Incident Action Checklist – Extreme Heat

The actions in this checklist are divided up into three "rip & run" sections and are examples of activities that water and wastewater utilities can take to: prepare for, respond to and recover from extreme heat. For on-the-go convenience, you can also populate the "My Contacts" section with critical information that your utility may need during an incident.

Extreme Heat Impacts on Water and Wastewater Utilities

An extreme heat event or heat wave is a period of abnormally hot and/or humid weather, typically lasting two or more days. Though temperature thresholds that mark extreme heat events can vary by geographic location, these events can be extremely dangerous; in fact, heat is the top weather-related killer in the United States. Extreme heat can impact employee operations and power delivery, and can cause the public to seek relief. Extreme heat or heat wave impacts to water and wastewater utilities may include, but are not limited to:

- Loss of power and communication lines due to increased electricity demand
- Increased water demand due to higher temperatures, which could result in shortages
- Changes in source water quality related to increased water temperatures due to both higher air temperatures and higher temperatures of industrial discharges (e.g., cooling water used at power plants)
- Safety risks for staff working in the field for prolonged periods of time

EPA

The following sections outline actions water and wastewater utilities can take to prepare for, respond to and recover from an extreme heat event. (Because extreme heat events and drought often coincide, please see the Drought Incident Action Checklist for drought-specific activities.)

Example of Water Sector Impacts and Response to an Extreme Heat Event

Wisconsin Utility Anticipates Potential Water Shortages

Madison, Wisconsin, experienced a heat wave in June and July 2012, which resulted in an increase in water use. Due to the high temperatures and drier-than-normal conditions, the Madison Water Utility anticipated a potential water shortage and issued advisories for their customers to stay hydrated, but otherwise conserve water during the heat wave to reduce the risk of a shortage.

The utility advised customers to water their gardens and lawns only when needed, repair leaks in their homes, install water-saving devices such as aerators and flow regulators and use the most efficient setting for dishwashers and washing machines.

Source: City of Madison News Release, "Use Water Wisely in Heat Wave and Dry Period"
Source: NOAA Report "2012 Wisconsin Yearly Weather Summary"

My Contacts and Resources

CONTACT NAME	UTILITY/ORGANIZATION NAME	PHONE NUMBER
	Local EMA	
	State EMA	
	State Primacy Agency	
	WARN Chair	
	Power Utility	

Planning

- Incident monitoring:
  - U.S. Hazards Assessment (National Oceanic and Atmospheric Administration [NOAA])
  - Mean Heat Index Forecasts (NOAA)
  - Watch, Warning, and Advisory Products for Extreme Heat (NOAA)
  - U.S. Drought Monitor (National Drought Mitigation Center, NOAA, U.S. Department of Agriculture [USDA])
  - U.S. Seasonal Drought Outlook (NOAA)
- Excessive Heat Events Guidebook (EPA)
- Living with Weather: Heat Waves (Midwestern Regional Climate Center [MRCC])
- Ready.gov: Extreme Heat (Federal Emergency Management Agency [FEMA])
- Planning for an Emergency Drinking Water Supply (EPA)
- National Weather Service Weather Alerts (NOAA)
- All-Hazard Consequence Management Planning for the Water Sector (Water Sector Emergency Response Critical Infrastructure Partnership Advisory Council [CIPAC] Workgroup)
- Vulnerability Self Assessment Tool (VSAT) (EPA)
- How to Develop a Multi-Year Training and Exercise (T&E) Plan (EPA)
- Preparing for Extreme Weather Events: Workshop Planner for the Water Sector (EPA)
- Tabletop Exercise Tool for Water Systems: Emergency Preparedness, Response, and Climate Resiliency (EPA)

Coordination

- Water/Wastewater Agency Response Network (WARN) (EPA)

Communication with Customers

- WaterSense (EPA)

Facility and Service Area

- Water Audit Tool (American Water Works Association [AWWA])

Power, Energy and Fuel

- EPA Region 1 Water/Wastewater System Generator Preparedness Brochure (EPA)

Documentation and Reporting

- Federal Funding for Utilities In National Disasters (Fed FUNDS) (EPA)

Mitigation

- Climate Resilience Evaluation and Awareness Tool (CREAT) (EPA)
- Adaptation Strategies Guide (EPA)

