GOVERNMENT RELATIONS
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February 28, 2024

Office of Administrative Hearings
Mr. William Moore
600 North Robert Street
P.O. Box 64620
Saint Paul, Minnesota 55164-0620

Re: **In the Matter of the Planned New Rules Governing Currently Unavoidable Use Determinations about Products Containing Per-and polyfluoroalkyl substances (PFAS); OAH Docket No. 71-9003-39667; Governor's Revisor's ID Number: R-4837**

Dear Mr. Moore,

The Minnesota Pollution Control Agency requested that the Office of Administrative Hearings review comments on its proposed rules governing PFAS in Products under the statutory authority of Minnesota Statutes Section 116.943, subdivisions 5(c), 9, for the following item:

i. **Definitions, Prohibitions, and Rulemaking Authority**; Minnesota Statutes Section 116.943, subdivisions 1, 5(c), & 9, respectively.

The request for comments was published in the State Register OAH Docket No. 71-9003-39667, on December 8, 2023. Enclosed for your review are the requested comments submitted by Honeywell.

Should you have any questions or concerns with our submission please don't hesitate to get in touch with us.

Sincerely,

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Senior Director, Global Government Relations
Atashi.Bell@honeywell.com

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Honeywell appreciates the opportunity to comment on the above-referenced Planned Rules ("Planned Rules") on unavoidable use determinations for Per- and Polyfluoroalkyl Substances ("PFAS") ("Unavoidable Use Determination Rule") pursuant to Minn. Stat. § 116.943, subdivision 5(c) issued by the Minnesota Pollution Control Agency ("MPCA" or the "Agency").

Honeywell is an integrated operating company serving a broad range of industries and geographies globally. Our business is aligned with three powerful megatrends - automation, the future of aviation, and energy transition - underpinned by our Honeywell Accelerator operating system and Honeywell Connected Enterprise integrated software platform. As a trusted partner, we help organizations solve the world's toughest, most complex challenges, providing actionable solutions and innovations that help make the world smarter, safer, and more sustainable. The company traces its roots in Minnesota back to 1927 when the Honeywell Heating Specialty Company merged with the Minneapolis Heat Regulator Company to form the Minneapolis-Honeywell Regulator Company.

Today, Honeywell's workforce in Minnesota includes approximately 1,870 employees at five facilities across the State. Three of these sites develop and manufacture various equipment and materials for the aviation, space, and defense sectors ("Aerospace & Defense" or "A&D").[1] Within the A&D sector, fluorinated substances comprise critical components of aircrafts, vessels, satellites, rockets, and missile actuation systems, and enable critical functions including thermal management, life support, avionics, fuel supply, engine operation, auxiliary power, navigation, communication, microelectronics, sensors, radars, insulation, and hydraulics. Of these materials listed, it is worth noting that Honeywell safety systems are included in 90% of all global aircrafts and 80% of all commercial satellites in orbit. Honeywell materials have been instrumental for every NASA human space mission and have demonstrated our ability as an industry leader to provide mission critical, safe, space-based optical and science equipment for nearly 60 years.

In addition to A&D, Honeywell operates two additional sites in Minnesota that produce a variety of switches; safety shut-off valves; flow meters; flame detectors; pressure regulators; residential heat, water, and gas meters; and other materials in the smart energy and thermal solutions sectors which are instrumental in safeguarding against hazards of those working within chemical and other manufacturing plants. These components are designed to meet extensive industry manufacturing standards, responsible manufacturing commitments from industry, and ensure negligible leakage during the use phase for all industrial production in semiconductors, automotive, medical, petrochemical, and crude oil sectors. Fluorinated polymeric materials make these critical components possible.

Honeywell is also a manufacturer of various fluorinated gases, including hydrofluorocarbons ("HFC"), hydrochlorofluoro-olefins ("HCFO"), hydrofluoroolefins ("HFO") refrigerants and their mixtures ("Blends"). Such products are used in refrigeration, heating, ventilation and air conditioning ("RHVAC"), mobile air conditioning ("MAC"), thermal management systems ("TMS") in electric vehicles ("EV"), propellants in medical dose inhalers ("MDI"), and foam blowing agents in insulation applications. Honeywell also manufactures a high-performance fluoropolymer - polychlorotrifluoroethylene ("PCTFE") - used in the primary and secondary packaging of medicinal products, medical devices, and over-the-counter ("OTC") medications globally.

Introduction

On May 24, 2023, Minnesota Governor Tim Walz signed into law Minnesota Session Law – 2023, chapter 60, article 3, section 21, (Minn. Stat. § 116.943). Specifically, subdivision 5(c) prohibits the sale or distribution of "any product that contains intentionally added PFAS, unless the commissioner had determined by rule that

[1] Across the United States, the Aerospace and Defense industry supported 2.1 million jobs in 2022. See https://www.aia-aerospace.org/industry-impact/.

the use of PFAS in the product is a currently unavoidable use," in the state of Minnesota beginning January 1, 2032. The term "currently unavoidable use" is defined in Minn. Stat. § 116.943, subdivision 1(j), as "a use of PFAS that the commissioner has determined by rule under this section to be essential for health, safety, or the functioning of society and for which alternatives are not reasonably available." Subdivision 9 of Minn. Stat. § 116.943 allows the MPCA to adopt "rules necessary to implement this section." Accordingly, the MPCA issued a request for comments regarding the Planned Rules on December 8, 2023. These comments address the specific questions posed by MPCA as well as other possible aspects of the Planned Rules that may assist MPCA in its rulemaking.

Honeywell fully supports MPCA's authority to mitigate unreasonable risks with sensible regulations when such risks are presented by specific chemical substances. However, Honeywell is concerned the Unavoidable Use Determination Rule will impose considerable burdens on the regulated community without achieving commensurate benefit to human health or the environment. It may also be duplicative of new federal and global classification efforts. Several federal agencies have already created robust review programs around PFAS unavoidable use determinations and viable alternatives (i.e. SNAP, TSCA). MPCA has both the authority and the obligation to create the most cost-effective and efficient regulatory program by incorporating use determinations that have already undergone review by a regulatory agency into the initial rulemaking process. Accordingly, Honeywell offers comments on opportunities to improve the effectiveness of unavoidable use determinations, which will be critical to MPCA's mission of assessing and mitigating potential risks to human health and the environment.

Question 1: Should criteria be defined for "essential for health, safety, or the functioning of society"? If so, what should those criteria be?

