Health Nutrition* 21, no. 8 (2018); Florent Vieux et al., "Trends in Tap and Bottled Water Consumption among Children and Adults in the United States: Analyses of NHANES 2011–16 Data," *Nutrition Journal* 10 (2020).

[141] U.S. Food and Drug Administration, "Bottled Water Everywhere: Keeping It Safe," April 22, 2022, https://www.fda.gov/consumers/consumer-updates/bottled-water-everywhere-keeping-it-safe; Aquafina, "Aquafina FAQ," 2022, https://www.aquafina.com/en-US/faq.html#:~:text=Aquafina%20originates%20from%20public%20water,can%20affect%20a%20water's%20taste.

Uncertainty	EPA's Notes
The analysis assumes that quantified benefits categories are additive.	EPA did not model birth weight, CVD, RCC, and bladder cancer benefits jointly, in a competing risk framework. Therefore, reductions in health risk in a specific benefits category do not influence health risk reductions in another benefits category. For example, lower risk of CVD and associated mortality implies a larger population that could benefit from cancer risk reductions, because cancer incidence grows considerably later in life.
The scope of the analysis does not include intra- or international migration throughout the evaluation period.	Throughout the analysis period people may migrate from one place to another. If persons migrate to locations with larger decreases in PFOA/PFOS under the regulatory alternative, EPA would be underestimating the impacts. The opposite is true if persons migrate to locations with smaller decreases in PFOA/PFOS under the regulatory alternative.
The analysis considers PFOA/PFOS concentrations from NTNCWSs.	Some SDWIS population served estimates for NTNCWSs represent the both the population that has regular exposure to the NTNCWS' drinking water (e.g., the employees at a location) and the peak day transient population (e.g., customers) who have infrequent exposure to the NTNCWS' drinking water. Estimating the demographic distribution and the share of daily drinking water consumption for these two types of NTNCWS populations would be difficult across many of the industries which operate NTNCWSs. The inclusion of NTNCWS results is an overestimate of benefits because daily drinking water consumption for these populations is also modeled at their residential CWS.
The derivation of PFOA/PFOS exposure-response functions for the relationship between PFOA/PFOS serum and associated health outcomes assumes that there are no threshold serum concentrations below which effects do not occur.	The new data and EPA's proposed MCLGs indicate that the levels at which adverse health effects could occur are much lower than previously understood when EPA issued the 2016 health advisories for PFOA and PFOS (70 parts per trillion or ppt) – including near zero for certain health effects. Therefore, the exposure-response functions used in benefits analyses assume that there are no threshold serum concentrations below which effects do not occur. This could result in a slight overestimate of benefits for certain health endpoints.

Uncertainty	EPA's Notes
The exposure-response functions used to estimate risk assume causality.	Analyses evaluating the evidence on the associations between PFAS exposure and health outcomes are ongoing and EPA has not conclusively determined causality. EPA modeled health risks from PFOA/PFOS exposure for endpoints for which the evidence of association was found to be likely. These endpoints include birth weight, TC, and RCC. While the evidence supporting causality between DBP exposure and bladder cancer has increased since EPA's Stage 2 DBP Rule,[142] causality has not yet been conclusively determined.[143]
EPA has quantified benefits for three health endpoints for PFOA and PFOS.	For various reasons, EPA has not quantified the benefit of removing PFOA and PFOS from drinking water for most of the health endpoints PFOA and PFOS are expected to impact.
EPA has quantified benefits for one co-removed contaminant group.	Treatment technologies that remove PFAS can also remove numerous other contaminants, including some other PFAS compounds, additional regulated and unregulated DBPs, heavy metals, organic contaminants, pesticides, among others. These co-removal benefits may be significant, depending on co-occurrence, how many facilities install treatment and which treatment option they select.
EPA has not quantified benefits for any health endpoint for PFHxS, PFNA, PFBS, and HFPO- DA.	PFHxS, PFNA, PFBS, and HFPO-DA each have substantial health impacts on multiple health endpoints.

[142] U.S. Environmental Protection Agency, "Economic Analysis for the Proposed Per- and Polyfluoroalkyl Substances National Primary Drinking Water Regulation"; Richard Weisman et al., "Estimating National Exposures and Potential Bladder Cancer Cases Associated with Chlorination DBPs in U.S. Drinking Water," *Environmental Health Perspectives* 130, no. 8 (2022).

[143] Stig Regli et al., "Estimating Potential Increased Bladder Cancer Risk Due to Increased Bromide Concentrations in Sources of Disinfected Drinking Waters" (American Chemical Society, October 21, 2015).

Uncertainty	EPA's Notes
The analysis does not take into account population growth and other changes in long-term trends.	The benefits analysis does not reflect the effects of growing population that may benefit from reduction in PFOA/PFOS exposure. Furthermore, EPA uses present- day information on life expectancy, disease, environmental exposure, and other factors, which are likely to change in the future. There are two potential datasets that could inform population growth under the final rule. EPA has described these datasets below. Population projections by year, county, single-year age, sex, and race/ethnicity are available through 2050 from the Woods & Poole Economics Inc. (2021) dataset and could be used for the final rule.[144] This dataset has been used in prior rulemakings, such as the National Ambient Air Quality Standards, the Steam Electric Effluent Limitations Guidelines, and the Federal Recreational Water Quality Criteria Applicable to Certain Waters in New York (unpublished; currently on hold until January 2023 at the earliest). Woods & Poole Economics population growth data are also used in EPA's air quality benefits programs BenMAP-CE and COBRA. EPA could project the county-, sex-, race/ethnicity-, and age-specific distribution of Woods & Poole Economics data from 2051 to 2104 using a transition ratio approach with normalization to obtain population projections throughout the period of analysis relevant to the NPDWR. Additional population projection estimates are available from the Socioeconomic Data and Applications Center (SEDAC) by county, age, sex, and race/ethnicity in five- year intervals through the year 2100. These projections were used in EPA's recent Waters of the United States rulemaking. If implemented in the PFAS NPDWR, EPA would need to distribute population within five-year intervals and project population estimates from 2101 to 2104.
WBS engineering cost model assumptions and component costs	The WBS engineering cost models require many design and operating assumptions to estimate treatment process equipment and operating needs. The Technologies and Costs document and individual WBS models in the rule docket provide additional information.[145] The component-level costs approximate national average costs, which can over- or under-estimate costs at systems affected by the proposed rule.

[144] Woods & Poole Economics Inc, "Complete Demographic Database," 2021, https://www.woodsandpoole.com/our-databases/united-states/all-geographies/.

[145] U.S. Environmental Protection Agency, "Technologies and Costs for Removing Per- and Polyfluoroalkyl Substances (PFAS) from Drinking Water."

Uncertainty	EPA's Notes
Compliance forecast	The forecast probabilities are based on historical full-scale compliance actions. Site-specific water quality conditions, changes in technology, and changes in market conditions can result in future technology selections that differ from the compliance forecast.
Total organic carbon concentration	The randomly assigned values from the two national distributions are based on a limited dataset. Actual TOC concentrations at systems affected by the proposed rule can be higher or lower than the assigned values.
POU not included in compliance forecast	If POU devices can be certified to meet concentrations that satisfy the proposed rule, then small systems may be able to reduce costs by using a POU compliance option instead of centralized treatment or source water changes.
National occurrence data for HFPO-DA, PFBS, and PFNA not available	The hazard index in the proposed option would regulate PFBS, PFNA, and HFPO-DA in addition to the modeled PFAS. In instances when concentrations of PFBS, PFNA, and/or HFPO-DA are high enough to cause a hazard index exceedance, the modeled costs may be underestimated. If these PFAS occur in isolation at levels that affect treatment decisions, or if they occur in sufficient concentration to result in an exceedance when the concentration of PFHxS alone would be below the HI, then costs would be underestimated. Note that EPA has conducted an analysis of the potential changes in system level treatment cost associated with the occurrence of PFBS, PFNA, and HFPO-DA using a model system approach.
Process wastes not classified as hazardous	The national cost analysis reflects the assumption that PFAS-contaminated wastes are not considered hazardous wastes. As a general matter, EPA notes that such wastes are not currently regulated under federal law as a hazardous waste. To address stakeholder concerns, including those raised during the SBREFA process, EPA conducted a sensitivity analysis with an assumption of hazardous waste disposal for illustrative purposes only. As part of this analysis, EPA generated a second full set of unit cost curves that are identical to the curves used for the national cost analysis with the exception that spent GAC and spent IX resin are considered hazardous. EPA acknowledges that if federal authorities later determine that PFAS-contaminated wastes require handling as hazardous wastes, the residuals management costs in the WBS treatment cost models are expected to be higher. The estimated costs are consistent with EPA OLEM's "Interim Guidance on the

Uncertainty	EPA's Notes
	Destruction and Disposal of Perfluoroalkyl and Polyfluoroalkyl Substances and Materials Containing Perfluoroalkyl and Polyfluoroalkyl Substances."[146]

[146] "Designation of Perfluorooctanoic Acid (PFOA) and Perfluorooctanesulfonic Acid (PFOS) as CERCLA Hazardous Substances."

APPENDIX B

Table 34: PFOA & Birthweight

	EPA[147]	Health Canada[148]	EFSA[149]	WHO[150]
Findings	Decreased survival in mice offspring exposed to PFOA in utero related to PPARα-related hepatotoxicity. Alterations to the gene expression related to growth and development in vivo in zebrafish. Inconsistent results for PFOA-related alterations to DNA methylation in human cord blood.	The data currently available regarding an association between PFOA and reduced birth weight are not consistent.	Relatively modest but consistent inverse associations with birth weight were observed for both PFOA & PFOS.	Odds ratios were 1.44, 2.33, and 1.04 for all infants, girls, and boys, respectively.[151] Odds ratio was 0.94 per unit increase in maternal serum PFOA.[152]
Interpretation	PFOA exposure during development can alter the epigenome and the expression of genes that control regular growth and development. It is possible that such changes are related, although the relationship has not been directly measured.	Cross-sectional studies or highly exposed communities do not show a significant association between PFOA water concentrations.	The studies they reviewed do not contradict the previous conclusion from their 2018 opinion that "there may well be acausal association between PFOS and PFOA and birth weight."	Studies collectively suggest that an increase of 1 ng PFOA per mL maternal serum is associated with a reduced birthweight of approximately 10 grams.

[147] U.S. Environmental Protection Agency, "2023b."

[148] Health Canada, "Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Perfluorooctanoic Acid (PFOA)."

[149] Schrenk et al., "Risk to Human Health Related to the Presence of Perfluoroalkyl Substances in Food."

[150] World Health Organization, "PFOS and PFOA in Drinking-Water: Background Document for Development of WHO Guidelines for Drinking-Water Quality."

[151] Sverre Wikstrom et al., "Maternal Serum Levels of Perfluoroalkyl Substances in Early Pregnancy and Offspring Birth Weight," *Pediatric Research*, 2020.

[152] Lyndsey Darrow, Cheryl Stein, and Kyle Steenland, "Serum Perfluorooctanoic Acid and Perfluorooctane Sulfonate Concentrations in Relation to Birth Outcomes in the Mid-Ohio Valley, 2005-2010," *Environmental Health Perspectives*, 2013.

	EPA[147]	Health Canada[148]	EFSA[149]	WHO[150]
Limitations	Very limited database. The role of epigenetic mechanisms in changes at the mRNA level is not clear, nor is the relationship between molecular changes and apical developmental outcomes.	The studies presented risk of selection bias, recall bias, chance findings, uncontrolled covariates, and absence of dose-response pattern.	The association might be partly confounded by physiological changes in pregnancy, and the lack of association with low birthweight or small for gestational age.	Reverse causality related to the magnitude of plasma volume expansion and glomerular filtration rate may contribute to the association.

Table 35: PFOS & Birthweight

	EPA[153]	HA[154]	EFSA[155]	WHO[156]
Findings	Evidence from zebrafish embryo assays demonstrate that PFOS exposure can lead to embryo and/or larva malformation and delays/reduction in hatching. Alterations to the expression of genes related to growth and development in vivo in zebrafish and rodents, and in human embryonic cell lines.	Inverse associations between PFOS at early pregnancy and birth weight have been reported in different general population studies.	Consistent but relatively modest inverse associations with birth weight were observed for both PFOA & PFOS.	Odds ratios were 1.56, 2.05, and 1.30 for all infants, girls, and boys, respectively (with upper quartile of exposure).[157] Odds ratio was 1.12. per unit increase in

[153] U.S. Environmental Protection Agency, "Toxicity Assessment and Proposed Maximum Contaminant Level Goal for Perfluorooctane Sulfonic Acid (PFOS) in Drinking Water," March 2023.

[154] Health Canada, "Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Perfluorooctane Sulfonate (PFOS)."

[155] Schrenk et al., "Risk to Human Health Related to the Presence of Perfluoroalkyl Substances in Food."

[156] World Health Organization, "PFOS and PFOA in Drinking-Water: Background Document for Development of WHO Guidelines for Drinking-Water Quality."

[157] Wikstrom et al., "Maternal Serum Levels of Perfluoroalkyl Substances in Early Pregnancy and Offspring Birth Weight."

	EPA[153]	HA[154]	EFSA[155]	WHO[156]
	Alterations to DNA methylation in human cord blood and in placenta from rodent studies.			maternal serum PFOS.[158]
Interpretation	PFOS exposure during development can alter the epigenome and the expression of genes that control regular growth and development; it is possible that such changes are related, although the relationship has not been directly measured.	The evidence supporting a link between early-life exposure to PFOS, and developmental toxicity is equivocal because most studies were not designed to allow causal inference.	There may be a causal association between PFOS and PFOA and birth weight.	Each increase in the quartile of exposure for PFOS and PFOA was associated with a mean reduction in birthweight.
Limitations	The role of epigenetic mechanisms in changes at the mRNA level is not clear, nor is the relationship between molecular changes and apical developmental outcomes.	Larger studies would be needed to support the results due to the poor precision of the point estimate, the relatively small size of the studies, and the risk of confounding and bias.	The association might be partly confounded by physiological changes in pregnancy, and the lack of association with low birthweight or small for gestational age.	Some findings were from different quartiles of exposure. There were also inconsistent results, with the Agency for Toxic Substances and Disease Registry concluding "no studies found increases in the risk of low-birthweight infants" associated with maternal PFOS serum levels.

[158] Darrow, Stein, and Steenland, "Serum Perfluorooctanoic Acid and Perfluorooctane Sulfonate Concentrations in Relation to Birth Outcomes in the Mid-Ohio Valley, 2005-2010."

Table 36: PFOA & CVD

	EPA[159]	Health Canada[160]	EFSA[161]	WHO[162]
Findings	Alterations in lipid metabolism results in alterations in serum levels of TG and TC via: PFOA accumulation in liver activates nuclear receptors, including PPARα.[163] Nuclear receptor activation alters the expression of genes involved in lipid homeostasis and metabolism.	CVD outcomes were not consistently found to be associated with PFOA in cohort and cross-sectional studies.	Five cross-sectional and four longitudinal studies did not show any clear association between PFOS & PFOA and cardiovascular disease.	One study's finding may have clinical significance, as an increase in LDL cholesterol is associated with an increase in cardiovascular risk.
Interpretation	Findings support plausibility that cardiovascular effects, specifically changes to serum TG and TC levels, can occur through changes in lipid metabolism related to PFOA exposure.	There is not a probable link between exposure to PFOA and diagnosed high blood pressure and coronary artery disease (including myocardial infarction, angina, and coronary bypass surgery).[164]	While some studies suggest an association between exposure to PFAS other than PFOA & PFOS and cardiovascular disease, the evidence is insufficient to use as a basis for a health-based guidance value.	Regardless of gender, age group, or quintile of exposure, there was no significant correlation between PFOA exposure and onset of hypertension or cardiovascular heart disease.

[159] U.S. Environmental Protection Agency, "2023b."

[160] Health Canada, "Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Perfluorooctanoic Acid (PFOA)."

[161] Schrenk et al., "Risk to Human Health Related to the Presence of Perfluoroalkyl Substances in Food."

[162] World Health Organization, "PFOS and PFOA in Drinking-Water: Background Document for Development of WHO Guidelines for Drinking-Water Quality."

[163] PPARα is a major transcription factor affecting expression of genes that regulate fatty acid oxidation and triglyceride and total cholesterol levels.

[164] C8 Science Panel, "C8 Probable Link Reports."

	EPA[159]	Health Canada[160]	EFSA[161]	WHO[162]
Limitations	Only a single study demonstrating PFOA accumulation in platelets in vitro. Results are inconsistent and conflicting regarding effects on indicators or mechanisms related to atherosclerosis, primarily related to clot formation.	Studies showing an association with cardiovascular, peripheral arterial disease, and systolic blood pressure are equivocal and were not confirmed in other occupational cohort studies.	The longitudinal studies could not demonstrate a very small increase of the relative risk.	It is unclear whether the effect of exposure on serum cholesterol levels results in an increased risk of cardiovascular disease.

Table 37: PFOS & CVD Findings

	EPA	Canada	EFSA	WHO
Findings	PFOS exposure was associated with changes in the expression of genes involved in cholesterol metabolism, mobilization, or transport in whole blood of adult humans. PFOS induced oxidative stress and upregulated inflammatory response genes in human umbilical vein endothelial cells exposed in vitro, which can lead to vascular inflammation. PFOS can bind to human FXII in vitro, which is the initial zymogen of plasma KKS activation, a regulator of inflammation, blood pressure, coagulation, and vascular permeability.	Overall, associations between PFOS and alterations in lipid parameters have been observed, although the conclusions face limitations.	Five cross-sectional and four longitudinal studies did not show any clear association between PFOS & PFOA and cardiovascular disease.	Statistically significant positive associations between exposure to PFOS and/or PFOA and total serum cholesterol are reported. Similar findings were reported for LDL cholesterol but not for HDL cholesterol.

	EPA	Canada	EFSA	WHO
Interpretation	Findings support the plausibility that PFOS exposure can lead to changes in the expression of genes involved in cholesterol regulation, as well as molecular and cellular changes that are related to atherosclerosis, although no association was observed between PFOS exposure and atherosclerosis in human epidemiological studies.	The clinical significance of some of the studies is uncertain given the low number of participants changing from the high to the normal level of cholesterol categories, the unknown mechanism of action, and the low magnitude of the changes.	While some studies suggest an association between exposure to PFAS other than PFOA & PFOS and cardiovascular disease, the evidence is insufficient to use as a basis for a health-based guidance value.	These findings may have clinical significance, as an increase in LDL cholesterol is associated with an increase in cardiovascular risk.
Limitations	Small database; the only in vivo evidence is reported in two human studies with conflicting results for markers of platelet activation. Results regarding the association between PFOS exposure and carotid artery atherosclerotic plaques or CIMT, which are mechanisms of atherosclerosis, are inconsistent in human epidemiological studies.	Lack of consistency across studies, study designs, the possibility of selection bias, and chance finding from the high number of testing conducted.	The longitudinal studies could not demonstrate a very small increase of the relative risk.	It is unclear whether the effect of exposure on serum cholesterol levels results in an increased risk of cardiovascular disease.

Table 38: PFOA & Cancer

	EPA	Canada	EFSA	WHO
Findings	Available PFOA data are consistent with four descriptions of data that support the "Likely to Be Carcinogenic to Humans" descriptor as part of the	It would be premature to base a guideline on a cancer risk in epidemiology studies, without a stronger	Reviewed studies provided insufficient support for	Two studies focused on emissions from a West Virginia plant showed a positive association between plasma PFOA levels and self-reported

	EPA	Canada	EFSA	WHO
	Guidelines for Carcinogen Risk Assessment. These include tumor presence and plausible association between exposure and cancer.	understanding of the potential causality between PFOA and the observed cancers.	carcinogenicity of PFOS and PFOA in humans.	cases of kidney and testicular cancers.
Interpretation	PFOA has carcinogenic potential in humans and at least one animal model. A plausible, though not definitively causal, association exists between human exposure to PFOA and kidney and testicular cancers in the general population and highly exposed populations.	It is suggested to continue monitoring the epidemiological evidence to understand better the relationship between PFOA and cancer risk.	This is in line with the conclusion from the IARC report on PFOA, which found that there was limited evidence for carcinogenicity. Additional studies have not changed the previous conclusion for PFOS and PFOA.	There is suggestive evidence of carcinogenic potential for PFOA, based on the availability of studies that demonstrate an association between PFOA exposure and kidney and testicular tumors among highly exposed individuals.
Limitations	There are significant uncertainties regarding the MOAs for tumor types observed in humans.	In studies showing some cancer associations with PFOA exposure, there was a high variability of the risk estimates, low case number, and multiple endpoints calculated with two modelling approaches.	Studies among background and occupationally exposed individuals provide limited evidence to suggest that exposure to PFOA and PFOS are associated with increased cancer risk.	The relevance of these findings to interpreting the risk of cancer in the general population following exposure to these chemicals remains unclear.

Table 39: PFOS & Cancer

	EPA	Canada	EFSA	WHO
Findings	Available PFOS data are consistent with three descriptions of data that support the "Likely to Be	Some associations between PFOS and risk of certain cancers were observed.	Reviewed studies provided insufficient support for	Epidemiological studies in occupationally exposed cohorts and case-control studies found mixed associations between

	EPA	Canada	EFSA	WHO
	Carcinogenic to Humans" descriptor as part of the *Guidelines for Carcinogen Risk Assessment*. These include tumor presence and positive tests in animal experiments.	However, the evidence does not support the carcinogenicity of PFOS.	carcinogenicity of PFOS and PFOA in humans.	PFOS exposure and cancers of the breast, bladder, kidney, colon, liver, pancreas, or prostate.
Interpretation	While the association between PFOS and cancer found mixed results across tumor types, the available study findings support a plausible correlation between PFOS exposure and carcinogenicity in humans.	Although some evidence of an association between PFOS and the risk of cancer has been observed, the effects were equivocal, and no clear trend could be determined.	This is in line with the conclusion from the IARC report on PFOA, which found that there was limited evidence for carcinogenicity. Additional studies have not changed the previous conclusion for PFOS and PFOA.	While some studies found higher incidence ratios, others concluded there is insufficient support for carcinogenicity of PFOS in humans.
Limitations	The study designs, analyses, and mixed results do not allow for a definitive conclusion on the relationship between PFOS exposure and cancer outcomes in humans.	Study limitations included a small number of cases, confounding, and participant selection bias.	Studies among background and occupationally exposed individuals provide limited evidence to suggest that exposure to PFOA and PFOS are associated with increased cancer risk.	Temporal changes in cancer incidence rates, risk factors, survivability, and diagnostic criteria may result in biased non-comparable outcomes incidence reported between the 1950s and 2000.

Full Name (First and Last): Jessica Giambra
Name of Organization or Community: AZ Farm to School - School Garden Community of Practice
City and State: Phoenix, AZ
Brief description: Recommendation to fund and support the practice of school gardening, ecological education, and green schoolyards. Environmental justice can be completely fulfilled by ensuring that schools create a first-hand experience with nature for developing children. With nature as our teacher, an understanding of the interconnectedness of life is automatically transmitted to students. Curiosity, inquiry-based learning, hands-on, outdoor, and project-based learning are all research-proven strategies to allow the next generation to thrive in their fullest potential and understanding of their possibilities in the natural world. So many communities have lack of green shade, biodiversity habitats, nutritious food, and even parks, that schools are a practical way to balance the scales in favor of righting the wrongs of the concrete takeover of communities. We already know that green spaces bring down heat, uplift the mood, and overall create a richer environment for communities. Schools should be at the center of the conversation around green spaces so that the children can grow up with fresher air, with the observational skills cultivated through witnessing natural cycles and processes, and can then develop with fundamental experiences which will influence their imagination toward public spaces for the rest of their life. The solution starts with the youth, and the youth belong in nature, learning about nature, and discovering how nature is the source of everything we need.

To Whom it May Concern at the WHEJAC,

I don't know what to ask for from the WHEJAC other than a paradigm shift. A big environmental concern is taking place in my community, which is the destructive and unwanted construction of the world's largest copper mine just one hour from Phoenix at the Apache sacred site known as Oak Flat.

Issues include: Billions of tons of water to construct this mine that the desert does not have • Irreversible loss of wildlife habitat unique to this land• Destruction of a cultural and spiritual site used since time immemorial • The billions of tons of toxic MINE TAILINGS are supposed to be dumped on native land as well, in the Gila River Indian Community on Pee Posh land! o and by the way, they unconstitutionally changed the boundaries of the Pee Posh land (did not get the individual parcel owners to sign off on the change) in order to get access to the area for dumping. • Gila River is also responsible for selling the water to Oak Flat Pros of the mine include: • Absolutely nothing. The mine is owned by Resolution Copper/Rio Tinto who has already been banned from Australia for its destruction of aboriginal sites. So what is to be done? This is not the only issue like this in the country, in the world. We need ethical practices and the international standard of Free, Prior, and Informed Consent to be in place for every action that disrupts nature and community. Really, we shouldn't be disrupting nature and community and using a system that extracts all nature's creativity and wealth for the profit of a few while the rest are forced to suffer. I am truly at a loss of how we can continue living here in Phoenix if this mine were to begin blasting. The mine is located in the direction of the SOURCE of our water. I am not willing to put the lives of my generations at risk from drinking water contaminated by toxic chemicals! This is an urgent issue and requires pressure to be halted, not just temporarily, but forever banished from our lands. Also, following is my comment on a positive *solution* to environmental justice relating to school garden issues. I wanted to include both, although I submitted a similar comment in the form on the website. I just wanted to ensure it is passed along to the people of the council. Thank you so much for your kind attention, Sincerely, Jessie Giambra Phoenix, AZ

Subject: Recommendation to fund and support the practice of school gardening, ecological education, and green schoolyards. Environmental justice can be completely fulfilled by ensuring that schools create a first-hand experience with nature for developing children. With nature as our teacher, an understanding of the interconnectedness of life is automatically transmitted to students. Curiosity, inquiry-based learning, hands-on, outdoor, and project-based learning are all research-proven strategies to allow the next generation to thrive in their fullest potential and understanding of their possibilities in the natural world. So many communities lack green shade, biodiversity habitats, nutritious food, and even parks. Schools abundant in native, natural greenery are a practical way to balance the scales in favor of righting the wrongs of the concrete takeover of communities. We already know that green spaces bring down heat, uplift the mood, and overall create a richer environment for communities. Schools should be at the center of the conversation around green spaces so that the children can grow up with fresher air, with the observational skills cultivated through witnessing natural cycles and processes, and can then develop with fundamental experiences which will influence their imagination toward public spaces for the rest of their life. The solution starts with the youth, and the youth belong in nature, learning about nature, and discovering how nature is the source of everything we need.

~

I have been working with my school district as well as various community organizations for several years to date around the practice of gardening in schools and have seen nothing less than incredible transformations in the culture and climate of my school, the wisdom and understanding demonstrated by my students, and in the motivation and positivity of our community. Please consider this to be a widespread movement toward justice carried by the next generation and bridging the gap between our current practices of ignorance and greed to a practice of wisdom and care. This is truly the paradigm shift.

Jessie Giambra

Article was the one down the list on 110 F temps in a country which has NEVER had such high temps. And also…has no air conditioning..

https://replica.startribune.com/infinity/article_popover_share.aspx?guid=513578ee-4e32-4e56-aa45-6e7cfa23f046

Let's say you pick one subject which gives sway to CC. Like the article above.

Hundreds more articles from all over the world point to the same high number.

Can crops survive such temperatures? No.

Can humans? Yes - with A/C..

Farm animals? No.

One such example is the 25,000 people who died in France about 8-10 years ago. A heat wave during their 4 week summer vacation - in which government officials also were not at work. Most were retired persons. Yes, grandmas and grandpas. Why did they die? Because they lived in brick homes and apartment buildings that had always kept them cool - without A/C.

Until now.

Another story is that about 1 million persons are currently dying of starvation due to dried up land, and dead animals in Africa. I know. I know. No one will blame us for their death. But they, like the 1/3 of Pakistan's population, produce 1/2 ton of CO2 per person. We Americans produce about 20 tons each. 40 times the citizens of Africa and Pakistan. There is a pointed gun we hold - about to unleash massive death in the coming decade or two. What is massive? Let's say 1/2 billion. And perhaps many times that number to wild animals and livestock. Easy solutions? Well, for one: lower emissions by 1/2 in the next 10 years. No reason we can't do that. We just choose not to deal with it right now. Heard that story before? It is America as usual. Talk, talk, talk, worry, worry, worry ….. and drive to get a coffee with cream and sugar to feel "right" again. If an argument to park your body by doors of elected officials is not the one such above——— then what is?

Jim Davidson

Greetings WHEJAC Members and Interested Federal Officials as copied in this email. Please accept this email and the attachments as my submission of public comment for the subject public meeting, during which I attended virtually and orally presented my statements in the Public Comment period the evening of Tuesday, June 13, 2023. This submission can also be considered a brief compilation of certain salient facts supporting the argument that it is time to end water fluoridation in the United States. Please know that I also spoke earlier on Tuesday, June 13, 2023, as a virtual attendee at the public meeting of the Advisory Committee on Infant and Maternal Mortality (ACIMM) of the Department of Health and Human Services. Considering the proximity of timing of the two meetings that day, this emailed submission includes copies of the 3-minute script I had prepared similarly but separately for each of the two meetings as tailored with relevance to the special agenda items specific to each meeting. The pdf files attached with this email are briefly described as follows: LULAC Civil Rights Violation.pdf, This document has been submitted as additional material with previous public comments for earlier public meetings, and is being provided again as a reminder that artificial water fluoridation is a well-documented civil rights and environmental justice problem needing resolve now by the banning of fluoridation chemicals to the public water supplies, and with Justice40 designated grant funding replacing fluoridation programs with newer, more effective, individualized childhood oral health programs where needed most. Such localized, targeted programs shall replace the obsolete practice of a one-size-fits-all program, the CDC's Community Water Fluoridation (CWF) program, which is applied indiscriminately in whatever community has accepted the propaganda and false narratives that fluoridation is safe and effective, and which is a purported public health measure of mass medication, but recklessly applied regardless of individual need, rich or poor, healthy of ill, and Black or White or in-between. CofA Mosaic with 1983 Hanmer.pdf, This is a copy of a Certificate of Analysis, annotated in red font and boxed outlines, the original of which was provided with a shipment of fluorosilicate acid to a large drinking water treatment plant in a major U.S. city. The annotations include a quote from a senior official at the EPA's Office of Water; a copy of the complete letter is also attached. This is the complete letter attached as noted immediately above, from which the quote is taken, and with highlighting on this copy. Oral script WHEJAC 6-13-2023.pdf, This is a copy of my 3-minute oral presentation at the subject WHEJAC public meeting on June 13, 2023. Oral script final ACIMM 6-13-2023.pdf, This is a copy of my 3-minute oral presentation at the ACIMM public meeting on June 13, 2023. My recommendation to the WHEJAC and interested federal officials copied on this email as shown, with your respected and due consideration and appreciation of the attached materials, is that all such parties, and others as deemed necessary, cooperate and coordinate via the IAC as expressly charged and directed in Executive Order 14008, to initiate and expedite the necessary coordination for the EPA and its legal defense from the Department of Justice (DOJ) to concede in the currently pending TSCA lawsuit: FOOD & WATER WATCH, INC., et al., Plaintiffs, v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, et al., Defendants, Case 3:17-cv-02162-EMC, in the U.S. District Court Northern District of California. I further pray that such recommendation be accepted, embraced, and supported at the highest level executive offices of the current Biden-Harris administration, and that the recommended action of ultimately granting the essence of the petitioners' requested relief of an ultimate ban on the addition of fluoridation chemicals to drinking water supplies, be implemented at the referenced lawsuit's next bench trial, currently scheduled to begin January 29, 2024, in the Court of the Honorable Edward M. Chen.Thank you for this opportunity to further advance the current and ongoing achievements of our great nation's Environmental Justice initiatives. Sincerely, John Mueller Guthrie, OK

Certificate of Analysis (CofA) delivered with tanker truckload of FSA on 03/08/2013 to City of Tulsa drinking water treatment plant.

A CofA is required with each tanker truck delivery of FSA. FSA is then added to treated drinking water for human consumption for dental treatment, needed or not, with no follow-up for efficacy, and no informed consent. Fluoride is not an essential nutrient.
This is compelling evidence that fluoridation has been an egregious violation of the spirit and intent of the Safe Drinking Water Act and must end with proper EPA regulation and SDWA enforcement.

Mosaic™

8813 Hwy 41 South
Riverview, FL
Telephone: (813) 677-9111 - TELX52666
Fax: (813) 671-6283 ACCOUNTING

This product was produced at the Production Plant - Riverview facility

CAR NO: GATX011210

Deliveries: 5001084843

Material: Our / Your reference
200011 FLUOROSILICIC ACID /

Quality Certificate
Date
03/20/2013
Purchase order item/date

Delivery item/date
5001084843 000010 / 03/08/2013
Order item/date

Customer number
2445

Inspection lot 110000002967 from 03/20/2013

Chemical Analysis		
Net H2SiF6	24.20	%
P2O5	0.04	%
Free Acid	0.35	%
Lead	0.00	ppm
Arsenic	52.00	ppm MCLG = 0
Physical Analysis		
Density	1.2230	g/cm3
APHA	30	CU

"By recovering by-product fluosilicic acid from fertilizer manufacturing, water and air pollution are minimized, and water authorities have a low-cost source of fluoride available to them." Rebecca Hanmer, EPA Office of Water, 1983

This policy remains endorsed by EPA to this day almost 40 years later.

Annotations by John Mueller
Guthrie, OK Rev 2/5/2023

"We certify that product shipped with this Certificate of Analysis meets AWWA B703-11"

NSF

Certified to ANSI/NSF 60 | Max. Use: 4 mg/L

Kwasi Sakyi-Amfo
QC Lab Supervisor - Riverview

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAR 30 1983

OFFICE OF
WATER

Leslie A. Russell, D.M.D.
363 Walnut Street
Newtonville, Mass. 02160

Dear Dr. Russell:

Thank you for your letter of March 9, 1983, in regard to the fluoridation of drinking water.

The information available to the Environmental Protection Agency is that fluoridation is a safe and effective means for reducing the occurrence of dental caries. The fluoridation process has been endorsed by several Presidents of the United States and by several Surgeons General, including the current Surgeon General, Dr. C. Everett Koop. A copy of Dr. Koop's statement on fluoridation is enclosed.

Water treatment chemicals, including fluosilicic acid, have been evaluated for their potential for contributing to the contamination of drinking water. The Water Treatment Chemicals Codex, published by the National Academy of Sciences, prescribes the purity requirements for fluosilicic acid and other fluoridation chemicals.

In regard to the use of fluosilicic acid as a source of fluoride for fluoridation, this Agency regards such use as an ideal environmental solution to a long-standing problem. By recovering by-product fluosilicic acid from fertilizer manufacturing, water and air pollution are minimized, and water utilities have a low-cost source of fluoride available to them. I hope this information adequately responds to your concern.

Sincerely yours,

Rebecca Hanmer

Rebecca Hanmer
Deputy Assistant Administrator
for Water

Enclosure

LEAGUE of UNITED LATIN AMERICAN CITIZENS

Civil Rights Violation Regarding Forced Medication

WHEREAS, the League of United Latin American Citizens is this nation's oldest and largest Latino organization, founded in Corpus Christi, Texas on February 17, 1929; and

WHEREAS, LULAC throughout its history has committed itself to the principles that Latinos have equal access to opportunities in employment, education, housing and healthcare; and

WHEREAS, LULAC advocates for the well-being of, but not exclusively of, Hispanics throughout our country; and

WHEREAS, safe drinking water is a necessity for life; and

WHEREAS, the purpose of a public water supply is to supply water to the entire community which is composed of people with varying health conditions, in varying stages of life, and of varying economic status; not to forcibly mass medicate the population which is a civil rights violation; and

WHEREAS, fluoridation is mass medication of the public through the public water supply; and

WHEREAS, current science shows that fluoridation chemicals pose increased risk to sensitive subpopulations, including infants, the elderly, diabetics, kidney patients, and people with poor nutritional status; and

WHEREAS, minority communities are more highly impacted by fluorides as they historically experience more diabetes and kidney disease; and

WHEREAS, minorities are disproportionately harmed by fluorides as documented by increased rates of dental fluorosis (disfiguration and discoloration of the teeth); and

WHEREAS, the National Research Council in 2006 established that there are large gaps in the research on fluoride's effects on the whole body; a fact that contradicts previous assurances made by public health officials and by elected officials, that fluorides and fluoridation have been exhaustively researched; and

WHEREAS, a growing number of cities and health professionals have rejected fluoridation based on current science and the recognition of a person's right to choose what goes into his/her body; and

WHEREAS, the CDC now recommends that non-fluoridated water be used for infant formula (if parents want to avoid dental fluorosis – a permanent mottling and staining of teeth), which creates an economic hardship for large numbers of families, minority and otherwise; and

WHEREAS, the League of United Latin American Citizens (LULAC), founded in 1929, has historically been a champion of the disenfranchised and a leader in the fight for social and environmental justice; and

WHEREAS, City Council Districts I-6 of San Antonio (predominantly minority districts) voted overwhelmingly that the public water supply should not be contaminated with fluoridation chemicals; and

WHEREAS, the election to fluoridate the water, essentially disenfranchised the right of these minority Districts to safe drinking water for all; and

WHEREAS, the U.S. Health and Human Services and the EPA (January 2011) have recently affirmed the NRC Study results that citizens may be ingesting too much fluoride and that the exposure is primarily from drinking water; and

WHEREAS, the proponents of fluoridation promised a safe and effective dental health additive, but the San Antonio Water System's (SAWS) contract for fluoridation chemicals proves a "bait and switch"; as SAWS is adding the toxic waste by-product of the phosphate fertilizer industry, that has no warranty for its safety and effectiveness for any purpose from the supplier (PENCCO, Inc.) or the source (Mosaic Chemical); and

THEREFORE, BE IT RESOLVED, that LULAC commends efforts by organizations that oppose forced mass medication of the public drinking supplies using fluorides that are industrial grade, toxic waste by-products which contain contaminants (arsenic, lead, mercury) which further endanger life; and

BE IT FURTHER RESOLVED, that LULAC supports efforts by all citizens working to stop forced medication through the public water system because it violates civil rights; and

BE IT FURTHER RESOLVED, that LULAC opposes the public policy of fluoridation because it fails to meet legislative intent; and

BE IT FURTHER RESOLVED, that LULAC demands to know why government agencies entrusted with protecting the public health are more protective of the policy of fluoridation than they are of public health.

Approved this 1st day of July 2011.

Margaret Moran
LULAC National President

My name is John Mueller; and I am a retired public works engineer and former water treatment professional, and I thank you for this opportunity to continue advocating for the end of artificial water fluoridation.

Last week I emailed materials to this committee which hopefully you have reviewed as they pertain directly to infant and maternal mental health, respecting the NTP's report on the science, and the current TSCA lawsuit to end fluoridation.

I am now going to read to you the brief closing statements in an article published in the Spring 1999 edition (24 years ago) of the Florida State University Journal of Land Use and Environmental Law. The title of the article is, "Highlights in North American Litigation During the Twentieth Century on Artificial Fluoridation of Public Water Supplies."

And I quote:

> "The end of fluoridation will take time, but not because time is necessary to develop essential scientific information. We already know enough to appreciate the enormity of the risk. We knew enough many years ago. But the end will finally arrive, because, as Aristotle said at the beginning of *The Metaphysics,* all men by nature desire to know.[231]

The article then finishes by telling us,

> "Ignorance cannot be perpetuated forever. The necessary legal and scientific reforms will come in the twenty-first century. Our descendants will look back on us, and they will be amazed." [1]

I pray you will agree that the fluoridation controversy has now reached critical mass favoring the end of the practice, and that the time is now for ending dental treatment with our tap water. The current administration is telling us the time is now as directed in President Biden's highest priority initiatives on environmental justice and listening to the science, spelled out in multiple Executive Orders, including 13985, 13990, 14008, and further reiterating and promoting those in the more recent EO 14091.

The rapidly increasing public awareness of this issue also tells us the time is now. An article was recently published by an online business news service, about the current TSCA lawsuit. The article has had over 120,000 views just in its first few weeks.

In summary, it is time to apply the precautionary principle, and first do no harm. Current and emerging science tells us fluoridation is harmful to prenatal and early life brain development.

The precautionary principle can be embraced and applied most judiciously and with integrity by the EPA conceding in the TSCA lawsuit with coordination through the Interagency Council established in Executive Order 14008 section 220.

Thank you again for this special opportunity to help promote public health and especially the future brain trust of our great nation.

231. SICBAWORICSOF ARISToTLE 689(W.0. Ross trans., Richard McKeon ed.1941)

1. Graham, John Remington and Morin, Pierre-Jean (2018) "Highlights in North American Litigation During the Twentieth Century on Artificial Fluoridation of Public Water Supplies," *Florida State University Journal of Land Use and Environmental Law*: Vol. 14 : No. 2 , Article 1.
Available at: https://ir.law.fsu.edu/jluel/vol14/iss2/1

My name is John Mueller; and I am a retired public works engineer and former water treatment professional, and I thank you again for this opportunity to continue my advocacy for ending the practice of artificial water fluoridation. This is my 11th or 12th WHEJAC public meeting, and the Justice40 Initiative is a clear and present solution to the environmental injustice of water fluoridation. Justice40 investment can and should be directed to shifting and reallocating grant funds from the CDC's Community Water Fluoridation (CWF) program to more targeted programs in communities of need. These are communities that call out with children literally crying in pain in their epidemic of tooth decay and horribly poor oral health. The environmental injustice indicators are readily available and have been submitted for previous WHEJAC public meetings that I and others have attended.

One category of Justice40 investment, and I quote from the White House website, ". . remediation and reduction of legacy pollution, and the development of critical clean water and wastewater infrastructure."

Ending fluoridation will result in substantial utility savings by ending the damage to drinking water infrastructure due to the storage and handling of the extremely corrosive and harmful raw chemicals required to fluoridate the tap water and adjust the pH.

I pray that you will agree that, with the pending TSCA lawsuit and the NTP's reviews of the science, that the fluoridation controversy has now reached critical mass, and that the time for fluoridation reform is now, from President Biden's highest priority initiatives on environmental justice and listening to the science, as spelled out in multiple Executive Orders, including 13985, 13990, 14008, and further reiterating and promoting those in the more recent EO 14091. The Biden Administration is telling us the time is now.

In summary, it is time to apply the precautionary principle, and for a paradigm shift to more effective and technologically advanced dentistry where needed most, instead of a one-size-fits-all attempt to treat the childhood tooth decay epidemic in disadvantaged families and communities with everybody's tap water.

This can be achieved most judiciously and with integrity by the EPA conceding in the TSCA lawsuit with coordination through the Interagency Council.

And just one more thing: Ms Tilousi, Carletta if I may, please know I have a special place in my heart for Supai and the Havasu Canyon with its spectacular waterfalls. I have packed in twice and hiked up from the Colorado River once, and spent inspiring days and nights taking in and savoring their awesome beauty.

Thank you again for this special opportunity to help promote the public health and especially the future brain trust of our great nation.

Hello,

Please see the attached letter (2023-6-29 WHEJAC Letter final) from Earthjustice and a large number of community groups and environmental groups regarding the upcoming Lead and Copper Rule Improvements proposal and the Consumer Confidence Report proposed rule. Also attached are two other documents referenced in the aforementioned letter.

Thanks,

Julian Gonzalez

May 22, 2023

Radhika Fox, Assistant Administrator for Water
U.S. Environmental Protection Agency
1200 Constitution Ave., NW
Washington, DC 20460

Re: Comments on EPA' Proposed "National Primary Drinking Water Regulations: Consumer Confidence Report Rule Revisions" [EPA–HQ–OW–2022–0260]

On behalf of our millions of members, supporters, and allies who are concerned about the health effects of contaminants in their drinking water, and who believe in the public's right to know about the contaminants in their drinking water and potential health risks they pose, we thank you for the opportunity to comment on EPA's Proposed "Consumer Confidence Report [CCR] Rule Revisions." 88 Fed. Reg. 20092 (April 5, 2023). We shall refer to these reports as "right-to-know" (RTK) reports, as that term better reflects the intent of providing these reports to consumers. Unfortunately, these reports to date have been used more to obscure problems than to educate consumers, as discussed further below. Too often, water systems have used these reports more as public relations documents than to meaningfully inform their consumers about health risks posed by contaminants in their drinking water and how they may protect themselves and their families. Frequently, the utilities bury and obscure problematic information about their water deep into the report and include sweeping generalizations about safety and compliance, while minimizing all too real risks, at the front. It is therefore imperative that the final rule includes every mechanism possible to ensure that these reports serve their purpose. These comments highlight portions of the proposed rule we believe are good steps forward and set forth suggestions to improve the proposed rule.

I. RIGHT-TO-KNOW REPORTS—INTENT AND RESULTS

A. Original Intent of 1996 SDWA Amendments in Creating Right-to-Know Reports

Congress enacted what were often referred to by Congressional sponsors as the "Right-to-Know" report requirement[1] in 1996 as part of its effort to ensure that consumers of drinking water are provided accurate, understandable, and important information on the quality of their drinking water and its source. As the House Committee Report notes,

[1] *See, e.g.*, Statement of Chairman Bliley, 114th Cong., 2d Sess., Cong.Rec. (daily ed.) at H6742 (June 25, 1996); Statements of Chairman Bliley and Rep. Saxton, *id.* at H6752; Statement of Rep. Camp, *id.* at H6761; Statement of Rep. Ensign, *id.* at H6762; Statement of Senator Boxer, 114th Cong., 1st Sess., at S17768 (daily ed.) (No. 29, 1995).

