



**REPORT TO REGIONAL WATER SUPPLY COMMISSION  
MEETING OF WEDNESDAY, SEPTEMBER 16, 2020**

---

**SUBJECT**     **August 17, 2020 Lightning Strike Wildfires in the Greater Victoria Water Supply Area**

**ISSUE SUMMARY**

To report on conditions and wildfire management activities related to two lightning-caused fires in the Greater Victoria Water Supply Area.

**BACKGROUND**

A lightning storm passed through the Greater Victoria Water Supply Area (GVWSA) and southern Vancouver Island on the night of Sunday, August 16, 2020, after a day of high air temperatures and dry outflow wind conditions. Nineteen lightning strikes were recorded in the GVWSA of which two near Horton Ridge caused fires within the watershed catchments of Sooke Lake Reservoir and Deception Reservoir overnight. The two fires were referred to as the Healey Fire and the Rithet Fire. The fires were detected on the morning of Monday, August 17 and grew to a total of 8 hectares (ha) before being largely contained by end of Tuesday, August 18. CRD staff and BC Wildfire Service (BCWS) worked together on suppression, aided by a shift to lower temperatures, higher humidity, and relatively calm conditions. Suppression efforts included considerable air support on the fires including one load of fire retardant dropped in four lines, and several hours of water drops. Approximately 20 millimeters (mm) of rain on Wednesday and Thursday greatly assisted with the suppression and mop up effort. The fires were patrolled until Sunday, August 30 and called “out” by the BCWS Incident Commander on August 31. Water quality parameters measured in Sooke Lake Reservoir, nearest the burned areas, have not detected any effects on water quality from the burned area or retardant. The burned areas have been assessed and a remediation plan is being developed which will be implemented prior to fall rains. Water quality monitoring will continue through the first significant fall rains however no water quality concerns are anticipated as a result of the fires.

**Fire Weather Conditions and Fire Hazard**

The wildfire danger condition in the GVWSA on the weekend of August 15 and 16 had just reached Extreme at one station due to periodic rains through the summer. However, the weather conditions on the afternoon and evening of Sunday August 16, were conducive to fire starts and spread as humidity had dropped below the air temperature, a condition known as “crossover”.

**Lightning Strikes and Fire Starts**

The BCWS lightning locator application recorded a total of 19 lightning strikes in the GVWSA on the night of Sunday, August 16. Fortunately, fire starts occurred at only two sites, both on Horton Ridge to the west of Sooke Lake Reservoir (Appendix B: Map 1). The fire starts on Mount Healey were the first reported. A fire at a second, much more isolated site, dubbed Rithet, was discovered during the response to the Mount Healey fire.

### Suppression Response

A total of 24 CRD staff responded to the fires on Monday morning. An intermediate helicopter was hired to provide assistance bucketing water to the fires from Deception Reservoir. The fires were immediately reported to BCWS, which responded with staff, contract crews and air suppression resources. BCWS assumed command of the wildfire mid-morning on Monday. Watershed Protection staff continued to work on the fire throughout the week, although most staff were released back to regular duties on Wednesday after the fires were largely contained.

A load of fire retardant was dropped on the Mount Healey fire on Monday afternoon to try and prevent further spread. This was followed up on Monday afternoon by water drops on both fires from seven skimmer aircraft over approximately 2.5 hours. These air suppression efforts played a major role in constraining the size of the fires.

Throughout the suppression response there were no safety incidents and only one minor injury (bruised leg) with no time loss.

Weather greatly assisted containment, suppression and mop up efforts. Weather conditions on Monday and Tuesday were relatively stable with low wind speeds, lower temperature, and higher relative humidity. About 28 mm of rain fell on Thursday and Friday. By the weekend, mop up activities were no longer required although the sites were patrolled daily by both BCWS and Watershed Protection staff.

Images of the areas burned and a detailed overview of weather conditions, wildfire preparedness, and a log of wildfire response actions and resources is provided in Appendix A.

### Location and Characteristics of the Fires

Both wildfires were located in areas identified by wildfire models as increased risk for lightning and burn probability. The fire locations are described as extensive areas of moss covered rock outcrops interspersed with trees and shrubs. The fires behaved largely as expected, spreading slowly across the moss but flaring up when reaching areas with accumulations of fuel. The understory salal burned readily. Although the fine fuels were dry, it was fortunate that the larger and deeper fuels were not as dry as in recent past years, and that wind speeds remained relatively calm throughout the week.

