Drinking Water Incident Case Studies

Case Study 1: Water Main Break

In November 2018, the Orange Water and Sewer Authority (OWASA) experienced a major water main break in Carrboro. The break affected residents and businesses in both Carrboro and Chapel Hill.

INCIDENT

The events from the break occurred over a 34-hour period, beginning on a Monday morning around 6 a.m. Water main breaks typically affect only utility customers in the vicinity of the break. However, in this case all of OWASA's customers were asked to conserve water for a 24-hour period. The utility also issued a boil water advisory.

Due to complicating factors such as the pipe's depth and its location within the pipe network, the break took eight hours to fix. Over this period the system lost 9.5 million gallons of water. On average, the community uses about 7 million gallons per day. OWASA's storage levels dropped to near-emergency levels at 2.9 million gallons.

EFFECTS ON THE COMMUNITY AND LOCAL GOVERNMENT

The service area was subject to conservation requirements and a boil water advisory that lasted 31 hours. Standard sampling procedures after an advisory take a minimum of 24 hours to complete. Quick response by OWASA thus limited the duration of the boil water advisory.

Many Town of Chapel Hill services had to be suspended, including the public library, parks and recreation facilities, fields and aquatic centers, planning and development services, and business management services. The transit system, police, fire, and public works remained in operation. Chapel Hill-Carrboro City Schools closed early.

OWASA worked with the Orange County Emergency Operations Center, which helps the Towns of Chapel Hill, Carrboro, UNC, and UNC Hospitals coordinate emergency communications and responses.

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POST-INCIDENT FOLLOW-UP

An independent professional engineering firm was engaged to conduct an after-action review. According to the review, the water main break was caused by a manufacturing defect in the pipe. The section of the 16-inch pipe that broke was thinner than the rest of the pipe. The pipe that broke was 77 years old and constructed of cast iron. According to the American Water Works Association, cast iron pipes in the South have an average service lifespan of 110 years. Although the broken pipe was well below the average service life for its kind, and although about half of OWASA's revenue goes toward renewing and replacing infrastructure, unforeseen incidents can still occur.

The review concluded that opportunities for improvement included improved accuracy of GIS mapping and identification of valves.

DISCUSSION QUESTIONS TO CONSIDER

This case study may be used as an exercise tool in local planning. Here are some questions for discussion by local communities:

- Do your community's emergency plans account for businesses, sensitive facilities such as health care facilities or schools, and other special facilities such as universities, in incidents involving drinking water? If so, how?
- What plans does your community have for communicating with the public when an incident requires water conservation?
- What plans does your community have for communicating with the public when an incident requires an advisory, such as a boil water advisory, to be issued? What communication channels will be used? How will sensitive populations be reached?
- How should local governments respond to drinking water incidents caused by failures of drinking water infrastructure?
- What opportunities exist for local collaboration in an incident such as this one?
- What would be the challenges to local collaboration?

Sources

Orange Water and Sewer Authority, November 5, 2018 Water Main Break Root Cause Analysis and After Action Review (Hazen & Sawyer Professional Engineers, December 2018), available at https://www.owasa.org/Data/Sites/1/media/owasa-jfr-nov-5-final-report-public-18-12-18-v6.pdf.

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