



Learn, Design, and Implement for Water Quality Surveillance and Response

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



*The Intelligent Water Network Summit
Surveillance and Response Systems
(Panel 2, 1:15)*

February 12, 2018
Alexandria, VA

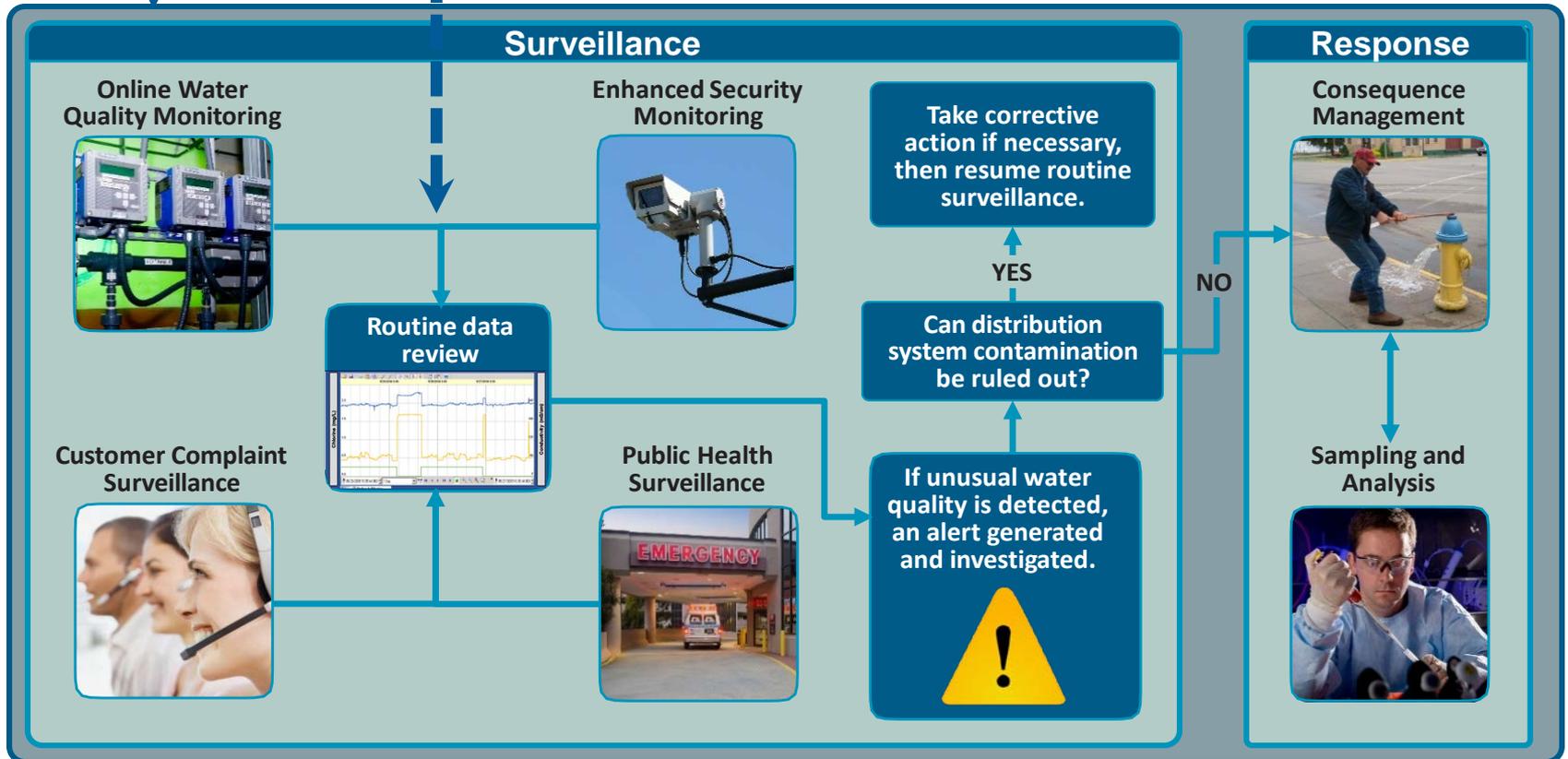


Surveillance and Response System Architecture

Source Water Monitoring



Advanced Metering Infrastructure





Water Quality Surveillance and Response

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Defining information management system requirements is a critical step in the design of an effective SRS. [Learn more about defining requirements.](#)



1 2 3 4

Other Resources

- [Water Resilience](#)
- [Contamination detection research](#)

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Learn



- [Surveillance and response system \(SRS\) fact sheet](#)
- [SRS primers](#)
- [SRS case studies](#)

Design



- [Assess existing SRS capabilities](#)

Implement



- [Access guidance and tools](#)
- [Develop and conduct exercises](#)



SRS Guidance and Tools

Environmental Topics

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Water Quality Surveillance
& Response Home

Primers

Case Studies

Design a Surveillance &
Response System

Guidance & Tools

Water Quality Surveillance and Response Systems Guidance and Tools

EPA offers documents and tools to support the design and implementation of Surveillance and Response Systems.

- [System Design Resources](#)
- [Online Water Quality Monitoring Resources](#)
- [Enhanced Security Monitoring Resources](#)
- [Customer Complaint Surveillance Resources](#)
- [Public Health Surveillance Resources](#)
- [Consequence Management Resources](#)
- [Sampling and Analysis Resources](#)





Example of Customer Complaint Surveillance Resources



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Primers

Case Studies

Design a Surveillance &
Response System

Guidance & Tools

Water Quality Surveillance and Response System Customer Complaint Surveillance Resources

These products support the design and implementation of Customer Complaint Surveillance (CCS), a component of a Surveillance and Response System (SRS).

- [Threshold Analysis Tool](#) (4 pp, 4 MB) A software tool used to develop alert thresholds for customer water quality complaints.
- [Alarm Estimation Tool](#) (1 pg, 269 K) A spreadsheet tool used to estimate the number of CCS alerts generated at a given alert threshold.

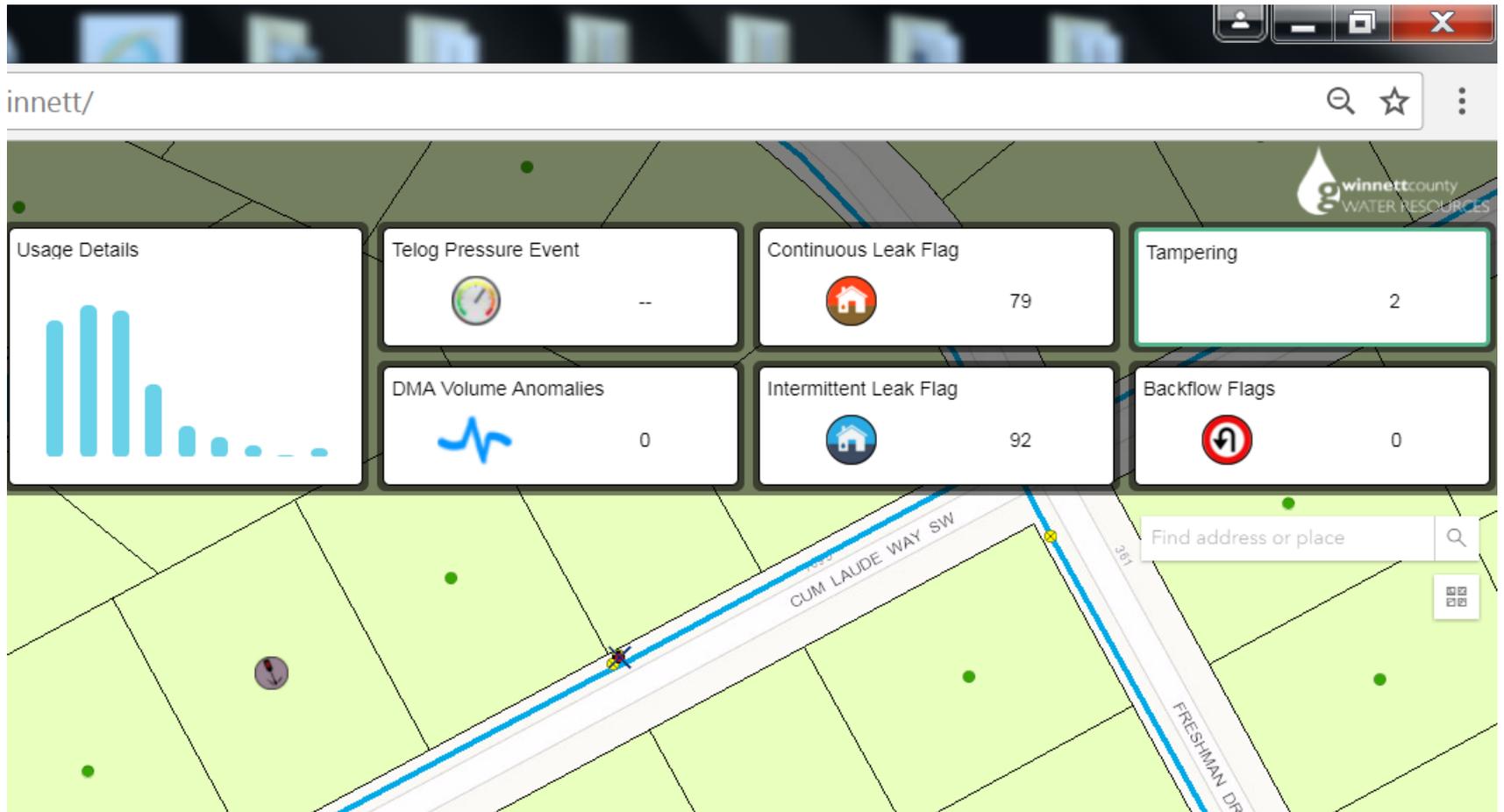
You may need Adobe Reader to view files on this page. See EPA's [About PDF page](#) to learn more.

- [Evaluation of the Customer Complaint Surveillance Component of the Cincinnati Contamination Warning System Pilot \(PDF\)](#)

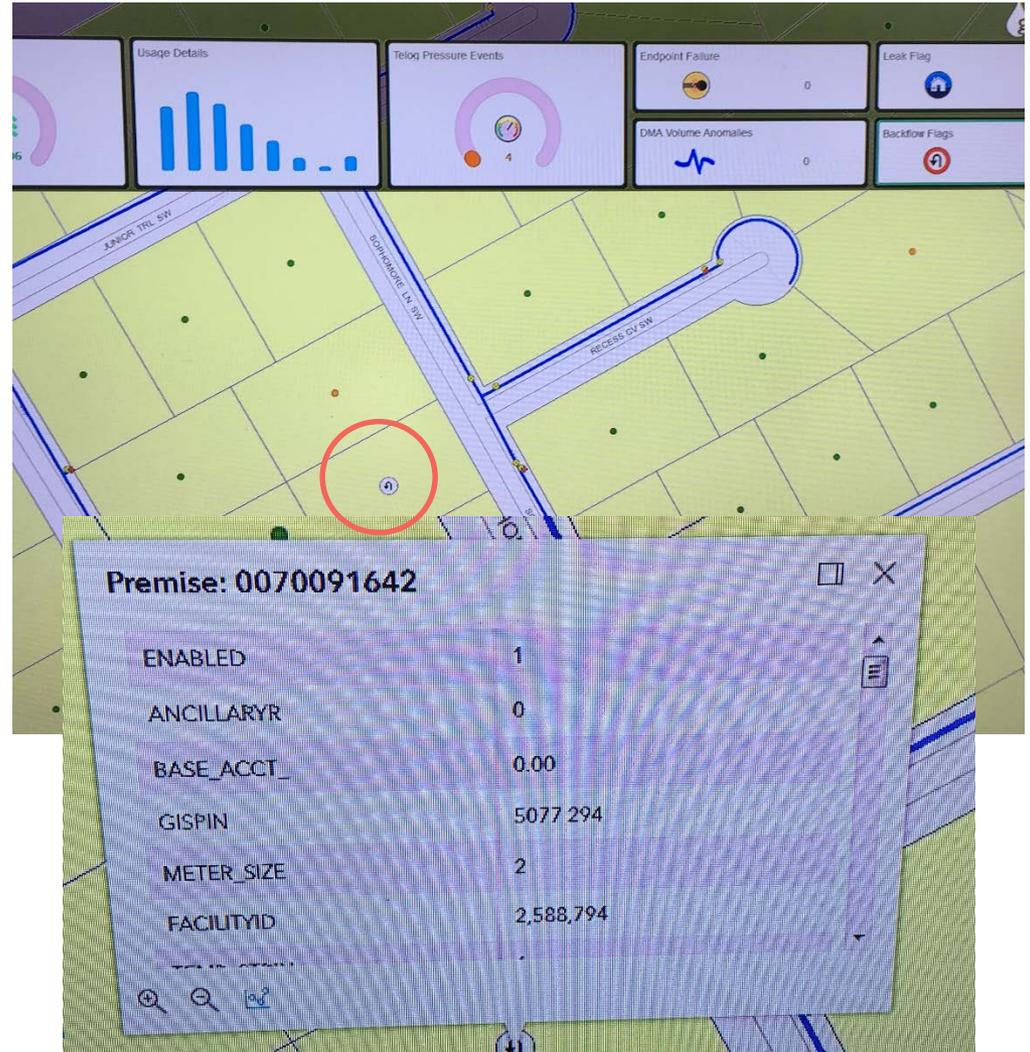
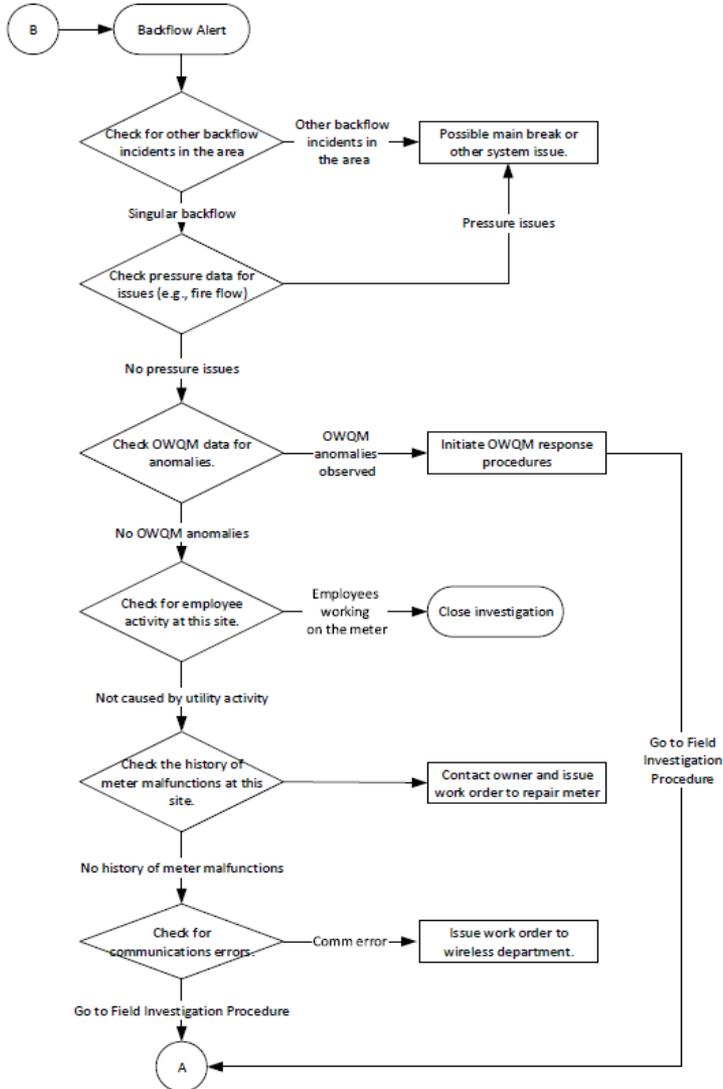
(24 pp, 2 MB)

This component monitors water quality complaint data to identify abnormally high volumes or spatial clustering of complaints that may be indicative of drinking water contamination.