The rugged steep terrain hampered ground suppression and mop up, although there was good road access to Mount Healey. The isolated location of the Rithet fire required an access foot trail and helipad to be constructed.

The Mount Healey fire eventually grew to just under 6 ha (Appendix C: Map 2). Most of the area burned was within the catchment of Deception Reservoir, which is not used for water supply. Portions of the fire did burn into the catchment of Sooke Lake Reservoir and onto adjacent private managed forest land. The fire did not spread toward the Capital Regional District (CRD) communications facility on Mount Healey. This was likely due to FireSmart fuel management and clearing for radio sightlines as well as containment priorities. However, the tower-mounted wildfire infrared camera appears to have been damaged by lightning strike activity. The Rithet fire burned approximately 2 ha within the catchment of Sooke Lake Reservoir (Appendix D Map 3).

A review of the available information on lightning and wildfires in the GVWSA indicates that rocky uplands, such as Horton Ridge have had multiple lightning strikes and fires since the 1930's, although lightning storms are relatively infrequent. The most recent previous event occurred on August 17, 2008 when four fires were started by lightning strikes clustered near Horton Ridge. Based on this history, a forest fuel reduction corridor has been put in place along a road on Horton Ridge to facilitate access for suppression and slow the spread of wildfire. This is one of a series of forest fuel reduction corridors put in place or underway to protect the GVWSA (Appendix E: Map 4).

### BC Wildfire Service (BCWS)

There was excellent support from the BCWS on the Healey and Rithet wildfires in the GVWSA. BCWS responded to the GVWSA wildfires under the terms of the current CRD-BCWS Wildfire Response Agreement. For 2020, the fee for unlimited BCWS response is \$7,100 or \$0.35 per hectare. While there has yet to be a final tally of costs, the resources provided by the BCWS, particularly the air support, were substantial.

The handover of incident command to BCWS was appropriate and timely, however caused some delays in the field. In addition, the CRD had some difficulty in obtaining accurate information from BCWS on strategies and resources, and there could have been more timely participation of CRD staff in decisions important to the GVWSA such as the use of fire retardants and water sources to be used. Learnings from these fires will help fine tune the relationship with BCWS and will further enhance the wildfire response in the GVWSA.

### Use of Fire Retardant

The chemical fire retardant (commercially called PHOS-CHECK LC95A) used by BCWS on the Mount Healey fire on Monday, August 17 has the active chemical ingredient ammonium polyphosphate which is an inorganic salt at approximately 15% concentration. Approximately 11,000 L of retardant was dropped, meaning about 1,700 L of the active ingredient was applied with colouring to make it visible. When flames come into contact with the retardant, the resulting reaction releases a combination of water and carbon dioxide that cools and suffocates the fire<sup>1</sup>. The retardant is applied by air in the path of the fire to contain it. The purpose of retardants and other suppressants applied by air is to contain and slow down the fire or suppress its behavior to buy time and allow for safe deployment of ground suppression resources.

BCWS consulted with CRD staff prior to utilizing retardant, although the time for decision making was short. The issue of when and where to apply chemical retardants in the GVWSA has been pre-planned by Watershed Protection and Water Quality staff in terms of mapping of exclusion zones where retardant is never to be applied (Appendix E: Map 4); and required water quality monitoring protocols if retardant is applied. The decision whether to allow application of fire retardant is necessarily situation dependent and was made collaboratively between senior staff. The decision making principle is based on causing least harm – weighing the risk of a large scale wildfire impacting water quality against the risk from retardant potentially reaching and impacting the water supply.

The retardant contains chemicals that are similar to those used as agricultural fertilizer and pose no direct risk to public health. Unless deposited directly and in large amounts into a small fish

---

<sup>1</sup> Province of British Columbia – Water Quality – Fire Retardants Used to Fight Wildfires

bearing stream, there is no environmental toxicity associated with this product. As a potent fertilizer, any significant amount of retardant reaching Sooke Lake Reservoir could stimulate algal growth and lead to short and mid-term water quality deterioration.

A post-fire water quality assessment with additional and targeted water quality monitoring in Sooke Lake Reservoir and potentially affected tributary streams began on Friday, August 21. The data analysis has not yet detected any measurable water quality impact as a result of the retardant application and the wildfires. This post-fire water quality assessment will continue once currently dry streams begin to flow after the onset of the fall rains.

