Foam Fractionation for PFAS Removal: Leveraging the Physiochemistry of PFAS Against Itself

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Foam fractionation has been used for decades in the aquarium industry to remove protein wastes. In recent years, the technology has been "re-purposed" to remove PFAS compounds from groundwater, landfill leachate, fire-fighting foam spills, and other high-concentration liquid waste streams. Using the natural propensity for PFAS compounds to adsorb to the surface of small air bubbles introduced into the waste stream, it has increasingly been deployed as a cost-effective treatment technology capable of achieving strict discharge limits – in certain applications. Factors that can impact the efficacy of the technology include the presence of co-contaminants, influent flow rate, and desired treatment goals.

This discussion will focus on four case studies - from two landfill sites, and two industrial facilities. The first is a municipal landfill looking at pre-treatment options for PFAS prior to discharge to the city sewer. The second is a hazardous waste landfill with high, and highly variable concentrations of PFAS; foam fractionation is planning to be implemented post- metals and biological treatment, prior to discharge. Lastly, two industrial facility with highly variable, "challenging waters" will be covered.

The goal of this presentation is twofold; provide the audience with the fundamentals of the technology but, more importantly; highlight where and when it makes the most sense to deploy foam fractionation as a tool in the PFAS treatment toolbelt

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Paul Newman is the Department of Defense Market Sector Leader for ECT2 (Emerging Compounds Treatment Technologies). ECT2 is an equipment company focused on developing and implementing treatment technologies for PFAS and other emerging, difficult-to-treat contaminants, with full-scale PFAS treatment plants operating in the US and Australia since 2017. Paul's focus is currently on supporting the DoD in pilot- and full-scale water treatment deployment, and pairing our regenerable ion exchange process with destruction technologies. He received his Bachelor's Degree in Geology from the University of Windsor and his Master's Degree in Mineral Exploration Geology from McGill University.