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Part 2
Emergency Preparedness in the Water Sector

Wyoming Association of Rural Water Systems
April 23, 2015

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Water Security Division
Office of Ground Water and Drinking Water
USEPA

Starting Preparedness Discussions

- **Helping Your Community Understand…Overview of Drinking Water and Wastewater Infrastructure**
- **Understanding ALL (or at least MORE) of the Angles…A Day Without Water**
- **Tools and Resources to Help YOU Get Your Message Out…Community Based Water Resiliency**

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Why is Communications Important?

- Treatment plant operators are First Responders…YOU may have to communicate with other responders, media, elected officials, and the public

- YOU must advocate for your system
  - Do you need more/different/better equipment to do your job?
  - Do you need more staff?
  - Do you need community-wide support to make system improvements?
- YOU ARE “The Face of the Plant” in YOUR community
- You NEED to drive Water Sector Preparedness!

What Do I Say???

K.I.S.S.

- Keep
- It
- Simple
- $tup!d

Translation

- Most people know little about water treatment
- Messages must be clear and concise
- People will help if they know what you need

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Communication Tips

DO

- Be prepared
- Designate a spokesperson
- Provide complete, accurate, and timely information
- Tell the truth
- Express empathy
- Acknowledge uncertainty and offer to get back with more information later
- Document your communications

DO NOT…

- Speculate on cause or outcome of incidents
- Blame or debate
- Minimize or brush off concerns of customers
- Treat community inquiries as annoying distractions from real business of emergency response

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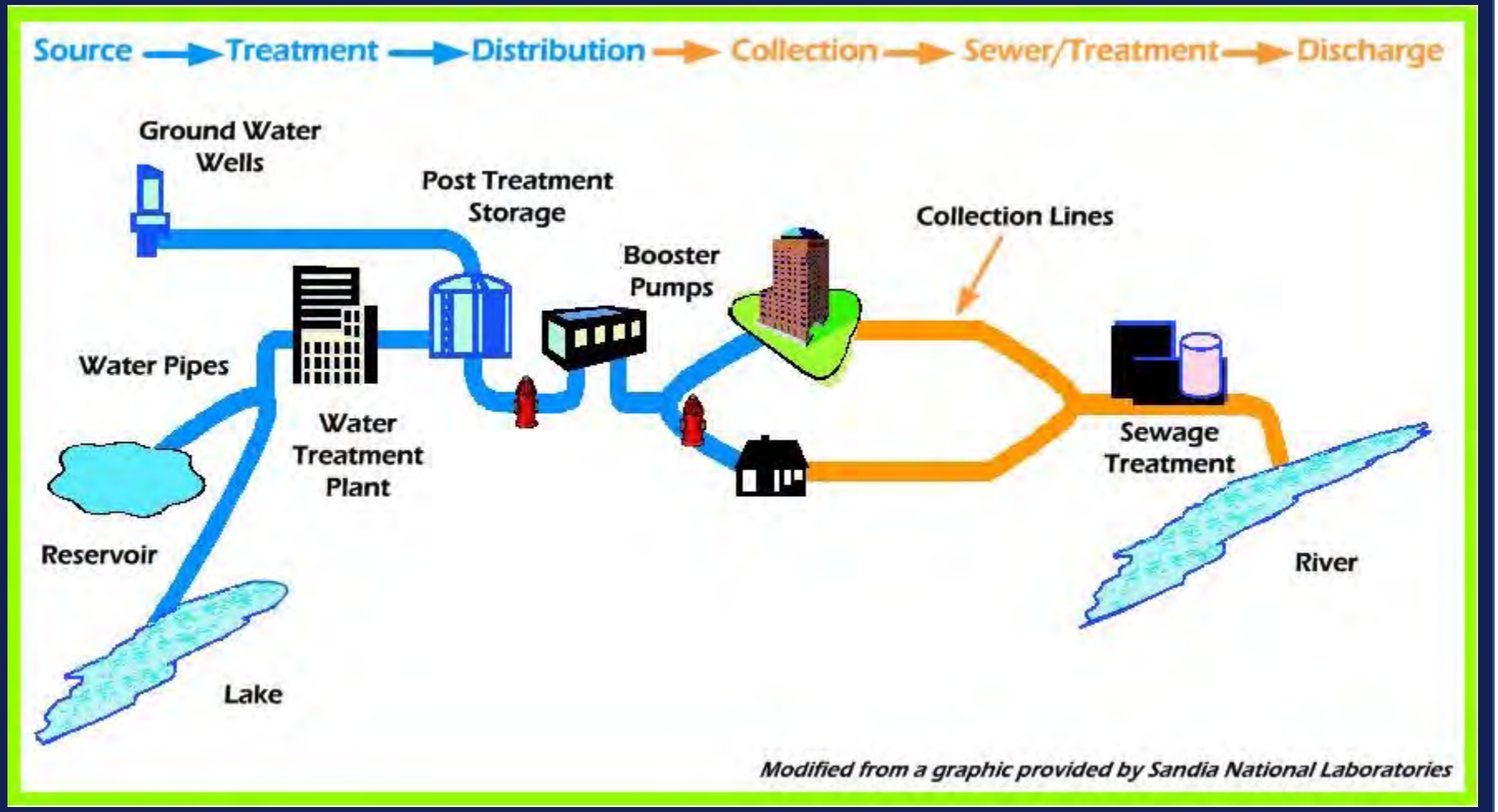
Emergency Response Begins with PREPAREDNESS…

Explaining Basic Water Treatment

Life Cycle of Water Treatment



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Setting the Stage for Response by Explaining IN ADVANCE What “Water System” or “Assets” Means

Water Assets in the U.S.

- **Over 153,000 public drinking water systems**
- **Over 16,000 Publicly Owned Treatment Works**
- Assets include:
  - Water intakes
  - Treatment facilities
  - Reservoirs and storage tanks
  - Distribution lines
  - Collection Systems
  - Pumping stations
  - Hydrants and residential/commercial taps
  - Cyber control systems
  - Treatment chemicals
  - Human resources

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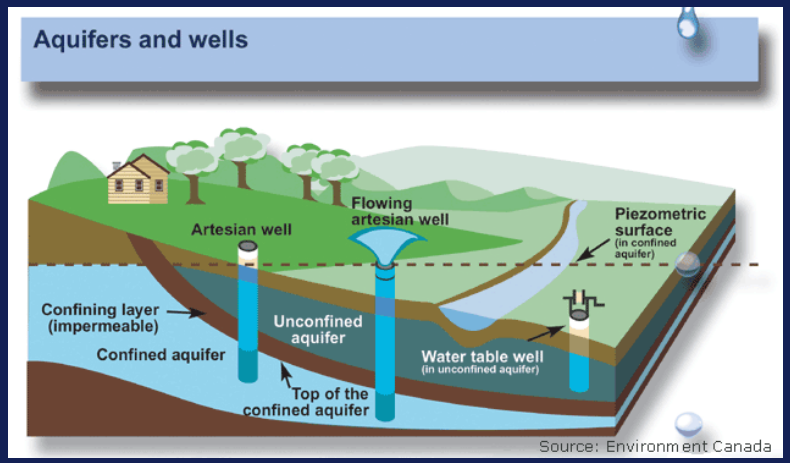
Drinking Water Sources

