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October 7, 2020

Ms. Marija Tresoglavic
Acting Commission Secretary and Manager
Regulatory Support
British Columbia Utilities Commission
Suite 410, 900 Howe Street
Vancouver, BC V6Z 2N3

Dear Ms. Tresoglavic:

RE: British Columbia Utilities Commission (BCUC or Commission)
British Columbia Hydro and Power Authority (BC Hydro)
COVID-19 Emergency Response and Wildfires Mitigation Plans
Information Responses to BCUC STAFF Questions No.1

BC Hydro writes to provide its responses to Commission STAFF Information Request No. 1.

For further information, please contact Chris Sandve at 604-974-4641 or by email at bchydroregulatorygroup@bchydro.com.

Yours sincerely,

Fred James
Chief Regulatory Officer

bh/tl

Enclosure

1.0 Reference: COVER LETTER
Cover Letter, p.2

On the Cover Letter of British Columbia Hydro and Power Authority (BC Hydro) COVID-19: Emergency Response and Wildfires Mitigation Plans submission, BC Hydro states:

> This year BC Hydro will participate in the British Columbia ShakeOut exercise in October to test our earthquake response capabilities. Regarding cyber security preparedness, BC Hydro completed the GridEx exercise in November 2019 and our Technology department is currently reviewing potential cyber security exercise scenarios to test our cyber security plan this fall.

1.1.1 Please summarize BC Hydro's view on its earthquake response capabilities based on the ShakeOut exercise completed in October 2019.

RESPONSE:

The 2019 ShakeOut exercise demonstrated that BC Hydro has plans, processes, and staff in place to respond to an earthquake.

BC Hydro has and continues to invest in people, processes, and tools needed to prepare for earthquakes. We have a well-established emergency management structure and response capability across our worksites. Notable highlights of the 2019 ShakeOut exercise include:

- **Operations crews across Vancouver Island and Lower Mainland completed team check-ins to confirm status and availability to work;**
- **All Vancouver Island offices performed an earthquake drill. Inspections were performed at seventeen office buildings and substations to assess occupant safety;**
- **Emergency centers were activated to manage our response, including situation reporting and communications messaging;**
- **We also simulated a tsunami event. An alert was issued to west coast Vancouver Island locations, and Jordan River staff evacuated to high ground and used radio communications to confirm safety;**
- **Dam Safety simulated impacts at nine Vancouver Island dams. Seven alerts were sent to notify people of dam conditions through our Send Word Now application. Send Word Now is used to conduct mass notification for**

employees and some external agencies (to support notification of dam emergencies only to local response agencies), but it is not used for public emergency notifications. In a real event, our notification lists are pre-set to include emergency response personnel; and

- **A new video was launched to educate our employees on what to do after a major earthquake.**

Although ShakeOut demonstrated that BC Hydro has the key elements in place for earthquake preparedness, it did identify areas for improvement which would further enhance our preparedness. The exercise noted twenty-seven actions for improvement, including, for example, updates to local plans, review of roles and responsibilities with staff, process updates for dam safety and aircraft operations personnel, and improvements to our damage assessment procedures.

Twenty of the identified actions have subsequently been completed and closed. The remaining actions relate to enhancement of our logistics and mutual aid plans with other utilities to accommodate a larger workforce and improve our situational awareness, and for regional coordination to prioritize response and support recovery. BC Hydro is addressing these remaining items and is committed to participating in future ShakeOut exercises to test our earthquake readiness, with the goal of continually improving our response.

1.0 Reference: COVER LETTER
Cover Letter, p.2

On the Cover Letter of British Columbia Hydro and Power Authority (BC Hydro) COVID-19: Emergency Response and Wildfires Mitigation Plans submission, BC Hydro states:

> This year BC Hydro will participate in the British Columbia ShakeOut exercise in October to test our earthquake response capabilities. Regarding cyber security preparedness, BC Hydro completed the GridEx exercise in November 2019 and our Technology department is currently reviewing potential cyber security exercise scenarios to test our cyber security plan this fall.

1.1.2 Please summarize BC Hydro's view on its cyber security preparedness based on the GridEx exercise completed in November 2019.

RESPONSE:

The 2019 GridEx exercise demonstrated that BC Hydro has the plans, processes, and staff, supplemented with third-party contracts for incident response support, in place to effectively manage a major cybersecurity event.

BC Hydro continues to invest in the people, processes, and tools needed to remain prepared in an ever-changing threat landscape. We have a team of dedicated, trained professionals whose mission is to protect, detect, and respond to all cyber incidents. Notable highlights of the 2019 GridEx exercise include:

- **Activation of the Cyber Incident Response Plan and associated incident response and escalation procedures;**
- **The IT Incident Management Team and Emergency Coordination Centre were activated to manage response, including situation reporting and communications; and**
- **Validating the roles and responsibilities of third-party service providers in the event of a cyber attack on multiple applications.**

The GridEx exercise noted ten action items, eight of which have already been addressed. The remaining two items relate to clarifying and refining command and control responsibilities and developing additional technical procedures to isolate breached networks and systems. BC Hydro is addressing these remaining items in fiscal 2021 and is committed to participating in future GridEx exercises as a means of maintaining and improving our cybersecurity preparedness.

2.0 Reference: T&D ASSET MANAGEMENT FRAMEWORK
Attachment 2, pp. 92-93

Attachment 2 of BC Hydro COVID-19: Emergency Response and Wildfires Mitigation Plans submission consists of BC Hydro's Transmission and Distribution (T&D) Asset Management Framework. On pages 92–93 of Attachment 2, the change log indicates the document was last updated in November 2016.

1.2.1 Please discuss how often the T&D Asset Management Framework is reviewed and updated.

RESPONSE:

The original Asset Management Framework (AMF) was issued in 2012 (September 2012). Following 2012, the AMF was updated and re-published in February 2014 (fall 2013 version), December 2014, December 2015, and December 2016. These documents were reviewed and approved by the Vice Presidents of Asset Investment Management.

In 2017, the Transmission and Distribution organization was realigned to BC Hydro's new Plan-Build-Operate-Support model when Generation Stations, Dams and Water Conveyances were added to the Integrated Planning organization. The T&D Asset Management Framework has not been updated since the organizational realignment in December 2016.

The Integrated Planning organization plans to have the T&D Asset Management Framework updated to include the new asset categories. Based on current priorities, we anticipate this work will be completed within fiscal 2022.

3.0 Reference: T&D WILDFIRE HAZARD STRATEGY
Attachment 3, pp. 2-3

Attachment 3 of BC Hydro COVID-19: Emergency Response and Wildfires Mitigation Plans submission consists of BC Hydro's T&D Wildfire Hazard Strategy. On page 3 of Attachment 3, under *Asset Count, Condition, and Performance*, 2015-2017 statistics are provided. These statistics are reproduced, in part, below:

Number of Wildfires Involving Transmission or Distribution Assets 2015-2017

	2015		2016		2017		
Cause	**T**	**D**	**T**	**D**	**T**	**D**	**Total**
Trees	0	29	0	35	2	27	93
Landslide	1	0	0	0	0	0	1
Wires Down	0	1	1	1	4	4	11
Other Utility	6	7	2	2	4	9	30
No Cause Found	2	7	1	4	2	2	18
Line taken OOS to fight wildfire	1	0	2	0	1	1	5
Wind	0	1	0	0	0	0	1
Animal	0	1	0	0	0	0	1
MVA	0	0	0	0	0	1	1
Total	10	46	6	42	13	44	161

1.3.1 For the Wildfires listed as cause "trees," please explain how these wildfires were started and how, in general terms, the transmission or distribution assets were involved. Specifically, please explain whether these wildfires were started due to trees making contact with a powerline, which resulted in ignition of a wildfire.

RESPONSE:

The information in this table was prepared by comparing Ministry of Forests, Lands, Natural Resources, Operations and Rural Development (FLNRORD) data for powerline infrastructure fires and BC Hydro's outage information. Where FLNRORD identified powerline infrastructure as a potential cause of a fire, BC Hydro researched its outage information to identify specific cause details, if available.

For the cause listed as 'Trees', BC Hydro determined that the fire resulted from a tree or branch making contact with electrical equipment. All incidents where a tree or branch made contact with electrical equipment that resulted in a fire were on

distribution and lower voltage transmission circuits, where corridors are narrow and tree-line contacts are more likely.

Trees contacting powerlines can cause fires in several ways:

(a) A tree falling across the power line can break the conductor resulting in an energized conductor falling to ground and igniting a fire;

(b) A tree branch that falls onto the conductors and spans two or more conductors may ignite and drop burning material to the ground; and

(c) A branch that remains in contact with a conductor and continues to arc may eventually cause the conductor to break and fall to the ground.

All these scenarios are included in incidents where the cause was listed as 'Trees'.

3.0 Reference: T&D WILDFIRE HAZARD STRATEGY
Attachment 3, pp. 2-3

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Animal	0	1	0	0	0	0	1
MVA	0	0	0	0	0	1	1
Total	10	46	6	42	13	44	161

1.3.2 Please provide the same statistics as shown above, if available, for years 2018 and 2019.

RESPONSE:

As explained in BC Hydro's response to BCUC Staff IR 1.3.1, data is required from the Ministry of Forests, Lands, Natural Resources, Operations and Rural Development (FLNRORD), to perform the required analysis. BC Hydro has requested the required data for 2018 and 2019 from FLNRORD, however the data has not been received at the time of this filing. Upon receipt of the data BC Hydro can compare the data with our outage data and provide an updated analysis to the BCUC.

Since March 2020, BC Hydro has begun to track fires caused by our system or inadvertently caused by work activities on the system (either on, or under the powerlines), and this data will also support this type of analysis in future.

3.0 Reference: T&D WILDFIRE HAZARD STRATEGY
Attachment 3, pp. 2-3

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Animal	0	1	0	0	0	0	1
MVA	0	0	0	0	0	1	1
Total	10	46	6	42	13	44	161

1.3.3 Please discuss how BC Hydro uses the above statistics to inform its various asset management strategies (i.e.: vegetation maintenance programs, etc.).

RESPONSE:

The data in this table was used to update BC Hydro's Incident Management System (IMS) to specifically capture incidents involving fire. In 2020, a weekly review of this information was initiated to collect details, identify trends, and identify new risks on the system. BC Hydro is in the process of re-evaluating some current asset management strategies and adjusting some work programs to address these identified risks. For example:

- **Distribution pole-top fires resulting from porcelain cut-out failures have prompted BC Hydro to increase cut-out replacements in areas where such incidents occurred;**

- **BC Hydro has completed additional clearing of vegetation around key substations identified as having higher risk exposure to wildfires, to avoid high intensity fires near their perimeters; and**

- **Regarding the transmission system, BC Hydro is negotiating with a third-party vendor to have crews on standby during fire season, to be able to proactively apply pre-approved fire-retardant gel to high value wood pole structures in high fire risk areas if required. These crews would also be available to perform reactive pole protection work such as vegetation removal around the base of wood structures.**

BC Hydro is also reviewing its vegetation standards to identify those standards that require modifications for wildfire mitigation. Changes being considered include increased overhanging limb removal, additional hazard tree removals and enhanced debris management in areas identified as extreme wildfire risk in the wildfire risk model. The wildfire risk model is described further in our response to BCUC Staff IR 1.3.4.

3.0 Reference: T&D WILDFIRE HAZARD STRATEGY
Attachment 3, pp. 2-3

On page 2 of Attachment 3, BC Hydro lists the following Key Performance Indicators (KPIs):

- Fire probability/consequence models are prepared for all transmission corridors and electrical and communications facilities.
- Mitigation strategies are developed and in place for all critical infrastructure.
- Number of fire incidents from contact with or ignition by energized electrical equipment: 0.
- Number of fire incidents from personnel performing maintenance activities: 0.

1.3.4 For bullets 1 and 2, please discuss whether these KPI's have been achieved.

RESPONSE:

The Key Performance Indicators (KPIs) under bullet 1 and bullet 2 have been completed. They are currently being reviewed and updated as described below.

With respect to the KPI identified in bullet 1, BC Hydro currently has a probability/consequence wildfire model for the transmission system that was developed in 2006. Work is now progressing on an updated probability/consequence wildfire risk model that will include information for transmission and distribution lines, substations, generation infrastructure and communication assets and facilities. There are two components to the updated wildfire risk model:

- **The wildfire probability model, which was completed in June 2020 and is available for use in our Geographic Information System (GIS) platforms. This model is based on an analysis of historical fire records and suppression response capability to develop a predictive model that can be used to map variations in fire likelihood across a region. It considers influential factors such as fuel type and weather conditions; and**

- **The wildfire consequence model, which is currently under development and is planned to be completed before the end of December 2020. This model graphically demonstrates the consequence of wildfires to watersheds and interface areas that are near our infrastructure.**

With respect to the KPI identified in bullet 2, BC Hydro's key strategies include, at the program level, vegetation and line maintenance work plans, and also a fire services agreement with the Ministry of Forests regarding protection of

BC Hydro's infrastructure in the event of a fire. Additional mitigation strategies will be developed utilizing the updated probability/consequence wildfire risk model, once it is completed. The timeline for developing the additional strategies for critical infrastructure has not been finalized. Please refer to our response to BCUC Staff IR 1.3.7 for a discussion of potential future mitigating activities.

3.0 Reference: T&D WILDFIRE HAZARD STRATEGY
Attachment 3, pp. 2-3

On page 2 of Attachment 3, BC Hydro lists the following Key Performance Indicators (KPIs):

- Fire probability/consequence models are prepared for all transmission corridors and electrical and communications facilities.
- Mitigation strategies are developed and in place for all critical infrastructure.
- Number of fire incidents from contact with or ignition by energized electrical equipment: 0.
- Number of fire incidents from personnel performing maintenance activities: 0.

1.3.4 For bullets 1 and 2, please discuss whether these KPI's have been achieved.

1.3.4.1 If not, please discuss why not or whether there is a timeline for achieving these objectives.

RESPONSE:

Please see BC Hydro's response to BCUC Staff IR 1.3.4 regarding timelines for achieving these objectives.

3.0 Reference: T&D WILDFIRE HAZARD STRATEGY
Attachment 3, pp. 2-3

On page 2 of Attachment 3, BC Hydro lists the following Key Performance Indicators (KPIs):

- Fire probability/consequence models are prepared for all transmission corridors and electrical and communications facilities.
- Mitigation strategies are developed and in place for all critical infrastructure.
- Number of fire incidents from contact with or ignition by energized electrical equipment: 0.
- Number of fire incidents from personnel performing maintenance activities: 0.

1.3.5 For bullets 3 and 4, please discuss these KPI's in relation to the 2015-2017 Statistics provided on page 3 of Attachment 3, and the 2018 and 2019 statistics, if available, as provided in IR 3.2.

RESPONSE:

The KPIs for the number of fires caused by contact with or ignition by energized equipment and incidents from personnel performing maintenance activities were set as aspirational targets, similar to BC Hydro's approach to establishing safety targets. As shown in the table referenced in BCUC Staff IR 1.3.2, in the 2015-2017 timeframe, a number of fire incidents resulted from contact with energized electrical equipment.

BC Hydro monitors fire incidents caused by energized electrical equipment and personnel performing maintenance activities and takes measures to identify fire incident risks and develops strategies to reduce and avoid incidents. Given our experience, we will be reviewing and establishing new KPIs and associated targets with management oversight.

As discussed in BC Hydro's response to BCUC Staff IR 1.3.2, BC Hydro has requested the required data for 2018 and 2019 from the Ministry of Forests, Lands, Natural Resources, Operations and Rural Development (FLNRORD), however the data has not been received at the time of this filing.

Potential future strategies and program improvements are discussed in further detail in BC Hydro's response to BCUC Staff IR 1.3.7, and improvements will be informed by the wildfire risk model as discussed in BC Hydro's response to BCUC Staff IR 1.3.4.

3.0 Reference: T&D WILDFIRE HAZARD STRATEGY
Attachment 3, pp. 2-3

On page 2 of Attachment 3, BC Hydro states under *Future Requirements*:

> Since 2000, BC has had three very significant fire years in 2003, 2017 and 2018 where much higher than average fire activity occurred. In 2017 and 2018, we had the two highest record years for area burned by wildfire, exceeding the old 1958 record. With climate change and increased interface from building activity in wildland areas, we expect an increased risk from significant wildfire activity over the next few decades, particularly in the South and Central Interior and southern Vancouver Island, which are often subject to prolonged dry spells each summer.

1.3.6 Please describe if and how BC Hydro wildfire mitigation and preparedness strategies evolved following the significant fire activity in 2017 and 2018.

RESPONSE:

BC Hydro's wildfire mitigation strategies have been developed over a number of years, and are reviewed on an ongoing basis. Any change in strategy is done in a considered way, after the review of relevant information and experience.

