

Information for Water Suppliers Impacted by Wildfires

Wildfires can result in a variety of impacts to water systems that can cause contamination and drinking water related hazards. These include:

- **The loss of power, which in turn can lead to:**
 - Backflow of water into the system – this can occur when there is a loss of pressure in the system causing contaminated water to be pulled back into the system through cracks in the piping or cross connections with non-potable water sources.
 - Loss of water treatment equipment functionality – this can allow untreated water to enter the distribution system and be consumed.
 - Water sitting in the distribution system and becoming stagnant – this can allow microorganisms in the distribution system to multiply, which can pose a health risk and lead to taste and odour problems.
- **Physical damage to water system components and equipment.**
- **Impacts to your water source**, including the loss of source water or contamination from fire retardant.



If you don't have the knowledge, skill, or experience required to conduct the activities described in this document, it may be necessary to retain the services of someone who has experience operating a small water system.

Returning to Normal Operations

Refer to **your** Emergency Response and Contingency Plan (ERCP) for procedures specific to your system. Here is some general advice for operators:

- If there is any doubt about the state of the system or the safety of the drinking water, the water supplier **must issue a Boil Water Notice (BWN) immediately** and [contact an Environmental Health Officer \(EHO\)](#).
- When safe to do so, inspect the water system components to ensure they have not been damaged and are working properly. Check to make sure all water treatment infrastructure (if any) is working properly. If your system is damaged, refer to the information further down about dealing with damage to the water system.
- Begin performing maintenance procedures to repair the water system. The specific actions required will depend on factors including likelihood of contaminants entering the system, if the system was abandoned, and for how long:

- Flushing the distribution system – this involves discharging water from the pipes through hydrants, standpipes or other discharge points. It allows stagnant water, debris and other contaminants to exit the system. It should be done prior to disinfecting the system in order to reduce the amount of chlorine required. Techniques for flushing distribution systems are included at the end of this document. Information that can be supplied to homeowners to help them flush their plumbing systems if it is necessary is included in *Appendix A*.
- Disinfect the system – this involves introducing chlorine into all or part of the water system to kill any harmful microorganisms that may be present.
 - Water Wells – if the system is supplied by a well, please refer for to the document entitled [Water Well Disinfection Using the Simple Chlorination Method](#) from the BC Ministry of Environment for information on well disinfection.
 - Distribution System – the distribution system can be disinfected by introducing chlorine into the water mains to achieve an initial concentration of 25 mg/L (ppm). Allow this solution to stand in the pipes for 24 hours, at which time there should be at least 10 mg/L of chlorine left. A test kit is required to measure residuals. The pipes can then be flushed to remove the remaining chlorine. Refer to *Appendix B* for the amount of chlorine required to produce 25 mg/L in 30.5 meters (100 feet) of pipe. This method follows the continuous-feed method described by the American Water Works Association (AWWA). There are other acceptable methods that can be used to disinfect a distribution system. Refer to *AWWA Standard C651-14* for more information.
- Verify water quality by taking two sets of bacteriological samples at least 24 hours apart – once acceptable results have been obtained, the Boil Water Notice (BWN) can be lifted.
- If contamination of a chemical nature is suspected, a higher level of public notification may need to be issued. This could include a Do Not Consume or a Do Not Use notification. Ideally, this should be done in consultation with an Environmental Health Officer or Medical Health Officer (for after hours emergencies).

Is there Damage to your Water System?

Wildfires significantly damage water systems. When it is safe to do so, begin the process of trying to assess and inventory any damage to the system. Some things to keep in mind include:

- Refer to your Emergency Response and Contingency Plan and inventory any damage that has occurred. [Contact an EHO](#) for additional consultation or help in assessing the system.
- Underground components are more protected than those above ground and in many cases may not be substantially affected by wildfires.
- Where it has been determined that work is required to repair the water system, a Construction Permit is usually required. These can be obtained through Engineering Direct at 1- 855-743-3550 or through engineeringdirect@interiorhealth.ca. There is more information on [our public website](#). In some circumstances, emergency repair work can be completed without a permit. To determine if this applies to your situation, [contact an EHO](#) prior to doing any work.

- In the event of extensive damage to the water system, including the loss of the water source or complete loss of the system, it may be necessary to obtain additional approvals. [Please contact an EHO.](#)
- Water suppliers are encouraged to consult with their insurance provider to determine if coverage is available

In some cases it may be necessary to retain the services of a qualified person, such as an engineer or water system design professional, for help with assessing the state of the system.