AMI: Tampering Alerts



Response Flow Chart for Backflow Alerts





Free Downloads:

The screenshot shows a web browser window with the following elements:

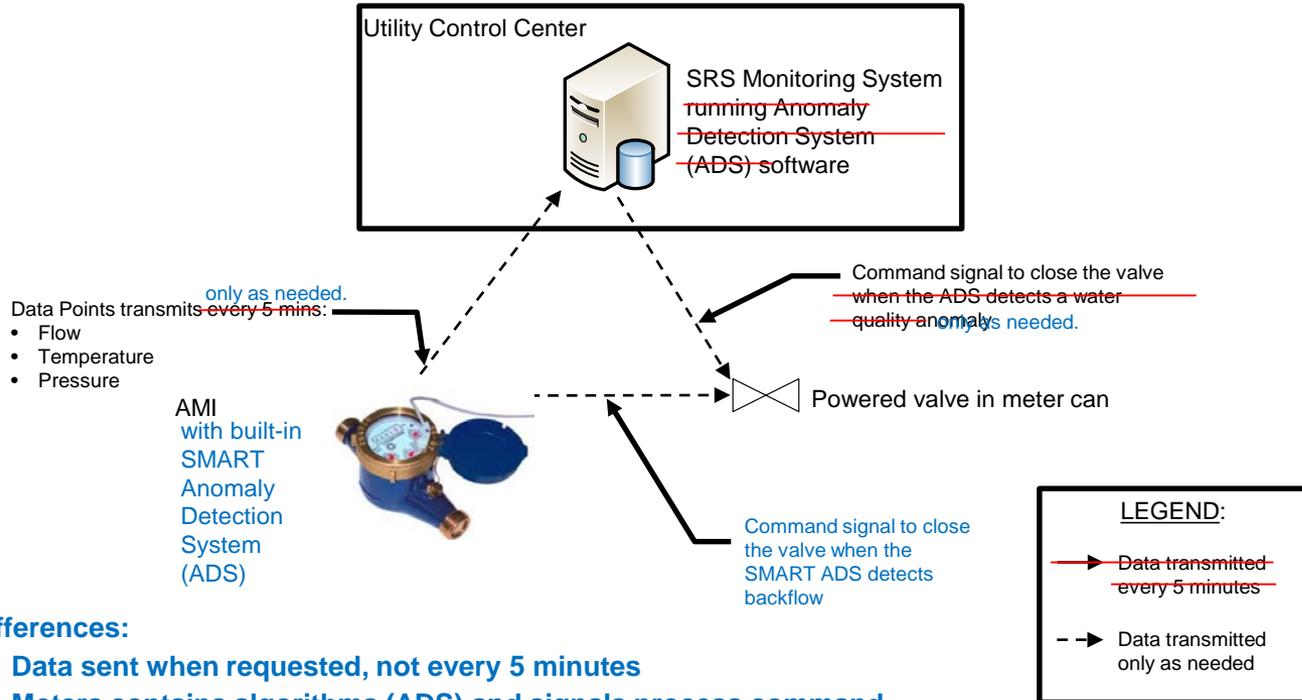
- Address Bar:** https://www.epa.gov/sites/production/files/2016-09/documents/srs_communications_guida
- Page Header:** EPA United States Environmental Protection Agency
- Section-Header:**

Guidance for Designing Communications Systems For Water Quality Surveillance and Response Systems
- Image Row:** Four circular images showing water quality monitoring equipment, a water tower, a power line tower, and a computer monitor.
- Table of Contents (Left Sidebar):**
 - Section 1: Introduction
 - Section 2: Evaluation Criteria
 - Section 3: Communications Technologies
 - Section 4: SRS Component Requirements for Communications Systems
 - Section 5: Selecting a Communications System
 - Section 6: Design and Implementation
 - Section 7: Looking Ahead
 - Resources
 - References
 - Glossary
- Taskbar:** Shows various application icons (Windows, Internet Explorer, VLC, File Explorer, Skype, Outlook, PowerPoint) and a system clock indicating 12:45 PM on 10/6/2016.



Advanced Metering Infrastructure ~~Traditional Interconnect~~

The future of SMART AMI w/ Peer to Peer (P2P) Architecture with At-The-Edge Processing?