> The Committee expects that the Administrator will promulgate regulations that ensure risks from exposure to contaminants in drinking water will be communicated in an accurate and understandable manner. . . . The Committee expects that in most cases, the reports will be one-page reports which can be included in ordinary mailings. Therefore, the statements which the Administrator is required to develop, and water systems are required to use, concerning the definition of terms and the explanation of health effects, should be as simple and straightforward as possible.[2]

As the original Senate sponsor of this provision, Senator Boxer noted in advocating for requiring these right-to-know reports,

> I have a new grandchild, and that grandchild is the most precious thing to me and to his family. When that grandchild visits Washington, DC, I am not sure if I should mix that formula with the tap water, because there has been an advisory of late to be careful. I think it is important for people to know if they should, in fact, mix that formula with tap water. They should know, if they are concerned about an elderly person, whether the water is safe. …So if someone does have someone living with them who is part of a vulnerable population—be it an infant, be it a child under 6, be it a grandma, a grandpa who has some problem, be it a cancer victim, be it an AIDS victim—we would have an opportunity to know if, in fact, that water could harm them….
>
> I do believe that the… amendment will also benefit water suppliers because it will increase consumer awareness of how their local water system performs and what challenges that system faces as it tries to maintain water quality. We have a water board in our home county, and they come to us once in a while and say, ''You know, we have to increase your water rates.'" ''Why?'' If I know it is to make that water safer, if it is to make sure contaminants are taken out of the water, that is a plus for that water district, and there will be more support.
>
> Currently, consumers are required to be notified only if a water supplier violates an enforceable standard. Consumers do not have to be told if their tap water contains common contaminants which are not regulated, such as cryptosporidium and radioactive radon. We know cryptosporidium kills people. We do not happen to have a standard established for cryptosporidium. Does that mean we should not let people know if it is in their water supply?[3]

Thus, the intent for these reports has always been to ensure that people drinking the water will be provided with helpful information to assist them in deciding whether their tap water could harm them or any vulnerable members of their household. The intent is to inform them of such health risks in plain and understandable language, regardless of whether their water system has experienced a violation of EPA standards or treatment techniques. The intent also is to help consumers understand that water rate increases may be necessary to help their water system upgrade to remove health risks from their drinking water.

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[2] H.R. Rep. No. 104-632 Part 1, 104th Cong. 2d Sess. at 36 (June 24, 1996)

[3] Statement of Senator Boxer, 114th Cong., 1st Sess., at S17768 (daily ed.) (No. 29, 1995) (note that the Boxer Amendment was tabled by the Senate, but later incorporated into the House bill and eventually approved in Conference and included in the finally-enacted 1996 SDWA Amendments.)

B. The Historic Failure of Right-to-Know Reports to Serve Their Intended Purpose

The Congressional intent of the drinking water right-to-know requirement in the 1996 Safe Drinking Water Act amendments was to inform the public about: 1) the contaminants in their drinking water and their water source; 2) the health effects of these contaminants; and 3) how to protect themselves from the impact of these contaminants. Instead, far too many water systems converted these reports into public relations documents with confusing, unintelligible, and sometimes false and misleading information often designed to placate consumers into believing their water was fine regardless of the results of contaminant monitoring. In fact, even the name assigned these right-to-know reports – Consumer Confidence Reports - undermines the Congressional intent.

In 2003, NRDC published a review of the RTK reports of 20 of the nation's largest cities and in four California cities (the "NRDC Study") finding that many of these cities had obfuscated, downplayed, or outright misled their consumers about water quality issues. What has been found since then, unfortunately, is that even in cases of extreme water quality problems, violations, and Lead Action Level Exceedances (LALEs), the reports still often fail to convey any real indication of the seriousness of the problem.

The following are just a few examples to illustrate how water systems have used these reports to convey false and misleading information about the safety of their drinking water.

- **"Your drinking water is safe."** This sweeping generalization is often used even when the water system has had violations, action level exceedances, or other levels of contaminant levels, such as lead, well in excess of the health-based Maximum Contaminant Level Goals.
  - In the **Newark, NJ** 2017 report (page 1) amid that community's lead in drinking water crisis, Mayor Baraka wrote:

    "I am pleased to present the Water Quality Report, which confirms that the City of Newark's water is not only safe to use and drink but that it is some of the best water in the State of New Jersey."

  - The **Flint Water Crisis** made international headlines after residents exposed elevated lead levels in that community's drinking water. At the height of the crisis, the City's RTK reports provided little information about the status of lead in the community's drinking water. Although Flint's 2015 report (page 5) includes the following statement, inexplicably, there is no statement about the city's massive lead in drinking water problem.

    "We also wish to openly acknowledge that other water quality data collected during 2015 and included in this annual report may not have accurately measured the condition of Flint's drinking water at the time. Recent events have shown that not all sampling sites used by the City of Flint – Water Treatment Plant for compliance with the lead and copper rule qualified as high risk sites defined in the regulation. Therefore, the compliance results reported by the City likely did not accurately represent the water quality this monitoring is intended to reveal by targeting high risk sites. Since discovering this fact, the City of Flint – Department of Utilities has been

working diligently with the Michigan Department of Environmental Quality and the United States Environmental Protection Agency to develop a sampling program that includes sites that have been confirmed by inspection as posing the greatest risk for containing high levels of lead in water samples. The results of this enhanced lead and copper monitoring that began in February of 2016 and will continue through the end of this year can be found on the internet at: http://www.michigan.gov/flintwater. We want our customers to know that the lead and copper results from 2015 compliance monitoring are included in this report because it is a requirement of the Federal and State SDWA even though it was discovered after the fact that these sampling sites did not all comply with the selection criteria established for his compliance monitoring."

Further, the 2015 Lead and Copper results table states there was no violation of the LCR.

- During the height of **Washington, DC's** lead in drinking water crisis, the water system proclaimed its drinking water was safe despite having elevated levels of several contaminants at the time. As the NRDC Study explained:

*'The cover pages of the 1999, 2000, and 2001 Washington, D.C., right-to-know reports, for example, included prominent and unqualified statements of safety: "Your Drinking Water Is Safe!"—**even though the city had the highest levels of cyanide reported in this study, as well as elevated levels of chlorination byproducts, lead, and bacteria, among other pollutants** [emphasis added]. Such prominent and unqualified statements undercut mandatory warnings issued later in the reports explaining that infants, children, and pregnant women may be at special risk from lead, and that immunocompromised people may be at risk from pathogens in city tap water."*

While the Washington, DC RTK reports are available online, the cover pages are no longer visible.

- **"Your drinking water contains no lead when delivered to you [or when it leaves our treatment plant]."** Such statements are made when the water system is well aware that the lead generally enters tap water from a lead service line or premise plumbing, particularly when the system does not have adequate CCT.
  - Although **Portland, OR** has a history of elevated lead levels, the 2022 RTK report's contaminant data section (page 6) included lead for the first time in the section labeled "Treated drinking water: Metals and nutrients at the entry point" and indicates the maximum lead level **at the treatment plant** [emphasis added] was 15 ppb. Diligent readers can finally discover that year's LALE on page 8; on that page, these few hardy readers learn the water system exceeded the lead action level with a 90th percentile of 21 ppb. The accompanying text states:

"Lead and copper testing results from homes with higher risk of lead in water. The Portland Water Bureau offers free lead-in-water tests to anyone in the service area. Twice each year, the Portland Water Bureau also collects water samples from a group

of over 100 homes that have lead solder and are more likely to have higher levels of lead in water. Testing results from fall 2021 showed that more than 10 percent of these homes had elevated levels of lead. Because these results exceeded the action level for lead, the Portland Water Bureau informed customers about the lead results. We also completed construction and brought improved corrosion treatment online to reduce lead levels at the tap. See page 9 for more information."

On that same page, the report refers to "homes with higher risk of lead in water," which could pertain to thousands of homes that have lead solder or other lead components in their household plumbing and fixtures.

In another attempt to minimize the water system's high lead levels, a footnote at the end of the compliance monitoring data table states: *"90 percent of the sample results were less than the values shown."*

Another excerpt on that same page 8 attempts to assign homeowner's responsibility for the release of lead in their drinking water, yet fails to mention that even new plumbing products and fixtures contain lead. The excerpt also attempts to minimize the dangers of lead in drinking water despite the water system's LALE and the knowledge that lead in drinking water can contribute significantly to blood lead and overall lead exposure.

"In Portland, lead enters drinking water from the corrosion (wearing away) of household plumbing materials containing lead. These materials include lead-based solder used to join copper pipe— commonly used in homes built or plumbed between 1970 and 1985—and brass components and faucets installed before 2014. In Portland, the most common sources of lead exposure are lead-based paint, household dust, soil, and plumbing materials. Lead is also found in other household objects such as toys, cosmetics, pottery, and antique furniture."

The report references bringing improved CCT online during the reporting period (page 6), but there is no mention of the responsibility the water system has for using ineffective CCT prior to that time or that it could take months or years to determine if this attempt at CCT is effective. Consequently, the water system's suggestion that residents "Consider using a filter certified to remove lead," (again on page 8) falls far short of providing the information consumers need to protect themselves from the water system's inability to control corrosion at the treatment plant.

- **"We are in full compliance with state and federal regulations."** This phrase is often used to convey the impression that the water is completely safe, and often used in present tense even though there were past violations, action level exceedances, problematic sanitary survey results, or unregulated contaminant monitoring findings that may recur and pose real health risks.
    - During **Washington, DC's** lead in drinking water crisis between at least 2000 and 2004, the 2001 and 2002 DC water system reports exclaim in the opening "letter" summary on page 1 that:

"We are once again proud to report that Washington DC.s drinking water met or surpassed all requirements of the Federal Safe Drinking Water Act (SDWA) every single day in [2001/2002.]"

- **Trenton, NJ** was an EPA "enforcement priority" system in 2020 and 2021 for a range of violations including ongoing treatment technique violations of the Lead and Copper Rule, a disinfection byproduct MCL violation, a Long Term 1 Surface Water Treatment Rule treatment technique violation, and numerous monitoring and other violations. Yet, the cover of the 2020 RTK report stated "Quality drinking water is an essential resource. The good news is your tap water is top quality. Our water meets all federal and state standards." This is flatly false. Indeed, much later the report includes in unintelligible technical language loaded with acronyms a litany of violations of treatment techniques, MCLs and other EPA rules. Also, in large, bold letters the cover of the report says "Your drinking water: It's high quality." This is highly misleading or flatly false.
- **Providence, RI's** 2016 and 2017 reports included this language during an LALE.

  Exceptional Drinking Water for You and Your Family: We are once again proud to present our annual water quality report covering all testing performed between January 1 and December 31, 2016. Over the years, we at Providence Water have dedicated ourselves to producing world-class drinking water at a bargain price that ***meets all state and federal standards*** *[emphasis added]. We continually strive to adopt new methods for delivering the best-quality drinking water to you. As new challenges to drinking water safety emerge, we pledge to remain vigilant in meeting the goals of source water protection, water conservation, and community education, while continuing to serve the needs of all our water users.*

  Reports from 2017, 2018, and 2019 included the same language.

- **Photos or graphics showing happy children or consumers drinking clear water and implying water safety when the system has had violations or action level exceedances.** Often, violations and action level exceedances are discussed late in the text or noted in extensive difficult to read tables. For example, despite an ongoing LALE and extensive lead contamination in the city's water system, the 2001 DC Water and Sewer Authority report features attractive photos of happy children and adults using water on the first page and stated, falsely, that "Once again, Washington D.C.'s drinking water met or surpassed all requirements of the federal Safe Drinking Water Act (SDWA) every day in 2001."

  Similarly, the cover of the Trenton, NJ report for 2020 includes a happy child drinking water above the proclamation in large bold print that "Your Drinking Water: It's High Quality," and a false claim on the cover that the system "meets all state and federal standards" despite a litany of violations in that year.

  The Denver Water report for 2013, a year when the system exceeded the lead action level, also has photos of happy consumers drinking water on the cover and inside, and asserts "Denver proudly serves high quality water" and "We take our water quality very seriously." The mandatory notice regarding lead says "*if* present" lead poses certain health risks but

makes no mention of the action level exceedance or the City's estimated 64,000 to 84,000 lead service lines; the LALE is only noted in small print in a table on the last page (page 7), which also says there was no violation of the lead rule.

- **The omission of important information**. Key information such as violations, action level exceedances, significant levels of contaminants above an MCLG or Health Advisory, or problematic sanitary survey results are often omitted (or as noted below, buried in the report), and are especially often missing from summaries or up-front information provided in the report.
  - **Flint's 2016 report**, released during a LALE, includes this statement:

    *"**If present** [emphasis added], elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Infants and young children are typically more vulnerable to lead in drinking water than the general population. Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. The City of Flint is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline (800-426-4791) or at http: www.epa.gov.safewater/lead. Officials recommend that all residents use water filters provide[d] by the state in areas where construction activities are taking place to remove service lines."*

    This report also includes the 90th percentile for lead at 20 ppb but states there is no violation.
  - The **Fort Lauderdale, FL** water system, identified as an EPA "enforcement priority" due to ongoing total coliform rule and groundwater rule violations throughout 2020, 2021, and 2022, makes no mention of any violations in its RTK reports. In fact, the reports for 2020 and 2021 say in a table "N" for whether there was a coliform violation, and state in a footnote "No violations were identified within the City's area of purview."
  - **Shreveport, LA**'s water system was also identified as an EPA "enforcement priority" due to violations of the Surface Water Treatment Rule and Long Term 1 Surface Water Treatment Rule in 2021 and 2022. However, the 2022 report mentions the violations in a

footnote to a table on page 5 of 6 pages in the report. A table indicates that there was a violation of the turbidity standard which is not explained until the footnote.

- The **York, PA** water system, flagged as an EPA "enforcement priority" for violations of the total coliform rule and disinfection byproducts rule in 2022, also had a violation of the asbestos MCL in that year. The 2022 RTK report fails to mention the total coliform MCL violation and the disinfection byproducts monitoring violation entirely, and only discusses the asbestos MCL violation and the coliform monitoring violation in a footnote to the table on page 10 of 11 in the report.
- **Franklin Township, NJ's** water system is an EPA "enforcement priority" due to LCR treatment technique and monitoring violations, a total coliform rule violation, public notice rule violations, and more recently disinfection byproduct rule and surface water treatment rule violations. The 2021 report mentions, as a "Special Note" on page 6 of 7 following a series of definitions and after pages of tables that don't mention any violations, that states the system "experienced" pH monitoring violations and "had a small number of samples which fell out of the range for pH…" There is no discussion of potential health impacts or effects on lead levels of these violations.
- The **La Habra Heights, CA** system's report is a fairly typical example of a problematic report. This water system failed to mention in its 2021 RTK report that it had a violation of the requirement to monitor for chlorine until an attachment at the end of the report, and it failed to mention elevated levels of PFAS found in its drinking water except in an extremely small font table deep in the report. Neither of these issues is mentioned in the beginning of the report or highlighted as important issues in the body of the report.
- Despite EPA's July 14, 2021 **Clarksburg, WV** Administrative Order (Docket No. CWA-03-2021-0110DS), shockingly, there is no mention in that community's 2021 RTK report of a problem with elevated lead levels in the drinking water.
    - *"If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The Clarksburg Water Board is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your drinking water, you may wish to have your water tested. Information on lead in drinking water, testing methods and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline at 1-800-426-4791 or at http://www.epa.gov/safewater/lead."*
    - Further, Clarksburg's boilerplate lead information did not mention service lines as a potential source of lead in drinking water. In 2021, the year the community's water crisis was discovered, Clarksburg's boilerplate lead source language reads:

"Corrosion of household plumbing systems; erosion of natural deposits," and it made no mention of service lines.

- **Benton Harbor, MI**, another community that experienced a lead in drinking water crisis, lead service lines were not included in the RTK reports as a potential source of lead in drinking water until 2017. In the aftermath of Flint, this language was included in Benton Harbors 2017 report: *"*A New Message, Please read: The Michigan Legislature has revised the Safe Drinking Water Act of 1976; In the new Act there are many changes regarding Lead and Copper Issues. One of those changes is for the Community Water Supplier to tell the Water Customers about the Major Source of Lead in Drinking Water and some Additional Health Concerns about Lead. *1st, the additional Health Effects Statement, required: * Infants and children who drink water containing lead could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure*. *2nd Major Source of Lead in Drinking Water: *Lead services lines, corrosion of household plumbing including fittings and fixtures; erosion of natural deposits* (Required Language in Michigan's revised ruling.)"*

- **Inclusion of language seeking to excuse or explain away violations or action level exceedances.**
  - **Benton Harbor, MI** sought to downplay multiple violations through statements like the following that were included with the city's 2021 report (issued in 2022):

    "Our water system violated a drinking water treatment requirement on May 18, 2021. A brief lapse in chemical addition resulted in a precautionary water advisory, which was lifted on May 21, 2021 after flushing and sampling ruled out microbial contamination of the water system. ***We were required by the State of Michigan to send this notice to each customer no later than June 30, 2021 but this was not done due to an oversight. This is no longer an emergency, but the public has the right to know about events impacting the drinking water system.*** *[emphasis added.] This notification is required to be sent by USEPA and the State of Michigan."*

    "We, the Benton Harbor water system, have no record of contacting the State in 2017 prior to modifying our disinfection practices. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we did to correct this situation. Between 2010 and 2017, changes were made to our disinfection practices. Those changes required collaboration and approval with the State to conduct Study of Disinfection Profiling and Benchmarking Process as the first step prior to making any changes. Disinfection is a critical element in controlling the transmission of disease from drinking water by inactivating disease-causing pathogens, such as bacteria, protozoa, and viruses that can affect human health. We were required to submit to the State a description of the proposed change to our disinfection

practices, specific disinfection records, and an analysis of how the proposed change would affect the levels of disinfection in our system."

- Orchard Dale Water District (CA) and La Habra Heights, CA RTK reports seek to minimize the importance of MCL violations, apparently using an industry template that says:

  "Exceedance of a primary MCL does not usually constitute an immediate health threat. Rather, it requires testing the source water more frequently for a short duration. If test results show that the water continues to exceed the MCL, the water must be treated to remove the substance, or the source must be removed from service."

- **Burying key information on contamination, violations, action level exceedances in tables and verbiage late in the report.** Often key information is buried, such as by including extensive discursive verbiage on several pages prior to a brief buried mention of these problems in text or on a table deep into the report that few if any consumers will ever find or understand. Consumers often are likely to simply give up and toss the report aside, assuming that anything important would be brought to their attention.

  - As previously noted, **Washington, DC** had an extensive lead contamination problem from at least 2000 to 2004, yet the water utility buried that information in verbiage deep in the reports and in tables. For example, the 2002 Washington, DC RTK report, issued when the city had a LALE of 49 ppb, included a first page cover letter that said the system was in compliance with every drinking water standard every day of the year. It then, buried on page 6 in a nearly unintelligible table, the fact that the city had a LALE of more than 3 times higher than the action level, and it included a brief textual mention that it exceeded the action level (without including the levels detected) buried in one sentence on page 4.
  - **Denver, CO** has had elevated lead levels for years but has only one recorded LALE, which took place in 2012. The only reference to the 2012 LALE is in the regulated contaminant table on page 7 of the City's 2013 report where it states in its table "N"—meaning that there was no violation for lead, and then notes that the action level was exceeded in small print and then has a small print footnote stating the following:

    "Lead isn't found in Denver's treated water. However, lead might be present in ***household plumbing*** *[emphasis added]."*

    There was no reference to the City's estimated 64,000-84,000 LSLs that were the focus of the water system's 2019 LCR variance request

    The only other references to lead in drinking water was in this boilerplate language, used during a LALE, and which omitted any reference to LSLs:

    "If present* *[emphasis added], elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Denver Water is responsible for providing high quality drinking water, but*

*cannot control the variety of materials used **in plumbing components** [emphasis added]. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead."*

- **Portland, OR** finally disclosed an action level exceedance on page 7 of its 2017 report where they stated: "In testing conducted in October 2016, more than 10 percent of homes, 14 of 112, exceeded the lead action level."

- **Overly technical language and unreadable tables are common.** Utilities often include extensive detailed discussions prior to a statement about a water quality issue, or they bury violations or exceedances of action levels in complex, difficult to interpret tables.
  - Providence, RI included this paragraph in the middle of a section entitled "Lead in Home Plumbing" on page 4 as a way of disclosing its LALE:

    "Providence Water analyzes lead concentrations in water samples collected from 300 homes in our retail area two times each year. There is no MCL for lead. The EPA determines a lead exceedance based on whether 90 percent of the homes tested have lead levels less than the action level (AL) of 15 ppb. In the first half of 2017, this 90th-percentile value was 14 ppb. In the second half, the 90th percentile was 17 ppb, which exceeds the 15 ppb AL. This exceedance triggered public notification and treatment technique requirements. Providence Water is working with a panel of nationally recognized corrosion experts to optimize our treatment. We are also committed to improving our distribution system through our flushing and water main rehabilitation programs."
  - **Trenton, NJ** was an EPA enforcement priority in 2020 and 2021 for a range of violations including treatment technique violations for the Lead and Copper Rule, disinfection byproduct MCL violations, Long Term 1 Surface Water Treatment Rule treatment technique violation, and numerous monitoring and other violations. In reporting these violations to the public in its 2020 RTK report, Trenton provided these essentially unintelligible notifications:

    Trenton Water Works Violation: Description of noncompliance
    2019-4101 3/6/19 Failed to remediate LRAA MCL within one year for TTHM issued 3/19/19.

    2019-4103 Turbidity 1. Failure to conduct continuous monitoring 2. Failure to record IFE results every 15 minutes (since they kept the bed on and it wasn't recording properly) 3. Failure to take the daily grab sample on 5/4/19 to verify analyzers as indicated below

2019-4102 system failed to conduct grab samples after a continuous monitoring IFE failure at filter #3E and 7W. Continuous monitoring equipment failed on 05/04/2019 @ 12:40 AM and was noticed on 05/04/2019 at 6:00 PM;

2020-4106 Failure to replace 14 percent of all lead service lines by July 31, 2020.

- **No infographics or easily intelligible charts are common**. Without readily-digestible infographics or other easy to read charts, consumers are left to plow through page after page of text and complex, difficult to read tables to get relevant information.
- **Failure to deliver to all consumers (i.e., renters, condo owners, residents of nursing homes, etc.).** This is a serious and widespread problem the authors of these comments know from personal experience. The required "good faith effort" to reach people who drink the water but do not see the water bill is an abject failure. Renters, condo owners, and residents of group facilities such as nursing homes rarely, if ever, see these reports.

- **Reliance on electronic delivery means most people never see the report.** Nearly one in four U.S. households lack home internet.[4] For the reasons set forth in more detail in section IV, enormous swaths of consumers, disproportionately underserved populations, never see applicable RTK reports, defeating their very purpose.

- **Failure to translate the reports.** About one in five Americans does not speak English at home and, while some of these people are bilingual at least to some extent, fully 25 million adults in the U.S. do not speak English very well, according to Census data.[5] Thus, when RTK reports are not translated, tens of millions of Americans are not able to understand the reports even if they are literate in other languages.

C. 2018 AWIA Amendments

After Congressional hearings and media reports focused attention on the inadequacy of RTK reports at effectively getting the word to consumers about problems with their water, and in the wake of the Flint water crisis, Congress adopted amendments to the right-to-know report provisions in the America's Water Infrastructure Act of 2018 (AWIA).[6] Those amendments required EPA to overhaul its rules for RTK reports, and to improve the "readability, clarity, and understandability" of the reports, as well as to "increase the accuracy of information presented

[4] Catherine McNally, Nearly 1 in 4 Households Don't Have Internet—and a Quarter Million Still Use Dial-Up, Aug. 17, 2021, https://www.reviews.org/internet-service/how-many-us-households-are-without-internet-connection/
[5] https://www.census.gov/data/tables/2013/demo/2009-2013-lang-tables.html
[6] Pub. L. No. 115-270 (Oct. 23, 2018)

and risk communication" in the reports.[7] The measure also required systems serving more than 10,000 people to provide the reports twice a year, and allows electronic delivery in certain cases.

The lead sponsor of these provisions in AWIA, Rep. Dingell, noted,

> Everybody remembers Flint. Now we have PFAS. It is important that every American be able to trust the water they are drinking. This is why I am proud that this bill includes important provisions from legislation I introduced that would increase drinking water notifications and make consumer confidence reports on drinking water easier for every American to understand. It is an essential part of our response to drinking water crises in this country. We have a crisis of confidence in our systems, and consumers deserve clear and immediate notifications and transparency when it comes to the quality of the water they are drinking. By requiring large water systems to provide consumer confidence reports biannually, the American people will have more frequent reports on water quality, which will help identify and mitigate risks sooner.[8]

II. EPA's PROPOSED RTK/CCR RULE: SOME POSITIVE REVISIONS

It is now EPA's responsibility to carry out Congress' mandate in AWIA to ensure that these reports are more understandable, readable, clear, and accurate.

We strongly support certain measures in the Proposed Rule that we believe are steps towards realizing Congress' mandate, including requiring:

- A short summary at the front of report, with succinct information on any violations and action level exceedances. This is the single most important provision in the proposal.
- A prohibition on false, misleading statements. This also is critical.
- Requiring submission of all compliance monitoring data to EPA and making the data public.
- Distributing the reports twice per year for large systems as required by AWIA.

It is necessary, however, to make certain changes to those measures, as well as other provisions of the proposed rule, for them and the rule overall to be effective and have the RTK reports serve their purpose. The changes we believe are necessary are discussed below.

III. THE CONTENT OF RIGHT-TO-KNOW REPORTS MUST INCLUDE ALL NECESSARY INFORMATION IN A WAY THAT CAN BE EASILY UNDERSTOOD AND EPA MUST DEVELOP AND MANDATE STANDARDIZED LANGUAGE WHEN VARIATION IS NOT WARRANTED.

A. Reading Level of Report Language and Visuals Must Be One That Most Adults Can Understand (6th Grade)

[7] Id. §2008, codified at 42 U.S.C. §300g-3(c)(4).
[8] Statement of Rep. Debbie Dingell, 115th Cong,, 2d Sess., Cong. Rec. at H8227 (Sept. 12, 2018)

As EPA develops its revised rules, the Agency must ensure that any language and graphics it mandates to be included in RTK reports conforms to no higher than a 6th grade reading level. The final rule should also mandate that the additional language included in individual reports must also conform to no higher than a 6th grade reading level. A U.S. Department of Education survey data found that 130 million adults in the country have low literacy skills, meaning that more than half (54%) of Americans between the ages of 16 and 74 read below the equivalent of a sixth-grade level, according to an analysis published in 2022.[9] On average, adults in the U.S. have a 7th to 8th grade reading level.[10] When we put typical RTK reports through standard software to evaluate the reading level of the material, it tested at a 10th to 12th grade or higher levels. EPA's rules must include a requirement for graphics and a very simplified one-page summary of the report, including plainly-worded text about the health risks of contaminants found and any violations.

B. EPA Needs to Fix the Content of Right-to-Know Reports

Although the proposed rule is intended to meet the Congressional mandate to "increase the readability, clarity, and understandability," key provisions allowing water utilities flexibility in the contaminant data section will perpetuate misinformation. We support EPA's goal of preventing false and misleading information, but this regulatory flexibility would allow water systems to continue providing incomplete and inaccurate information about health effects, contaminant sources, and other information contained in the report, with grave public health ramifications.

Health effects of contaminants like nitrates, arsenic, lead, and those included in the Unregulated Contaminant Monitoring Rule (UCMR) remain consistent across water systems and, therefore, EPA should provide standardized language to water systems. Similarly, potential sources of contamination should be consistent from one system to another, and EPA should standardize this language. Where potential contamination sources are *not* consistent compared to most other systems, EPA should take care to explain the history and potential sources of this contamination unique to those systems. For example, some tribal communities are exposed to uranium, which may have adverse carcinogenic, cardiovascular, and renal effects.

Among the other key reforms that should be required in the final rule, we recommend:

1. **Templates.** EPA should issue templates in regular as well as large type for the reports that include the information recommended below. People with visual impairments, including

[9] Emily Schmidt, APM Research Labs, READING THE NUMBERS: 130 MILLION AMERICAN ADULTS HAVE LOW LITERACY SKILLS, BUT FUNDING DIFFERS DRASTICALLY BY STATE, March 16, 2022, https://www.apmresearchlab.org/10x-adult-literacy#:~:text=by%20EMILY%20SCHMIDT%20%7C%20March%2016%2C%202022&text=This%20means%20more%20than%20half,of%20a%20sixth%2Dgrade%20level, citing Jonathan Rothwell, PH.D. Assessing the Economic Gains of Eradicating Illiteracy Nationally and Regionally in the United States, GALLUP, 2020, https://www.barbarabush.org/wp-content/uploads/2020/09/BBFoundation_GainsFromEradicatingIlliteracy_9_8.pdf

[10] Center for Plain Language, What is readability and why should content editors care about it? March 22, 2017, https://centerforplainlanguage.org/what-is-readability/

many senior citizens as well as some other adults, prefer or exclusively use large print media. A recent survey of libraries found that consumer preference for large print media has increased in recent years and, although most such readers are older, there are many younger readers who also use or prefer large print media.[11]

2. **Summary.** The summary should highlight violations and action level exceedances for regulated contaminants as well as for PFAS and other UCMR results along with mandatory health effects language for each of the above. The short summary should be required to be no longer than one page, and we strongly urge that EPA require the following first three specific labeled sections to be included in the one-page summary:

   a. **Contaminants Found Above MCLGs or Health Advisories, and Arsenic/Nitrate found at >50% of MCL, and Health Effects Information for Three of Those Contaminants.** The summary should note in plain EPA-established language any regulated or UCMR-tested contaminants found at a level exceeding an MCLG or EPA Health Advisory, with a brief discussion of the health effects that are associated with at least three of those contaminants.[12] If lead is found **at any level**, that should be disclosed and health effects information included, as proposed below. If nitrates or arsenic are found at levels above half of the MCL, health information must be included for those contaminants; the nitrates information must mention not only blue baby syndrome, but also the risk of cancer among other harms.[13] If those three contaminants are not found as noted above, the water system should be required to include health effects information drafted by EPA for a total of three contaminants found at levels exceeding an MCLG or Health Advisory. This should also include information on how citizens can protect their own and their family's health.

   b. **Any violations. Action Level Exceedances or Significant Deficiencies Identified in a Sanitary Survey**. The summary should briefly note in plain EPA-established language any violations, action level exceedances or significant deficiencies found in a sanitary survey, and EPA-established health effects language for those violations, exceedances or deficiencies.

   c. **Lead Statement.** The summary should include a short, standardized statement, clearly set aside and visible on this page-one summary, which briefly (i.e. no more than 5 sentences) details the ubiquitous and pervasive nature of lead in drinking water, the public health risks associated with lead in drinking water, and an explicit statement that: no level of lead in drinking water is safe; that water that complies with federal standards

[11] Hebert, H. S., & Huwieler, C. (2022). Adult large print collections in the United States: An exploratory survey. Journal of Librarianship and Information Science, 54(1), 3–15. https://doi.org/10.1177/0961000620985921

[12] See 42 U.S.C. 300g-3(c)(4)(B)(vii).

[13] See for example Ward MH, Jones RR, Brender JD, de Kok TM, Weyer PJ, Nolan BT, Villanueva CM, van Breda SG. Drinking Water Nitrate and Human Health: An Updated Review. Int J Environ Res Public Health. 2018 Jul 23;15(7):1557. doi: 10.3390/ijerph15071557. PMID: 30041450; PMCID: PMC6068531.

does not mean lead is not present; and, what people can do to protect themselves from lead in drinking water. This would fulfill the agency's intention per the Federal Register notice that "CCRs are intended to provided consumers, especially those with special health needs, with information they can use to make informed decisions regarding their drinking water." The notice specifically calls out potential lead in drinking water exposure as an example of when stating that the water is safe may not be an accurate statement.

Below is an example of what a standardized statement could say:

> "*A warning: there is no safe level of exposure to lead. Lead is a pervasive contaminant in drinking water because it is in lead in service lines and also often in solder, plumbing, and in fixtures, all of which are common even in homes and other buildings without lead service lines. Lead exposure is associated with brain damage, impaired intellectual development, ADHD, high blood pressure, cardiovascular disease, kidney disease, miscarriage, and reproductive problems in men and women. We encourage you to take steps to protect yourself from lead regardless of the reported levels by: always using cold water that has been filtered with filters certified to remove lead; following filter manufacturers' installation and maintenance instructions; not boiling water without filtering it; not mixing unfiltered tap water with baby formula; and cleaning sink aerators regularly."*

d. **Discretionary Statement on Compliance Accompanied by Explanation of Standards.** If the water system desires to, and has room to, it should be authorized to state in the one-page summary that it was in full compliance with EPA regulations and action levels during the relevant year (if true), but it should be required to make that that statement in a section separate from the mandatory sections set forth above and to place the statement after the first two mandatory sections. The water system should be required to disclose whether it is (and was for the entire year) in compliance with all state and federal standards and note that drinking water standards are not fully protective of health, since they consider costs and feasibility, and only maximum contaminant level goals are fully protective of health.

3. **False and Misleading Information.** While we commend EPA for proposing to ban false or misleading statements in the reports, these terms are somewhat ambiguous, so we strongly urge the agency to include a list of examples of false or misleading statements. For example, EPA should make clear that a water system cannot explicitly state or implicitly contend that the water is "safe" on the basis that an MCL was not reached, a treatment technique was not violated, or an action level was not exceeded. We have listed several other categories of such statements above in our comments and urge EPA to include additional examples in the final rule EPA should also set forth that if water systems choose to eliminate tables from their reports, they must use EPA templates for how to present the data so important information is not buried in the report. This model RTK report provides an example of how to bury information (see pages 22 and 26) in a visually pleasing format.

As discussed below, EPA also should require a certification to be submitted to EPA and the primacy agency by the CEO of the water system that the report is in compliance with EPA's rules and includes no false or misleading information.

4. **Lead Service Line and Inventory Disclosure.** Water systems should be required to disclose if they have lead service lines, connectors, galvanized service lines, and if there is other lead in the system. A summary statement should be required on the status of the water system's lead service line inventory, with a link to the inventory (and map if there is one) and instructions for how to obtain a hard copy. This should be accompanied by the lead health effects language recommended above.

5. **Lead Action Level Exceedances Identification.** AWIA required RTK reports to identify any LALEs during the period the report covers. Health effects information must accompany these identifications and reinforce instructions for how residents can protect themselves from lead. These components must be included but are missing from the proposed rule. Further, comprehensive information regarding potential sources of contaminants found in the water system's drinking water must be included. For example, household plumbing, pipes, components, and fixtures, lead and galvanized service lines, lead connectors and fittings must be listed as a potential source for lead (unless, for the latter, the community has completed its inventory and has no remaining lead or galvanized service lines including connectors). See example statement earlier in these comments about lead's prevalence and dangers in section III. B. 2.c. as an example of how to disclose such information.

6. **Corrosion Control Treatment Descriptions.** EPA needs to provide clear language for how water systems describe their Corrosion Control Treatment efforts in response to the question asked in Section IV. D. of the preamble to the proposed rule. Otherwise, the CCT language could further confuse residents, and water systems could issue misleading information about their CCT approach. CCT is a vulnerability in the nation's lead in drinking water protections, and this measure could help further public's understanding of and water system accountability for this critical aspect of containing lead.

7. **Prohibit deceptive infographics.** The rule and EPA's templates should include easy-to-read infographics that do not mislead consumers about the threats posed by the presence of any contaminants detected in the system's monitoring results.

8. **Prohibit the use of analogies when explaining health implications of contaminants.** The use of analogies do not explain the science behind health-based protections, and they can have the effect of minimizing the impact of the contaminant's presence in drinking water. Examples of such comparisons can be found on page 13 of this document, which includes the following language: "1 part per million is equivalent to 1 drop in a hot tub, 1 part per billion is equivalent to a drop in an Olympic size swimming pool, and 1 ppt is equivalent to one drop in a 6-acre lake." This kind of analogy, often used by industry to downplay the risks of low levels of contamination that EPA has determined based upon the best available science poses health risks, should not be allowed or encouraged by EPA's final rule.

9. **Address Limited English Proficiency.** In addition to requiring information on how to obtain a full translation of the report, EPA should provide the above referenced templates in multiple languages to accommodate local customer needs. The rule should not allow the proposed unbridled flexibility between states and water systems for how to address Limited English Proficiency persons.

10. **Explain Detection (or Lack Thereof).** The report should state that not all contaminants are monitored. It should also include an explanation that for those contaminants monitored, the levels of many contaminants can vary substantially over time, so the levels detected are only a snapshot at the point in time when they were taken.

11. **Explain Health Effects of at Least 3 Contaminants Detected Above MCLG, Health Advisory or Action Level.** EPA should require water systems to include a section that has a more robust discussion of the health effects of at least three contaminants detected at a level above an MCLG, Health Advisory or action level in addition to the short version included in the one-page summary. As suggested for the summary, lead should be one of these. If nitrates or arsenic are detected at over half of the MCL, they should be discussed in more detail here. And if three contaminants are not discussed per those requirements, a minimum of three contaminants detected at a level exceeding an MCLG, Health Advisory, or action level should be included. EPA should also require the report to discuss risks known for contaminants and substances for which there are toxicity levels, and include estimates that there is risk if you're exposed to a certain amount, and potentially link to a website or how to get further information (such as from EPA's Drinking Water Hotline

12. **Biannual Reports.** These reports should not be mere duplicates of the earlier reports, but should include any new detections exceeding MCLGs or Health Advisories, violations, action level exceedances, significant deficiencies identified in sanitary surveys, and new unregulated contaminant monitoring results.

13. **Water Rates Information.** EPA should encourage states to require that RTK reports include information on water rates and typical residential bills. Improving transparency around water rates would support EPA's growing efforts to ensure that water service is affordable for all and that water systems are financially sound. As with water quality data, information about rates should be limited to factual information, without commentary or editorializing that is inherently subject to dispute. The New York example cited below offers a reasonable template to recommend.

    Residents should have a right to clear information about how much their water system charges them for safe—or unsafe—water. One of the lessons from the lead crisis in Flint, Michigan, for example, was that residents were paying among the highest rates in the country for unsafe water.

Yet, in many or most communities, information on water rates is notoriously hard to find or access—even for researchers, much less for customers.[14] Customers receive bills, but these bills may not explain the rates on which the bill is based. And individual customers' bills almost certainly do not provide context on the "typical" water costs for residential customers.

If water rates were universally available online through RTK reports, members of the public would be able to compare both water quality and cost across systems, to understand more about how each water system is performing relative to others. Moreover, consistent access to information on rates, in each annual RTK report, would help enable states and EPA to assess a water system's capability to provide safer water into the future.[15] Rates that are unaffordable, particularly for low-income households, are recognized as a risk factor to water systems' financial stability[16] and must be addressed to facilitate compliance with health-protective standards under the Act.[17] Unaffordable rates are also a barrier to physical access to safe water, as customers who are unable to afford their bills may lose access through disconnection of service.[18]

We recognize that section 1414(c)(4) is focused on providing customers with information on drinking water quality.[19] However, the Act clearly authorizes states to require that additional information be included in RTK reports.[20] For example, New York requires RTK reports to include information on the average annual water bill.[21] EPA should encourage more states to require similar information.

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[14] See, e.g., Patterson LA, Bryson SA, Doyle MW (2023) Affordability of household water services across the United States. PLOS Water 2(5): e0000123. https://doi.org/10.1371/journal.pwat.0000123.

[15] Information on water rates is critical for assessing whether a utility has the "technical, managerial, and financial capability" to maintain adequate revenue, as required under the Safe Drinking Water Act, 42 U.S.C. § 300g-9, or whether a more equitable rate structure or other interventions are needed to ensure the system's financial stability. Similarly, in the Clean Water Act context, EPA recognizes that

[16] See, e.g., California Water Board, 2023 Drinking Water Needs Assessment (2023), https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/needs/2023needsassessment.pdf.

[17] Analogously, EPA recently highlighted the importance of addressing affordability, specifically for low-income customers, to enable prompt compliance by wastewater utilities with Clean Water Act pollution limits. EPA, Clean Water Act Financial Capability Assessment Guidance (Feb. 2023), https://www.epa.gov/system/files/documents/2023-01/cwa-financial-capability-assessment-guidance.pdf.

[18] Natural Resources Defense Council and National Consumer Law Center, *Water Affordability Advocacy Toolkit* (2022), https://www.nrdc.org/resources/water-affordability-advocacy-toolkit.

[19] 42 U.S.C. 300g-3(c)(4).

[20] Section §1414(c)(4)(E)), 42 U.S.C. 300g-3(c)(4)(E).

[21] New York requires reports to include "the annual average charge for water, either in annual charge per average resident user or annual charge per one thousand gallons of water delivered." 10 NYCRR 5-1.72(f)(13)(xi). The state provides further explanation and examples in supporting guidance. New York State Dept. of Health, Preparing Your Drinking Water Annual Water Quality Report, Guidance for Water Suppliers, Updated Feb. 2023, pp. 23-24, https://www.health.ny.gov/environmental/water/drinking/annual_water_quality_report/docs/guidance.pdf.

IV. DELIVERY OF RIGHT-TO-KNOW REPORTS MUST BE CHANGED TO BETTER ENSURE THAT THEY ARE RECEIVED BY ALL PERSONS WITHIN EACH DRINKING WATER SYSTEM'S DELIVERY VICINITY.

Problems

We agree with EPA's aim to encourage broader distribution of the reports. We believe, however, that such distribution will not be accomplished by the provisions in the Proposed Rule and several of them must be changed. The Proposed Rule allows community water systems to use electronic report delivery with an option for customers to request a paper copy, meaning that residents must "opt-in" to receive hard copy reports. That does not make sense. Nearly one in four U.S. households lack home internet.[22] Even in areas where broadband is available, approximately 100 million Americans still do not subscribe.[23] According to a Pew Research Center poll, roughly a quarter of Americans who are 65 or older never go online.[24] That's about 13.5 million seniors. Permitting opt-in to obtain a hard copy of the report also would perpetuate the ongoing outrage that renters, do not receive these reports. Emailed reports would presumably be sent only to customers and not renters who do not usually pay water bills. Thus, renters would not know about opt-ing in to receive a hard copy. Water systems also generally struggle to obtain personal information from customers in their water service area, so obtaining email addresses even for account holders who subscribe to broadband poses serious challenges. The facts above lead to the inescapable conclusion that a significant portion of the country would never receive RTK reports or know to opt-in to receive a hard copy.

Permitting a system where residents must opt-in to obtain a hard copy of RTK reports perpetuates environmental injustices. Those lacking broadband service are disproportionately low income, underserved, and BIPOC. In rural areas, nearly one-fourth of the population —14.5 million people—lack any opportunity to access to broadband service.[25] In tribal areas, nearly one-third of the population lacks access.[26] Income is also a major factor; 14% of adults who make less than $30,000 per year avoid going online, perhaps due to the high cost of broadband.[27]

Solutions

EPA should change the mechanisms for delivery set forth in the Proposed Rule to ensure that all consumers, including renters/non-customers receive RTK reports. The Rule should require bulk delivery of the report to every address in the service area. If EPA continues to allow e-delivery

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[22] Catherine McNally, Nearly 1 in 4 Households Don't Have Internet—and a Quarter Million Still Use Dial-Up, Aug. 17, 2021, https://www.reviews.org/internet-service/how-many-us-households-are-without-internet-connection/

[23] Id.

[24] Chris Morris, Meet the 17.9 Million Americans Who Don't Use the Internet, NASDAQ, April 23, 2021. https://www.nasdaq.com/articles/meet-the-17.9-million-americans-who-dont-use-the-internet-2021-04-23, citing Pew Research Center Poll, https://www.pewresearch.org/wp-content/uploads/2021/03/Non-internet_users_2021_Methodology-Topline_FOR_RELEASE.pdf .

[25] FCC, Eighth Broadband Progress Report, https://www.fcc.gov/reports-research/reports/broadband-progress-reports/eighth-broadband-progress-report

[26] Id.

[27] Id.

and an "opt-in" system—which it definitely should not since it undermines the very purpose of the report—it must, at a minimum, require water systems to send a post card to every address in their service area with a QR code and website link for the report along with a stamped return card for requesting a hard copy. In addition, water systems serving more than 10,000 people should be required to send out a geofenced text[28] to cell phones in their service area with a link to the RTK report. That approach would better address both the digital divide and the renter exclusion concerns.

EPA should also make it easy for people to search for and find RTK reports online. To do so, EPA should:

- Require all systems serving more than 10,000 people to post their reports online, instead of the 50,000 person threshold in the Proposed Rule.
- Require all water systems to simultaneously electronically deliver the reports to EPA and the state or posting.
- Create a national searchable database of all reports electronically submitted to it.

Finally, EPA should require the CEO from each water system to certify to EPA and the state primacy agency, subject to criminal penalties for falsifying, that they: 1) have delivered the reports as required; 2) have not included false or misleading information; and, 3) have otherwise complied with the rule. EPA should automatically penalize water systems that fail to submit the required certifications.

V. PROPOSED COMPLIANCE MONITORING DATE REQUIREMENTS: MORE NEEDS TO BE DONE TO ENSURE TIMELY AND ACCURATE REPORTING.

As mentioned earlier, we applaud EPA for recognizing the need for both it and the public to have access to water system compliance monitoring data and including that concept in the proposed rule. And while EPA's proposal to require states to report compliance monitoring data to EPA once a year is a step in the right direction, for proper oversight and public awareness, reporting needs to be done more frequently. We are also concerned that the mechanisms proposed in the rule will not result in the transfer or public availability of such data and urgently recommend that EPA require data to be directly transferred to EPA from laboratories, with a brief (perhaps 14-day) correction period allowed for water utilities and states to make documented corrections. Both our concerns with the compliance monitoring data measures and our suggested solutions are discussed further below.

Problems

A. States Frequently Fail to Comply with Regulatory Mandates to Submit Data to EPA.

EPA's proposal to receive water systems' compliance monitoring data involves having states transferring compliance monitoring data to EPA through SDWIS/Fed. It has been known for decades, however, that states, have abysmal rates of compliance with current reporting

[28] See "What is Geofencing," https://www.techtarget.com/whatis/definition/geofencing.

requirements to EPA through SDWIS/Fed.[29] We are therefore concerned that this new proposed requirement, without changes as to how the information gets to EPA, will have little practical effect.

Poor state compliance with regulations requiring states to report data through SDWIS/Fed is well documented. For example, a GAO audit published in a 2011 report estimated that 84 percent of monitoring violations committed by community water systems were either not reported or inaccurately reported to SDWIS/Fed.[30] The report also estimated that 26 percent of health violations were not reported or inaccurately reported to SDWIS/Fed.[31] And in one of its own publications, "EPA reported that the 37 states it audited did not report or inaccurately reported about 49 percent of health-based violations committed by community water systems to SDWIS/Fed."[32] The GAO report also acknowledged the obvious—that the poor rate of monitoring compliance likely masks many more health violations, making the number and percentage of actual health violations not reported much higher than the GAO estimates.[33]

One reason behind the historically poor and inaccurate water data reporting is the convoluted system for reporting—labs→water systems→states→EPA. As EPA has explained, "[t]he shorter the distance from the beginning of the lifecycle to the end use in analysis the better, since an error can be introduced into the data flow each time the data changes hands."[34] The proposed rule unfortunately maintains that convoluted system. While we of course support requiring all compliance monitoring data to be submitted by states to EPA, there is little reason to believe an additional reporting requirement alone, maintaining that same mechanism of reporting with no additional incentives for compliance, would result in strong compliance with it without other incentivizing mechanisms.

B. EPA Has Repeatedly Stated That It Would Develop Technological Tools to Facilitate Reporting of Drinking Water Data to EPA and Enable Better Enforcement but Has Not Done So.

EPA states in the proposed rule that "[p]rior to the compliance date, EPA anticipates it will develop the database to maintain the collected data and provide a CMD extraction and sharing tool for primacy agencies that use the Safe Drinking Water Information System State (SDWIS/State) and a database extract option for the primacy agencies that do not use SDWIS

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[29] GAO, Drinking Water: Unreliable State Data Limit EPA's Ability to Target Enforcement Priorities and Communicate Water Systems' Performance, GAO-11-381, at 31 (June, 2011), https://www.gao.gov/products/gao-11-381 (discussing how data called into question by media in 1990s and subject of 2004 EPA Office of Inspector General report).

[30] GAO, Unreliable State Data, supra note 29 at 16.
[31] GAO, Unreliable State Data, supra note 29 at 13.
[32] GAO, Unreliable State Data, supra note 29 at 14.
[33] GAO, Unreliable State Data, supra note 29 at 17.
[34] EPA, Drinking Water Compliance Monitoring Data Strategic Plan, EPA-810-R-19-002 (July, 2022) at 5, https://bit.ly/3MqrBHV[34]

State."[35] While this is laudable, past experience casts doubt on whether that will come to fruition. At least as far back as 2009, EPA has indicated that it would develop tools to give EPA "direct access to the states' raw monitoring data" (rather than just violation data) thereby improving "EPA's ability to better understand national patterns of compliance and to diagnose problems faced by states."[36] But no such system has been developed. Moreover, the extraction tools EPA proposes would not alleviate the problems with the convoluted reporting structure discussed above.

C. EPA Has Repeatedly Proposed Making Drinking Water Data Available to the Public but Has Not Done So.

It is laudable that EPA "intends" to make the compliance monitoring data public.[37] But, once again, EPA has stated an intention to make more drinking water information available to the public for over a decade,[38] but has not. And EPA has admitted that publicly available data is "substantially incomplete,"[39] and EPA's front end for public access to SDWIS is largely impenetrable to average consumers.

Solutions

There are several steps EPA could take to facilitate receiving accurate compliance monitoring data. Most importantly, it should require simultaneous direct reporting from the laboratories the water system contracted with to primacy agencies and EPA. Indeed, it appears that EPA developed technology that would allow for, or could be adjusted for, such reporting at least 14 years ago. In 2009, the Director of EPA's Office of Groundwater and Drinking Water issued a memorandum where she discussed several data management tools EPA had developed that could be used to improve reporting, including electronic data verification (eDV) and electronic reporting from laboratories to states, and encouraged increased use of them.[40] EPA should immediately adjust that technology so that the data goes directly from the laboratories to EPA. The rule could then allow the water systems and states a short window (e.g. 14 days) during which they could adjust the data while documenting the reason for adjustment, before the data becomes final. If necessary, EPA could employ the previously developed technology and require direct reporting from laboratories to states until the adjusted technology was ready. That

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[35] *See* National Primary Drinking Water Regulations: Consumer Confidence Report Rule Revisions, 88 Fed. Reg. at 20097.
[36] GAO, Unreliable State Data, supra note 29 at 38.

[37] *See* National Primary Drinking Water Regulations: Consumer Confidence Report Rule Revisions, 88 Fed. Reg. at 20094.
[38] GAO, Unreliable State Data, supra note 29 at 37 n.54.
[39] *See*, *e.g.*, EPA, 2013 National Public Water Systems Compliance Report (2015), at 3, https://www.epa.gov/sites/default/files/2015-06/documents/sdwacom2013.pdf ("EPA has evaluated state and regional programs' data quality by conducting data verification audits and national data quality assessments, comparing primacy agencies' files and records with information in SDWIS/FED to verify accuracy, completeness and whether appropriate compliance determinations are made (that is, in accordance with federal regulations). These audits and assessments have shown that violation data are substantially incomplete.")
[40] GAO 11-381 at p.32

system would cut out at least one "stop" in reporting, which should increase compliance and accuracy. For example, New Jersey currently has a system in place whereby laboratories and water systems can directly electronically file monitoring results with NJ DEP.[41]

EPA could also increase compliance with the new proposed reporting requirement as well as the current ones, and the accuracy of the data, by mandating that all states, territories and the Navajo Nation to use electronic reporting for all water data reporting requirements and to use SDWIS/State.[42] EPA should provide any necessary guidance and technical support to implement that.

EPA should also build into the final rule (as well as other drinking water rules) provisions that incentivize water system compliance with the monitoring data reporting requirements. It should require the electronic submission of compliance monitoring data quarterly.[43] EPA should also ensure that the data system that receives the laboratory information (a) automatically rejects a report that is incomplete; and, (b) immediately determines when the data entered is in compliance both with both the monitoring requirements and substantive requirements of the applicable rule. (EPA can use its previously developed technology or look to the Greenhouse Gas Reporting and Acid Rain Programs for guidance.) The rule should also provide that a water system's failure to monitor will result in an automatic assumption that there was an MCL violation or action level exceedance (or other strong immediate consequence) for that monitoring period. [44]

Finally, EPA should immediately create a web-based portal for public access to national drinking water data, including compliance monitoring data. As EPA has previously recognized, "[a]ccess to drinking water compliance monitoring data can empower communities to take needed action. It also provides a more complete picture of water quality than simple violation information, and this can improve consumer confidence or identify a potential problem."[45]

VI. COMPLIANCE DATES SHOULD NOT BE EXTENDED

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[41] *See* New Jersey Department of Environmental Protection, NJDEP E2 Reporting System, https://www.nj.gov/dep/online/e2/.

[42] According to the 2011 GAO report, Florida, Massachusetts, Minnesota, New Hampshire, Pennsylvania, South Dakota, Washington, Wisconsin, the Navajo Nation, and American Samoa do not use SDWIS/State at all. And EPA Regions 1 and 9 do not use SDWIS/State to manage their data on tribal programs. Some states that use SDWIS/State use it for only certain drinking water rules. GAO, Unreliable State Data, supra note 29 at 32 & fn 48.

[43] If EPA does not require direct laboratory reporting, which we hope it will, it should mandate that water system executive certifies the quarterly reports as true, accurate and complete, subject to criminal penalties for false reporting.

[44] If EPA does not include direct laboratory reporting, penalties should also be applied for failure to report.

[45] Drinking Water Compliance Monitoring Data Strategic Plan, supra note 34 at 2; *see also* 88 Fed. Reg. 20092 at 20095.

EPA should not extend the compliance date for water systems beyond the 2025 deadline and should not extend primacy states' timeline for compliance beyond the two year requirement despite potential requests from state primacy agencies.

VII. CONCLUSION

We appreciate the opportunity to comment on EPA's proposal and urge the agency to take additional steps to ensure that Congress' intent under the original 1996 Safe Drinking Water Act's right-to-know provisions, and the 2018 AWIA provisions, are carried out. The problematic history of difficult to understand, misleading or outright false RTK reports, which often never reach or are left unread by most consumers even in cases where there are major drinking water contamination problems, highlights the need for major reforms in the rule.

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David Kyler
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Sylvia Orduño
Organizers
Michigan Welfare Rights Organization

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John Rumpler
Clean Water Director
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Ya Sin Shabass
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Danielle Melgar
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Ben Hirsch
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Executive Director
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Yvette Jordan
Newark Education Workers (NEW) Caucus

Nick Leonard
Executive Director
Great Lakes Environmental Law Center

Olivia Wein
Senior Attorney
National Consumer Law Center

Abré Conner
Director, Center for Environmental and Climate Justice
NAACP

Madeleine Foote
Deputy Legislative Director
League of Conservation Voters

Nicole Horseherder
Director
To Nizhoni Ani

June 29, 2023

Via e-mail
White House Environmental Justice Advisory Council
U.S. Environmental Protection Agency
1200 Pennsylvania Ave. NW Washington, D.C. 20460
whejac@epa.gov

Dear White House Environmental Justice Advisory Council members:

The undersigned thank the White House Environmental Justice Advisory Council (WHEJAC) for your role in ensuring that the Biden Administration places the concerns of impacted and underrepresented communities front and center. We hope that WHEJAC will be able to communicate to President Biden, Vice President Harris, the Council on Environmental Quality (CEQ), and the White House Interagency Council on Environmental Justice (Interagency Council) the necessity of not squandering the unique moment we find ourselves in regarding equitable access to clean drinking water.

Attached to this letter are two additional documents. The first is a prior letter to WHEJAC from environmental NGOs and community groups regarding the upcoming *"Lead and Copper Rule Improvements"* proposed rule (LCRI). The second document is a comment submission on EPA' Proposed *"National Primary Drinking Water Regulations: Consumer Confidence Report Rule Revisions"*, also signed by a group of environmental NGOs and community groups.

Policy directives like Justice40 and critical data repositories like the Climate and Economic Justice Screening Tool are vital for communities across the country. However, without strong regulations mandating full removal of lead service lines and taking other steps to reduce lead in drinking water, overburdened communities will continue to be harmed unjustly and those tools and directives will ultimately be undermined. The tools will instead become mere measuring sticks for lack of progress by this Congress and this Administration. This is why in addition to directives like Justice40 and tools like CJEST, this administration must also implement transformational reforms to EPA's notoriously ineffective Lead and Copper Rule (LCR). The attached letter to WHEJAC provides more details on what frontline community groups expect from a strong LCRI.

The undersigned also wanted to draw your attention to an incredibly important regulation that has received far less attention in media and even among environmentalists: EPA's proposal to improve utility-issued, EPA-regulated drinking water "consumer confidence reports" (better known as Right-to-Know reports).

The public has a right to know about the contaminants in their drinking water and potential health risks they pose, but these reports are frequently used to obscure problems rather than to educate consumers. Too often, water systems have used Right to Know reports more as public relations documents than to meaningfully inform their consumers about health risks posed by contaminants in their drinking water and how they may protect themselves and their families. It is therefore imperative that the final rule includes every mechanism possible to ensure that these reports serve their purpose: helping people protect themselves from potential exposure to contaminants from drinking water. The attached comments on the Right-to-Know Reports provide more details.

EPA's rulemaking on what these reports contain is an opportunity for this administration to demonstrate that they are proactively working to provide transparency and information to environmental justice communities dealing with water pollution. The attached comments on EPA's proposed Right-to-Know requirements provide details on what information water systems should be required to provide, as well as how they can more effectively deliver it to people. We hope that the members of WHEJAC can lift up the importance of this less-well-known regulation and identify it for the Administration as another important environmental justice tool for them to take advantage of as they seek ways to help frontline communities.

Sincerely,

A Community Voice - Louisiana
Abarigani
Alabama Rivers Alliance
Alabama Rivers Alliance
Alabama State Association of Cooperatives
Alliance for the Great Lakes
American Indian Mothers INC
Amigos Bravos
Bayou City Waterkeeper
Benton Harbor Community Water Council
BioRegional Strategies
Campaign for Lead Free Water
Campaign for Lead Free Water
Center for a Sustainable Coast
Center for Biological Diversity
Center for Neighborhood Technology (CNT)
Children's Environmental Health Network
Choctawhatchee Riverkeeper
Choices Interlinking
Citizens for Clean Water Sycamore Illinois
Clean and Healthy New York
Clean Cape Fear
Coalition on Lead Emergency
Community Water Center
Detroit Mercy Law Environmental Law Clinic
Earthjustice
East Chicago Calumet Coalition Community Advisory Group
Environment America Research & Policy Center
Environmental Coalition for Water Justice
Environmental Transformation Movement of Flint
Flint Rising
Food & Water Watch

Freshwater for Life Action Coalition
Freshwater Future
Great Lakes Environmental Law Center
Green & Healthy Homes Initiative, Inc
GreenLatinos
Harambe House, Inc./Citizens for
Harpeth Conservancy
Hijra House
Idaho Conservation League
Immigrants & Minorities Unify Services Association
League of Conservation Voters
League of Conservation Voters
Little Village Environmental Justice Organization
Micah Six Eight Mission
Michigan Welfare Rights Organization
Milwaukee Riverkeeper
Missouri Confluence Waterkeeper
NAACP
National Consumer Law Center
National Wildlife Federation
Natural Resources Defense Council
NC League of Conservation Voters
New Beginnings UMC
Newark Education Workers (NEW) Caucus
Newburgh Clean Water Project
Nourishing Our Mind
Ohio Environmental Council
Ohio River Foundation
Organization
Park Watershed
Passaic River Coalition
Pennsylvania Council of Churches
Portland Advocates for Leadfree Drinking
Portland Harbor Community Coalition
RE Sources
Rio Grande International Study Center
River Guardian Foundation
River Network
Rural Coalition
Safe Water Engineering, LLC
Saint Joseph's Carpenter Society
Sierra Club
St Francis Prayer Center, Flint MI

The Water Collaborative of Greater New Orleans
Toxic Free NC
U.S. PIRG
United Parents Against Lead
Universal Access to Clean Water for Tribal
Washington Environmental Council
Water You Fighting For?
Waterkeeper Alliance
Waterway Advocates
We the People of Detroit
West Street Recovery
Women for a Healthy Environment

April 14, 2022
Via e-mail

White House Environmental Justice Advisory Council
U.S. Environmental Protection Agency
1200 Pennsylvania Ave. NW Washington, D.C. 20460
whejac@epa.gov

Dear White House Environmental Justice Advisory Council members:

Earthjustice writes to thank the White House Environmental Justice Advisory Council (WHEJAC) for your role in ensuring that the Biden Administration places the concerns of impacted and underrepresented communities front and center as they work to ensure communities in need see 40% of the benefits of critical federal investments through the Justice40 initiative. WHEJAC plays a unique and important role, as community members and environmental justice champions who have the ear of various arms of the Administration. Because of this unique position, we hope that WHEJAC will be able to communicate to President Biden, Vice President Harris, the Council on Environmental Quality (CEQ), and the White House Interagency Council on Environmental Justice (Interagency Council) the necessity of not squandering the unique moment we find ourselves in regarding equitable access to clean water. With lead service line replacement enjoying massive support to the tune of a $15 billion dollar investment in the bipartisan Infrastructure Investment and Jobs Act, the administration must recognize that now is the time to *require* the U.S. Environmental Protection Agency (EPA) to take bold, decisive action. We urge WHEJAC to communicate the necessity of 1) a transformative Lead and Copper Rule Improvement (LCRI), and 2) equitable disbursement of the aforementioned $15 billion to communities around the country based on need.

I. A Transformative Lead and Copper Rule

As WHEJAC members well know, the significance of drinking water as a lead exposure pathway is often underestimated. EPA modeling has shown that drinking water can constitute up to 80% of many U.S. children's lead exposures. Yet, the existing Lead and Copper Rule (LCR) itself is not anchored in science, is fundamentally broken, and is rarely enforced. Hazardous lead exposure of children as a result of drinking water has been documented throughout the US, not only by water systems that have a "lead action level exceedance," but also by many that do not. It is no accident that the lead crises in Washington DC, Flint, MI, Newark, NJ, and Clarksburg, WV, all occurred while the water systems claimed their water was safe.

Accordingly, we recommend that WHEJAC urge **EPA to take bold action by committing to propose a reformed, improved LCR by early 2023 and to finalize that rule by early 2024. EPA must also ensure that 100 percent of all lead service lines are removed within 10 years.** Attached as an appendix to these comments are specific recommendatons contained in a sign-on letter joined by Earthjustice and over 50 other partners including many community and

environmental justice goals. Mere tweaks to the existing flawed framework of the LCR and the reforms to it finalized during the Trump administration will not deliver the protection or justicr that communities dealing with years of dangerously elevated lead levels require from the federal government.

II. Ensuring IIJA funding for Lead Service Line Replacement is decided based on need

The funding provided to EPA through IIJA – including the $15 billion for lead service line replacement (LSLR) -- is distributed to communities through the Clean Water and Drinking Water State Revolving Funds (CWSRF and DWSRF, or SRFs collectively). The SRFs depend on an outdated formula to determine how much funding from the SRFs go to each state. Among other flaws, the allocation does not factor in how many lead services exist in each state. As a result, certain states project to receive more funding for LSLR than they need, in proportion to how many lead service lines are in their state, and others with greater need will receive an inadequate share of this historic investment.

To avoid this inequitable outcome, we urge WHEJAC to recommend that EPA take two steps within their authority:

1. Complete, this year, the Drinking Water Infrastructure Needs Survey and Assessment (DWINSA). The analysis of the needs for lead service line replacement is needed in time to determine the FY23 allocations of funds under IIJA, as required by the America's Water Infrastructure Act of 2018.

2. Separate within the Drinking Water State Revolving Fund (DWSRF) three separate sub-funds: (1) the $15 billion in IIJA for lead service lines; (2) the $4 billion for emerging contaminants "with a focus on" PFAS; and (3) the $11.7 billion in general DWSRF funding. EPA should then separately allocate funding from these three sub-funds based upon the needs for each category assessed in the DWINSA.

Thank you for your dedication to environmental justice and equitable access to clean water. Your efforts and partnership are critical to ensuring the Biden administration follows through on their promise to set us on the path to removal of all lead service lines across the country in ten years.

Sincerely,

Julian Gonzalez

Legislative Counsel
Earthjustice

Appendix: April 12 Letter to EPA from environmental and community groups

April 12, 2022

The Honorable Michael Regan
Administrator
US Environmental Protection Agency
1200 Pennsylvania Avenue NW
Washington, DC. 20004

Dear Administrator Regan,

We write to thank you and the White House for continuing to raise awareness and take action related to the lead crisis plaguing communities across the country. As a result of our collective efforts, the issue of lead service line replacement has become a priority for President Biden. And the U.S. Environmental Protection Agency (EPA) promised in December 2021 to overhaul and strengthen the health protections in its Lead and Copper Rule (LCR) for drinking water. EPA has also publicly committed to taking advantage of the $15 billion in lead service line replacement funding provided by Congress in the Infrastructure, Investment, and Jobs Act to begin an unprecedented push to, in the words of our President, "begin to replace poisonous lead pipes—so every child—and every American—has clean water to drink at home and at school." A multi-pronged strategy using distribution of Congressionally appropriated funds, interagency coordination, collaboration with states, media outreach, and strengthening EPA's rules governing lead exposure is exactly what is needed to get the lead out of our communities.

All of these initiatives, all of this media attention, and all of the community engagement this Administration has spearheaded will be undermined, however, if EPA does not issue a transformative further revised LCR. The significance of drinking water as a lead exposure pathway is often underestimated. EPA modeling has shown that drinking water can constitute up to 80% of many U.S. children's lead exposures.[1] Yet, the LCR itself is not anchored in science, is fundamentally broken, and is rarely enforced. Hazardous lead exposure of children as a result of drinking water has been documented throughout the US, not only by water systems that have a "lead action level exceedance," but also by

[1] *See* Lindsay W Stanek et al., *Modeled Impacts of Drinking Water Pb Reduction Scenarios on Children's Exposures and Blood Lead Levels*, 54 Environ Sci Technol 9474, 9474–82 (Aug. 2020); Ronnie Levin et al., *The Urban Lead (Pb) Burden in Humans, Animals and the Natural Environment*, 193 Environ Res (Feb. 2021)

many that do not. It is no accident that the lead crises in Washington DC, Flint, MI, Newark, NJ, and Clarksburg, WV, all occurred while the water systems claimed their water was safe. EPA itself has acknowledged that there are "significant opportunities to further improve upon" the LCR and the recent revisions to it "to achieve increased protection of communities from lead exposure through drinking water." 86 Fed. Reg. 71,574, 71,577 (Dec. 17, 2021). EPA must take bold action and should commit to propose a reformed, improved LCR by early 2023 and to finalize that rule by early 2024.

EPA must ensure that 100 percent of all lead service lines are removed within 10 years to achieve the Biden Administration's bold goal to "Replace All Lead Pipes in the Next Decade," as promised by the Vice President in her December 2021 announcement of the Administration's Lead Pipe and Paint Action Plan. The Trump LCR revisions, which the Biden Administration allowed to go into effect in December 2021, *extended* the allowable timeframe for replacement to up to 33 years for systems required to replace LSLs.

The LCR must be revamped so that it meets the SDWA's requirements and goals to protect health. If EPA retains treatment technique,[2] the LCR must "prevent known or anticipated adverse effects on the health of persons to the extent feasible,"[3] which it does not currently do. More specifically, EPA should shift its focus to prevention, rather than "testing and fixing," given the dangers associated with lead, the variability of lead in drinking water, and the long-term benefits and cost savings associated with such an approach.

Under its current approach, remedial action is premised on extremely limited water sampling at a miniscule number of homes and often only once every few years. Due to the sporadic nature of lead release in drinking water, the very limited testing of tap water under the LCR does not provide an adequate snapshot of the actual public health threat from lead service lines and other lead-bearing plumbing materials. Further, no meaningful remediation is required until the lead levels in at least 10 percent of sampled homes exceed 15 parts per billion ("ppb") at the time of sampling, even though any level of lead presents a health risk at any time. That construct knowingly and systematically sacrifices 9 percent of homes—which in New York City, for example, equates to almost 800,000 homes—regardless of how high the lead levels in their drinking water are at the time of sampling. In many jurisdictions, it likely sacrifices a far higher percentage of homes with significant lead-in-water contamination that the extremely limited LCR testing missed. Up to 12 million homes are served by LSLs and the majority of US homes have other lead-bearing plumbing; risking the health of that many people is unconscionable. With respect to schools and childcare centers, the LCR's shockingly limited testing requirements (i.e.

[2] As many of the signatories of this letter have noted in previous correspondence, the SDWA requires EPA to establish a Maximum Contaminant Level (MCL) for lead because it is feasible to ascertain lead levels in drinking water. *See* 42 U.S.C § 300g-1(b)(7)(A). However, the agency has made it clear that it has no intention of establishing an MCL for lead, so we discuss how an LCR treatment technique should be strengthened in this letter.

[3] 42 U.S.C § 300g-1(b)(7)(A).

only a one-time test of 5 outlets per school and two outlets in a childcare center) are inadequate, scientifically unsound (i.e., one-time testing is not appropriate for determining the "safety" of any single tap), and likely to mislead parents and staff into believing there is not a lead problem when there might very well be serious contamination.

A new LCR treatment technique must, at minimum:

- Mandate full and equitable removal of lead service lines at utility expense to be completed within 10 years for all water systems at no cost to homeowners. The rule should:
    - Tightly limit -- and over time eliminate -- the number of service lines permitted to be characterized as "lead status unknown" in a lead service line inventory;
    - Prioritize replacement in communities disproportionately exposed to lead from other sources.

- Improve LCR compliance sampling in lead service line homes by requiring more frequent, more widespread, and more representative sampling including both 1st- and 5th-liter samples for lead. The higher of the two samples should trigger corrective action.

- Require corrective actions to be health protective. To accomplish this, an LCR must:
    - Require system-wide action at as low a 90th percentile lead level as feasible, no higher than 5 parts per billion;
    - When system-wide action is mandated, require water systems to:
        - Immediately provide lead certified filters, as well as installation and training assistance to all homes with known or possible lead service lines and/or elevated lead levels (i.e. exceeding LAL) and then do a comprehensive investigation of the lead source;
        - Fully replace all lead service lines as quickly as possible, at no cost to the consumer, as even filter efficacy depends on a number of factors.

    - Ensure that customers served by small water systems are protected by regulatory standards as stringent as those applying to larger utilities.

- Establish a prevention-oriented approach to stop lead contamination of water in schools and child-care facilities. To accomplish this, an LCR must:
    - Shift away from relying mainly on a "test-remediate" paradigm where our kids go to learn and play each day;

- Use all appropriate policy levers to drive utilities, schools and child care centers to implement a "filter first" approach so that all water outlets used for cooking and drinking at schools and childcare facilities are equipped with filtration stations, point of use filters, or filtered water pitchers certified to remove lead.

- Installing water filtration stations in schools is significantly less expensive[4] than inaccurate testing regimes, and more protective of public health with the added benefit of filtering out other contaminants of concern in school drinking fountains.

The LCR and EPA have also failed the public in terms of education by allowing public water systems to hide behind statements of "compliance" with the complex and non-health protective LCR, and by misleading people into believing their water presents no harmful exposure to lead, when, in reality, it may dispense exceedingly high concentrations of the contaminant. Given the commitment of this administration to environmental justice and community engagement, a new LCR framework should mandate resident-led community advisory councils provided with sufficient technical expertise and resources, and it must center public education that is complete and accurate. For example, EPA should broaden and strengthen public education and notification requirements to explain the widespread nature of lead in drinking water, the limitations of lead testing, and health impacts in all populations but especially including the most vulnerable – fetuses and infants dependent on reconstituted formula. Such outreach should also include steps people can take to decrease their families' exposure to lead, such as using filters certified to remove both soluble and particulate lead.

For decades, advocates across the country have conveyed the urgency of this crisis at every turn, and another round of "tweaking" the LCR will not only undercut the historic investments in lead service line removal Congress recently authorized but, more importantly, it will condemn another generation of families to exposure to dangerous levels of lead in drinking water. We are hopeful that EPA will propose changes that our communities need, and we look forward to working with the agency as this urgent process unfolds.

Sincerely,

A Community Voice - Louisiana

Alabama Rivers Alliance

Alabama State Association of Cooperatives

American Indian Mothers INC

[4] *See* "MI Lawmakers Introduce Lead in Water Protections for Kids" https://www.nrdc.org/experts/cyndi-roper/mi-lawmakers-introduce-lead-water-protections-kids

BioRegional Strategies

Campaign for Lead Free Water

Center for Biological Diversity

Center for Neighborhood Technology (CNT)

Choctawhatchee Riverkeeper

Citizens for Clean Water Sycamore Illinois

Clean and Healthy New York

Waterway Advocates

Coalition on Lead Emergency

Community Water Center

Detroit Mercy Law Environmental Law Clinic

Earthjustice

East Chicago Calumet Coalition Community Advisory Group

Environmental Coalition for Water Justice

Environment America Research & Policy Center

Environmental Transformation Movement of Flint

Flint Rising

Food & Water Watch

Freshwater For Life Action Coalition

Green & Healthy Homes Initiative, Inc

GreenLatinos

Idaho Conservation League

Immigrants & Minorities Unify Services Association

League of Conservation Voters

Little Village Environmental Justice Organization

Metropolitan Planning Council

Milwaukee Riverkeeper

Natural Resources Defense Council

NC League of Conservation Voters

New Beginnings UMC

Newburgh Clean Water Project

Nourishing Our Mind

Ohio Environmental Council

Passaic River Coalition

Pennsylvania Council of Churches

Portland Advocates for Leadfree Drinking Water

Portland Harbor Community Coalition

RE Sources

River Guardian Foundation

River Network

Rural Coalition

Saint Joseph's Carpenter Society

Sierra Club

St Francis Prayer Center, Flint MI

The Water Collaborative of Greater New Orleans

U.S. PIRG

United Parents Against Lead

Washington Environmental Council

Water You Fighting For?

Waterway Advocates

We the People of Detroit

I wanted to share with you that the community where I live and actively lead climate adaptation activities, the Village of Owego, was officially deemed a disadvantaged community in NYS a couple of weeks ago by DEC. FEMA Region 2 views Owego as a model community for addressing flood risk and my main FEMA contact, Jason Fenn, will present at an upcoming Water Resources Association tech event on success in Owego.

https://www.dec.ny.gov/press/127364.html

all the best,

Julie Nucci

I am asking for help to stop the transfer of a piece of land in Oak Flat, Tonto National Forest, Arizona to be used for a copper mine, since this act will irrevocably impact the groundwater, air quality, and tourism of the Phoenix Metropolitan East Valley. Just a 30 minute drive from the edge of the East Valley, Oak Flat is where you can camp, hike, and go bouldering in an unexpected area of green strewn with creek beds and boulders the size of cars that tumbled down from the mountain. It is one of the last beautiful areas still within the perimeter of the valley. Though the mining will bring jobs and revenue it is also extremely short-sighted for several reasons: *The mining company, Resolution Copper, is co-owned by two of the largest international mining companies Rio Tinto and BHP, of which Rio Tinto is a London/Australia based company, whose largest investor is China. *It has been stated that Resolution Copper's mining proposal would create a 1.8 mile long, 1000 foot deep pit, which is larger than the meteor crater located just outside of Flagstaff, Arizona. *Copper mining of that magnitude includes the release of toxic chemicals, slag stockpiles, and the smelting and refining of ore. *This process will require over 250 billion gallons of water over 40-60 years, in a desert already battling drought conditions.

The mining company has stated that it would protect the soaring cliffs of Apache Leap and leave Oak Flat campgrounds open. However, hikers have noticed that they are already test drilling near Apache Leap, and at some point, the 1.8 mile wide crater will destroy everything–the campgrounds, the plant life, the groundwater, and the tourism of an important part of the East Valley. I ask that you do anything in your power to stop this destruction of land from happening. Once this is done, we won't be able to undo it.

Thank you for your guidance and consideration.

Kristin Elwood

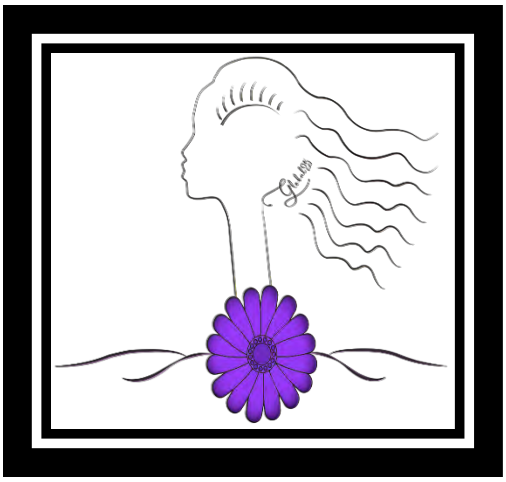
Lorna Moffat

>
> Dear Karen,
> My name is Lorna Moffat. I reside in Monterey, California.
> For many years I have stood before our city council educating them about the use of pesticides , unnecessary tree removal, toxic 5 G cell tower placement, overkill sediment removal projects and the invented science that Monasanto proliferated called Invasive Species so herbicides would remove 55% of all non natives in our country with their toxic herbicides ,more dangerous than the non natives.
> I was able to get our town to stop using herbicides after two years of educating them about the effects of these sprays on our towns health but now they are bringing them back.
> Our council members live in the dark ages and now they are allowing for a most destructive sediment removal project of a stream that provides water to our local lake. It's an overkill project where they plan to remove 75 trees which hold in sediment. Once the roots are gone all that earth beneath will be free to go downstream and cause sediment to our lakes. They also plan to spray herbicides for an Invasive plant removal project. > For years I have been trying to educate people about where this invasive species program was born, with Monsanto's public relations man, Neroy Jackson, back in the fifties who co-founded the California Exotoc Pest plant council and with funding from many chemical companies outreached to all the state, national parks, and garden clubs across America to drive home the need to poison non natives with their poisonous herbicides which is now in most of our bloodstreams and waters around our country.
> In case you didn't know, Denmnark banned Roundup because it lasted
> five years in their
> groundwater.https://gcc02.safelinks.protection.outlook.com/?url=https%
> 3A%2F%2Fwww.carlsonattorneys.com%2Fnews-and-update%2Fbanning-roundup&d
> ata=05%7C01%7Cwhejac%40epa.gov%7C5afc65a300e14790da3408db4c2e9ed5%7C88
> b378b367484867acf976aacbeca6a7%7C0%7C0%7C638187535341893897%7CUnknown%
> 7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJX
> VCI6Mn0%3D%7C3000%7C%7C%7C&sdata=Kxq5dCtRtYmm%2F9YRnQF3F%2F8aAmPD14Cfr
> lEs%2BBDIWhs%3D&reserved=0 Anyway, this beautiful peaceful canyon,
> called Iris Canyon, is about to be violated in the most hideous manner.where potential endangered long toed salamanders dwell and red legged frogs.
> Can you help?
> I'm just testing these waters.
> Thank you,
> Sincerely,
> Lorna Moffat
> 831 582 1705

Remarks By: Malikka D. Karteron

Date: June 13th, 2023

White House Environmental Advisory Council Public Meeting



Good Evening,

Thank you for the opportunity to "bring" remarks this evening. My name is Malikka D. Karteron; I am the President and CEO of Global25. Global25 is located in New York.

I enjoyed the presentation this evening. They were very informative.

The question I will be addressing this evening is: **"What resources are needed"?**

1. Real time updates on legislation that addresses Environmental Issues
   - So "we" can be advocates and ambassadors of the "new positive" Legislation.

2. Information about changes to systemic legislation / policy that has disproportionately affected communities of color and disenfranchised communities (i.e., the placement of toxic release inventory sites (TRIs)

3. More conferences like this one - White House Environmental Advisory Council Public Meeting

4. More opportunities for specific "local" round tables discussions and formation of action steps to address / bring about change as it relates to
   - Social Justice
   - Environmental Justice
   - Educational Justice
   - Economic Justice

   * Because it is all related to "equity and justice for all"

5. Workforce Development for Environmental jobs
   - This can change the trajectory of communities and the environment

6. Funding to address hyper local environmental concerns (i.e., air quality, flooding, water table rising, lead poisoning, drinking water contamination, etc.)

7. People need to see a correlation between legislation, policies, and action steps; that in turn fosters positive changes in their communities and the environment

Please let me know how I can be of further assistance in these endeavors

Thank you

Have a good evening

Malikka D. Karteron is the President and CEO (Chief Executive Officer) of Global25. Global25 is Headquartered (HQ) in New York and designed to have a global impact (Defined as: Local, National, and International). Global25 focuses on Economic Justice, Social Justice, Environmental Justice, Educational Justice, and Equity; particularly, as it relates to Communities of Color Worldwide. The initiative(s) are project based. Global25 areas of expertise are founded in Project Development, Economic Development, Economic Mobility, The Arts, Women's Empowerment, “Place Making”, ESG (Environmental and Social Governance) Strategies, Executive Coaching, Social Emotional Development, Dual Language Learners, and Global 25 also focus on the incorporation of S.T.E.A.M, (Science, Technology, Education, Art, and Math).

Full Name (First and Last): Maribel Araiza

Name of Organization or Community: Líderes campesinas en California

City and State: Bakersfield, CA

Brief description about your recommendation relevant to your selection above: What activities are carried out to be able to carry out Environmental justice

Dear WHEJAC,

In Arizona, where some of the largest and fastest growing cities in the United States continue to develop, despite a 23 year long megadrought, multiple Indigenous Communities are being denied basic water rights and fighting to protect and preserve the natural resources in which these developing cities require for economic growth.

Water insecurity is and has been a current issue for the population of Arizona, yet multiple city councils greenlight multimillion, sometimes multibillion dollar projects for luxury living complexes to allow hundreds of new residents to move to Arizona - as was a $535 million dollar project approved by Phoenix City council to build 541-foot tall glass tower building just Wednesday, June 28th, 2023.

All the while, homelessness, food insecurity, and poverty rates are on the rise, forever chemicals are finding their way into public water systems, and a foreign mining company is posing its biggest and most current threat to Arizona by attempting to complete a federal land swap to mine the largest copper deposit in North America.

In 2019, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) released the most comprehensive report on economic development and its impacts on Mother Earth. The systematic review states, "three-quarters of the land-based environment and about 66% of the marine environment have been significantly altered by human actions. On average these trends have been less severe or avoided in areas held or managed by Indigenous Peoples and Local Communities'' (www.un.org).

While there has been more than enough evidence-based research stating that indigenous knowledge is a key component towards developing sustainable solutions to the climate crisis, the United States government actively disregards Indigenous Communities working to protect their ancestral homelands and cultural resources from being destroyed to perpetuate economic development.

Today I make this public comment to strongly urge that WHEJAC advise the federal government to begin respecting Indigenous Rights as outlined in the United Nations Declaration on Rights of Indigenous Peoples (UNDRIP), which was agreed upon in the Paris Agreement by the Biden Administration in 2021.

Per Executive Order 14008, titled Tackling the Crisis at Home and Abroad, the federal government needs to start immediately addressing and correcting the Human and Indigenous Rights they are violating to achieve economic growth. The climate crisis has long enough been attempted to be cured by ignorant and genocidal policies - future generations do not need to suffer today's complacency. Respectfully, Marina Thomas

Full Name (First and Last): Michele Rumpf
Name of Organization or Community: City of Mobile
City and State:
Subject of Comment is Related to:: Justice 40 Initiative Brief description about your recommendation relevant to your selection above:
While I understand and agree with the premise of Justice40, as a grant writer I find it really difficult to work with because it is so vague and so one-size-fits-all.
1. 40% of Justice40 project benefits are supposed to flow to disadvantaged communities. How are you supposed to measure that? There needs to be a more realistic metric that is measurable.
2. Justice40 projects should provide the opportunity for well-paying jobs that include the option to join a union. I'm in Alabama, a decidedly anti-union state. With few excpetions, we can't meet that requirement.
The idea of Justice40 is great but how its written makes it just an empty gesture.

Dear WHEJAC

I am writing to submit a comment on behalf of Oak Flat, a plot of land under discrepancy in the state of Arizona. There is a proposed mining project that would have disastrous consequences to the land, water of Arizona, and indigenous communities.

It is imperative that Oak Flat be preserved, as is, and protected. The mining project must be banished from and rights they may claim to have. This land was swapped in a shady deal, snuck in as a midnight rider to the 2014 National Defense Authorization Act, by our then Senator, John McCain, in alliance with Jeff Flake.

The proposed mine has dire consequences to the environment, as Oak Flat is home to what is known as a riparian zone, which is one of the most important and unique systems in the southwest. They are responsible for rehydrating aquifers below them, and support a vast range of biolife. Arizona is in a water crisis, and this mine threatens the health and prosperity of future generations. We cannot afford to damage the aquifers and contaminate the land that would be the result of this project.

Oak Flat is also sacred land to the Western Apache tribes, who have held coming of age ceremonies and other important gatherings on this land since time immemorial. The destruction of this land would cause an irreversible loss to their culture and way of life. Native Americans have suffered genocide at the hands of the United States government for centuries, that still continues to this day. What is left of these important cultures must be preserved, and allowed to rebloom. These communities have always been at the center of land and water protection, and in our modern times we must stand by their guidance to live in symbiosis with land and water systems.

There is legislation: The Save Oak Flat Act, that exists, but not yet formally introduced. This piece of legislation must be prioritized and given support. We are in a water crisis. Our water must be protected, and in the "Land of Law" this is a strong chance to protect resources for posterity.

I urge your support to Protect Oak Flat. This topic is a reflection of our times, and how we are running out of opportunities to make the right choices to save our water and create a sustainable future.

Thank you for your time, Michelle Meyer

Full Name (First and Last): naomi yoder
Name of Organization or Community: Healthy Gulf
City and State: Houston,
Type of Comment: Present Comment at Meeting
Subject of Comment is Related to:: Environmental Justice Scorecard Brief description about your recommendation relevant to your selection above:
I'd like to comment on the scorecard and the CJEST - thank you

Just to be clear, I think it's important for the Administration to put pressure on Saudi Arabia to conduct climate adaptation research on the future of the Hajj pilgrimage. As of now there is an embarrassingly, and shocking lack of research for climate adaptation efforts for the country, and the Hajj pilgrimage.

Thank you to the White House for your efforts the past two years on climate change.

On Thu, Apr 13, 2023 at 2:54 PM Oz Adnan <oz.adnan.000@gmail.com> wrote:
I share the Administration's concerns regarding MBS. I 'm not a fan of him either, but I think this should be of the utmost importance to get ahead of this issue.

“This necessary outdoor Muslim ritual is likely to become hazardous to human health, especially for the many elderly pilgrims, when the Hajj occurs during the boreal summer.”

Osman Adnan JD

Full Name (First and Last): Paige Powell

Name of Organization or Community: Commission Shift

City and State: Houston, TX

Brief description: Request That WHEJAC Urge the Biden Administration to Take Action Needed to Prevent the Injection of Carbon Dioxide into Class II Oil and Gas Wells for Long-Term Storage from Contaminating Underground Sources of Drinking Water and Endangering Nearby Communities

White Paper

The Carbon Sequestration Loophole: Long-Term Carbon Storage in Poorly Regulated Class II Oil and Gas Underground Injection Control Wells

Keri N. Powell, Powell Environmental Law LLC*

June 22, 2023

I. Introduction & Overview

Most of the controversy around the safety and effectiveness of carbon capture and sequestration (CCS) technology as a tool for mitigating climate change has focused on the U.S. EPA's federal regulations governing Class VI Underground Injection Control (UIC) permits under the Safe Drinking Water Act. Though the UIC program's purpose is to protect underground sources of drinking water (USDWs), not to help avert climate change, the Class VI rules are the primary federal requirements applicable to wells used for the purpose of sequestering carbon dioxide (CO_2) underground. **However, there is growing awareness among climate and environmental justice advocates that the federal UIC regulations allow companies to circumvent the detailed Class VI well requirements and instead store captured carbon in Class II oil and gas wells with little government oversight.** In fact, the Inflation Reduction Act of 2022 includes tax incentives designed to encourage CO_2 storage in Class II wells, either through injection for enhanced recovery of oil or gas (ER) or injection for the sole purpose of long-term storage.

Though CO_2 storage in Class II wells presents substantial environmental and public health risks, the Class II regulations are far weaker than the Class VI regulations. Moreover, even when a Class II well is used for the primary purpose of long-term CO_2 storage, it is unlikely that the well owner or operator will be required to obtain a Class VI permit. Rather, a Class VI permit is only required if a Class II well will be used for the primary purpose of long-term CO_2 storage and there are increased risks to USDWs that exceed those of Class II operations. Though EPA has been promising since 2010 to issue guidance regarding how to evaluate increased risks from long-term CO_2 storage in Class II wells, to date EPA has only finalized a brief, 2-page memorandum on the subject.[1]

Even if a Class II well owner/operator is required to obtain a Class VI permit, not all Class VI requirements will apply. For example, the structural requirements that otherwise govern Class VI wells generally would not apply to a converted Class II well. Furthermore, the federal UIC rules rely on well owners or operators injecting CO_2 into Class II wells to undertake their own assessments as to whether they should obtain a Class VI permit, with no requirement that

[1] EPA published a 93-page draft guidance document in 2013 but never finalized it and does not include it in the list of guidance documents applicable to Class VI permitting. It is currently available at https://19january2017snapshot.epa.gov/sites/production/files/2015-07/documents/epa816p13004.pdf

* Keri N. Powell is a public interest environmental attorney in private practice in Decatur, Georgia. She holds a J.D. from New York University School of Law and a B.A. in Earth Science from Trinity University in San Antonio, Texas, and is admitted to practice law in Georgia, New York, and Washington, DC. She prepared this White Paper in her role as a consultant for the Rockefeller Family Fund.

they notify regulators of their determination. Thus, enforcement of the Class VI transition rules will be *ad hoc* and likely occur only after CO_2 injection has caused harm to people or the environment.

Several states, including Louisiana, Texas, West Virginia, and Arizona are currently working on or have filed applications with EPA to obtain "primacy" over the UIC Class VI program. If EPA approves a state's primacy application, the state assumes primary responsibility for administering Class VI permitting requirements for Class VI CO_2 sequestration wells within state boundaries. This includes the requirement to ensure that oil and gas companies that plan to store captured CO_2 in Class II wells convert those wells to Class VI if warranted by an assessment of safety and environmental risks.

