Course Title**: Disinfectant Residual Control in Water Distribution Systems**

*60 minutes of instruction*

Course Description: This 60-minute seminar will provide water system managers, operators and engineers a practical understanding of the conditions, chemistry and science behind affecting positive control of both chloramine and free-chlorine levels in water distribution systems.  Importantly, the second half of the seminar will present a suite of proven technologies that can be employed to automatically control disinfectant residual levels in real world water distribution systems.

Course Outline:

1. Background on the importance of controlling disinfectant residual levels in water systems
    a. Prevalence of low residual related MCL violations
    b. AWWA 2017 Disinfection Survey results
2. Nitrification
    a. Role of nitrifying bacteria in the destruction of water quality (chloramine systems)
    b. Operational procedures currently used to stave-off nitrification
3. The Breakpoint Curve – Understanding Fluctuating Residual Levels in Networks
    a. A simple explanation to a lot of chlorine based residual chemistry
    b. Requirements to controlling setpoint on a breakpoint curve
4. Equipment options and equipment form factors
    a. Roles of tank mixing, chemical feed, real-time water quality analysis and feedback algorithms
5. Case Studies:
    a. Automatic control of chloramine residuals in water networks
    b. Automatic control of chloramine residuals in water networks with multiple tanks
    c. Controlling free-chlorine residual versus chloramine residual

Presenter Bios:

**Ethan Brooke**
*Senior Product Manager, THM Removal System, PSI Water Technologies, Inc.*

Ethan Brooke is an internationally recognized expert on aeration technologies for trihalomethane (THM) removal. His master's thesis on THM aeration was published in the *Journal American Water Works Association* and resulted in three patents which are held by the University of New Hampshire. Ethan has a background in civil engineering and product management and has worked on a variety of water, wastewater and distribution system infrastructure improvement projects.

Learning Outcomes:

- Attendees will understand the conditions and basic chemistry of chloramine and free-chlorine residual destruction in water distribution systems
- Attendees will understand how the breakpoint curve can be used to intelligently boost residual levels in an automated mode versus today's manual and time-consuming methods

- Attendees will be able to understand the roles of various technology choices and form factors that can be specified and employed in water systems to stabilize and improve residual levels

Tracking of Attendance:

- When the invitation is sent out, it includes a registration link. This registration link requires them to enter in their contact information. That is captured in an Excel format into a spreadsheet. These spreadsheets are stored on our internal website for future needs to be accessed.