In response to the 2017/2018 wildfire experience, BC Hydro has been updating and expanding its wildfire risk model (WRM). The updated WRM will include BC Hydro's generation, stations, transmission and distribution and communications infrastructure, and will provide the information required to determine if any change in wildfire strategies is warranted.

In addition, wildfire risk is being evaluated as part of new transmission projects, and the risk models are being used to inform line design and structure material selection, to reduce long-term risk to the system. As an example, due to increasing wildfire risk we are considering fire resiliency in transmission line route selection and design in a more comprehensive way than previously.

Following the wildfire activity in 2017 and 2018, we also reviewed potential changes to work procedures and documentation that could reduce risks of wildfire to the system. For example, wildfire risk was the focus of a safety audit undertaken in 2019, which resulted in significant improvements in field and program documentation.

Specific outcomes of the safety audit include:

- **A wildfire preparedness package was developed that clarified operational fire equipment requirements;**
- **Job site wildfire risk assessment forms were updated;**
- **BC Hydro's internal wildfire mobile app that retrieves up to date Wildfire Danger Class Rating data from weather stations in B.C. was enhanced to include more weather data, a map overlay of BC Hydro assets and offline access;**
- **Internal web-based and classroom courses related to wildfire safety were updated;**
- **A wildfire risk management program document is currently under development and several engineering and vegetation standards are being reviewed and revised to include wildfire considerations; and**
- **BC Hydro is in the process of updating procurement documents to clarify wildfire roles and responsibilities for BC Hydro staff and its contractors, and also identify contractor requirements for wildfire risk management.**

3.0 Reference: T&D WILDFIRE HAZARD STRATEGY
Attachment 3, pp. 2-3

On page 2 of Attachment 3, BC Hydro states under *Future Requirements*:

> Since 2000, BC has had three very significant fire years in 2003, 2017 and 2018 where much higher than average fire activity occurred. In 2017 and 2018, we had the two higest record years for area burned by wildfire, exceeding the old 1958 record. With climate change and increased interface from building activity in wildland areas, we expect an increased risk from significant wildfire activity over the next few decades, particularly in the South and Central Interior and southern Vancouver Island, which are often subject to prolonged dry spells each summer.

1.3.7 Please discuss the increase in risk, as noted in the above preamble, from significant wildfire activity over the next few decades, and what future requirements BC Hydro may have resulting from this increased risk.

RESPONSE:

A number of different factors are contributing to an increasing wildfire risk. In general, wildfire seasons are getting longer and less predictable due to climate change. Further, populations in wildfire-prone areas are increasing as people move to live and work outside of urban centers, thereby increasing the likelihood of human-caused fires and impacts. Forests are also becoming increasingly flammable as a result of fire suppression, forest management practices and increases in forest pest populations.

To address and plan for the increasing risk, BC Hydro is updating the wildfire risk model that identifies the probability and consequence of wildfires near our system. This model will inform activities in the future regarding wildfire risk management. Further, we are considering modelling a number of climate change scenarios to identify potential impacts to wildfire risk and assist with long term planning.

Future requirements are difficult to predict, and mitigating activities will be driven by emerging wildfire trends and characteristics. However, based on emerging trends, future requirements and activities could include:

(a) System resiliency such as replacement of wood poles with non-combustible structures, elimination of expulsion fuses, and coating of wood poles with fire retardant material;

(b) More aggressive vegetation management including increased hazard tree removal and debris management, and additional clearing at the base of guy wires and structures;

(c) Wider power line corridors (this may be difficult as it may require additional rights-of-way);

(d) Increased inspection frequencies in high risk fire areas to identify hardware and structural defects sooner;

(e) Increased maintenance and sustainment investments to correct the defects sooner; and

(f) Increased situational awareness through the installation of additional weather stations, and the increased use of tools such as Light Detection and Ranging Survey Technology (LIDAR), which provides accurate data on line and vegetation proximity.

BC Hydro participated in the development of, and is reviewing the direction from the Canadian Electrical Association (CEA) Utility Wildfire Mitigation Guide (https://electricity.ca/library/utility-wildfire-mitigation-guide-2020/) to reduce the chances of our system igniting or contributing to the spread of wildfire and to take actions to ensure our system is as resilient as possible if a wildfire occurs. The guide presents best practices to achieve these goals. BC Hydro will be using this guide and other utility best practices to inform and aid in identifying and implementing appropriate mitigating actions in the future.

3.0 Reference: T&D WILDFIRE HAZARD STRATEGY
Attachment 3, pp. 2-3

On page 2 of Attachment 3, BC Hydro states:

> Wildfire risks occur across the province but the risk is broken out by the Province into high/medium/low probabilities based on how hot and dry the March-November fire period is in various regions. The risk is highest in the Central and Southern Interior and Southern Vancouver Island, and typically lowest along the Coast especially the Central and North-West Coast.

1.3.8 Please discuss whether BC Hydro maintains any system mapping where up to date risks of wildfires are identified.

RESPONSE:

BC Hydro has two mapping systems where current information on potential risks to the electrical system from wildfire incidents are identified:

1. **BC Hydro Emergency Operations Dashboard - this application includes current fire locations, perimeters and evacuation orders and alerts from the BC Government as well as NASA's Moderate Resolution Imaging Spectroradiometer (MODIS) fire detections; and**

2. **PowerGrid GIS application - this GIS application also uses the MODIS and B.C. provincial data to identify current wildfire locations and perimeters, automatically calculates proximity of the fires to BC Hydro's transmission, stations, and telecom infrastructure, and produces a daily email alert to operations staff listing the current wildfire threats.**

The PowerGrid GIS database is also used to store the wildfire probability and consequence (risk) mapping. Please refer to BC Hydro's response to BCUC Staff IR 1.3.4 for a discussion of the probability/consequence wildfire risk model.

3.0 Reference: T&D WILDFIRE HAZARD STRATEGY
Attachment 3, pp. 2-3

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1.3.8 Please discuss whether BC Hydro maintains any system mapping where up to date risks of wildfires are identified.

1.3.8.1 If yes, please provide a current copy.

RESPONSE:

Both mapping systems identified in BC Hydro's response to BCUC Staff IR 1.3.8 are Geographic Information System (GIS) platform based (i.e., live databases) and are difficult to submit. Below Figure 1 and Figure 2 are screenshots that provide examples of the GIS for each mapping system. The coloured lines on the map screenshots represent BC Hydro transmission circuits.

Figure 1 **BC Hydro Emergency Operations Dashboard sample:**

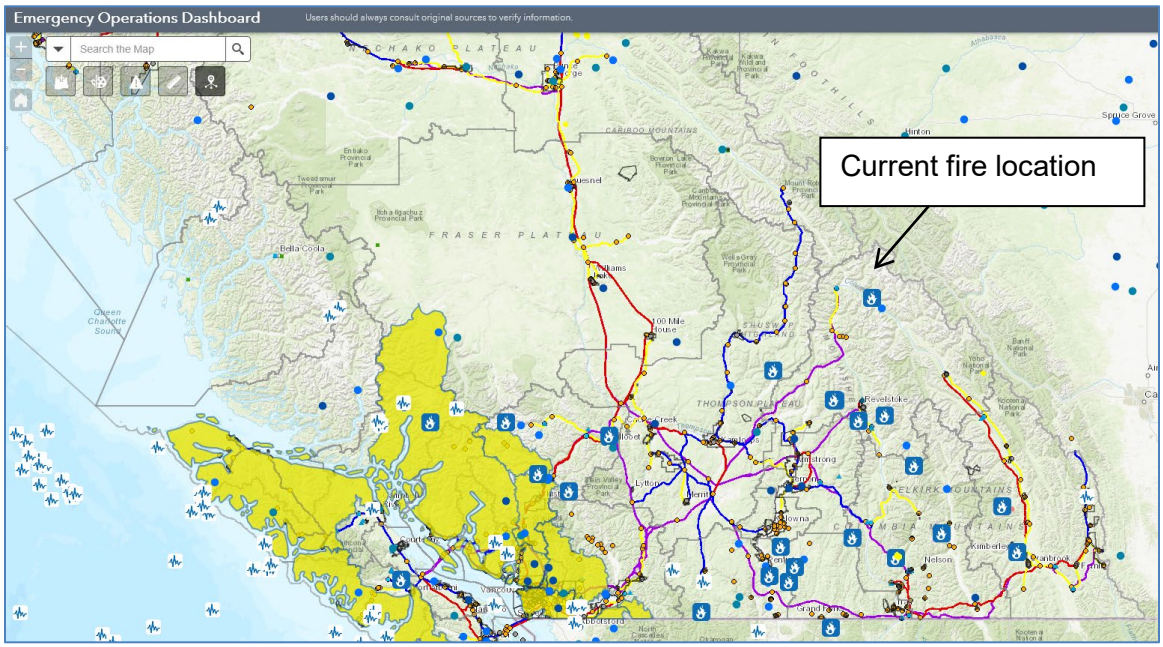
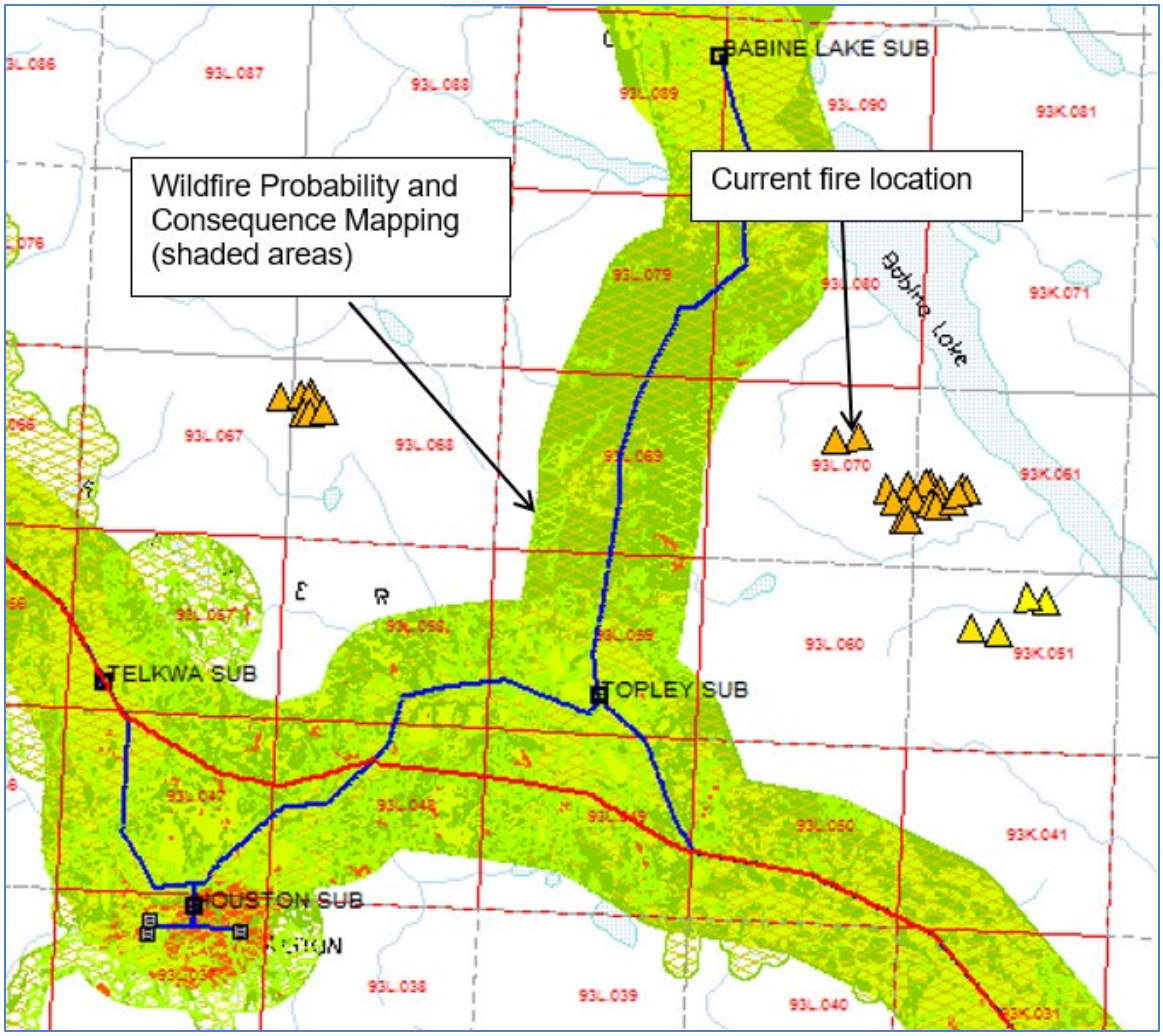


Figure 2 **PowerGrid GIS Sample showing Active Fires and Wildfire Risk Mapping:**



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Attachment 3, pp. 2-3

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1.3.8 Please discuss whether BC Hydro maintains any system mapping where up to date risks of wildfires are identified.

