CASE SCHOOL OF ENGINEERING
CASE WESTERN RESERVE UNIVERSITY

Department of Civil and Environmental Engineering
Case Western Reserve University
Bingham Bldg. Room 208
10900 Euclid Ave
Cleveland, OH 44106

Civil and Environmental Engineering Department Seminar

*H*ydrothermal *AL*kaline *T*reatment (*HALT*): An Innovative Technology for Complete Destruction of Per- and Polyfluoroalkyl Substances (PFASs)

Timothy J. Strathmann
Professor, Colorado School of Mines, Department of Civil and Environmental Engineering

Date: Friday April 9, 2021, 12:45 – 2:00 PM
Meeting ID: 925 0263 5986 **Passcode**: 151477
https://cwru.zoom.us/j/92502635986?pwd=dkZEMWVocGZWL0UvQlJudlM4bHl5Zz09

Abstract. This webinar presents results from recent research in my laboratory where we developed a new technology for complete destruction of per- and polyfluoroalkyl substances (PFASs) in both aqueous and wet soil matrices, referred to as HALT: Hydrothermal ALkaline Treatment. HALT applies elevated temperatures (250 – 375° C) and pressures (5 – 22 MPa) to liquid phase water amended with low-cost alkalis (e.g., NaOH) to create unique reactive properties that promote rapid defluorination and destruction of PFASs. HALT is ideal for treating high moisture content wastes (e.g., water, wet soils, wastewater biosolids) contaminated with PFASs because input energy requirements are much less than competing thermochemical technologies (e.g., incineration, gasification, pyrolysis) because volatilization of water is avoided. Results will be presented showing treatment of a wide range of PFASs identified in in aqueous film-forming foam (AFFF) solutions and AFFF-impacted water and soil samples, including perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). This will include evidence obtained from high resolution liquid chromatography with quantitative time-of-flight mass spectrometry (LC-QToF-MS), nuclear magnetic resonance (^{19}F-NMR) spectroscopy, and fluoride ion analysis. Potential applications of this patent-pending technology will also be discussed.

Speaker Bio: Timothy Strathmann is a Professor in the Department Civil and Environmental Engineering at the Colorado School of Mines, and holds a collaborative researcher appointment at the National Renewable Energy Laboratory (NREL). He is also a member of the Re-inventing the Nation's Urban Water Infrastructure (ReNUWIt) Engineering Research Center. His research focuses on the development of innovative technologies for remediation and destruction of perfluoro- and polyfluoroalkyl substances (PFASs), and the advancement of hydrothermal processes for valorizing waste streams by producing fuels, fertilizers and other valuable products from these resources. Dr. Strathmann is the recipient of a National Science Foundation CAREER Award, and his research has been sponsored by DoD-SERDP, AFCEC, NSF, USDA, and DOE. His formal training includes a PhD in environmental engineering from Johns Hopkins, BS and MS degrees from Purdue, and postdoctoral training at Princeton University.