This white paper describes the problem of EPA's Class VI UIC regulations allowing storage of captured CO_2 in Class II wells with virtually no oversight, and concludes with recommendations for what EPA could do to help address this problem. Among other things, this paper recommends that EPA:

(1) pause proceedings to grant primacy to states to administer the Class VI UIC program until EPA finalizes a long-promised guidance regarding how states should implement the federal UIC requirement that a Class II well convert to Class VI if warranted by safety and environmental risks (the "Class II-to-Class-VI-transition regulations"),

(2) ensure that any state receiving Class VI primacy have effective rules and policies in place to implement the federal Class II-to-Class-VI-transition regulations, including the requirement that within two years of EPA's approval of a state's Class VI program, the state must issue Class VI permits to all injection wells in the state that are required to obtain such permit, and

(3) ensure that both EPA and primacy states consider environmental justice and comply with Title VI of the Civil Rights Act of 1964 when deciding whether to allow a company to store captured CO_2 in a Class II well rather than in a much more rigorously regulated Class VI well.

Note that the discussion herein refers to "long-term" CO_2 storage rather than "permanent" geological sequestration because nothing in the Class VI rules requires that storage be permanent. While EPA's website describes "geologic sequestration" as the process of storing CO_2 underground "permanently,"[2] the 2010 Class VI rules notably avoid that word, instead defining geological sequestration as "the process of injecting CO_2 into deep subsurface rock formations for *long-term* storage."[3] In fact, in subsequently issued guidance, EPA expressly acknowledged "that some owners or operators of Class VI wells may plan to eventually produce

[2] EPA, Carbon Dioxide Capture and Sequestration: Overview, https://19january2017snapshot.epa.gov/climatechange/carbon-dioxide-capture-and-sequestration-overview_.html#:~:text=Safety%20and%20Security-,What%20is%20carbon%20dioxide%20capture%20and%20sequestration%3F,plants%20and%20large%20industrial%20sources (visited Apr. 10, 2023).

[3] 75 Fed. Reg. 77,291, 77,233 (Dec. 10, 2010) (emphasis added).

the carbon dioxide from the injection zone or might be interested in preserving this option (e.g., to sell that carbon dioxide for EOR[Enhanced Oil Recovery]/EGR[Enhanced Gas Recovery]).”[4]

II. Discussion

A. Well Operators Can Utilize Underground Injection Control (UIC) Program Class II Oil and Gas Wells for Long-Term CO_2 Storage Without Complying with Class VI Geological Sequestration Requirements.

For a well operator to inject CO_2 underground for the purpose of long-term storage, it must obtain, among other things, an “Underground Injection Control” (UIC) permit under the federal Safe Drinking Water Act, 42 U.S.C. § 300f *et seq*. There are six “classes” of UIC permits, two of which pertain to the underground injection of CO_2: Class II and Class VI. **Class VI wells** are specifically designed for geologic sequestration of CO_2 and must be constructed and operated in compliance with EPA’s Class VI regulations at 40 C.F.R. part 146, Subpart H, which EPA promulgated in 2010.[5] EPA’s Class VI regulations are much more rigorous and detailed than the federal regulations governing other UIC well classes.[6] The reasons for this higher stringency include: (1) CO_2 is quite buoyant, meaning that it will rise to the surface if it comes in contact with a fault, fracture, or improperly constructed or plugged well, (2) wells designed for CO_2 sequestration are anticipated to be very large, so the upward pressure from stored CO_2 will pose a greater risk than the pressure produced from other liquids stored in smaller UIC wells, (3) the potential presence of impurities in the CO_2 stream like mercury and hydrogen sulfide that pose a serious threat to water quality, and (4) the corrosivity of CO_2 in the presence of water, which may cause leaching and mobilization of naturally-occurring metals or other contaminants from geologic formations into groundwater (such as arsenic and lead).[7]

Though permanent sequestration (or long-term storage) of CO_2 underground for the purpose of mitigating climate change is relatively new, the oil and gas industry has been injecting CO_2 into **Class II wells** for decades.[8] Class II wells are used for the injection of fluids associated with oil and gas production. There are approximately 180,000 of these wells located in the United States, with the majority located in Texas, California, Oklahoma, and Kansas.[9] At least 40

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[4] EPA, Geologic Sequestration of Carbon Dioxide: Underground Injection Control (UIC) Program Class VI Well Plugging, Post-Injection Site Care, and Site Closure Guidance, Dec. 2016, at 32, https://www.epa.gov/sites/default/files/2016-12/documents/wp-pisc-sc_guidance_final_december_clean.pdf. EPA’s agnosticism regarding withdrawal of supposedly sequestered CO_2 reflects the UIC program’s purpose of protecting ground water rather than the climate; while removing sequestered CO_2 is harmful to the climate, removal does not necessarily threaten ground water quality.

[5] 75 Fed. Reg. at 77,291. Note that this rulemaking also made various other changes to different parts of the UIC regulations that relate to Class VI wells.

[6] For a detailed comparison between Class II and Class VI well requirements, see Appendix C to Congressional Research Service, “Injection and Geologic Sequestration of Carbon Dioxide: Federal Role and Issues for Congress,” (Updated Sept. 22, 2022), https://sgp.fas.org/crs/misc/R46192.pdf.

[7] 75 Fed. Reg. at 77,234-77,235. *See also,* Personal Email Communication from Brandon Maples, EPA Region 6, to Keri Powell, Powell Environmental Law, on Feb. 23, 2023.

[8] U.S. EPA, “Class II Oil and Gas Related Injection Wells,” https://www.epa.gov/uic/class-ii-oil-and-gas-related-injection-wells (visited Mar. 27, 2023).

[9] *Id.*

states have primacy over the Class II UIC program.[10] Not only are Class II regulations themselves laxer than Class VI regulations, but it is also substantially easier for a state to obtain primacy over Class II wells than over Class VI wells. Specifically, while Section 1422 of the Safe Drinking Water Act requires a state to satisfy EPA's UIC regulatory requirements to obtain primacy over UIC well classes, section 1425 of the Act provides states seeking primacy over the Class II program with the opportunity to make an "alternative showing of effectiveness" that involves demonstrating that the state Class II program is effective in preventing underground injection that endangers underground sources of drinking water.[11]

The vast majority of Class II wells—about 80%—are used for "Enhanced Oil Recovery" (EOR) and "Enhanced Gas Recovery" (EGR) (together referred to as "ER"), which involves the injection of water, CO_2, or other fluids into a depleted oil or gas reservoir to increase production.[12] Presently, CO_2 injected into Class II wells for ER is usually "natural CO_2" withdrawn from naturally formed geologic domes in Colorado, New Mexico, and Mississippi.[13] Most of the CO_2 injected underground for ER is pumped back up to the surface and captured either for continued use in the same ER project or for use in another ER project.[14] However, some CO_2 may be left behind intentionally or unintentionally and can qualify for a CO_2 storage tax credit under Section 45Q of the U.S. Internal Revenue Code.[15] Furthermore, the increased 45Q tax credits made available pursuant to the Inflation Reduction Act of 2022 may incentivize oil and gas companies to leave more CO_2 underground after completion of oil production activities, or even utilize Class II wells for the primary purpose of long-term CO_2 storage.[16]

About 20% of Class II wells are used for acid gas disposal, which involves the reinjection of brines brought up during oil and gas extraction.[17] CO_2 can be injected into Class II disposal wells for long-term storage along with brines, or, potentially, a Class II disposal well could be used solely for CO_2 storage.

When EPA promulgated the Class VI UIC regulations in 2010, it wanted to avoid impacting the longstanding oil and gas industry practice of injecting CO_2 into Class II wells for the purpose of ER. Thus, since ER always results in leaving some CO_2 underground after an ER project is complete, EPA's 2010 rulemaking expressly authorizes long-term CO2 storage in Class II wells. In most cases, even if a Class II well is used for the primary purpose of CO_2 storage, the more protective Class VI rules do not apply. The only exception is when CO_2 is injected into a

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[10] Congressional Research Service, "Injection and Geologic Sequestration of Carbon Dioxide: Federal Role and Issues for Congress," (Updated Sept. 22, 2022), at 11, https://sgp.fas.org/crs/misc/R46192.pdf.
[11] 42 U.S.C. § 300h-4.
[12] Congressional Research Service, *supra* note 10, at 5.
[13] 75 Fed. Reg. at 77,244. It bears emphasis that at present, the oil and gas industry is contributing to climate change by (among other things) withdrawing CO_2 that has been naturally stored underground for millions of years and using it to increase production of oil and gas.
[14] *Id.*
[15] 26 U.S.C. § 45Q(a)(2) and (a)(4).
[16] *See* International Energy Agency, Insights Series 2015, "Storing CO_2 through Enhanced Oil Recovery: Combining EOR with CO_2 storage (EOR+) for profit" (2015), https://iea.blob.core.windows.net/assets/bf99f0f1-f4e2-43d8-b123-309c1af66555/Storing_CO2_through_Enhanced_Oil_Recovery.pdf (discussing the potential increase in CO_2 storage in connection with EOR if sufficient incentives provided).
[17] U.S. EPA, Class II Oil and Gas Related Injection Wells, https://www.epa.gov/uic/class-ii-oil-and-gas-related-injection-wells (visited Mar. 27, 2023).

Class II well **"for the primary purpose of long-term storage"** ***and*** **"there is an increased risk" to underground sources of drinking water "compared to Class II operations."**[18]

EPA's preamble to the 2010 rule acknowledges that **"if the business model for ER changes to focus on maximizing CO_2 injection volumes and permanent storage, then the risk of endangerment to USDWs is likely to increase."**[19] Specifically:

> This [increased risk to underground sources of drinking water] is because reservoir pressure within the injection zone will increase as CO_2 injection volumes increase. Elevated reservoir pressure is a significant risk driver at GS sites, as it may cause unintended fluid movement and leakage into USDWs that may cause endangerment. Additionally, increasing reservoir pressure within the injection zone as a result of GS will stress the primary confining zone (i.e., geologic caprock) and well plugs to a greater degree than during traditional ER (e.g., Klusman, 2003). Finally, active and abandoned well bores are much more numerous in oil and gas fields than other potential GS sites, and under certain circumstances could serve as potential leakage pathways. For example, in typical productive oil and gas fields, a CO_2 plume with a radius of about 5 km (3.1 miles) may come into contact with several hundred producing or abandoned wells (Celia et al., 2004).[20]

Though these same factors likely result in increased risks to the environment other than to underground sources of drinking water, EPA's preamble does not discuss such risks, presumably because the express purpose of the UIC program is to protect underground sources of drinking water, not to guard against climate change or protect ecosystems.

Where long-term CO_2 storage will be the "primary purpose" of a Class II well, EPA's final 2010 regulations identify various factors to be considered by the well's "owner or operator" in determining whether injection of CO_2 into the well triggers the requirement to apply for a Class VI permit.[21] These factors are:

> **(1)** Increase in reservoir pressure within the injection zone(s);
>
> **(2)** Increase in carbon dioxide injection rates;
>
> **(3)** Decrease in reservoir production rates;
>
> **(4)** Distance between the injection zone(s) and USDWs [underground sources of drinking water];
>
> **(5)** Suitability of the Class II area of review delineation;
>
> **(6)** Quality of abandoned well plugs within the area of review;

[18] 40 CFR § 144.19(a) (emphasis added).
[19] 75 Fed. Reg. at 77,244 (emphasis added).
[20] *Id.*
[21] 40 C.F.R. § 144.19(b).

(7) The owner's or operator's plan for recovery of carbon dioxide at the cessation of injection;

(8) The source and properties of injected carbon dioxide; and

(9) Any additional site-specific factors as determined by the Director.[22]

EPA explained that "[a]ny single factor may not necessarily result in a determination that a Class II owner or operator must apply for a Class VI permit; rather, all factors must be evaluated comprehensively to inform a Director's (or owners' or operators') decision."[23] EPA further noted that it was **"developing guidance to support Directors and owners or operators in evaluating these factors and making the determination on whether to apply Class VI requirements."**[24]

B. Despite Acknowledging the Need for Technical Guidance Regarding How Regulators Should Evaluate Risk Factors in Deciding Whether a Class II Well Must Transition to Complying with Class VI Requirements, to Date EPA Has Only Issued a Brief, 2-Page Memorandum.

In 2015, EPA issued a two-page memorandum entitled "Key Principles to EPA's Underground Injection Class VI Rule Related to Transition of Class II Enhanced Oil or Gas Recovery Wells to Class VI."[25] This memorandum appears to be the only guidance EPA has issued to date regarding how regulators should evaluate risk factors for the purpose of determining whether a Class II well used for long-term CO_2 storage should be required to obtain a Class VI permit.[26]

In the memo, EPA affirmed that geologic storage of CO_2 can be permitted under the Class II program.[27] EPA also clarified that Class VI well closure requirements do not apply to Class II CO_2 injection operations, and that even if "oil or gas recovery is no longer a significant aspect of a Class II permitted ER operation," there is no need for a Class VI permit unless there is increased risk to underground sources of drinking water "related to significant storage of CO_2 in the reservoir, where the regulatory tools of the Class II program cannot successfully manage the risk."[28] EPA further stated that the most direct indicator of increased risk "is increased pressure in the injection zone related to the significant storage of CO_2," but explained that even if there is increased pressure, a Class VI permit "should only be considered if the Class II tools are insufficient to manage the increased risk."[29]

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[22] *Id.*
[23] 75 Fed. Reg. at 77,245.
[24] *Id.*
[25] Memorandum from Peter C. Grevatt, Director, U.S. EPA Office of Ground Water and Drinking Water, to U.S. EPA Regional Water Division Directors, "Key Principles in EPA's Underground Injection Control Program Class VI Rule Related to Transition of Class II Enhanced Oil or Gas Recovery Wells to Class VI, Apr. 23, 2015, https://www.epa.gov/sites/default/files/2020-08/documents/class2eorclass6memo_0.pdf (visited Mar. 31, 2023) ("Class II Transition Memo").
[26] Email from Brandon Maples, EPA Region 6, to Keri Powell, Powell Environmental Law, dated April 3, 2023.
[27] Class II Transition Memo at 1.
[28] *Id.* at 2.
[29] *Id.*

EPA concludes the 2015 memo by stating that it is working with other entities "to finalize technical guidance focused on risk factors discussed in the Class VI Rule at 40 CFR 144.19."[30] To date, no such technical guidance has been released. According to a UIC program staffer in EPA Region 6, no additional guidance appears to be under development.[31] However, this same staffer stated that at present, "there are no hard and fast cutoffs for 'acceptable' levels of risk—much of this is still being worked out."[32]

C. The Class II Transition Requirements Generally Do Not Apply Where CO_2 Sequestration is Not the Primary Purpose of CO_2 Injection.

Notably, the regulatory Class II transition requirements described above only apply where CO_2 is injected into a Class II well for the "primary purpose" of "long-term storage" of CO_2.[33] Thus, **while the risks of storing CO_2 in Class II wells described above obviously would arise from ER operations where CO_2 injection is maximized for purposes of obtaining carbon storage tax credits, under the federal regulations, the Class VI safeguards would not apply.** Instead, EPA apparently envisions that increased risks posed by long-term CO_2 storage that occurs at wells where ER is underway will be managed by the Class II program. EPA explains that it "expects that, in most cases, the ER owners or operators will use these same factors [applicable to injection or the primary purpose of CO_2 storage pursuant to 40 C.F.R. § 144.19(b)] to evaluate whether there is an increased risk to USDWs."[34]

So, what is the threshold beyond which the "primary purpose" of a Class II well shifts from ER or waste disposal to long-term CO_2 storage? EPA indicates that ER is no longer the "primary purpose" of a Class II well "[i]f oil or gas recovery is no longer *a significant aspect* of a Class II permitted ER operation."[35] "Significant aspect" seems to be a lower standard than "primary purpose." It is likely that states will consider the "primary purpose" to be ER so long as at least some amount of oil and gas is produced from the well in question. And in fact, Texas' Class VI rules explicitly state that a well's "primary purpose" is "enhanced recovery operations" if "there is reasonable expectation of **more than insignificant future production** volumes of oil, gas, or geothermal energy and operating pressures are no higher than reasonably necessary to produce such volumes or rates."[36]

A state has the option of promulgating more stringent rules than required by federal law, and it appears that Texas' Class VI rules would require a Class II well operator to apply for a Class VI permit based solely on a determination of increased risk from CO_2 injection, regardless of a well's primary purpose. Specifically, Texas' Class VI regulations provide that a Class II well operator or owner must apply for a Class VI permit if the Director determines that "the injection

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[30] *Id.*
[31] Brandon Maples email, April 3, 2023, *supra* note 26.
[32] Email from Brandon Maples, EPA Region VI, to Keri Powell, Powell Environmental Law, dated Feb. 23, 2023.
[33] 40 C.F.R. § 144.19(a).
[34] 75 Fed. Reg. at 77,245.
[35] Class II Transition Memo, *supra* note 25, at 2.
[36] *See, e.g.,* Texas' Class VI regulations at 16 TAC §5.201(b)(1) (indicating that a well's "primary purpose" is "enhanced recovery operations" if "there is reasonable expectation of more than insignificant future production volumes of oil, gas, or geothermal energy and operating pressures are no higher than reasonably necessary to produce such volumes or rates.").

well is no longer being used for the primary purpose of enhanced recovery options **or** there is an increased risk" to underground drinking water sources.[37] Likewise, in defining "primary purpose," Texas includes consideration of whether "operating pressures are no higher than reasonably necessary" to produce the volume/rate of oil or gas production anticipated from ER. Because "[e]levated reservoir pressure is a significant risk driver,"[38] Texas' definition of "primary purpose" has the effect of enabling Texas regulators to require a Class II well owner/operator injecting CO_2 for long-term storage to comply with Class VI requirements based on increased risk regardless of whether the well is being used for ER. Unlike Texas, the Louisiana Department of Environmental Quality ("LDEQ"), largely copied the pertinent federal regulations into Louisiana's Class VI regulations.[39]

D. Even if Increased Risks from Long-Term CO_2 Storage in a Class II Well Used for the Primary Purpose of Long-Term Carbon Storage Exceeds What Can Be Managed Under Class II, Wells Do Not Need to Fully Comply with Class VI Standards.

Even under circumstances where a Class II well is used for the primary purpose of CO_2 sequestration and either its owner or operator or possibly regulators determine there is an increased risk to underground sources of drinking water compared to Class II operations, the Class VI regulations do not require a Class II well to fully comply with Class VI requirements. Rather, EPA's 2010 preamble explains that the final Class VI regulations "allow[] the constructed components of Class II ER wells to be grandfathered into the Class VI permitting regime at the discretion of the Director and pursuant to requirements at [40 CFR] § 146.81(c), in order to facilitate the transition from Class II to Class VI wells without undue regulatory burden."[40] Very few Class II wells could be modified such that they would fully comply with the Class VI structural requirements.[41] Thus, even if it is determined that long-term carbon sequestration in a given Class II well presents an increased risk that cannot be managed using Class II tools, a well operator need only "demonstrate to the Director that the wells were engineered and constructed to meet the requirements at [40 C.F.R.] § 146.86(a) and ensure protection of USDWs,"[42] instead of complying with the Class VI regulations specifying "casing and cementing"[43] and "[l]ogging, sampling, and testing prior to injection well operation."[44] The "requirements" of § 146.86(a) leave the Director with a lot of discretion:

> **(a)** ***General.*** The owner or operator must ensure that all Class VI wells are constructed and completed to:
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> **(1)** Prevent the movement of fluids into or between USDWs or into any unauthorized zones;

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[37] 16 TAC §5.201(b)(2) (emphasis added)
[38] 75 Fed. Reg. at 77,244.
[39] Louisiana Administrative Code, Title 43, Part XVII, §601(G)(1).
[40] *Id.*
[41] Railroad Commission of Texas, "Geologic Storage of Anthropogenic CO2," https://www.rrc.texas.gov/oil-and-gas/applications-and-permits/injection-storage-permits/co2-storage/ (visited Apr. 12, 2023) ("Be advised that most O&G wells and O&G injection wells (UIC Class II) will not meet [Class VI] requirements.").
[42] 40 C.F.R. § 146.81(c).
[43] 40 C.F.R. § 146.86(b)
[44] 40 C.F.R. § 146.87(a).

(2) Permit the use of appropriate testing devices and workover tools; and

(3) Permit continuous monitoring of the annulus space between the injection tubing and long string casing.

E. EPA's Regulations Fail to Establish Procedures by Which Regulators Review Decisions by Class II Owner/Operators as to Whether Their Injection of CO_2 for Long-Term Storage Trigger the More Protective Class VI Requirements.

To ensure that the federal Class II transition requirements will work in practice, there must be clear and reliable procedures for determining whether a well owner or operator must obtain a Class VI permit prior to injecting CO_2 into a Class II well. Unfortunately, such procedures are not provided in the UIC regulations and EPA's extremely limited guidance has so far failed to fill the gap. Unfortunately, the federal rules are unclear on both points.

As explained above, EPA's UIC regulations unambiguously place initial responsibility on Class II well owners/operators to make their own assessment of whether they must apply for a Class VI permit before injecting CO_2 for long-term storage. Specifically, the UIC rules state: "Owners or operators that are injecting carbon dioxide for the primary purpose of long-term storage into an oil and gas reservoir" must consider the factors spelled out above in determining whether such storage presents an increased risk to USDWs, and if it does, "must apply for and obtain a Class VI geologic sequestration permit.[45]

But how are regulators to know whether a Class II owner or operator has undertaken the requisite review, and what happens if the owner or operator of a Class II well that should transition to Class VI requirements fails to file a Class VI application? The federal rules are ambiguous regarding how state and federal regulators are to oversee compliance with Class VI transition requirements.

The federal UIC regulations, immediately after directing well owners or operators to apply for a Class VI permit if warranted by consideration of the specified risk factors, go on to declare that it is "[t]he Director" who "shall determine when there is an increased risk to USDWs compared to Class II operations and a Class VI permit is required."[46] EPA explains in the preamble that the reason for this dual authority is that EPA wanted to give the Director "the discretion to make this determination in the absence of an owner or operator notification and, in doing so, require the owner or operator to apply for and obtain a Class VI permit in order to continue injection operations."[47]

There are two problems with the above-described oversight mechanism. First, it is unclear who the "Director" is that is responsible for making the determination that a Class VI permit is required. The general UIC regulations define "Director" to mean the EPA Regional Administrator when there is no approved State or Tribal program.[48] When there is an approved State or Tribal program, the "Director" is the State or Tribal director. Here, there are two UIC

[45] 40 C.F.R. § 144.19(a).
[46] 40 C.F.R. § 144.19(b).
[47] 75 Fed. Reg. at 77,245.
[48] 40 C.F.R. 144.3.

programs in question: Class II and Class VI. Presently, most states with oil and gas operations have primacy over the Class II program, but the Class VI program is administered by EPA (with the exception of North Dakota and Wyoming). The Class II transition provisions appear in the "General Program Requirements" for all UIC permitting. So, is the "Director" with the authority to require a Class II well owner or operator to apply for a Class VI permit the Director of the Class II program or the Director of the Class VI program? The rules are unclear. In states where the state has primacy over the Class II program and EPA retains authority over the Class VI program, or where different state agencies have authority over the two programs, this lack of clarity could cause problems.

EPA, in its 2015 memo addressing Class II/Class VI transition requirements, explained that the director of the Class II program "will have the relevant data on the pressure and volume of CO2 injected into Class II ER operations."[49] EPA noted that this official is likely to be a state official (because most states with significant oil and gas mining operations have primacy to administer the Class II UIC program).[50] EPA "encourages the Class II director to contact the Class VI director where he/she believes the risk has changed as a result of significant storage of CO_2 in the reservoir."[51] However, the 2015 memorandum does not clarify who is ultimately responsible for making the decision as to whether a transition to Class VI is required.

In a 2020 report, the Congressional Research Service concluded that the Class VI director is responsible for making the determination as to whether a Class II well must comply with Class VI requirements, stating: "The Class VI program director (EPA or primacy state) determines whether a Class VI permit is required based on site-specific risk factors associated with USDW endangerment. No transition has yet been required."[52]

On the other hand, the Texas Railroad Commission ("RRC"), which currently has primacy over the Class II program but not over the Class VI program, indicates on its website that the "RRC may make a determination that operation of your Class II injection well [CO_2 EOR or Acid Gas Disposal well(s)] is no longer for the primary purpose of enhanced recovery operations or has increased risk to USDWs and the well(s) must be converted to a Class VI permit, 16 TAC §5.201(b)(2)."[53] Consistent with the RRC's position, in email correspondence, an EPA Region VI staff member explained: "[W]e in Region 6 would be relying on the state program's judgement (RRC here [in Texas]) surrounding factors in 40 CFR 144.19 and a determination of when a Class VI permit may be needed, as they are the Class II primacy agency."[54]

The second problem with the regulatory oversight procedures for Class VI transition requirements is perhaps larger than the ambiguity over who has the authority to decide whether a Class VI permit is required: the regulations fail to require Class II well owners or operators to

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[49] Class II Transition Memo, *supra* note 25, at 2.
[50] *Id.*
[51] *Id.*
[52] Congressional Research Service, "CO_2 Underground Injection Regulations: Selected Differences for Enhanced Oil Recovery and Geologic Sequestration," June 16, 2020, at 3, https://crsreports.congress.gov/product/pdf/IF/IF11578.
[53] Railroad Commission of Texas, "Geologic Storage of Anthropogenic CO_2," https://www.rrc.texas.gov/oil-and-gas/applications-and-permits/injection-storage-permits/co2-storage/ (visited Apr. 12, 2023).
[54] Email from Brandon Maples, EPA Region VI, to Keri Powell, Powell Environmental Law, dated Apr. 6, 2023.

notify regulators of their determination. Thus, while the regulations provide the Director with discretion to determine that a Class II well needs to transition to Class VI requirements, there is no trigger for the Director to review a determination by an owner or operator that a Class VI permit is not required. In fact, it is unlikely that the Director will even know whether an owner or operator even considered whether a Class VI permit is required. As an EPA Region VI staff person acknowledges, "specific trigger points are never really spelled out anywhere."[55]

The logical trigger for the Director to determine whether a Class VI permit is required prior to CO_2 injection into a Class II well for the primary purpose of long-term storage would be before such injection occurs. Unfortunately, it likely will not be necessary for a Class II well operator to apply for UIC pre-approval, especially if the Class II well in question is already approved for ER. If the CO_2 injection volume would exceed what has been previously permitted for an ER project, it is possible that a state might require a permit modification, but nothing in the federal regulations requires consideration of whether a Class VI permit should be required at that point. Furthermore, even if a well operator is simply switching from using "natural" CO_2 to using "anthropogenic" CO_2 captured from industrial sources for which a new permit is definitively not required,[56] the operator may be planning to leave more CO_2 underground than it had previously so as to take advantage of available tax credits, and the existing Class II permit may not have placed any restriction on the amount left underground for long-term storage.

Given the lack of a pre-injection notice or approval requirement, an agency's regulatory oversight role would be limited to after-the-fact enforcement based on a well owner/operator's subsequent monitoring and reporting. As EPA explains in the preamble to the Class VI regulations,

> In the event that an injection operation makes changes to the ER operation such that the increased risk to USDWs warrants transition to Class VI and does not notify the Director, the owner or operator may be subject to specific enforcement and compliance actions to protect USDWs from endangerment, including corrective action within the AoR [Area of Review], cessation of injection, monitoring, and/or PISC [Post-Injection Site Care] under sections 1423 and 1431 of the SDWA.[57]

In other words, government oversight of Class VI transition requirements will be reactive and *ad hoc*, at best. To the extent that enforcement occurs, it will be only after injection has commenced and harm has resulted.

[55] *Id.*
[56] Class II Transition Memo, *supra* note 25, at 1.
[57] 75 Fed. Reg. at 77,245.

F. Aside from the differences between the Class II and Class VI UIC Requirements, Class II Wells Used for Long-Term CO_2 Storage Also Are Not Necessarily Subject to the Same Monitoring, Recordkeeping, and Reporting (MRV) Requirements as Class VI Wells.

In promulgating the 2010 Class VI regulations, EPA determined that facilities that inject CO_2 for long-term storage are subject to the federal Greenhouse Gas Reporting Program. Thus, EPA concurrently promulgated greenhouse gas reporting rules for carbon sequestration in Class VI wells at 40 CFR Part 98, Subpart RR. The purpose of Subpart RR is to "verify[] the amount of CO_2 sequestered and collect[] data on any CO_2 surface emissions."[58] Among other things, Subpart RR requires that a facility owner or operator develop and implement a monitoring, reporting, and verification ("MRV") plan, which must be approved by EPA.[59] The MRV Plan also serves to meet the 45Q tax credit program sequestration verification requirement.

In general, Class II well operators are subject to the less stringent greenhouse gas reporting requirements at 40 CFR Part 98, Subpart UU, which do not require an MRV plan.[60] However, if a Class II well operator/owner wishes to obtain 45Q tax credits for long-term CO_2 storage in connection with an ER project, the well operator/owner must *either* develop and implement an MRV plan as required under Subpart RR *or* comply with the International Organization for Standardization (ISO) standard for CO_2 capture, transportation, and geological storage.[61]

Unlike an MRV plan requirements, the ISO standard does not involve review by EPA. Instead, the taxpayer seeking tax credit must provide all required documentation to the verifying third-party (a qualified independent engineer or geologist).[62] Neither the IRS nor the EPA receives the underlying documentation. Also, while MRV plans and associated Subpart RR annual reports must be made available to the public, "[t]he Treasury Department and the IRS do not have the authority to disclose taxpayer information or to require taxpayers to self-disclose taxpayer information as a condition of using the ISO standard provided in the final regulations."[63] Finally, while EPA's approval of an MRV plan can be challenged by impacted members of the public before EPA's Environmental Appeals Board (EAB),[64] and the EAB's decision is a final agency action that can be reviewed by a federal court,[65] it is unclear what legal oversight mechanism, if any, is available for challenging the IRS's acceptance of third-party verification of a project's compliance with the ISO standard.

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[58] 75 Fed. Reg. at 77,263.
[59] 40 CFR § 98.448. Links to final EPA decisions on MRV plans are available at https://www.epa.gov/ghgreporting/subpart-rr-geologic-sequestration-carbon-dioxide.
[60] 40 CFR Part 98, Subpart UU.
[61] 26 CFR § 1.45Q-3(b)(2)(ii).
[62] 86 Fed. Reg. 4728, 4740 (Jan. 15, 2021).
[63] 86 Fed. Reg. at 4742.
[64] EPA, "Mandatory Reporting of Greenhouse Gases: Injection and Geologic Sequestration of Carbon Dioxide," Final Rule, 75 Fed. Reg. 75,059, 75,071 (Dec. 1, 2010) ("EPA plans to post approved MRV plans to a public Web site, to the extent consistent with any confidentiality determination. "Interested persons" can then appeal EPA decisions on MRV plans to the Environmental Appeals Board (EAB) through the appeals process described in 40 CFR part 78.").
[65] Clean Air Act 307(b), 42 U.S.C. § 7607(b).

H. Tax Credits for Long-Term Storage of CO_2 in Class II Wells Will Likely Lead to Increased Oil and Gas Extraction.

As explained above, the vast majority of CO_2 injected into Class II wells is "natural CO_2" withdrawn from naturally formed geologic storage domes in Colorado, New Mexico, and Mississippi.[66] Natural CO_2 is quite expensive, accounting for as much as 68 percent of the cost of a CO_2-ER project.[67] Also, "natural CO_2" sources are limited and fully committed to existing CO_2-ER projects. The expanded 45Q tax credits for long-term CO_2 storage authorized by the Inflation Reduction Act of 2022 would substantially reduce the cost of CO_2-ER projects that utilize anthropogenic CO_2 captured from industrial sources and provide new sources of CO_2 that will allow for a dramatic increase in CO_2-ER project development. Thus, EPA projects that "oil and gas fields now considered to be 'depleted' may resume operation because of increased [CO2] availability and decreased cost of anthropogenic CO_2."[68] Furthermore, the U.S. Department of Energy projects early carbon sequestration projects likely will be sited in depleted or active oil and gas reservoirs (regardless of ER potential) because they already have wells and pipelines in place. [69]

I. At Least in the Short Term, Most CO_2 Sequestration is Likely to Occur in Class II Oil and Gas Wells.

There are currently at least twelve EPA-approved MRV plans for long-term storage of captured CO_2 in Class II wells.[70] Most of these plans are for captured CO_2 stored in connection with ER projects, though some involve straightforward captured CO_2 storage in Class II wells permitted for disposal of oil and gas wastes.[71] Note that a single approved MRV plan can encompass a large number of Class II wells: the twelve approved MRV plans include over 900 planned or active Class II wells.[72] Meanwhile, EPA has issued only six Class VI wells for CO_2 sequestration, four of which involved projects that went bankrupt before the wells became active.[73] Of the two states that have obtained Class VI primacy to date, North Dakota has issued two Class VI permits[74] and Wyoming has not issued any.[75] Of course, a single Class VI well likely can sequester many times the amount of CO_2 that can be stored in a Class II well, and there are currently 89 Class VI well applications pending with EPA.[76] Thus, eventually, Class VI

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[66] 75 Fed. Reg. at 77,244.
[67] *Id.*
[68] *Id.*
[69] *Id.*
[70] BTU Analytics, "How to Store CO_2 via Class II Wells," Dec. 15, 2022, https://insight.factset.com/how-to-store-co2-via-class-ii-wells. Links to EPA-approved MRV plans and EPA's approval decisions are available on EPA's website at https://www.epa.gov/ghgreporting/subpart-rr-geologic-sequestration-carbon-dioxide#decisions.
[71] BTU Analytics, *supra* note 70.
[72] *Id.*
[73] EPA, Class VI Wells Permitted by EPA, https://www.epa.gov/uic/class-vi-wells-permitted-epa (visited 6/19/2023); EPA, Presentation for UIC Inspector Training, "Geologic Sequestration of CO_2 and Class VI Wells," (July 2019), https://www.epa.gov/sites/default/files/2019-08/documents/graves_-_class_vi_wells_2019.pdf.
[74] North Dakota, Class VI - Geologic Sequestration Wells, https://www.dmr.nd.gov/dmr/oilgas/ClassVI (visited 6/20/23).
[75] Wyoming Department of Environmental Quality, Class VI Permits, https://deq.wyoming.gov/water-quality/groundwater/uic/class-vi/ (visited 6/20/23).
[76] EPA, Class VI Wells Permitted by EPA, *supra* note 73.

well storage may dwarf Class II storage. As CCS is initially implemented, however, the ease of storing CO_2 in Class II wells, and the potential for higher returns on investments from CO_2 ER projects relative to Class VI sequestration projects, likely means that most early CO_2 storage projects will utilize Class II wells.[77]

Even if CO_2 is initially injected into a Class VI well, it might subsequently be withdrawn for ER use. As EPA acknowledges, Class VI well operators remain free to withdraw CO_2 from Class VI well storage (though withdrawal may impact tax credits). Thus, advocates are well-advised to keep an eye on how planned Class VI storage projects might interact with nearby Class II ER wells.

The most likely reason for CO_2 to be withdrawn from a Class VI well would be to use it for ER in other fields or to re-initiate ER operations in the same field. Alternatively, Class II ER projects might just piggyback on Class VI projects, with captured CO_2 being used for ER projects when needed and diverted to Class VI storage when not needed. Or, ER in Class II wells could be envisioned as the second stage of a CO_2 storage project, with initial pipelines being constructed to serve a Class VI well project, and then Class II ER projects making use of the Class VI project pipelines once the Class VI well is at capacity.[78] In fact, once the sequestration project is constructed and the political need to obfuscate a possible connection to ER is no longer needed, ER developers likely would not even need to wait for the Class VI well to reach capacity before accessing CO_2 from pipeline for use in ER. In sum, even for a Class VI carbon sequestration project, the availability of Class II wells for ER and long-term CO_2 storage (and resulting 45Q tax credits) may play a role in attracting investment in and making a proposed CO_2 sequestration project profitable.

III. EPA Must Take Action to Ensure That Risks Posed by Long-Term CO_2 Storage in Class II Wells are Properly Evaluated and That Well Owners/Operators Comply with Class VI Requirements if Warranted.

At present, EPA implements UIC Class VI permitting requirements throughout the United States except for in Wyoming and North Dakota. Thus, in most states, EPA is the entity responsible for ensuring that Class II well owners/operators injecting CO_2 for long-term storage apply for and obtain a Class VI permit if warranted. Yet there is no indication that EPA has made any attempt to follow through on this responsibility; to date, no Class II well has had to convert to Class VI, and it does not appear that EPA has even sought to evaluate whether such conversion is needed for any Class II well. Furthermore, EPA does not appear to have required states that

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[77] *See generally* BTU Analytics, *supra* note 70 (especially the graphic entitled "Current Amount of CO_2 Sequestered & Number of Approved MRV Plans for Class II Wells").

[78] Telephone Conversation with Derick Braaten, Apr. 4, 2023. Mr. Braaten observed that the billionaire Harold Hamm, founder and chairman of Continental Resources (a major fracking firm), has agreed to make a $250 million investment in the Summit Carbon Solutions' carbon sequestration project at Theraldson Ethanol, and theorized that Mr. Hamm's interest is driven, at least in part, by wanting to support construction of a CO_2 pipeline that ultimately would provide CO_2 for ER at Continental Resources' Class II wells in North Dakota after the Class VI well is filled. *See also*, Helman, Christopher, "Fracking Billionaire Harold Hamm Plans to Reverse Course and Pump Millions of Tons of Carbon into the Earth," Forbes, Mar. 2, 2022, https://www.forbes.com/sites/christopherhelman/2022/03/02/fracking-billionaire-harold-hamm-reverses-course-and-starts-pumping-carbon-into-the-earth/?sh=238b706a2a6b.

have Class VI primacy (Wyoming and North Dakota) to present an adequate plan—or any plan—for evaluating the need for Class II wells to convert to Class VI. For EPA to fulfill its obligation under the Safe Drinking Water Act to protect underground sources of drinking water, as well as applicable executive orders addressing environmental justice, EPA must take immediate action to ensure that risks posed by long-term CO_2 storage in Class II wells are assessed in a timely fashion and that well operators/owners are required to comply with Class VI requirements if warranted. Specific recommendations are provided below.

A. EPA Must Issue the Promised Guidance on How to Evaluate the Risk of Long-Term CO_2 Storage in Class II Wells.

As discussed above, for more than a decade, EPA has been promising to issue guidance on how states are to evaluate risks posed by CO_2 injection into Class II wells and determine whether to apply Class VI requirements. Without this guidance, there can be no assurance that well operators/owners will comply with Class VI requirements and that underground injection of CO_2 will not contaminate drinking water. Thus, EPA must promptly draft the guidance and publish it in the *Federal Register* for public comment. **EPA should pause all state Class VI primacy proceedings until the final guidance on the evaluation of risks from long-term CO_2 storage in Class II wells is published.**

B. In States Where EPA is Responsible for Class VI Permitting, EPA Must Transparently Evaluate Whether Class II Wells Storing CO_2 Must Convert to Class VI.

According to EPA, to ensure that Class II wells are converted to Class VI when CO_2 injection poses risks that exceed what the Class II program is designed to manage, the Class VI program director must coordinate with the Class II program director. Specifically, the Class II program director is most likely to have the information needed to evaluate the risks posed by CO_2 storage in a Class II well. At present, EPA is responsible for Class VI permitting in all but two states, while most states have primacy over Class II permitting. Thus, in most states, the Class VI program director is an EPA official, whereas the Class II program director is a state official. Nonetheless, there is no indication that EPA developed a plan for coordinating with state Class II program directors in these states to ensure that the risks posed by CO_2 storage in Class II wells does not warrant application of Class VI requirements. **To fulfill its legal responsibilities in states where EPA administers Class VI permitting requirements, EPA must immediately establish procedures for evaluating the risks of long-term CO_2 storage in Class II wells located in those states and for ensuring that Class II wells convert to Class VI if necessary.** Such procedures must include public notice of any determination as to whether a well owner/operator can store captured CO_2 in a Class II well.

C. EPA Must Require Any State Seeking Primacy to Demonstrate That it Has an Adequate Plan to Ensure Compliance with the Requirement that a Class II Well Convert to Class VI if Risks Exceed What the Class II Program is Designed to Manage.

To obtain primacy, a state must show that it has adopted and will implement "an underground injection program which meets the requirements of regulations in effect under section 300h" of the SDWA.[79] As explained above, these regulatory requirements include the requirement that a well owner/operator obtain a Class VI permit before injecting CO_2 into a Class II well if the primary purpose of the injection is storage and if the risks posed by such storage exceed expected Class II well risks. **Thus, as a condition of granting primacy, EPA must require a state to demonstrate that it has specific rules and policies in place for evaluating the risks of long-term CO_2 storage in Class II wells and for ensuring that Class II wells convert to Class VI if required.**

Specific rules and policies needed to ensure conversion of Class II wells to Class VI if warranted include:

(1) a requirement that well owners/operators report to the state and EPA if they are injecting CO_2 into a Class II well for the purpose of storing it there and for which they will seek or have sought a 45Q tax credit, and a requirement for such reports to be publicly available;[80]

(2) a requirement that Class II well owner/operators perform monitoring, recordkeeping and reporting sufficient to document that that injection of CO_2 for long-term storage is safe;

(3) publicly transparent procedures that the state will follow to ensure the safety of long-term CO_2 storage in Class II wells;

(4) timely public access to any decision by the state that a Class II well must convert to Class VI; and

(5) a transparent process by which the UIC program director is to determine which requirements apply to a well that is converting from Class II to Class VI.

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[79] 42 U.S.C. § 300h-1(b)(1)(A)(i). *See also, id.* § 300-h-1(b)(1)(B) (after the EPA Administrator amends the federal regulations, the state shall submit "a notice to the Administrator containing a showing satisfactory to him that the State underground injection control program meets the revised or added requirement.").

[80] While the public can identify some Class II wells storing captured CO_2 by reviewing MRV plans submitted to EPA, there is no way for the public to identify facilities that opt to comply with the ISO standard instead of filing an MRV plan. Without public access this information, effective public oversight of anthropogenic CO_2 storage in Class II wells governed by the ISO standard is impossible. *See supra* at p. 12. Indeed, since EPA does not receive the underlying information that a company submits for ISO standard compliance, it does not appear that EPA can exercise appropriate oversight of anthropogenic CO_2 storage in such wells, either. *Id.*

D. EPA Must Require Any State Seeking Class VI Primacy to Demonstrate That Within Two Years of Program Approval, the State Will Assess the Risks Posed by All Class II Wells Located in the State that are Injecting CO_2 and Require Conversion to Class VI Where Necessary.

Aside from generally requiring a state's primacy application to demonstrate how the state will implement the Class-II-to-Class-VI-conversion requirement, federal UIC regulations instruct that a state seeking primacy must produce a schedule under which it will issue a Class VI permit to any existing well that needs one within two years of program approval. Specifically, 40 CFR 145.23(f)(1) provides that a State UIC program description must include:

> A schedule for issuing permits within five years after program approval to all injection wells within the State which are required to have permits under this part and 40 CFR part 144. **For Class VI programs, a schedule for issuing permits within two years after program approval**.

(Emphasis added). Accordingly, as a condition of receiving Class VI primacy, a state must demonstrate that, within two years, it will assess the risks posed by all Class II wells located in the state that are injecting CO_2 and require conversion to Class VI where necessary.

It does not appear that EPA has been communicating to states that their primacy applications must include a schedule that satisfies this two-year requirement. For example, the Class VI primacy application for the state of Louisiana, which EPA recently proposed to approve, states:

> The agency will evaluate information about Class II enhanced oil recovery wells (e.g., carbon dioxide injection and production data or information related to the other factors at LAC 43:XVII.3603.G.2) and identify whether any projects are approaching risk thresholds **within four years** of receiving Class VI primacy in accordance with 40 CFR 145.23(f).[81]

In other words, Louisiana appears to be committing to evaluate all existing Class II EOR wells to identify which of these wells requires a Class VI permit **within four years**. Thus, Louisiana's primacy application does not satisfy the applicable two-year deadline for Class VI permitting at 40 CFR 145.23(f)(1).

Furthermore, given that Louisiana already has primacy over Class II permits, Louisiana's explanation that it will identify which Class II ER require a Class VI permit within four years begs the question of whether Louisiana is currently evaluating whether long-term storage of captured CO_2 in existing Class II wells presents risks that exceed the scope of the Class II program. As explained above, EPA asserts that it is the Class II program director that possesses the relevant risk information regarding the long-term storage of captured CO_2 in Class II wells, and since Louisiana has primacy over Class II wells, the Class II program director is a state official. If Louisiana is not currently assessing such risks at Class II wells, that raises red flags

[81] Louisiana Primacy Application at 11, https://www.dnr.louisiana.gov/assets/OC/im_div/uic_sec/ClassVIPrimacyApplicationstamped.pdf

regarding whether Louisiana can be relied upon to properly implement the Class-II-to-Class-VI-conversion requirement after it obtains primacy over the Class VI program.

As a condition of granting a state's primacy application, EPA must ensure that the state submits a schedule of no more than two years for evaluating the risks posed by Class II wells located in the state that are used for long-term storage of captured CO_2 and for issuing Class VI conversion permits where required.

E. EPA Must Ensure That It and States Consider Environmental Justice When Deciding Whether the Risks of Long-Term CO_2 Storage Warrant Requiring a Class II Well to Comply with More Protective Class VI Requirements.

