April 8, 2024

Mr. Narendra Chaudhari
Office of Resource Conservation and Recovery (5304T)
United States Environmental Protection Agency
1200 Pennsylvania Avenue, Northwest
Washington, DC 20460

Re: Listing of Specific PFAS as Hazardous Constituents; Docket ID No. EPA-HQ-OLEM—2023-0278

Dear Mr. Chaudhari:

The American Petroleum Institute (API) and the American Fuel & Petrochemical Manufacturers (AFPM) respectfully submit these comments in response to the U.S. Environmental Protection Agency's (EPA) proposed rulemaking to add nine per-and polyfluoroalkyl substances (PFAS), their salts and structural isomers to the list of Resource Conservation and Recovery Act (RCRA) hazardous constituents (89 Federal Register 8606, February 8, 2024). API member companies are leaders of a technology-driven industry that supplies most of America's energy, supports more than 10.3 million jobs and nearly 8 percent of the U.S. economy, and since 2000, has invested more than $3 trillion in U.S. capital projects. API's members are involved in all major points of the chemical supply chain — from natural gas and crude oil production — to refinery production of fuels and other products, to service companies using chemicals. AFPM represents America's petrochemical refining and manufacturers, facilities across the United States that produce gasoline, diesel, jet fuel, and other products that keep America running. AFPM members support more than three million quality jobs, contribute to our economic and national security, and enable the production of thousands of vital products used by families and businesses throughout the United States.

The members of our associations have a strong interest in this rulemaking. Our members and the public have relied on aqueous film-forming foams (AFFF), i.e., Class B fluorinated firefighting foams, for essential life-saving firefighting, community mutual aid, and fire prevention training activities. Our members are significantly engaged in the process to develop, and support the use of, effective replacements for AFFF-containing long-chain PFOA/PFOS compounds. Alternative firefighting substances are undergoing testing and the transition to such replacements is ongoing and will require additional years to successfully complete. API and AFPM members are also subject to regulation under RCRA, including provisions related to corrective action for permitted treatment, storage and disposal facilities (TSDFs) under 3004(u) and 3004(v) or as former interim status facilities subject to 3008(h).

We recognize our responsibility to work with the public, the government, and others to develop and use natural resources in an environmentally sound manner while protecting the health and safety of our employees and the public. We are aligned with EPA's policies and guidance for targeted, risk-based, and cost-effective cleanups for sites that pose legitimate threats to human health and the environment. We support balanced remedial approaches for these

substances that rely on sound science, appropriate considerations of risk, and efficient, proven technologies.

Summary of Comments

API/AFPM's comments cover the following five topics, presented at a high level here and in more detail in the following section.

1. EPA must clearly define the criteria for listing a constituent on Appendix VIII before proceeding to list any PFAS substances.
2. EPA has not conducted a robust and transparent review of the widely varying available toxicological information for the nine PFAS substances and has not included an appropriate scientific weight-of-evidence methodology necessary to adequately support listing any of these substances.
3. EPA needs to consider the cost of this rulemaking.
4. EPA's assessment of costs and benefits associated with this proposed rule is significantly flawed.
5. The inclusion of isomers in the definitions of the nine PFAS substances is not justified.

Detailed Comments

1. EPA must clearly define the criteria for listing a constituent on Appendix VIII before proceeding to list any PFAS substances.

Congress did not direct EPA to develop a hazardous constituent list under RCRA nor did it statutorily define any criteria for such a designation. EPA created Appendix VIII and defined the term "hazardous constituent" when it promulgated regulations establishing the criteria for identifying or listing a hazardous waste under Section 3001(a) of the statute.[1] EPA regulation allows substances to be listed as hazardous constituents only: "if they have been shown in scientific studies to have toxic, carcinogenic, mutagenic or teratogenic effects on humans or other life forms."[2]

Since promulgating this broad threshold for listing, EPA's regulations have not provided further definition or clarification, nor has EPA issued any policies or guidance to elucidate these broad criteria. No guidance exists on what constitutes a "scientific study" (i.e., is it a peer-reviewed study? A study from a recognized toxicology agency or entity?). Nor has EPA issued guidance on what constitutes an "effect" for the purposes of listing a substance on Appendix VIII.

EPA has listed substances in Appendix VIII since the beginning of the RCRA program using the broad and vague definition in its regulations. However, with the exception of its initial listing of hazardous constituents in 1980, it has almost always done so in conjunction with the listing of a hazardous waste. In such instances, EPA has conducted extensive studies of wastes that it believes potentially warrant regulation as hazardous wastes, including evaluating specific instances of environmental damage resulting from the

[1] 45 Federal Register, May 19, 1980.