1.3.8.2 If not, please discuss why not.

RESPONSE:

Please see BC Hydro's response to BCUC Staff IR 1.3.8.1.

4.0 Reference: VEGETATION MANAGEMENT
Attachment 5, p.1
Corridor Integrated Vegetation Management Program

Attachment 5 of BC Hydro's COVID-19: Emergency Response and Wildfires Mitigation Plans submission consists of BC Hydro's Corridor Integrated Vegetation Management Program. Page 1 of Attachment 5 indicates the document is dated May 2016.

1.4.1 Please discuss how often the Corridor Integrated Vegetation Management Program is reviewed and updated.

RESPONSE:

BC Hydro notes that the cover page of Attachment 5 of BC Hydro's COVID-19 Emergency and Wildfire Mitigation Plans is mistakenly labeled "Corridor Integrated Vegetation Management Program". The actual document contained in Attachment 5 is the "Integrated Vegetation Management Plan for BC Hydro Transmission and Distribution Power Line Corridors" (IVMP).

The Integrated Vegetation Management Plan (IVMP) is reviewed and updated every five years, in accordance with section 58 of the Ministry of Environment's Integrated Pest Management Regulation. Please also refer to BC Hydro's response to BCUC Staff IR 1.4.2 for additional information on the IVMP.

4.0 Reference: VEGETATION MANAGEMENT
Attachment 5, p.1
Corridor Integrated Vegetation Management Program

Attachment 5 of BC Hydro's COVID-19: Emergency Response and Wildfires Mitigation Plans submission consists of BC Hydro's Corridor Integrated Vegetation Management Program. Page 1 of Attachment 5 indicates the document is dated May 2016.

1.4.2 Please discuss how the effectiveness of the Corridor Integrated Vegetation Management Program is measured and documented.

RESPONSE:

As indicated in BC Hydro's response to BCUC Staff IR 1.4.1, Attachment 5 contains the "Integrated Vegetation Management Plan for BC Hydro Transmission and Distribution Power Line Corridors" (IVMP).

The IVMP is one element of BC Hydro's vegetation maintenance program. It is a document that is submitted to the Ministry of Environment and Climate Change (MOECCS) to demonstrate BC Hydro's compliance with section 58 of the BC Integrated Pest Management Regulation (IPMR). It informs MOECCS on the main aspects of BC Hydro's vegetation maintenance program (i.e., work executed in the field), why such operational programs are required, the selection and use of vegetation control methods (i.e., manual and mechanical, chemical and cultural/biological controls), and how our vegetation maintenance work is monitored. The IVMP also outlines how vegetation maintenance is achieved in an environmentally responsible manner within the MOECCS regulations. Compliance with section 58 of the BC Integrated Pest Management Regulation provides BC Hydro with the regulatory confirmation required to apply herbicides as part of our vegetation maintenance program for powerline corridors.

Effectiveness of the IVMP is measured through regular inspections of the executed annual vegetation maintenance activities. The inspections serve as validation that methods used to control the desired vegetation have been completed to the specification under the IVMP, have been effective in achieving the desired outcome, and have not resulted in any adverse impact on surrounding vegetation or the environment. Results from the inspections are documented as part of our normal work practices. BC Hydro also submits an annual report of herbicides applied as well as total work volumes using non-chemical controls (i.e., mowing, brushing, pruning and hazard tree removal activities) to the BC MOECCS as required by the Integrated Pest Management Regulation. For further information on monitoring methodologies utilized to evaluate vegetation

control effectiveness and compliance with the MOECCS regulation, please see pages 17-19 of the IVMP.

In addition to the inspections mentioned above, BC Hydro also monitors the effectiveness of its vegetation maintenance activities by reviewing information including:

- **BC Wildfire Services Branch data and BC Hydro data with respect to fires recorded on or near powerline corridors, to assess the frequency, size and cause of such incidents;**
- **Reliability metrics such as those included in the annual BC Hydro Transmission and Distribution Service Performance Report; and**
- **Information or benchmarking results from other utilities.**