- Surface water:
  - 12,000 systems serve over 200 million people

- Ground water:
  - 40,000 systems serve 90 million people



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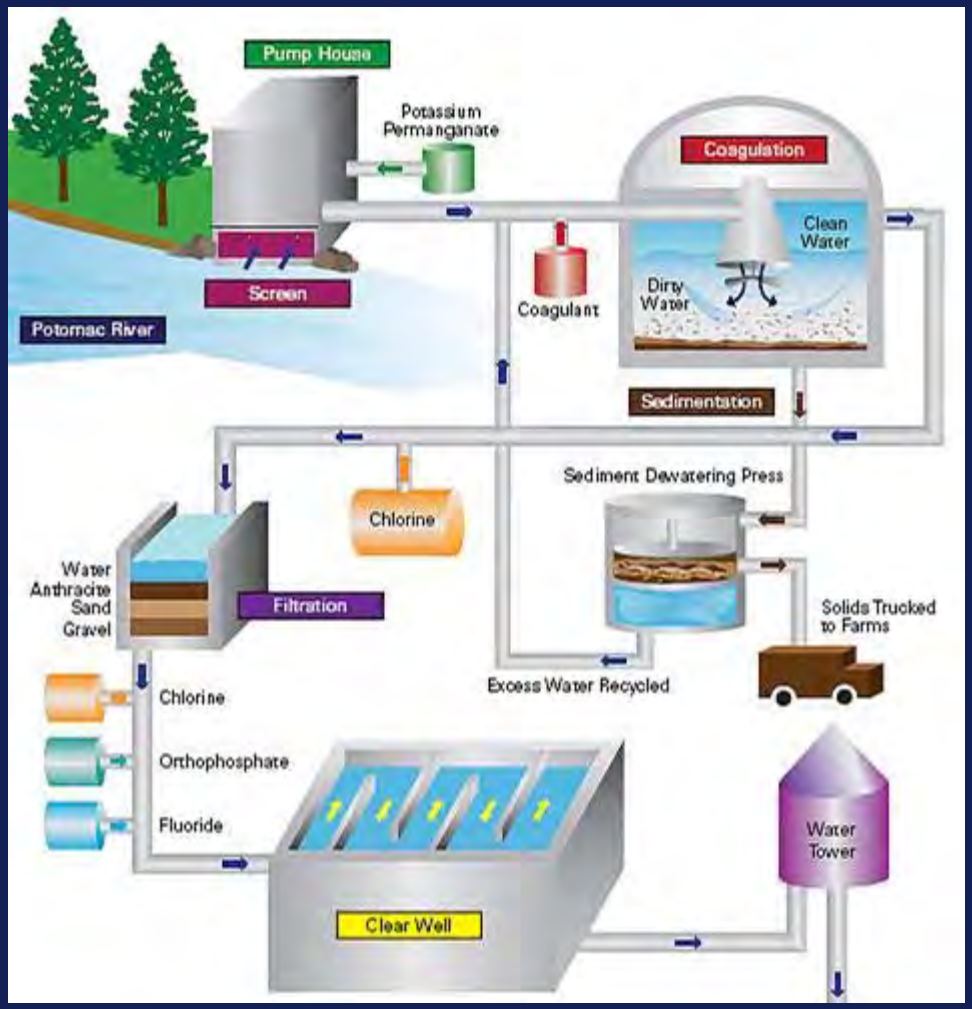
Digging Deeper

Making Sure the Right People Have the Right Knowledge

Drinking Water Treatment Facility



Source: http://www.rockvillemd.gov/environment/drinking-water/treatment.html

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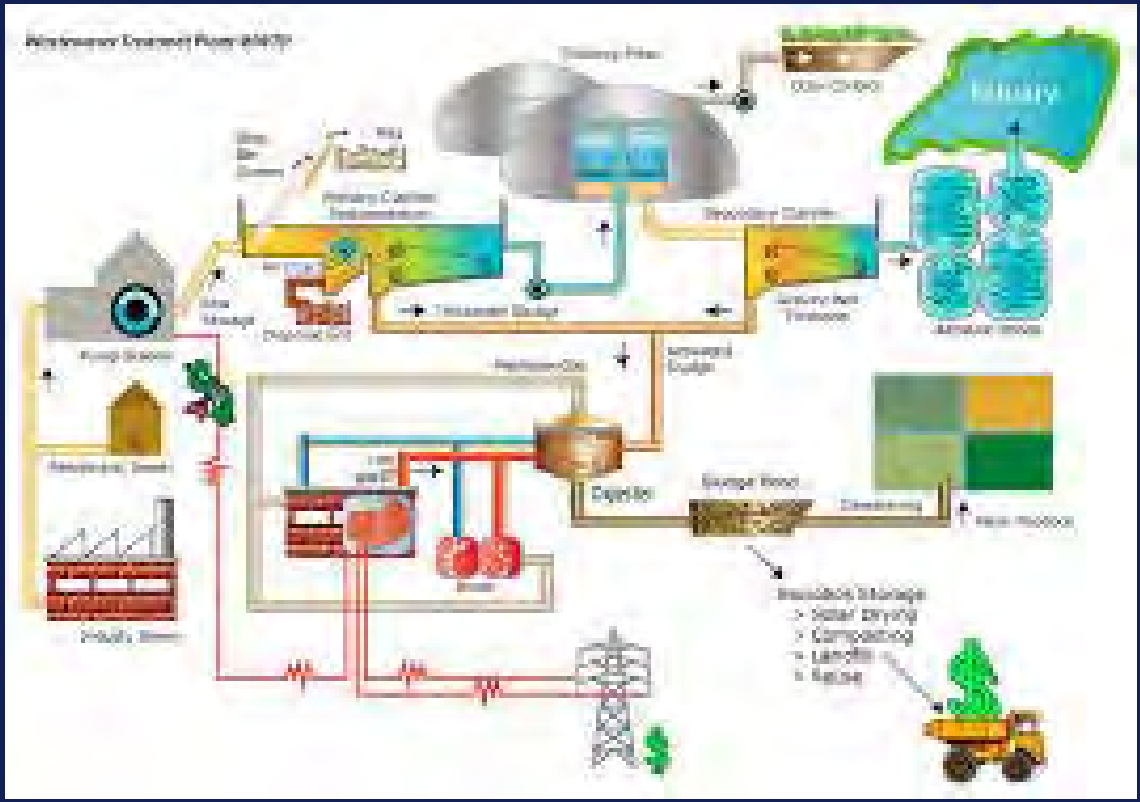
Wastewater Treatment Facility



Chemicals at Treatment Facilities

- Water-Reactive
  - Ammonia (anhydrous)
  - Ammonia (liquid)
  - Sulfur dioxide
- Highly Flammable
  - Methane
  - Propane
  - Hydrogen sulfide
- Explosive & Strong Oxidizing Agents
  - Chlorine dioxide
  - Hydrogen peroxide
- Strong Oxidizing Agents
  - Chlorine
  - Liquid Oxygen

Who might need to know what you store on site?