[2] 40 CFR 261.11(a)(3)

management of the waste. In this proposal, EPA departs from its existing practice and would conduct a "stand-alone" listing of hazardous constituents without any evaluation of the specific wastes that contain the constituents, or of existing waste management practices or instances of environmental damage associated wastes containing the constituents.

In seeking to list substances on Appendix VIII without reference to a hazardous waste listing, it is even more important for EPA to clarify the criteria on which it is relying. Of particular importance is clarifying the amount and type of scientific evidence necessary to conclude a substance has a toxic, carcinogenic, mutagenic or teratogenic effect and the methodology for weighing information. The need for such clarification is evident given the wide range of information presented on the nine substances EPA has proposed to list as discussed in our comment below.

2. EPA has not conducted a robust and transparent review of the widely varying available toxicological information for the nine PFAS substances and has not included an appropriate scientific weight-of-evidence methodology necessary to adequately support listing any of these substances.

API and AFPM are signatories to the U.S. Chamber of Commerce's ("the Chamber's) comments on this proposed rulemaking.[3] The Chamber's comments describe in detail the varying toxicity information EPA relies on for each of the nine PFAS substances it proposes to list as hazardous constituents. This information varies significantly in depth, substance, and quality. The information ranges from draft toxicity assessments in support of the national primary drinking water regulation to IRIS assessments to Agency for Toxic Substances and Disease Registry (ATSDR) toxicological profiles to Human Health Toxicity Values (HHTV) assessments to individual journal articles. There are wide variations in the methodologies of these citations and the quality of the data for each of the nine substances. Many of the supporting documents are still in draft form and many have been subject to only limited, if any, peer review.

This wide variation in the supporting information highlights the need for EPA to provide additional criteria and guidance for the amount and quality of information needed to list a hazardous constituent on Appendix VIII before the Agency proceeds to list any PFAS substances. In the absence of such criteria and guidance, EPA has not conducted a robust and transparent review of this widely varying available information, including an appropriate scientific weight-of-evidence methodology, that would adequately support listing any of these PFAS substances.

3. EPA needs to consider the cost of this rulemaking.

EPA asserts that it is precluded from the consideration of costs when identifying hazardous constituents and, therefore, precluded from considering the costs of this proposal.[4] API and

[3] Comments of the U.S. Chamber of Commerce's Coalition of companies, trade associations, and other stakeholders on the U.S. Environmental Protection Agency's Proposed Rule, Listing of Specific PFAS as Hazardous Waste (EPA-HQ-OLEM-2023-0278) (Feb. 8, 2024), (April 8, 2024).

[4] 89 Federal Register 8606, 8611 (February 8, 2024).

AFPM disagree with this conclusion. EPA bases its claim on sections 3001 and 3004(u) of the statute. Section 3001 relates to EPA's authority to identify the characteristics of hazardous waste and listing hazardous wastes. EPA is correct that it has not historically considered costs when determining what solid wastes should be classified as a hazardous waste, but that is not what this proposed action does. The proposed rule is neither modifying EPA's hazardous waste characteristics (i.e., it does not change the existing characteristics of toxicity, ignitability, corrosivity, or reactivity) nor is it a listing of a hazardous waste. The proposed rule does not change the existing universe of hazardous wastes.

Instead, EPA's proposed action increases the requirements related to the management of hazardous waste by expanding the universe of constituents potentially subject to corrective action. That is, EPA's proposal would increase the requirements applicable to existing hazardous waste treatment storage or disposal facilities (TSDFs) subject to 3004(u) and 3004(v) and, potentially, interim status facilities subject to 3008(h). EPA must, and does, take cost into consideration when considering the regulations applicable to hazardous waste TSDFs. Therefore, EPA must consider costs when evaluating this rulemaking.

It is unclear why EPA also cites to section 3004(u) in support of its conclusion that it is precluded from considering costs. Section 3004(u) is not the underlying authority for EPA to list a hazardous constituent and is therefore not relevant in considering whether EPA is required to consider costs for this rulemaking. Regardless, neither section 3001 or 3004(u) preclude EPA from considering the costs of this rulemaking.

4. EPA's assessment of costs and benefits associated with this proposed rule is significantly flawed.

Despite asserting it is precluded from considering costs, EPA has prepared an economic cost-benefit assessment for the proposal.[5] This assessment of costs and benefits is significantly flawed for the following reasons:

a. EPA has estimated the cost impacts by presenting entirely arbitrary incremental corrective action cost increases.