Potential Impacts to Surface Water Sources

Surface water sources may experience some longer term impacts as a result of wildfire activity. Wildfires can change the surrounding geology, which can lead to increased runoff. Surface water sources can also be impacted by fire retardants. Fire retardants used in BC are not toxic, they do, however, contain nutrients which can temporarily increase nitrogen concentrations and stimulate algae growth.

They may also cause aesthetic changes to the water, such as a salty taste. Water suppliers relying on a surface water source may wish to undertake additional testing to monitor for changes to their source water. [Contact an EHO](#) if you are unsure.

Additional Resources

Water System Flushing

Developing and Implementing a Distribution System Flushing Program (Free PDF) (2002). American Water Works Association.

<https://www.awwa.org/publications/journal-awwa/abstract/articleid/14615.aspx>

Unidirectional Flushing: A Powerful Tool (Free PDF) (1999). American Water Works Association.

<https://www.awwa.org/publications/journal-awwa/abstract/articleid/14075.aspx>

Water System Disinfection

AWWA Standard C651-14: Disinfecting Water Mains (2014). American Water Works Association.

<https://www.awwa.org/store/productdetail.aspx?productId=45320336>

AWWA Standard C652-11: Disinfection of Water Storage Facilities (2011). American W

<https://www.awwa.org/store/productdetail.aspx?productId=45320336>

Other Resources

[Small Water Users Association of British Columbia](#) – the association provides information to small water suppliers about assistance programs, local equipment suppliers, consulting engineers, and other issues related to small water systems.

Appendix A – Information for Homeowners Procedure for Flushing Your Home &/or Building Plumbing System

All water systems that have been shut down should be flushed as there will be stagnant water in the lines.

- If in doubt, seek the services of a trained professional such as a plumber. In most cases, instructions for flushing various appliances can be found in the owner's manuals provided with water softeners and other equipment. It is recommended that these instructions should be followed.
- For homes on a septic system, make sure that your septic system will be able to handle large volumes of water before you begin flushing. Consider running inside taps using a hose &/or buckets to drain the water outside instead of into the septic tank.

General Plumbing System Flushing Procedure:

1. Flush the water line to the house. This should be accomplished by running outside taps to waste for five minutes. Once the main line is flushed, then the house plumbing system can be flushed. This will reduce loading on septic systems.
2. Flush household pipes/faucets. To flush your plumbing, run your cold water faucets on full for at least five minutes each. Remove all aerators (screens on end of taps) to ensure there is enough flow through taps.
3. Follow the manufacturer's instructions for flushing the hot water tank. Shut off the breaker at the electrical panel and wait at least two hours before flushing the hot water tank to allow the water to cool. (For gas or propane hot water tanks, please follow the manufacturer's instructions for turning off the element and pilot light.) Run the hot water taps until the warm water runs out and cold water is coming from the hot taps. Once all of the water has been flushed from the hot water taps, turn off all of the taps and turn the breaker back on to the hot water tank.
4. For other appliances such as in-line filters, treatment systems, water softeners, fridge water dispensers with direct water connections or water tanks: Run enough water to completely replace at least one full volume of all lines and tanks. If your filters are near the end of their lives, replace them.
 - Water softeners: Run through a regeneration cycle.
 - Reverse Osmosis (RO) units: Replace pre-filters, check owner's manual.
 - Replace other water filters, as they are disposable and may be contaminated. This applies especially to carbon filters.
5. Other appliances such as coffee makers, Brita filters, or bathroom Water Piks that are not directly connected to a water line but may have been used during the event should also be thoroughly cleaned and flushed.

Appendix B – Information for Water Suppliers

Chlorine required to produce 25 mg/L concentration in 100ft (30.5m) of water main by diameter (as described in AAWA Standard C651-05)

Pipe Diameter		100% Chlorine		1% Chlorine Solution*	
<i>Inches</i>	<i>Millimetres</i>	<i>Pounds</i>	<i>Grams</i>	<i>Gallons</i>	<i>Liters</i>
4	100	0.013	5.9	0.16	0.6
6	150	0.030	13.6	0.36	1.4
8	200	0.054	24.5	0.65	2.5
10	250	0.085	38.6	1.02	3.9
12	300	0.120	54.4	1.44	5.4
16	400	0.217	98.4	2.60	9.8

*Please note that commonly used sources of chlorine are household bleach (5% chlorine) and industrial strength bleach (12-15% chlorine). These will need to be diluted to achieve a 1% chlorine solution.