#### CRD Emergency Operations Centre

The CRD Emergency Operations Centre (EOC) was activated on the morning of Tuesday, August 18 in support of wildfire response in the region. There were several other wildfires burning west of Sooke River as a result of the lightning storm, in addition to the fires in the GVWSA. The EOC provided a coordinating role with Corporate Communications on the wildfires in the GVWSA as well as senior CRD staff. The involvement of the EOC allowed CRD Integrated Water Services (IWS) staff to focus on wildfire response and updates to the Water Commissions.

#### Public Communications

Given that the incident command on the wildfires was the responsibility of the BCWS, it was decided that the CRD would provide supplemental information on the provincial communications about the fires in the GVWSA. However, given the level of media interest, IWS staff provided an interview to give an update on the status of the fires.

#### Recovery and Rehabilitation

An assessment of the two burned areas is being undertaken following the Post-wildfire Natural Hazards Risk Analysis in BC methodology<sup>2</sup> and early results indicate less than 0.5 ha of high burn severity, and approximately 4 ha of moderate burn severity. Soil hydrophobicity (water repellence), erosion and debris flow potential are being calculated, however given the amount of exposed bedrock and shallow soils there does not appear to be any significant risk of soil and debris being transported from the burned areas. Any movement of sediment and nutrients downslope will most likely be taken up by forest vegetation as the burned sites are about a kilometer away from Sooke Lake Reservoir (Appendix E: Map 4).

Rehabilitation will be undertaken by spreading wood “straw”, an engineered and kiln dried wood product designed for erosion control on the high and moderate burn severity areas. CRD has wood straw in inventory and has ordered additional product for the rehabilitation. The need for grass seeding and/or planting will be re-assessed in the following year or two after allowing for natural regeneration. Grass seeding in particular has been shown in post-wildfire rehabilitation studies to be ineffective in the first year.

---

<sup>2</sup> Hope, G., P. Jordan, R. Winkler, T. Giles, M. Curran, K. Soneff, and B. Chapman. 2015. Post-wildfire natural hazards risk analysis in British Columbia. Prov. B.C., Victoria, B.C. Land Management Handbook 69. [www.for.gov.bc.ca/hfd/pubs/Docs/Lmh/LMH69.htm](http://www.for.gov.bc.ca/hfd/pubs/Docs/Lmh/LMH69.htm)

The CRD, with the help of the BC Wildfire Service, was successful in responding to and suppressing two wildfires that started as a result of a lightning storm that passed through the region on August 17. The CRD 2020 GVWSA Wildfire Preparedness Plan was followed and adequate wildfire preparedness resources in patrol, equipment and on standby were in place. CRD staff monitored lightning and weather and responded quickly to detect and deploy to the wildfires. BCWS responded quickly, prioritized the GVWSA wildfires over others on southern Vancouver Island, and provided significant ground and air support resources.

The fires were kept to small size and contained within two days. The FireSmart fuel management around the Mt. Healey communication facility and the clearing of radio site lines, helped protect the facility from heat and fire damage.

Lessons learned from the incident will be used to refine wildfire response and suppression procedures and assess the need for additional forest fuel management on Horton Ridge. The burned areas provide an opportunity to test and monitor rehabilitation methods in order to better prepare for the impacts of future wildfires. The learnings from this event will also help improve the working relationship with the BCWS on wildfires in the GVWSA.

**RECOMMENDATION**

That the Regional Water Supply Commission receive the report for information.

|               |  |
|---------------|--|
| Submitted by: | Annette Constabel, M.Sc., R.P.F., P.M.P., Senior Manager, Watershed Protection |
| Concurrence:  | Ted Robbins, B. Sc., C. Tech., General Manager, Integrated Water Services      |
| Concurrence:  | Robert Lapham, MCIP, RPP, Chief Administrative Officer                         |

**ATTACHMENTS**

- Appendix A: Details of Lightning Strike Wildfires in the GVWSA
- Appendix B: Map 1: 2020 Wildfire Locations - Horton Ridge
- Appendix C: Map 2: Mount Healey Fire Perimeter
- Appendix D: Map 3: Rithet Fire Perimeter
- Appendix E: Map 4: GVWSA Risk Mitigation Features