

Effects of Wildfires on Pools

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Brought to you by the APSP Recreational Water Quality Committee (RWQC)

I. INTRODUCTION

In the case of active fires, the first concern should always be for the immediate safety of people. The following provides guidance for pool professionals in dealing with the restoration and repair of swimming pools after a wildfire.

II. DURING THE FIRE

Use extreme caution in and around areas where wildfires are still active. Protective gear such as respiratory mask, goggles and gloves may be required in these situations. It is prudent to carry some emergency supplies on your truck at all times. This could include bottled water, safety flares, a protective non-flammable blanket, a battery powered radio and flashlight. In addition, it is vital to comply with the emergency management in the area. Avoid areas of heavy smoke where emergency crews are setup. Service companies should never attempt to cross an emergency barrier or evacuation zone to deal with pools. Fire can change course and move rapidly especially in areas of high winds. If your route is anywhere near where fires are, make sure to have several planned escape routes thought out ahead of time. Smoke and ash can be a problem for miles beyond the fire. In the summer of 2017, smoke from the fires in British Columbia spread all the way down to the Seattle Washington area. The airborne ash and debris affected many pools in the area. Some of the pools developed filter problems and bouts of algae.

Water pressure and water quality at the source will be affected during and after times of wild fires. For residents trying to protect their property, using the hose may not always be effective. In some cases where water pressure becomes an issue during the fire, some fire departments may incorporate pumps in the pool to use the water for protecting homes. Homeowners in wildfire areas can also buy pumps that can soak down their property. These pumps can typically work at a flow of 150 gpm and can disperse the contents of a 20,000-gallon pool within 2 hours.

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Pool techs should be aware ahead of time of this possibility and should check that hydrostatic relief valves are in place on these pools to prevent the pool vessels from popping out of the ground during these emergency use times. If there is a high groundwater table or the pool is over an underground spring, this could be a very real possibility.

All types of debris are possible during times of wildfires as result of possible high winds. Smoke, ash, tree branches, leaves and fire suppressant chemicals will all most likely end up in the pool. There is the possibility that live animals may seek shelter in the water or pool area. Do not attempt to deal with live wild animals on your own. Immediately contact your local animal control or wildlife management officials.

III. AFTER THE FIRE

Take great care when undertaking the task of clean up after a fire. Be aware of live downed power lines. In many cases in fire-damaged homes, the fire department will turn off the power. This is done because wires may have melted or been fused from the heat. Be sure to check with the fire department before attempting to turn pump and filter breakers back on. Only a licensed electrical contractor should determine the integrity of the breakers for the pumps.

IV. POOL CLEAN UP

Swimming pools in fire areas may contain toxic ash, debris, and firefighting suppressants. Since it is impossible to determine the nature and amount of foreign materials that have entered the pool, it is best when allowable, to drain and re-fill the pool. Inspect the integrity of the pool walls, interior finishes, the pipefittings, decking and surrounding landscape. The components of smoke from fire can cause severe lasting damage to equipment and structures. In addition, the chemistry of the pool will be adversely affected. Smoke is corrosive. It will cause severe damage wherever it has settled. If equipment and decking are covered in ash and smoke, continue to use caution. Wear personal protective equipment and a breathing apparatus as well as gloves. There are many toxins in smoke and ash residue that may be hazardous to human health. The best case is to allow professionals to deal with excessive clean up situations.

V. THE CONTENTS OF ASH

In the case of wildfires, there will be a lot of ash that ends up in pools. Ash from fires that burn lower than 840 degrees Fahrenheit is mostly organic carbon. At a higher temperature, the carbon is burned away and inorganic compounds are left. These include things like calcium, magnesium and sodium. Past fires in California not only burned forests, but also homes and structures. The combustion rate is much higher for buildings and the make-up of the corresponding ash is significantly different. At a very high combustion rate, the ash can contain potassium and calcium oxides, which create quicklime. If enough of this ash gets into the pool and then to the filter, it can create a limestone cement coating on the filter media. Ash from homes and structures can also contain toxins such as lead, arsenic and hexavalent chromium. Most of the ash that lands in pool water is also hydrophobic and repels water. This explains why the ash floats and is so difficult to remove by skimming. Changing the charge of the ash by using a chitosan clarifier or an enzyme can help in the removal of the ash.

VI. THE INGREDIENTS OF FIRE-FIGHTING SUPPRESSANTS

Most of the dry suppressants dropped on wild fires are made primarily of di-ammonium phosphate. The result of this is an increase in phosphate ending up in the waterways and in swimming pools. Phosphate in pools leads to many water quality issues and can combine with calcium to form calcium phosphate scale on heat exchangers. In 2003, the Cedar Fire in San Diego, California was one of the biggest wildfires in California history. After that fire, pool service professionals reported a very high spike in phosphate levels in pools. This could have been in direct relation to the large amounts of phosphate-based suppressants dropped in the area.

In cases of homes not damaged but in a vicinity to the fire, take the following steps:

- Remove all larger debris as soon as is possible.
- Brush all surfaces thoroughly
- Skim smaller material with a pool net
- Make sure filter is clean and in operational order
- Inspect all equipment
- Super chlorinate the pool to 20 ppm or use a quality chlorine-free oxidizer
- Follow immediately with a clarifier or filter aid material to help remove small ash material to the filter
- Use of an enzyme can help break down some un-filterable non-living organic material
- Test and treat for phosphates once the chlorine levels have come down below 5 ppm
- Add a good broad spectrum algaecide
- Clean filter as necessary throughout this process

VII. FURTHER CAUTIONS

The extreme heat from fires can cause the ground to bake leading to a lack of absorption. The heat bakes the soil forming a solid layer that causes it to repel water. This is a condition known as hydrophobicity. When rains come, the hydrophobic condition of the soil increases the rate of water run-off. Water can concentrate in these areas causing erosion. Excessive erosion can come from firefighting efforts and lead to flooding during rains. Pool areas need protection with sand bags or other diversion methods to drains to prevent an influx of floodwater in the pool.

Pools drained during the fire must be inspected for damage to interior finishes, deck areas and all equipment connections. Most likely, these pools will need re-surfacing before regular use can begin.

VIII. CONCLUSION

In conclusion:

- Use extreme caution in areas where wildfires are active.

- Always check ahead of time with emergency management personnel before attempting to enter neighborhoods where fires have been.
- Wear smoke protection when necessary (breathing mask and goggles).
- Since water in pools can contain toxins from smoke, ash, and firefighting suppressants, it is best to drain when possible. No one should ever swim in a pool in the immediate aftermath of a fire.
- Remember that wildfires can move fast and change course in seconds. Have more than one escape route planned ahead of time. It is best to stay out of the area.
- The use of shocking and flocking chemicals, phosphate removal treatments, enzymes, filter aids, and algicides are all good remedial treatments once the fires are gone.
- Check and inspect all equipment thoroughly during the clean-up process. Filters may need to be backwashed and cleaned frequently during this time.
- Ensure that pools equipped with firehose pumps also have hydrostatic relief valves to prevent popping from rapid draining.
- Be aware of erosion and flooding problems that may occur from damaged soil. Sand bag any vulnerable areas in advance. Ensure that the flow of water is to drains and culverts to prevent flooding.

VIII. REFERENCES

[How to Prepare For a Wildfire](#) – Federal Emergency Management Agency (FEMA); FEMA.gov

[Wild Fire Information Sheet](#) – FEMA May 2018

[Flood After Fire: The Increased Risk](#) – FEMA October 2017

[California Environmental Protection Agency \(CalEPA\) Fire Response and Recovery](#); calepa.ca.gov

[Wildland Fire Chemical Products Toxicity and Environmental Concerns General Information](#) – US Forest Service January 2007