

# BC Health and Smoke Exposure (HASE) Coordination Committee Guideline



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## Section 1: Introduction

During the 2009 and 2010 wildfire seasons, significant wildfire smoke events occurred in regions of BC requiring health interventions for susceptible populations in communities. An After Action Report was developed in 2010 by the Ministry of Health (HLTH) in consultation with BC public health stakeholders. The findings in the report were presented to the Environmental Health Policy Advisory Committee (EHPAC) in 2012, where the decision was made to convene a working group to develop provincial health sector wildfire response guidelines. Following that recommendation, the Health and Smoke Exposure (HASE) Coordination Committee was created to coordinate planning and response efforts related to public health impacts for significant wildfire smoke events in BC. This Guideline represents a joint effort between all agencies represented as part of HASE.

This document is organized by three sections. The first section provides the background and purpose for the development of the BC HASE Coordination Committee Guideline. This section also includes a brief description of legislation that can be applied by decision-makers when considering evacuation or other measures due to wildfire smoke and describes the specific powers for medical health officers (MHOs) during a public health event. The second section addresses response coordination related to public health impacts for significant wildfire events in BC. This includes the preparedness activities of the HASE Coordination Committee as well as the activation process and response coordination role of HASE. The third section focuses on the process for assessing the risk of smoke conditions and will inform the recommendations for health interventions during a significant wildfire smoke event.

Complementing this Guideline, in 2014 the BC Centre for Disease Control (BCCDC) developed the [Guidance for BC Public Health Decision Makers During Wildfire Smoke Events](#). This evidence-based document “describes the wildfire smoke hazard, identifies which health effects are associated with wildfire smoke exposure and which populations are susceptible. It provides BC-specific guidance about tools for situational awareness: smoke and health surveillance and summarizes the evidence for the effectiveness of intervention measures to protect public health.”

### Purpose

The purpose of this Guideline is to describe how the HASE Coordination Committee will support regional response to a wildfire smoke event that may impact the health of a population in BC. It is acknowledged that regional, provincial, and federal health agencies have existing plans and procedures internally for emergency response. The intent of this Guideline is to ensure a coordinated response across the province and among the various response agencies in order to mitigate health impacts to the public.

### Scope

The HASE Guideline addresses a significant wildfire smoke event in any region of BC and:

- outlines how the HASE Coordination Committee will convene to support the local response
- describes the roles and responsibilities of the regional, provincial, and federal agency members of HASE

- provides guidance on assessing the population health risk and considerations for public health interventions

This Guideline is intended to be used in coordination with the [BCCDC Guidance for BC Public Health Decision Makers During Wildfire Smoke Events](#). This Guideline does not supersede health authority response plans or existing local, regional and provincial linkages.

### **Concurrent Public Health Emergencies**

Wildfires and smoke can occur at the same time as other public health emergencies, such as localized flooding or global pandemics. Concurrent emergencies may affect the ability of any agency within the HASE Coordination Committee to dedicate resources to the wildfire smoke response, depending on internal priorities. Furthermore, concurrent emergencies may require adaptations to the wildfire smoke responses outlined in this Guideline. For example, public health guidance to reduce SARS-CoV-2 transmission should be considered when making recommendations or plans for community cleaner air shelters. The HASE agrees that this Guideline be adapted to evolving circumstances, as needed.

### **Plan Administration**

This document will be reviewed annually and updated as lessons are learned through events, exercises, and emerging best practices.

### **Audience**

This Guideline is intended to be used by the health sector partners included in this plan. It is recognized that other agencies not included in this plan may have a role during a significant wildfire smoke event and should activate their emergency plans as required.

### **Legislation**

There is a minimum of two pieces of BC legislation that may be applicable during a significant wildfire smoke event: the *BC Emergency Program Act* and the *BC Public Health Act*. The *BC Emergency Program Act* provides the legislative framework for the management of disasters and emergencies within BC, and specifically addresses evacuation orders under a state of emergency.

In addition or alternatively, the *BC Public Health Act* may also be used as it includes provisions that may be applicable during a wildfire smoke event, such as addressing the powers of a MHO when a health risk is identified.

See Appendix A for relevant sections of the *Emergency Program Act* and *Public Health Act*.

### **Public Health Authority**

During wildfire smoke events that affect communities within a single regional health authority boundary, public health management decisions remain with the regional health authority MHO. Regional health authorities may seek extra-jurisdictional support from HASE as needed. For wildfire smoke events where the smoke is affecting multiple communities across several health authorities, the

Provincial Health Officer (PHO) or delegate may choose to lead the public health risk assessment and management, in coordination with the health authority MHOs.

## **Section 2: Response Coordination**

Following recommendations from public health stakeholders in 2010, the HASE Coordination Committee was established to support planning and response efforts related to public health impacts for significant wildfire smoke events in BC. The Group membership includes HLTH, BCCDC, regional health authorities (HAs), First Nations Health Authority (FNHA), BC Emergency Health Services (BCEHS), Ministry of Environment and Climate Change Strategy (ENV), Metro Vancouver, BC Wildfire Service (BCWS), Health Emergency Management BC (HEMBC), the Public Health Agency of Canada (PHAC), and WorkSafe BC. Membership of HASE may expand and evolve as required.

### **Preparedness**

The HASE has a seasonal meeting schedule in order to maintain situational awareness, to review response capacity and to ensure consistency. This schedule includes:

- Meeting prior to wildfire season to review current guidance documents, share the wildfire season forecast and specific preparations required, and update the group membership list
- Identifying situations for which new or updated guidance is required, and supporting the development of such
- Attending HEMBC seasonal stakeholder meetings to ensure situational awareness
- Scheduled teleconferences during periods of significant wildfire or wildfire smoke activity, or at the request of the Office of the PHO or HLTH
- Meeting after wildfire season to review any recommendations for future planning or response

### **Activation**

During a significant wildfire smoke event with a threat to public health the regional MHO or PHO can request rapid support from the HASE Coordination Committee. The request can be made through the regional health emergency management structure to the provincial level via the HLTH 24/7 Duty Officer. The Duty Officer will then convene a meeting with HASE that includes the local MHO.

### **Response Coordination**

The HASE will provide consultation and advice during a wildfire smoke event to assist in the development of recommendations or actions in response to the risk to human health. This response coordination role of the group includes:

- Maintaining situational awareness of the current wildfire / wildfire smoke risk(s) and, when requested by an MHO or the PHO, activate in order to provide recommendations to local/regional government and/or First Nations

- To provide recommendations, a risk assessment will be completed by the HASE which will include a review of current and projected weather, wildfire data, wildfire smoke modeling, air quality ratings, and health and environmental surveillance data from BCCDC (see Section 3)
- Following any activation of the group, the HASE will coordinate post event debriefs and documentation as required (see Diagram 1: Response Coordination Cycle)

When HASE is required to convene in response to a significant wildfire smoke event, each agency member of HASE has a role in response coordination. These agency roles and responsibilities are outlined in *Appendix A – Agency Roles and Responsibilities*. This appendix also includes considerations for local authorities, health facilities and the health authority.

**Diagram 1: Response Coordination Cycle**



### Section 3: Risk Assessment and Public Health Interventions

When HASE is required to convene to support response to a significant wildfire event, a rapid risk assessment will be conducted based on current and projected conditions. This assessment will:

- ensure consistency in messaging across health authorities and local jurisdictions
- support recommendations for interventions to protect public health
- support decisions made by public health officials during wildfire smoke events

The risk assessment will be conducted with reference to the BCCDC [Guidance for BC Public Health Decision Makers During Wildfire Smoke Events](#) and include the following criteria:

- current and projected weather
- current wildfire data
- air quality measurements
- wildfire smoke projections
- the Air Quality Health Index
- an Air Quality Visual Assessment
- supplementary air monitoring information
- health surveillance data (<https://maps.bccdc.ca/bcaps/> or <https://internalmaps.bccdc.ca/bcaps/>)

The frequency for conducting a risk assessment will be determined by HASE based on the nature of the wildfire smoke event.

### **Weather**

The current weather situation and forecast can be provided by ENV air quality staff or through the Daily Wildfire Situation Report provided by the BCWS. In addition, BCWS conducts fire weather forecasting in each of the six Regional Wildfire Coordination Centres (RWCC), as well as a provincial forecast for the Provincial Wildfire Coordination Centre (PWCC). During periods of increased activity, the PWCC and RWCCs hold daily fire weather briefings via conference call and online meeting, conducted by a fire weather forecaster. Although these briefings are primarily intended to help inform wildfire response and preparedness, factors related to visibility and atmospheric stability may also be presented, specifically in relation to wildfire operations limitations (i.e. air tanker and helicopter operations). This can be used to determine how long smoke is expected to remain in a geographical area.

### **Wildfire Data**

The Daily Wildfire Situation Report is distributed by BCWS to government and partner agencies daily during periods of elevated wildfire activity. General wildfire situation information is also available on the public website. For further information, contact the PWCC's Information section at [FireInfo@gov.bc.ca](mailto:FireInfo@gov.bc.ca).

### **Air Quality Measurements**

ENV and Metro Vancouver maintain networks of air quality monitoring stations across the province. Different stations measure different air pollutants in real-time and report hourly average concentrations to the central [website](#). The pollutant most relevant to wildfire smoke exposures is particulate matter less than 2.5 microns in diameter (PM<sub>2.5</sub>), though other pollutants such as ozone (O<sub>3</sub>) and carbon monoxide (CO) can also be elevated when smoke affects air quality. As of summer 2021 there are approximately 70 stations monitoring PM<sub>2.5</sub> concentrations across BC.

## Wildfire Smoke Projections

There are two systems that provide smoke forecasts for BC: FireWork and BlueSky. Environment and Climate Change Canada (ECCC) produces animated maps of PM<sub>2.5</sub> forecasts using its FireWork system, which is a smoke-specific addition to the ECCC air quality prediction system. FireWork forecasts are issued twice daily at approximately 05:00 and 17:00 universal time and the animated maps indicate how surface smoke is expected to behave hour-by-hour across North America over the 48 hours following the time at which the forecast was made. Additional information is provided [here](#).

The University of British Columbia (UBC) produces animated maps of PM<sub>2.5</sub> forecasts using the Western Canada BlueSky Smoke Forecasting System, which was developed by the US Forest Service. BlueSky forecasts are issued four times daily, at approximately 02:00, 08:00, 14:00 and 20:00 Pacific time daily, and the hourly maps depict the expected movement of surface smoke over the next 48 hours. Additional information is provided [here](#).

While FireWork and BlueSky are conceptually similar, they are different from an operational perspective. The most important difference between them is related to the forecast area, which includes all of North America for FireWork and most of Canada and the USA for BlueSky. Both systems have strengths and limitations and gathering information from both is preferable to gathering information from one in isolation.

Air quality meteorologists at ENV and Metro Vancouver monitor PM<sub>2.5</sub> measurements, FireWork forecasts, and BlueSky forecasts during the wildfire season. In conjunction with the local MHO, the ENV can issue a Smoky Skies Bulletin for a geographical area when smoke concentrations may reach levels expected to affect human health. The purpose of Smoky Skies Bulletin is to inform the public about degraded air quality or the potential for degraded air quality, especially in areas without PM<sub>2.5</sub> monitoring stations. This allows people to make informed choices about reducing their exposures and provide vulnerable individuals and the general public with health advice developed by BC health agencies.

The BC Government [Air Quality Subscription Service](#) can be used to receive text or email notifications of Smoky Skies Bulletins and Air Quality Advisories covering areas outside of Metro Vancouver and Fraser Valley Regional District (FVRD). The Metro Vancouver [Subscription Service](#) can be used to receive email notifications of Air Quality Advisories and Bulletins for Metro Vancouver and FVRD.

## Air Quality Health Index

The Air Quality Health Index (AQHI) (*see Table 1*) is a public information tool that helps Canadians protect their health from the effects of poor air quality. This tool has been developed by Health Canada and ECCC, in collaboration with the provinces and key health and environment stakeholders. The AQHI provides information about the health risk associated with local air quality on an hourly basis. The index value is calculated using 3-hour average measurements from a combination of common air pollutants known to be harmful to human health. Under smoky conditions the multi-pollutant AQHI value may be overridden by the single-pollutant AQHI-Plus value based on 1-hour PM<sub>2.5</sub> concentrations alone (Table 1). There will be no outward changes to the AQHI reporting mechanisms when this occurs, but



stakeholders on the ENV AQHI-Plus email distribution list will be notified when the system is triggered. The AQHI communicates four primary pieces of information:

1. An AQHI value on a scale of 1 to 10+. The higher the number, the greater the health risk associated with the air quality.
2. A category that describes the level of health risk associated with the index value (Low, Moderate, High or Very High).
3. Health messages customized to each category for both the general population and the 'at risk' population.
4. Current hourly AQHI values and maximum forecast values for today, tonight, and tomorrow.

Current and forecasted AQHI values can be found at <http://www.bcairquality.ca>. The ENV, Metro Vancouver, or BCCDC representative on HASE will review ratings and provide a synopsis as required.

**Table 1. Smoke-optimized Air Quality Health Index (AQHI-Plus) Categories and Health Messages used for wildfire smoke communications in BC**

1-HOUR PM <sub>2.5</sub> ( $\mu\text{g}/\text{m}^3$ )	PROVINCIAL AQHI	AQHI RISK CATEGORY	HEALTH MESSAGE FOR PEOPLE AT HIGHER RISK	HEALTH MESSAGE FOR GENERAL POPULATION	ACTIONS TO REDUCE WILDFIRE SMOKE EXPOSURE
0 – 10	1	<b>LOW</b>	Enjoy your usual outdoor activities.	Ideal air quality for outdoor activities.	Normal air quality in British Columbia
11 – 20	2				
21 – 30	3				
31 – 40	4	<b>MODERATE</b>	Consider reducing or rescheduling strenuous activities outdoors if you experience symptoms.	No need to modify your usual outdoor activities unless you experience symptoms.	<ul style="list-style-type: none"> <li>• Use a portable air cleaner to reduce smoke in your home</li> <li>• Stay inside with doors and windows closed, but keep cool – being too hot is more risky than breathing smoke for most people</li> </ul>
41 – 50	5				
51 – 60	6				
61 – 70	7	<b>HIGH</b>	Reduce or reschedule strenuous activity outdoors.	Consider reducing or rescheduling strenuous activities outdoors if you experience symptoms.	<ul style="list-style-type: none"> <li>• Visit places with cleaner and cooler air, such as libraries, community centres, and shopping malls</li> </ul>
71 – 80	8				
81 – 90	9				
91 – 100	10				
101+	10+	<b>VERY HIGH</b>	Avoid strenuous activity outdoors.	Reduce or reschedule strenuous activity outdoors, especially if you experience symptoms.	<ul style="list-style-type: none"> <li>• If you cannot access cleaner air, consider using a well-fitted N95 respirator or relocating to an area with less smoke</li> </ul>

### Air Quality Visual Assessment

It is important for health professionals to receive up-to-date information about air quality to assist in making timely decisions to protect public health. Communities without continuous PM<sub>2.5</sub> monitoring require alternate means to estimate concentrations. Because smoke concentrations can vary widely within short distances and can change rapidly, having alternate means to estimate PM<sub>2.5</sub> may also be useful for areas that do have continuous monitors. An environmental health officer (EHO) or other trained personnel located in the affected area can assist with estimating the AQHI from Visibility

Assessment. The visibility index (*Table 2*) provides a quick, alternate way to estimate smoke levels. Using landmarks at known distances, an experienced observer can provide a reasonable estimate of the particle concentration in the air. It is wise to identify visibility landmarks before they are needed.

**Table 2. Estimates of the AQHI-Plus from Visibility Assessments, using data from multiple sources.**

Visibility in km (Visual Range)	Approximate PM <sub>2.5</sub> 1-hr average in µg /m <sup>3</sup>	Air Quality Health Index (AQHI-Plus) Value
> 15 km	0 to 15	Low (1-2)
10 to 15 km	16 to 40	Low-Moderate (2-4)
5 to 10 km	41 to 65	Moderate-High (4-7)
2.5 to 5 km	66 to 100	High (7-10)
< 2.5 km	100+	Very High (10+)

When using the visibility index to determine smoke concentrations, it is important to:

- Face away from the sun
- Determine the limit of your visibility range by looking for targets at known distances (kms). The visible range is the point at which even high-contrast objects (e.g., a dark forested mountain viewed against the sky at noon) totally disappear

Using Visual Range for this purpose is only appropriate at humidity <70%. At higher humidity it is possible to have very low visibility with relatively low PM<sub>2.5</sub> concentrations. These methods should not be used at night or in the period of dawn or dusk. The Visual Range/AQHI relationship shown here involves a number of assumptions – consider the visibility values as very approximate. If available, use air quality monitoring data rather than Visual Range to estimate health risk. Visual Range is ideally estimated from a location with a view in several directions to multiple landmarks of known distance.

### Supplementary Air Monitoring Equipment

ENV has few portable monitors that can be deployed for emergency monitoring. These monitors require power and cellular connectivity at the site. The number of available portable monitors is small and therefore monitoring requests must be carefully evaluated. ENV air quality staff will work with HASE to understand data requirements and define monitoring plans, ensuring that the most appropriate instrumentation is deployed.

Other air quality monitoring equipment may be obtained directly through Health Canada or through PHAC from the Water, Air and Climate Change Bureau. This equipment can be deployed on short notice from the National Capital Region. Additional supports can be requested through the Bureau to support the deployment of Health Canada assets. Data analysis and interpretation services may also be available

through the PHAC, Health Canada, and other federal partners with mandates in Air Quality and Emergency Management.

Some groups or communities may choose to purchase their own low-cost sensors for air quality assessment during wildfire smoke events. The reliability of some of these sensors has been well-studied and understood, such as Purple Air monitors. A group at the University of Northern British Columbia has been gathering and calibrating Purple Air data across North America, and showing them on a scale consistent with the AQHI-Plus (<https://cyclone.unbc.ca/aqmap/#4/57.68/-110.29>). Other types of low-cost sensors are also in wide use across BC and Canada. The HASE should be prepared to receive and interpret supplemental air quality information from such sources.

### **Health Environmental Surveillance Data**

Both BCCDC and the local health authority have a responsibility for monitoring the effects of smoke on local residents. Since the summer of 2017, BCCDC has been running the BC Asthma Prediction System (BCAPS) daily, which is intended for use by BC health professionals and the general public in support of health protection during wildfire smoke events. There are versions for those within the health network (<https://internalmaps.bccdc.ca/bcaps/>) and those outside (<https://maps.bccdc.ca/bcaps/>).

The BCAPS framework is designed to predict health outcomes associated with smoke exposures over the next 48 hours based on regional smoke forecasts from FireWork. The health forecasts are based on the historic Relationship between PM2.5 and the health outcomes within each of the 16 health service delivery areas (HSDAs). The version for health users includes forecasts for asthma-specific physician visits and inhaler dispensations, while the public version includes inhaler dispensations only. The online tool also shows the smoke forecasts for the coming days and can be used to search for impacts in specific communities.

Physician Visits: BCAPS provides information on physician visits for asthma. The data include all billings submitted to the Medical Services Plan (MSP), with the limitation that some practices bill daily while others may only bill on a monthly cycle. Information from the BCAPS systems does not stabilize until at least five days of data are available. Previous work has shown that outpatient visits for asthma are consistently increased when populations are exposed to wildfire smoke.

Salbutamol (Ventolin) Dispensations: BCAPS provides information on dispensations of salbutamol, which is used to control acute exacerbations of asthma. These data are made available from the HLTH every week with a 1-week delay. Previous work has shown that salbutamol dispensations are consistently increased when populations are exposed to wildfire smoke.

Other potentially useful means of monitoring health effects within a population may include monitoring calls to BCEHS, information gathered from local health facilities or community health care workers and monitoring the number of calls to or information requested from Health Link BC.

## Health Effects of Smoke and Public Health Interventions

The BCCDC [Guidance for BC Public Health Decision Makers During Wildfire Smoke Events](#) provides a summary of the current evidence-based information on wildfire smoke exposure, health effects and effectiveness of interventions. Interventions to protect public health during wildfire smoke events can include communications advising the public to shelter in place and take specific precautions, providing community cleaner air shelters and augmenting air filtration/smoke exclusion in institutions.

A number of factors may contribute to some populations being more susceptible to the effects of air pollution, which includes wildfire smoke. The BCCDC [Guidance for BC Public Health Decision Makers During Wildfire Smoke Events](#) identifies populations that are known or suspected to be sensitive to wildfire smoke. The level and duration of exposure, age, individual susceptibility, including the presence or absence of pre-existing lung or heart disease and other factors, play a significant role in determining whether someone will experience smoke-related health problems.

At this time, BC policy recommends sheltering in place for wildfire smoke protection. Evacuation to protect populations from wildfire smoke exposure should only be considered as a last resort for multiple reasons:

- Evacuations are themselves disruptive to mental and physical wellbeing
- Smoke can be very dynamic in space and time, so it may be impossible to identify communities that are not also affected by smoke to host the people being evacuated
- Evacuations take time to coordinate, and [evidence from Canadian smoke-specific evacuations](#) found that smoke concentrations within the communities were higher pre-evacuation than post-evacuation in about 50% of cases (i.e. the evacuation occurred too late to protect against the worst of the smoke)

The decision to evacuate a population (or subgroup of a population) due to wildfire smoke is the responsibility of the local authority in coordination with the local MHO.

## Appendix A: Legislation

The following are excerpts from two pieces of BC legislation that may be applicable during a significant wildfire smoke event: the *BC Emergency Program Act* and the *BC Public Health Act*. The content represented in this appendix is taken from sections of the Acts that may be relevant to health interventions during a wildfire smoke event. To see the full version of the Act go to the link provided below.

BC Emergency Program Act: [http://www.bclaws.ca/Recon/document/ID/freeside/00\\_96111\\_01](http://www.bclaws.ca/Recon/document/ID/freeside/00_96111_01)

BC Public Health Act: [http://www.bclaws.ca/civix/document/id/complete/statreg/00\\_08028\\_01](http://www.bclaws.ca/civix/document/id/complete/statreg/00_08028_01)

<i>BC Emergency Program Act</i>
<p>Emergency Program Act Definition of Emergency</p> <p>"emergency" means a present or imminent event or circumstance that</p> <p>(a) is caused by accident, fire, explosion, technical failure or the forces of nature, and</p> <p>(b) requires prompt coordination of action or special regulation of persons or property to protect the health, safety or welfare of a person or to limit damage to property;</p>
<p>Section 9 (1)</p> <p><b>9</b> (1) If satisfied that an emergency exists or is imminent, the minister or the Lieutenant Governor in Council may, by order, declare a state of emergency relating to all or any part of British Columbia.</p>
<p>Section 10 (1) (h)</p> <p><b>10</b> (1) After a declaration of a state of emergency is made under section 9 (1) and for the duration of the state of emergency, the minister may do all acts and implement all procedures that the minister considers necessary to prevent, respond to or alleviate the effects of an emergency or a disaster, including any or all of the following:</p> <p>Cause the evacuation of persons and removal of livestock, animals, and personal property from any area of BC that is or may be affected by an emergency or disaster and make arrangements for the adequate care and protection of those persons, livestock, animals, and personal property.</p>

*BC Public Health Act*

**30** (1) A health officer may issue an order under this Division only if the health officer reasonably believes that

- (a) a health hazard exists,
- (b) a condition, a thing or an activity presents a significant risk of causing a health hazard

**31** (1) If the circumstances described in section 30 [*when orders respecting health hazards and contraventions may be made*] apply, a health officer may order a person to do anything that the health officer reasonably believes is necessary for any of the following purposes:

- (b) to prevent or stop a health hazard, or mitigate the harm or prevent further harm from a health hazard;

**32** A health officer may order a person to do one or more of the following:

- b) in respect of a place,
  - (i) leave the place
  - (ii) not enter the place...etc

**39** (3) An order may be made in respect of a class of persons.

*This allows an order to be directed at defined groups of people, such as those with health issues that would be impacted by smoke*

**81** In the event that a medical health officer determines that public health is threatened by a health hazard, an infectious agent or a hazardous agent,

- (a) the medical health officer is responsible for directing the local response, in respect of public health, to the threat, and
- (b) for the purposes of paragraph (a), the health authority that employs the medical health officer must
  - (i) provide the medical health officer with the staff and other resources that the medical health officer reasonably believes are necessary for the response.

## Appendix B: Agency Roles and Responsibilities

Agency	Program Area	Roles/Responsibilities
<b>BC Centre for Disease Control (BCCDC)</b>	Environmental Health Services (EHS)	<ul style="list-style-type: none"> <li>• Chair and coordinate HASE</li> <li>• Routine surveillance of provincial smoke exposures and associated population health response</li> <li>• Daily province-wide smoke exposure information available from the Optimized Statistical Smoke Exposure Model (OSSEM), which integrates air quality information with satellite data and meteorological information</li> <li>• Integration of FireWork forecasts and provincial PM2.5 measurements into the BC Asthma Prediction System (BCAPS)</li> <li>• Daily BCAPS visualizations of asthma-related physician visits and dispensations of salbutamol sulfate (Ventolin)</li> <li>• Development of fact sheets and guidance related to the air quality and public health impacts of smoke exposures</li> <li>• Provision of epidemiologic expertise on the population health impacts of smoke exposures and interventions to minimize those effects</li> <li>• Interface with media as required/requested by other partners</li> </ul>
<b>Ministry of Health (HLTH)</b>	Emergency Management Unit / Health Emergency Management BC (HEMBC)	<ul style="list-style-type: none"> <li>• Support chair and coordination of HASE</li> <li>• HLTH 24/7 Duty Officer receive and disseminate emergency advisories and notifications</li> <li>• Provide support to regional HAs, FNHA, BCEHS</li> <li>• Provide support to PHO</li> <li>• Situational awareness and recommendations for decision makers</li> <li>• Liaise with other government ministries as required</li> <li>• Support Provincial Emergency Coordination Centre (PECC) with appropriate health representation</li> </ul>
	Office of the Provincial Health Officer	<ul style="list-style-type: none"> <li>• Monitor health of the population, provide independent advice on health issues to the Minister, Ministry of Health, and other public officials</li> <li>• Report to British Columbians on the health of the population and other health issues</li> <li>• Recommend actions with respect to health promotion and health protection</li> <li>• Work with BCCDC and MHOs to fulfill their responsibilities on disease control and health protection</li> </ul>
	Communications and Engagement	<ul style="list-style-type: none"> <li>• Support communications efforts led by the HLTH</li> </ul>
	Health Protection Branch	<ul style="list-style-type: none"> <li>• Respond to public queries regarding the health effects of Wildfire smoke and direct public to appropriate resources and/or agencies</li> </ul>

Agency	Program Area	Roles/Responsibilities
<b>Ministry of Environment and Climate Change Strategy (ENV)</b>	Environment Standards Branch Clean Air staff and Regional Operations Branch Air Quality staff	<ul style="list-style-type: none"> <li>• Issue Smoky Skies Bulletins, in conjunction with Health Authority MHO/Communications</li> <li>• Monitor FireWork and BlueSky Smoke forecasting system</li> <li>• Monitor weather forecast and general synoptic conditions</li> <li>• Collaborate with ECCC and BCWS to improve knowledge of current and predicted wind, weather, fire, and smoke information near threatened communities</li> <li>• Provide real time analysis of the current PM<sub>2.5</sub>, ozone, nitrogen oxides and AQHI for the affected area(s)</li> <li>• Assist in the analysis and acquisition of supplemental monitoring equipment</li> <li>• Provide advice on predicted smoke plume behavior using all available tools, including FireWork, BlueSky and other forecast models</li> <li>• Respond to public queries regarding Wildfire smoke and direct public to appropriate resources and/or agencies</li> </ul>
<b>Metro Vancouver</b>	Air Quality and Climate Change	<ul style="list-style-type: none"> <li>• Issue air quality advisories and bulletins in the Lower Fraser Valley on behalf of all partner agencies which include the BC Ministry of Environment and Climate Change Strategy (BC ENV), Fraser Valley Regional District (FVRD) and Environment and Climate Change Canada (ECCC)</li> <li>• Inform local health agencies about deteriorating air quality conditions and consult on appropriate health messaging as required</li> <li>• Monitor smoke model and satellite imagery websites</li> <li>• Monitor weather forecast and general synoptic conditions</li> <li>• Monitor air quality measured by the Lower Fraser Valley Air Quality Monitoring Network operated by Metro Vancouver</li> </ul>
<b>Ministry of Forests, Lands and Natural Resource Operations</b>	BC Wildfire Service (BCWS)	<ul style="list-style-type: none"> <li>• Lead agency for wildfire prevention and suppression</li> <li>• PWCO provides strategic direction and accountability for provincial wildfire operations</li> <li>• Perform detailed fire weather forecasting at the regional and provincial levels to enhance situational awareness related to wildfire operations</li> <li>• Forecast smoke impacts in relation to aviation safety (i.e. air tankers and helicopters)</li> </ul>
<b>Regional Health Authorities</b>	HA Emergency Response Structure	<ul style="list-style-type: none"> <li>• Lead and coordinate the integrated health response at the regional and local level</li> <li>• Provide liaison to external agencies (EMBC Provincial Regional Emergency Operation Centres (PREOCs), regional/municipal EOCs, agencies, ENV, HLTH, etc)</li> </ul>
	Medical Health Officer	<ul style="list-style-type: none"> <li>• Issue Smoky Skies Bulletins (in conjunction with ENV)</li> </ul>



Agency	Program Area	Roles/Responsibilities
		<ul style="list-style-type: none"> <li>• Conduct media interviews (support from HA Communications and BCCDC as needed)</li> <li>• Review provincial smoke related documents to ensure the public health advice is medically accurate and appropriate to the risk</li> <li>• Encourage preparations to shelter in place and provide supportive information</li> <li>• As a last resort, responsible for Ordering population specific or community wide evacuation due to extremely poor air quality conditions</li> </ul>
	Environmental Health Officer	<ul style="list-style-type: none"> <li>• Validate anecdotal reports of poor air quality where air quality monitoring equipment does not exist</li> <li>• Assist with estimating AQHI from Visibility Assessment (Table 2). The ability to complete a Visibility Assessment is determined by location of staff during the wildfire smoke event</li> <li>• Work with local government EOC to determine suitable community clean air shelters locations/facilities if/when considered</li> </ul>
<b>BC Emergency Health Services (BCEHS)</b>	Emergency Management	<ul style="list-style-type: none"> <li>• Maintain situational awareness and make recommendations to BCEHS executive on response and response coordination</li> <li>• Provide liaison to partner agencies</li> </ul>
	Responder	<ul style="list-style-type: none"> <li>• Perform a Hazard Risk Assessment when responding to determine whether their personal safety/health is at risk. The risk assessment will determine whether or not to continue to respond or rather to stage in a safe area waiting for the patient to be handed over to them</li> </ul>
	Dispatch	<ul style="list-style-type: none"> <li>• If a 911 call for someone requiring pre-hospital care is received, ensure that there are no risks to responding crews due to extreme smoke conditions</li> <li>• Activate Internal/External notifications</li> </ul>
<b>First Nations Health Authority (FNHA)</b>	Senior Medical Officer	<ul style="list-style-type: none"> <li>• Issue Smoky Skies Bulletins (in conjunction with MHO, ENV)</li> <li>• Conduct media interviews (support from FNHA Communications and BCCDC as needed)</li> <li>• Review provincial smoke related documents to ensure the public health advice is medically accurate and appropriate to the risk</li> <li>• Encourage preparations to shelter in place and provide supportive information</li> <li>• As a last resort, work with MHO to order community evacuation for First Nation communities due to extremely poor air quality conditions. Note: SMO does not have legislated power to enact orders for evacuation</li> </ul>
	Environment Health Officer	<ul style="list-style-type: none"> <li>• Validate anecdotal reports of poor air quality where air quality monitoring equipment does not exist</li> </ul>

Agency	Program Area	Roles/Responsibilities
		<ul style="list-style-type: none"> <li>• Assist with determining AQHI from Visibility Assessment</li> <li>• Work with local government EOC to determine suitable community clean air shelters locations/facilities if/when considered</li> </ul>
	<b>Manager of Emergency Management</b>	<ul style="list-style-type: none"> <li>• Coordinate FNHA response to emergency and disaster events</li> <li>• Act as a liaison on behalf of FNHA to Provincial Emergency Operations Centers</li> <li>• Work with First Nations communities to address concerns and provide guidance on actions and supports available</li> <li>• When required, provide emergency management funds to support counselling services, traditional wellness ceremonies, and food for impacted communities</li> </ul>
<b>Emergency Management BC (EMBC)</b>		<ul style="list-style-type: none"> <li>• Co-Chair the CCG for Wildland Urban Interface Fire</li> <li>• Lead coordinating agency in the provincial government for emergency management activities</li> <li>• Provide executive coordination, strategic planning and coordination with emergency management stakeholders</li> <li>• Provide internal and external situational awareness</li> <li>• Activate the PECC or PREOC(s) as required</li> <li>• Assist with the distribution of health-related messaging that is developed by HASE</li> <li>• Facilitate information sharing between local authorities, First Nations, health authorities and key stakeholders</li> </ul>
<b>WorkSafe BC</b>		<ul style="list-style-type: none"> <li>• Has responsibilities related to the enforcement of the Provincial Occupational Health &amp; Safety Regulation (OHSR)</li> <li>• Recommend actions about workplace controls and personal protective equipment</li> <li>• Lead the development of educational materials for workers</li> <li>• Support communications efforts led by other HASE agencies</li> <li>• Provide support to other local and regional authorities</li> </ul>
<b>Public Health Agency of Canada</b>		<ul style="list-style-type: none"> <li>• During large scale emergency events, assist in coordination of federal health portfolio response and can coordinate requests for federal assistance from the various program areas of the health portfolio</li> <li>• Work to ensure an effective and appropriate response capacity, providing support to the provincial response</li> <li>• Mobilize the National Emergency Stockpile System (NESS), Microbiological Emergency Response Team (MERT), Epidemiological Response Team (Epi ERT), and any Health Portfolio program area assets including air quality monitoring equipment, as well as services such as those provided by Health Canada's Chemical Emergency Preparedness Response Unit (CEPRU), Environmental and Radiation Health Sciences</li> </ul>

Agency	Program Area	Roles/Responsibilities
		<p>Directorate (ERHSD), regional Health Programs, and those provided by Safe Environments Division</p> <ul style="list-style-type: none"> <li>• Has responsibilities related to the International Health Regulations (IHR)</li> <li>• The regional PHAC EP&amp;R Program (BC/AB) serves as a link between BC and AB Emergency Management Organizations and provincial units with responsibilities in environmental and population health</li> </ul>
<p><b>Additional Considerations</b></p>		
<p><b>Local Authority</b></p>	<p>Both the Emergency Program Act and the Local Authority Emergency Management Regulation established the responsibility of local authorities to develop emergency plans. The following are considerations for the local authority during a wildfire smoke event.</p> <p><i>Activities for the local Emergency Manager/Coordinator:</i></p> <ul style="list-style-type: none"> <li>• Work with the impacted health authority and local MHO when making decisions impacting the health of a community</li> <li>• Connect with ENV regional contacts in each community to identify specific landmarks at various distances that can then be used to estimate smoke concentrations and risks using the FireWork and BlueSky forecasting tools and estimating the AQHI from the Visibility Assessment chart (Table 2)</li> <li>• Identify sites within the community that can be used as cleaner air shelters in the event of short-term smoke conditions within the community</li> <li>• Develop a list of key contacts and decide who takes charge during an incident</li> <li>• Educate citizens about hazards and provide a plan to follow in case of a wildfire</li> </ul>	
<p><b>Health Authority/ Facilities</b></p>	<p>The Emergency Program Act also requires that health authorities develop emergency plans. The following are considerations for the health authority and health emergency managers to consider during a wildfire smoke event:</p> <ul style="list-style-type: none"> <li>• Support health facilities preparation and planning</li> <li>• Arrange a planning review with the local authority or community's emergency coordinator or contact person</li> <li>• Collaborate with MHO, other public health staff and local government to ensure the community has a plan to inform its citizens of hazards and procedures to follow in the event of a wildfire</li> <li>• Meet with the local authority officials/emergency coordinator and identify someone to assess smoke conditions and changes in visibility</li> <li>• Collaborate with the local authority to identify and communicate the location of facilities within the community to use as cleaner air shelters when short-term smoke conditions occur and make sure they are available for emergency use</li> </ul>	

Agency	Program Area	Roles/Responsibilities
		<p>A health facility may consider the following when developing a routine seasonal plan for wildfire smoke events:</p> <ul style="list-style-type: none"> <li>• Reviewing the stock of emergency supplies related to: first aid, oxygen, oxygen delivery systems, emergency kits, and stock of filters</li> <li>• Educating facility staff about the wildfire smoke response plan</li> <li>• Update the list of sensitive and vulnerable patients, including the patient’s health information and specific care needs; during smoke threats, a list of priority risk people will be required and this will help - in larger communities, several care providers may be involved in preparing these lists. <i>[Note: Individual health information records partially filled out in advance can help during a selective priority or full evacuation; a copy should be given to the evacuee and a copy kept at the facility]</i></li> </ul>

## Appendix C: Example of an ENV Smoky Skies Bulletin



### Smoky Skies Bulletin - September 10, 2020

The Regions of BC highlighted on the map are being impacted or are likely to be impacted by wildfire smoke over the next 24-48 hours. The smoky skies advisory remains in place for southern BC. Wildfire smoke concentrations have continued to drop over the past 24 hours except for a few isolated areas. However, smoke forecast models indicate potential for intermittent long-range transport of smoke from the United States in the next day. With falling temperatures overnight, temperature inversions in mountain valleys can increase the likelihood of smoke being trapped near the ground. Localized impacts from the Talbot Creek, Woodbury Creek, and Doctor Creek fires continue to be expected.

The next bulletin update will be available September 11, 2020.

The bulletin can be accessed online at: <https://www2.gov.bc.ca/gov/content/environment/air-land-water/air/air-quality/air-advisories>.

#### Be informed

During a wildfire, smoke conditions can change quickly over short distances and can vary considerably hour-by-hour.

Wildfire smoke is a natural part of our environment but it is important to be mindful that exposure to smoke may affect your health.

People with pre-existing health conditions, respiratory infections such as COVID-19, older adults, pregnant women and infants, children, and sensitive individuals are more likely to experience health effects from smoke exposure.



Figure 1: A description of highlighted region(s) are provided at the end of the bulletin.

#### During smoky conditions

##### Follow your common sense

- Stop or reduce your activity level if breathing becomes uncomfortable or you feel

unwell.

- Stay cool and drink plenty of fluids.
- If you have asthma or other chronic illness, carry any rescue (fast-acting) medications with you at all times and activate your personal care plan that has been designed with your family physician.
- Make sure that children and others who cannot care for themselves follow the same advice.

### **Monitor your symptoms**

- People respond differently to smoke. Mild irritation and discomfort are common, and usually disappear when the smoke clears.
- Exposure to wildfire smoke and the virus that causes COVID-19 can both result in respiratory symptoms such as a dry cough, sore throat, or difficulty breathing. Use the [BC COVID-19 Self-Assessment Tool](#) to help determine whether you need further assessment or testing for COVID-19.
- If you are unsure whether you need medical care, call HealthLink BC at 8-1-1.
- If you are experiencing difficulty in breathing, chest pain or discomfort, or a severe cough, contact your health care provider, walk-in clinic, or emergency department. If you are having a medical emergency, call 9-1-1.

### **Tips to reduce your smoke exposure**

- Smoke levels may be lower indoors but will still be elevated, so stay aware of your symptoms even when you are indoors.
- Running a commercially available HEPA (high efficiency particulate air) filter can improve indoor air quality in the room where the device is located.
- If you have a forced air heating/cooling system in your home, it may help to change the filter and set the fan to run continuously.
- Reduce indoor air pollution sources such as smoking, burning incense, and frying foods.
- If travelling in a car with air conditioning, keep the windows up and the ventilation set to recirculate.
- If you are very sensitive to smoke, consider moving to another location with cleaner air, but be aware that conditions can change rapidly.
- Maintaining good overall health is a good way to prevent health effects resulting from short-term exposure to air pollution.

### **More information**

**For additional general information about wildfire smoke and air quality:**

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- Current Air Quality Health Index (AQHI) and air quality measurements: <http://www.env.gov.bc.ca/epd/bcairquality/data/aqhi-table.html>
- Smoke forecasts (next 48 hours)
  - Environment and Climate Change Canada FireWork prediction system: [https://weather.gc.ca/firework/index\\_e.html](https://weather.gc.ca/firework/index_e.html)
  - Blue Sky Canada Smoke Forecasting System: <https://firesmoke.ca/forecasts/current/>

**For additional general information about wildfire smoke and your health:**

BC Centre for Disease Control

- Wildfire smoke and your health: <http://www.bccdc.ca/health-info/prevention-public-health/wildfire-smoke>
- Wildfire smoke and COVID-19: <http://www.bccdc.ca/health-info/diseases-conditions/covid-19/prevention-risks/wildfires>

Provincial Health Authorities

- First Nations Health Authority: <http://www.fnha.ca/what-we-do/environmental-health/wildfire-information>
- Interior Health Authority: For resources related to forest fire smoke exposure, air quality, food safety when the power is out and ensuring your drinking water is safe visit <http://www.interiorhealth.ca> (Environment Tab/Emergency Information).

HealthLink BC

- Wildfires and your health: <https://www.healthlinkbc.ca/health-feature/wildfires>
- Phone 8-1-1 (toll free, 24 hours a day, 7 days a week)

Worksafe BC

- For information about working outdoors during smoky conditions, see the wildfire FAQ website: <https://www.worksafebc.com/en/resources/health-safety/information-sheets/wildfire-smoke-frequently-asked-questions-faq>.

**Contact information**

**Media and public inquiries regarding air quality and this bulletin:**

Trina Orchard, Air Quality Meteorologist, Ministry of Environment & Climate Change

Strategy, 250 420-6461.

**Media questions regarding health implications of wildfires:**

First Nations Health Authority  
Environmental Public Health Services or Main FNHA Line: 604-693-6500  
After Hours: 1-844-666-0711  
Email: Ephs.afterhours@fnha.ca  
Media line: 604-831-4898

Fraser Health Authority  
Media Line: 604-831-4898

Interior Health Authority  
Media line: 1-844-469-7077  
Email: media@interiorhealth.ca

Vancouver Coastal Health Authority  
Matt Kieltyka, Acting Communications Leader, Public Health: matt.kieltyka@vch.ca  
After-hours media line: 604-202-2012

Vancouver Island Health Authority  
Meribeth Burton, Media Relations: 250-519-1815  
After-hours media line: 250-716-7750