Differences:

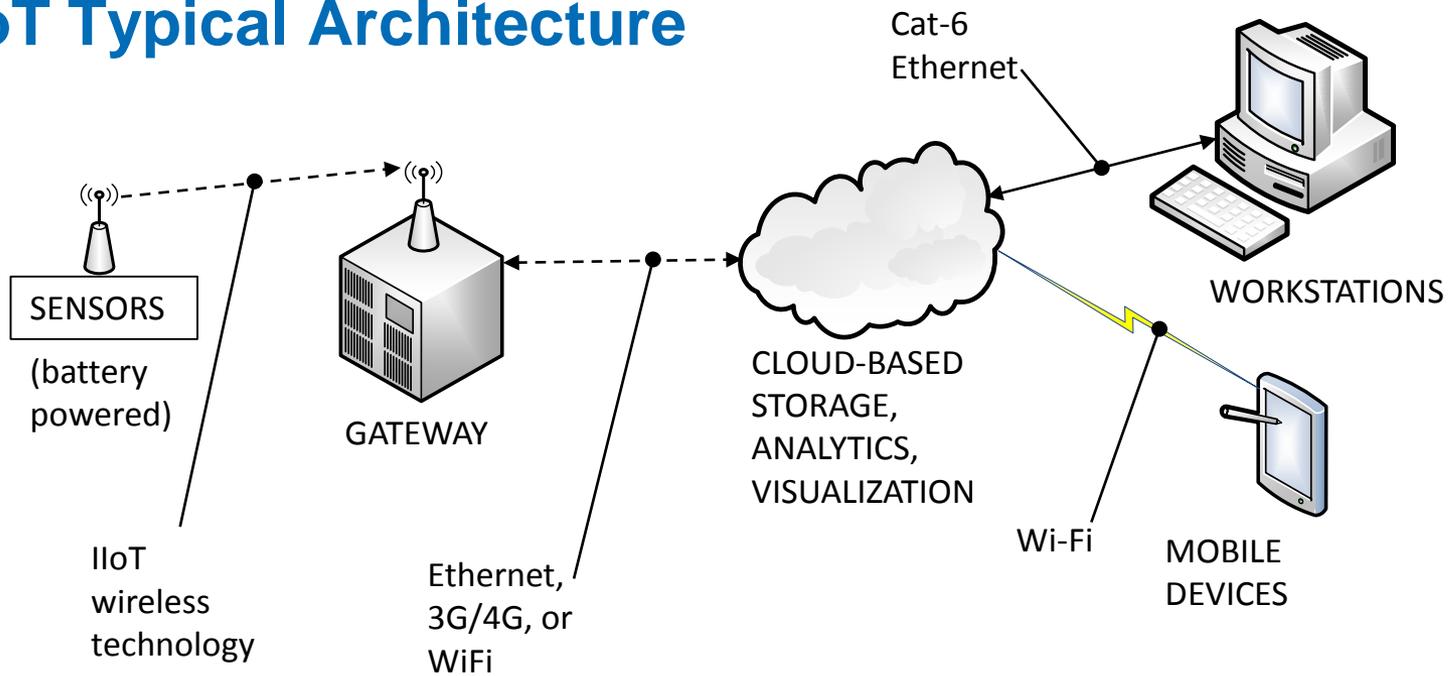
- Data sent when requested, not every 5 minutes
- Meters contains algorithms (ADS) and signals process command



Industrial Internet of Things (IIoT)

- 50 Billion things predicted to be connected to the Internet by 2020.
- Things for the water industry = sensors that are battery powered and generate small amounts of data
- IIoT requires low power, low bandwidth wireless communications technologies
 - Unlicensed frequencies: SigFox, LoRaWAN
 - Licensed frequencies (cellular answer to SigFox and LoRaWAN):
 - NB-IoT, LTE CAT-M

IloT Typical Architecture



Key Takeaways

- **SRSs can be implementable, sustainable and effective**
 - Dual use benefits
 - Adaptive as data streams can be added
- **Technology will continue to evolve**
 - IIOT, analytics, and communications continue to progress and get SMART. Security will always be a factor.
- **Guidance and other tools are available**
 - The EPA SRS team is looking to partners to showcase component implantation



For More Information

Water Quality Surveillance and Response System Website

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

Learn

- [Surveillance and Response System \(SRS\) basics](#)
- [SRS components](#)
- [SRS case studies](#)

Assess

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Implement

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