SCADA System

- Supervisory Control and Data Acquisition (SCADA) system
  - Controls many drinking water and wastewater systems

- Electronic network links monitoring system and controls for:
  - Drinking water system
    - Treatment
    - Distribution
  - Wastewater system
    - Collection
    - Treatment
    - Discharge

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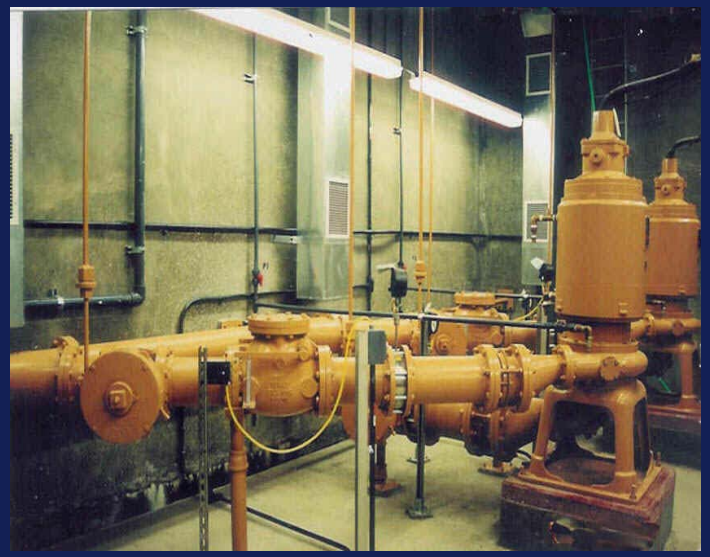
Wastewater System Components



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So…Who are the "Right" People?

Imagine a Day Without Water…

How would you meet your needs for:

- Drinking water
- Sewage disposal and sanitation
- Firefighting

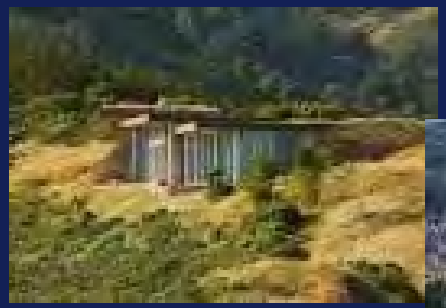
What about…

- Food processing and manufacturing
- Energy, transportation, and banking
- Hospitals, nursing homes, and dialysis services
- Aquaculture and agriculture

Infrastructure failures are not a matter of "if" they are a matter of "when"…we all need to be prepared and plan ahead.

Does Your Community Suffer from “Not Me” Syndrome……or Why Me?

I live way above the river…
…I won’t flood



I live on a lake…
…there’s PLENTY of water

My utility has a generator and a back-up chemical provider!

When “Not Me” Becomes “Why Me?”

May 12, 2010; BNSF train derails south of Thermopolis at the north end of Wind River Canyon.

Two engines derailed after hitting a rockslide. Two engines derailed; one of which split in two and was leaking diesel fuel and oil into the river.

Several towns downstream, including Thermopolis, suspending drinking water treatment. Booms were setup and crews siphoned off the diesel and oil but Thermopolis had to operate on reserve water tanks and wells to supply the community.

Natural Disasters

<u>Domestic Examples:</u>

- Colorado Floods
- Hurricane Sandy
- Western States Droughts & Wildfires
- Yellowstone Supervolcano??

<u>International Examples:</u>

- Christchurch, NZ and Haiti Earthquakes
- Japan Tsunami & Nuclear Crisis

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Water Terrorism…a Snapshot

There is a long history of using water as a political or military target or tool, going back over 2,500 years. Water resources and systems are attractive targets because there is no substitute for water. (Gleick).

- 1748 United States Yes Ferry house on Brooklyn shore of East River burns down. New Yorkers accuse Brooklynites of having set the fire as revenge for unfair East River water rights.
- 2003 United States No: threat Al-Qaida threatens US water systems via a call to a Saudi Arabian magazine. Al-Qaida does not “rule out. . .the poisoning of drinking water in American and Western cities”.
- 2003 United States Yes Four incendiary devices were found in the pumping station of a Michigan water-bottling plant. The Earth Liberation Front (ELF) claimed responsibility, accusing Ice Mountain Water Company of “stealing” water for profit. Ice Mountain is a subsidiary of Nestle Waters.
- 2003 Colombia Yes A bomb blast at the Cali Drinking Water Treatment Plant killed three workers May 8. The workers were members of a trade union involved in intense negotiations over privatization of the water system.
- 2003 Jordan No: threat Jordanian authorities arrested Iraqi agents in connection with a failed plot to poison the water supply that serves American troops in the eastern Jordanian desert near the border with Iraq.
- 2003 Iraq Yes Sabotage/bombing of main water pipeline in Baghdad. The sabotage of the water pipeline was the first such strike against Baghdad’s water system, city water engineers said. An explosive was fired at the six-foot-wide water main in the northern part of Baghdad, according to the chief engineer for the city’s water treatment plants.
- 2003–2004 Sudan Yes The ongoing civil war in the Sudan has included violence against water resources. In 2003, villagers from around Tina said that bombings had destroyed water wells. In Khasan Basao they alleged that water wells were poisoned. In 2004, wells in Darfur were reportedly contaminated as part of a strategy of harassment against displaced populations.
- 2004 Pakistan Yes In military action aimed at Islamic terrorists, including Al Qaida and the Islamic Movement of Uzbekistan, homes, schools and water wells were damaged and destroyed.
- 2004 India, Kashmir Yes Twelve Indian security forces were killed by an IED planted in an underground water pipe during “counter-insurgency operation in Khanabal area in Anantnag district”.
- 2006 Sri Lanka Yes Tamil Tiger rebels cut the water supply to government-held villages in northeastern Sri Lanka.