Essential Use Criteria Considerations and Examples

Honeywell recommends the rulemaking establish a clear-cut process under specified timelines for determination and criteria whereby any PFAS-containing product manufacturer may seek a "currently unavoidable use" determination. When making a "currently unavoidable use" determination, MPCA should consider the following factors:

- benefits to public health, the environment, community safety, national security, critical infrastructure, or other critical function of society;
- the known effects of the PFAS or PFAS-containing product on human health and the environment including the specific substance's physical-chemical characteristics, its environmental fate, as well as its toxicity, including how such characteristics compare to other substances which provide the similar performance characteristics;
- the availability of technically and economically feasible chemical alternatives that can be used for the same purpose and which can be demonstrated to be environmentally preferable to the PFAS under consideration;
- whether the use of the PFAS or PFAS-containing product contributes to achieving environmental objectives, including the mitigation of climate change;
- whether the use of the PFAS or PFAS-containing product is of value to society because it contributes to the safety, efficacy, or accuracy of useful activities and products including those used in scientific research, medical equipment or treatments, pharmaceuticals and their packaging, medical devices, and in the manufacture of components in critical goods; and
- whether the use is beneficial in other applications or commercial uses in important sectors of

the economy (such as aerospace, defense, industrial and commercial equipment, and automotive sectors.

- the product or substance has been approved, governed or authorized by a federal or state agency

Possible tools for the agency to adopt in its decision-making process may include a decision tree (Fig. 1) or a risk matrix (Fig. 2) where chemical risks factors like persistence, bioavailability, and toxicity (PBT) characteristics can be ranked in alignment with emissions or production volumes of the chemical in question.

Figure 1: Essentiality Decision tree

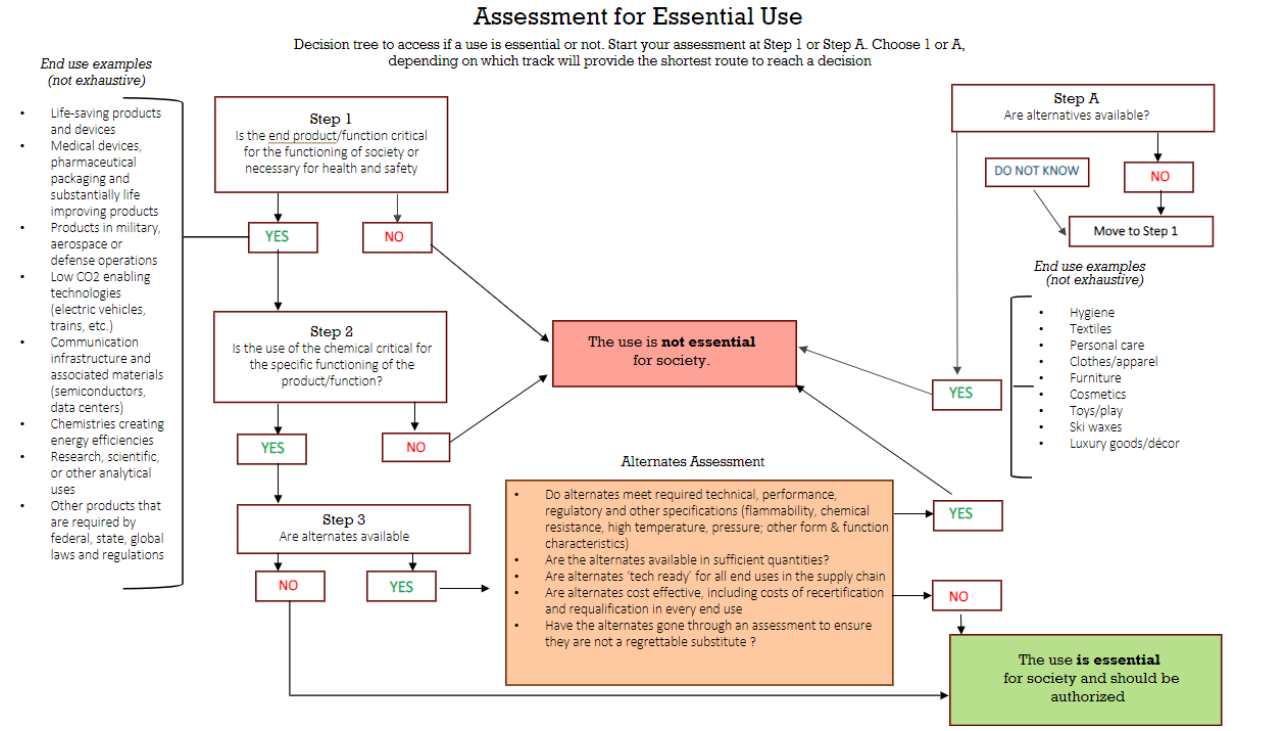

Figure 2: Risk Matrix

	Known Low Production/Emissions	Unknown Production/Emissions	Known High Production/Emissions	
Known High PBT Risk				High priority regulatory targets; decreasing priority to the left
Unknown Risk				High priority for risk studies to identify or eliminate additional substances of concern; decreasing priority to the left
Known Low PBT Risk				Lower priority for both regulations and additional research
	Candidates to monitor for change in production/emissions volume; increasing priority toward the top	Candidates for more research on production/emissions; increasing priority toward the top	Candidates for research on emissions profiles & environmental fate; increasing priority toward the top	

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Essential Use Product Example: Honeywell's Solstice® Hydrofluoroolefin ("HFO") Technology

HFO technology is an example of a fluorotechnology that safely meets important societal needs while providing significant environmental benefits. To date, the use of Honeywell HFO technology has helped avoid the potential release of the equivalent of more than 326 million metric tons of carbon dioxide into the atmosphere. This is equal to removing the carbon emissions from nearly 70 million gasoline-powered passenger vehicles annually.[2]

Mobile Air Conditioning (MAC) and Electric Vehicle Thermal Management Systems (EV TMS)

HFO-1234yf (or refrigerant R-1234yf, trademark Solstice® yf) is widely used as a refrigerant in MAC, vehicle HVAC and TMS in EV systems.

HFO-1234yf is a refrigerant that was specifically designed to minimize persistence and overall environmental impact. As of today, **every vehicle manufacturer producing vehicles for sale in Europe, Turkey, the United Kingdom, South Korea, Canada and the US is using HFO-1234yf successfully.** HFO-1234yf is the low-GWP refrigerant of choice for carmakers, consumers and the environment. The shift from R-134a, an older generation automotive refrigerant, to HFO-1234yf, which took 10 years to transition, has had a dramatic positive impact on the environment. The most recent assessment of the Intergovernmental Panel on Climate Change (IPCC AR6 of 2021) shows HFC-134a with a GWP (100) figure of 1530 while the GWP (100) of HFO-1234yf to be 0.501.[3] Assuming 200 million vehicles on the road with R-1234yf and an average charge of 0.6Kg per vehicle, the refrigerant change from R-134a to R-1234yf equals more than 183 metric tons of CO_2e reduction.