Actions to Prepare for Extreme Heat

Planning

- [ ] Actively monitor weather conditions and extended weather forecasts.
- [ ] Review and update your utility's emergency response plan (ERP), and ensure all emergency contacts are current.
- [ ] Conduct briefings, training and exercises to ensure utility staff is aware of all preparedness, response and recovery procedures.
- [ ] Identify priority water customers (e.g., hospitals), obtain their contact information, map their locations and develop a plan to restore those customers first, in case of water service disruptions.
- [ ] Monitor water supply and calculate how long water could be provided if increased demand persists.
    - Actively monitor surface water levels and groundwater well levels, and identify the sustainable withdrawal rate for each
- [ ] Establish "triggers" or "threshold values" for extreme heat conditions that will require action (e.g., if reservoirs fall below a certain level, if water quality measures exceed a specified level).
- [ ] Develop an emergency drinking water supply plan and establish response partner contacts (potentially through your local emergency management agency [EMA] or mutual aid network) to discuss procedures, which may include bulk water hauling, mobile treatment units or temporary supply lines, as well as storage and distribution.
- [ ] Conduct a hazard vulnerability analysis in which you review historical records to understand the past frequency and intensity of extreme heat events and how your utility may have been impacted. Consider taking actions to mitigate drought impacts to the utility, including those provided in the "Actions to Recover from Extreme Heat Events: Mitigation" section.
- [ ] Complete pre-disaster activities to help apply for federal disaster funding (e.g., contact state/local officials with connections to funding, set up a system to document damage and costs).
- [ ] Determine if technical assistance programs are offered by the state, including wellhead protection programs for community water supplies. Assistance may involve:
    - Development and utilization of predictive water use models that assist in locating water for communities
    - Development and utilization of formal groundwater monitoring networks

Coordination

- [ ] Join your state's Water/Wastewater Agency Response Network (WARN) or other local mutual aid network.
- [ ] Coordinate with WARN members and other neighboring utilities to discuss:
    - Outlining response activities, roles and responsibilities and mutual aid procedures (e.g., how to request and offer assistance)
    - Conducting joint tabletop or full-scale exercises
    - Obtaining resources and assistance, such as equipment, personnel, technical support or water
    - Establishing interconnections between systems and agreements with necessary approvals to activate this alternate source. Equipment, pumping rates and demand on the water sources need to be considered and addressed in the design and operations
    - Establishing communication protocols and equipment to reduce misunderstandings during the incident

Actions to Prepare for Extreme Heat *(continued)*

- [ ] Coordinate with other key response partners, such as your local EMA, to identify potential points of distribution for the delivery of emergency water supply (e.g., bottled water) to the public, as well as who is responsible for distributing the water.
- [ ] Understand how the local and utility emergency operations center (EOC) will be activated and what your utility may be called on to do, as well as how local emergency responders and the local EOC can support your utility during a response. If your utility has assets outside of the county EMA's jurisdiction, consider coordination or preparedness efforts that should be done in those areas.
- [ ] Sign up for mobile and/or email alerts from your local EMA, if available.

Communication with Customers

- [ ] Communicate with critical customers, high water users and agricultural customers to discuss seasonal demand, conservation measures and irrigation practices.
- [ ] Review public information protocols with local EMA and public health/primacy agencies. These protocols should include developing water advisory messages (e.g., boil water, warnings that service disruptions are likely) and distributing them to customers using appropriate mechanisms, such as reverse 911.
- [ ] Develop outreach materials for the public (e.g., radio, social media, and bill stuffers) that encourage personal hydration, as well as materials that clearly describe conservation measures and activities.
  - Become a WaterSense partner and download free water efficiency outreach materials to distribute to your customers: http://www.epa.gov/watersense/

Facility and Service Area

- [ ] Document pumping requirements and storage capabilities, as well as critical treatment components and parameters.
- [ ] Maintain a full storage tank to assist with demand should there be a source loss, power failure or fire suppression needs.
- [ ] In the case of a power loss, ensure personnel are trained to shut down and start up the system manually.

Power, Energy and Fuel

- [ ] Evaluate condition of electrical panels to accept generators; inspect connections and switches.
- [ ] Document power requirements of the facility; options for doing this may include:
  - Placing a request with the US Army Corps of Engineers 249th Engineer Battalion (Prime Power): http://www.usace.army.mil/249thEngineerBattalion.aspx
  - Using the US Army Corps of Engineers on-line Emergency Power Facility Assessment Tool (EPFAT): http://epfat.swf.usace.army.mil/
- [ ] Confirm and document generator connection type, capacity load and fuel consumption. Test regularly, exercise under load and service backup generators.
- [ ] Collaborate with your local power provider and EOC to ensure that your water utility is on the critical facilities list for priority electrical power restoration, generators and emergency fuel.