EPA has made no effort to determine the actual number of sites that will require corrective action if its proposed rule is finalized, nor the actual costs of corrective measures at those sites. Instead, EPA's analysis merely presents arbitrary cost increase scenarios of 2%, 5%, and 10% over an estimation of baseline corrective action costs. This is not a substitute for a structured and methodical assessment of corrective action measures and potential costs. EPA, itself, recognizes the fundamental flaw in its own cost analysis:

> Ideally, this analysis would assess indirect costs based on a robust suite of empirical data on the extent and magnitude of PFAS handling at affected facilities, the likely presence of PFAS contamination at these

[5] Office of Land and Emergency Management, U.S. Environmental Protection Agency, Economic Assessment of the Potential Costs, Benefits, and Other Impacts of the Proposed Rulemaking to List Specific PFAS as RCRA Hazardous Constituents (December 2023).

> facilities, site-specific data on the environmental media contaminated, and the cost and performance of corrective measure options at each site. Data on PFAS handling at permitted facilities, however, is not available, and the frequency and severity of PFAS contamination at these facilities is uncertain. In addition, due to limited data associated with PFAS remediation in the U.S., costs associated with addressing PFAS at TSDFs is highly uncertain.[6]

The fact that data were not readily available to assess the "likely presence of PFAS contamination" or the costs of corrective measure options does not relieve EPA of the responsibility to make a good faith effort to estimate these costs. EPA has considerable resources and capabilities at its disposal to collect the information necessary to perform a more informed and robust analysis of the extent of potential contamination and the costs associated with addressing that contamination.

b. EPA's basis for its estimated incremental costs increases is based on faulty assumptions regarding PFAS contamination and remediation.

EPA's cost-benefit assessment offers the following justification for its unrealistically small estimated incremental cost increases:

> This range of cost scenarios was chosen based in part on the co-location of PFAS contamination and other contamination at affected facilities. Because PFAS will have migrated with other hazardous constituents for which facilities are already performing remediation, it is likely that resources applied to contain contaminant plumes will be concentrated in the same general vicinity. In addition, some of the same corrective measures for PFAS contamination of soil or groundwater are likely being applied for other hazardous constituents in many cases. For example, Granular Activated Carbon (GAC) may be applied at facilities to remediate groundwater contamination involving other hazardous constituents; remediating for PFAS may just increase the pace of GAC replacement. In addition, most costs for this and other types of pump-and-treat remediation are typically associated with the initial system infrastructure development, and in many cases such infrastructure is already in place at TSDFs. For soils, excavation and disposal may already be applied in the baseline, limiting the additional costs incurred. To the extent that TSDFs included in this analysis are located in states with related applicable state regulations, these facilities may already be required to address PFAS in the baseline, limiting the costs that they might incur as a result of the proposed rule.[7]

EPA's assumptions here are flawed for several reasons, including the following:

[6] Ibid, p. 19.

[7] Ibid, p. 20.

- **PFAS Contamination is Not Always Co-located with Other Contamination**. EPA's assumption that PFAS contaminants will likely be co-located with other hazardous constituents is faulty. To the extent releases occurred at facilities that relied on AFFF, they are most likely to have occurred at designated fire training areas. Releases of other hazardous constituents may have occurred in operating areas or areas where product is stored. In addition, because some states have established lower removal endpoints for PFAS compared to many other hazardous constituents, PFAS plumes that may require remediation can be considerably larger than other contaminant plumes.

- **Limited Treatment Options for PFAS.** EPA's assumption that the same corrective measures applied for PFAS can be applied for other hazardous constituents is inaccurate. In general, remedial projects increasingly relying on in situ technologies and monitored natural attenuation (MNA) and relying less on pump-and-treat technologies, which are often less effective and more costly. This is particularly true in the petroleum industry as hydrocarbon releases have well-known biodegradation processes and models for fate and transport. For many PFAS-impacted facilities, pump-and-treat technologies are the only option to address groundwater. Facilities will be required to install and operate these pump-and-treat systems in addition to in situ technologies already implemented.

- **Increase in Granular Activated Carbon (GAC) Usage.** The rate of GAC usage may significantly increase, particularly at sites with short-chain PFAS such as PFBS and PFBA subject to low clean-up standards. Facilities will require either more frequent GAC media replacement of the installation of multiple GAC vessels to operate their systems.

- **Limited Treatment and Disposal Options for Remedial Wastes.** EPA has not appropriately acknowledged or evaluated issues associated with the disposal of remedial wastes. Increasingly, landfills are beginning to either prohibit or charge more for PFAS-containing soil (and other waste) disposal and the costs associated with the disposal of remedial wastes are likely to significantly increase and will be exacerbated by declining landfill space.