HFO-1234yf is a low hazard, non-bioaccumulative, very low persistent (atmospheric lifetime 10 days), mildly flammable gas with very low-GWP, no-ODP and with well-established DNEL/PNEC levels as well as no noticeable health or environmental hazards or PBT/vPvB equivalent concerns.

Oak Ridge National Laboratory on HFOs

Further, as confirmed in recent analyses from Oak Ridge National Laboratory, HFOs represent greater energy efficiencies across important commercial applications, including in appliances, residential air conditioners, supermarket refrigeration systems, and spray foam insulation.[4] In commercial refrigeration applications, HFO solutions will consume 5% to 21% less energy as compared to propane systems over the lifetime of the system (15 years), and 8% to 50% less energy as compared to CO_2 systems over the lifetime of the system (15 years).[5] When evaluating the performance attributes of HFO blowing agents to evaluate energy efficiency, as well as safety attributes to identify HFOs' flammability characteristics, Oak Ridge National Laboratory researchers concluded that "HFOs can effectively replace higher GWP solutions, such as HFCs, to

[2] Calculations are based on actual sales of Solstice products (in lbs.) from Jan 2010 through Jan 2022, and utilize the EPA GHG equivalency calculator for conversion.
[3] Smith C et al. (2021) The Earth's Energy Budget, Climate Feedbacks and Climate Sensitivity Supplementary Material, IPCC AR6 Report, 2021,Table 7.SM.6 at pp. 17-18.
[4] Minnesota's Building Code permits the use of HFO as insulation for residential dwellings. *See* Minn. R. 1322.0402, 1346.0604. Restrictions on the use of HFO under the pending rule would be inconsistent with other agencies that have approved HFO as a safe and appropriate product for residential use.
[5] Oak Ridge National Laboratory Study "Technology Options for Low Environmental Impact Air-Conditioning and Refrigeration Systems"

reduce emissions and mitigate the use of flammable and explosive materials in high-density, urban areas."[6]

Department of Defense on HFOs

The Department of Defense recently identified refrigeration, air conditioning, cooling and electronics thermal control as a ***mission critical application*** in their recent report on the Critical Uses of PFAS report[7] stating that,

> *"Most refrigerants used in civil and military cooling and refrigeration applications can be classified as PFAS. Many next-generation refrigerant alternatives adopted by U.S. industry (and U.S. households) between now and the end of 2025 are also PFAS. Under the AIM Act and EPA technology transition regulations, the U.S. economy is in the process of switching from one set of PFAS-classified refrigerants (e.g., HFCs) to a new generation of refrigerants (e.g., HFOs), which are also, in the broadest definitions, considered to be PFAS. Known non-PFAS alternatives (e.g., hydrocarbon or ammonia alternatives) pose flammability, toxicity, or high-pressure concerns. The same PFAS that are used in quantities of several hundred million pounds per year throughout the U.S. economy for cooling applications are used in much smaller quantities (i.e., a fraction of one percent) for military cooling and military thermal control of all kinds."*

<u>Unavoidable Use Criteria Should Acknowledge Past Precedents and Incorporate Federal Authorizations</u>

The concept of essential use has witnessed both successes and failures in its historical implementation. The following section will aim to summarize examples and concepts from both ends of this spectrum, highlighting the complexities and challenges inherent in balancing policy with the practical needs of society.

A Successful Model: the Montreal Protocol

The "essential-use" concept was first introduced in 1987 in the Montreal Protocol to phase out ozone-depleting chlorofluorocarbons, except for certain "essential" uses. The concept of "essential use" was developed to address situations where the complete elimination of ODSs would cause significant societal or economic harm, or where there were no technically or economically feasible alternatives available at the time. It acknowledges that in some specific applications, alternatives to ODSs may not yet exist, or their adoption might have serious adverse effects on health, safety, or the environment. The Montreal Protocol framework sets rigorous criteria and procedures for determining essential use exemptions, recognizing that the designation of essential use should not be taken lightly. It was agreed that a "controlled substance should qualify as 'essential' only if:

> (1) it is necessary for the health, safety, or is critical for the functioning of society (encompassing cultural and intellectual aspects); and
>
> (2) there are no available technically and economically feasible alternatives or substitutes that are acceptable from the standpoint of environment and health. It is also mentioned that essential uses should be permitted if all economically feasible steps have been taken to minimize the emissions of the controlled substance.[8]

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[6] Oak Ridge National Laboratory Study "Assessment of the Performance of Hydrofluoroolefins, Hydrochlorofluoroolefins, and Halogen-Free Foam Blowing Agents in Cellular Plastic Foams"

[7] Department of Defense "Report on Critical Per- and Polyfluoroalkyl Substance (PFAS) Uses" https://www.acq.osd.mil/eie/eer/ecc/pfas/docs/reports/Report-on-Critical-PFAS-Substance-Uses.pdf, p.14

[8] Decision IV/25, 'Essential Uses', 4th Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer,

Under the Montreal Protocol, substances deemed "essential" for specific applications are granted exemptions from phase-out schedules. This means that despite the overall goal of phasing out ozone-depleting substances (ODSs), certain uses are considered necessary and are permitted to continue for a limited time until suitable alternatives become available.

One significant aspect of the essential use concept is the allowance for the use of these substances as feedstocks. Feedstocks are raw materials that are used to manufacture other products. In some cases, ODSs serve as crucial feedstock in various industrial processes, such as the production of pharmaceuticals, electronics, or specialty chemicals. Recognizing the importance of these substances as feedstocks, the Montreal Protocol provides exemptions for their use in specific applications.

Critically, Montreal Protocol focuses on a very limited number of essential substances keeping the scope narrow, well-defined, and reviewed on a regular cadence; publishing its decisions relating to essential uses with the most recent released in 2020.[9]

An Unsuccessful Model: European Union (EU) Chemicals Strategy for Sustainability (CSS)

Recently in 2020, the European Union (EU) released its Chemicals Strategy for Sustainability (CSS), calling for the phase out of the most harmful uses of chemicals, except for those uses that are determined to be essential for society.[10] This strategy was developed with neither prior public consultation nor a proper impact assessment. As such, CSS has been unsuccessful in that it neither defined which harmful chemicals would justify use of this concept, what criteria should be applied, nor did it provide a process to help identify or select chemicals of concern. At present, there does not exist agreement or a formal process to incorporate the essential use concept into existing European frameworks like the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) or the classification, labelling and packaging of substances (CLP). Attempts to bring them into alignment over the last few years have been met with significant debate and concern from various stakeholders. As seen from the notes of the competent authorities for REACH and CLP, many proponents caution that "banning or restricting uses of substances on the basis of their essentiality, without sufficient assessment of the impacts may lead to regrettable substitution or impaired competitiveness and innovation."[11]

