Incident Action Checklist – Wildfire

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 wildfires. For on-the-go convenience, you can also populate the "My Contacts" section with critical information that your utility may need during an incident.

Wildfire Impacts on Water and Wastewater Utilities

A wildfire is any instance of uncontrolled burning in grasslands, brush or woodlands. Wildfires can be caused by lightning, human carelessness or arson. Wildfires often begin unnoticed spread quickly and present a direct risk to property and infrastructure, in addition to potential degradation of the water supply. In some cases, source water quality issues can persist for 5-10 years following a wildfire. Areas that have experienced a wildfire are also at an increased risk of flash flooding and mudslides because the ground where vegetation has burned away cannot effectively absorb rainwater. Often, post-fire impacts (including those impacts resulting from flash floods) are more detrimental to drinking water and wastewater systems than the fire itself. Specific impacts to drinking water and wastewater utilities may include, but are not limited to:

- Infrastructure damage to the facility or distribution system due to proximity to the fire or firefighting activities
- Loss of water quantity due to increased withdrawals for firefighting activities
- Source water quality changes due to increased nutrients and other pollutants, which can result in higher turbidity, algal blooms, potential odor and taste issues, and subsequent higher treatment costs
- Increased sediment in reservoirs as a result of runoff and flash floods from burned areas, which can affect water quality, and reduced reservoir capacity and effective service lifespan
- Increased sediment and debris in stormwater runoff following flash floods, impacting water quality and treatment processes
- Decreased water supply downstream, as loss of forest canopy can lead to increased evaporation and reduction in the amount of water stored in snowpack

The following sections outline actions water and wastewater utilities can take to prepare for, respond to and recover from wildfires.

Examples of Water Sector Impacts and Response to a Wildfire

Denver Water responds to impacts from wildfire and flooding

On May 18, 1996, the 11,900-acre Buffalo Creek fire occurred on a tributary to the upper South Platte River, the main source of Denver, Colorado's water supply. While Buffalo Creek itself contributes a very small share of Denver's water supply, it is located directly upstream of the Strontia Springs Reservoir, the intake point for the Foothills Treatment Plant – a facility that handles approximately 80% of Denver's water.

Two months after the Buffalo Creek fire, heavy thunderstorms occurred directly over the burned area, causing a flash flood that washed more sediment into the reservoir than had accumulated over the previous 13 years, resulting in an estimated loss of 30 years of the reservoir's planned 50-year life.

The emergency cleanup costs totaled nearly $1 million. Chronic cleanup costs due to increased turbidity totaled $250,000 in water treatment costs per year, and dredging was estimated to cost $15 to $20 million over 10 years.

To mitigate future damage, the utility installed sensors upstream of the reservoir to monitor the amount of debris and sediment coming down the river, allowing the utility to shut down its treatment plant before flash floods could cause damage. Denver Water and the US Forest Service Rocky Mountain Region are also investing $33 million over a 5-year period for mechanical thinning, fuel reduction, creating fire breaks, erosion control, decommissioning roads and reforestation.

Source: EPA "Adaptation Strategies Guide for Water Utilities, 2012"

My Contacts and Resources

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

Planning

- Fire mapping and outlooks:
  - Active Fire Mapping Program (U.S. Forest Service [USFS])
  - National Significant Wildland Fire Potential Outlooks (National Interagency Coordination Center [NICC])
  - NOAA National Weather Service – Fire Weather (National Oceanic and Atmospheric Administration [NOAA])
  - Fire Weather Outlooks and Forecasting Tools (National Weather Service [NWS])
  - Incident Information System (InciWeb)
  - Geospatial Multi-Agency Coordination (GeoMAC) Group Wildland Fire Support application (U.S. Geological Survey [USGS])
  - Fire Forecast (National Public Radio)
  - Wildfire Assessment System (USFS)
- National Interagency Fire Center (NIFC)
- NIFC Burned Area Emergency Response (BAER)
- Firewise Communities (National Fire Protection Association [NFPA])
- Ready.gov Wildfire Preparedness (Federal Emergency Management Agency [FEMA])
- Fire Management Planning for Public Water Systems (CoWARN)
- Best Management Practices for Fire Preparedness and Response (Florida Rural Water Association [FRWA])
- U.S. Drought Portal (National Integrated Drought Information System [NIDIS])
- Wildfire Impacts on Water Quality (Southwest Hydrology)
- All-Hazard Consequence Management Planning for the Water Sector (Water Sector Emergency Response Critical Infrastructure Partnership Advisory Council (CIPAC) Workgroup)
- 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)
- Community Based Water Resiliency (EPA)

Facility and Service Area

- Defensible Space Guidance (CAL FIRE)
- Private Wells after the Fire: A private well owner's guide to protecting your drinking water source (Arizona Department of Environmental Quality [ADEQ])
- Firewise Landscaping and Plant Lists (NFPA)
- Firewise Guide to Landscape and Construction (NFPA)
- Post-Fire Rehabilitation Techniques (Colorado State University)
- Recovery Assistance for Water Utilities Dealing with the Effects of Wildfire (CoWARN)
- Water Quality Concerns Fact Sheet (ADEQ)
- Municipal Water Supply Systems and Evaluation Methods for Fire Protection (FEMA)

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

- Burned Area Emergency Response (BAER) Treatment Catalog (USFS)
- Plants for Wildfire Protection and Restoration (USDA)
- Land Rehabilitation FAQ: Lower North Fork Fire (Jefferson Conservation District)
- Climate Resilience Evaluation and Awareness Tool (CREAT)
- Adaptation Strategies Guide (EPA)

Actions to Prepare for a Wildfire

Planning

- [ ] Actively monitor fire and weather conditions and be aware of regional wildfires.
- [ ] 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.
- [ ] 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.
- [ ] Review and update fire management plans, including contingency plans for system operation if critical facilities are impacted by wildfire and access is limited or not possible.
- [ ] Conduct a hazard vulnerability analysis in which you review historical records to understand the past frequency and intensity of wildfires and how your utility may have been impacted. Consider taking actions to mitigate wildfire impacts to the utility, including those provided in the "Actions to Recover from a Wildfire: 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, take photographs of the facility for comparison to post-damage photographs).
- [ ] Ensure proper safety gear is available for field employees.

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
- [ ] Coordinate with other key response partners, such as your local EMA, to discuss:
  - How restoring system operations may have higher priority than establishing an alternative water source
  - 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.

Actions to Prepare for a Wildfire *(continued)*

- [ ] Meet with the fire agency with authority in your utility's area. This could include a local fire department, state conservation and forestry offices, and/or the US Forest Service. Review plans, discuss response activities (e.g., fire suppression chemical use) and identify hazards and vulnerabilities at your utility.

- [ ] Ensure credentials to allow access will be valid during an incident by checking with local law enforcement.

- [ ] Sign up for mobile and/or email alerts from your local EMA, if available.

Communication with Customers

- [ ] Develop outreach materials to provide your customers with information they will need during a wildfire (e.g., clarification about water advisories, instructions for private well and septic system maintenance, and information about fire prevention and mitigation).

- [ ] Review public information protocols with local EMA and public health/primacy agencies. These protocols should include developing water advisory messages (e.g., boil water) and distributing them to customers using appropriate mechanisms, such as reverse 911.

Facility and Service Area

- [ ] Inventory and order extra equipment and supplies, as needed:
  - Motors
  - Fuses
  - Chemicals (ensure at least a two week supply)
  - Cellular phones or other wireless communications device
  - Emergency Supplies
    - Tarps/tape/rope
    - Cots/blankets
    - First aid kits
    - Foul weather gear
    - Plywood
    - Flashlights/flares
    - Sandbags (often, sand must be ordered as well)
    - Bottled water
    - Batteries
    - Non-perishable food

- [ ] Ensure communication equipment (e.g., radios, satellite phones) works and is fully charged.

- [ ] Develop a GIS map of all system components and prepare a list of coordinates for each facility.

- [ ] Practice mechanical thinning, weed control, selective harvesting, controlled burns and creation of fire breaks on utility managed property, and encourage these practices on property that may directly impact the utility, its water supply and/or water quality.

Notes:

Actions to Prepare for a Wildfire *(continued)*

- [ ] Address and, if possible, remove vegetation from around facilities located in medium to high fire danger zones. Consider replacing flammable vegetation with fire-resistant landscaping.
- [ ] Create a zone of defensible space of approximately 50-100 feet for utility equipment and facilities (e.g., wellheads, structures, supports to wires and transformers). Consult with your local fire department for specific recommendations or requirements.
- [ ] Install manual or automatic irrigation systems to provide wetting of components and groundcover for vulnerable areas (e.g., chlorine storage, control equipment buildings).
- [ ] Assess the possibility of and procedures for using reclaimed water for fire suppression (prepare public notice and talking points).
- [ ] Document pumping requirements and storage capabilities, as well as critical treatment components and parameters.
- [ ] Back-up essential records and data, and store in a fireproof safe or offsite facility.

Personnel

- [ ] Identify essential personnel and ensure they are trained to perform critical duties in an emergency (and possibly without communication), including the shut down and start up of the system.
- [ ] Establish communication procedures with essential and non-essential personnel. Ensure all personnel are familiar with emergency evacuation and shelter in place procedures.
- [ ] Pre-identify emergency operations and clean-up crews. Establish alternative transportation strategies if roads are impassable.
- [ ] Consider how evacuations or limited staffing due to transportation issues (potentially all utility personnel) will impact your response procedures.
- [ ] Identify possible staging areas for mutual aid crews if needed in the response, and the availability of local facilities to house the crews.
- [ ] Encourage personnel, especially those that may be on duty for extended periods of time, to develop family emergency plans.