Pursuant to Title VI of the Civil Rights Act of 1964 and EPA's civil rights regulations, environmental programs for which the state receives federal funds may not discriminate against any person based on race, color, or national origin.[82] Likewise, Environmental Justice Executive Orders 12898,[83] 14008,[84] 13990,[85] and 14096[86] instruct that every federal agency, including EPA, address environmental justice when implementing regulatory programs. To comply with these directives, EPA and state agencies with primacy over UIC programs must ensure "the fair treatment and meaningful involvement of all people regardless of race, color, national origin or income with respect to implementation and enforcement" of UIC permitting requirements.[87] Given the dramatic difference between the detailed requirements of the Class VI program and the far laxer Class II requirements, decisions by EPA and state regulators regarding whether risks warrant requiring Class II wells to convert to Class VI inevitably will raise environmental justice concerns. **Before granting primacy over Class VI permitting to any state, EPA must confirm that the state will assess the environmental justice impacts of any decision to allow a Class II well to engage in long-term CO_2 storage without converting to Class VI and will ensure the fair treatment and meaningful involvement of all people impacted by that decision. In addition, EPA must also develop policies and procedures to ensure that its own decision-making regarding the Class-II-to-Class-VI conversion requirement comports with environmental justice principles.**

The most effective was for EPA to ensure that environmental justice is considered in Class-II-to-Class-VI conversion decisions is to amend the federal regulations to incorporate such a requirement. In addition, EPA should amend the federal UIC regulations to require

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[82] 42 U.S.C. §§ 2000d to 2000d-7; 40 C.F.R. Part 7.
[83] E.O. 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" (Feb. 11, 1994), https://www.epa.gov/sites/default/files/2015-02/documents/exec_order_12898.pdf.
[84] E.O. 140008, "Tackling the Climate Crisis at Home and Abroad (Jan. 27, 2021), https://www.govinfo.gov/content/pkg/FR-2021-02-01/pdf/2021-02177.pdf.
[85] E.O. 13990, "Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis," (Jan. 20, 2021), https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/20/executive-order-protecting-public-health-and-environment-and-restoring-science-to-tackle-climate-crisis/.
[86] E.O. 14096, Revitalizing Our Nation's Commitment to Environmental Justice for All (Apr. 21, 2023), https://www.whitehouse.gov/briefing-room/presidential-actions/2023/04/21/executive-order-on-revitalizing-our-nations-commitment-to-environmental-justice-for-all/.
[87] *See*, U.S. EPA, *Interim Environmental Justice and Civil Rights in Permitting, Frequently Asked Questions* (August 2022), at 4, https://www.epa.gov/system/files/documents/2022-08/EJ%20and%20CR%20in%20PERMITTING%20FAQs%20508%20compliant.pdf.

consideration of environmental justice in Class VI permitting decisions more generally. Specific detail regarding how to consider environmental justice in Class VI permitting decisions should be included in an update to the outdated Class VI environmental justice guidance issued by EPA in 2011.[88] Such update to the Class VI environmental justice guidance should incorporate input from affected communities.

[88] EPA, *Geologic Sequestration of Carbon Dioxide – UIC Quick Reference Guide: Additional Tools for UIC Program Directors Incorporating Environmental Justice Considerations into the Class VI Injection Well Permitting Process* (June 2011), https://www.epa.gov/sites/default/files/2015-07/documents/epa816r11002.pdf.

June 27, 2023

To: White House Environmental Justice Advisory Council (WHEJAC)

Re: Request That WHEJAC Urge the Biden Administration to Take Action Needed to Prevent the Injection of Carbon Dioxide into Class II Oil and Gas Wells for Long-Term Storage from Contaminating Underground Sources of Drinking Water and Endangering Nearby Communities

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Most of the controversy around the safety and effectiveness of carbon capture and sequestration (CCS) technology as a tool for mitigating climate change has focused on the U.S. EPA's federal regulations governing Class VI Underground Injection Control (UIC) permits for carbon sequestration under the Safe Drinking Water Act. We remain deeply concerned that these regulations are insufficient to guard against the contamination of underground sources of drinking water, ensure the safety of impacted communities, and prevent sequestered carbon dioxide (CO_2) from re-entering the atmosphere. However, it has come to our attention that even the Class VI requirements can be circumvented by companies looking for the easiest and quickest way to earn tax credits for carbon sequestration. Specifically, as documented in the attached white paper, *The Carbon Sequestration Loophole: Long-Term Carbon Storage in Poorly Regulated Class II Oil and Gas Underground Injection Control Wells*, the federal UIC regulations allow companies to circumvent the Class VI well requirements and instead store captured carbon in Class II oil and gas wells with little government oversight.

We request that WHEJAC recommend that the Biden Administration take immediate action to tighten regulatory oversight of Class II wells used for carbon sequestration and require agencies to consider environmental justice before allowing a company to store CO_2 in a poorly regulated Class II well.

Though CO_2 storage in Class II wells presents substantial environmental and public health risks, the Class II regulations are far weaker than the Class VI regulations. Moreover, even when a Class II well is used for the primary purpose of long-term CO_2 storage, it is unlikely that the well owner or operator will be required to obtain a Class VI permit. Rather, a Class VI permit is only

required if a Class II well will be used for the primary purpose of long-term CO_2 storage and there are increased risks to underground sources of drinking water that exceed those of Class II operations. Though EPA has been promising since 2010 to issue guidance regarding how to evaluate increased risks from long-term CO_2 storage in Class II wells, to date EPA has only finalized a brief, 2-page memorandum on the subject.[1] Making matters worse, the federal UIC rules rely on well owners or operators injecting CO_2 into Class II wells to undertake their own assessments as to whether they should obtain a Class VI permit, with no requirement that they notify regulators of their determination. Thus, enforcement of the Class VI transition rules will be *ad hoc* and likely occur only after CO_2 injection has caused harm to people or the environment.

Given the dramatic difference between the detailed requirements of the Class VI program and the far laxer Class II requirements, decisions by EPA and state regulators regarding whether risks warrant requiring Class II wells to convert to Class VI inevitably will raise environmental justice concerns. As with other efforts to address climate change, it is essential that the Biden Administration's carbon sequestration policies avoid discrimination against or inequitable treatment of any person on the basis of race, color, national origin or income. Accordingly, to protect communities located near Class II oil and gas wells and to guard against contamination of their underground drinking water resources, we ask WHEJAC to recommend that the Biden Administration do the following:

(1) pause proceedings to grant primacy to states to administer the Class VI UIC program until EPA finalizes a long-promised guidance regarding how states should implement the federal UIC requirement that a Class II well convert to Class VI if warranted by safety and environmental risks (the "Class II-to-Class-VI-transition regulations"),

(2) ensure that any state receiving Class VI primacy has effective rules and policies in place to implement the federal Class II-to-Class-VI-transition regulations, including the requirement that within two years of EPA's approval of a state's Class VI program, the state identify existing Class II wells used for carbon sequestration that need to convert to Class VI and issue such permits as warranted, and

(3) amend the federal UIC regulations and adopt guidance designed to ensure that both EPA and states with primacy to implement the Class VI program provide for "the fair treatment and meaningful involvement of all people regardless of race,

[1] EPA published a 93-page draft guidance document in 2013 but never finalized it and does not include it in the list of guidance documents applicable to Class VI permitting. It is currently available at https://19january2017snapshot.epa.gov/sites/production/files/2015-07/documents/epa816p13004.pdf

color, national origin or income with respect to implementation and enforcement" of UIC permitting requirements, including but not limited to when deciding whether to allow a company to store captured CO_2 in a Class II well rather than in a much more rigorously regulated Class VI well.[2] Specific details regarding how to consider environmental justice in Class VI permitting decisions should be included in an update to the outdated Class VI environmental justice guidance issued by EPA in 2011.[3] Such updates to the Class VI environmental justice guidance should incorporate input from affected communities.

Additional detail regarding the above recommendations is provided in the attached white paper, especially in the "Recommendations" section that begins on page 14. Please feel free to contact us with any questions about this request.

Thank you for your consideration of this important issue.

Sincerely,

Paige Powell
Policy Manager
Commission Shift[4]

Scott Eustis
Community Science Director
Healthy Gulf[5]

Attachment: White Paper entitled *The Carbon Sequestration Loophole: Long-Term Carbon Storage in Poorly Regulated Class II Oil and Gas Underground Injection Control Wells*

[2] *See*, U.S. EPA, *Interim Environmental Justice and Civil Rights in Permitting, Frequently Asked Questions* (August 2022), at 4, https://www.epa.gov/system/files/documents/2022-08/EJ%20and%20CR%20in%20PERMITTING%20FAQs%20508%20compliant.pdf.

[3] EPA, *Geologic Sequestration of Carbon Dioxide – UIC Quick Reference Guide: Additional Tools for UIC Program Directors Incorporating Environmental Justice Considerations into the Class VI Injection Well Permitting Process* (June 2011), https://www.epa.gov/sites/default/files/2015-07/documents/epa816r11002.pdf.

[4] Commission Shift is reforming oil and gas oversight by building public support to hold the Railroad Commission of Texas accountable to its mission in a shifting energy landscape.

[5] Healthy Gulf's purpose is to collaborate with and serve communities who love the Gulf of Mexico by providing the research, communications, and coalition-building tools needed to reverse the long pattern of over exploitation of the Gulf's natural resources.

Hello!

I am writing to you regarding the proposed gondola for a local gem, little cottonwood canyon in salt lake county, Utah. The canyon hosts millions of skiers, hikers, climbers, bikers, etc year round. The health and well being of the canyon is being threatened by its overuse, but the current UDOT proposal does not mitigate any of the issues. In fact, I believe it is on a path to exacerbate the situation further.

I do believe that the continuation of this project has violated the goals of EJ and the WEJAC board.

The current gondola proposal, while a potential engineering marvel, would not create a sustainable transport alternative. The gondola as proposed will cause additional negative environmental impacts to the canyon and further restrict access for lower income families.

Additionally, UDOT provided no (or inaccessible) resources on how to make effective comments regarding this project.

UDOTs decision to continue with the gondola project is a threat to the health and wellness of the canyon and those that recreate in it. Creating a limited use— resort only transport that requires riders to pay for gondola use while being funded by taxpayer dollars, most certainly violates the standards of EJ, sustainable practices, and overall best planning practices.

Your consideration and consultation on this project would be greatly appreciated and valued.

Thank you for your time, Sarah Foran

Arizona Snow Bowl's new parking lot under construction on Hart Prairie, summer 2020. Realignment of sewer drainage system has exacerbated existing runoff problems on the prairie. Triangle is cadastral corner monument marking north to south (left) and west to east boundary of Arizona Snow Bowl's Special Permit Use Area.

Documented Stormwater Runoff Beyond Arizona Snow Bowl's Permit Area Causes Erosion and Pollution of Hart Prairie's Ecosystem

by

Richard Hereford, Tom Brownold, and Gwendolyn Waring

Flagstaff, Arizona

October 1, 2021

Ver. 1.2 with Addendum

Culvert of lower drainage system flowing into previously eroded gully on Hart Prairie, July 18, 2021 around 4 pm. Culvert passes under Forest Road 516. Culvert was well over half-full in the surge of the first of two runoff events. The second surge was almost half-full, which is above the level in the photograph.

"ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER QUALITY STANDARDS R18-9-704. General Requirements …
G. Prohibited activities …
3. Misapplying reclaimed water for any of the following reasons: …
c. Allowing runoff of reclaimed water or reclaimed water mixed with stormwater from a direct reuse site"

SUMMARY

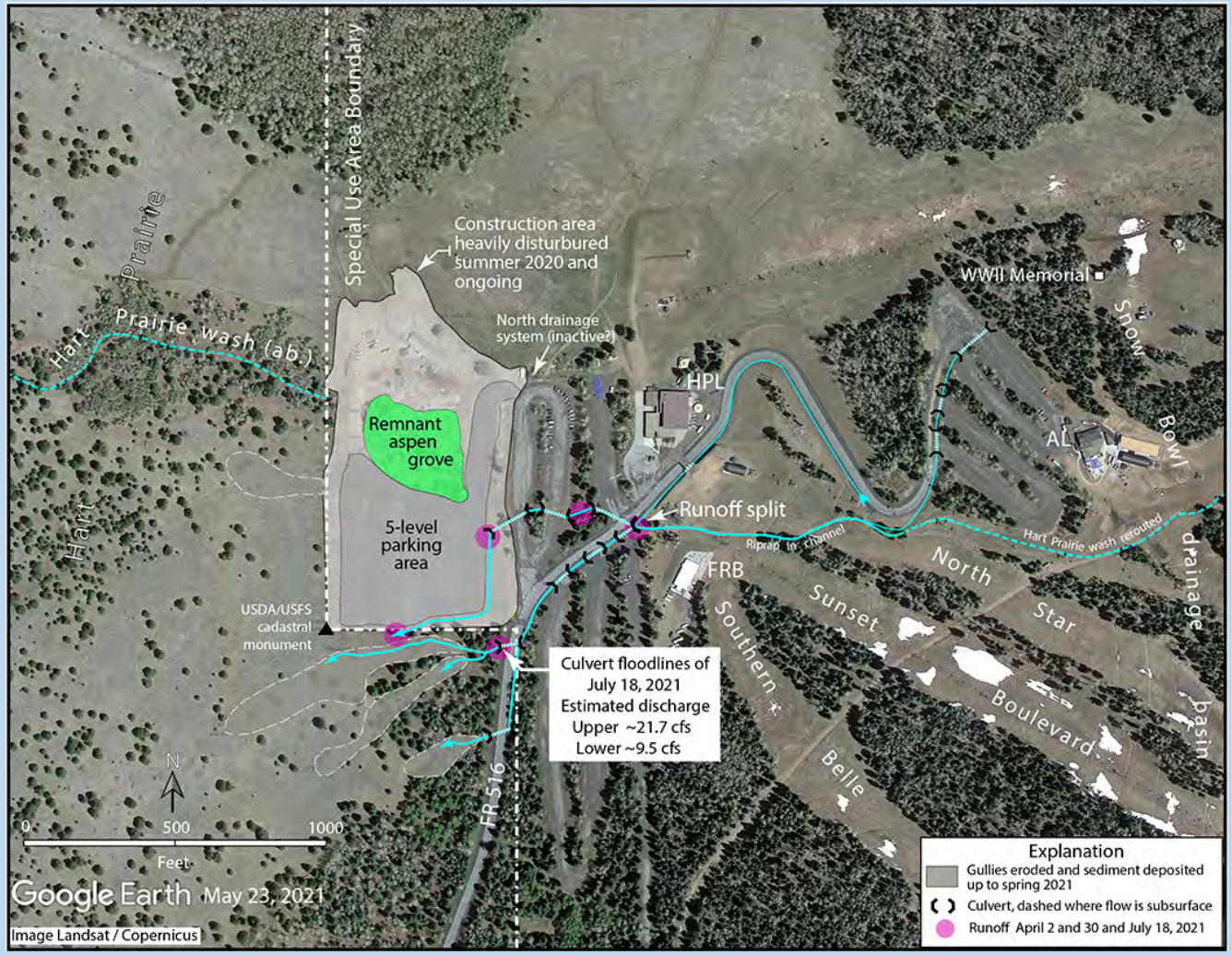
- Documented runoff onto Hart Prairie, a lush sub-alpine meadow adjoining Arizona Snow Bowl, occurred beyond Snow Bowl's permit boundary on April 2 and late July of 2021. April runoff was snowmelt and July runoff followed four days of light to heavy rain culminating with two flood peaks on or shortly before July 18, 2021.
- Preliminary discharge rates of the July runoff are 9.5 and 21.7 cubic feet second (cfs) as estimated from two floodlines in a culvert (p. 4). The sewer system drains the one-square mile Snow Bowl drainage basin, which has 3,000 feet of vertical relief; runoff can be substantial. Analysis of monsoon (July, August, and September) climate data suggest rainfall-producing runoff like late July 2021 occurred nine times since 1998 (p. 10).
- The combined runoff of two segments of the sanitary sewer system was 103–180 feet wide. Runoff spread over the prairie south of the new parking lot far beyond the permit boundary. The resulting stream, although with width decreased, extended southwest 2,620 feet (about one-half mile) beyond the culvert (p. 7 and ADDENDUM).
- Stormwater runoff (p. 6)—polluted with litter consisting of basaltic cinders, plastics, clothing, and granule- to small cobble-size clasts of reclaimed asphalt derived from the parking lots (p. 7)—spread onto the prairie where it further eroded preexisting gullies (p. 8-9) .
- Evidence indicates erosion is coincident with development of a sewer system beginning between 1997 to 2003; in October 1997 gullies did not exist on the prairie (ADDENDUM). The runoff of July 2021 and its detrimental effects on the prairie are not new. But the concentration of runoff on the south side south of the new parking lot is new and results from realignment of the sewer system to accommodate the parking lot (p. 5).
- Finally, runoff possibly contains contaminants from ski slopes treated with reclaimed water used in snowmaking, which began in 2012. Rainfall-generated hillslope runoff, such as July 2021, can entrain soil contaminates on heavily treated ski slopes along with other runoff producing areas in the basin. Initial analysis of the July 18, 2021 runoff indicates it contained a disturbingly high nutrient load: 2,540 and 303 mg/l of phosphorous and nitrogen, respectively. Nutrient loading at these levels is much larger than any permitted in streams, lakes, or reservoirs. The analysis does not necessarily pin-point reclaimed water as the principal nutrient source; but treated ski slopes remain as one of several possible origins. Regardless of source, runoff with such high nutrient loadings will quite likely disrupt Hart Prairie' ecosystem. Further study is necessary to clarify these nutrient values.

Above—West side of San Francisco Mountain. Hart Prairie spreads out across the mouth of snow bowl valley in center of photograph below and to the left of Agassiz Peak, the highest summit on right. Ski runs and lifts above the prairie comprise Arizona Snow Bowl. Below—Typical display of vegetation on the prairie; Bebb's willow (Salix Bebbiana) on middle left and Arizona fescue (Festuca arizonica), a perennial bunch grass lies across mid-ground (Photograph courtesy of Max Licher).

About Hart Prairie—A Botanist's View

Hart Prairie is an upland riparian prairie on the western slope of San Francisco Mountain. The prairie is a popular scenic area and the mountain and prairie comprise an important sacred landscape and place of worship for over 13 Indigenous Nations and Peoples. The prairie covers more than 250 acres below the mouth of Snow Bowl basin at elevations between 8,400 and 9,000 feet. A diverse assemblage of more than 280 plant species are on the prairie. All of the conifer species that occur elsewhere on the mountain are also present on the prairie. Shaded habitats created by aspen groves, famous for their fall colors, support stands of Bebb's willow. The Hart Prairie population is near the southern limit of Bebb's in Arizona; it is perhaps the largest population in the United States. The willows support small communities of plants under their canopies, including delphiniums, roses, bluebells and geraniums. Forty species of grasses occur on the prairie. Also present on the open prairie and in the shade of trees are 13 species of shrubs including two elderberries, two currants, and nine species of roses. Additionally, milkweeds, sunflowers, bell flowers, honeysuckles, two violets, two geraniums, irises, wild bergamot, two orchids, and nine species of buckwheat are present. All of these plants contribute to the great lushness and diversity of the prairie.

Prairies are endlessly encroached upon by conifers. The Nature Conservancy at Hart Prairie is maintaining the prairie's presence with aggressive forest thinning programs. Considerable investment has been made to preserve the health of this ecosystem, which is relatively pristine and pollution free. However, the prairie's ecosystem is threatened by uncontrolled, highly contaminated runoff onto the prairie from Arizona Snow Bowl's sanitary sewer system.



Map of Snow Bowl facilities showing lower Snow Bowl drainage basin, Hart Prairie, and problematic sanitary sewage system (open channel and culvert symbols). Light colored pattern is 13.7 acres of prairie largely covered, except remnant aspen grove, by fill used in construction of the new parking area and space for future development. Snowmaking with reclaimed water is applied heavily from November to March to several ski runs three of which are labelled on southeast corner of map. HPL, FRB, and AL are Hart Prairie Lodge, Fremont Restaurant and Bar, and Agassiz Lodge, respectively.

Mapping Arizona Snow Bowl's Harmful Effects on Hart Prairie

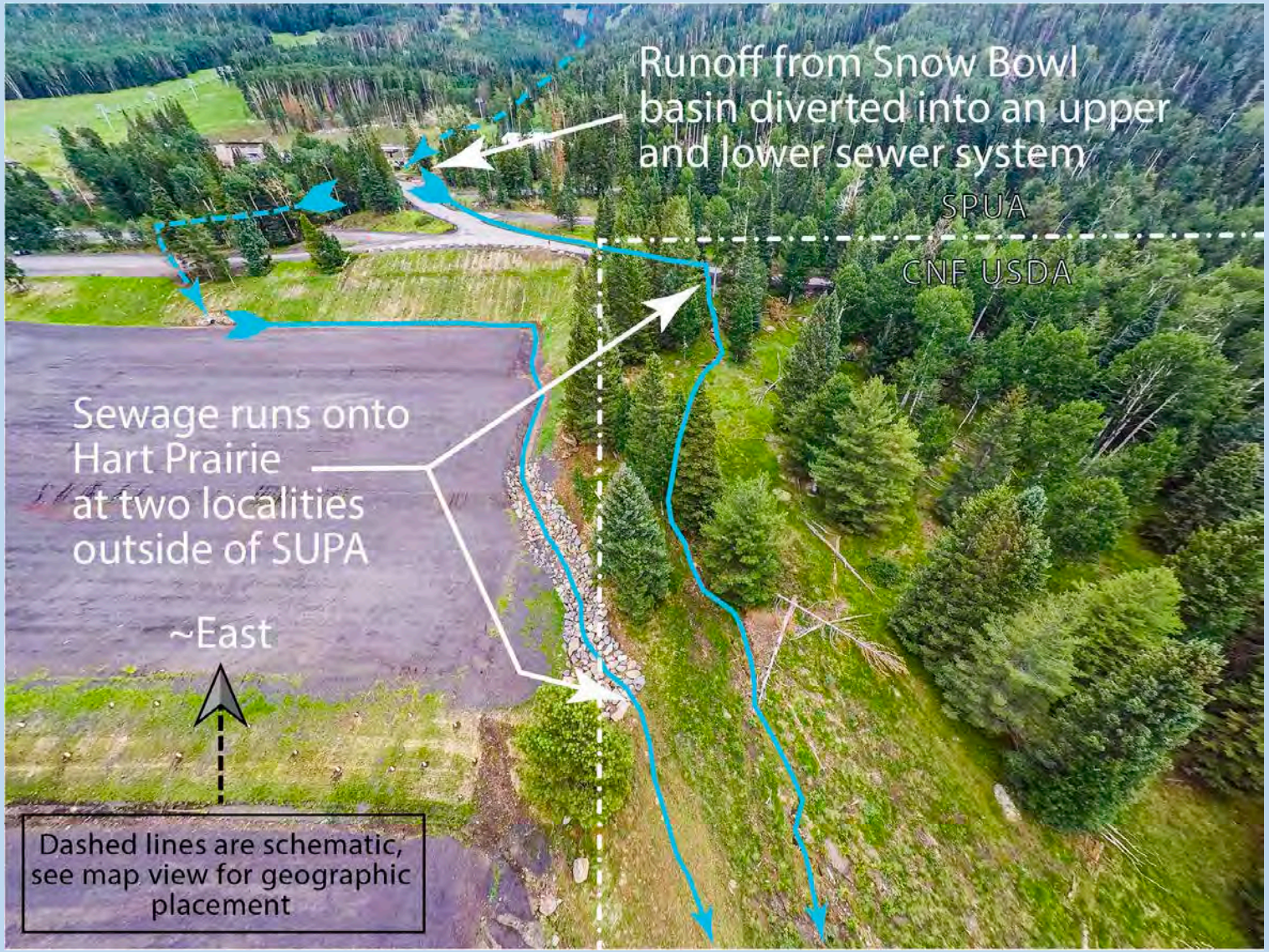
Development of Snow Bowl's parking lots between 1976–92 blocked the historical course of Hart Prairie wash, which was abandoned and replaced by a sanitary stormwater sewer system. Runoff from the entire drainage basin enters the sewer system at the runoff split. A substantial portion of stormwater originates on numerous ski slopes treated with reclaimed water used in snowmaking since 2012. It is apparent that stormwater can mix in the sewer system with derivatives of reclaimed water . Runoff also contains fragments of asphaltic material from heavily littered parking lots paved with granular reclaimed asphalt.

Riprap in the channel upstream of the split is designed to reduce flow, but this treatment does not eliminate downstream runoff as documented in this report. After percolating through riprap, this mixture of storm and reclaimed waters from snowmelt can mix with groundwater.

Below the split, runoff is redistributed to the south end of the new parking lot (upper sewer segment) and southwest along FR 516 (lower sewer segment); their termini are separated by only 320 feet, thereby spreading runoff over a large area. Runoff (circled) was observed in both segments in April and late July 2021. In July, both segments combined and flowed almost one-half mile southwest across Hart Prairie far beyond the cadastral corner monument. A preliminary estimate of peak discharges of the lower segment is 9.5 and 21.7 cfs based on two waterlines preserved in the indicated culvert. The culvert was well above half-full in the large and first runoff surge of late July. Another drainage system at the north end of the new parking lot appears inactive.

Four light gray patterns map gullies, sediment, and litter from several runoff events mostly after 2011 (if not 2003) and before 2021. See NOTES (p. 11) for mapping details, discharge calculations, and definitions (p. 12). The ADDENDUM (following p. 12) documents the chronology of sewer and gully development and in certain cases relates erosional activity to monsoon rainfall.

Problematic Drainage System



Oblique (distorted) view of southern sewer system where it debouches onto Hart Prairie. Path of upper (left) and lower (right) segments of the system are shown with blue lines. Paved parking lot is partially surrounded on east and south sides by the upper sewer segment. Note riprap where upper segment exits parking lot over which runoff flowed.

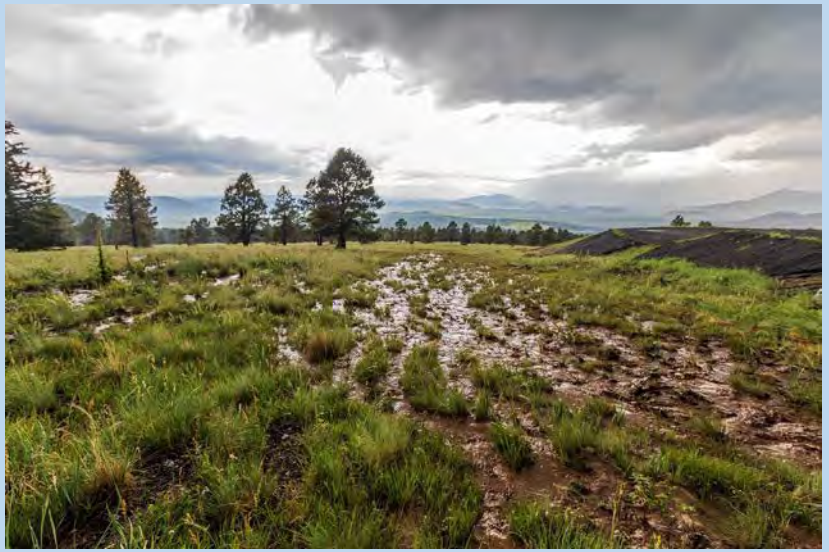
The sewer system carries snowmelt and stormwater runoff from Snow Bowl basin, which covers ~1 square mile and has 3,040 feet of vertical relief. Runoff was formerly into Hart Prairie wash before modern development of Snow Bowl. Then it flowed west-southwest down Hart Prairie alluvial fan contained within a well defined channel that favored riparian vegetation and replenished groundwater. Physical evidence indicates that the wash once (historically) carried high volume floods that the basin produced either from snowmelt, rain on snow, or monsoonal rainfall.

Wastewater runoff is incising gullies on Hart Prairie where none existed, a process that will severely alter the prairie landscape. More importantly, analysis of the sewage reveals damagingly high high nutrient levels: nitrogen 303 and phosphorus 2,540 mg/l. This result is preliminary and further analysis and study are necessary to fully comprehend the chemistry of runoff waters.

Documentation of Stormwater Runoff Effects on Hart Prairie, late July 2021

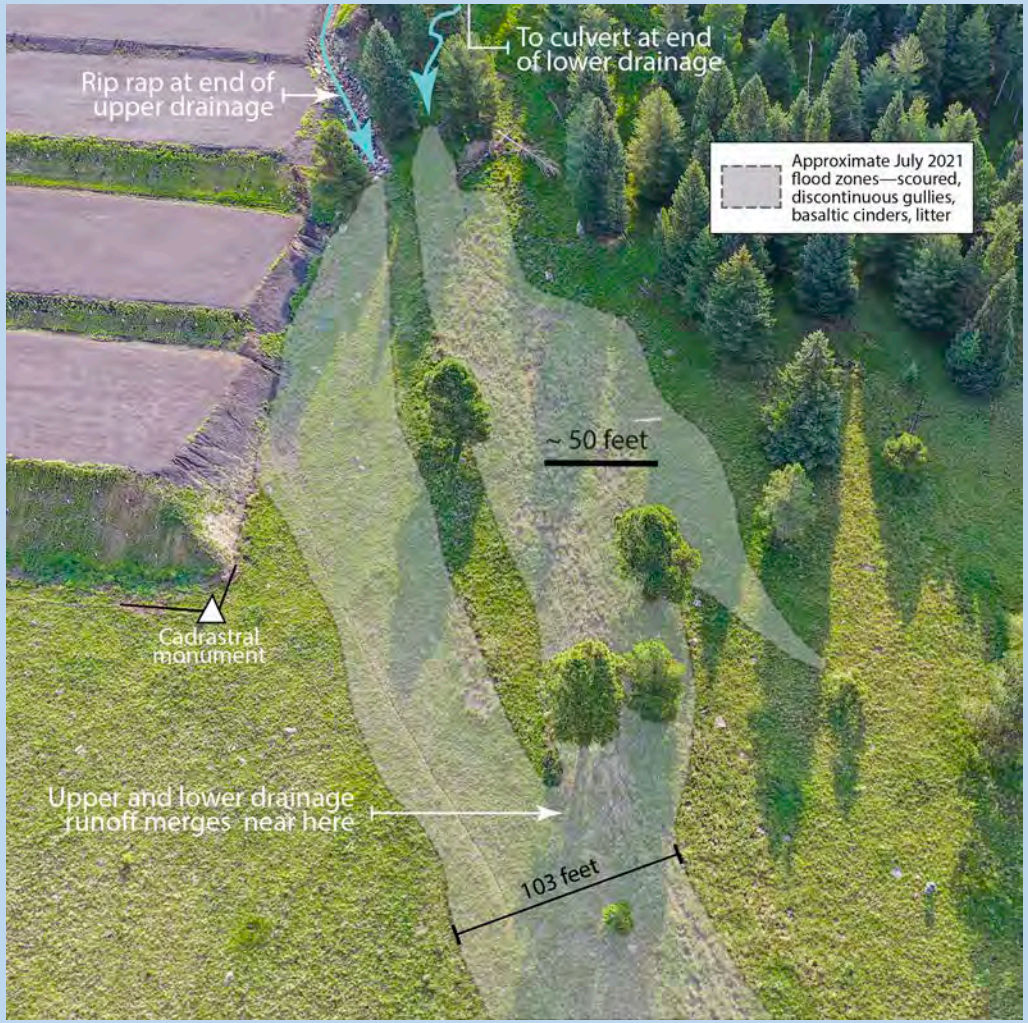
Top—Left to right, video clips of lower drainage system. Culvert outflow under FR 516 (far left). Waterline in culvert from peak July flow was substantially deeper than flow in this photograph. Downstream view of eroding gully (middle) and view of runoff across prairie (right). All runoff was south of permit boundary, as seen here by south side of parking lot, July 18, 2021. Videos available on request.

Bottom—Left to right, upstream view of wastewater from lower drainage culvert onto meadow; downstream view of runoff over riprap at end of upper drainage system onto the prairie; downstream view of runoff near junction of the two drainage segments. Total width of two segments at this point was 180 feet.



Flood Zones, Flood Path, and Example of Litter Carried in Floods

Below—Oblique aerial view of flood scour zone (gray pattern) showing combined runoff of upper and lower drainage segments. Diagnostic features are litter from parking lots and other Snow Bowl facilities: dark basaltic cinders, granular asphaltic debris, and discontinuous gullies. Boundary of permit follows south side of parking lot. Flood zone above split at lone tree is 180 feet wide with 25 feet of separation.



Top—Path of combined wastewater down southwest side of Hart Prairie alluvial fan. Flow ended 2,620 feet southwest of lower system culvert (see ADDENDUM*). Runoff along preexisting tracks, trails (such as here), and roads is a widely recognized precursor of gully incision and arroyo development in the Southwest.*

Middle—Flow terminated northeast of Alfa Fia tank. A single plastic water bottle is near scale.

Bottom—Example of litter in sewage consisting of aluminum cans, face mask(s), miscellaneous colored plastic fragments, and various clothing items (circled). Face masks are diagnostic of 2021 runoff. Inset, cobble-size asphaltic clast in gravel.

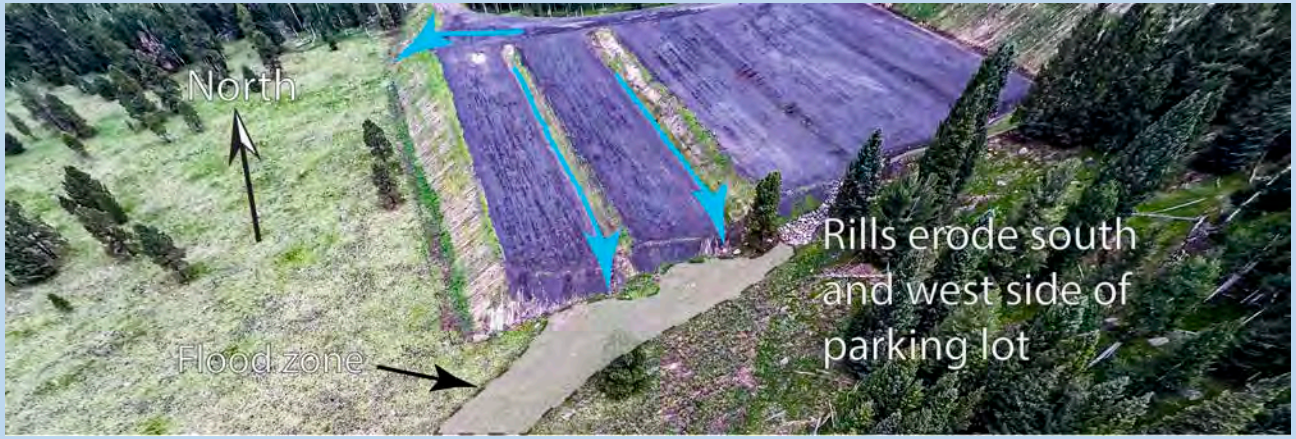
Repeat Photographs Document Sediment Movement and Widening and Deepening of Gullies Since 2020

Upstream views of lower drainage system at and downstream of culvert. Upper left 9/20/2020 upper right 7/27/2021, scale 50 cm long with 10 cm (~4 inches) divisions. Common features are circled. Gully is deeper and substantially wider (rectangles).

Lower left and right dates same as above; left–configuration on gravel bar of pebble-size clasts and basaltic cinders (at scale); right–in this wide-angle view of meadow clasts were moved while others moved downstream; gully is wider and deeper particularly at distant scale where gully is more than two feet deep reaching four feet deep at plunge pool farther upstream.

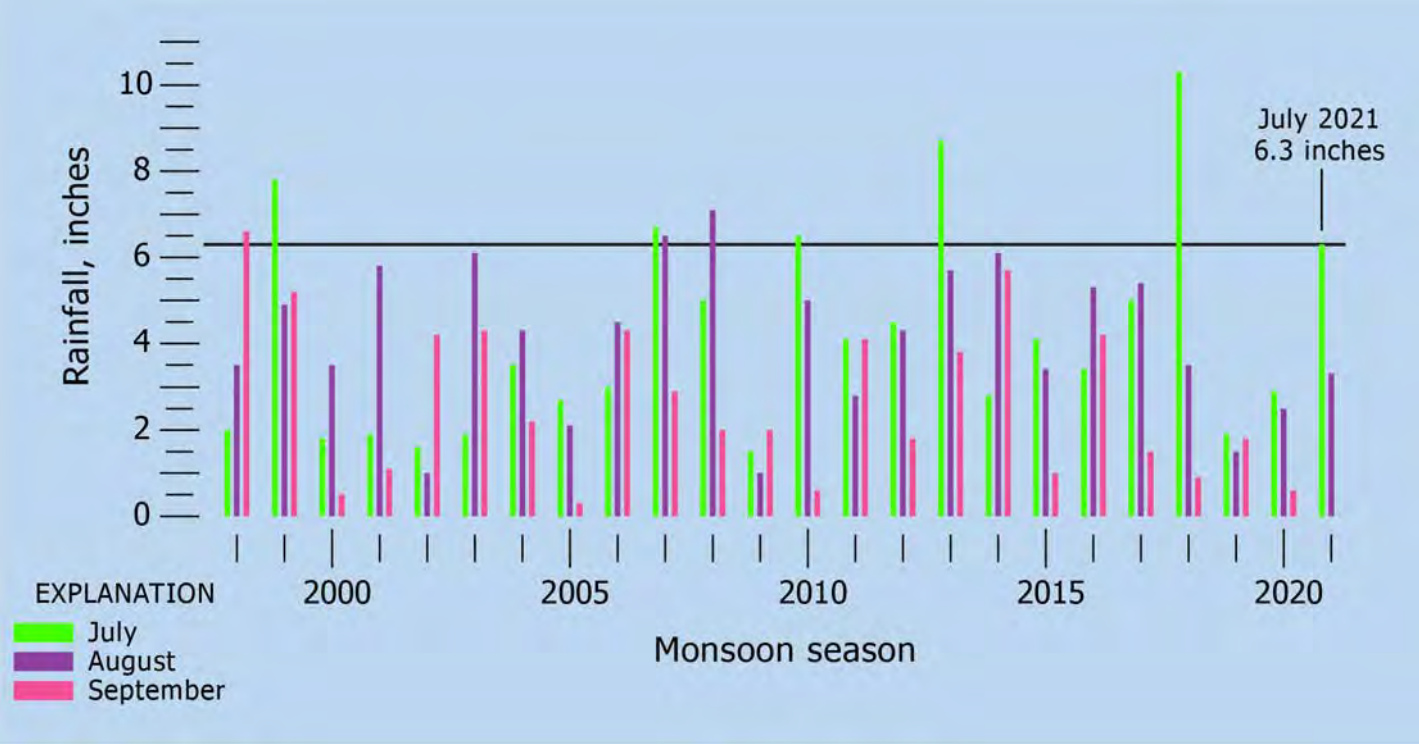
Upstream view of lower drainage gully—left 9/20/2020, right 7/27/2021. Gully substantially deeper and wider.

Rills, Another Style of Runoff-Related Erosion



Left, rills were eroded into south and west-facing sides of parking lot during late July runoff. Right, rill of farthest west of two channels.

How Unusual was the Rainfall of July 2021?



Bar chart of seasonal monsoon rainfal, 1998–2021. The seasonal total rainfall of the monsoon months, July, August, and September, are color coded.

July 2021 rainfall was not particularly unusual. That rainfall event, however, is important because it is a fair representation of the amount of rainfall necessary to produce runoff. All things being equal, a broad but useful supposition, the July runoff-producing rainfall of 6.3 inches is a meaningful threshold. Damaging runoff is evidently possible near or above this rainfall amount. See NOTES (p. 11) for source of monthly rainfall data.

July is typically the wettest month of the monsoon season; rainfall was close to or above the threshold six times between 1998 and 2021. The damaging results of July 2021 runoff are documented here. But rainfall was also close to or above the July threshold two times in August and once in September. So, since 1998, runoff-producing rainfall within 10 percent of the threshold occurred nine times, if not more often. The average recurrence interval of monsoon rainfall close to and above 6.3 inches is only two to three years (that is 24 divided by 9). This does not consider winter snowmelt runoff; we know little about how often it occurs nor the size of such runoff.

The nine runoff events, by analogy with July 2021, were capable of eroding Hart Prairie and transporting sediment and other contaminants. Although we are unable to identity the effects of all nine runoff events, four large mapped areas show evidence of runoff activity (p. 4). And examination of sequential Google Earth imagery (see ADDENDUM) reveals that since 1998 erosional and depositional activity accelerated as the sewer system developed. The take-away point is that damaging runoff occurs frequently.

The three monsoonal runoff events since 2012 are particularly interesting as they post-date snowmaking on ski slopes with reclaimed water. Water-quality sampling of surface runoff from ski slopes at the termini of the sewer system in both winter and summer can help resolve the extent of prairie contamination by reclaimed water. Although plastics and asphaltic litter in runoff, constitute serious pollution by themselves; the alarmingly high nutrient levels of runoff are ecologically unacceptable and damaging.

NOTES

A second drainage system at the north end of the new lot captures runoff from the parking lot adjoining the new lot's east side. This system is evidently not functioning. It is apparently designed to direct runoff through dual culverts across the remnant aspen grove into abandoned Hart Prairie wash outside the permit area.

A recreational grade GPS instrument was used to map the area disturbed by summer 2020 construction and other features shown on the map (page 4). Locational accuracy is about 5 feet, which is adequate for the intended purposes and map scale. The perimeter of the disturbed area surrounding the lot was surveyed by following the base of the parking-lot fill or the top of the cut above the fill. The boundary of the Special Use Permit Area is from Figure 2-2 of the 2005 EIS. The southwest corner of the parking lot is marked by a USDA/USFS 1997 cadastral survey monument. Land west and south of the corner monument is *outside* the permitted area.

Relatively high resolution, rectified (WGS 84 datum) Google Earth satellite imagery (https://google.com) covering the Snow Bowl area is used in this report. GPS points were originally plotted on June 12, 2017 imagery. The present map (page 4) was compiled on recent imagery of May 23, 2021. The disturbed area was remapped guided by this image. Sequential development of Snow Bowl since 1954 was studied using archival mapping aerial photography flown between 1954–2005 (https://earthexplorer.usgs.gov). This photography documents blockage of Hart Prairie wash by construction of Snow Bowl facilities. Development of gullies and contamination of upper Hart Prairie related to the main or southern storm drainage system was documented using sequential Google Earth imagery (see ADDENDUM following p. 12).

Culvert discharge calculations were done using standard engineering software incorporating Manning's roughness coefficient. Slope of the culvert, which is relativley steep, was obtained by instrumental leveling over the culvert's length.

Monsoon season (July, August, and September) monthly rainfall totals from two sources were evaluated. The Natural Resources Conservation Service SNOTEL climate sensor that measures rainfall in Snowslide Canyon within the Inner Basin of San Francisco Mountain. Rainfall data covering Snow Bowl drainage basin is modeled and gridded PRISM* data. The modeled data are statistically indistinguishable from SNOTEL measurements. The SNOTEL data were used to estimate rainfall in Snow Bowl basin from 1998 to July 2021.

*Parameter-elevation Regressions on Independent Slopes Models, Oregon State University

About the Authors

Richard Hereford, Research Geologist (Emeritus), Fellow Geological Society of America**

Tom Brownold, owner Tom Brownold Photography, Flagstaff

Gwendolyn Waring, PhD, author of *The Natural History of the San Francisco Peaks, A sky Island of the American Southwest* (2018), 205 pages.

**herefordrichard@gmail.com

DEFINITIONS*

sewage (p. 183)—The waste and *wastewater* [emphasis theirs] produced by residential and commercial sources and discharged into sewers (USEPA, 1994).

wastewater (p. 225)—(a) *return flow*. (b) *Seepage* of water from a ditch or reservoir. (c) The spent or used water of a community or industry that contains dissolved and suspended matter. Cf: *effluent* (b); *industrial waste*; *reclaimed water; municipal waste*. See also: *gray water*; *sanitary wastewater*; *septic wastewater*; *sewage*.

storm water (p. 199*) direct runoff.*

storm sewer (p. 199) A *sewer* that carries direct runoff from rain or snow (USEPA, 1994). Cf: sanitary sewer; combined sewer.

***** Glossary of Hydrology, 1998, Wilson, W.E., and Moore, J.E., eds., Alexandria, Virginia, American Geological Institute, 248 p.

ADDENDUM
Development of Drainage System and Gullies Using Google Earth Imagery, 1997–2021

Interpretation of 13 sequential images reveals gully erosion of Hart Prairie is linked to Snow Bowl's sanitary sewer drainage system. Erosion began between 1997 and 2003 and accelerated after installation of present drainage system between September 2010 and June 2011

Refer to map on page 4 of report for locations named on images, images are arranged chronologically by month and year. Main elements of evolving drainage system shown with trianglular symbols. Outline of disturbed area related to new parking lot and remnant aspen grove shown with thin white lines. Full track of July 2021 runoff is on last page of addendum.