Secondly, many of these existing frameworks already have infrastructure built-in for chemicals of concern to request authorizations or "use-specific" exemptions if the requestor can demonstrate that under normal conditions of use, the risks are adequately controlled. Lastly, a broader concern with this concept, cautions that assessments around essential use can vary widely depending on who and how they are determined. Placing diligence around best practices should be exercised where some chemicals deemed "non-essential" today, could be "essential" in the future, thus allowing space for science and technology to evolve, be it for

UNEP, 23–25 Nov. 1992, available at: https://ozone.unep.org/treaties/montreal-protocol/meetings/fourth-meeting-parties/decisions/decision-iv25-essential-uses?q=fr/meetings/fourth-meeting-parties-montreal-protocol/decisions/decision-iv25-utilisations-essentielles

[9] UNEP Ozone Secretariat, Handbook for the Montreal Protocol, Section 3.2 "Essential Use Exemptions" pg 752-767 https://ozone.unep.org/sites/default/files/Handbooks/MP-Handbook-2020-English.pdf

[10] Scholz, S., Brack, W., Escher, B.I. *et al.* The EU chemicals strategy for sustainability: an opportunity to develop new approaches for hazard and risk assessment. *Arch Toxicol* 96, 2381–2386 (2022). https://doi.org/10.1007/s00204-022-03313-2

[11] CARACAL 1, Pg 7 https://files.chemicalwatch.com/38%20%20CA_61_2020_Essential%20uses%20%282%29.pdf

global emergencies, or other unforeseen future needs where flexibility in these areas will be needed to eliminate supply chain vulnerabilities or barriers to innovation, trade, or commerce.

Minnesota-Specific Essential Use Examples

Minnesota has many examples of both successful and unsuccessful regulatory schemes from which to learn in its development of unavoidable use criteria. MPCA should look to the successes and challenges of its past phaseouts when developing unavoidable use criteria. Such learnings may be found in the regulation of Trichloroethylene (TCE), Formaldehyde, Heavy Metals, and PCBs.

For example, in the case of Formaldehyde, Minn. Stat. 325F.174 et seq., the Minnesota legislature recognized the extensive, existing regulatory structures around specific product categories and thus exempted many FDA-regulated products and products in conformance with ASTM International Standard F963. In doing so, the state reduced MPCA's administrative burden, reduced the regulatory burden on industry by minimizing duplicative or inconsistent regulation, and effectuated the goal of reducing this potentially hazardous chemical in Minnesota. A similar approach was taken with Heavy Metals in consumer products, Minn. Stat. 325E.3891 et seq. Further, in the case of TCE, a successful phaseout was tied to an existing permitting program, thereby focusing MPCA's efforts on some of the state's largest users, Minn. Stat. 116.385 et seq. While the Minnesota Legislature did not specifically dictate these exemptions or structures in the case of PFAS regulation, it did give MPCA wide latitude to define and implement unavoidable use criteria.

Recognizing Existing Essential Use Determinations and Criteria

As the MPCA promulgates its own essential use rules, it must ensure that they align with the detailed criteria developed under other domestic and international programs. Harmonization with existing criteria is crucial to maintain consistency in regulations, promote efficiency, and avoid conflicting requirements that could hinder effective environmental protection efforts such as ozone layer protection.

For instance, our strong recommendation would be that the MPCA consider the criteria outlined by the Montreal Protocol and any guidance provided by relevant international bodies, such as the United Nations Environment Programme (UNEP) and its Ozone Secretariat. These criteria typically include considerations such as technical feasibility of alternatives, economic impact assessments, and environmental considerations.

Furthermore, coordination with other domestic programs, such as those established by federal agencies like the Environmental Protection Agency (EPA), is essential to ensure coherence in regulatory frameworks and prevent duplication of efforts. Other PFAS essential use determinations that can be relied on by MPCA include the SNAP program under the Clean Air Act, the EPA's new chemical review program under Section 5 of the Toxic Substances Control Act (TSCA) , the Federal Food, Drug, and Cosmetic Act (FFDCA), and other federal programs whereby either the PFAS, or products containing them, have been deemed acceptable for their intended use through risk assessments by federal agencies. PFAS-containing products that are subject to, or necessary for, meeting federal specifications (e.g., military specifications, United States Federal Aviation Administration (FAA) standards, or NASA requirements) also should be considered currently unavoidable use. Such an approach will help MPCA concentrate its efforts on non-essential uses within consumer products. This approach also provides fairness and market stability for businesses that have successfully completed federal reviews for their PFAS-containing products under these federal programs. The approach will also ensure the continued availability of products that must meet military, technical, or similar government specifications.

Question 2: Should costs of PFAS alternatives be considered in the definition of "reasonably available"? What is a "reasonable" cost threshold?

Costs of PFAS Alternatives Should be Taken into Consideration When Determining Their Availability

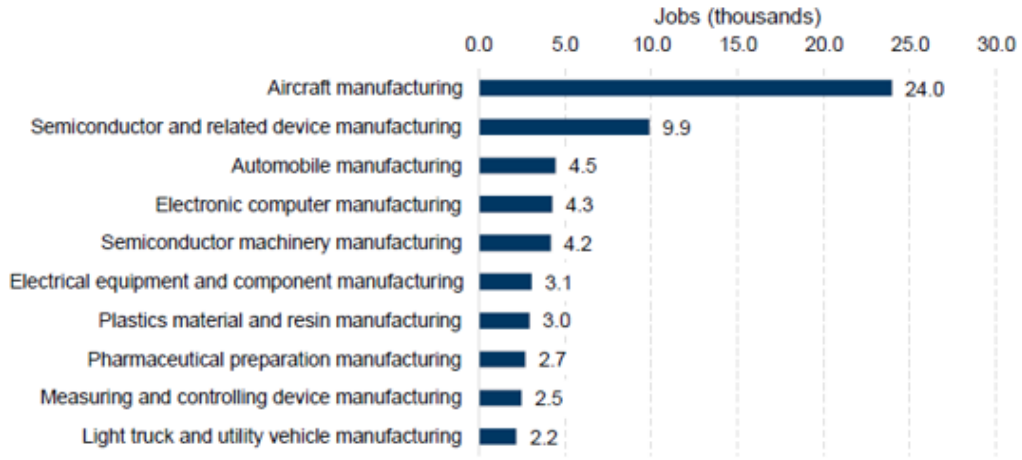
High costs can create barriers to adoption for industries or applications and may have severe impacts on end users and consumers with limited financial resources. Evaluating costs will allow regulators to assess the economic feasibility, or reasonableness, of transitioning to alternative substances and will ensure that feasible alternatives are identified where needed.

