Managing Emerging Contaminants, a Key Priority for the 21st Century

By

E. McBean, *Ph.D. (MIT), BASc (UBC), P.Eng., P.E., FCAE, D.WRE., FEC, FCSCE, F.AGGS, FIAH*
Professor of Water Resources Engineering
University of Guelph Research Leadership Chair, Water Supply Security
Former Tier 1 Canada Research Chair, Water Security
School of Engineering
University of Guelph
Guelph, Canada

Abstract

With the introduction of thousands of emerging chemicals each year, thorough investigations are infeasible to establish their individual, potential detrimental impacts. As an important step for estimating whether a chemical will result in an exposure pathway and therefore create the potential for a detrimental impact, a coefficient-based strategy consisting of eight key coefficients, is desribed. The strategy is based upon key factors which are used to assess the potential for a chemical to attenuate or change its phase or medium, as part of its fate and transport pathway (e.g. volatility, biodegradation, etc.). Eight key coefficients are described, knowledge of which will assist in determining whether a chemical will result in an environmental fate and exposure pathway change and/or potential to attenuate, as a means of developing a strategy to assess the risks of emerging contaminants. Further, knowledge of the magnitude of the key coefficients provide indications which type of treatment technology may be effective.

Guidance will also be provided to technical literature which can assist in knowing the carcinogenicity of a contaminant. The need is already upon us for attention to this next, needed water revolution, to improve our understanding of characteristics of chemicals, to assess some of the risks of new chemicals as they are introduced to the marketplace.

Dr. Ed McBean received his BASc from University of British Columbia (UBC) in 1968, and his PhD (*Magna Cum Laude*) from Massachusetts Institute of Technology (MIT) in 1973. After a post-doc at Cornell University, he was a professor at the University of Waterloo in Canada and then worked in industry, as Vice President of CRA (3rd largest engineering firm in Canada) and President of CRA Engineering, Inc. In 2003, McBean was awarded a Tier 1 Canada Research Chair in Water Security and Supply, which he held at the University of Guelph until 2017. Subsequently, he has been a University of Guelph Research Leadership Chair Professor in Water Security. Ed is an academician in Canada, being a Fellow of Canadian Academy of Engineering and an academician in the US, being Diplomate, American Academy of Water resources Engineering and American Society of Civil Engineers. Ed has received many additional awards including the Research and Development Medal from Professional Engineers of Ontario, the K Y Lo Award from the Engineering Institute of Canada, Lifetime Achievement awards from both UBC and from Ton Duc Thang University in Viet Nam, and the Julian C. Smith Award from the Engineering Institute of Canada. Ed has published three books and more than 400 papers in engineering journals.