WW II Memorial
Lot 1,
drains
north
Drainage system not detected, Lot 1 in place by 1992 blocking Hart Prairie wash; gullies absent; note faint track crossing southwest corner of new parking lot that was utilized by July 2021 runoff
Google Earth
Oct 1997
N
1000 ft
Image U.S. Geological Survey


WW II Memorial
Gully present west of Lot 1 probably results from rerouting of former Hart Prairie wash, which is incised south of Hart Prairie Lodge; possibly eroded by heavy rainfall in September 1998, July 1999, and August 2003
Google Earth
Dec 2003
N
1000 ft
Image © 2021 Maxar Technologies


WW II Memorial
Little change from 2003; low monsoon rainfall
2004 to 2006
Feb 2006
Google Earth
Image © 2021 Maxar Technologies
N
1000 ft


WW II Memorial
Elements of present drainage system not detected,
image resolution low
Google Earth
Image USDA Farm Service Agency
Sept 2010
N
1000 ft


WW II Memorial
Upper segment of drainage system in place at runoff split, sewer passes northwest under road then turns west to pass under Lot 1 where it empties onto prairie in gully; former Hart Prairie wash incised; evidence of runoff west of FR 516, possibly related to heavy rain July 2010
Google Earth
June 2011
N
1000 ft


WW II Memorial
Lower segment of system present with two culverts under FR 516
Google Earth
May 2012
N
1000 ft


Drainage ditch probably directs sheetwash north of remnant aspen grove and elsewhere into small retention pond (above left)
WW II Memorial
Sediment plume and gully now clearly extend 870 feet west of Lot 1 onto prairie
Incipient gully below upper culvert
April 2013
Google Earth
N
1000 ft


WW II Memorial
Gully west of lot 1 appears active; gullies here probably related to large rainfall of July 2013 and August 2014
Gully well formed, sediment deposited 900 feet southwest of culvert
April 2015
Google Earth
N
1000 ft


WW II Memorial
Gullies and sediment from both culverts present, up to 900 feet long and 340 feet wide
Google Earth
April 2017
N
1000 ft


WW II Memorial
Former Hart Prairie wash incised and appears recently active
June 2017
Google Earth
1000 ft
N


WW II Memorial
Construction of new parking lot underway; construction east of Hart Prairie Lodge completes upper drainage segment that drains four parking lots at Agassiz Lodge and treated ski slopes south and southeast of lodge
Google Earth
Image © 2021 Maxar Technologies
Oct 2017
N
1000 ft


New five-level parking lot mostly complete, paved with granular reclaimed asphalt,drains south; future development and construction continue north of remnant aspen grove
WW II Memorial
Former channel of Hart Prairie wash armored with riprap
Upper segment of sewage system rerouted to south end of new parking lot, first active July 2021; termini of segments separated by only 320 feet
May 2021
Google Earth
N
1000 ft


Runoff Track
Legend
Runoff track July 2021
WW2 MONUMENT
Present Runoff Split
Avg Cadastral Location
Snowmaking with reclaimed water occurs here since 2012
Runoff track is 2,620 feet long
Reclaimed water pond
Alfa Fia tank
Google Earth
N
2000 ft

Joseph Robinette Biden, Jr. June 29, 2023
President, United States of America
1600 Pennsylvania Ave NW
Washington, DC 20500

Dear President Biden,

We, Indigenous Elders and Medicine Peoples, welcome you, your family and your administration to your responsibility as President of the United States of America. The tradition of welcoming newcomers started long before the formation of the United States; it began at first arrival of our relatives that came from across the ocean. This ceremonial act is to promote peaceful relations, to respect one another and to recognize each other as an integral part of Creation.

We formally invite, President Joseph Robinette Biden, Jr. to sit with us in council, just as the founding fathers did in the earlier days prior to the inception of the United States of America. We understand government-to-government. This meeting goes beyond that. We will speak about the Great Spiritual Law of Creation and how to maintain peace with this Law.

We are the Spiritual People of the Earth, united under the Creator's Natural Law working in unity to restore peace, harmony and balance for the future of all living beings. After well over 500 years of abuse from our relatives across the ocean we still are willing to offer our assistance to restore peace and healthiness back to this Land.

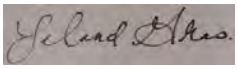
As a President for your people you have more than an obligation to heal a Nation divided. Your Administration has a responsibility to heal a people who have caused irreversible environmental destruction and global climate change by abandoning their sacred responsibility and relationship to the Natural World.

When looking at prophesies, the ancient wisdom of our ancestors, the dire sense of urgency is here and we must extend our hand once again to help guide this young Nation. Our sacred aboriginal indigenous science and your western science must unite to provide hope for the future. It will take all of us, people from all faiths, to put our good minds together to begin correcting all laws and policies which are abusing Mother Earth and the people of the Earth. We believe peace is possible in our life time when we uphold the Creator's Natural Law as a foundation for all decision-making.

We speak on behalf of all Creation with an unwavering faith and belief in the Creator. We are the Original Nations and Peoples of this Land and thus, must be included in the discussions and decision-making process from the beginning. To uphold the Laws of Creation and create a peaceful path forward it is imperative that we personally meet with you and your staff as we did in November of 2009 under the Obama Administration.

Respectfully, Representatives of the Council

Chief Arvol Looking Horse
19th Generation Keeper of Sacred White Buffalo Calf Pipe
Spiritual Leader
The Great Sioux Nation



Leland Grass,
No'hooka' Dine' Traditionalist

Big Buck
Wokotaqa (Hopi)

Please contact and work with Shawn Mulford to facilitate this meeting:
smulford@comcast.net (520) 488-6610

Attached is information about the on-going violations at Dookooosliid (San Francisco Peaks, Flagstaff Arizona). The legacy nutrients are destroying the ritual purity of the Holy Mountain. We have provided the USDA with this information and more. The USDA has inadequately addressed these violations, avoiding not only their Trust Responsibility but also their own laws.

Thank you for the opportunity to submit,

Shawn Mulford

Potential Problems Related to Disruption of Hydrologic and Nutrient Dynamics Associated with Snowmaking Using Wastewater Effluent at Arizona Snowbowl

by

E. Allen Stewart III, P.E.

Punta Gorda, Florida

February, 2022

PART I

Problems with Snowmaking Using Wastewater Effluent and Alternative #2 of the 2005 FEIS

The Arizona Snowbowl facility located in the San Francisco Peaks of Northern Arizona has been the subject of controversy since issuance of a Special Use Permit (SUP) from the U.S.D.A. Forest Service over eighty years ago. Initial protests related to the imposition on the religious and cultural integrity claimed by several Tribes who hold the San Francisco Peaks as sacred and of substantial religious and cultural significance. The cases which arose from these protests were consistently rejected by the courts, with the Supreme Court in 1979 determining that the findings of the lower courts should hold. This allowed expanded development of recreational facilities to proceed, although not without continued protests. When the use of treated wastewater effluent was approved as a result of the 2005 Final Environmental Impact Statement (FEIS) and the subsequent Record of Decision (ROD), the basis of protest expanded beyond cultural and religious issues associated with Indigenous Peoples, to include concerns with human health and environmental degradation—recognizing that these all are in fact related issues.

In summary, the decision to approve and permit implementation of Alternative #2[1] as described within the FEIS, which includes the use of wastewater effluent for snow

[1] ALTERNATIVE #2 Per FEIS

- Approximately 205 acres of snowmaking coverage throughout the SUP area utilizing Class A reclaimed water as a source.
- A 10-million-gallon snowmaking water reservoir near the top terminal of the existing Sunset Chairlift, and catchment pond below the Hart Prairie Lodge.
- Construct a reclaimed water pipeline between Flagstaff and the Snowbowl with booster stations and pump houses.
- Construct a 3,000 to 4,000 square foot snowmaking control building in the vicinity of the existing maintenance shop.
- A professionally designed and managed snow play/tubing facility at the base area including sculpted lanes, lifts and a lodge.
- Replace of the Sunset Chairlift with a high speed, detachable chair.
- Relocate the existing Sunset Chairlift as the Humphreys Chairlift, accessing a pod of proposed ski trails.
- Upgrade and extension of the Hart Prairie Chairlift with a high-speed, detachable lift.
- Upgrade and realignment of the Aspen Chairlift.
- Install three surface conveyors in the area north of the Hart Prairie Lodge.
- Install a handle tow is proposed to service a halfpipe and terrain park.
- Additional terrain, bring total skiable acreage at the Snowbowl to approximately 204 acres
- Approximately 47 acres of thinning to created improved glades.
- Approximately 87 acres of terrain improvements (grading/stumping and smoothing). □
- Create a dedicated teaching area near the Hart Prairie Lodge.
- Construct a halfpipe.
- Enlarge the Hart Prairie Lodge by approximately 6,000 square feet to a total of 24,900 square feet.
- Construct a new 10,000 square foot guest services facility adjacent to the Agassiz Lodge.
- Construct a 2,500 square foot Native American cultural and education center constructed in or near the Agassiz Lodge
- Replace existing on-mountain ski team buildings.
- Construct a 14.8-mile pipeline to transport reclaimed water from Flagstaff to Snowbowl.
- Install snowmaking pipelines buried within existing and proposed trails.
- Redesign the entrance circle, which would have signs directing guests to parking lots, day lodges, and snow play parking.
- Construct a 400-space parking area to service the proposed tubing facility.
- Combine parking lots #1 and #2 by re-grading and leveling them.
- Develop approximately 1,110 feet of additional on-mountain access road.
- Reconstruct approximately 3,650 feet of existing two-track mountain access road.

making, represents a significant disruption of material and energy flows associated with the long-established stability of the ecology of the region, including ecosystems contiguous to the facility, such as the Hart Prairie grasslands, and possibly to even more remote systems.

The complexity of the dynamics of surface and groundwater flows and attendant nutrients and minerals is recognized within the FEIS as not being well understood[2], and yet within the FEIS the stated presumption is *"that overall benefits of providing stable winter recreational opportunities for the public and community…. merit its (Alternative #2) selection."* Furthermore, it is stated that selecting Alternative #2 meets the purpose and need *"to provide consistent and reliable operating season and to improve safety, skiing conditions, and recreational opportunities by bringing terrain and infrastructure into balance with existing demand."*

It is not clear what is meant by terrain. It could be that this is a surrogate word for ecosystem. There is similar ambiguity with the use of the word balance. Typically, balance would imply a dynamic equilibrium in which internal processes maintain equality between inputs and outputs. In this case however it might mean a compromise between disruptive anthropogenic influences and historical ecological stability. The presumption appears to be that these disruptions do not seriously impose upon the ecological stability of the region, and yet support for such presumption is eroded by statements of uncertainty in groundwater and associated solutes movement, as noted in footnote 2, and by field evidence of polluted runoff being discharged off site during heavy rainfall periods as delineated within the report included as Appendix 1.

To reiterate, the presumption that Alternative #2 would sustain a balance between this terrain and the recreational opportunities is not well supported within the FEIS text, particularly in the movement of excess water associated with heavy rainfall and snow melt, and with wastewater effluent associated with snowmaking and the various components carried by the effluent, including the nutrients nitrogen and phosphorus as well as mineral loads associated with typical wastewater. In addition, the introduction of impervious infrastructure areas, such as parking lots and new buildings, combined with increased visitation, can be expected to decrease the time of concentration and increase maximum rate while degrading the quality of runoff associated with stormwater, and hence interfere with the pre-development rapid rate of seepage into the

- Decommission approximately 3,050 feet of existing two-track mountain access road/
- Install buried 10,000-gallon water storage tanks at each of the lodges and at the snow play building to facilitate the use of reclaimed water.
- Construct a pedestrian underpass

[2] From FEIS: *"The patterns of groundwater movement in the perched aquifers are complex; groundwater movement in these perched systems do not necessarily coincide with the topographic divides for surface water flow; and the divides for groundwater movement are complex and likely change in response to annual variations in the amount and distribution of snowmelt in the Hart Prairie watershed. Due to the complex movement of groundwater through the surficial deposits and underlying volcanic deposits in this area, it is not presently possible to precisely project where snowmelt infiltrated from upslope areas flows in the downgradient Hart Prairie watershed….Due to the complex movement of groundwater through the surficial deposits and underlying volcanic deposits in this area, it is difficult to specifically determine the sources of shallow groundwater for the perched aquifers in the Hart Prairie area. Therefore, the degree to which any change in groundwater availability or water quality resulting from implementation of Alternative 2 actions would impact the wells, springs, and stock tanks in this area cannot be projected with certainty."*

permeable volcanic sediments as well as with the rates of transmission and retainage of nutrients and minerals—see Appendix 1.

It has been observed and documented that discharge of surface runoff to downgradient watersheds, e.g., Hart Prairie riparian grassland occurs during heavy storm events. There is a real possibility that this runoff includes reclaimed water from snowmelt associated with the ski slopes, as well as septic tank seepage and eroded soils. A detailed reporting of such occurrences, dated October 1, 2021, is included in a field study directed by Richard Hereford, research geologist. This report, entitled Documented Stormwater Runoff Beyond Arizona Snowbowl's Permit Area Causes Erosion and Pollution of Hart's Prairie Ecosystem, is included as Appendix 1 to this summary. Within this report it is noted that off-site discharge of substantial stormwater runoff was observed during two 2021 events, one in April and one in July. The April event was associated with snowmelt, while the July event was primarily the result of rainfall. Runoff at rates of up to 21.7 cubic feet per second were noted to have moved beyond the limits of the SUP boundary onto the Hart Prairie region. This runoff carried with it heavy sediment and nutrient loads, as well as trash and other debris. This discharge outside the SUP boundary, if it contained components of reclaimed water, is in violation of the Arizona Department of Environmental Quality -- Water Quality Standards

R18-9-704:
G. Prohibited Activities
(3) misapplying reclaimed water for any of the following reason:
c. allowing runoff of reclaimed water or reclaimed water mixed with stormwater from a direct reuse site.

Part II of the report covers increased nutrient loading by use of wastewater effluent in snowmaking. This part offers detailed comparative evaluation of nutrient loads (nitrogen and phosphorus) for pre-development and post-Alternative #2 conditions. The loading increase is significant for both nutrients with Alternative #2, far exceeding the calculated historical loading, and suggestive that perturbations of this magnitude could render the nutrient dynamics away from a nearly equilibrium state. And while within the FEIS it is recognized that:

> *"The addition of snowmaking to operations at Snowbowl would result in an overall increase in moisture and nutrients and may change plant species composition within the SUP area. Proposed snowmaking is likely to add 31.1 lb/acre/yr of nitrogen over historic natural deposition. This may increase the dominance of early successional or weedy plant species. In turn, this may reduce overall plant diversity in some portions of the SUP."*

This is conditioned by a presumption that:

> *"…however, this effect would be restricted to developed ski trails and therefore localized."*

There presently is insufficient reason to justify this presumption. To effectively assess the ecological impact of the disruption to the hydrologic and nutrient loading dynamics associated with Alternative #2 upon the Arizona Snowbowl SUP area as well as contiguous and downgradient areas, a more extensive evaluation is required. It is recommended that this issue be further evaluated by experts in Systems Ecology and the behavior of complex systems supported by additional, well designed field investigations, as well as the input from indigenous peoples with expansive, multi-generational knowledge of the San Francisco Peaks.

PART II

Increased Nutrient Loading Caused by Use of Wastewater Effluent for Snowmaking at Arizona Snowbowl

INTRODUCTION AND REVIEW OF POTENTIAL PROBLEMS

Ecosystems typically establish their collection of naturally selected species through an evolutionary process known as succession. When environmental conditions stabilize within a consistent range of fluctuations over an extended period, the successional process will trend towards a quasi-steady state, meaning the balance of material and energy inputs and outputs are maintained through active internal processes. The collections of species within the steady state ecosystem adapt to this range of fluctuations and adjust accordingly to sustain steady state and ensure a high level of stability. In their paper Chemostasis and Homeostasis in Aquatic Ecosystems , Stumm and Stumm-Zollinger[3] note that *"steady state is one of minimum entropy production (least free energy dissipation) compatible with external constraints upon the system (e.g., fixed concentrations or affinities in the environment) …. (*with*) well-known stability against external perturbations because a state of minimum entropy production cannot leave this state by a spontaneous irreversible change. If as a result of some fluctuation it deviates slightly from this state, internal changes will take place and bring back the system to its stable state."*

Stable ecosystems, which are said to be in a mature or climax state, rely upon the establishment of a quasi-steady state in which production (P) matches respiration (R), and hence there is minimal Net Ecosystem Production (NEP)—i.e., accumulation of excess biomass when P>R. The ability to maintain this stability through adjustments to a range of environmental fluctuations associated with the successional history of the system is known as homeostasis. Consequently, the rate of change over time approaches zero, and allows the system to persist over long periods of time.

The San Francisco Mountain is the result of volcanic activity within the San Francisco Volcanic Field with the last eruption of the mountain occurring about 400,000 years ago[4]. The most recent volcanic activity within the Field was at the nearby Sunset Crater about 1,000 years ago. While the eruption of Sunset would be expected to have at least a short-term impact on the ecosystems associated with the San Francisco Mountain, an eventual return to historical environmental conditions supported the repair of any short-term consequences of this perturbation and reclamation of the previous ecological stability. However, regardless of the influence of the Sunset eruption, the ecosystems associated with the San Francisco Mountain have, as a minimum, had close to one thousand years to achieve a quasi-steady state.

In his book "The End of Certainty" Ilya Prigogine[5] introduces the concept of systems "Far-From-Equilibrium" in which "*new processes set in and increase the production of entropy"* and the system *"becomes unstable at some critical distance from equilibrium."*

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[3]Stumm, W.R. and E.H. Stumm-Zollinger (1971) Chemostasis and Homeostasis in Aquatic Ecosystems; Principles of Water Pollution Control IN: Nonequilibrium Systems in Natural Water Chemistry; Hem, J.; Advances in Chemistry; American Chemical Society: Washington, DC, 1971.

[4] Priest, S.S., W.A. Duffield, K. Malis-Clark, J.W. Hendley II and P.H. Stauffer. The San Francisco Volcanic Field, Arizona U.S. Geological Survey Fact Sheet 017-01

[5] Prigogine, I, 1997 The End of Certainty: Time Chaos and the New Laws of Nature The Free Press, New York, NY ISBN 0-684-83705-6

At this point the system seeks another path to recover stability, which results in significant changes. In summary, as noted by Prigogine, distance from equilibrium becomes an essential parameter in describing nature. Near equilibrium fluctuations are harmless, but “Far-From-Equilibrium” fluctuations are critically influential to system changes, and the exact nature of these changes becomes unpredictable. H.T. Odum[6] explained these disruptions as resulting in reduction in system maturity, which drives the ecosystem into a younger developmental stage of higher net productivity and of decreased complexity and stability, e.g., agricultural monocultures.

Consequently, when systems in steady state such as the evolved ecosystems associated with the San Francisco Mountain, are disrupted by extensive anthropogenic inputs, such as wastewater used for snowmaking, as well as disturbances from clearing, invasive species, escalating levels of atmospheric carbon dioxide, increased traffic activity, and installation of septic tanks and drain fields, the systems can be expected to move towards a “Far-From-Equilibrium” status, as these additional materials and energy imposed by our technological society, can far exceed the successional experience of the established ecosystems, as will be presented further into this text.

There are many examples of the impact of such far reaching anthropogenic disruptions to the flow of materials and energy to established, stable ecosystems. Many of these impacts occurred despite previous environmental studies which suggested findings of no significant impact (FONSI). There are some highly publicized examples associated with Florida of which I am most familiar. For example, the Indian River Lagoon (IRL) on Florida’s East Coast developed as a diverse estuarine ecosystem with a high value of natural resources. The IRL achieved quasi-steady state stability over a successional period of 5,000 to 7,000 years following the stabilization of sea level and climate. Material inputs, particularly of the growth modulating nutrients, nitrogen and phosphorus were limited primarily to atmospheric deposition within a limited watershed, and some interchange through tidal movement. Therefore, a paucity of biologically available nitrogen and phosphorus was a significant factor in the control of primary production and gave a selective advantage to emergent seagrasses which benefitted from the clarity of the overlying water column, which allowed high transmissivity of light, and the ability of seagrasses to efficiently extract nutrients from the sediments. Early into the twentieth century however extensive urbanization and agricultural development resulted in substantial increases in inputs of nutrients, with a fourfold increase in phosphorus loading and significant inputs of ammonia-nitrogen. While these loadings were initially relegated to the estuarine sediments, with time these sediment stores became exhausted and began to release these stored nutrients to the water column—what have become known as “legacy nutrients.” These legacy nutrients in combination with continued heavy nutrient loading from an expanded watershed have driven the ecosystem towards “Far-From-Equilibrium” conditions, which has resulted in a shift from seagrass dominance to phytoplankton dominance—including potentially toxic

[6] Odum, H. T., Environment, Power and Society (1971) Wiley-Interscience, New York ISBN-13-978-0471652700.

Cyanobacteria and Dinoflagellates[7]. In 2021 over 1,000 manatees died of starvation as they wintered in the IRL because of a 50% loss of seagrasses the previous year[8]. In addition, expansive fish kills have become problematic within the lagoon. The impact upon the local economy has been lower property values, reduced tourist activity, and potential threats to human health[9].

Similar stories are associated with other environmental features in Florida, including the replacement of native submerged grasses in Florida's Springs with invasive benthic Cyanobacteria such as *Lyngbya sp.* as a result of extensive use of nutrient laden reclaimed wastewater and septic tank seepage[10]; the increased occurrence of Cyanobacteria within the 450,000 acre Lake Okeechobee as a result of "legacy" phosphorus[11]; the expansion of "red tide" organisms on Florida's West Coast likely associated with nutrient releases from Lake Okeechobee[12]; and loss of scrub habitat attendant with widespread development, which has disrupted soil integrity and deleteriously impacted threatened species, including the Florida Scrub Jay[13].

Florida's stories are similar to many documented throughout the nation, whether it is the problems in Toledo, Ohio from Harmful Algal Blooms (HAB) around the drinking water intake on Lake Erie[14]; the outbreak of Lyme's disease in the Northeast as a result of reduction of species predatory to the deer mouse[15]; or loss of soil and water quality within the Yellowstone National Park as attendant with elimination of the gray wolf[16]. Considering these and other developments, it is clear that the consequences of moving a stable ecosystem towards a "Far-From-Equilibrium" status are often severe, costly, and unanticipated.

The situation associated with the snowmaking alternative (Alternative #2) as delineated within the Final Environmental Impact Statement (FEIS) for Arizona Snowbowl Facility's Improvements[17] certainly deserves assessment in terms of the extent of disruption to the surrounding stable ecosystems, rather than a simple evaluation based upon subjective projections of impacts. This is particularly germane to the issue of increased nutrient and water loads, although other factors are also of concern, including the

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[7] A 10-year Comprehensive Conservation and Management Plan for the Indian River Lagoon, Florida (2020) National Estuary Program www.irlcouncil.com

[8] Florida Fish and Wildlife Conservation Commission, Marine Mammal Pathobiology Laboratory 2021 Preliminary Manatee Mortality Table with 5-year summary 2/2/21 through 7/30/21

[9] http://blogs.ifas.ufl.edu/extension/2020/12/02/irl-fish-kill/

[10] Xueqing, G. (2008) TMDL Report Nutrient TMDLs for the Wekiva River (WBIDs 2956, 2956A, and 2956C) and Rock Springs Run (WBID 2967) Florida Department of Environmental Protection, Division of Water Resource Management, Bureau of Watershed Management Central District, Middle St. Johns Basin

[11] Missimer, T.M.; Thomas, S.; Rosen, B.H. Legacy Phosphorus in Lake Okeechobee (Florida, USA) Sediments: A Review and New Perspective. Water **2021**, 13, 39. https://doi.org/10.3390/w13010039

[12] https://calusawaterkeeper.org/news/algae-blooms-triggered-by-lake-okeechobee-releases-harm-wildlife-and-coastal-communities-7442/

[13] https://www.fws.gov/verobeach/msrppdfs/floridascrubjay.pdf

[14] https://www.npr.org/sections/thetwo-way/2014/08/03/337545914/algae-toxins-prompt-toledo-to-ban-its-drinking-water

[15] Levi, T, A.M. Kilpatrick, M. Mangel, and C.C. Wilmers (2012) Deer, predators, and the emergence of Lyme disease Proc Natl Acad Sci U S A. 10942–10947. Published online 2012 Jun 18. doi: 10.1073/pnas.1204536109PMCID: PMC3390851

[16] https://www.yellowstonepark.com/things-to-do/wildlife/wolf-reintroduction-changes-ecosystem/

[17] United States Department of Agriculture Forest Service Southwestern Region (2005) Final Environmental Impact Statement for Arizona Snowbowl Facilities Improvements, Volume 1 Coconino National Forest, Coconino County, Arizona

presence and influence of endocrine disruptors, metagenomics factors, synthetic organic contaminants, and other anthropogenic impositions.

The following section is centered around changes in the loadings and movement of additional loads of the nutrients nitrogen and phosphorus as compared to pre-development conditions, with implications regarding the extent of departure from steady state—i.e., how “Far-From-Equilibrium.”

NUTRIENT ACCOUNTABILITY REVIEW

The potential influence of additional flows and nitrogen loads associated with proposed snowmaking (Alternative #2) is addressed within subsection 3H—Watershed Resources-- of the FEIS (pg. 3-160 to 3-224). Not included is any detailed discussion related to phosphorus other than soil content and leaching testing. Review of any nutrient loads associated with septic systems or the loadings from non-point sources is not included. The narrative on the nature and source of the wastewater effluent used for snowmaking is included in subsection 3G—Infrastructure and Utilities (pg. 3-150 to 3-159), but no discussion of phosphorus levels is included. Other subsections which provide information pertinent to the assessment of nutrient and hydrologic dynamics include 3I-Soils and Geology; 3J-Vegetation; 3K-Wildlife; and 3L-Geotechnical.

Within subsection 3H is a review of the groundwater dynamics associated with the 1,060.8-acre Snowbowl Sub-Area and the associated Hart Prairie Watershed and the Agassiz Sub-Watershed. The Snowbowl Sub-Area straddles the divide between these two, and is wholly contained within them, with most of the area within the Hart Prairie Watershed. The combined area of the 4,249.9-acre Hart Prairie Watershed and the 768.8-acre Agassiz Sub-Watershed is 5,018.7 acres.

The soils associated with the region are noted to be highly permeable, and consequently much of the precipitation and snowmelt is thought to recharge rather quickly into groundwater, with surface runoff being minimal. Recharged groundwater is noted to move vertically towards deeper aquifers but is impeded to some extent by lenses of confining silts and clay, which create intermittent, and often temporary perched conditions. These perched areas are important to maintenance of vegetation and wildlife. In some cases, this perched groundwater intersects with the ground surface creating springs and seeps. Within the FEIS it is made clear that there is considerable uncertainty regarding the nature and extent of groundwater flows, particularly those associated with these perched zones.

Analysis within the FEIS of the hydrological and water quality impact of snowmaking is limited to projections for wet, average, and dry season in terms of precipitation and snowmelt input as Acre-Feet (AF), evaporation and sublimation losses; Total Dissolved Solids (TDS); Total Organic Carbon (TOC); and Total Nitrogen (TN). These projections, summarized within Tables 3H-6 through 3H-8 of the FEIS, indicate that there is expected substantial increases in TDS, TOC, and TN concentrations within the groundwater during the dry season within the Snowbowl Sub-Area, with TN projected at

19.0 mg/L[18], well above the drinking water standard of 10 mg/L as Nitrate-N. Increases are not as severe with average and wet season projections, but still showing a doubling of TN and a tenfold increase in TDS during the average year.

In the FEIS discussion related to these projections it is suggested these increases are conservative (worst case) values, which do not account for retention within the soils, biological uptake, denitrification or additional commingling with other groundwater. The problem with the retention argument is the issue of long-term storage. If the soils are serving as nutrient stores, what is their storage limit and what happens when this limit is reached? This is how legacy nutrient conditions are established—by discounting the reality of conservation of mass. And while this could be countered by claiming extensive denitrification in the case of nitrogen dynamics, a substantial organic carbon source is required to facilitate denitrification. The rate and influence of the denitrification process was not evaluated within the FEIS, and was only mentioned once as a means of reducing nitrate levels.

It is noteworthy that movement of Nitrate-N from reclaimed effluent through groundwater has often proven problematic in terms of downgradient impact. For example, Nitrate from an effluent spray field owned and operated by the City of Tallahassee, Florida had profound impact upon the ecology of the downstream Wakulla Springs—a major tourist attraction—some fifteen miles away, resulting in lawsuits directed towards the city[19].

The comingling argument is a version of the *"dilution is the solution to pollution"* adage. A more comprehensive and meaningful approach to assessing influence of nutrient loading increases is to compare pre-and post-development nutrient inputs in addition to projecting long term rates of nitrogen within downgradient groundwater. This would provide nutrient accountability and offer further insight into the extent by which the associated ecosystem dynamics are driven from equilibrium.

For purposes of assessing nutrient dynamics, the initial study limits within this text will be the Snowbowl Sub-Area as well as the combined Hart Prairie Watershed and the Agassiz Sub-Watershed—5,018.7 acres. In a pre-development status, a major nitrogen input was likely atmospheric deposition and nitrogen fixation, as well as contributions from wildlife visitations. Phosphorus inputs would be primarily from atmospheric deposition and wildlife visitation to a lesser extent. The post-development (Alternative #2) nutrient input would be the sum of snowmaking from effluent; atmospheric deposition; nitrogen fixation; septic seepage; non-point sources, and wildlife visitation.

In the FEIS, atmospheric deposition is set at 0.50 mg/L Total Nitrogen, based upon records from the National Atmospheric Deposition Program (NADP)[20]. The review of

[18] The reported value as Total Nitrogen does not distinguish between Nitrate/Nitrite, Ammonia-N or organic-N. Effluent from a Bardenpho process—that used by Flagstaff Rio de Flagg facility—includes complete nitrification. As indicated in Table 3H-1 of the FEIS, most of the effluent nitrogen is as Nitrate-N.

[19] Davis, J.H, B.G. Katz, and D.W. Griffin (2010) Nitrate-N Movement in Groundwater from the Land Application of Treated Municipal Wastewater and other Sources in the Wakulla Springs Springshed, Leon and Wakulla Counties, Florida, 1966-2018 USGS Scientific Investigation Report 2010-5099

[20] https://www.usgs.gov/water-resources/national-water-quality-program/national-atmospheric-deposition-program-nadp

NAPD data from 1981 to the present for the Grand Canyon area indicates an annual average of 0.12 mg/l Ammonia-N and 0.14 mg/L Nitrate-N, or a Total Nitrogen, assuming no organic nitrogen is present, of 0.26 mg/L, somewhat lower than the FEIS value.

Atmospheric deposition of phosphorus was investigated from a number of sites around the world by Tipping et.al.[21]. They found the mean total phosphorus atmospheric loading rate at 0.027 g/m^2-yr, or 0.24 lb/acre-yr, or 256 lb/yr and 1,208 lb/yr Total Phosphorus for the Snowbowl Sub-Basin, and the Combined Hart Prairie/Agassiz for the Snowbowl Sub-Basin, and the Combined Hart Prairie/Agassiz, respectively.

Hartley et. al[22] included nitrogen fixation ranges for the Colorado Plateau from 0.002 to 0.98 nmol/cm^2-hr under ideal conditions, which occur during limited periods during the year. They noted the areal fixation rate in drier environments could be as high as 35 kg/ha-yr or 31.3 lb/acre-yr. Within the FEIS nitrogen fixation is given as 15 kg/ha –yr, or 13.4 lb/acre-yr, which is commensurate with the literature. Fixation then is a major input source of nitrogen, amounting to about 14,215 pounds and 67,251 pounds of Total Nitrogen annually for the Snowbowl Sub-Basin, and the Combined Hart Prairie/Agassiz, respectively, over the study area. These rates are assumed to be applicable to both pre- and post-development conditions, although some disruption of nitrogen fixation dynamics as well as the rate of nitrogen output as denitrification may occur with the introduction of effluent. Often, nitrogen fixation is accomplished through symbiosis, and the captured nitrogen as ammonia-nitrogen is incorporated into plant biomass. It may be retained within long-term standing biomass or become part of the detrital food web, where it may again be recovered by the standing plant crop, be lost through denitrification, enter into the groundwater network, or sequestered within the soil matrix as refractory organic nitrogen. It is assumed that wildlife contributions (imports) of nutrients are offset by exports.

With the development of the Snowbowl Facilities, there is potential for some nutrient influx from runoff from impervious areas such as parking facilities, roads and roof structures. Typical nutrient loading rates for impervious land uses were estimated by Donigan et.al.[23] at about 11.7 lb/acre-yr for Total Nitrogen and 0.89 lb/acre-yr for Total Phosphorus. Considering the planned developments for Alternative #2 as delineated within the FEIS, there will be an estimated 4 acres of developed area, exclusive of the ski trails, which is typically in impervious urban/commercial /residential land use. The nitrogen addition from these non-point sources is rather modest at 46.8 lb/yr Total Nitrogen and 3.6 lb/yr Total Phosphorus for the combined study area. These values do not include increased runoff from the skiing trails during the warmer season, and it is

[21] Tipping, E., S. Benham, J. F. Boyle, P. Crow, J. Davies, U. Fischer, H. Guyatt, R. Helliwell, L. Jackson-Blake, J. Lawlor, D. T. Monteith, E. C. Roweg and H. Tobermanac (2014) Atmospheric deposition of phosphorus to land and freshwater The Royal Society of Chemistry 2014 Environ. Sci.: Processes Impacts DOI: 10.1039/c3em00641g

[22] A. Hartley, N. Barger, J. Belnap, and G. Okin (2007) Dryland Ecosystems In: Soil Biology, Volume 10 Nutrient Cycling in Terrestrial Ecosystems P. Marschner, Z. Rengel (Eds.) © Springer-Verlag Berlin Heidelberg 2007

[23] Donigian, A.S., R.V. Chinnaswamy, P. N. Deliman (1998) Use of Nutrient Balances in Comprehensive Watershed Water Quality Modeling of Chesapeake Bay US Army Corps of Engineers Waterways Experiment Station, Technical Report EL-98-5

possible that changes in the soil characteristics under these trails could result in increased sediment loads (erosional losses), as well as nutrient loads. Recent investigations into the nature of the runoff from disturbed areas indicate increased erosional loss does occur[24].

Nutrient inputs from the on-site septic system should also be included in the mass balance assessment. Recent septic tank studies in Florida provide indication that even following the drain field, septic tank effluent was as high as 50 mg/L Total Nitrogen and 6 mg/L Total Phosphorus[25]. With visitation to the proposed Alternative #2 Snowbowl Facility at about 3,000 persons during season, the water consumption is reported in the FEIS at about 1.5 million gallons annually, with most of this for restroom use. This would amount to 625 lb/yr Total Nitrogen and 75 lb/yr Total Phosphorus.

Using the hydrologic loadings for precipitation and snowmaking effluent, and effluent nutrient levels at 6 mg/L Total Nitrogen as reported in the FEIS and 3 mg/L effluent Total Phosphorus which would be a reasonable assumption for a 4-stage Bardenpho[26] effluent, a nutrient input assessment can be developed as shown in Table 1 for dry, wet

[24] Personal communications with Richard Hereford retired USGS Geologist

[25] Wekiva-Area Septic Tank Study (2018) Division of Environmental Assessment and Restoration, Florida Department of Environmental Protection 2600 Blair Stone Rd. Tallahassee, FL 32399 www.dep.state.fl.us

[26] The four-stage Bardenpho process is intended to remove nitrogen through two stages of nitrification and denitrification, and is less expensive than a modified Bardenpho which includes additional units for phosphorus reduction. It is assumed Flagstaff uses the four-stage process, as phosphorus removal is not required by permit. As noted in Metcalf &Eddy Wastewater Engineering: Treatment, Disposal and Reuse 3rd Edition (1991) McGraw-Hill edited G. Tchobanoglous ISBN 0-07-041690-7 pg 670, effluent quality from an advanced wastewater treatment system using activated sludge + separate stages of nitrification and denitrification--e.g., four-stage Bardenpho--the total phosphorus in the effluent ranges from 6-10 mg/L

Table 1: Pre- and Post-Development (Alternate #2) Nutrient Inputs Snowbowl Sub-Area and Combined Hart Prairie/Agassiz Watershed

	Snowbowl Sub-Area						Agassiz + Hart Prairie					
	Pre-development Alternative			Post-Development Alternative #2			Pre-development Alternative			Post-Development Alternative #2		
	Average Season	Wet Season	Dry Season	Average Season	Wet Season	Dry Season	Average Season	Wet Season	Dry Season	Average Season	Wet Season	Dry Season
ACRES	1,061	1,061	1,061	1,061	1,061	1,061	5,019	5,019	5,019	5,019	5,019	5,019
Precipitation Acre-feet/yr.	2,892	4,408	1,190	2,892	4,408	1,190	12,498	19,051	5,144	12,498	19,051	5,144
Snowmaking Acre-feet/yr.	0	0	0	334	223	446	0	0	0	334	223	446
Percent increase in water inputs				**12%**	**5%**	**37%**				**3%**	**1%**	**9%**
NITROGEN INPUTS (lb.-N/yr.):												
Atmospheric Deposition	2,044	3,115	841	2,044	3,115	841	8,831	13,462	3,635	8,831	13,462	3,635
Nitrogen Fixation	14,215	14,215	14,215	14,215	14,215	14,215	67,251	67,251	67,251	67,251	67,251	67,251
Reclaimed Water	0	0	0	5,446	3,636	7,273	0	0	0	5,446	3,636	7,273
Septic	0	0	0	625	625	625	0	0	0	625	625	625
Non-Point Source	0	0	0	47	47	47	0	0	0	47	47	47
Total Nitrogen Input including N-fixation	***16,258***	***17,330***	***15,056***	***22,330***	***21,591***	***22,953***	***76,082***	***80,712***	***70,885***	***82,153***	***84,974***	***78,783***
Total Nitrogen Input excluding N-fixation	***2,044***	***3,115***	***841***	***8,115***	***7,376***	***8,739***	***8,831***	***13,462***	***3,635***	***14,903***	***17,723***	***11,533***
Percent increase including N-fixation				***37%***	***25%***	***52%***				***8%***	***5%***	***11%***
Percent increase excluding N-fixation				***297%***	***137%***	***939%***				***69%***	***32%***	***217%***
PHOSPORUS INPUTS (lb.-P/yr.):												
Atmospheric Deposition	256	256	256	256	256	256	1,208	1,208	1,208	1,208	1,208	1,208
Reclaimed Water	0	0	0	2,723	1,818	3,636	0	0	0	2,723	1,818	3,636
Septic	0	0	0	75	75	75	0	0	0	75	75	75
Non-Point Source	0	0	0	4	4	4	0	0	0	4	4	4
Total Phosphorus Input	***256***	***256***	***256***	***3,058***	***2,149***	***3,967***	***1,208***	***1,208***	***1,208***	***4,010***	***3,101***	***4,919***
Percent increase				***1095%***	***740%***	***1450%***				***232%***	***157%***	***307%***

and average season for the Snowbowl Sub-Area and the combined study area. It is noteworthy that while the increases in hydrologic loadings are minimal, the same is not true for Nitrogen and Phosphorus.

DISCUSSION AND SUGGESTIONS

Offered is an analysis regarding pre- and post-development nutrient balances and dynamics within the watersheds directly associated with and contiguous to the Snowbowl Facility. The indication that nitrogen and phosphorus loadings are notably increased with the use of wastewater effluent for snowmaking raises serious concerns related to ecosystem stability and uncertainty, which deserve additional consideration and study beyond the rather casual dismissal included in the FEIS—see quote below.

"The addition of snowmaking to operations at Snowbowl would result in an overall increase in moisture and nutrients and may change plant species composition within the SUP (Special Use Permit—which includes the Snowbowl Facility) *area. Proposed snowmaking is likely to add 31.1 lb/acre/yr of nitrogen over historic natural deposition. This may increase the dominance of early successional or weedy plant species. In turn, this may reduce overall plant diversity in some portions of the SUP; however, this effect would be restricted to developed ski trails and therefore localized."*

A mass balance analysis (Table 1) of the pre- and post-development conditions associated with the snowmaking Alternative #2 reflect an increase in nutrient inputs which could exceed the homeostatic capabilities of affected ecosystems. This analysis included both nitrogen and phosphorus, and it is not clear why phosphorus was not considered more relevant within the FEIS. (Phosphorus loading associated with Alternative #2 exceeded pre-development condition by over 700% in the Snowbowl Sub-Area and over 150% in the combined Hart Prairie/Agassiz watershed.) When such loadings are persistent and exceed that representative of the successional history of the associated ecosystems, conditions "Far-From-Equilibrium" conditions can be established, which can foment significant ecological disruptions. While typically unpredictable, changes may well include--but not limited to:

- Increased Net Ecosystem Production (NEP) as a result of high rate of primary productivity in response to increased nutrient availability.
- Provide selective advantage to invasive plant species, which can change soil characteristics; interfere with critical symbiotic relationships such as related to nitrogen fixation; and possibly render key species vulnerable to pests and pathogens.
- Changes in vegetative complexion can impact consumer species and disrupt critical Predator-Prey relationships.
- May impact the rate of herbivory if key predators are deleteriously impacted, which can change the complexion of primary production.
- Accumulation of excess biomass from increased NEP renders the systems more vulnerable to destructive fires.

- Loss of vegetative complexity and diversity may make the region more vulnerable to erosion.
- Loss of overall ecological diversity reduces overall homeostatic capabilities, adding to the uncertainty of future changes.
- Imposes upon available nutrient stores within the soils, which when eventually saturated can create a “legacy” situation, resulting in long scale internal nutrient releases.
- Transmission of nutrient loads through groundwater may impact downgradient ecosystems, such as Hart Prairie.

While it is suggested within the FEIS that the nutrients associated with the snowmaking process will impact only the local region around the skiing trails, this is inconsistent with claims also included in the FEIS that most of the water and associated nitrogen will quickly enter the underlying groundwater. It should be noted that discarding excessive nutrients into groundwater is typically not a solution, for eventually some if not most of this groundwater finds a surface outlet either as springs and seeps along the ground surface, or release into larger water bodies. In both instances these nutrients can become problematic. Admitting that the groundwater patterns within the region are complex and not well understood should give concern regarding the fate of these excess nutrients.

Like aquatic, estuarine and marine systems, which have received the most attention from the scientific community regarding eutrophication related to Harmful Algal Blooms (HAB) and serious fish wildlife and habitat loss, terrestrial systems such as those associated with the Snowbowl study area can also be disrupted by excessive nutrient loading. This is particularly true when these loads exceed that associated with the successional history of these systems. In such cases the homeostatic capabilities may be exceeded, and the system driven to a “Far-From-Equilibrium” situation. Over the long-term this can lead to changes which can be unpredictable and irreversible.

NITROGEN

Nitrogen loads as noted in Table 1 increase by 25% to 52% in the Snowbowl Sub-Area when effluent is used in snowmaking, dropping to a 5% to 11% increase in the combined study area. However, as nitrogen loads may impact the symbiotic relationships associated with nitrogen fixation, these increases need to be considered without the influence of fixation—resulting in an increase to 137% to 939% for the Snowbowl Sub-Area and 32% to 217% for the combined study area if nitrogen fixation is seriously disrupted.

Nitrogen within the Class A+ effluent used for snowmaking is expected to be largely as nitrate, which is a form readily available for biological uptake. As the amount of readily available nitrogen increases, the need for nitrogen fixation is reduced, and the nitrogen fixing plants could face a disadvantage. This could be particularly damaging to the

sensitive Alpine Tundra in the upper reaches of the Snowbowl but could also impact downgradient grasslands and conifer forests.

Because nitrates are readily soluble, their rapid movement into the groundwater can be expected. High nitrate levels therefore can occur in perched groundwater, particularly during periods of high evaporation and sublimation, which tends to concentrate the solutes within the groundwater. It could be expected that the grasslands which likely rely heavily upon the perched groundwater, could be profoundly impacted. The high nitrates would offer a selective advantage to highly productive invasive species—both native and exotic—which were previously restrained by the paucity of available nutrients. Leaching studies evaluated within the FEIS indicate bleed through of nitrogen.

In general, the FEIS language related to nutrient impacts upon the ecological stability of the area is presumptive at best. It is not realistic to make reliable long-term projections of change considering the extent of departure from the successional history of the involved ecosystems.

PHOSPHORUS

The FEIS discussions related to increased phosphorus loading associated with snowmaking was limited to studies within the laboratory of leaching rates through collected soil columns. These tests provided some indication that phosphorus would be retained within the soils and would not be expected to leach into the groundwater. However, the laboratory testing must be considered limited because of the short time duration, the lack of seasonal fluctuations, and the absence of complex biological activity which would be seen in the field. The initial water sample used in the leaching tests, which presumably was the effluent used for snowmaking, was noted to contain <2.0 mg/L ortho-phosphate (also known as Soluble Reactive Phosphorus or SRP which is readily bioavailable), which is lower than the presumed 3 mg/L total phosphorus used to develop Table 1 in this text. It is unclear if organic phosphorus was considered, as this is often a common form within wastewater effluents. No other effluent phosphorus levels, including any summation of long-term phosphorus levels in the Rio de Flag were given in the FEIS studies.

It is apparent from the FEIS text that phosphorus was not seriously considered as an influential factor in the ecological dynamics of the region. This may be because it is assumed there is an abundance of available phosphorus as the volcanic soils are comparatively high in phosphorus—about 0.10% to nearly 0.20% as phosphorus (circa 0.30%-0.55% as phosphate) on a dry weight basis. However, the surficial soils are noted to be low in phosphorus, as shown in Table 3I-35 of the FEIS.

Phosphorus dynamics within soils are driven by complex interactions of factors such as adsorption-desorption, precipitation, temperature, resolubilization, diffusion, pH and Redox potential. These are influenced by climate, moisture, biological activity and the presence of organic material. While the volcanic soils associated with the study area have substantial ability to sequester phosphorus, which certainly has to a large extent

influenced the ecological successional processes, it is not known with any certainty how the dynamics of phosphorus movement and biological availability will be impacted by the substantial increase in phosphorus loading.

SUGGESTIONS

Considering the inherent uncertainty of the consequences of high level nutrient loading, and other actions, upon the stability of the ecosystems associated with the study area, it would seem prudent to establish a group of qualified and diverse investigators to conduct a detailed, independent, and objective review of the proposed action (Alternative #2) which would extend beyond the presumptions included in the FEIS.

Such investigation would include field work and a comprehensive literature review as well as consultation with other experts, including the indigenous peoples. Historically, the indigenous peoples in the wide region of the San Francisco Peaks have objected to the impacts associated with the development and operation of the Resort. It is important to note that these objections based on their indigenous traditional ecological knowledge may have validity based on our initial review. The indigenous history and implementation of traditional ecological knowledge of the region would benefit any long term plans aimed at restoring the health of this ecosystem.