- **Revised Remedial Investigations.** EPA's analysis of cost increase scenarios is also flawed because many facilities have already completed Remedial Facility Investigations, Corrective Measure Studies, and Corrective Measure Implementation, so addressing PFAS will require entirely new measures, not merely incremental expansions of existing or future efforts.

All of these deficiencies compel the conclusion that EPA's arbitrary incremental cost increase estimates significantly underestimate the potential costs associated with this proposal and also emphasize the need for EPA to undertake a more robust evaluation of the extent of contamination likely to be addressed and costs of the investigation and corrective measures associated with this contamination.

c. EPA's analysis entirely ignores the cost impacts on the thousands of facilities that applied for interim status and are subject to potential corrective action under 3008(h).

Under section 3008(h) EPA may issue a corrective action order to facilities that at one time had interim status. EPA has historically applied its section 3008(h) authority to both hazardous waste and Appendix VIII hazardous constituents.[8] By adding the nine PFAS to Appendix VIII, this authority will now expand to include these additional constituents. As a result, thousands of facilities that at one time had interim status, but do not now have a TSDF permit, could be subject to corrective action for these additional hazardous constituents. Surprisingly, EPA makes no mention of the impact on 3008(h) in the preamble to the proposed rule. EPA's cost-benefit analysis does acknowledge 3008(h) but does not assess the costs or benefits associated with 3008(h) using the following reasoning:

> By its terms, RCRA 3008(h) applies to hazardous wastes, which EPA has consistently interpreted as meaning wastes meeting the statutory hazardous waste definition. Thus, the addition of the nine PFAS to Appendix VIII does not expand the scope of substances that are subject to section 3008(h). As a result, interim status facilities are not considered further in this Economic Assessment (EA).[9]

API and AFPM disagree with this analysis. As described in more detail in our comments on EPA's companion rulemaking regarding the definition of hazardous waste applicable to corrective action, EPA has not, in fact, consistently interpreted or applied the statutory definition of hazardous waste under 3008(h).[10] There has been no difference in how EPA has historically interpreted the term "hazardous waste" for the purposes of 3004(u) and 3004(v), which apply to TSDFs, and 3008(h) which applies to interim status facilities. Yet, EPA's cost-benefit analysis does assess the cost impacts of 3004(u) and 3005(v) on TSDFs. It is inconsistent for EPA to assess the costs on TSDFs and not the costs on the large number of other facilities potentially subject to a corrective action order under 3008(h).

d. EPA's analysis of benefits is entirely hypothetical as well as incomplete in scope. As EPA has not conducted any evaluation of the extent or amount of PFAS in the environment that will be addressed by this proposed rule, it has no way to make an actual assessment of any benefits potentially associated with this proposal. EPA acknowledges as much:

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[8] Memorandum from J. Winston Porter, Assistant Administrator, Office of Solid Waste and Emergency Response, Interpretation of Section 3008(h) of the Solid Waste Disposal Act (December 16, 1985).

[9] Office of Land and Emergency Management, U.S. Environmental Protection Agency, Economic Assessment of the Potential Costs, Benefits, and Other Impacts of the Proposed Rulemaking to List Specific PFAS as RCRA Hazardous Constituents (December 2023), p. 11.

[10] Comments of the American Petroleum Institute and the American Fuel & Petrochemical Manufacturers on Definition of Hazardous Waste Applicable to Corrective Action for Releases from Solid Waste Management Units, 89 Federal Register 8598 (February 8, 2024).

> "Due to uncertainty regarding cleanups that may be required by Corrective Action implementing authorities following the addition of certain PFAS to Appendix VIII and the extent to which baseline cleanups may or may not remediate for these compounds, it is not possible to estimate the precise magnitude of potential indirect benefits associated with the proposed rule."[11]

As a substitute for conducting the work required to estimate how much of the nine substances will be addressed because of this rulemaking, and any associated benefits, EPA instead merely provides a wide range of annualized benefits using different assumptions regarding the percentage of drinking water wells with PFOA/PFOS detection and different reductions (in parts per trillion) in PFOA/PFOS concentrations. However, the estimates of the percentage of wells with PFOA/PFOS detections and the reductions in concentrations are not based in any actual evaluation of contamination associated with TSDFs. EPA, in fact, notes that there are no data on PFAS occurrence in any wells near TSDF sites.[12] Further, EPA's quantitative assessment is limited to PFOA and PFOS, ignoring entirely the other seven PFAS substances EPA is proposing to list.

Finaly, even ignoring these limitations, EPA's assessment of annualized benefits is not particularly precise, as the estimated range is so broad. EPA's estimates range from a total benefit of only $266,000 to a high estimate of $12,200,000 with numerous scenarios within that range. Nonetheless, even the upper estimate of benefits is small compared to the total cost of corrective action measures this rule will mandate.

