What Will Emerge Next? A Data-Based Analysis to Anticipate Emerging Contaminants

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Background/Objectives. Current developments in global regulations and the science of toxicology/ecotoxicology have increased the likelihood that new contaminants will emerge. The original TSCA Inventory of existing chemicals, created in the years after the passage of TSCA in 1976, listed approximately 62,000 existing chemicals. The US Environmental Protection Agency (USEPA) has evaluated the risks from only a few hundred of those chemicals, and the Inventory has grown to list more than 84,000 chemical substances based on Premanufacture Notices of new chemicals. The length of this inventory contrasts sharply with the suite of chemicals that we look for in contaminated groundwater, which typically number in the hundreds, not thousands of compounds. Therefore while well-known chemicals can be difficult and costly to clean-up, trying to anticipate what chemicals may emerge under new or heightened scrutiny for investigation and clean-up efforts can create new and different set of challenges, especially in this day of social media which has created a perfect venue for venting of public outrage and consequent pressure on regulators to take action.

This presentation will expand upon previous works by the authors by further exploring the nexus between regulatory programs associated with the Lautenberg Chemical Safety Act (aka TSCA Reform), the Unregulated Contaminant Monitoring Rule (UCMR) and other regulations, data quantifying the potential for exposure, and ever-evolving public outrage.

Approach/Activities. Under TSCA reform, the EPA is prioritizing chemicals for risk review. The authors previously identified the potential for concerns about contaminants to emerge from this work, based on an analysis of EPA's priorities, the availability of toxicity data, and the amount of target chemicals in commerce. This next phase of our evaluation takes a closer look at the chemical classes which emerged from the initial analyses, considering additional data and layering in the wild card of public outrage, in particular when related to drinking water risk, as evidenced by the release of the UCMR3 results which fueled visible and emotional debates on 1,4-dioxane and perfluorinated alkyl substances (PFAS).

Results/Lessons Learned. We will present the output of the next phase of our analysis of the factors that may result in compounds "emerging" in both scientific and public venues. This presentation will provide a framework for anticipating the emergence of new contaminants so that the risks – whether to human health and the environment or to a business – can be anticipated and appropriately managed.