Sector Example: Aircraft Manufacturing in the Aerospace and Defense Industry

In the most recent 'Minnesota by the Numbers' Aerospace and Defense was listed as a top industry in Minnesota[12]. It is important for the agency to perform a sector-by-sector risk assessment within the State that accounts for impacts to Minnesota's top revenue-generating industries. In light of some of these complex supply chains there could also be global repercussions with crippling costs or critical equipment obsolescence that might occur if a key use is missed. When the US Chamber of Commerce recently reviewed trade implications between the US and Europe that could be impacted under PFAS restrictions in Europe[13], the market sector with the largest estimated trade value at risk was Aerospace and Defense at $48 billion. Figures taken from that report also considered US GDP and distribution of total impacts. The figures showed that aircraft manufacturing would suffer the most significant impact to jobs by sector (Fig. 3). Further, the State of Minnesota (fig 4) would have over 8000 jobs that could be impacted by PFAS restrictions if exemptions were not provided for this sector. For Honeywell's A & D facilities alone, an initial assessment has revealed more than 2,000 distinct part numbers stand to be affected should the sector not be classified as essential. This has the potential for significant supply chain disruptions as well as significant financial considerations. As a company with deep ties to the state of Minnesota, and a thriving Aerospace and Defense business, these numbers are deeply concerning to us as an employer within the state in this industry.

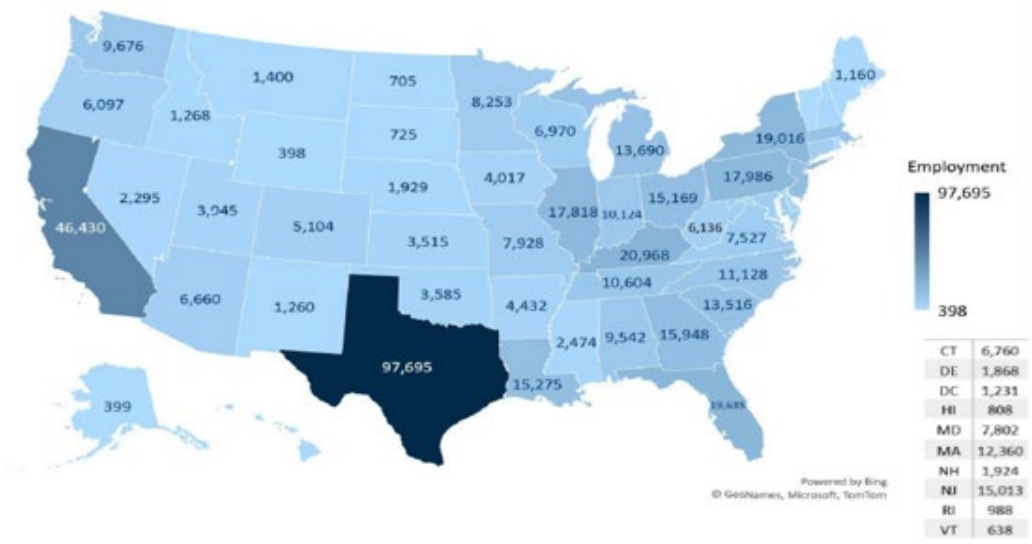
[12] Minnesota's Aerospace and Defense Industries (mn.gov)
[13] https://www.uschamber.com/international/impacts-of-the-pfas-restriction-on-trade-between-the-u-s-and-the-european-union

Figure 3: Top 10 Most impacted sector by jobs



Source: https://www.uschamber.com/international/impacts-of-the-pfas-restriction-on-trade-between-the-u-s-and-the-european-union

Figure 4: Job Impacts by State



Source: https://www.uschamber.com/international/impacts-of-the-pfas-restriction-on-trade-between-the-u-s-and-the-european-union

Product Example: PCTFE in Medical Packaging

In the pharmaceutical sector, Honeywell provides the fluoropolymer, PCTFE, for use in medicinal packaging for both humans and animals. If new alternatives must be identified, for every change to an approved packaging, this could require additional stability testing and approval of changes/variations by the US FDA and other

international medicine authorities for each existing active substance and dosage of the final medicinal product. This will not only require substantial development time (i.e., tests normally performed for long time periods with regular intermediate controls) but also considerable human resources from the industry and authorizations by authorities. According to available information, the costs of stability testing for each medicinal product could reach $100,000-500,000 USD, for the approval of potential variations. There are currently over 600 products which may be impacted.

In cases where alternative packaging would not provide satisfactory stability characteristics to active substances or final medicinal products, changes to medicinal formulations could be required. Formulation changes will demand considerable costs and time for developing new medicinal products and obtaining marketing authorizations. This will also trigger additional costs for processors/producers of packaging materials to retool and retrofit their machinery for other barrier materials. According to Honeywell's estimates, new packaging changes alone could potentially add over $3 million of additional costs for one drug and close to $2B for the entire PCTFE product portfolio. All of these costs would likely be passed on to final consumers and public budgets.

Understanding the revenue impacts at the state level will help keep regulations from becoming overly burdensome on all sizes of business owners, continue to drive innovation, foster competition, and keep jobs and tax revenue within the State of Minnesota. Regulatory perception amongst investors and entrepreneurs can also impact future business for investment and economic growth, thus making it critical for policymakers to strike a balance between necessary regulations to protect citizens while simultaneously supporting an environment of growth and sustainability of its key industries.

Honeywell further requests that the MPCA make the information used in conducting an assessment or evaluation of alternatives including their socioeconomic impacts on both costs and jobs by sector publicly available for review and comment.

Need to Consider Small Businesses and Municipalities

Finally, Minnesota Statutes Section 14.127, specifically requires MPCA to determine the financial impact of this rule on small businesses and municipalities—if MPCA determines that the rule will cost these entities more than $25,000 in the first year after the rule takes effect, affected entities may apply for an exemption that can only be overridden by subsequent legislative action. A failure on the part of MPCA to consider these entities results in a deviation from proper rulemaking procedures under Minnesota's Administrative Procedures Act. While Honeywell is not a small business under this statute, many of its supply-chain partners in Minnesota fall into this category. Therefore, Honeywell will be working closely with our small business partners to assist MPCA's evaluation of how PFAS regulation will impact these entities pursuant to Minn. Stat. § 14.127. For example, most of the foam blowing contractors reliant on Honeywell's HFOs are characterized as small businesses. These enterprises often operate on a local or regional scale, providing insulation services to residential, commercial, and industrial clients. Due to the specialized nature of their work, these contractors typically have limited resources and may face challenges in transitioning to alternative, blowing agents.