A final report would be a joint effort by all of the mentioned contributors to include a review of the potential impacts to the associated ecology, as well as long-term economic considerations and the nature of cultural impositions. This report would include an assessment of impacts, options for reparation, and methods for assigning responsibility for correction and compensation for any damages done as a result of the implementation of the proposed action.

APPENDIX 1

Documentation of July 2021 Runoff

(following this page)

Arizona Snow Bowl's new parking lot under construction on Hart Prairie, summer 2020. Realignment of sewer drainage system has exacerbated existing runoff problems on the prairie. Triangle is cadastral corner monument marking north to south (left) and west to east boundary of Arizona Snow Bowl's Special Permit Use Area.

Documented Stormwater Runoff Beyond Arizona Snow Bowl's Permit Area Causes Erosion and Pollution of Hart Prairie's Ecosystem

by

Richard Hereford, Tom Brownold, and Gwendolyn Waring

Flagstaff, Arizona

October 1, 2021

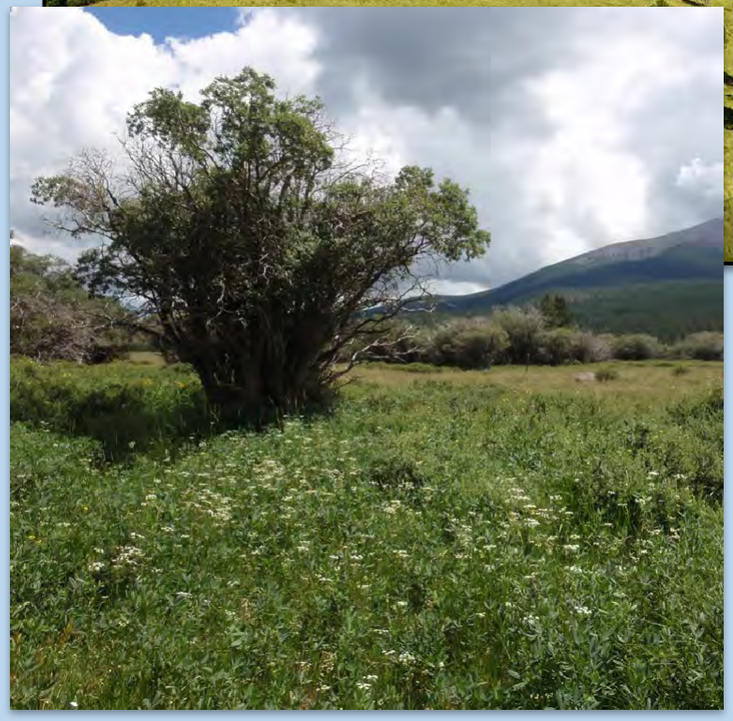
Ver. 1.2 with Addendum

SUMMARY

Culvert of lower drainage system flowing into previously eroded gully on Hart Prairie, July 18, 2021 around 4 pm. Culvert passes under Forest Road 516. Culvert was well over half-full in the surge of the first of two runoff events. The second surge was almost half-full, which is above the level in the photograph.

"ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER QUALITY STANDARDS R18-9-704. General Requirements …
G. Prohibited activities …
3. Misapplying reclaimed water for any of the following reasons: …
c. Allowing runoff of reclaimed water or reclaimed water mixed with stormwater from a direct reuse site"

- Documented runoff onto Hart Prairie, a lush sub-alpine meadow adjoining Arizona Snow Bowl, occurred beyond Snow Bowl's permit boundary in April and late July of 2021. April runoff was snowmelt and July runoff followed four days of light to heavy rain culminating with two flood peaks on or shortly before July 18, 2021.
- Preliminary discharge rates of the July runoff are 9.5 and 21.7 cubic feet second (cfs) as estimated from two floodlines in a culvert (p. 4). The sewer system drains the one-square mile Snow Bowl drainage basin, which has 3,000 feet of vertical relief; runoff can be substantial. Analysis of monsoon (July, August, and September) climate data suggest rainfall-producing runoff like late July 2021 occurred nine times since 1998 (p. 10).
- The combined runoff of two segments of the sanitary sewer system was 103–180 feet wide. Runoff spread over the prairie south of the new parking lot far beyond the permit boundary. The resulting stream, although with width decreased, extended southwest 2,620 feet (about one-half mile) beyond the culvert (p. 7 and ADDENDUM).
- Stormwater runoff (p. 6)—polluted with litter consisting of basaltic cinders, plastics, clothing, and granule- to small cobble-size clasts of reclaimed asphalt derived from the parking lots (p. 7)—spread onto the prairie where it further eroded preexisting gullies (p. 8-9) .
- Evidence indicates erosion is coincident with development of a sewer system beginning between 1997 to 2003; in October 1997 gullies did not exist on the prairie (ADDENDUM). The runoff of July 2021 and its detrimental effects on the prairie are not new. But the concentration of runoff on the south side south of the new parking lot is new and results from realignment of the sewer system to accommodate the parking lot (p. 5).
- Finally, runoff possibly contains contaminants from ski slopes treated with reclaimed water used in snowmaking, which began in 2012. Rainfall-generated hillslope runoff, such as July 2021, can entrain soil contaminates on heavily treated ski slopes along with other runoff producing areas in the basin. Initial analysis of the July 18, 2021 runoff indicates it contained a disturbingly high nutrient load: 2,540 and 303 mg/l of phosphorous and nitrogen, respectively. Nutrient loading at these levels is much larger than any permitted in streams, lakes, or reservoirs. The analysis does not necessarily pin-point reclaimed water as the principal nutrient source; but treated ski slopes remain as one of several possible origins. Regardless of source, runoff with such high nutrient loadings will quite likely disrupt Hart Prairie' ecosystem. Further study is necessary to clarify these nutrient values.



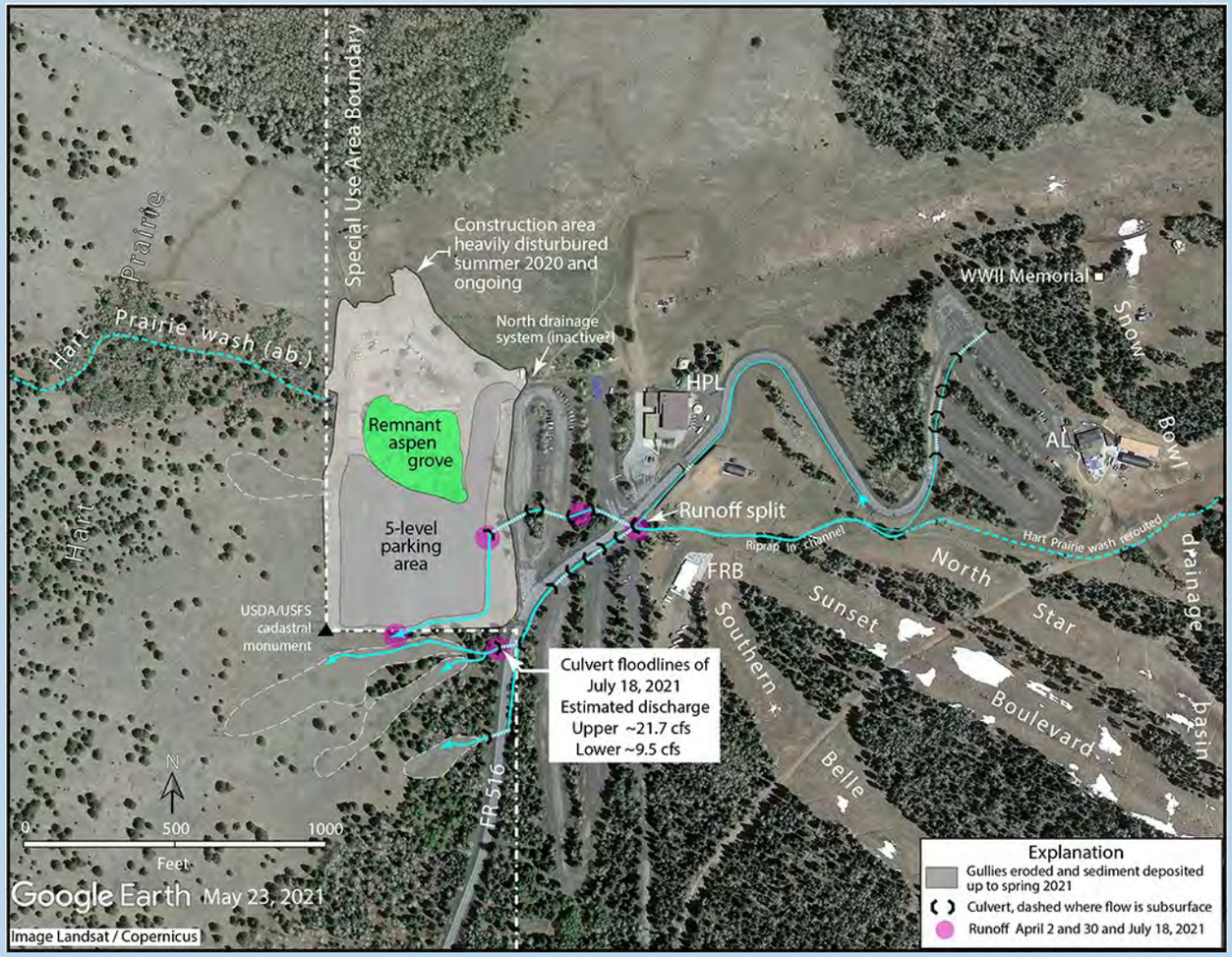
Above—West side of San Francisco Mountain. Hart Prairie spreads out across the mouth of snow bowl valley in center of photograph below and to the left of Agassiz Peak, the highest summit on right. Ski runs and lifts above the prairie comprise Arizona Snow Bowl. Below—Typical display of vegetation on the prairie; Bebb's willow (Salix Bebbiana) on middle left and Arizona fescue (Festuca arizonica), a perennial bunch grass lies across mid-ground (Photograph courtesy of Max Licher).

About Hart Prairie—A Botanist's View

Hart Prairie is an upland riparian prairie on the western slope of San Francisco Mountain. The prairie covers more than 250 acres below the mouth of Snow Bowl basin at elevations between 8,400 and 9,000 feet. A diverse assemblage of more than 280 plant species are on the prairie including all of the conifer species that occur elsewhere on the mountain. Shaded habitats created by aspen groves, famous for their fall colors, support stands of Bebb's willow. The Hart Prairie population is near the southern limit of Bebb's in Arizona; it is perhaps the largest population in the United States. The willows support small communities of plants under their canopies, including delphiniums, roses, bluebells and geraniums. Forty species of grasses occur on the prairie. On the open prairie and in the shade of trees, 13 species of shrubs are present, including two elderberries, two currants, and nine species of roses. Additionally, milkweeds, sunflowers, bell flowers, honeysuckles, two violets, two geraniums, irises, wild bergamot, two orchids, and nine species of buckwheat are present. All of these plants contribute to the great lushness and diversity of the prairie.

Prairies are endlessly encroached upon by conifers. The Nature Conservancy at Hart Prairie is maintaining the prairie's presence with aggressive forest thinning programs. Considerable investment has been made to preserve the health of this ecosystem, which is relatively pristine and pollution free. However, the prairie's ecosystem is threatened by uncontrolled, highly contaminated runoff onto the prairie from Arizona Snow Bowl's sanitary sewer system.

The prairie is a popular scenic area enjoyed by many locals and tourists. But beyond the botanist's view and the prairie's scenic beauty, the mountain generally and the prairie in particular comprise an important sacred landscape and place of worship for over 13 Indigenous Nations and Peoples.



Map of Snow Bowl facilities showing lower Snow Bowl drainage basin, Hart Prairie, and problematic sanitary sewage system (open channel and culvert symbols). Light colored pattern is 13.7 acres of prairie largely covered, except remnant aspen grove, by fill used in construction of the new parking area and space for future development. Snowmaking with reclaimed water is applied heavily from November to March to several ski runs three of which are labelled on southeast corner of map. HPL, FRB, and AL are Hart Prairie Lodge, Fremont Restaurant and Bar, and Agassiz Lodge, respectively.

Mapping Arizona Snow Bowl's Harmful Effects on Hart Prairie

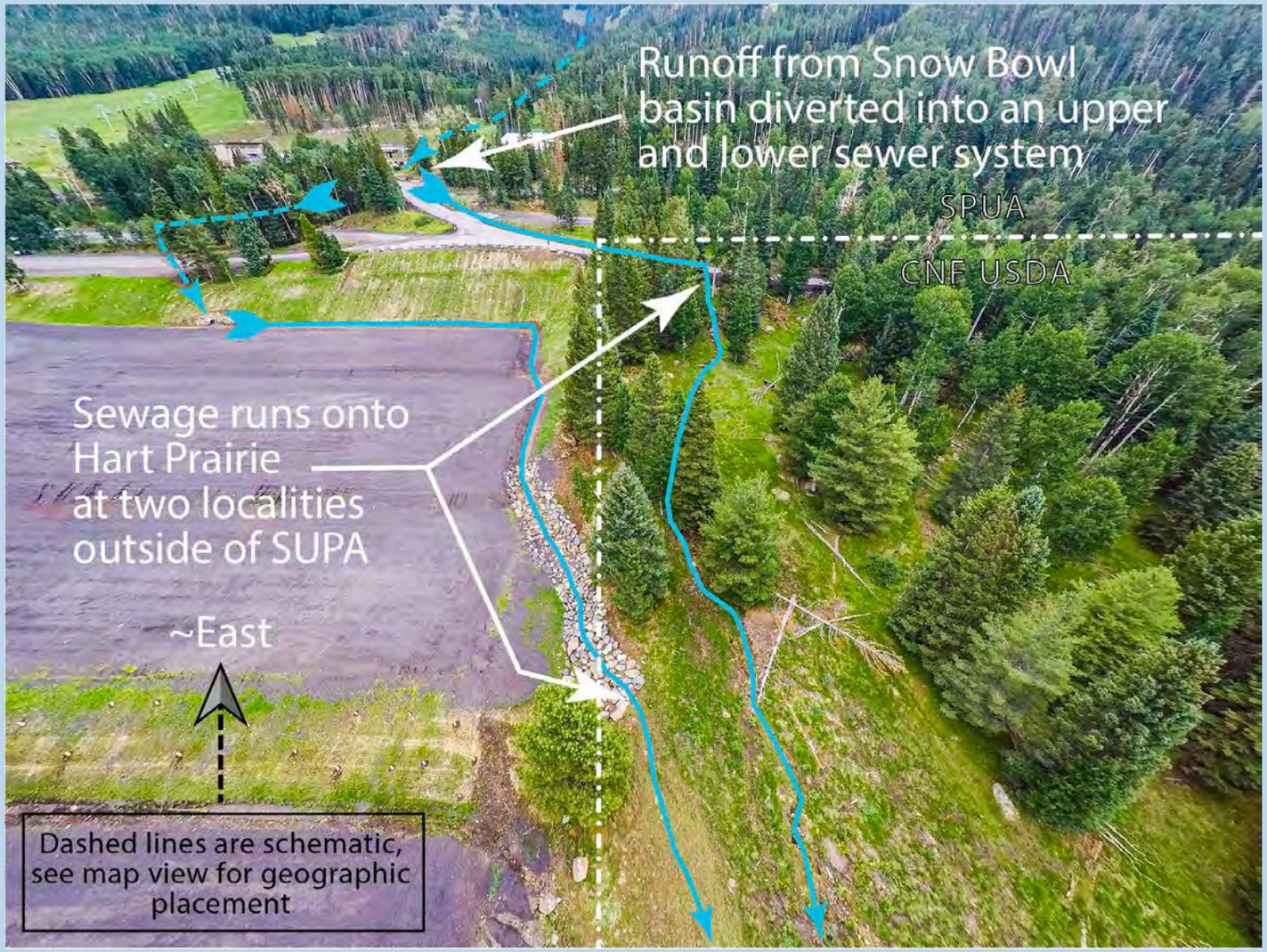
Development of Snow Bowl's parking lots between 1976–92 blocked the historical course of Hart Prairie wash, which was abandoned and replaced by a sanitary stormwater sewer system. Runoff from the entire drainage basin enters the sewer system at the runoff split. A substantial portion of stormwater originates on numerous ski slopes treated with reclaimed water used in snowmaking since 2012. It is apparent that stormwater can mix in the sewer system with derivatives of reclaimed water. Runoff also contains fragments of asphaltic material from heavily littered parking lots paved with granular reclaimed asphalt.

Riprap in the channel upstream of the split is designed to reduce flow, but this treatment does not eliminate downstream runoff as documented in this report. After percolating through riprap, this mixture of storm and reclaimed waters from snowmelt can mix with groundwater.

Below the split, runoff is redistributed to the south end of the new parking lot (upper sewer segment) and southwest along FR 516 (lower sewer segment); their termini are separated by only 320 feet, thereby spreading runoff over a large area. Runoff (circled) was observed in both segments in April and late July 2021. In July, both segments combined and flowed almost one-half mile southwest across Hart Prairie far beyond the cadastral corner monument. A preliminary estimate of peak discharges of the lower segment is 9.5 and 21.7 cfs based on two waterlines preserved in the indicated culvert. The culvert was well above half-full in the large, first runoff surge of late July. The July 18, 2021 runoff was sampled for chemical analysis at the exit of this culvert; it carried an extremely high nutrient load of 2,540 and 303 mg/L of total phosphorus and nitrogen, respectively, far above any allowed in streams. Another drainage system at the north end of the new parking lot appears inactive.

Four light gray patterns map gullies, sediment, and litter from several runoff events mostly after 2011 (if not 2003) and before 2021. See NOTES (p. 11) for mapping details, discharge calculations, and definitions (p. 12). The ADDENDUM (following p. 12) documents the chronology of sewer and gully development and in certain cases relates erosional activity to monsoon rainfall.

Problematic Drainage System



Oblique (distorted) view of southern sewer system where it debouches onto Hart Prairie. Path of upper (left) and lower (right) segments of the system are shown with blue lines. Paved parking lot is partially surrounded on east and south sides by the upper sewer segment. Note riprap where upper segment exits parking lot over which runoff flowed.

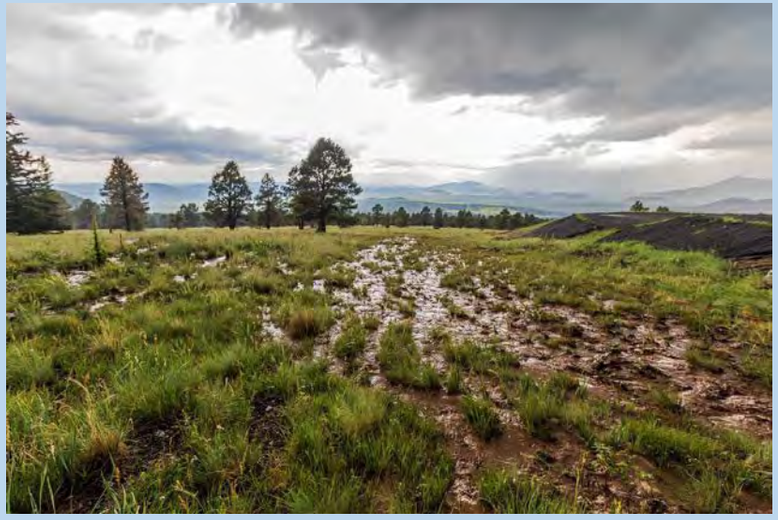
The sewer system carries snowmelt and stormwater runoff from Snow Bowl basin, which covers ~1 square mile and has 3,040 feet of vertical relief. Runoff was formerly into Hart Prairie wash before modern development of Snow Bowl. Then it flowed west-southwest down Hart Prairie alluvial fan contained within a well defined channel that favored riparian vegetation and replenished groundwater. Physical evidence indicates that the wash once (historically) carried high volume floods that the basin produced either from snowmelt, rain on snow, or monsoonal rainfall.

Wastewater runoff is incising gullies on Hart Prairie where none existed, a process that will severely alter the prairie landscape. More importantly, analysis of the sewage reveals damagingly high high nutrient levels: nitrogen 303 and phosphorus 2,540 mg/l. This result is preliminary and further analysis and study are necessary to fully comprehend the chemistry of runoff waters.

Documentation of Stormwater Runoff Effects on Hart Prairie, late July 2021

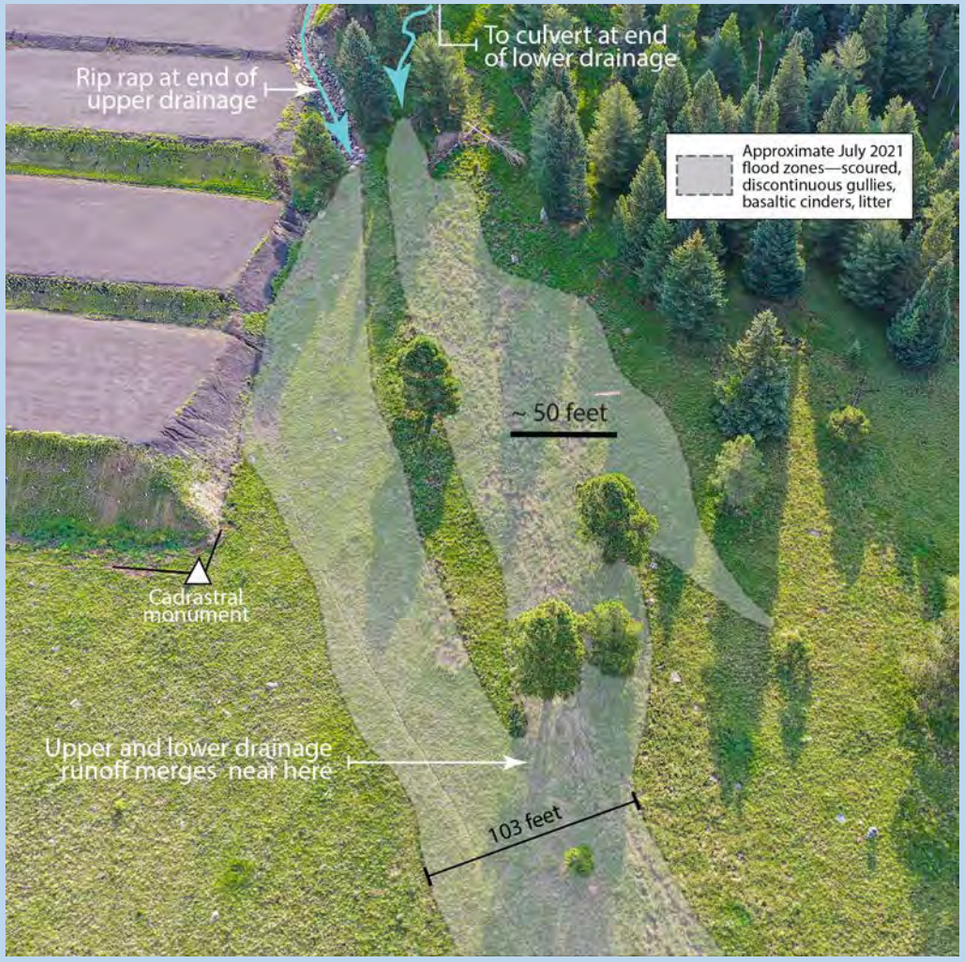
Top—Left to right, video clips of lower drainage system. Culvert outflow under FR 516 (far left). Waterline in culvert from peak July flow was substantially deeper than flow in this photograph. Downstream view of eroding gully (middle) and view of runoff across prairie (right). All runoff was south of permit boundary, as seen here by south side of parking lot, July 18, 2021. Videos available on request.

Bottom—Left to right, upstream view of wastewater from lower drainage culvert onto meadow; downstream view of runoff over riprap at end of upper drainage system onto the prairie; downstream view of runoff near junction of the two drainage segments. Total width of two segments at this point was 180 feet.



Flood Zones, Flood Path, and Example of Litter Carried in Floods

Below—Oblique aerial view of flood scour zone (gray pattern) showing combined runoff of upper and lower drainage segments. Diagnostic features are litter from parking lots and other Snow Bowl facilities: dark basaltic cinders, granular asphaltic debris, and discontinuous gullies. Boundary of permit follows south side of parking lot. Flood zone above split at lone tree is 180 feet wide with 25 feet of separation.



Top—Path of combined wastewater down southwest side of Hart Prairie alluvial fan. Flow ended 2,620 feet southwest of lower system culvert (see ADDENDUM*). Runoff along preexisting tracks, trails (such as here), and roads is a widely recognized precursor of gully incision and arroyo development in the Southwest.*

Middle—Flow terminated northeast of Alfa Fia tank. A single plastic water bottle is near scale.

Bottom—Example of litter in sewage consisting of aluminum cans, face mask(s), miscellaneous colored plastic fragments, and various clothing items (circled). Face masks are diagnostic of 2021 runoff. Inset, cobble-size asphaltic clast in gravel.

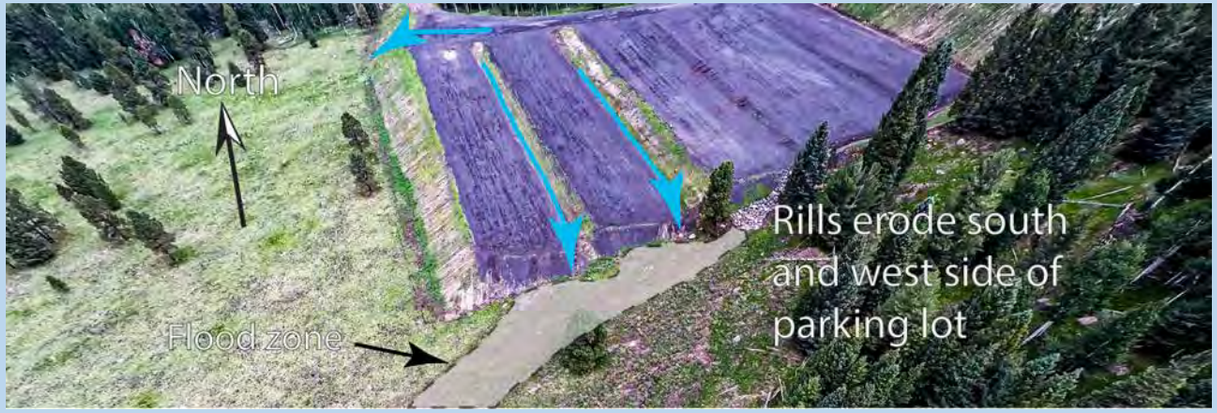
Repeat Photographs Document Sediment Movement and Widening and Deepening of Gullies Since 2020

Upstream views of lower drainage system at and downstream of culvert. Upper left 9/20/2020 upper right 7/27/2021, scale 50 cm long with 10 cm (~4 inches) divisions. Common features are circled. Gully is deeper and substantially wider (rectangles).

Lower left and right dates same as above; left– configuration on gravel bar of pebble-size clasts and basaltic cinders (at scale); right–in this wide-angle view of meadow clasts were moved while others moved downstream; gully is wider and deeper particularly at distant scale where gully is more than two feet deep reaching four feet deep at plunge pool farther upstream.

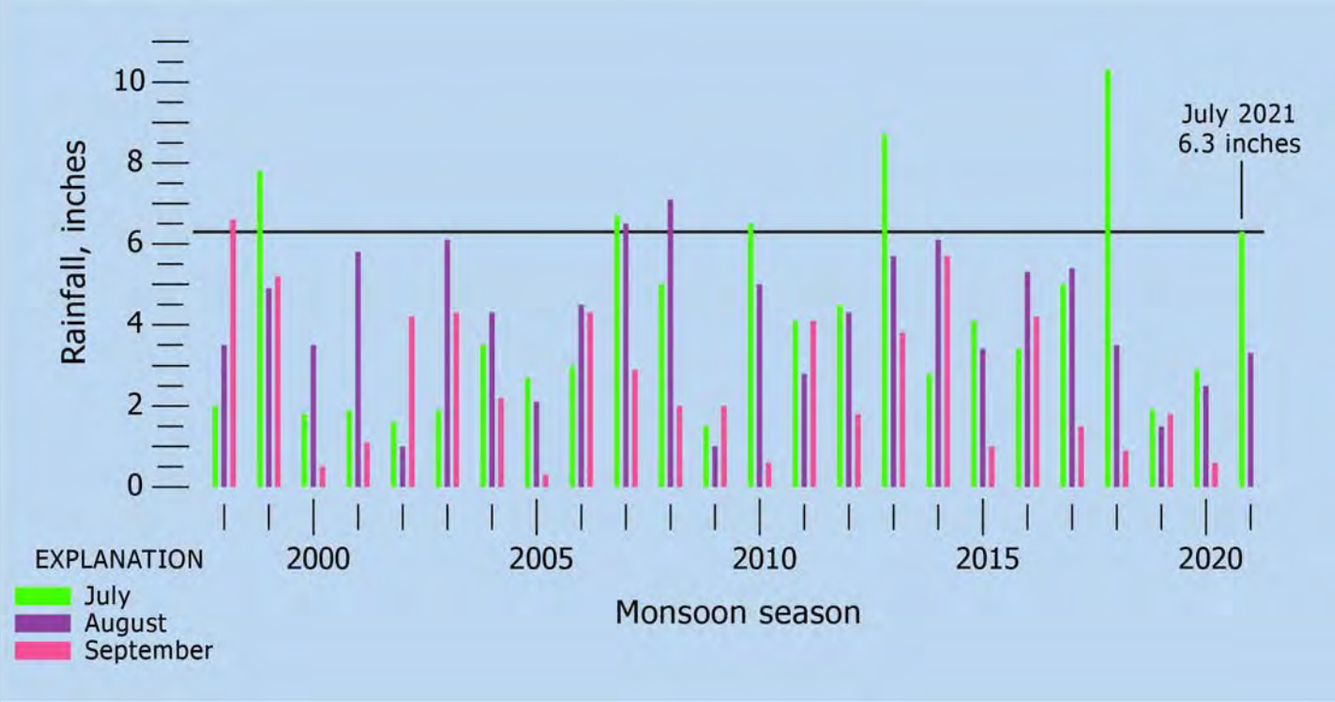
Upstream view of lower drainage gully—left 9/20/2020, right 7/27/2021. Gully substantially deeper and wider.

Rills, Another Style of Runoff-Related Erosion



Left, rills were eroded into south and west-facing sides of parking lot during late July runoff. Right, rill of farthest west of two channels.

How Unusual was the Rainfall of July 2021?



Bar chart of seasonal monsoon rainfal, 1998–2021. The seasonal total rainfall of the monsoon months, July, August, and September, are color coded.

July 2021 rainfall was not particularly unusual. That rainfall event, however, is important because it is a fair representation of the amount of rainfall necessary to produce runoff. All things being equal, a broad but useful supposition, the July runoff-producing rainfall of 6.3 inches is a meaningful threshold. Damaging runoff is evidently possible near or above this rainfall amount. See NOTES (p. 11) for source of monthly rainfall data.

July is typically the wettest month of the monsoon season; rainfall was close to or above the threshold six times between 1998 and 2021. The damaging results of July 2021 runoff are documented here. But rainfall was also close to or above the July threshold two times in August and once in September. So, since 1998, runoff-producing rainfall within 10 percent of the threshold occurred nine times, if not more often. The average recurrence interval of monsoon rainfall close to and above 6.3 inches is only two to three years (that is 24 divided by 9). This does not consider winter snowmelt runoff; we know little about how often it occurs nor the size of such runoff.

The nine runoff events, by analogy with July 2021, were capable of eroding Hart Prairie and transporting sediment and other contaminants. Although we are unable to identity the effects of all nine runoff events, four large mapped areas show evidence of runoff activity (p. 4). And examination of sequential Google Earth imagery (see ADDENDUM) reveals that since 1998 erosional and depositional activity accelerated as the sewer system developed. The take-away point is that damaging runoff occurs frequently.

The three monsoonal runoff events since 2012 are particularly interesting as they post-date snowmaking on ski slopes with reclaimed water. Water-quality sampling of surface runoff from ski slopes at the termini of the sewer system in both winter and summer can help resolve the extent of prairie contamination by reclaimed water. Although plastics and asphaltic litter in runoff, constitute serious pollution by themselves; the alarmingly high nutrient levels of runoff are ecologically unacceptable.

NOTES

A second drainage system at the north end of the new lot captures runoff from the parking lot adjoining the new lot's east side. This system is evidently not functioning. It is apparently designed to direct runoff through dual culverts across the remnant aspen grove into abandoned Hart Prairie wash outside the permit area.

A recreational grade GPS instrument was used to map the area disturbed by summer 2020 construction and other features shown on the map (page 4). Locational accuracy is about 5 feet, which is adequate for the intended purposes and map scale. The perimeter of the disturbed area surrounding the lot was surveyed by following the base of the parking-lot fill or the top of the cut above the fill. The boundary of the Special Use Permit Area is from Figure 2-2 of the 2005 EIS. The southwest corner of the parking lot is marked by a USDA/USFS 1997 cadastral survey monument. Land west and south of the corner monument is *outside* the permitted area.

Relatively high resolution, rectified (WGS 84 datum) Google Earth satellite imagery (https://google.com) covering the Snow Bowl area is used in this report. GPS points were originally plotted on June 12, 2017 imagery. The present map (page 4) was compiled on recent imagery of May 23, 2021. The disturbed area was remapped guided by this image. Sequential development of Snow Bowl since 1954 was studied using archival mapping aerial photography flown between 1954–2005 (https://earthexplorer.usgs.gov). This photography documents blockage of Hart Prairie wash by construction of Snow Bowl facilities. Development of gullies and contamination of upper Hart Prairie related to the main or southern storm drainage system was documented using sequential Google Earth imagery (see ADDENDUM following p. 12).

Culvert discharge calculations were done using standard engineering software incorporating Manning's roughness coefficient. Slope of the culvert, which is relativley steep, was obtained by instrumental leveling over the culvert's length.

Monsoon season (July, August, and September) monthly rainfall totals from two sources were evaluated. The Natural Resources Conservation Service SNOTEL climate sensor that measures rainfall in Snowslide Canyon within the Inner Basin of San Francisco Mountain. Rainfall data covering Snow Bowl drainage basin is modeled and gridded PRISM* data. The modeled data are statistically indistinguishable from SNOTEL measurements. The SNOTEL data were used to estimate rainfall in Snow Bowl basin from 1998 to July 2021.

*Parameter-elevation Regressions on Independent Slopes Models, Oregon State University

About the Authors

Richard Hereford, Research Geologist (Emeritus), Environmental Consultant.**

Tom Brownold, owner, Tom Brownold Photography, FAA Part 107 Certified Drone Pilot.

Gwendolyn Waring, PhD, author of *The Natural History of the San Francisco Peaks, A sky Island of the American Southwest* (2018), 205 pages.

**herefordrichard@gmail.com

DEFINITIONS*

sewage (p. 183)—The waste and *wastewater* [emphasis theirs] produced by residential and commercial sources and discharged into sewers (USEPA, 1994).

wastewater (p. 225)—(a) *return flow*. (b) *Seepage* of water from a ditch or reservoir. (c) The spent or used water of a community or industry that contains dissolved and suspended matter. Cf: *effluent* (b); *industrial waste*; *reclaimed water; municipal waste*. See also: *gray water*; *sanitary wastewater*; *septic wastewater*; *sewage*.

storm water (p. 199*) direct runoff.*

storm sewer (p. 199) A *sewer* that carries direct runoff from rain or snow (USEPA, 1994). Cf: sanitary sewer; combined sewer.

***** Glossary of Hydrology, 1998, Wilson, W.E., and Moore, J.E., eds., Alexandria, Virginia, American Geological Institute, 248 p.

ADDENDUM
Development of Drainage System and Gullies Using Google Earth Imagery, 1997–2021

Interpretation of 13 sequential images reveals gully erosion of Hart Prairie is linked to Snow Bowl's sanitary sewer drainage system. Erosion began between 1997 and 2003 and accelerated after installation of present drainage system between September 2010 and June 2011

Refer to map on page 4 of report for locations named on images, images are arranged chronologically by month and year. Main elements of evolving drainage system shown with trianglular symbols. Outline of disturbed area related to new parking lot and remnant aspen grove shown with thin white lines. Full track of July 2021 runoff is on last page of addendum.


WW II Memorial
Lot 1, drains north
Drainage system not detected, Lot 1 in place by 1992 blocking Hart Prairie wash; gullies absent; note faint track crossing southwest corner of new parking lot that was utilized by July 2021 runoff
Google Earth
Image U.S. Geological Survey
Oct 1997
N
1000 ft


WW II Memorial
Gully present west of Lot 1 probably results from rerouting of former Hart Prairie wash, which is incised south of Hart Prairie Lodge; possibly eroded by heavy rainfall in September 1998, July 1999, and August 2003
Google Earth
Dec 2003
N
1000 ft
Image © 2021 Maxar Technologies


WW II Memorial
Little change from 2003; low monsoon rainfall
2004 to 2006
Google Earth
Feb 2006
N
1000 ft
Image © 2021 Maxar Technologies


WW II Memorial
Elements of present drainage system not detected, image resolution low
Google Earth
Image USDA Farm Service Agency
Sept 2010
N
1000 ft


WW II Memorial
Upper segment of drainage system in place at runoff split, sewer passes northwest under road then turns west to pass under Lot 1 where it empties onto prairie in gully; former Hart Prairie wash incised; evidence of runoff west of FR 516, possibly related to heavy rain July 2010
Google Earth
June 2011
N
1000 ft


WW II Memorial
Lower segment of system present with two culverts under FR 516
May 2012
Google Earth
N
1000 ft


Drainage ditch probably directs sheetwash north of remnant aspen grove and elsewhere into small retention pond (above left)
WW II Memorial
Sediment plume and gully now clearly extend 870 feet west of Lot 1 onto prairie
Incipient gully below upper culvert
April 2013
Google Earth
N
1000 ft


WW II Memorial
Gully west of lot 1 appears active; gullies here probably related to large rainfall of July 2013 and August 2014
Gully well formed, sediment deposited 900 feet southwest of culvert
April 2015
Google Earth
1000 ft
N


WW II Memorial
Gullies and sediment from both culverts present, up to 900 feet long and 340 feet wide
Google Earth
April 2017
1000 ft
N


WW II Memorial
Former Hart Prairie wash incised and appears recently active
June 2017
Google Earth
1000 ft
N


WW II Memorial
Construction of new parking lot underway; construction east of Hart Prairie Lodge completes upper drainage segment that drains four parking lots at Agassiz Lodge and treated ski slopes south and southeast of lodge
Google Earth
Image © 2021 Maxar Technologies
Oct 2017
N
1000 ft


New five-level parking lot mostly complete, paved with granular reclaimed asphalt,drains south; future development and construction continue north of remnant aspen grove
WW II Memorial
Former channel of Hart Prairie wash armored with riprap
Upper segment of sewage system rerouted to south end of new parking lot, first active July 2021; termini of segments separated by only 320 feet
May 2021
Google Earth
N
1000 ft


Runoff Track
Legend
Runoff track July 2021
WW2 MONUMENT
Present Runoff Split
Avg Cadastral Location
Snowmaking with reclaimed water occurs here since 2012
Runoff track is 2,620 feet long
Reclaimed water pond
Alfa Fia tank
Google Earth
N
2000 ft

To: White House Council on Environmental Quality and
Environmental Justice Advisory Council

Date: June 29, 2023

RE: Sacred Places Protection

Subject: Written Comment on Environmental Justice Teleconference

Dear White House Staff and EJ Advisory Council,

Attached is information regarding the continued on-going violations that remain unenforced by the State of Arizona's Department of Environmental Quality (ADEQ). The legacy nutrients being sprayed on the Holy Sacred Mountain is destroying our medicine plants and the overall health of the mountain.

The Indigenous Elders and Medicine Peoples Council would like to meet in-person to discuss the role of the spiritual people in decision-making. There are executive orders and other policies that justify this meeting with the spiritual authorities.

We respectfully advise the EJ Advisory Council to recommend this meeting to the White House staff. When we talk about Indigenous Knowledge it's the Elders and Medicine who possess this knowledge.

Thank-you,

Shawn Mulford
PO Box 526
Pinon, Az 86510

(520)488-6610
smulford@comcast.net

CapturePoint Solutions llc (CPS) is in the business of capturing carbon dioxide from existing industrial plants, transporting by pipeline, and storing it deep underground. It is a subsidiary of Capture Point llc, which currently captures carbon dioxide from two industrial plants, transports by its own pipelines and sequesters in connection with enhanced oil recovery. CPS currently is developing in a significant carbon capture and sequestration project in the Central Louisiana Regional Storage Hub (CENLA Hub) including lands within Vernon Parish, LA. CENLA, due to its excellent geologic formation, has the capacity to store permanently over 2 billion metric tons of carbon dioxide. CPS has purchased pore space rights for carbon storage from property owners in the Parish. Carbon dioxide will be captured from existing industrial facilities in the Haynesville Shale and other areas.

Recently, CPS partnered with the Vernon Parish School Board and the United Association of Plumbers and Pipefitters (UA) to benefit the students of Vernon Parish with unique Career and Technical Education (CTE) opportunities in a project known as the "Vernon Parish School Board Capturing Better Futures Initiative. " This Initiative focuses on eligible Vernon Parish High School juniors and seniors to prepare them with training and skills to enter into the work force and pursue employment either through the private sector or through the UA's continued apprenticeship program. The CTE program will commence August 22, 2023, at Leesville High School and all Parish juniors and seniors are eligible for the program, made possible through the contributions of CPS and the UA..

The Vernon Parish School Board has recognized that this partnership is the result of a first-of-its-kind in the nation proactive environmental and economic justice initiative associated with a carbon capture and sequestration project. Its resolution is attached along with its invitation to the signing of the Memorandum of Understanding by the parties on June 21, 2023. CPS is submitting this comment as an example of environmental and economic justice initiative which serves this community.

For further information or questions, please contact Sherry Tucker,

The Vernon Parish School Board & Superintendent James Williams

Cordially Invite You to Attend

The Signing Ceremony for the
Memorandum of Understanding establishing
The Vernon Parish School Board,

"Capturing Better Futures" Initiative

11:00 a.m,Wednesday, June 21st, 2023
East Leesville Elementary School
Multi-Purpose Building
203 Belview Road, Leesville, Louisiana

A partnership between the Vernon Parish School Board, CapturePoint Solutions LLC, and the United Association, Plumbers and Steamfitters Local Union No. 247

Creating unique Career and Technical Education (CTE) opportunities for Vernon Parish students in a first-of-its-kind in the nation proactive environmental and economic justice initiative associated with a significant Carbon Capture and Sequestration (CCS) project

Lunch Provided. Please RSVP by Monday, June 12, 2023:
Phone: (337) 718-8876 or Email: vernon.travis@vpsb.us

Vernon Parish School Board

201 Belview Road
LEESVILLE, LOUISIANA 71446
(337) 239-3401
Fax (337) 238-5777

RESOLUTION

WHEREAS, the members of the Vernon Parish School Board wish to acknowledge the intent to join a Memorandum of Understanding with **CapturePoint Solutions LLC (CPS)** of Allen, Texas and the **United Association, Plumbers and Steamfitters Local Union No. 274 (UA)** to benefit the students of Vernon Parish with unique Career and Technical Education (CTE) opportunities in a project to be known as the Vernon Parish School Board Capturing Better Futures Initiative, and

WHEREAS, the Vernon Parish School Board Capturing Better Futures Initiative will focus on eligible Vernon Parish High School juniors and seniors to prepare them with training and skills to enter into the work force and to pursue employment either through the private or public sector or through the UA's continued apprenticeship program, and

WHEREAS, the Board recognizes that this partnership is the result of a first-of-its-kind in the nation proactive environmental and economic justice

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initiative associated with a significant carbon capture and sequestration project to be constructed and operated by CPS in the Central Louisiana Regional Carbon Storage Hub™ (CENLA Hub™), which includes lands within Vernon Parish, Louisiana, and

WHEREAS, CPS is a leading company in the development of deep underground CCS projects in the United States, which will help the nation achieve significant environmental goals by capturing millions of metric tons of carbon dioxide from Louisiana industrial sources that would otherwise be released into the atmosphere, and then permanently storing those emissions at depths of one to two miles below the surface under thick geologic capstones of solid rock, and

WHEREAS, CPS abides by mission goals of maintaining the highest standards of public health and safety in all operations, of meeting or exceeding CCS permitting requirements promulgated by both the United States Environmental Protection Agency and the State of Louisiana, of providing market-rate compensation to Vernon Parish property owners whose

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lands are included within the CENLA Hub™, and of being a model corporate citizen within our community, and

WHEREAS, CPS proactively coordinated with the Board and the UA for the creation and financial support of the Vernon Parish School Board Capturing Better Futures Initiative; now

BE IT THEREFORE RESOLVED that the Vernon Parish School Board expresses recognition for the example of corporate citizenship that CapturePoint Solutions LLC is establishing within Vernon Parish, support for CPS's project in Vernon Parish, gratitude for CPS support of students and public education in partnership with the Board, and appreciation for the economic, environmental and safety benefits CPS brings to our community.

JAMES WILLIAMS
VERNON PARISH SCHOOL BOARD
SUPERINTENDENT

Submission for White House Environmental Justice Advisory Council

Dcket ID No. EPA-HQ-OEJECR-2023-0099-0009

RE: Written Submission to the White House Environmental Justice Advisory Committee Recommending Greater Government Action to Address Reproductive Justice in Environmental Justice

WHEJAC members, Thank you for your service to environmental justice in the US and for this opportunity to provide public comment on environmental justice activities, the Justice 40 Initiative, the Climate and Economic Justice Screening Tool, the Environmental Justice Scorecard and on environmental justice resources and tools that would be beneficial from federal agencies. We are a group of organizations working in different ways to address the maternal health crisis in the US. Because of historical and ongoing systemic racism in the US, preterm birth rates, rising over the past years, are twice as bad for Black women than for white women. We are concerned that action to protect maternal health against snowballing environmental crises in the US is insufficient and lags far behind the science. Failure to act not only risks the right to health of pregnant people, but also impacts newborn, lifelong, and intergenerational health. Epidemiological studies disaggregated by race show greater effects on Black pregnant people and a lack of action at the intersection of reproductive and environmental justice is driving inequities in who gets to have a healthy pregnancy and a healthy newborn in the US. Epidemiological literature shows exposure to extreme heat, hurricanes, wildfire smoke and other climate change impacts and climate change-related disasters is linked with preterm birth and other adverse birth outcomes. We ask that you continue to press the US government to ensure environmental justice policy includes maternal health and reproductive justice considerations in efforts to address environmental justice. We hope to see federal, state, and local government message on these problems, including by "calling in" the reproductive justice community and by ensuring community perinatal health workers and others working with the most marginalized pregnant people and families are properly resourced in the face of the climate crisis and other environmental crises.

More specifically, we recommend: Resources to address environmental injustice, including those flowing from the Inflation Reduction Act, reach frontline perinatal community health workers and RJ activists. We ask you to recommend that the US government ensures midwives, doulas, and other non-traditional environmental justice actors/those excellently placed to work with pregnant people and newborns in environmental justice communities are also beneficiaries of the Inflation Reduction Act (IRA) and this administration's environmental justice promises. We want to see efforts to "call in" community organizations that work to support pregnant and newborn health to apply for IRA and other environmental justice/health funding as grantees or subgrantees, including for example doula or other perinatal community health workers. Community-based perinatal community health workers, like doulas, are often trusted in their communities, operate using justice principles, are experts at linking clients with other programming or services, and spend much more time with pregnant clients during their pregnancy than clinicians. Increasing public and provider knowledge of snowballing environmental harms to reproductive justice goals in the US and moving this up on the policy agenda. We would like you to join us in recognizing EnviroNatal Equity Week annually from April 18-21. This new awareness opportunity and call-to-action bridges Black Maternal Health Week (April 11-17, recognized by the White House in 2021) with Earth Day (April 22). EnviroNatal (a combination of "environment" and "natal" or relating to birth) Equity Week combines the momentum from climate action with reproductive justice, connecting the dots between these two often siloed conversations.

We recommend a multi-agency state of the science white paper on environmental harms to reproductive justice in the US, perhaps in coordination with the RJ community as well as the academics providing us with concerning science of climate, chemical and other environmental harms to sexual and reproductive health including undermining fertility, conditions like fibroids, harms to the developing fetus and maternal health during pregnancy. We have seen fetal harms addressed within the child health space (even though most pregnant people are not children), but fetal impacts are better positioned within a reproductive justice framework. We also understand that maternal health will be considered in several places in the upcoming National Climate Assessment 5 (November-December the EPA told us last week), and perhaps this will also have its own section within the Human Health chapter. Some of us are hoping to use this as an opportunity to draw attention. We also wanted to provide some advocacy documents that many of us or in some cases all of us have been involved in producing.

- We asked for the Climate and Economic Justice Screening Tool to include reproductive health indicators, like preterm birth rates. We want to continue to advocate for all US states to provide data about preterm birth, so this information is available for the tool. We would also hugely appreciate HHS and other relevant agencies explicitly including maternal and newborn health indicators/dimensions as they reach great results in the EJ Scorecard.

- We were some of 30 organizations that have been encouraging the EPA to establish a reproductive justice leader as they continue to staff up the new Office Justice and External Civil Rights. https://www.hrw.org/sites/default/files/media_2023/01/Joint%20letter%20to%20the%20Office%20of%20Environmental%20Justice%20and%20External%20Civil%20Rights.pdf (Please also see attached).

We strongly support your efforts to promote an environmental justice approach to climate change-related and other disasters in the US and thank you for your many efforts already. Yours sincerely, Skye Wheeler, Human Rights Watch,

Full Name (First and Last): Stuart L.T. Chavez

Name of Organization or Community: Havasupai Tribe

City and State: Supai, Arizon

Brief description about your recommendation relevant to your selection above: Written Comments To whomever it may concern, I am attaching a written comment document to go with my verbal comments from the June 13th public comment period.

Introduction

Good evening, my name is Stuart Chavez, I am a Havasupai tribal member and former Havasupai Tribal Council member, I come from a small village located on the Havasupai reservation called Supai. The population of Supai is 750 members with numbers slowly decreasing due to cancer-related deaths.

We, The Havasupai People – Havasuw 'Baaja (The People of the Blue-Green Water) have lived in our homeland, deep in the Grand Canyon, for thousands of years. Our ancestors have fought for years to protect our water, our home and preserve the beauty and natural resources abundant within our village and surrounding ancestral land. The largest threat to our survival, over 30 years has been the mining industries. Mining for uranium, not only harms the surface environment but also contaminates groundwater resources. For our Tribe, whose sole source of water comes from the very aquifers that have been contaminated by mining related activities currently occurring on our aboriginal lands, our very existence is also at stake.

The battle against uranium mining is an inter-generational trauma effect inflicted on us and our ancestral lands by the mining industries, State of Arizona and a lack of enforcement from federal agencies.

Background

1-2 – Trash

Approximately mid-1980's EPA and IHS assisted the Havasupai Tribe in developing a waste plan for solid waste and sewage. Originally the plan was simply to create a trash pit, approximately 2 stories in height and bury the trash, over time trash contained flammable substances (butane or fuel bottles) that would be bad for the environment and eventually with no monitoring of the location burned by younger generations. Air pollution would result from the fire. As time went on, a new location was developed - an elevated mound with a gate around it and individuals employed by the Havasupai Solid Waste Program. Currently the Havasupai Tribe pay individuals to sort through trash and extract the trash onto the plateaus of Long Mesa. There is little to no monitoring of the trash as it is slowly littering the higher cliffs of Long Mesa North-West of the village.

1-2 – Lagoon

Alongside the trash there is a 4 compartment Sewage Lagoon that is not properly monitored and operated which is the responsibility of IHS and EPA.

Alongside the open pit dump, EPA and IHS assisted the tribe in developing a sewage system for Supai. Overtime there was little to no maintenance done to the system resulting in an overflow of liquid waste in time. EPA and IHS allowed

a tribe with no experience with sewage systems to operate it independently with little assistance. A recent overflowing of the sewage system resulted in contamination of Havasu Creek, and the springs North of the village. The worst of this situation was

contamination and flow of waste through burial grounds of several families, the best form of mitigation from Havasupai's local EPA was signs not to drink water and testing.

3 - San Francisco Peaks

The San Francisco Peaks (Wii Hagnbajah) is sacred and one of the bifurcating roots of origin to the Havasupai people. In past years, Havasupai elders and leaders fought to stop the progress and operation of the San Francisco Peaks Snow Bowl. The operation is run by a foreign family that was allowed permits to operate, through the years there have been government to government consultation on their operations and renewal of the existing permit. During these times Havasupai traditional leaders and Tribal council members relayed their concerns of the operation and for it to be discontinued. Alongside Havasupai leadership other tribes spoke together against this operation especially when their permit was allowed to continue operations with reclaimed water usage to create snow for a false prolonged winter operation. By making this decision the USFS, Coconino NFS and EPA allowed a spiritual location to be tainted and desecrated by using reclaimed water (reverse osmosis).

4 - Flooding

With Supai being located at the bottom of the Grand Canyon, the region experiences occasional flooding throughout the year, typically end of April- May time would be an early monsoon, August-mid-November typical monsoon season. As time progressed from the early 90's there has been an increase in rain fall within the region, increasing the typical monsoon season to a flood season. Supai residents have had to adjust to the increase of rainfall by preparing their yards with sand bags. Regardless of the preparedness from the residents we could never be prepared for heavy rainfalls resulting in extreme flooding. Climate change has increased the amount of flooding in Havasu Canyon resulting in damages within the village leading to the Campgrounds. Tourism is the number one source of financial structure for the Havasupai Tribe for it to be impacted by damages to the trail would cause catastrophic impacts to financial stability of the Havasupai Tribe.

5 - Uranium, Red Butte, Grand Canyon Region and Abandoned Mines

One of the biggest issues we have been dealing with for generations is the Pinyon Plain Mine (previously known as Canyon Mine) which sits within the TCP of Red Butte (Wii Gdwiisa), tainting a sacred area and operating above a large body of water called the R-aquifer (Red-Mauv Wall). The aquifer was punctured approximately 2016-17 by this mine but was allowed to continue to operate and destroy a precious natural resource that is connected to our village - Supai. The threat of uranium contamination to Supai's water is unacceptable and has been ignored. The significance of Red Butte to the Havasupai People is dramatically under-minded by not only the uranium industry but also the Kaibab Forest Service as Pinyon Plain Mine continues to operate and destroy large quantities of water from a natural resource that the Havasupai Tribe has Winter Rights to since the beginning of time.

Permits that are offered to mining companies belong to foreign companies, not locally sources individuals. There is little to no uranium conversion companies that exist in the United State, most Ore that is extracted from any uranium mine is extracted and shipped from the US to foreign countries to be processed while leaving a trail of contamination in in wake.

The responses that we have received from higher agencies is that Pinyon Plain Mine is the most highly monitored mine in the world as it allows to sit with an open pit pond and radiated rock pile where wildlife freely roam in and out of the gated area by simply flying over or digging under the gate. For any agency to allow a mine to destroy a water resource that is crucial to many tribes including Havasupai and the metropolitan area is a huge Environmental Injustice that should not be allowed to operate any longer.

Within the Grand Canyon region there have been several hundred claims for Uranium Mining. In the past mining companies would enter the region, mine and destroy areas and natural resources for energy and nuclear weaponry. Over time as the unstable industry of uranium mining fell silent, mines were abandoned and littered the Grand Canyon region – both North and South. Having abandoned mines within the region not only pose a threat to the natural resources of the Grand Canyon region but also pose a threat to the water resources and medical plants essential to all indigenous people that consider the Grand Canyon Region significant.

Request – Actions

1-2 - Lagoon & Trash

I strongly recommend that IHS and EPA need to assist the Havasupai Tribe in developing an operations plan to properly mitigate and update operation for the current outdated Lagoon as well as offer technical assistance and funding for an updated lagoon.

3 – San Francisco Peaks

I strongly recommend that the environmental impact be reviewed and stronger regulations be implemented on the Snow Bowl establishment, for a foreign company to come onto US soil and indigenous soil and contaminate the environment and medical plants AND contaminate an ancient body of water below (C-aquifer) and go without consequences should not be happening.

Any issues that should arise should result in a minimum of 5 million dollars in fines and a clean-up regulation that should be at minimum of 8 million dollars because of the impacts already implemented of discoloration of soil and medicinal plants in the region.

NO more permits should be allowed to foreign companies and local companies to mitigate contamination of any water beds within the US! Revoking of the current permit and agreement of Snow Bowl should be implemented and should not be allowed after all of the pleas and requests from all tribes within the Arizona region.

4 - Climate Adaptation Funding for flooding

The Havasupai Tribe and neighboring tribes in the Southwest should be provided Climate Adaptation funding due to more severe weather patterns which include extreme monsoon rains that cause flooding up-canyon and through Supai village (Grand Canyon region). The tribe has been evacuated multiple times due to extreme flooding events. The funding should be a sustained, predictable and adequate.

Any other tribes within the Southwest region should be provided the same assistance to prevent any issues from occurring to tribes that have been impacted by the federal government and regional enemies in past.

5 – Uranium Mining

All Uranium mining claims and uranium mines that exist should have their claims and permits revoked due to, little to no mitigation to ensure the safety of natural resources and the precious resources that is the water within the Grand Canyon region and Arizona state.

All lands should be protected in accordance to why the land was taken from indigenous people in the first place. Fines need to be enforced and implemented in a strict manner on all federally controlled lands, no more permits should be implemented or given in the already endangered areas of the Southwest. A requirement of destruction of lands and natural resources fine should be implemented with a permit if given and should be no less than 20 million dollars as well as having a clean-up plan ranging from a minimum of 25 million dollars-40 million dollars no less than this. Allowing foreign countries to contaminate US soil should be the highest priority of the US government to prevent!

EPA should revoke their authority given to ADEQ and should be doing their job in prevention of contamination within regions of natural wonder and impacts to indigenous people.

Any federal government that allows mining companies to mine should implement a law that should enforce mining companies of past, present and future that leave mines dormant to be held responsible to clean up these mines and regions, especially within the Southwest region and within Indigenous communities that have been impacted.

Dear Environmental Justice Council,

I am Sylvester L. Reeder, III a cofounder with Michael Bercu of Houston One Voice a 501c3 nonprofit partnership with a large multi national engineering, architecture , planning construction firm, & the University of Houston and other research Universities in the Houston Texas . Our goal is to have the same partnership with every research university in the metroplex. We assist Municipal ,County , State & Federal Governments to identify their Most Critical Needs, confirming with community consensus memorialized by an approved motion of their civic & public service organizations. With the use of our research partners ,determine the most resilient approach to solve those most critical needs, again receiving a community consensus. Our Construction, planning engineering & Architecture firm creates the implementation project plan with community consensus memorialized by the community organizations. If the implementation creates an asset our asset management partner will provide management. Our first project Ruffino Hills Landfill Stormwater detention Redevelopment Study can be seen at houstononevoice.org click on final report. This project study received the Houston region, State of Tex APA most resilient gold award and will enter the APA National competition this june. In Houston & Harris County there are 30+ closed Landfills. Our research indicates that most landfills in Houston were created in disenfranchised communities of color. Many of those landfills developed a hundred years ago. Today, however those communities may have large white population with only a few of the original owners still maintaining a residence. My recommendation for your council to consider is judging the community's demographics at the time the landfill was created versus present demographic.

Our focus today, because of our experience with the Ruffino landfill is to research the redevelopment of closed landfills , brownfields, into an asset that will eliminate the air & water pollution while creating a resilient approach to solve the community's most critical needs. My recommendation for your consideration is that their must be required a research quality SocioEconomic plan to ensure the long term viability of this new community of disenfranchised people of color ie: culture & the ability to withstand natural disasters & economic downturns. If this is not done at the beginning of the process with community consensus it will be impossible to achieve in the middle or end. Lastly, we must find an equitable, environmental Justice, approach for the many owners and their descendants who may not be alive but suffered the depreciation & loss of their assets, incurring many health consequences & lower life expectancy .

Thank you for giving Houston One Voice an opportunity to share these recommendations. If Houston One Voice or its partners can be of assistance in your deliberations we stand ready & willing .

Best Regards,

Sylvester L. Reeder

JUST SOLUTIONS

June 29, 2023

Submitted by email to whejac@epa.gov

Re: Justice40 Implementation in Inflation Reduction Act Programs

Dear Members of the White House Environmental Justice Advisory Council:

Just Solutions is pleased to have the opportunity to provide our comments to the White House Environmental Justice Advisory Council (WHEJAC). Just Solutions is a BIPOC-led, national climate justice organization that partners with communities disproportionately impacted by climate change to turn their priorities and ideas into policies and laws.

We are writing today to raise for WHEJAC's awareness of outstanding issues with the implementation of the Justice40 Initiative for three Inflation Reduction Act (IRA) programs, and to urge WHEJAC to make certain recommendations to maximize the impact of Justice40 and the Biden Administration's commitment to advancing environmental justice.

I. WHEJAC Should Recommend a Required 40% Set-Aside for Environmental Justice Communities for the Department of Energy's Home Energy Rebates Programs

IRA created two different rebate programs, for energy efficiency and electrification, grouped together as Home Energy Rebates. The Department of Energy (DOE) will distribute the almost $9 billion in rebate funds to states, which will have significant discretion in implementing the rebate programs. These rebates are the flagship example of IRA investments that will directly benefit households, and could be the best way to show residents in communities with environmental justice concerns that Justice40 can deliver meaningful benefits.

Along with several other organizations, we have advocated for DOE to require that states implement these rebate programs to do so in line with the Biden Administration's Justice40 commitment and ensure that 40% of the rebates are reserved for residents in communities with environmental justice communities. Specifically, we have recommended that DOE require that states establish a 40% set-aside for either "disadvantaged communities" as identified by the Climate and Economic Justice Screening Tool (CEJST), consistent with guidance issued by the

Office of Management and Budget (OMB),[1] or as identified by robust state environmental justice screening tools like CalEnviroScreen.

To ensure that the Administration fulfills its Justice40 commitment, we urge WHEJAC to recommend that DOE require states to reserve 40% for residents of environmental justice communities.

II. WHEJAC Should Recommend the Incorporation of Best Practices for Equity and Governance in Implementation of the Greenhouse Gas Reduction Fund

In terms of funding, the $27 billion Greenhouse Gas Reduction Fund (GGRF) is the single largest climate and energy program in the IRA. While the Environmental Protection Agency (EPA) designated the GGRF as a "covered program" under Justice40, EPA has also expressed that the funding recipients who will be redistributing funds will also be responsible for ensuring compliance with Justice40.

In coalition with several other organizations, we are working with both EPA and potential applicants and deployment partners to ensure that environmental justice is centered and community members are empowered in the implementation of this program. To that end, we have developed a Best Practices for Equity and Governance pledge, which has been endorsed by over 60 organizations. We are calling on applicants to the GGRF competitions to publicly commit to adhering to the practices outlined. At a high level, these practices include:

- Prioritizing direct benefits to low-income and disadvantaged communities
- Requiring community engagement
- Accountability to local communities
- Operating with transparency
- And applying robust safeguards.

We urge WHEJAC to recommend that EPA incorporate these best practices into their evaluation and selection process of applicants to the GGRF competitions, and ultimately into the grant award agreements.

III. WHEJAC Should Recommend that Treasury Designate the Energy Tax Credits as Covered Programs Under Justice40

The suite of energy tax credits constitute the vast majority of spending in the IRA, totalling at least $270 billion, with some independent estimates totalling over $1 trillion, over the next decade. However, Treasury and IRS have still not designated any of the tax credits as covered programs under Justice40.

[1] "Addendum to the Interim Implementation Guidance for the Justice40 Initiative, M-21-28, on using the Climate and Economic Justice Screening Tool," M-23-09 (January 27, 2023). https://www.whitehouse.gov/wp-content/uploads/2023/01/M-23-09_Signed_CEQ_CPO.pdf

We urge WHEJAC to recommend that Treasury designate the IRA's energy tax credits as covered programs under Justice40.

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As you are no doubt aware, there remains much to be done to realize the promise of the Justice40 Initiative, and these recommendations are only one step. We deeply appreciate WHEJAC's work in advising the Biden Administration and advancing environmental justice throughout the federal government, and look forward to further opportunities to support your work.

Sincerely,

Sylvia Chi, Esq.
Senior Policy Analyst
Just Solutions Collective

Terry Rambler
Chairman

SAN CARLOS APACHE TRIBE

P.O. Box 0, San Carlos, Arizona 85550
Phone (928) 475-1600 ❖ Fax (928) 475-2567

Tao Etpison
Vice-Chairman

November 23, 2022

Via E-mail and U.S. Postal Service

Tracy Toulou
Director
Office of Tribal Justice

Todd Kim
Assistant Attorney General
Environment and Natural Resources
U.S. Department of Justice
950 Pennsylvania Avenue, NW
Washington, D.C. 20530
E-M: OTJ@usdoj.gov

Dear Ms. Toulou and Mr. Kim:

On behalf of the over 17,000 members of the San Carlos Apache Tribe ("Tribe"), I provide comments in response to your request of November 16, 2022, regarding whether the U.S. Department of Justice Environment and Natural Resources Division can "develop a comprehensive environmental justice enforcement strategy," pursuant to Executive Order 14008, Tackling the Climate Crisis at Home and Abroad.

Here, on the San Carlos Apache Reservation, our Tribe's homeland, we face historic challenges from pollution of our airshed, while our waters have been severely compromised by massive illegal pumping, mine waste spills, and salt laden dissolved solids. While we support the policy objective of EO 14008 and its clarion call to identify "priority enforcement cases", it is hard to conceive of a comprehensive strategy that will effectively address the human disaster we face here on our Reservation homeland, one that violates our human rights. What is happening here on our homeland is nothing less than a paradigmatic environmental injustice that has not been addressed by the United States or its Department of Justice. Perhaps you can see to it that this tragedy becomes a priority and the injustice against us be reversed.

Airshed

Our Tribe has been engaged in extensive efforts to protect our members' lives and health and our air, water, land, and treaty resources from the many serious airborne harms caused by copper mining and copper smelters. In fact, major industrial mining polluters surround our airshed, but the federal government has looked the other way.

Of the three primary copper smelters currently operating in the United States, the two largest are both located less than ten miles from our Reservation – Grupo México's ASARCO Ray and Hayden mine and smelter to the southwest on the Gila River and south of the Coolidge Dam, both of which are in gross non-compliance with the Clean Air Act; and, Freeport-McMoRan Miami mine and smelting operation to the west. But these are just two of five pollution-emitting sources within our airshed; the others include the Freeport-McMoRan Miami mine and smelting operation to the west, and Freeport's Morenci mine, smelter and sulfuric acid plant to the east.

Each of these plants has a conditional operating permit that does not comply with the national air quality standards for stationary sources for emissions. Each of the smelters have long been considered a source of airborne lead, arsenic, and mercury pollution, emitting coarse particulate matter with diameters 10 micrometers or less (PM_{10}), fine particulate matter with diameters 2.5 micrometers or less ($PM_{2.5}$), volatile organic compounds (VOCs), nitrogen oxides (NO_X), sulfur dioxide (SO_2), carbon monoxide (CO), sulfuric acid mist (H_2SO_4), and hazardous air pollutants (HAPs).

Our Tribe is thus directly – and disproportionately – impacted by toxic airborne emissions from copper smelters and by the Environmental Protection Agency ("EPA") decisions about how to control these emissions. To provide just one example, EPA's demographic analysis indicates that Native Americans make up less than one percent of the population nationwide but twenty-seven percent of the population with elevated risk of multiple cancers as a result of exposure to copper smelter emissions.[1]

According to EPA and owner-generated reports to EPA's Toxics Release Inventory ("TRI"), copper smelters emit many hazardous air pollutants, including toxic metals such as lead, arsenic, and mercury as well as toxic organic chemicals such as dioxins and naphthalene. Of particular concern are the smelters' emissions of lead and arsenic. EPA estimates that they emit 13 tons of lead and 2 tons of arsenic each year.[2] TRI reports indicate their emissions are even

[1] 87 Fed. Reg. 1616, 1641 (Jan. 11, 2022) (Table 3).

[2] EPA, Residual Risk Assessment for the Primary Copper Smelting Source Category in Support of the 2021 Risk and Technology Review Proposed Rule (Feb. 2021) ("RRA"), EPA-HQ-OAR-2020-0430-0051, at 39-40 (Table 3.1-1).

higher. Just one smelter, the Freeport-McMoRan smelter in Miami, Arizona, reported emitting almost 30 tons of lead in 2018.[3] Based on EPA's TRI reports, it emitted more lead into the air in 2018, 2019, and 2020 than any other industrial facility of any kind in the United States.[4]

Even "[a]t lower levels of exposure that cause no obvious symptoms, lead is now known to produce a spectrum of injury across multiple body systems."[5] "In particular, lead can affect children's brain development, resulting in reduced intelligence quotient (IQ), behavioral changes such as reduced attention span and increased antisocial behavior, and reduced educational attainment. Lead exposure also causes anemia, hypertension, renal impairment, immunotoxicity, and toxicity to the reproductive organs. The neurological and behavioral effects of lead are believed to be irreversible."[6]

To make matters worse, lead (as well as arsenic, mercury, and dioxins) is both persistent in the environment and bioaccumulative.[7] During the decades that the smelters in Miami and Hayden, Arizona have been operating in close proximity to the San Carlos Apache Reservation, their emissions of lead, arsenic, and dioxins have been deposited here and have built up in soil, water, and wildlife. Each year's new emissions from these smelters exacerbates this contamination.

The EPA issued air toxics standards for primary copper smelters 20 years ago, in 2002.[8] That rule lacked any emission limits for certain emission points at copper smelters (*e.g.*, anode refiners) and for certain hazardous air pollutants that copper smelters emit (*e.g.*, mercury, dioxins, and naphthalene).[9] It reduced copper smelters' vast emissions of hazardous air pollutants by less than 25 percent[10] and, as a result, left the San Carlos Apache largely unprotected from enormous quantities of highly toxic air pollution and allowed lead, arsenic, and other persistent and bioaccumulative poisons to continue to build up in our soil, water, and food.

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[3] TRI Reports for top 100 emitters of lead compounds in 2018, 2019, and 2020, Attachment 2 hereto.

[4] *Id.*

[5] Fact Sheet, Lead Poisoning, WHO (Oct. 11, 2021), https://www.who.int/en/news-room/factsheets/detail/lead-poisoning-and-health.

[6] *Id.*

[7] EPA, *TSCA Work Plan for Chemical Assessments 2014 Update* (lead & lead compounds are listed on the Work Plan with a persistence and bioaccumulation score of 3), https://www.epa.gov/sites/default/files/2015-01/documents/tsca_work_plan_chemicals_2014_update-final.pdf.

[8] 67 Fed. Reg. 40,478 (June 12, 2002).

[9] *Id.*

[10] *Id.* at 40,482.

The Clean Air Act gives EPA an opportunity and an obligation to fix inadequate air toxics rules. Eight years after promulgating an air toxics rule, the agency must ensure that it does not present unacceptable health risks and, in fact, protects public health with an ample margin of safety.[11] Every eight years, EPA must review its air toxics rules and must revise them "as necessary," taking into account developments in practices processes, and control technologies.[12] In particular, it is "necessary" for EPA to ensure that its air toxics standards comply with the Clean Air Act.[13]

Regrettably, EPA has neglected its obligation to fix its defective air toxics standards for copper smelters. Although the Clean Air Act required EPA to complete its residual risk and technology review of its 2002 rule no later than 2010,[14] the agency has not even commenced the process until now.[15]

Issued early this year, EPA's proposed residual risk and technology review (RTR) for copper smelters recognizes, appropriately, that the health risks from copper smelters are unacceptable.[16] It includes new limits for some emission points that EPA previously left unregulated as well as for mercury, a hazardous air pollutant that EPA previously left unregulated.[17] EPA states, however, that its proposed RTR would reduce copper smelters' total hazardous air pollutant emissions only by about 4 tons per year.[18] Accepting EPA's estimate that their current baseline emissions are "approximately 21 tons per year,"[19] that would be a reduction of less than twenty percent.

The EPA acknowledges that greater reductions could be achieved. For example, EPA states that stack emissions of toxic metals could be reduced by installing a wet electrostatic

[11] 42 U.S.C. § 7412(f)(2).

[12] 42 U.S.C. § 7412(d)(6).

[13] *Louisiana Environmental Action Network v. EPA*, 955 F.3d 1088, 1096-1098 (D.C. Cir. 2020).

[14] 42 U.S.C. § 7412(d)(6), (f)(2).

[15] EPA commenced its residual risk and technology review of the 2002 Copper Smelters Rule only after being ordered to do so by a federal court. *See Community In-Power and Development Ass'n v. Pruitt*, 304 F.Supp.3d 212 (D.D.C. 2012).

[16] 87 Fed. Reg. 1616 (January 11, 2022).

[17] *Id.* at 1632.

[18] 87 Fed. Reg. at 1650.

[19] RRA at 5.

precipitator (WESP), but refused to require these reductions based on claims about the cost per ton of reductions.[20] Similarly, EPA acknowledges that fugitive emissions of metals could be reduced substantially but refused to require these reductions based on arguments about the cost per ton.[21] EPA does not even consider reductions from some of the emission points at copper smelters including, for example, stack emissions from converters. Likewise, EPA does not even mention controls for copper smelters' entirely uncontrolled emissions of organic hazardous air pollutants such as dioxins and naphthalene, even though it has been well established for more than 20 years that the agency has a clear statutory obligation to set limits for each hazardous air pollutant that they emit.[22]

The ultimate result of EPA's approach is a proposed RTR that would reduce copper smelters' toxic emissions by less than twenty percent, even though far greater reductions of up to ninety percent are both technically and financially "achievable" for the industry.[23] Our Tribe is left asking why?

The Copper Smelters RTR provides EPA with an opportunity to engage in a transparent process that respects tribal consultation, recognizes science, and advances environmental justice. EPA can do a far better job of controlling copper smelters' toxic emissions, and the San Carlos Apache need the agency to do it. The Tribe formally requests an opportunity to engage in government-to-government discussions with EPA leadership regarding this rule.

In addition to airborne pollutants from smelters, sulfuric aerosol mist generated from Freeport's Morenci mining operation adversely affects our forest, wildlife, and livestock. The precipitation of particulates out of the smelter stacks onto the water shed on the Reservation, taken up by wildlife, vegetation, and stock.

Our Waters

Water, tú in Apache, is sacred. It is the essence of life itself, a gift from our Creator. Without tú, there is no life, no future. In this sense, the Gila River is sacred to Apaches.

[20] 87 Fed. Reg. at 1633.

[21] *Id.* at 1633-1634.

[22] *See Louisiana Environmental Action Network*, 955 F.3d at 1089 (citing *National Lime Ass'n v. EPA*, 233 F.3d 625, 634 (D.C. Cir. 2000)).

[23] *See* 42 U.S.C. § 7412(d)(2) (requiring the "maximum" degree of reduction in emissions of hazardous air pollutants that is "achievable" considering cost).

The Gila River, which runs through the Tribe's Reservation, remains the subject of historic and extensive litigation, known as the Gila River General Stream Adjudication.[24] The Adjudication arose because the Gila has historically been over appropriated and over allocated. Excessive diversion and pumping from over 8,000 wells constructed upstream of the Tribe's Reservation boundary in violation of the Globe Equity Decree result in substantial depletion of the flow and quality of the Gila within the Tribe's Reservation. For example, in calendar year 2021, irrigation districts upstream of the Tribe's Reservation pumped a total of 77,262.25 acre-feet in violation of the Globe Equity Decree.[25] Diversion downstream from Coolidge Dam and the Tribe's Reservation by approximately 8,000 new wells drilled since 1980 have reduced its tributary, the San Pedro River to a trickle. As of 1994, the median flow at the mouth of the San Pedro River yielded approximately 4,500 acre-feet per year.[26] The combination of these unlawful diversions continually interferes with the Tribe's successful use of its Globe Equity Decree water.

By the time it reaches our Reservation border, as a result of farming, mining and overuse – none of which have been addressed by the Bureau of Indian Affairs ("BIA") or EPA – the Gila has been reduced to a toxic trickle, while San Carlos Lake has become a cesspool. Furthermore, the resulting groundwater depletion and defoliation of the forest from aridification has decreased the uptake of carbon dioxide that would naturally occur from the vegetation on the Reservation.

Because of unlawful pumping of waters upstream from the Reservation and the advent of the Coolidge dam on the Gila, the River's waters have become salt laden and filled with other dissolved, mineral solids. This unnatural buildup in the Gila and the San Carlos Lake and the subflow zones exceeds the Total Maximum Daily Load standards of the Clean Water Act ("CWA"), making agriculture for the Tribe exceptionally difficult, if not impossible, in some locations. In addition to poisonous salts, there are substantial loads of heavy metal and copper residues flowing into the Reservation from upstream sources, which also has not been addressed by BIA or EPA. For example, a 2005 report by the U.S. Geological Survey found 600 metric tons of copper sludge at the basin of the San Carlos Lake.[27]

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[24] *In re the General Adjudication of All Rights to Use Water in the Gila River System and Source*, case number W1-4.

[25] Gila Water Commissioner's 86th Annual Report, Distribution of Waters of the Gila River (2021), App. 1-3, https://www.gilawater.org/wp-content/uploads/2022/09/ORIG-2021-ANNUAL-REPORT-Updated.pdf.

[26] Memorandum Decision, Findings of Fact and Conclusions of Law for Group 1 Cases Involving Stockwatering, Stockponds, and Domestic Uses at 17, Case No. W1-11-19 (Nov. 14, 1994).

[27] *See* Church, S.E., Choate, L.M., Marot, M.E., Fey, D.L., Adams, Monique, Briggs, P.H., and Brown, Z.A., 2005, Geochemical Assessment of Metals and Dioxin in Sediment from the San Carlos Reservoir and the Gila, San Carlos, and San Francisco Rivers, Arizona: U.S. Geological Survey Scientific Investigations Report 2005-5086, at 34, https://pubs.usgs.gov/sir/2005/5086/.

As a result, we cannot eat the fish, we cannot swim in or drink the water, and the water is bad for livestock. Again, our Tribe is left asking why? Why has the United States allowed what amounts to a superfund site to exist for decades on our Reservation in the Gila River and the San Carlos Lake? Why is the River upstream from the Reservation not regulated and monitored for the benefit of the public health of the Apaches?

If this level of pollution existed anywhere else in the U.S., for any other community, in any other waterway, it would be a national scandal. The fact of the BIA report means that the U.S. knew of the problem, but failed to properly label, designate, and enforce the CWA water quality requirements for the Reservation, despite the trust responsibility of the United States to the Tribe.

Then, there is the Resolution Copper Mine ("RCM") to consider. The development of RCM further threatens air quality and precipitation over the Reservation because of the subsidence of the mountain and the tailings, which will also leach into the Gila and release particulates perpetually. The EPA has not directly engaged in the questions raised by this mine, including those related to the primary impact on religious and cultural sites of importance to the Tribe and other tribes. Local TNF have been disinterested in these impacts, and more interested in the facilitation of mining.

At this point, the only means to protect the Gila River has been the Adjudication, the only forum available to the Tribe to ensure environmental justice. However, here too, the United States has begun to step back as to the San Pedro River, despite its position as the first watershed in which water rights are being adjudicated.

On March 8, 2022, I wrote to Attorney General Garland and Secretary of Interior Haaland of my concern that the Department of Justice was not performing its trust responsibility in defending the Tribe's interests – by failing to appear in the matter of the San Pedro; failing to name lawyers of record; and failing to fund historical research. These failures placed the Tribe's interests in the San Pedro in jeopardy.

The United States must address the 8,000 new wells that have appeared along the Gila River since 1980; the Gila River's depletion by the mines and irrigation districts; and the depletion of the San Pedro River as a tributary to the Gila.

Conclusion

The Tribe continues to face an environmental catastrophe among its airshed and its waters. While the U.S. Department of Justice has stood with the Tribe to defend its interests in the Gila River as to water rights, it has nearly abandoned the Tribe in protecting the San Pedro. Yet, the United States has done very little else, if anything, to effect environmental justice necessary to restore our natural resources on our Reservation homeland.

This inaction by the United States has left pollution to wreak havoc, poisoning our air and water, destroying our agriculture, and leaving us with one of the highest, most disproportionate rates of cancer when compared to other communities. Our human rights have been sacrificed in the name of mining and off-Reservation farming interests, which is inconsistent with the U.S. adoption of the United Nations Declaration on the Rights of Indigenous Peoples.

If there were to be environmental justice, the U.S. must designate these violations as a top priority. Only then, may the United States meet its trust responsibility. Only then may we enjoy the protections that must be afforded to the Gila River and its tributaries, and the air we breathe.

As we say in our Apache language, Ahi'yi'é (thank you) in advance for your review of this comment. It is my hope that the U.S. Department of Justice make the San Carlos Apache Tribe a priority in its quest for environmental justice.

Sincerely,

SAN CARLOS APACHE TRIBE

Terry Rambler
Chairman

Cc: Joshua Edelstein, Dept. of Interior Intermountain Field Solicitor
Allen Anspach, Bureau of Indian Affairs Western Regional Director
Catherine Wilson, Division Chief, Natural Resources,
Supervisory Water Rights Specialist, Trust Programs, BIA-Western Region
Samuel Alexander, Section Chief, Indian Resources Section, ENRD, DOJ
Carter Brown, Associate Solicitor, Division of Water Resources, Office of the Solicitor for Interior
Yosef Negose, U.S. Department of Justice
Lee Leininger, U.S. Department of Justice
Emmi Blades, U.S. Department of Justice
Stephen Roe Lewis, Governor of the Gila River Indian Community
Calvin Johnson, Chairman of the Tonto Apache Tribe
John Huey, Chairman of the Yavapai-Apache Nation

San Carlos Apache Tribe
Tao Etpison, Vice Chairman
San Carlos Council Members
Vernelda Grant, THPO
Victoria Wesley, Mgr. Forest Resources
Christy Sangster-Begay, Dir., DEP
Water Rights Team
A.B. Ritchie, AG, DOJ

Hi Neighbors – I hope you read this. I spoke at yesterday's METRO Board Meeting (June 29). A PDF with what I said is attached. Other people who spoke about the METRORapid University Corridor issue include Dominic Mazoch and Arthur Smiley. Here's a link to the video. These days METRO schedules public comments at the start of the agenda. So if you watch the video, start at the beginning. After I got home yesterday, I studied the York/Hirsch and Lockwood alignments METRO is considering for their University Corridor BRT. To help me understand, I pieced together a map that covers the area from I-45 to Little York. It's attached as a PDF and a snip is below. The map source is HCAD Parcel Viewer set to Parcel Basemap with additional layer FEMA Flood Zone. Obviously, I consider the Lockwood alignment to be bad because it puts an overpass or underpass through the center of Eastwood. But the more I understand, the more I can see that there no good option for a north-south BRT alignment. Any of them will be harmful to Houston. Use Google Maps Street View to follow York/Hirsch (or just choose selected points along the way). Pretty much all the way it's 2 lanes north and 2 south, with a median that's usually grassy and mostly with trees, lined with houses and churches. At Crosstimbers, it becomes a 2-lane road. Wayside isn't much better. Neither is Lockwood. Simply the physical impact on Houston's livability, what laying down concrete all along the median of any of these roads, would do to these communities, would be shameful. Looking at the METRO presentation document, the BRT line would run down the center of whatever road they use. It would wipe out all the grassy treed medians along the entire route. It would be a sin. All this is in addition to the fact that there will be little benefit to the north/south alignment. For one thing, METRO is using misleading ridership numbers to represent potential riders. (They're using riders per route Mon-Fri rather than riders per revenue mile all days.) Of benefit would be lines between the convention center and the two airports, but that's another story.

I don't know if we can do anything to prevent this north/south alignment from happening. But at the least people should know what METRO proposes to do to our city. How can we get the word out? *Map snip near I-45 with the York/Hirsch and Lockwood.*

Tina Brady

June 29, 2023

My name is Tina Brady and I live in Eastwood

The METRORapid University Corridor project plans to build an overpass or underpass on Lockwood Drive through the center of my residential neighborhood. Although METRO claims to have had robust community engagement, almost all public engagement activities were performed without telling us that an overpass or underpass was planned there.

Prior to late February, Segment 4 public meeting presentations excluded visualizations or any mention of overpass or underpass on the Lockwood alignment. About a month later, the METRO Board approved that alignment. A month is not enough time for meaningful engagement.

The METRO presentation document with these visualizations of Segment 4 designs and structures wasn't published to the METRO website until March 9. The previous revision, from July 2022, provided renderings of designs and structures south of the Eastwood Transit Center and north of Canal. But for the section between, the section that's controversial, the detail was omitted. Why?

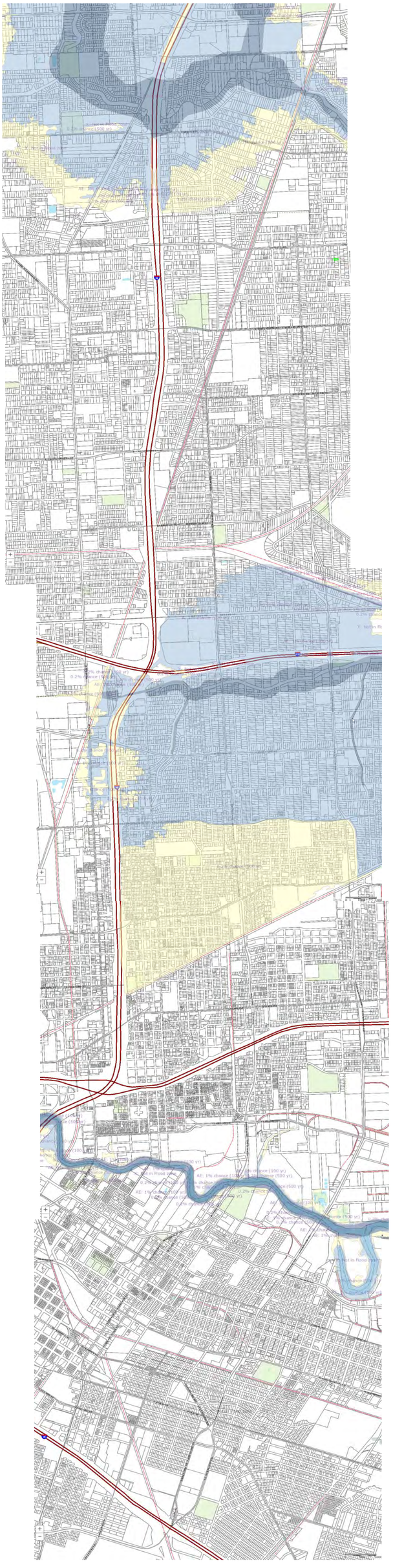
After the document was published online March 9, there were nine working days before the LPA approval vote that was planned for March 23; eighteen working days before the actual vote occurred April 5. Insufficient time to engage with an informed community. Even still, METRO is now working to submit the LPA to the NEPA process.

A course I recently took taught a lesson that applies here. It says,
"Rework is typically the result of moving forward to development without knowing the true needs and scope. Teams often forge ahead without much consideration for discovery and analyzing what aspects of a solution matter to the customer. As a result, we often build the wrong thing for the customer."
And that's what's happening here.

I look forward participating in the promised advisory committee for Segment 4. Last I heard (about a week ago), once METRO has a better understanding of the timeline, you will coordinate with the project team to formulate a schedule. Is there any news on fulfilling the promise?

In conclusion, let me be clear, at no time have I stated or inferred the Lockwood *alignment* was withheld until this year. We all recognize there were many, many open houses, public meetings, outreach events, and lots of other shows of engagement. What I am saying is, METRO community engagement failed to provide the public with complete and accurate project details. Until this year, we were kept ignorant of the crucial fact that the Lockwood alignment would cause an overpass or underpass through our residential neighborhood of Eastwood.

Accountability to The People should be a METRO principle, not just a concept.



White House Environmental Justice Advisory Council

Tupac Enrique Acosta

TONATIERRA

The Right of Free, Prior, and Informed Consent and the rinciples of Environmental Justice

"We call upon the White House Environmental Justice Advisory Council to recommend to the City of Phoenix the implementation of an effective policy of Cultural Competency in the planning department of the city as a necessary civil rights guarantee to insure the realization of Environmental Justice in all public projects of development and/or redevelopment going forward." In late 2021, our organization became informed regarding concerns from neighborhood residents about the lack of information and communication regarding the Land Reuse Area (LRA) planning process in the Nuestro Barrio neighborhood, where decades of public policies have devastated one of the oldest Mexican communities in Phoenix, lying in the flight path of Sky Harbor International Airport. The expansion of Sky Harbor Airport and the subsequent commercial development that has brought about the physical and cultural devastation of this community is a classic example of environmental racism. We approached the City of Phoenix Development Office in December of 2021 with a set of questions requesting clarifications and advice on how to best proceed to best address the flaws, inconsistencies, and systematic pattern of discrimination against the Mexican Community residents of the Nuestro Barrio neighborhoods. To date, none of these questions have been substantively answered. One of these questions from the initial communique to the city in 2021 was the following: • Regarding the 743 City-owned vacant parcels in the LRS area, how does the stated strategy of "accelerated" "market driven" development integrate the criteria of the Principles of Environmental Justice. January 7,2022 response from the City of Phoenix: "This may be addressed during the Request-for-Proposal process."

It is the position of TONATIERRA that the implementation of the criteria of the Principles of Environmental Justice is not an issue that "may" or "may not" be addressed in the active Request For Proposals (RFP) process that is now being finalized in the Land Reuse Area that includes the Barrio Cuatro Milpas and Barrios Unidos Park in the Nuestro Barrio neighborhood.

The Principles of Environmental Justice constitute a necessary response and remedy to address the systematic violations of US Civil Rights laws in the context of public policies and discriminatory practices of environmental racism across the country. This is a civil rights issue, an issue of an ongoing pattern of discrimination, displacement, and the denial of the collective human rights of the Indigenous Peoples of the Treaty of Guadalupe Hidalgo territories (US-Mexico 1848), including the Chicano-Mexicano barrios of central Phoenix.

The lack of substantive response to our initial set of questions as submitted to the Economic Development Department of the City of Phoenix in December of 2021, must now be addressed as blatant and persistent acts of malfeasance and discrimination by officials of public office in violation of the Right of Free, Prior, and Informed Consent and the Principles of Environmental Justice.

As a grassroots community based organization of Indigenous Peoples, it is the position of TONATIERRA that the international Human Rights standard of Free, Prior, and Informed Consent must now be linked to the Civil Rights guarantees of the Principles of Environmental Justice across the board of US jurisdictions, and that effective reporting mechanisms be brought to bear to monitor these violations of

human rights in the context of the obligations under International Law that the US must comply with as a signatory to the International Convention on the Elimination of All Forms of Racial Discrimination (CERD).

From Civil Rights to Human Rights Indigenous Rights and the defense of the Territorial Integrity of Mother Earth

White House Environmental Justice Advisory Council Public Meeting
June 13-14, 2023
Phoenix, AZ

Public Comment
By
Tupac Enrique Acosta
TONATIERRA

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