

Detection of microorganisms in water using online sensors

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Abstract

Despite the application of a multi-barrier, conventional approach for municipal water treatment, outbreaks associated with potable water continue to occur in the United States. Even finished waters meeting all regulated water quality parameters have been associated with outbreaks of infectious disease leading to adverse public health. A major concern with drinking water supplies is the introduction of pathogenic microorganisms from the distribution system. Microbial intrusion can occur due to breaks or leaks in the distribution system or deliberate acts of contamination (i.e., bioterrorism). Waterborne outbreaks caused by distribution system deficiencies have been linked to: 1) contamination of mains due to construction, repair or flushing; 2) inadequate separation of water main and sewer lines; 3) cross-connection, 4) broken or leaking water mains, 5) corrosion, 6) contamination of service lines, 7) contamination of household plumbing, and 8) contamination during storage. Moreover, online sensors can ensure the detection of contaminants found in potable water due to inadequate treatment or intentional contamination through acts of bioterrorism. The overall goal of this project is to use on-line sensor technology to demonstrate real-time detection of microbial contaminants in potable water within a model distribution system.

Specific objectives

1. Demonstrate real-time technology to ensure contaminant-free potable water, safeguarding public health
2. Utilize molecular and cultural assays to validate the use of online sensors that demonstrate the absence of microbial contaminants in potable water.