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The Reasonable Availability of Alternatives Should Take into Account Multiple Factors Beyond Cost

How the MPCA will determine when alternatives are not reasonably available should also be explained in the regulation and should include the concepts of performance, safety, cost, and supply chain considerations. A long-term perspective is crucial when evaluating unavoidable use, especially considering the potential for future regulations, liabilities, and societal expectations regarding environmental stewardship.

In many essential A&D applications, only fluorinated substances can fulfill all required technical (AMS3255, AMS3678, ASM3659, ASTM D1710, AMS7276, AMS7287, AMS365 AMS3667) and military specifications (MIL-S-46163, MIL-PRF-276717)[14]. A&D production also needs to adhere to strict quality standards like ISO AS9100 and Nadcap. Due to the nature of critical A&D uses, known alternative materials are not available to simultaneously satisfy all required properties, such as low flammability, high service temperature (above~200 °C), low dielectric constant, electric arc tracking resistance, mechanical strength and elasticity, and chemical resistance/inertness to even the most aggressive chemicals.

Moreover, the combination of properties required in most A&D applications will be difficult to achieve in a new material. Even after a material with the suitable combination of properties would be discovered or invented, it will take decades to approve its use by the overall A&D industry (e.g., all major aircraft producers should test and approve) and to certify it under all applicable standards worldwide. It is estimated that, in practice, this process would require approximately 30 years (on average) for many critical aircraft components.

Industry Example: Halons-Based Applications

Although Halons are not part of our chemistry, they are an industry application example of ozone-depleting substances with an essential use exemption under the Montreal Protocol. Despite decades of innovation efforts to replace them, the only result has been a 'regrettable substitution'. Recently the A&D industry successfully substituted Halon 1211 in portable (handheld) and lavatory receptacle extinguishers used in commercial aircrafts and is working to substitute halons in commercial aircraft fire suppression systems. The new Halon 1211 substitutes constitute a "regrettable substitution," because they are still technically deemed a PFAS substance under Minnesota's definition of PFAS, thus making the 'new' solutions non-viable.

In addition, the industry has been working for many years to substitute Halon 1301 in cargo & auxiliary power unit (APU) compartment and engines nacelles commercial aircraft fire suppression systems. Despite these efforts, viable halon alternatives have not been found. Many potential alternatives turned out to be technically not feasible, because they do not meet specific performance requirements. Moreover, fire suppression is a critical safety item and specific airworthiness requirements apply to fire suppression, which must be met in the aircraft certification process. Many of the remaining potential Halon 1301 substitutes the industry is currently investigating are PFAS. Therefore, additional restrictions of PFAS potentially used in fire suppression systems would put the industry's achievements at risk and potentially require a restart of the research by focusing on non-PFAS agents, should they even be available.

[14] For example, technical specifications for PTFE/ETFE insulated wire under M22759 (SAE AS22759) standards or requirements for heat transfer fluids, solvent resistance O-rings, etc.

A Transparent and Well-Defined Framework for Reasonableness Determinations

The Agency should consider establishing a transparent and well-defined framework in determining the reasonable availability of alternatives, considering cost and additional factors. Subsection (i) of the American Innovation and Manufacturing Act of 2020 (AIM Act), entitled "Technology Transitions," may serve as a useful example of criteria that a substitute, or alternative, must meet prior to EPA establishing restrictions on the use of a substance being substituted. Specifically, when determining whether to restrict the use of a substance, EPA, under this provision, is required to consider "the availability of substitutes for use taking into account technological achievability, commercial demands, affordability for residential and small business consumers, safety, consumer costs, building codes, appliance efficiency standards, contractor training costs, and other relevant factors…"[15] Honeywell urges the MPCA to consider adopting a similar approach in assessing substitutes to PFAS, and to identify the criteria that the MPCA intends to use in ascertaining the reasonable availability of alternatives.

Question 4: What criteria should be used to determine the safety of potential PFAS alternatives?

The Definition of "Alternatives" Should Include Concepts of Functional Equivalency and Reduction of Potential Risk

Honeywell requests that MPCA provide a detailed definition of "alternatives" as that term is used within the definition of "currently unavoidable use." The definition should include concepts of functional equivalency and reducing potential risk to human health or the environment. The basis for those concepts must be consistent, fair, transparent, and well-defined.

For example, in the Montreal Protocol on Substances that Deplete the Ozone Layer, an international treaty designed to protect the ozone layer by phasing out the production and consumption of ozone-depleting substances (ODS), defines "alternatives" as substances or technologies that:

- Do not deplete the ozone layer: Alternatives must not have ozone-depleting potential or, at the very least, have significantly lower potential compared to the substances they are intended to replace.
- Are more environmentally friendly: Alternatives should have a reduced impact on the environment, including lower global warming potential and lower potential for other environmental impacts.
- Are technically and economically feasible: Alternatives should be practical and viable from both a technical and economic standpoint to ensure that industries can transition smoothly away from ozone-depleting substances.

The definition of alternatives is crucial to the success of the Montreal Protocol, as it guides the efforts to find and adopt substitutes for ODS in various industrial processes and applications. The protocol encourages the development and use of alternatives to accelerate the phase-out of substances like chlorofluorocarbons (CFCs), halons, and other ozone-depleting chemicals.

Another example is the definition of "substitute or alternative" under EPA's SNAP program, which defines the term as "any chemical, product substitute, or alternative manufacturing process, existing or new, that

[15] https://www.govinfo.gov/content/pkg/USCODE-2020-title42/html/USCODE-2020-title42-chap85-subchapVII.htm

could replace a class I or II substance."[16] EPA also takes into account an alternative that "(1) reduces overall risk to human health and the environment, and (2) is currently or potentially available.

In August of 2023, the Department of Defense (DoD) released their "Report on Critical Per- and Polyfluoroalkyl Substance (PFAS) Uses" which speaks to the challenges and costs relating to finding, and qualifying equally performing alternatives to existing materials in key sectors of strategic importance to our national security. When asked if alternatives[17] existed in most of these end uses, there were very few, with most citing complex, multi-leveled supply chains which would require 10–30-year recertification processes, and incompatibilities with other 'like' materials due to the strict performance, regulatory, and safety parameters these materials must meet. Trying to phase out chemistries in these applications could cost program offices millions of dollars, not to mention the countless hours that will need to be spent identifying and qualifying any new materials, thereby creating ripple effects in the economy that would be passed on to consumers, taxpayers, and cause supply issues with mission critical components leaving our country at risk or vulnerable in our defense of national security.

Defining alternatives with respect to Aerospace and Defense (A&D) companies will be challenging. As previously mentioned, these alternatives must be qualified (i.e., evaluated and tested) in the context of the aircraft system or sub-systems. These processes must be repeated where the alternatives are found to be unsuitable. Once qualified, the system must be revalidated to maintain certification of the product (e.g., aircraft, vessel, vehicle, etc.). Certification is strictly controlled by regulatory bodies in both the United States and other jurisdictions, in both the civil aerospace and military domains. Examples include the EASA, the FAA, and their military counterparts.

As A&D products are subjected to some of the most austere environments around the world. They must operate successfully in extremes, including altitude, temperature, pressure, and precipitation, while having to fulfill the highest technical reliability and safety requirements. To ensure aircraft safety, comprehensive airworthiness regulations have been in place around the world for decades. These regulations require qualification of all materials and processes according to a systematic and rigorous process to meet stringent safety requirements subject to independent certification and approval. Such rigorous testing and qualification processes are required to assure that any changes do not compromise the integrity of the affected components or the safety of the product as a whole.

The DoD concluded in their paper that, "it is critical that future laws and regulations consider and balance the range of environmental and health risks associated with different individual PFAS, their essentiality to the U.S. economy and society, and the availability of viable alternatives."

It is critical that Minnesota give credence to federal authorizations for the use of PFAS in the state's development of unavoidable use criteria because failure to do so will jeopardize some of the nation's most critical industries and applications.

Question 5: How long should PFAS currently unavoidable use determinations be good for? How should the length of the currently unavoidable use determination be decided? Should significant changes in available information about alternatives trigger re-evaluation?

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[16] 40 CFR § 82.172 "Substitute or alternative"

[17] Report on Critical Per- and Polyfluoroalkyl Substance (PFAS) Uses, Appendix A-1 Alternatives Assessment pg 21-27 https://www.acq.osd.mil/eie/eer/ecc/pfas/docs/reports/Report-on-Critical-PFAS-Substance-Uses.pdf

Unavoidable Use Determinations Should Be Good for Unlimited Time

As stated in previous questions, the agency will need to look at each sector's specific use of PFAS and prioritize its actions accordingly. MPCA should identify critical PFAS and align with certain uses that have already undergone federal authorizations within existing regulatory frameworks within the United States for specific uses pursuant to programs such as, but not limited to, the SNAP program under the Clean Air Act, the EPA's new chemical review program under Section 5 of the Toxic Substances Control Act (TSCA) , the Federal Food, Drug, and Cosmetic Act (FFDCA), and other federal programs whereby either the PFAS, or products containing them, have been deemed acceptable for their intended use by federal government agencies. PFAS-containing products that are subject to, or necessary for, meeting federal specifications (e.g., military specifications, United States Federal Aviation Administration (FAA)-issued standards, NASA requirements) also should be considered currently unavoidable use. Such an approach will help MPCA concentrate its efforts on non-essential products. Fairness and market stability should be assured to businesses that have successfully completed federal reviews for their PFAS-containing products under these statutes. Likewise, the longest essential use determinations should be granted to companies that manufacture or provide products that must meet military or similar government specifications, taking into consideration supply chain complexity and length of qualification times for an alternative to be assessed, tested, and demonstrated safe at requisite scale and scrutiny.

Question 6: How should stakeholders request to have a PFAS use be considered for currently unavoidable use determination by the MPCA? Conversely, could stakeholders request a PFAS use not be determined to be currently unavoidable? What information should be submitted in support of such requests?

Role of a Technical Advisory Committee

Honeywell suggests the agency establish a Technical Advisory Committee (TAC) comprised of various stakeholders including but not limited to agency staff, scientists, health professionals, industry experts, small business owners, and those from civil sectors or those most similar representatives from industries within the State of Minnesota. Furthermore, MPCA should open these for public review, much like how the Montreal Protocol does, publishing its decisions relating to essential uses.[18] The agency should seek to find committee members who support the adoption of essential use criteria and help guide the Agency with the principles of understanding changing societal needs and a mindset for future innovations The technical committee must understand that a static view of essentiality could lead to a static society. Many concepts 30 years ago for instance like mobile phones were not considered essential, where now such devices are essential to societal function and progress. Having a process combining public review and proper membership should help guide the agency in its assessment of critical societal needs vetted by necessary expertise, sound science, and data. The technical committee should also help the agency identify representation of vulnerable and at-risk populations impacted by the Rule.

MPCA may model its Technical Advisory Committee after U.S. EPA's Science Advisory Committee on Chemicals ("SACC"). The SACC provides independent advice to EPA to assist the agency in implementing the Toxic Substances Control Act. Members are identified through a public call for nominations and are appointed by the Administrator of the EPA. Members have diverse backgrounds in policy, science, government, and industry, which inform their recommendations to the agency.

[18] UNEP Ozone Secretariat, Handbook for the Montreal Protocol, Section 3.2 "Essential Use Exemptions" pg 752-767 https://ozone.unep.org/sites/default/files/Handbooks/MP-Handbook-2020-English.pdf

Deferring to Environmental Protection Agency's (EPA) Significant New Alternatives Policy (SNAP) program Decisions

Another option that the MPCA should consider modelling their approach to is the EPA's SNAP program which operates as a regulatory framework aimed at identifying and promoting the use of environmentally preferable alternatives to ODS and high- GWP substances in various sectors. Here's how SNAP works to ensure the adoption of the best refrigerants across viable sectors:

1. **Identification of Alternatives:** SNAP assesses potential substitutes for ODS and high-GWP substances used in refrigeration, air conditioning, and other applications. It evaluates the environmental impact, safety, and efficacy of these alternatives to determine their suitability for specific sectors.

2. **Regulatory Determination:** Based on its evaluation, SNAP issues regulatory determinations that categorize alternatives as acceptable, unacceptable, or acceptable subject to use conditions. Acceptable alternatives are those deemed environmentally preferable and safe for use, while unacceptable alternatives are prohibited.

3. **Sector-Specific Guidelines:** SNAP develops sector-specific guidelines and regulations to guide the use of acceptable alternatives in various applications. These guidelines may include usage restrictions, performance standards, and reporting requirements to ensure proper implementation and monitoring.

4. **Stakeholder Engagement:** The SNAP program engages stakeholders, including industry representatives, environmental advocates, and scientific experts, throughout the decision-making process. This collaboration helps to gather input, address concerns, and foster consensus on the adoption of alternative refrigerants.

5. **Technology Assessment and Innovation:** SNAP encourages ongoing research and development of new refrigeration technologies and alternative substances with lower environmental impact. By promoting innovation, the program seeks to continually improve the availability and performance of environmentally friendly refrigerants across different sectors.

