

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. Conversely, 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 Broussard, 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) sectors¹. 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



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

Potential Consequences of Drinking Water and Wastewater Service Disruptions

Natural disasters and accidents can disrupt drinking water and wastewater services. The Northeast Blackout of 2003 resulted in widespread drinking water and wastewater treatment system failures and the discharge of sewage into beach areas, lakes, streams, and other water systems. In 2005, Hurricane Katrina disabled or compromised the operation of more than 1,220 drinking water systems and 200 wastewater treatment facilities. These two events, amongst many others, demonstrate the broad consequences of water service disruptions; several specific consequences are described in the table below:

Potential Drinking Water Service Disruption Consequences	Potential Wastewater Service Disruption Consequences
Lack of water for consumption, cooking, bathing, flushing, fire suppression, etc.	Sewage or storm water discharges (causing damage to buildings, institutions, and landmarks)
Loss of water for commercial irrigation, food supply, production of consumer needs	Release of hazardous chemicals into wastewater, negatively affecting public health and the environment
Decreased public confidence in water supply	Need to pre-treat wastewater before enters wastewater treatment plant; need to properly dispose of wastewater residual
Need to access alternate water supplies and/or issue a public notice to boil water	Lack of wastewater services, posing public health and sanitation issues
Adverse economic effects as industry and local governments experience water service interruption	Sewage or storm water discharges (causing damage plants, animals, and aquatic life)
Loss of water for cooling (disabling electrical and telecommunications equipment)	Adverse economic impacts, loss of property, and damaged service provider reputation

Collaboration with Interdependent Infrastructures

A number of actions to enhance the relationship between the water sector and other critical infrastructures and to strengthen water sector preparedness and community resiliency:

- Identify critical services and businesses that rely on water and coordinate planning and exercises to prepare for emergencies
- Identify potential steps for reducing risks in the event of water service disruptions
- Identify and incorporate best practices for water service disruptions into emergency response plans (ERPs) and continuity of operations plans (COOPs)
- Take advantage of existing mutual aid and assistance programs [e.g., Water/Wastewater Agency Response Networks (WARNs)]
- Engage decision makers in water sector and critical infrastructure preparedness planning process by participating in Local Emergency Planning Committees (LEPCs)

EPA’s Community-Based Water Resiliency Initiative provides communities with the tools necessary for launching a water resiliency program. This initiative was implemented to increase the awareness of interdependencies with the water sector and provide a holistic approach to water preparedness and community resiliency.

CONTACT US For more information on the water sector interdependencies and the CBWR initiative, please contact WSD-Outreach@epa.gov or visit us at <http://water.epa.gov/infrastructure/watersecurity>.