

Title: Contaminants of Emerging Concern (CEC) Position Statement

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BACKGROUND

Contaminants of Emerging Concern (CECs) represent a diverse group of primarily human-created substances increasingly detected in water environments, often without comprehensive understanding of their health and ecological impacts. CECs are often also referred to as trace organic contaminants, trace organic compounds, microconstituents, or chemicals/compounds of emerging concern. CECs are substances and microorganisms including physical, chemical, biological, or radiological materials known or anticipated in the environment, that may pose newly identified risks to human health or the environment. CECs include, but are not limited to:

CEC Category	Example CECs	Common Sources of CECs
Chemical Contaminants	pharmaceuticals, personal care products, pesticides, dyes, phthalates, quinones, unregulated per & polyfluoroalkyl substances (PFAS) ¹ and other organic compounds.	Manufacturing, industrial processes, agricultural application, consumer product use, improper disposal
Physical Contaminants	microplastics, nanoplastics, tire components, synthetic textile fibers, particulates, asbestos	Material production, product degradation, construction activities
Biological Contaminants	Cyanobacteria toxins, antibiotic resistant bacteria, genes, emerging pathogens	Agriculture and livestock operations, healthcare settings, natural ecosystems
Radiological Contaminants	uranium, radon, legacy isotopes, medical isotopes	Geological formations, mining activities, natural occurrence, medical facilities, hospitals

The pace of chemical innovation far exceeds the development of risk evaluation frameworks. Collectively, knowledge gaps remain in detection methods, toxicity profiles, synergistic impacts, and cost-effective mitigation strategies for many emerging contaminants. While some standards exist for specific contaminants, including some types of PFAS¹, regulatory frameworks take years to develop and vary widely across media and jurisdictions, creating inconsistencies in global risk management for CECs. Historical examples underscore the need for proactive research and robust support for long term prevention.

CECs find their way into the wastewater stream via residential, municipal, stormwater, industrial, and commercial sources. Once CECs enter WRRFs they may be transformed by microbial activity or they may persist in wastewater and biosolids, reentering the environment. These substances can transfer across media and may not be removed through traditional treatment processes, creating persistent challenges for treatment, disposal, and downstream users. Involuntary receivers of emerging contaminants—including WRRFs, stormwater retention facilities, solid waste facilities, drinking water utilities, and anyone using ground and surface waters—are dedicated to responsibly managing the risk of CECs to human health and the environment, while balancing the affordability of these critical services that address our basic human needs.

POSITION

Protecting public health and the environment has always been, and continues to be, the daily mission of water professionals worldwide. WEF is concerned about the presence of CECs in our communities and the knowledge gaps around health impacts, fate and transport, treatment, disposal, and safe handling of the countless compounds that have been introduced into global commerce. Water professionals are dedicated to responsibly managing the risk of CECs in water, wastewater, and biosolids. The water community stands as a last line of defense against chemical, physical, biological, and radiological contamination. To ensure long term protection from contaminants of emerging concern, policy makers need to address the source of contamination before it enters the water cycle and ensure robust and

¹ While many PFAS are considered CECs, this position statement is not intended to convey WEF's position on PFAS. See WEF's [PFAS Position Statement](#) for additional information.

ongoing investment in water infrastructure to address contaminants in the long term. WEF's position is as follows:

- **Risk Quantification First**
 - Advocate for proactive, consistent, transparent, and stable risk evaluation frameworks for CECs that keep pace with the rapid innovation of new substances.
 - Advocate for stronger frameworks that require every new substance undergoes comprehensive risk assessment, including potential human health and ecological impacts, and identifies potential exposure pathways and management strategies before substances are approved for use in commerce.
 - Prioritize the development and use of standardized and certified analytical methods for detecting and quantifying CECs in water, wastewater, and biosolids.
- **Understand Occurrence**
 - Encourage proactive evaluation of CEC occurrence at WRRFs, including the identification of potential residential, industrial, and commercial CEC sources.
 - Encourage robust CEC sampling programs, across the water treatment process and within the sewer shed.
- **Prioritize Source Control**
 - Identify and promote best management practices to minimize introduction of CECs into water systems and the environment through industrial pre-treatment programs, proactive identification strategies, innovation and research, product stewardship and restrictions, and development of alternatives or replacements for problematic CECs. Advocate for identification of trace CECs in commercial products and product substitutions where problematic CECs are identified.
- **Use Research-Based Policy Making**
 - Advocate for regulatory frameworks that are based on research and data, considering risks to human health and the environment before a CEC is introduced into commerce. Frameworks should consider affordability through cost-benefit analysis and incorporate proven mitigation strategies including effective source control measures and product substitutions..
- **Promote Research and Technology Development**
 - Advocate for sustained public and private investment and independent research into analytical methods, occurrence, risk assessment and cost-benefit tools, innovative treatment technologies, as well as the development of alternatives or replacements for CECs.
- **Support Balanced Remediation Cost Policies**
 - Advocate for policies that lower direct costs of CEC remediation and management for involuntary receivers and their ratepayers, shifting those costs to producers, users, and generators.
- **Integration with Circular Water Solutions**
 - Advance approaches that address CECs while enabling safe water reuse and responsible biosolids management and vice versa (see WEF's [Biosolids Position Statement](#)). Develop and share solutions for residuals management and prevention of contaminant accumulation.
- **Support Sustained Funding**
 - Advocate for reliable, affordable, and ongoing public and private funding mechanisms to support CEC research and mitigation efforts.
 - Support legislation and regulations that consider treatment and disposal costs and provide adequate funding for involuntary receivers to appropriately address CEC contamination without placing an undue financial burden on ratepayers.
- **Support Knowledge-Sharing and Training**
 - Equip water professionals with the knowledge and skills necessary to identify and communicate CEC

risks in their community. Share the most up to date and relevant information on CECs, including detection methods, mitigation strategies, regulatory frameworks, and safety protocols.

- **Engage a Broad Community**
 - Engage policymakers, legislators, community leaders, students, and the general public to build awareness and collaborative solutions for CEC mitigation.

ALIGNMENT WITH THE WATER ENVIRONMENT FEDERATION'S STRATEGIC GOALS

Since 1928, WEF and its members have created products and services for water and wastewater professionals. As a global water sector leader, our mission is to inspire the water community in pursuit of human and environmental well-being to create a life free of water challenges.

The CEC position statement aligns with WEF's mission and the following WEF strategic goals:

- **Attract and develop a diverse and passionate water workforce**
- **Cultivate a purpose-driven community to sustainably solve water challenges for all.**
- **Lead the transformation to the Circular Water Economy**