6. **Compliance Monitoring and Enforcement:** SNAP monitors compliance with its regulations and guidelines through inspections, data reporting requirements, and enforcement actions against violators. This helps to ensure that the best refrigerants are used in every viable sector while deterring the illegal use of prohibited substances.

Question 7: In order to get a sense of what type of and how many products may seek a currently unavoidable uses determination, please share what uses and products you may submit a request for in the future and briefly why. There will be a future opportunity to present your full argument and supporting information for a possible currently unavoidable uses determination.

Uses and Products for Which Honeywell May Submit an Unavoidable Use Request

The following are a categorical list of uses and products for which Honeywell anticipates it will submit an unavoidable use request:

(1) A product used in a manner that has been approved or authorized by a federal or state agency.
(2) Items that are required by Federal or State laws and regulations.

(3) Drugs, medical devices, biologics or diagnostics regulated by the Federal Food and Drug Administration or the US Department of Agriculture or otherwise subject to regulation under the Federal Food, Drug, and Cosmetic Act, as amended, 21 U.S.C. § 301 et seq;
(4) Packaging for drugs, medical devices, biologics, diagnostics or [non-pulp based] food regulated by the Federal Food and Drug Administration or the US Department of Agriculture or otherwise in scope of the Federal Food, Drug, and Cosmetic Act, as amended, 21 U.S.C. § 301 et seq
(5) Products registered for use under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, 7 U.S.C. § 136 et seq.
(6) Substances designated by rulemaking or otherwise as acceptable substitutes in specific uses under U.S. EPA's Significant New Alternatives Policy (SNAP) program, or substitutes needed to execute the American Innovation and Manufacturing (AIM) Act.
(7) Polymeric substances for which the main chain (backbone) of the polymer is either a per- or polyfluorinated carbon-only backbone or a perfluorinated polyether backbone.
(8) A used product offered for sale or resale.
(9) Finished products certified or regulated by the FAA or the DOD, or both, when used in a manner that was certified or regulated by such agencies, including parts, materials, and processes used to manufacture or maintain such regulated or certified finished products;
(10) Motorized vehicles, including on and off-highway vehicles, such as all-terrain vehicles, motorcycles, side-by-side vehicles, farm equipment, and personal assistive mobility devices;
(11) Inaccessible electronic components of an electronic product, and
(12) Cooling, heating, ventilation, air conditioning and refrigeration equipment, components and servicing needs.
(13) Apparel that would be deemed personal protective equipment or clothing items for exclusive use by the United States military, defense sector, space sector, or another agency or organization fitting these descriptions.

Question 8: Should MPCA make some initial currently unavoidable use determinations as part of this rulemaking using the proposed criteria?

MPCA Should Make Initial Currently Unavoidable Use Determinations

Honeywell recommends MPCA make initial unavoidable use determinations by incorporating parallel federal agency determinations into the final rule, much like the suggested list from question 7; MPCA has both the authority and obligation to promulgate initial determinations in this rulemaking for several reasons. First, Minnesota's Administrative Procedure Act (MAPA) specifically directs agencies to avoid unnecessarily costly and ineffective regulatory programs by developing programs that meet the regulatory objectives and provide the "maximum flexibility" for the regulated party. Minn. Stat. § 14.002. MAPA also requires each agency to submit a list of rules that are "duplicative of other state or federal statutes or rules" and act to repeal the duplicative rules. Minn. Stat. § 14.05, subd. 5. These statutes demonstrate the Minnesota legislature's strong preference to create efficient and complementary regulatory programs. Second, MAPA explicitly authorizes an agency to incorporate by reference the text from federal legislation and the Code of Federal Regulations. Minn. Stat. § 14.07, subd. 4. Third, the statutes governing MPCA specifically direct the commissioner to "coordinate the agency's activities where appropriate with the activities of other governmental agencies." Minn. Stat. § 16.03, subd. 2(a)(3). Fourth, Minn. Stat. § 16.943, subd. 3(c) authorizes the commissioner to enter into an agreement with other political subdivisions and accept information to a shared system.

In sum, several federal agencies have already created robust review programs around PFAS unavoidable use determinations and viable alternatives (i.e. SNAP, TSCA). MPCA has both the authority and the obligation to create the most cost-effective and efficient regulatory program by incorporating use determinations that

have already undergone review by a regulatory agency into the initial rulemaking process. Failure to align the MPCA's product review process with those federal review processes already in existence would result in a duplicative, inefficient regulatory process that MPCA seeks to avoid. Therefore, Honeywell recommends that MPCA incorporate products that have already completed the federal regulatory review process as final determinations on unavoidable use.

Question 9: Other questions or comments relating to defining currently unavoidable use criteria and the process MPCA uses to make currently unavoidable use determination.

Other Issues Related to Defining Currently Unavoidable Use

Speed of Innovation

An additional aspect the agency needs to understand is also the speed of innovation and development and how that process relates to the protection of intellectual property and confidential business information. There are times where inventors, innovators, entrepreneurs cannot discuss or publicize ideas or products prematurely, which could lead to difficulty in:

1. Sharing the idea, concept, or use publicly in a non-essential use/essential use forum.
2. Demonstrating the essential use to a TAC or others due to the 'newness or fluidity of the innovation process'.
3. Create an environment where truly innovative products could be produced outside of the State or the country where the State or United States could never recover to non-US competition.

Confidential Business Information

Much of the data needed to be analyzed to determine unavoidable use will be trade secret and otherwise business confidential. Under existing Minnesota law, this information should not be made publicly available. Minn. Stat. § 13.37, Subd. 2 identifies "trade secret information" as not available to the public pursuant to the Minnesota Data Practices Act. "Trade secret information" is defined under Minnesota law as "government data, including a formula, pattern, compilation, program, device, method, technique or process (1) that was supplied by the affected individual or organization, (2) that is the subject of efforts by the individual or organization that are reasonable under the circumstances to maintain its secrecy, and (3) that derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use." Minn. Stat. § 13.37, Subd. 1(b).

MPCA should apply this standard and pre-identify categories of information provided under the Minnesota Statute as trade secret and not publicly available pursuant to the Minnesota Data Practices Act. Such required information.

Honeywell recognizes the difficulty MPCA faces in its effort to develop and implement unavoidable use criteria. The agency must find a balance between protection of the environment and burden to industry. Honeywell appreciates the opportunity to provide comments to MPCA in the hope that the Unavoidable Use criteria are sufficiently protective while not suppressing innovation or stifling economic opportunity in the state.

Honeywell

Conclusion

Honeywell appreciates your consideration of these suggestions and would be glad to participate in further discussions about these comments. We look forward to reviewing and commenting on the Planned Rule.

Sincerely,

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