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What if Things Were Different?

What if:

- Citizens and community leaders understood impacts of water service interruptions *before* they happened…and prepared for them?
- Area ranchers and businesses factored water service interruptions into emergency plans supplies and could continue operating normally during service interruption?
- Law Enforcement coordinated with utilities and knew what assets needed protecting?
- Public health officials, animal health officials, and emergency managers coordinated emergency response plans with utilities so services are preserved/restored quickly?

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CBWR Addresses “What if…?”

- Brings utilities together with:
  - City/county managers
  - Human and animal health officials
  - Business community
  - Law enforcement
  - Emergency management officials
  - Members of the public
- Increases preparedness *at the community level* by:
  - Increasing understanding of critical interdependencies
  - Highlighting multiple benefits of preparedness
  - Improving integration of Water Sector into community emergency preparedness and response efforts
  - Assisting water utilities convey the message that utility personnel *are* emergency responders!

Communities, as a whole, are more resilient in the event of a water service interruption

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Do I Need ALL These People?

- All emergencies are local, all responses are local
- Threats and vulnerabilities vary by community

Water service interruptions can have serious economic, environmental, psychological, and public health consequences on a community. Resilient communities can significantly reduce these risks at negligible cost.

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Suite of CBWR Resources

EPA United States Environmental Protection Agency

Understanding Water Sector Interdependencies

Water Sector Infrastructure Interdependencies

Water is essential to life; human health, the economy, and many community services rely on water. Water infrastructure damage can adversely affect the operation of all other critical infrastructure sectors. In turn, damage to other critical infrastructure sectors could negatively affect drinking water and wastewater services, thereby creating an infrastructure interdependency. *Infrastructure interdependencies* are defined as the relationships between two or more critical infrastructures.

"Communities often ignore the needs of water and wastewater utilities until they experience a loss of service."
– Don Brousard, WSCC Chair

Critical Infrastructures are the physical and virtual assets, systems, or networks that are necessary for the functioning of society and the economy. The water sector, comprised of both drinking water and wastewater utilities, has been designated by the U.S. Department of Homeland Security (DHS) as one of 18 critical infrastructure and key resource (CIKR) sectors[1]. As a CIKR, the protection of the nation's water supply infrastructure is a top priority for the U.S. Environmental Protection Agency (EPA), the designated Sector-Specific Agency (SSA) for the water sector. EPA continues to work with other federal agencies, state drinking water programs, private sectors, and the public to increase preparedness and improve community resiliency in the face of water service interruptions.

Water Sector Critical Infrastructure

In the United States, public drinking water and wastewater infrastructure includes approximately:

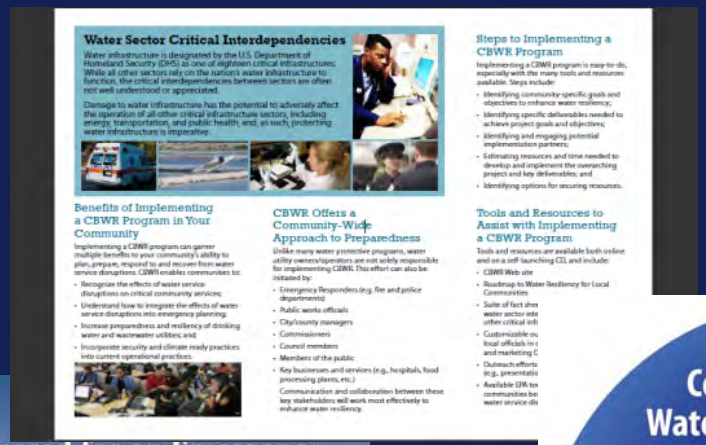
- 160,000 public drinking water systems (PWSs) that provide drinking water to about 84% of the U.S. population; 2.3 million miles of drinking water distribution system piping
- 16,000 publicly owned treatment works (POTWs) that provide sewage treatment to approximately 75% of the U.S. population

Demonstrated Interdependencies with the Water Sector

The following CIKR and/or community services share interdependencies with the water sector, and may be negatively affected in the event that drinking water and/or wastewater services are not available:

- Emergency services
- Healthcare facilities
- Schools
- Transportation
- Energy Production
- Postal and shipping services
- Telecommunications
- Food and beverage production and preparation

[1]For additional information on critical infrastructure and key resources, please visit: www.dhs.gov/files/programs/gc_1189168948944.shtm



Water Sector Critical Interdependencies

Water infrastructure is designated by the U.S. Department of Homeland Security (DHS) as one of eighteen critical infrastructures. While all other sectors rely on the nation's water infrastructure to function, the critical interdependencies between sectors are often not well understood or appreciated.

Damage to water infrastructure has the potential to adversely affect the operation of all other critical infrastructure sectors, including energy, transportation, and public health; and, as such, protecting water infrastructure is imperative.

Benefits of Implementing a CBWR Program in Your Community

Implementing a CBWR program can garner multiple benefits to your community's ability to plan, prepare, respond to and recover from water service disruptions. CBWR enables communities to:

- Recognize the effects of water service disruptions on critical community services;
- Understand how to integrate the effects of water service disruptions into emergency planning;
- Increase preparedness and resiliency of drinking water and wastewater utilities; and
- Incorporate security and climate ready practices into current operational practices.

CBWR Offers a Community-Wide Approach to Preparedness

Unlike many water protection programs, water utility owners/operators are not solely responsible for implementing CBWR. This effort can also be initiated by:

- Emergency Responders (e.g. fire and police departments)
- Public works officials
- City/county managers
- Commissioners
- Council members
- Members of the public
- Key businesses and services (e.g., hospitals, food processing plants, etc.)

Communication and collaboration between these key stakeholders will work most effectively to enhance water resiliency.

Steps to Implementing a CBWR Program

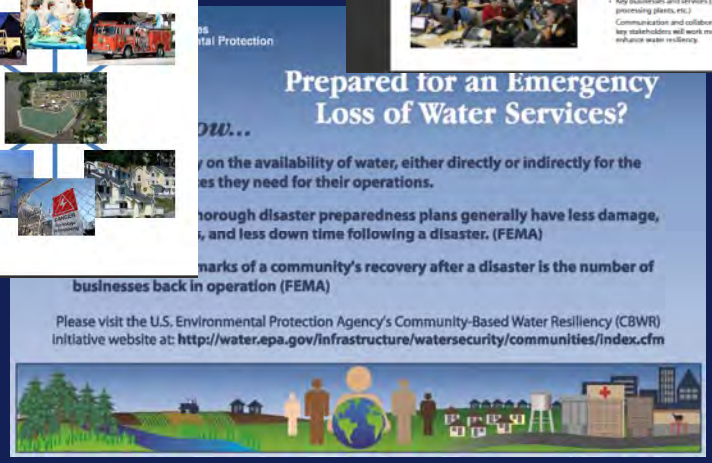
Implementing a CBWR program is easy-to-do, especially with the many tools and resources available. Steps include:

- Identifying community-specific goals and objectives to enhance water resiliency;
- Identifying specific deliverables needed to achieve project goals and objectives;
- Identifying and engaging potential implementation partners;
- Estimating resources and time needed to develop and implement the overarching project and key deliverables; and
- Identifying options for securing resources.