5. The inclusion of isomers in the definitions of the nine PFAS substances is unwarranted.

EPA has proposed to list not just the nine PFAS substances, but also "salts and structural Isomers" for each of these chemical compounds.[13] The listing of isomers on Appendix VIII is not justified and EPA does not cite any scientific information on their environmental and human health effects to support their inclusion. This expanded listing is problematic for multiple reasons, including that EPA has not identified what substances are included in "all salts and structural isomers."

To meet the regulatory criteria for listing under Appendix VIII, EPA must demonstrate that each of these PFAS isomers and salts "have been shown in scientific studies to have toxic, carcinogenic, mutagenic or teratogenic effects on humans or other life forms." EPA has not presented any such information in its proposal. To include structural isomers and salts on Appendix VIII is to presume these structural isomers and salts pose the same toxicity hazards as the linear perfluorinated isomer. This presumption is made in the proposed rule

[11] Office of Land and Emergency Management, U.S. Environmental Protection Agency, Economic Assessment of the Potential Costs, Benefits, and Other Impacts of the Proposed Rulemaking to List Specific PFAS as RCRA Hazardous Constituents (December 2023), p. 24.

[12] Ibid, p. 125.

[13] See proposed amendments to Appendix VIII to Part 261 (89 Federal Register 8620 (February 8, 2024)).

without information for even some of the simpler branched isomers let alone all other conceivable structural isomers.

EPA has cited the CAS registry number 335-67-1 as being applied to “perfluorooctanoic acid, and salts and structural isomers,” but this CAS registry number applies solely to PFOA (known more specifically as n-perfluorooctanoic acid). Similarly, EPA has cited CAS registry number 1763-23-1 as being applied to “perfluorooctanesulfonic acid and salts and isomers,” yet this CAS number only applies to PFOS (n-perfluorooctanesulfonic acid). The structural isomers of these compounds are also entirely different substances than the perfluorinated linear chain compounds, each with entirely different physical and chemical properties. In addition, certain structural isomers of these compounds are not organic acids, nor must these structural isomers necessarily be perfluorinated.

Current analysis for PFAS by any EPA method does not require, or even mention, chromatographic resolution of the structural isomer peaks (e.g., linear vs. branched isomers). Quantitative reference standards are not available for most of the branched isomers. For those isomers that are available for identification, quantification is based solely on the relative response factor (RRF) of the linear isomer. Therefore, to include apparent branched isomer peaks quantified in this manner using the linear RRF represents a qualitative guess, at best. The RRF of each branched isomer varies potentially significantly, and as such, quantification of branched isomers using the linear RRF will not yield accurate or reliable data. Hence, mandating the quantitative inclusion of all branched isomers is not possible given current commercial laboratory application of Method 1633, or any other current EPA method for PFAS.

There is insufficient scientific information as well as associated test methods to warrant the listing of salts and structural isomers.

6. Conclusion

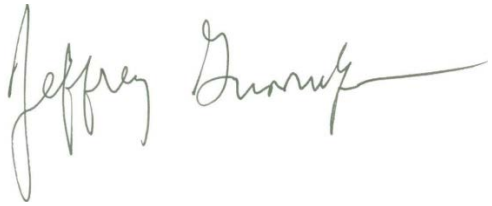
EPA should clearly define the criteria for listing a constituent on Appendix VIII before proceeding to list these and additional substances in the future, particularly when listing substances in actions entirely separate from hazardous waste listings. The wide variation in the type and quality of the supporting information highlights the need for additional criteria and guidance for determining the amount and quality of the information needed to list a hazardous constituent on Appendix VIII before the Agency proceeds to list any PFAS substances.

EPA is not prohibited from considering the costs and benefits of this rulemaking and is required to do so. To fail in that regard will result in a rulemaking that is arbitrary and capricious. EPA’s existing cost-benefit analysis is insufficient to meet EPA’s obligation to consider costs and benefits and a robust assessment of the extent of contamination that will be addressed because of this proposed action and the associated costs and benefits is imperative.

API and AFPM appreciate the opportunity to provide these comments and concerns regarding EPA's proposed listing of PFAS as hazardous constituents in RCRA. Should you have any questions concerning our comments, or wish to discuss the matter further, please contact Roger Claff, API, at (202) 682-8399, claff@api.org, or Jeff Gunnulfsen, AFPM, at (202) 457-0480, jgunnelfsen@afpm.org.

Sincerely,

Roger Claff
Senior Policy Advisor



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