Actions to Respond to Extreme Heat

Planning

- [ ] Work with your regulatory agency to assist in identifying and approving alternate water supplies and operational or design changes.
- [ ] Monitor wildfire conditions and outlooks. See the Wildfire Incident Action Checklist for more information on how to prepare for wildfires.

Coordination

- [ ] Communicate with public health officials, local EMA and other partners to:
  - Discuss issues related to extreme heat emergencies and public health activities
  - Evaluate conditions and water use requirements related to HVAC systems required by hospitals and identify alternative means to supply water if the utility is unable to meet demand
- [ ] If needed, request or offer assistance (e.g., water buffalos, water sampling teams, generators) through mutual aid networks, such as WARN.
- [ ] Work with your local EMA to establish cooling centers for the public.

Communication with Customers

- [ ] Implement mandatory or voluntary water conservation efforts, and conduct regular outreach to customers.
- [ ] If water shortages or outages occur, notify customers of water advisories; consider collaborating with local media (television, radio, newspaper, etc.) to distribute the message. If emergency water is being supplied, provide information on the distribution locations.

Facility and Service Area

- [ ] Utilize pre-established emergency connections or set up temporary connections to nearby communities, as needed. Alternatively, implement plans to draw emergency water from pre-determined tanks or hydrants. Notify employees of the activated sites.
- [ ] Monitor source water quantity (e.g., reservoir levels, stream flows, well levels, groundwater levels).
- [ ] Monitor water quality and adjust treatment, if necessary, as reduced water quantity and increased temperatures could change water chemistry.
- [ ] Notify regulatory/primacy agency if operations and/or water quality or quantity are affected.
- [ ] If possible, run pumps during off-peak hours when there is less demand on power and less risk of a power failure.

Notes:

Actions to Respond to Extreme Heat *(continued)*

Documentation and Reporting

- [ ] Document all damage assessments, mutual aid requests, emergency repair work, equipment used, purchases made, staff hours worked and contractors used during the response to assist in requesting reimbursement and applying for disaster funds. When possible, take photographs that illustrate the extreme heat conditions (with time and date stamp). Proper documentation is critical to requesting reimbursement.

Personnel

- [ ] Ensure all staff working in the field are aware of the risks of extreme heat and that they take actions to avoid health risks and over-exertion (e.g., hydration, sunscreen, taking frequent breaks in the shade, wearing appropriate clothing).

Power, Energy and Fuel

- [ ] Fill vehicles and fuel tanks to full capacity; ensure that you have the ability to manually pump gas in the event of a power outage.
- [ ] Use backup generators, as needed, to supply power to system components.
- [ ] Monitor and plan for additional fuel needs in advance; coordinate fuel deliveries to the generators.
- [ ] Maintain contact with electric provider for power outage duration estimates.

Notes:

Actions to Recover from Extreme Heat Events

Coordination

- [ ] Continue work with response partners to obtain funding, equipment, etc.

Communication with Customers

- [ ] Continue to communicate with customers concerning water conservation measures and practices.

Facility and Service Area

- [ ] Complete permanent repairs, replace depleted supplies and return to normal service.

FEMA

Documentation and Reporting

- [ ] Compile damage assessment forms and cost documentation into a single report to facilitate the sharing of information and the completion of state and federal funding applications. Visit EPA's web-based tool, Federal Funding for Utilities—Water/Wastewater—in National Disasters (Fed FUNDS), for tailored information and application forms for various federal disaster funding programs: http://water.epa.gov/infrastructure/watersecurity/funding/fedfunds/

- [ ] Develop a lessons learned document and/or an after action report (AAR) to keep a record of your response activities. Update your vulnerability assessment, ERP and extreme heat contingency plans.

- [ ] Revise budget and asset management plans to address increased costs from response-related activities.

Mitigation

- [ ] Identify mitigation and long-term adaptation measures that can prevent damage and increase utility resilience. Consider impacts related to the increased frequency of extreme heat waves when planning for system upgrades, such as installing energy efficient pumps/equipment to minimize power demands.

Notes: