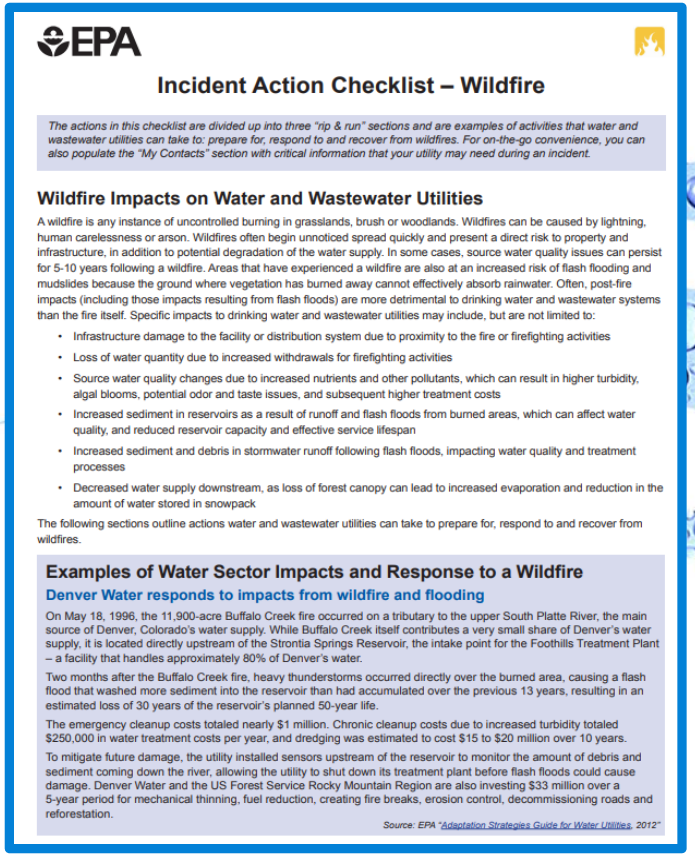
EPA United States Environmental Protection Agency



EPA

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"

Incident Action Checklist - Wildfire

Dawn Ison, Water Security Division

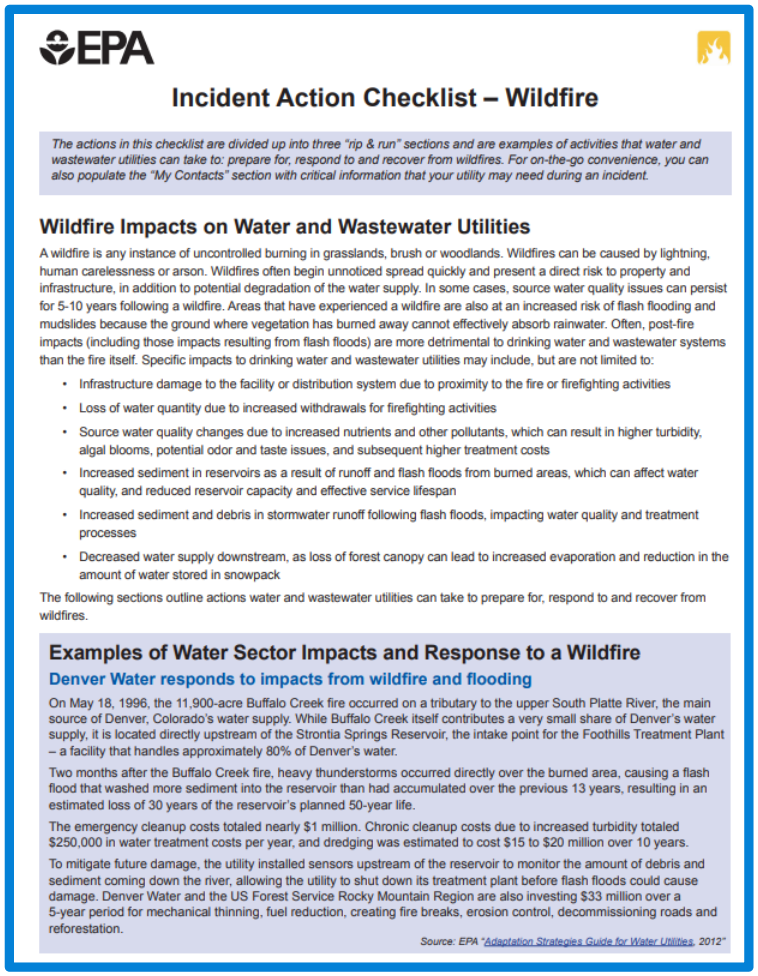
Protecting Source Waters Series

October 14, 2020

Incident Action Checklists Overview

Drought, Earthquake, Extreme Cold and Winter Storms, Extreme Heat, Flooding, Hurricane, Tornado, Tsunami, Volcanic Activity, Wildfire, Cyber, HABs, Power Outages

Introduction



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

- Outlines potential wildfire impacts on water and wastewater utilities
- Example of water sector impacts to a wildfire and future mitigation efforts

Prepare, Respond, Recover

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.

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)

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/

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.

Actions to Recover from a Wildfire

ith response partners to obtain
ent, etc.

land owners and other partners
eat burned areas.

n with Customers

- ☐ 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.

Notes and Resources

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])
- 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)

Before We Get Started – Key Message

Resilience = Planning and mitigating now….

….so you can bounce back as soon as possible.

Mitigation does not have to be part of recovery!

Wildfire IAC - PREPARE

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.

- Update ERP – AWIA Section 2013 requirement for Incident Specific Response Plan
- Identify priority customers
- Develop an emergency drinking water supply plan
- Do exercises

Wildfire IAC - PREPARE

Planning

- [ ] 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.
- [ ] 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.

- Create a fire management plan

Wildfire IAC - PREPARE

Coordination

- [ ] Join your state's Water/Wastewater Agency Response Network (WARN) or other local mutual aid network.

- [ ] 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.

- Join WARN
- Coordinate with your local EMA

Wildfire IAC - PREPARE

Coordination

- ☐ 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.

- Coordinate with the US Forest Service and DNR on watershed health and management
- Ensure access

Wildfire IAC - PREPARE

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.

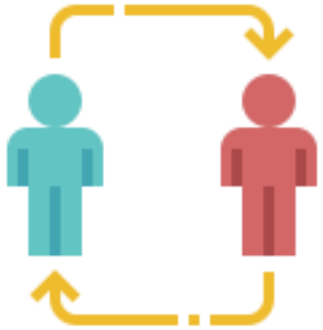
- Develop customer education materials
- Develop customer notification protocols

Wildfire IAC - PREPARE

Facility and Service Area

- ☐ Inventory and order extra equipment and supplies, as needed:
- ☐ 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.

- Communications
- Mapping
- Watershed and facility fire management



Wildfire IAC - PREPARE

Facility and Service Area

- ☐ 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).

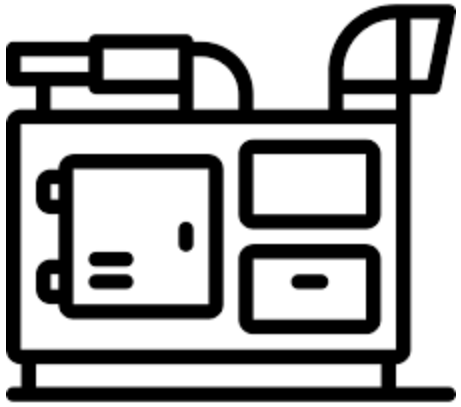
- Remove fuel
- Create a zone of defensible space
- Have ability to irrigation critical components of your utility

Wildfire IAC - PREPARE

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.

- Power requirements
- Generator specifics



Wildfire IAC - RESPOND

Facility and Service Area

- [ ] 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.

- Execute your plans
- Stay in close contact with your EMA and regulatory agency

Wildfire IAC - RECOVER

Mitigation

- 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

- Fire may be out, but now mitigate flooding

Wildfire IAC - RECOVER

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.

- Document everything
- Develop lessons learned

A Few Other Tools/Resources

Federal Funding for Utilities – Water/Wastewater – in National Disasters (Fed FUNDs)

www.epa.gov/fedfunds

Fed FUNDs Homepage

Which Funding is Right for You?

Federal Disaster Funding Programs

Be Prepared to Tap into Funding

Utility Examples, Training, and Assistance

Currently in a Disaster?

- FEMA Public Assistance
- FEMA Mitigation Programs
- USDA Water Grants
- EPA State Revolving Funds
- HUD Community Grants
- SBA Loans

FEMA Program	Description
Public Assistance	Provides grants to repair damage after a presidentially-declared disaster
Hazard Mitigation	Provides grants to reduce losses and protect life and property from future disaster
Pre-Disaster Mitigation Program	Provides planning grants to reduce overall risk
HMGP Post Fire Grant	Helps implement hazard mitigation measures after wildfire disasters
Flood Mitigation	Provides grants to reduce or eliminate the risk of flooding

- Resilience is a criteria for priority projects
- Use more as mitigation
- Clean Water SRF funds to protect source water

FEMA Post-Wildfire Pre-Calculated Benefits for Watershed Recovery

- Per FEMA, pre-calculated benefit for post-wildfire mitigation is $5,250/acre for the following mitigation projects:
  - Soil stabilization, flood diversion and reforestation projects
- Multiply # acres mitigated by benefits per acre
  - Project that provides ground cover, soil stabilization and replanting for 1,000 acres, 1,000 x 5,250 = $5,250,000 in benefits.
- Pre-calculated benefits based on planting forest and other vegetation with primary emphasis on flood reduction risk.
- https://www.fema.gov/grants/mitigation/post-fire

HAZARD MITIGATION FOR NATURAL DISASTERS

A Starter Guide for Water and Wastewater Utilities

Select a menu option below. New users should start with Overview Hazard Mitigation.

Overview Hazard Mitigation

Join Local Mitigation Efforts

Develop Mitigation Projects

Implement and Fund Project

Mitigation Case Study

https://www.epa.gov/waterutilityresponse/hazard-mitigation-natural-disasters

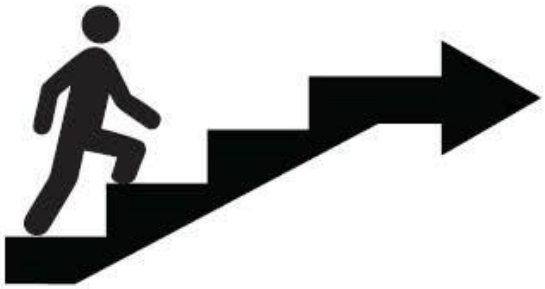
EPA

Next ▶

Develop Mitigation Projects

Steps

Click the icon to the right to learn about the four steps to develop mitigation projects.



Mitigation Resources by Natural Disaster

Click below to explore specific resources and mitigation examples for each natural disaster.

Flood

Earthquake

Drought

Wildfire

Tornado

Power Outage

Overview Hazard Mitigation
Join Local Mitigation Efforts
Develop Mitigation Projects
Implement and Fund Project
Mitigation Case Study

Wildfire Mitigation Resources

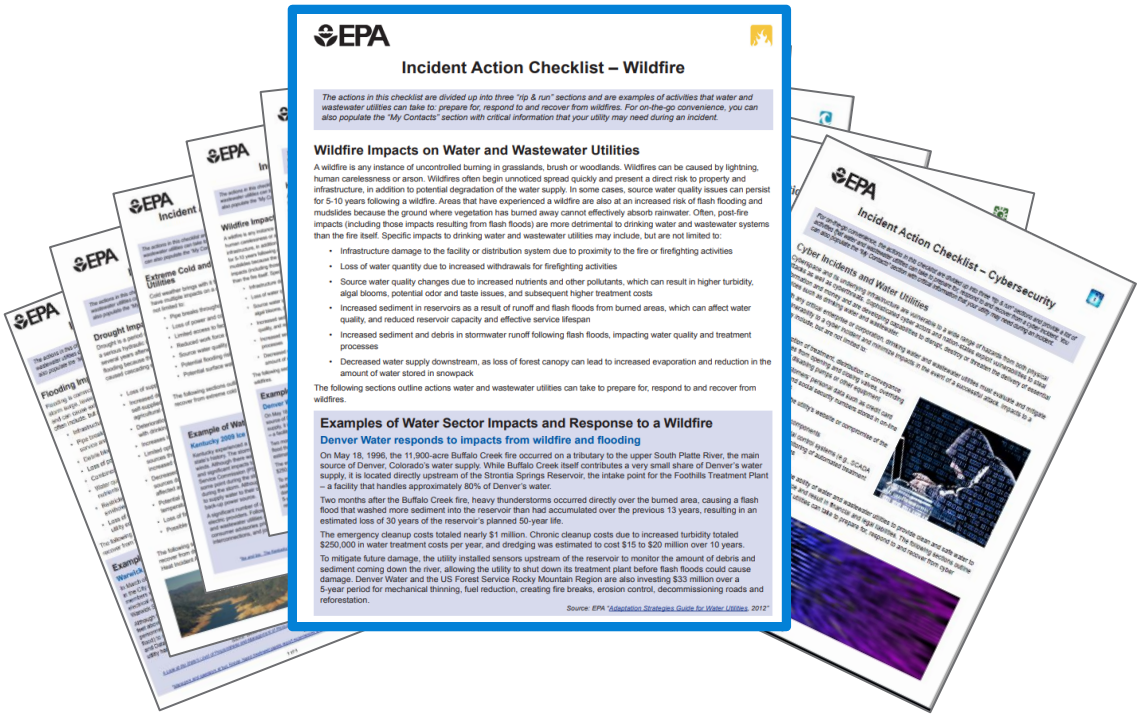
Resource	Description
Effects of Wildfire on Drinking Water Utilities and Best Practices for Wildfire Risk Reduction and Mitigation Exit	Explanation of how wildfires affect water and wastewater services. Includes how to mitigate risk including forest management strategies and hydrologic effects of wildfires. (EPA and Water Research Foundation)
Fire Management Planning for Public Water Systems Exit	Advice for developing a fire management plan. Includes links to other wildfire-related resources. (Colorado Department of Public Health and Environment)
Active Fire Mapping Program Exit	Interactive map of active wildfires across the United States. (US Fire Service)
Incident Action Checklist - **Wildfire**	Checklist of activities that water and wastewater utilities can take to prepare for, respond to and recover from wildfires. (EPA)
Wildfire Hazard Mitigation Handbook for Public Facilities Exit	Handbook of mitigation measures identified for pipes, pumping stations, treatment facilities, wells, chemical tanks and power supply. (FEMA)

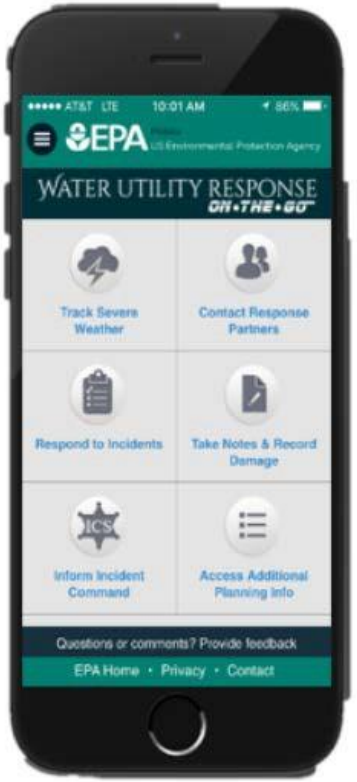
Wildfire Mitigation Examples

- Remove debris, trees or other fire-hazard materials.
- Institute high fire danger procedures such as smoking bans and fire bans.
- Install fire resilient building materials.
- Modify treatment process for sediment in water.

Before and after removal of at risk structures and debris

Return to Develop Mitigation Projects





Download any checklist at:
https://www.epa.gov/waterutilityresponse/incident-action-checklists-water-utilities

Response-On-The-Go App:
https://www.epa.gov/waterutilityresponse/water-utility-response-go-mobile-application

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