

Water Quality Surveillance and Response Systems Products to Help Utilities Improve Distribution System Monitoring and Management

The following is a comprehensive list of products, as of January 2018,
available on U.S. EPA's *Water Quality Surveillance and Response* website:

<https://www.epa.gov/waterqualitysurveillance>

Water Quality Surveillance and Response Overview

Water Quality Surveillance and Response System Introduction Video

This short video makes the business case for utilities to improve their distribution system surveillance and response capabilities, introduces the components of a Water Quality Surveillance and Response System, and directs the viewer to resources for implementation support. August 2015.

Water Quality Surveillance and Response System Primers

A Water Quality Surveillance and Response System (SRS) is a framework designed to support monitoring and management of distribution system water quality. The System Primer is a concise document that provides an overview of the design and purpose of an integrated SRS. Six additional Primers provide a description of each of the SRS components. EPA 817-B-15-002, May 2015.

Video Tutorials: Water Quality Surveillance and Response System Primers

These concise, user-friendly videos provide overviews of an SRS and its components. The system-level tutorial introduces each of the SRS components and discusses system-level design goals and performance objectives. The component tutorials discuss component-level design elements, design goals, performance objectives, and cost-effective approaches for implementation. March 2017.

Capabilities Assessment

Capabilities Assessment Tool for Water Quality Surveillance and Response Systems

This web-based tool presents a user with a brief series of questions to assess existing surveillance and response capabilities. The tool generates a custom report that summarizes existing capabilities, suggests potential enhancements, and lists potentially useful technical resources for implementing those enhancements. The tool is divided into modules, one for each of the six components of an SRS. **Expected release in July 2018.**

System Design and Information Management

Guidance for Developing Integrated Water Quality Surveillance and Response Systems

This document provides guidance for applying system engineering principles to the design of an SRS to ensure that the system functions as an integrated whole and performs its intended function. It covers topics including: project management, SRS master planning, information management, alert investigations, and training & exercise. EPA 817-B-15-006, October 2015.

Framework for Comparing Alternatives for Water Quality Surveillance and Response Systems

This document provides guidance for selecting the most appropriate SRS design from a set of viable alternatives. It guides the user through an objective, stepwise analysis for ranking multiple alternatives and describes, in general terms, the types of information necessary to perform this analysis. EPA 817-B-15-003, June 2015.

Information Management Requirements Development Tool

This tool helps utilities develop requirements for an SRS information management system, thereby preparing them to select and implement the most appropriate solution. Specifically, this tool guides users through the process of developing functional and technical requirements, and consolidating and prioritizing these requirements. EPA 817-B-15-004, November 2015.

Video Tutorials: Information Management Requirements Development Tool

This series of three video tutorials guides a user through the Information Management Requirements Development Tool. The first video introduces the tool, the second explains how to enter and rate functional and technical requirements, and the third describes how to consolidate requirements across different SRS components. **Expected release in February 2018.**

Dashboard Design Guidance for Water Quality Surveillance and Response Systems

This document provides guidance for designing an SRS dashboard, which is a visually-oriented user interface that integrates data from multiple SRS components to provide a holistic view of distribution system water quality. The document provides a description of common features and functions of a dashboard, along with example screenshots. It also presents a methodical process for establishing requirements for a dashboard. EPA 817-B-15-007, November 2015.

Guidance for Designing Communications Systems for Water Quality Surveillance and Response Systems

This document provides guidance and information to help utilities select an appropriate communications system to support operation of Online Water Quality Monitoring and Enhanced Security Monitoring. It provides rigorous criteria for rating communications system options, evaluates common technologies with respect to these criteria, describes the process for establishing requirements for a communications system, and provides guidance on selecting and implementing a system. EPA 817-B-16-002, September 2016.

Online Water Quality Monitoring

Online Source Water Quality Monitoring for Water Quality Surveillance and Response Systems

This document provides guidance to help drinking water utilities design a source water monitoring system using online water quality instrumentation. The document provides guidance on selection of water quality parameters and monitoring locations, design of monitoring stations and information management systems, and development of procedures to investigate and respond to unusual source water quality. EPA 817-B-16-003, September 2016.

Online Distribution System Water Quality Monitoring for Water Quality Surveillance and Response Systems

This document provides guidance to help drinking water utilities design an online water quality monitoring system for distribution systems. It introduces key concepts and directs readers to additional resources for guidance on specific technical elements of distribution system monitoring (e.g., designing monitoring stations and selecting sensor technologies). **Expected release in February 2018.**

Guidance for Building Online Water Quality Monitoring Stations

This document provides guidance for designing online water quality monitoring stations for both source water monitoring and distribution system monitoring applications. It describes different station designs and provides detailed design schematics; describes equipment required for basic stations as well as station accessories; and discusses considerations for fabricating and installing stations. **Expected release in February 2018.**

Selecting Online Water Quality Monitoring Sensor Technologies for Source Water and Distribution System Monitoring

This document provides an overview of sensor technologies that can be used to monitor various water quality parameters. It also addresses several considerations that can impact water quality instrument selection. **Expected release in Summer 2018.**

Exploratory Analysis of Time-series Data to Prepare for Real-time Online Water Quality Monitoring

This document describes methods for analyzing time-series water quality data to establish normal variability for each water quality parameter monitored at each location. It also describes how the results of this exploratory analysis can be used to develop tools and training to prepare utility personnel for real time analysis of online water quality data. EPA 817-B-16-004, November 2016.

Event Detection System Deployment, Integration and Evaluation System

A software application that supports real-time analysis of online water quality data, and allows users to evaluate historic water quality data to establish alerting parameters.

Enhanced Security Monitoring

Designing Enhanced Security Monitoring for Water Quality Surveillance and Response Systems

This document provides guidance for enhancing security monitoring at utility facilities in a distribution system that are determined to be at risk of intentional contamination. The document describes a process for selecting sites and equipment for security enhancements, evaluating communications and information management solutions, and developing procedures for investigating security alerts EPA 817-B-17-001, November 2017.

Commissioning Security Systems for Drinking Water Utilities

This document provides a step-wise process for verifying that security systems installed at drinking water utility facilities perform per specifications. EPA 817-R-12-002, February 2012.

Customer Complaint Surveillance

Designing Customer Complaint Surveillance for Water Quality Surveillance and Response Systems

This document provides guidance to help drinking water utilities design customer complaint surveillance to monitor for water quality problems. It uses the “filter, focus, funnel” approach to reliably detect unusual clusters of water quality complaints. The document also covers requirements for an information management system and procedures for investigating customer complaint alerts. [Expected release in January 2018.](#)

Threshold Analysis Tool & Alarm Estimation Tool

Two software tools that help water utilities develop alert thresholds for customer water quality complaints using statistical analysis of user-specified data. Establishing appropriate thresholds is an important step in designing customer complaint surveillance. June 2015.

Video Tutorials: Threshold Analysis Tool & Alarm Estimation Tool

A series of six videos that provide instruction on the use of these tools. There is one introductory video, one video about the alarm estimation tool, and four videos about the threshold analysis tool. [Expected release in January 2018.](#)

Public Health Surveillance

Public Health Surveillance Design Guidance for Water Quality Surveillance and Response Systems

This document provides guidance to help drinking water utilities work with their public health partners to implement public health surveillance as a component of an SRS. The document describes the roles and responsibilities of common public health partners, provides recommendations for establishing relationships with those partners, describes common public health surveillance systems, and provides guidance for developing a procedure to investigate public health alerts. EPA 817-B-16-001, July 2016.

Public Health Surveillance Assessment: Interview with Public Health Partners

A fillable form that utilities can use to engage their public health partners and document existing public health surveillance capabilities. Information collected on this form can be used as the foundation for building the public health surveillance component of an SRS. EPA 817-B-15-003, January 2015.

Video Tutorial: Training for Public Health Professionals on Recognition of Drinking Water Contamination

A video that provides basic information about the public health indicators of a possible drinking water contamination incident. The video also highlights the value of partnerships between public health agencies and local drinking water utilities in planning for the investigation of, and response to, a drinking water contamination incident. This video is a streamlined version of a live webinar, hosted in cooperation with CDC, which was delivered in 2014. February 2017.

Consequence Management

Designing Consequence Management for Water Quality Surveillance and Response Systems

This document provides guidance to help utilities prepare for a response to a possible drinking water contamination incident. It illustrates how planning for distribution system contamination incidents fits within the overall structure of an Emergency Response Plan. Guidance is also provided on practicing response procedures and working with external response partners. **Expected release in March 2018.**

Guide for Developing a Distribution System Contamination Response Plan

This product will help utilities to create a plan for responding to a possible drinking water contamination incident, as an annex or appendix to an existing Emergency Response Plan. The guide provides a detailed template and step-by-step instructions for building a “Distribution System Contamination Response Plan.” **Expected release in March 2018.**

Developing Risk Communication Plans for Drinking Water Contamination Incidents

This document provides guidance on developing an effective risk communication plan to guide communications with partner agencies and the public during the response to drinking water contamination incidents. EPA 817-F-13-003, April 2013.

Sampling and Analysis

Building Laboratory Capabilities to Respond to Drinking Water Contamination

This document provides guidance to assist drinking water utilities with building laboratory capabilities for responding to water contamination incidents. It presents contaminant classes of concern, lists analytical methods for contaminants from those classes, and provides information on the role of national laboratory networks in responding to drinking water contamination incidents. EPA 817-R-13-001, March 2013. **Updated version to be released in March 2018**

Building Field Capabilities to Respond to Drinking Water Contamination

This document provides guidance for planning and implementation of basic and advanced field response activities. Basic field response activities include visual site hazard assessment, sample collection, water quality parameter testing, and sample packaging and shipping. These activities can be performed by utility personnel with minimal additional training. Advanced activities include site safety screening, rapid field testing, and hazardous materials packaging and shipping which can be performed by emergency response partners or utility personnel with specialized training. EPA 817-R-16-001, January 2017.

Developing Contaminant Baselines for Emergency Response Sampling and Analysis

This document provides guidance for establishing baseline occurrence of contaminants, water quality indicators, and tentatively identified compounds in the distribution system. Sample results can then be compared to the baseline during drinking water contamination emergencies. Guidance is provided on selection of monitoring locations and criteria for determining if new monitoring is needed. **Expected release in Summer 2018.**

Training and Exercises

SRS Exercise Development Toolbox

An interactive software application designed to assist drinking water utilities in developing and conducting exercises based on realistic drinking water contamination scenarios. It guides users through a step-wise process to enter the information necessary to develop a drill or exercise and then generates the required documentation. Information entered by the user is stored for developing future exercises. February 2016.

Case Studies and Technical Evaluations

Summary of Implementation Approaches and Lessons Learned from the Water Security Initiative Contamination Warning System Pilots

This report summarizes implementation approaches and lessons learned from the five Contamination Warning System Pilots deployed under U.S. EPA's Water Security Initiative. It presents information for each of the surveillance and response components, as well as the integrated system, in a manner useful to future implementers of similar systems. EPA 817-R-15-002, October 2015.

Water Security Initiative: Cincinnati Pilot Post-Implementation System Status

This report provides a detailed description of the design of the contamination warning system deployed in Cincinnati, OH under U.S. EPA's Water Security Initiative. In addition to describing the design of each component of the system, this report breaks down the cost of the system. EPA 817-R-08-004, September 2008.

Water Security Initiative: System Evaluation of the Cincinnati Contamination Warning System Pilot

This report presents the results of a comprehensive technical evaluation of the Cincinnati contamination warning system pilot. The evaluation includes an assessment of the operation, performance, and sustainability of the system. Six additional reports provide a detailed technical evaluation of each of the SRS components. EPA 817-R-14-001, April 2014.

Philadelphia Water Department Case Study

A series of fourteen whitepapers that describe the implementation approach and lessons learned during deployment of Philadelphia Water Department's SRS. The whitepapers cover each component of the SRS as well as information management systems necessary for a fully integrated system. May 2013.

Water Quality Event Detection System Challenge: Methodology and Findings

This report summarizes the results of an extensive study into the performance of water quality event detection systems available at the time of the study. The report also provides a detailed description of the evaluation methodology, facilitating its application by other investigators. EPA 817-R-13-002, April 2013.

Final Report of the Contamination Warning System CIPAC Workgroup

This report summarizes the finding of an independent evaluation of U.S. EPA's Water Security Initiative, performed by a workgroup formed under the Water Sector Coordinating Council and Water Government Coordinating Council. The report presents the consensus findings of the workgroup and its recommendations for the future direction of the Water Security Initiative. March 2012.

For more information



To access these products, visit EPA's *Water Quality Surveillance and Response* website at <http://www.epa.gov/waterqualitysurveillance>.

Contact us at WQ_SRS@epa.gov if you'd like to learn about training opportunities for these products.