

Does Your Water System Meet the Latest Disaster Resiliency Requirements?

Most residents do not give much thought to where their water comes from or how it is made (a testament to the generally excellent performance of water systems) until there is a problem such as in Flint, Michigan. They certainly do not expect their water system to be the target or source of a chemical disaster.

Approximately 156,000 public water systems regulated by the Environmental Protection Agency (EPA) and delegated states and tribes provide drinking water to 90 percent of Americans. More than 97% are rated as small, serving fewer than 10,000 people. Per the U.S. Department of Homeland Security (DHS), this critical infrastructure faces a range of threats:



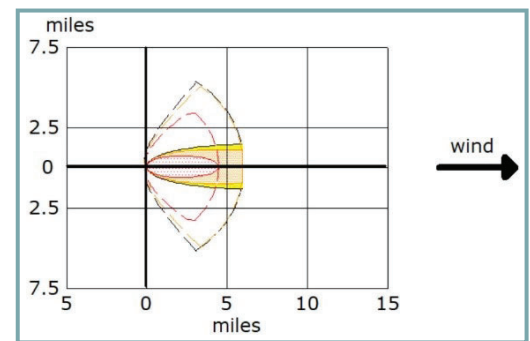
“The Water and Wastewater Systems Sector is vulnerable to a variety of attacks, including contamination with deadly agents; physical attacks, such as the release of toxic gaseous chemicals; and cyberattacks. The result of any variety of attack could be large numbers of illnesses or casualties and/or a denial of service that would also impact public health and economic vitality. The sector is also vulnerable to natural disasters. Critical services, such as firefighting and healthcare (hospitals), and other dependent and interdependent sectors, such as Energy, Food and Agriculture, and Transportation Systems, would suffer negative impacts from a denial of service in the Water and Wastewater Systems Sector.”

Numerous EPA and DHS safety requirements are in place for these systems, increasing in relation to size (measured in number of customers) and the type and amount of hazardous materials in use at the site. Perhaps the most established is the Risk Management Program (RMP), which most often applies to drinking water systems due to the use of gaseous chlorine for disinfection. Containers range from 150-pound cylinders (for size, think helium cylinder for birthday balloons) to one-ton cylinders (large refrigerator) to railcars that hold 90 tons.



The RMP Rule requires an offsite consequence analysis (OCA) using a defined worst-case scenario (entire contents release in 10 minutes) for only the single largest chlorine container and an estimate of “receptors” (victims) within the affected area. Given that many facilities have multiple cylinders or even railcars on-site at the same time, it is not difficult to imagine a scenario far worse than that.

Chlorine releases are particularly hazardous to downwind residents, as this toxic gas easily travels with little warning time and in concentrations



high enough to inflict irreversible effects (lung disfunction) for over half a mile and nuisance effects (coughing, tearing) for 1.5 miles from a single 150-pound cylinder. Large releases from railcars are potentially lethal for miles.

OCA's are not made public, and there are no requirements to notify potentially affected residents or to take any actions to reduce their numbers. The facility needs only to have made the analysis and developed a written plan to operate so as to minimize the chances of such an event and respond effectively should it occur.



Water systems serving over 3,300 customers are also subject to the requirements of the America's Water Infrastructure Act (AWIA) of 2018, which requires them to develop or update Risk Assessments (RAs) and Emergency Response Plans (ERPs) to improve resiliency to "malevolent acts" (terrorism) and natural hazards and submit a certification to the EPA that they conducted the assessment. EPA provides various forms of support to water systems to achieve this, including Drinking Water State Revolving

RISK MANAGEMENT PROCESS



Fund loans, a **water resiliency web page** with tools and guides, grants for lead line replacement and requirements for states to encourage the development of asset management plans, best practices and training.

Systems must conduct risk and resilience assessments and prepare emergency response plans that meet the specific **requirements** outlined under AWIA

Section 2013. They may use any standards, methods or tools that aid in meeting the requirements of AWIA Sections 2013(a) and (b), for example the EPA Vulnerability Self-Assessment Tool (VSAT). However, regardless of the use of any standard, method or tool, the water system is responsible for ensuring that its risk and resilience assessment and emergency response plan fully address all AWIA requirements. This is often done through third-party assessments by experienced consulting and engineering firms.

Assessments must include the:

- Risk to the system from malevolent acts and natural hazards;
- Resilience of pipes and constructed conveyances, physical barriers, source water, water collection and intake, pretreatment, treatment, storage and distribution facilities, electronic, computer, or other automated systems (including the security of such systems) utilized by the system;
- Monitoring practices of the system;
- Financial infrastructure of the system;
- Use, storage, or handling of various chemicals by the system; and
- Operation and maintenance of the system.

The assessment may optionally include an evaluation of capital and operational needs for risk and resilience management.

Risk Assessment deadlines are based on system size, with larger systems due first. Emergency Response Plan certifications are due six months from the respective Risk Assessment certification date. Assessments conducted and certified under the 2002 Bioterrorism Act are currently being "retired" by the EPA and replaced by these newer versions.

Population Served	RA Certification Due	ERP Due
100,000+	Mar 31, 2020	Sep 30, 2020
50,000 – 99,999	Dec 31, 2020	Jun 30, 2021
3,301 – 49,999	Jun 30, 2021	Dec 30, 2021

There are many moving parts, requirements and liabilities for everyone involved in this process due to the technical nature of the subject matter. Public relations and planning and zoning implications are many and obvious but not well understood by the general public, aka the receptors. It is our job as experts to quantify, manage and communicate those risks so that good, clean water produced safely continues to be the least expensive and most reliable utility in America. Choose your partners carefully.

Review AWIA requirements at the [EPA website](#) or contact a trusted advisor for additional information. ■

ABOUT THE AUTHOR



Scott Harris, PhD is the Associate Director of EHS Services in the Austin, TX office of GDS Associates, Inc. and an adjunct faculty at University of Texas at San Antonio, University of Utah and UNC-Chapel Hill. Dr. Harris received his PhD in Environmental Science, with a specialization in Disaster and Emergency Management, from Oklahoma State University and holds degrees in Public Health and Geology from Western Kentucky University.

Contact: scott.harris@gdsassociates.com