The Value of Water—Practically Speaking

Abstract: When we consider the growing role water reuse is playing in our society, much discussion has been focused around the "value" of the water that is being reused. The problem is, everyone's definition or perception of what "value" implies is different. This creates impediments to reuse. In the talk given in 2014, the concept of "One Water" was presented. In this concept, water's source, use and reuse should be understood as stretching across a continuum of: 1) avoiding the use entirely; 2) when use is unavoidable, reduce the amount used; 3) once the amount has been reduced to practical limits, reuse to augment supply; and 4) once reuse can be further optimized, recycle every drop. This concept "sounds" good, but can it be reality? In getting to a "One Water" culture (where all water source, supply and demand are considered holistically), this continuum must be a living activity, not just a rhetorical discussion.

So how do we bring this continuum into a practical focus? How do we make it something that every person's daily activities directly contribute to creating our "One Water" culture? At the heart of "One Water" is awareness of how much water is required to fuel the lifestyles we all enjoy and have come to expect. That awareness is what creates "value" for water that we use, because value emerges when water is no longer available to support the product or activity that we desire.

One way to begin establishing the real value of water is through "water footprinting." This process is an assessment of the total amount of water required as either a direct or indirect input to all the products, goods and services we produce, engage in, and consume daily. This assessment quantifies the volume of water specific to each engagement and aggregates it into a sum total that delineates the "water footprint". This cannot be confused with "carbon footprinting", something that has become a household term. Fugitive CO2 emissions released into the atmosphere from our product consumptions and activities contribute to the global imbalance of carbon but generally have no observable consequence locally. Water, on the other hand, is sourced and used in a specific geographic region within a specific time frame. The water's extraction and use result in direct consequences that specifically impact that region. This presentation will examine the implications of water footprinting as it applies to us as individual users of water, and to the society as a whole.

Perhaps the most enlightening concept that builds our awareness of water's value is that of virtual or embedded water. This is the volume of water that is "used up" along the entire supply chain of a product. For instance, how much water does it take to make an automobile? A hamburger? A T-shirt? A mobile phone? This "embedded" water concept makes up the largest portion of our water footprint. When it comes to the value of water, we must ask the question: why would we produce a water-intense product in an area where water is scarce? Rarely is the "cost" of that scarce water accounted for in that product, thereby greatly devaluing the water. This presentation will look at the concept of virtual water both globally and locally as an attempt to build awareness of its huge role in valuing water.

Water's value can only be understood within the context of its availability and accessibility. And that means that all the water in the "cradle-to-grave" processes that produce the products, goods and services we consume must be accounted for. Hopefully, when we come to appreciate the sheer volumes required, we then will begin to recognize the true cost, and thus the true value of water. Only then will we all begin to embrace the necessity of water reuse and the responsibility (personal and societal) to make it a lifestyle priority.

Drinking Water and Wastewater Professional CEUs are available from Idaho Bureau of Occupational Licensing for this session.

Presenter: **Art Umble, PhD, PE, BCEE**
Title: Americas Wastewater Practice Leader
Organization: MWH
Address: 1801 California St. Denver, CO 80202
Email address: Art.Umble@us.mwhglobal.com

Professional Background: Dr. Umble's experience covers many aspects of engineering practice. He began developing his engineering career in private development and municipal civil engineering in areas throughout the southwestern United States, specializing in hydraulics and water resources. After completing a Ph.D. in biological waste treatment at the University of Notre Dame, he added to his experience nearly a decade of municipal water and wastewater utilities management and operations for the City of Elkhart, IN, a city of 50,000. In this capacity he was responsible for strategic master planning, day-to-day treatment plant operations, regulatory compliance, facility planning, preliminary and final design of civil/sanitary systems, asset management and maintenance of the drinking water and wastewater treatment systems. During this time, Dr. Umble has also served as Adjunct Professor of Civil Engineering at the University of Notre Dame.

In his current role as the Americas Wastewater Practice Leader, Dr. Umble provides technical analysis and review support to design teams for new and rehabilitated wastewater treatment plants, with a focus on nutrient removal facilities, process optimization for treatment capacity, wet weather treatment, solids processing and disposal facilities, disinfection systems, and emerging contaminant removal technology. His role focuses on providing technical support to the wastewater facilities design staff, development of design guidelines, staff technical training, and a wide range of business development opportunities with existing and potential clients for business units across the country. He is also responsible for cultivating the firm's role and participation in professional associations both nationally and at the State level through a wide range of participatory activities.

Dr. Umble has been a leader in community initiatives involving the promotion of environmental stewardship, such as watershed planning and pollution prevention. He serves in numerous state and national forums and stakeholder work groups related to environmental rules, regulations and environmental legislation, and emerging treatment technologies. His focus has been in technical support for the environmental policy areas of water quality standards, treatment technology, water reuse, biosolids and residuals management, stormwater management, watershed planning, affordability for water environment program implementation, developing frameworks for stakeholder coalitions in environmental policy, and implementation of environmental management systems. He is active on numerous committees with the Water Environment Federation, and serves as a technical advisor/reviewer for Water Environment Research Foundation and the Water Reuse Foundation collaborative research projects.