Tools and Resources to Assist with Implementing a CBWR Program

Tools and resources are available both online and on a self-launching CD, and include:

- CBWR Web site
- Roadmap to Water Resiliency for Local Communities
- Suite of fact sheets
- Customizable outreach
- Outreach efforts
- Available EPA tools



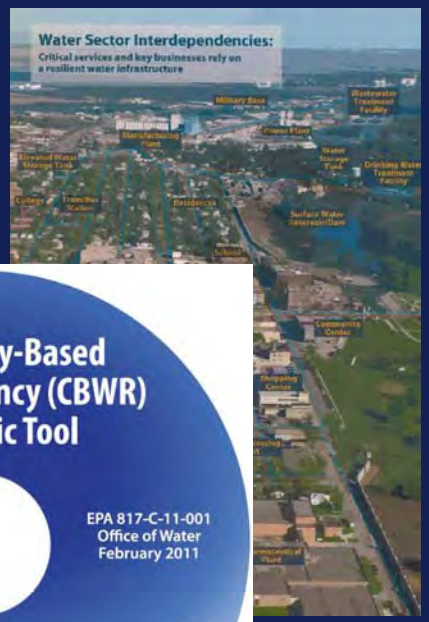
Prepared for an Emergency Loss of Water Services?

...on the availability of water, either directly or indirectly for the ...es they need for their operations.

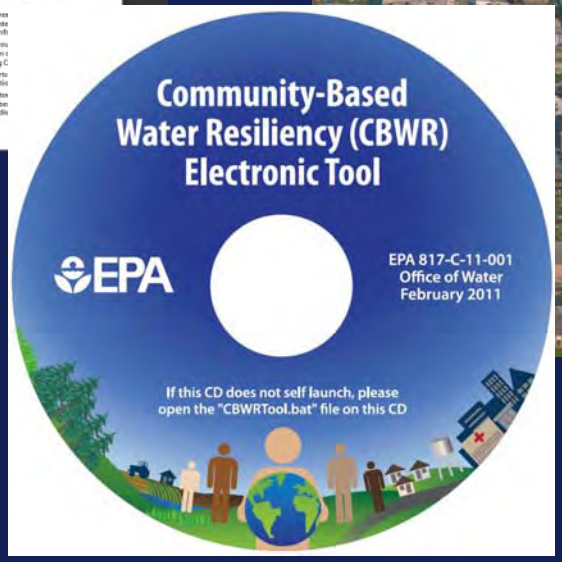
...horough disaster preparedness plans generally have less damage, ..., and less down time following a disaster. (FEMA)

...marks of a community's recovery after a disaster is the number of businesses back in operation (FEMA)

Please visit the U.S. Environmental Protection Agency's Community-Based Water Resiliency (CBWR) Initiative website at: http://water.epa.gov/infrastructure/watersecurity/communities/index.cfm



Water Sector Interdependencies:
Critical services and key businesses rely on a resilient water infrastructure



Community-Based Water Resiliency (CBWR) Electronic Tool

EPA

EPA 817-C-11-001
Office of Water
February 2011

If this CD does not self launch, please open the "CBWRTool.bat" file on this CD

What's New! with CBWR?

CBWR Widget

CBWR Video

E-Tool Update

What's a Widget?

- Electronic 'button' you add to your website
- Ours links to CBWR page & e-Tool

What's the video about?

- Lessons learned

- What's on updated tool?
  - > 400 free tools and resources
- Where Can I get them?

Water.epa.gov/infrastructure/watersecurity/communities

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Video #1

A Day Without Water

https://www.youtube.com/watch?v=xNJ2qgWYbUo

Community-Based Water Resiliency Tool

Home | Self Assessment | Toolbox | About CBWR | Contact Us

Return users can go straight to the CBWR Toolbox!

Welcome

using EPA's Community-Based Water Resiliency (CBWR) tool!

u'll find this an easy and interesting way to assess your
's current resiliency and learn more about Water Sector
pendencies. Preparing for a water service interruption can help your community foster the relationships, and gather the resources, needed in advance to avert potential crises.

If this is your first time using the CBWR tool, we recommend y
Self Assessment. You'll need about 15 - 20 minutes to comp
and afterwards you'll receive a tailored summary report wi
on tools and resources that can help your community enha
resiliency.

Beginners Start Here

Let's Get Started

If you've already completed the Self Assessment, or are looking for a specific water resiliency tool, you can go directly to the **CBWR Toolbox.**

Community-Based Water Resiliency Tool

Home | Self Assessment | Toolbox | About CBWR | Contact Us

CBWR Self Assessment

Please select stakeholder group to begin the self assessment

Water Utility

Healthcar
Pu

Emergency Services

Local Official / Community Partner

We've developed tailored sector-specific self-assessment modules

Community-Based Water Resiliency Tool

Home | Self Assessment | Toolbox | About CBWR | Contact Us

I Represent the Emergency Services Sector

As an Emergency Services Sector (ESS) representative, you will often be the first responder to an incident that affects the safety of your community's drinking water and/or wastewater services. For both response and preparedness planning, it is critical that you have a basic understanding of the drinking water and wastewater systems servicing your community, the chemicals used/stored at each facility, as well as the capabilities and vulnerabilities of the utilities. To build community resiliency you should identify and understand the interdependencies between your drinking water and wastewater utilities and your local institutions and agencies such as fire, law enforcement, education, public health, private business, and tourism.

The following self assessment will ask a series of questions with the intent of gauging your current preparedness levels and resiliency efforts. Following the self assessment, you will receive a summary report with a series of programs and tools that can help you to improve your community's water preparedness and resilience.

User Role: Law Enforcement

- Select a User Role
- Emergency Medical Services
- Fire
- Hazardous Materials
- Law Enforcement
- Local Emergency Planning Committee (LEPC) member
- Emergency Management Representative
- Public Affairs
- Other

Please ent

Community-Based Water Resiliency Tool

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Emergency Services Sector (First Responders)

The overarching goal of this self assessment is to increase community resiliency to man-made and natural disasters by developing an understanding of the interdependencies between critical infrastructure and key resources (CI/KR) essential to the community's security, public health and safety, economic vitality, and way of life. The Water Sector (comprising drinking water and wastewater utilities), a U.S. Department of Homeland Security-designated CI/KR, is often overlooked during preparedness planning due to the lack of visible infrastructure, the reliability of the services, and the historic self-reliance within the Water Sector. The increasing effects of natural disasters, climate change, and constant threat of international and home-grown terrorism on the nation's aging drinking water and wastewater infrastructure make it critical for preparedness planning to incorporate Water Sector interdependences.

Do you know which functions/services in your community fall within Emergency Services Sector?

○ Yes ◉ No

< Back | Next >

Start Over

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My Goals

The overarching goal of this self assessment is to increase community resiliency to man-made and natural disasters by developing an understanding of the interdependencies between critical infrastructure and key resources (CI/KR) essential to the community's security, public health and safety, economic vitality, and way of life. The Water Sector (comprising drinking water and wastewater utilities), a U.S. Department of Homeland Security-designated CI/KR, is often overlooked during preparedness planning due to the lack of visible infrastructure, the reliability of the services, and the historic self-reliance within the Water Sector. The increasing effects of natural disasters, climate change, and constant threat of international and home-grown terrorism on the nation's aging drinking water and wastewater infrastructure make it critical for preparedness planning to incorporate Water Sector interdependences.

My goals are:	Very important	Somewhat important	Not very important	Not at all important
Gain a better understanding of Water Sector interdependencies	○	◉	○	○
Enhance collaboration between the Water Sector and the Emergency Services Sector	○	◉	○	○
Increase my understanding of vulnerabilities to drinking water and wastewater infrastructure	◉	○	○	○
Identify training opportunities to increase community preparedness and resiliency in the event of a water or wastewater service disruption	◉	○	○	○

Other (provide or suggest additional goals by submitting an e-mail)

Community-Based Water Resiliency Tool

Public Notification

Great! Knowing how your utility issues public notification can ensure that consistent messages are being released to the public by all officials involved in the incident. By delivering clear, concise, and consistent messages, public officials can help ensure greater public confidence in the community's ability to deliver safe and reliable water services.

For additional information, please check out the following tools and resources:

Tools and Resources

- Revised Public Notification Handbook
  This handbook provides guidance to States, public water systems, and the general public concerning how EPA interprets its public notification regulations.

Coordination with Water Utility

Notification methods vary from jurisdiction to jurisdiction. In smaller communities, a phone call from the on-scene incident commander to a utility representative may suffice. Large communities have included utilities in 911 dispatch center notification lists. The earlier a utility representative is notified of an incident that may affect their drinking or wastewater treatment process, the sooner the utility can institute actions protective of public health and the environment. This, in turn, helps your community to be more resilient during emergencies and disasters.

Local Emergency Planning Committee

You indicated that you don't know if your drinking water and wastewater utility participates in your local emergency planning committee (LEPC). Having a representative from the utility on your LEPC can be mutually beneficial because the utility can be one of the most knowledgeable entities regarding chemicals and chemical safety. They can also be one of the larger chemical users in your community, and it would benefit you to include them on the LEPC. Consider inviting your local drinking water and wastewater utilities to an upcoming meeting.

For additional information on LEPCs, please check out the following tools and resources:

Tools and Resources

- Local Emergency Planning Committee (LEPC) Database
  Local Emergency Planning Committees (LEPCs) work to understand chemical hazards in the community, develop emergency plans in case of an accidental release, and look for ways to prevent chemical accidents.

Community-Based Water Resiliency Tool

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- Water Utility
- Healthcare and Public Health
- State / Tribal Primacy
- Emergency Services
- Local Official / Community Partner
- All CBWR Tools

Search this Toolbox

- Security Information Collaboratives: A Guide for Water Utilities
- Top 10 Ways Local Emergency Planners can Work with Water Utilities
- TOP TEN LIST - Drinking Water Supply and Wastewater Collection Systems Emergency Preparedness and Security for Law Enforcement (Visor Card)
- Top Ten List: Water Supply Emergency Preparedness and Security for Law Enforcement
- Training sessions on Water Sector Interdependencies
- Water and Emergency Services: A Critical Community Interdependency (Fact sheet)
- Water and Healthcare Sector Interdependencies: Working Together Towards Resiliency (Fact Sheet)
- Water Environment Federation (WEF)/Federal Emergency

Water Sector Interdependencies

You Can Lead a Horse to Water…

- Product Development ≠ Success
- Sophisticated Search Engine ≠ Useful Tool
- Success = Widely used, beneficial tools that work

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…Getting Them to Drink

Water Resiliency Action Plan (WRAP) Kit

Planning and Logistics

- Suggested goals and objectives
- List of potential partners
- Suggested planning team members
- List of major planning process steps and planning team roles
- Sample emails to gauge interest
- Sample telephone scripts for recruiting participants
- Suggested meeting locations/tip sheet

Meeting Materials

- Invitation letters
- Registration tracking tools
- Sample agendas
- Sample presentations
- Required resources checklist
- Sign-in table tips and tools
- Facilitators guide
- Tabletop exercises
- Discussion questions
- Evaluation Form

Post-Roundtable Products

- Thank you letters
- Attendee list template
- Action item tracking list
- Tips for keeping momentum going
- Sample final reports and templates

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…And Yet…..There's More!

Tools of Water Security Planning

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PREVENTION
- Best Security Practices
- Sector Metrics
- Physical Protection
- Backflow Prevention
- Cyber Security
- Vulnerability Assessment Tools
- Baseline Threat Document

DETECTION
- Information Tools: WCIT, Lab Compendium
- Water Lab Alliance
- Water Security Initiative
- Modeling
- EDS/Sensor Testing
- Method Validation

Utilities

Utilities

Risk Reduction

Utilities

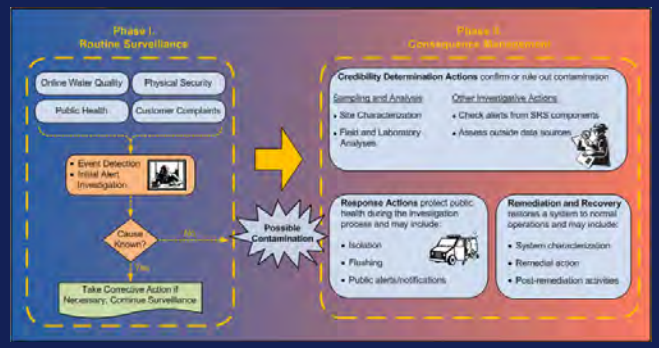
Utilities

RECOVERY
- Mutual Aid Agreements
- Decontamination Strategy
- Mobile Treatment Units
- Consequence Analysis

OVERARCHING
- Community-Based Water Resiliency
- Climate-Ready Water Utilities

RESPONSE
- Contaminant Response Training
- Response Plan Guidance
- Response Protocol Toolbox
- Pandemic Flu Guidance
- ICS/First Responder Training
- ESF-3 work under the NRF

Sustain Protection of Public Health & the Environment



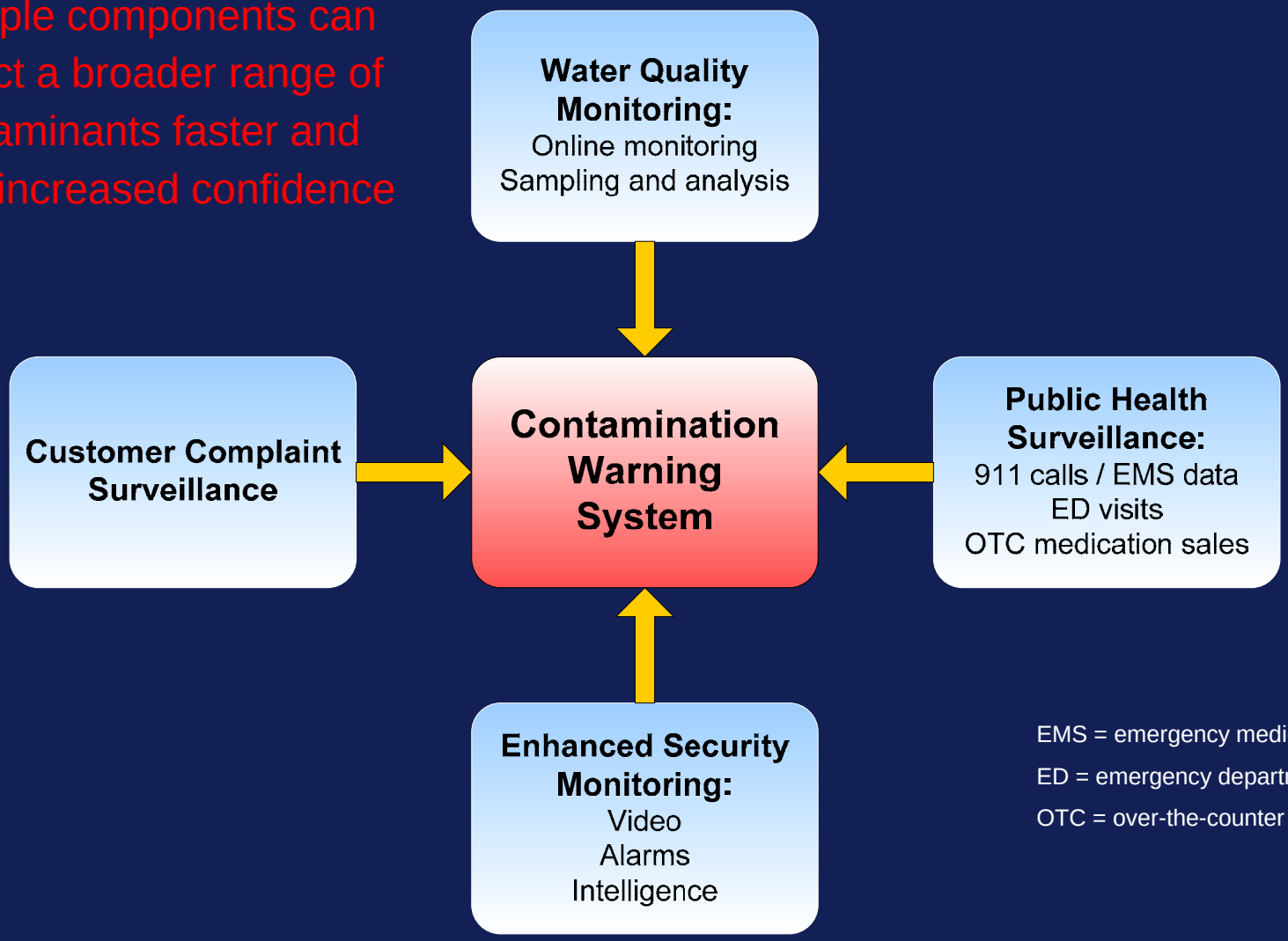
Water Security Initiative

Water Lab Alliance

Coordination w/DHS

WSi Detection Strategies

Multiple components can detect a broader range of contaminants faster and with increased confidence



EMS = emergency medical service

ED = emergency department

OTC = over-the-counter

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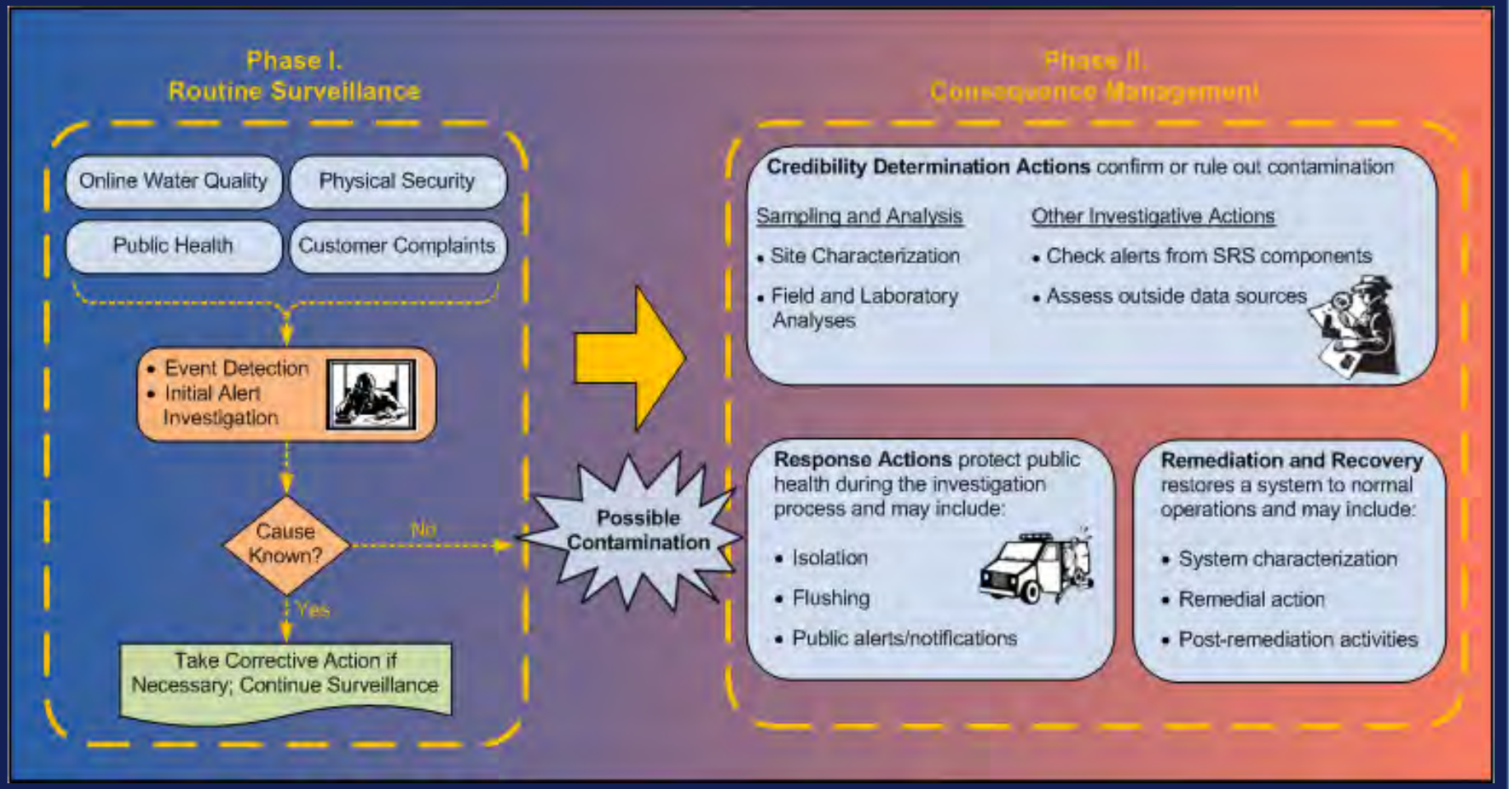
Concept of Operations



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Recognize & Reduce Risk

VSAT

CREAT

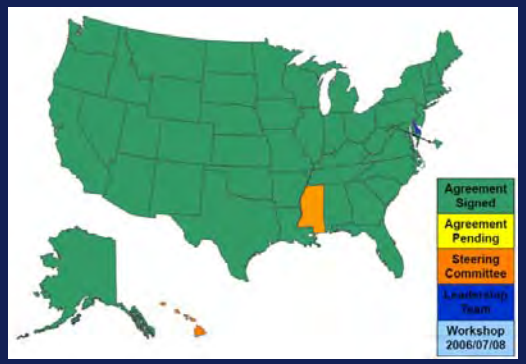
WHEAT WATER Health & Economic Analysis Tool

Risk Assessment Methodologies

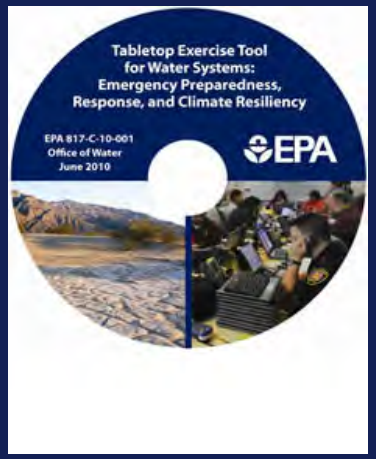
Consequence Analysis

Maintain a Resilient Infrastructure

Water Contaminant Info Tool



Water/Wastewater Agency Response Networks



TTX Tools

FedFUNDS

United States Environmental Protection Agency

Increase Communication, Outreach & Public Confidence

Blogs & Other Multimedia Communications

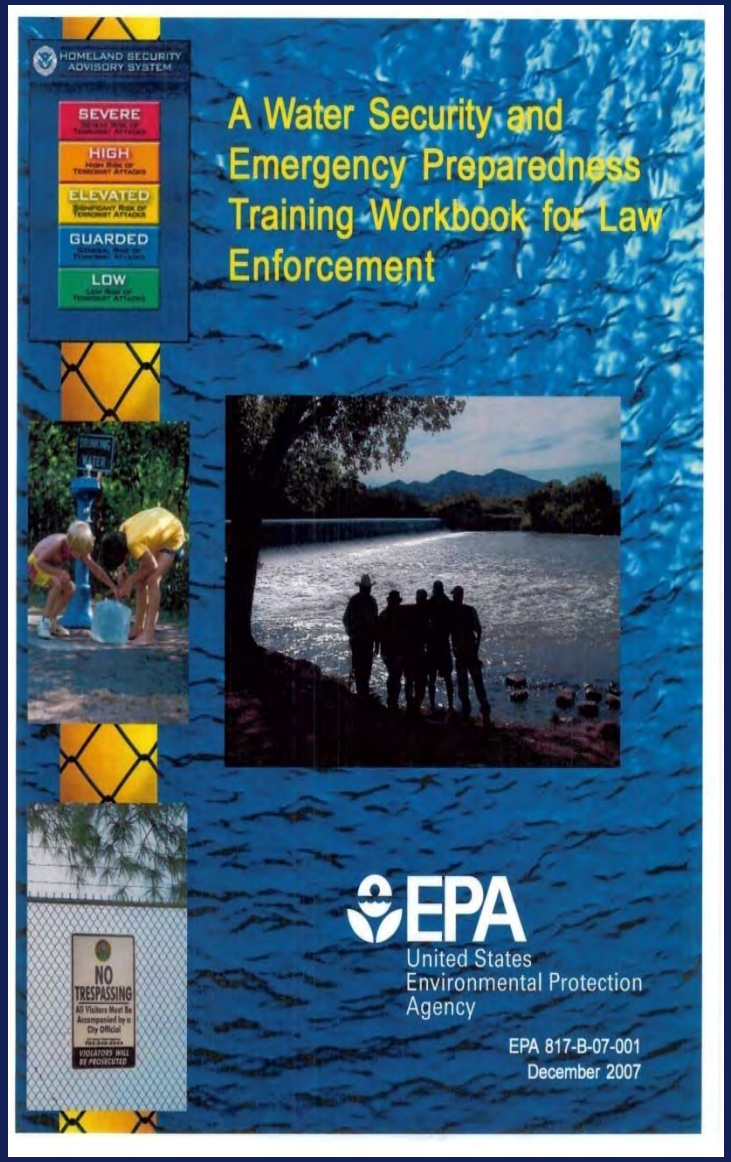
WaterISAC
Drinking Water and Wastewater Security Information Center

Water Information Sharing and Analysis Center

Public Information Officer Webinars

United States Environmental Protection Agency

Water Handbook for Law Enforcement



- Guides law enforcement personnel in dealing with water service interruptions
- LE Sensitive information
- Electronic & Hardcopy

United States Environmental Protection Agency

Video #2

Don't Get Soaked

- *http://water.epa.gov/infrastructure/watersecurity/basicinformation.cfm#dontgetsoaked*

Got Questions?

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water.epa.gov/infrastructure/watersecurity

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