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.
- [ ] Fill fuel tanks to full capacity and ensure that you have the ability to manually pump gas in the event of a power outage. Ensure this equipment and other hazardous materials are located in a safe zone.
- [ ] Contact fuel vendors and inform them of estimated fuel volumes needed if utility is impacted. Determine your ability to establish emergency contract provisions with vendors and your ability to transport fuel if re-fueling contractors are not available. Develop a backup fueling plan and a prioritization list of which generators to fuel in case of a fuel shortage.
- [ ] 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 a Wildfire

Planning

- [ ] Identify possible alternate water supplies and operational changes to assist in mitigating demand and water quality concerns.

Coordination

- [ ] Once the wildfire is about 40% contained, reach out to your local EMA, the incident's Public Information Officer (PIO) and the Burned Area Emergency Response (BAER) team to maintain awareness of the situation and, if possible, to lend assistance as resource advisors or observers.
- [ ] Notify your local EMA and state regulatory/primacy agency of system status.
- [ ] If needed, request or offer assistance (e.g., equipment, personnel) through mutual aid networks, such as WARN.
- [ ] Assign a representative of the utility to the incident command post or the community's EOC.

Communication with Customers

- [ ] Notify customers of any water advisories and 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

Overall

- [ ] Conduct damage assessments of the utility to prioritize repairs and other actions.
- [ ] Check that back-up equipment and facility systems, such as controls and pumps, are in working order, and ensure that chemical containers and feeders are intact.

Drinking Water Utilities

- [ ] If possible, refill storage tanks each day to ensure maximum storage for demand, including fire suppression.
- [ ] Work with the local EMA to identify passable access roads and to ensure that utility facilities in forest areas are clearly identified.
- [ ] Keep intakes and access hatches clear of debris.
- [ ] Monitor raw water quality, develop a sampling plan and adjust treatment as necessary.
- [ ] Notify regulatory/primacy agency if operations and/or water quality or quantity are affected.
- [ ] Utilize pre-established emergency connections or setup 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.

Notes:

Actions to Respond to a Wildfire *(continued)*

- [ ] Prepare and deploy equipment as needed to support firefighting operations, such as tanker trucks and related pumping equipment, as well as bulldozers for the construction of firebreaks.
- [ ] Conduct sediment removal activities, such as installing permanent or temporary debris basins.

Wastewater Utilities

- [ ] Inspect the utility and service area, including lift stations, for damage and power availability. Inspect the sewer system for debris and assess the operational status of the mechanical bar screen. If necessary, run system in manual operation.
- [ ] Notify regulatory/primacy agency of any changes to the operations or required testing parameters.

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 federal disaster funds. When possible, take photographs (with time and date stamp). Proper documentation is critical to requesting reimbursement.
- [ ] Work with your local EMA on the required paperwork for public assistance requests.

Personnel

- [ ] Account for all personnel and provide emergency care, if needed. If personnel are in the field, communicate with the National Weather Service (NWS) on local wind conditions in the fire area so staff are aware of how quickly winds are shifting and if evacuation from facilities is required.
- [ ] Deploy emergency operations and clean-up crews. Identify key access points and roads for employees to enter the utility and critical infrastructure; coordinate the need for debris clearing with local emergency management or prioritize it for employee operations.

Power, Energy and Fuel

- [ ] Use backup generators, as needed, to supply power to system components.
- [ ] Monitor and plan for additional fuel needs in advance; coordinate fuel deliveries to generators.
- [ ] Maintain contact with electric provider for power outage duration estimates.

EPA

Notes:

Actions to Recover from a Wildfire

Coordination

- [ ] Continue work with response partners to obtain funding, equipment, etc.
- [ ] Coordinate with land owners and other partners to restore and treat burned areas.

Communication with Customers

- [ ] Assign a utility representative to continue to communicate with customers concerning a timeline for recovery and other pertinent information.

Facility and Service Area

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

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, fire models and fire management 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 future climate conditions and the increased frequency of wildfires when planning for system upgrades (e.g., installing buffer strips, removing hazardous fuels).
- [ ] Consider implementing the following mitigation measures to prepare for possible flash flooding events following a wildfire:
  - Monitor the watershed, as conditions may be different post-fire. Identify potential failure points within your service area: ensure culverts can handle increased flow, and determine runoff points and areas where water will now collect
  - Install a rain gauge upstream of intake for early warning of heavy precipitation that could lead to high turbidity water and sensors to monitor the amount of debris and sediment coming downstream
  - Consider instituting erosion control measures to protect against runoff and sediment concerns that occur during suppression and precipitation

Notes: