



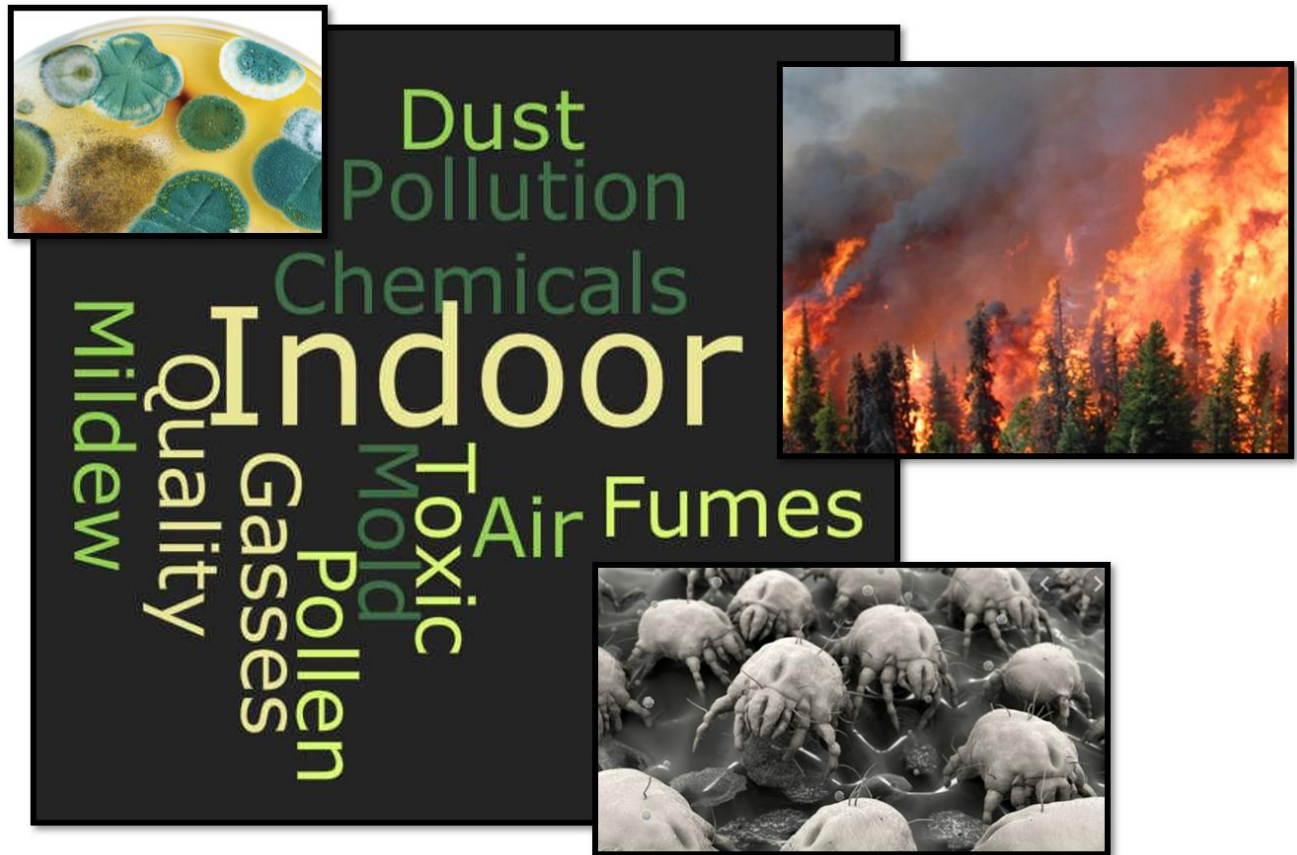
Preface:

Health Canada and the UBC Faculty of Medicine's School of Population and Public Health state that nearly 1,600 BC residents die each year from pollution related illnesses.¹ Exposure to air quality issues such as pathogens, toxins, airborne carcinogens, smog, ozone, mould, forest fire smoke, or other hazardous airborne contaminants can have significant effects on workers. In many cases, poor air quality can be fatal, such as with exposure to asbestos. While indoor air quality is often a concern for workers, with regular forest fires and wildfires (uncontrolled fires that affect large areas of land), there are now increased risks for both indoor and outdoor workers. Effects of exposure can be: direct and indirect; short or long term; cumulative; additive; and can aggravate pre-existing health conditions.

This Guide addresses some frequently asked questions about occupational health and safety ("OHS") / Prevention and WCB claims / Compensation issues, including filing WCB claims for air quality issues. There are often both indoor and outdoor air quality exposures with differing OHS Regulations and Compensation ("Claims") Policies for each; workers may be exposed to both. This Guide includes numerous resources, templates, infographics and statistics.

¹ University of British Columbia. Faculty of Medicine. School of Population and Public Health. March 30, 2020.

Tom McKenna, CUPE National Health and Safety Representative



Poor air quality affects many BC workers both directly and indirectly.

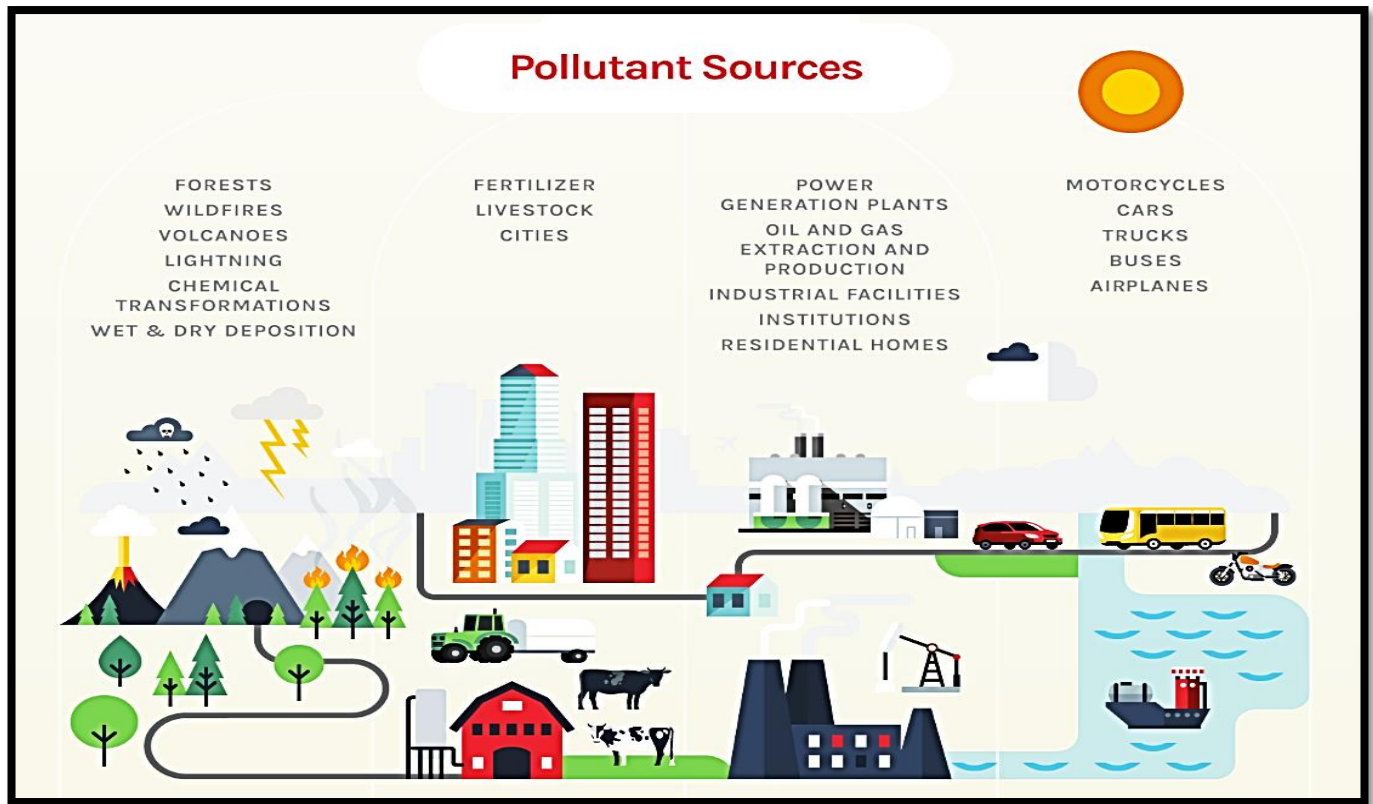
The BC Centre for Disease Control (BCCDC) has recommended the implementation of measures to decrease excess air pollution in populated airsheds across the province.

“There is strong evidence that exposure to air pollution increases susceptibility to respiratory viral infections by decreasing immune function.”

(BCCDC April 15, 2020)

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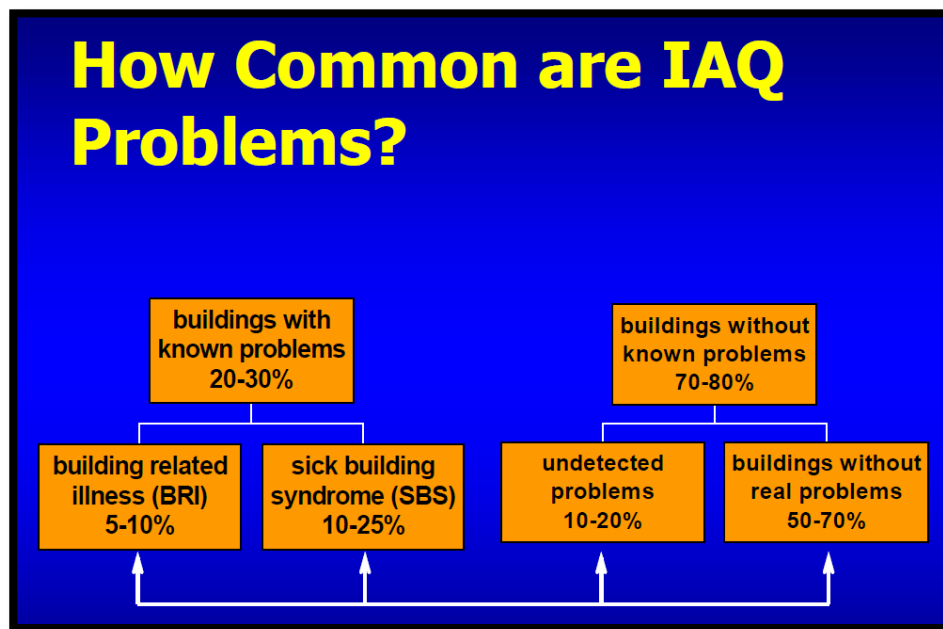
A. Overview of Indoor and Outdoor Air Quality Issues:

I. Overview:

According to data from the Association of Workers' Compensation Boards of Canada ("AWCBC"), occupational diseases caused 64% of deaths versus 36% from traumatic fatalities in 2017. Most occupations are affected. As an example, hazards at construction sites include lead dust and fumes; silica dust; solvent vapours; paints; strippers; isocyanate vapours; and carbon monoxide. As per the Canadian Council of Ministers of the Environment (and the infographic above) there are numerous causes of poor air quality. Poor Natural and human caused phenomena such as forest fires severely impact both indoor and outdoor air quality. This is being exacerbated by climate change – see the numerous 2020 resources on the impact of climate change on workers in BC on the CUPE BC OHS Committee website. The Occupational Health Clinics for Ontario Workers "Doing Something About Indoor Air Quality" (Oudyk, 2014)², stated that air quality concerns, especially indoor air quality, are common.

² <http://www.ohcow.on.ca/edit/files/25thanniversary/Doing%20something%20about%20IAQ%20presentation%20Oct-31-2014.pdf>

Health problems can range from minor irritation to Legionnaire's Disease, autoimmune diseases, Chronic Obstructive Pulmonary Disease, Aspergillus, Mesothelioma, and other forms of cancer such as Mesothelioma caused by asbestos. As per the March 26, 2020 BC Ministry of Environment and Climate Change Strategy Media Release "Deterioration in air quality may lead to more COVID-19 infections overall." Dr. Michael Metha, Thompson Rivers University stated that the mortality rate during the Severe Acute Respiratory Syndrome ("SARS") pandemic doubled due to higher air pollution. The numerous effects of poor quality arise from dozens of indoor air quality and outdoor air quality problems.



Up to 30% of buildings having detected problems and up to 20% with undetected problems. The true extent of the problem of air quality exposure will never be known as workers, especially workers in precarious employment, often do not report occupational health and safety issues nor do they file workers compensation claims. Under-reporting generally is over 40% per a number of studies.³ Complicating this are the different types of legislation, Regulations, Guidelines and Policies that apply to indoor versus outdoor air quality issues. This Guide addresses indoor and outdoor air quality separately.

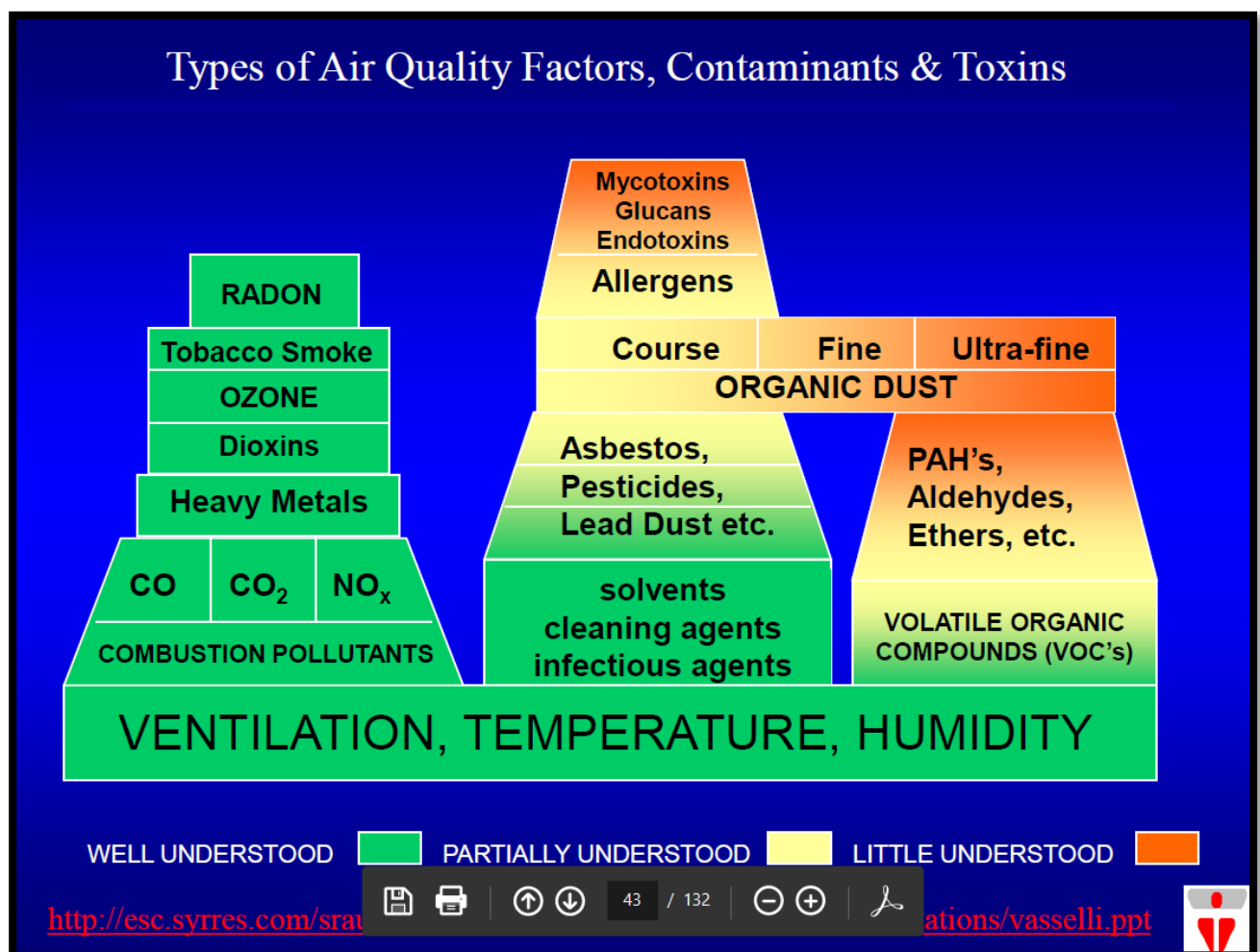
³ The consequences of underreporting workers' compensation claims. Thompson A. (2007). <http://www.cmaj.ca/content/176/3/343>; Work-Related Fatality and Injury Rates: A Comparison of Canadian Provinces and Territories. Tucker S. (2017). https://www.uregina.ca/business/faculty-staff/faculty/file_download/2017%20Report%20on%20Workplace%20Fatalities%20and%20Injuries.pdf; Work-Related Fatality and Injury Rates: A Comparison of Canadian Provinces and Territories. Tucker S. (2018). https://www.uregina.ca/business/faculty-staff/faculty/file_download/2018-Report-on-Workplace-Fatalities-and-Injuries.pdf

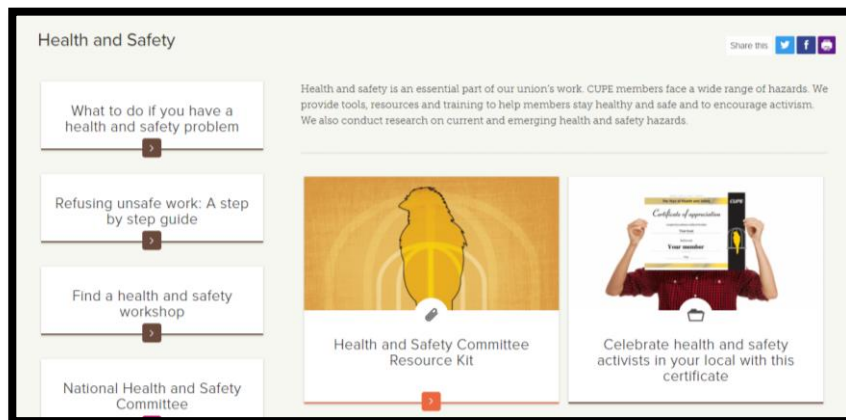
According to the OSHAcademy, air contaminants are commonly classified as either particulate or gas and vapor contaminants.

The most common particulate contaminants include:

- Dusts
- Aerosols
- Fumes
- Fibers
- Mists

Many aspects of the air quality that are not understood as per Occupational Health Clinics for Ontario Workers “Doing Something About Indoor Air Quality” (Oudyk, 2014).





I.I. Types of Contaminants and Definitions:

As per the CUPE National Health and Safety:

“Physical indoor air quality hazards include:

- Improper temperature and humidity levels.
- No HVAC maintenance workers or maintenance program in place due to cutbacks.
- Lack of worker-controlled HVAC systems.
- Workplace overcrowding due to cutbacks.
- Placement of workspace partitions, furniture and equipment preventing proper ventilation.
- Renovations that alter workplace layout without adjustments to HVAC system capacity.
- HVAC systems that begin to operate after workers have arrived or shut down before the end of the workday.
- Outdoor air intakes close to loading bays and busy streets.
- Windows that don’t open.
- Excessive noise and poor lighting.

Chemical indoor air quality hazards include:

- Asbestos for example, in ceiling tiles, pipe and duct insulation, old wallboard and plaster.
- Volatile organic compounds (VOCs) formaldehyde, organochlorines, phenols emitted from furniture, building materials, carpets and plastics.
- Carbon dioxide exhaled from building occupants.
- Carbon monoxide from gas burners and furnaces inside workplaces; vehicle exhaust and tobacco smoke outside workplaces.
- Pesticides in plant sprays and insect and rodent control products.
- Solvents such as benzene and toluene in cleaning products, copier toners and paints.
- Hazardous dusts, fibres and odours from building materials and occupants.
- Ozone from photocopiers, electric motors and electrostatic air cleaners.
- Radon from naturally occurring radioactivity in minerals and soil around workplace foundations.

Biological indoor air quality hazards include:

- Toxic moulds that grow on wood, drywall, upholstery, ceiling tiles, carpet and other building materials
- Bacterial diseases like Legionnaire's disease, Pontiac fever and Humidifier fever that originate in poorly maintained HVAC systems.
- Dust mites that can cause allergic reactions.
- Pollens and biological aerosols that don't get filtered out of indoor air due to poor HVAC maintenance.

Air contaminants can be categorized generally according to the type of contaminant e.g. biological or chemical and the form they take e.g. gas or fume.

These include:

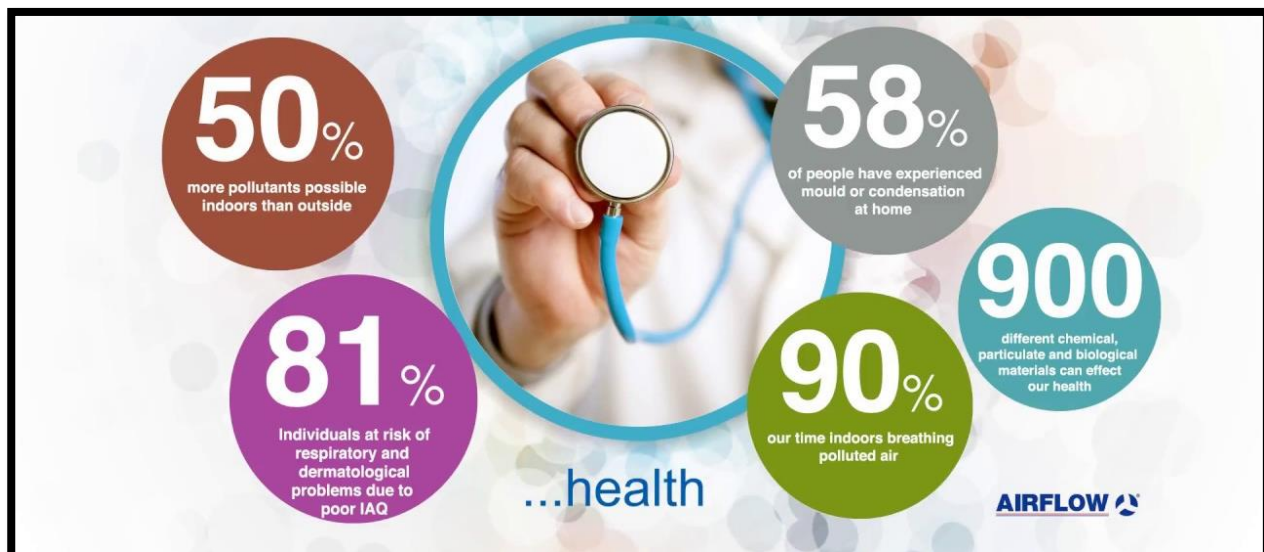
- Biological contaminants include bacteria, mould, dust mites, etc.
- Gases are formless fluids that expand to occupy the space or enclosure in which they are confined. Examples are welding gases such as acetylene, nitrogen, helium, and argon. It also includes carbon monoxide generated from the operation of internal combustion engines or by its use as a reducing gas in a heat treating operation.
- Fumes are formed when material from a volatilized solid condenses in cool air.
- Liquids change into vapors and mix with the surrounding atmosphere through evaporation.
- Mists are finely divided liquid suspended in the atmosphere. They are generated by liquids condensing from a vapor back to a liquid or by breaking up a liquid into a dispersed state such as by splashing, foaming or atomizing. Aerosols are also a form of a mist characterized by highly respirable, minute liquid particles.
- Vapors are the gaseous form of substances that are normally in a solid or liquid state at room temperature and pressure Vapors are formed by evaporation from a liquid or solid.
- Dusts are solid particles (solid organic or inorganic materials) created by crushing, grinding, drilling, abrading or blasting.
- Fibers are solid particles whose length is several times greater than their diameter.

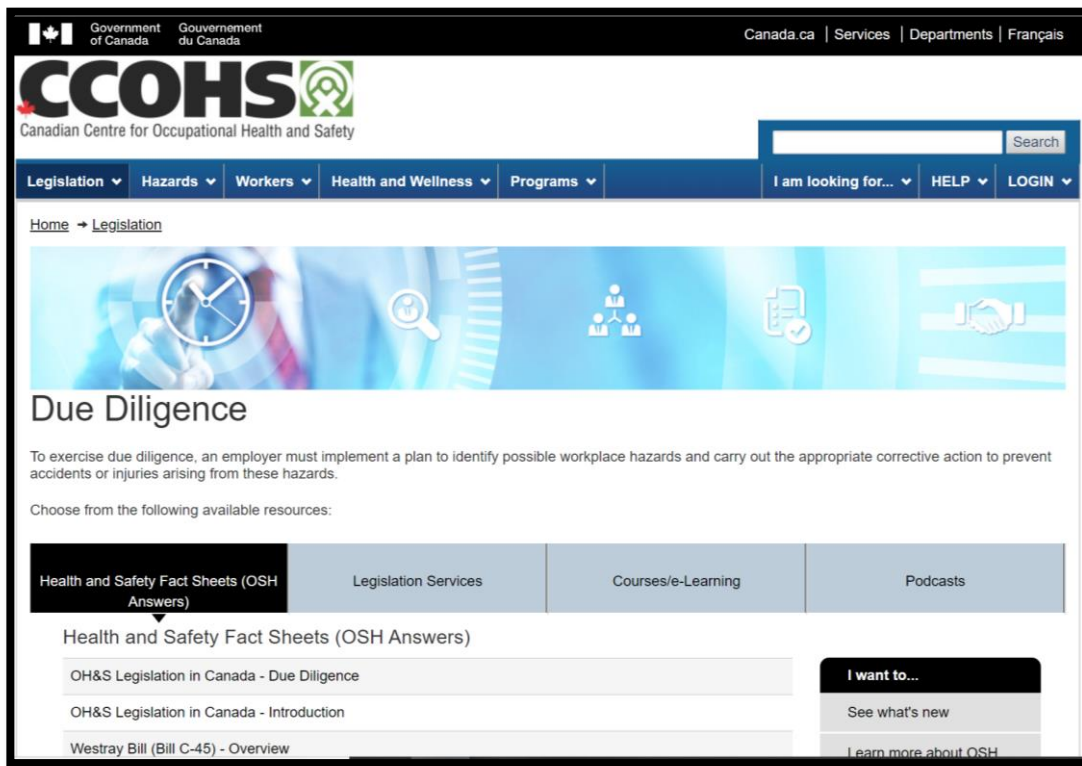
Common types of mould found in buildings include:

- *Stachybotrys chartarum*
- *Aspergillus* sp.
- *Penicillium* sp.
- *Fusarium* sp.
- *Trichoderma* sp.
- *Memnoniella* sp.
- *Cladosporium* sp.
- *Alternaria* sp.

In modern buildings, moisture may be present as the result of:

- Flooding
- Leaks in the roof / basement or plumbing
- Sealed buildings that do not allow excess moisture to escape
- Sources of humidity such as cooking facilities, showers, bathtubs, etc





I.II. Legislation Overview:

As per the Canadian Centre for Occupational Health and Safety (“CCOHS”) many Canadian jurisdictions do not have specific legislation that deals with indoor air quality issues nor is there legislation or regulations that specifically address forest fires. In the absence of such legislation, the "general duty clause" applies. An Employer must provide a safe and healthy workplace, including ensuring good air quality. There are both provincial and Federal legislation and Regulations.

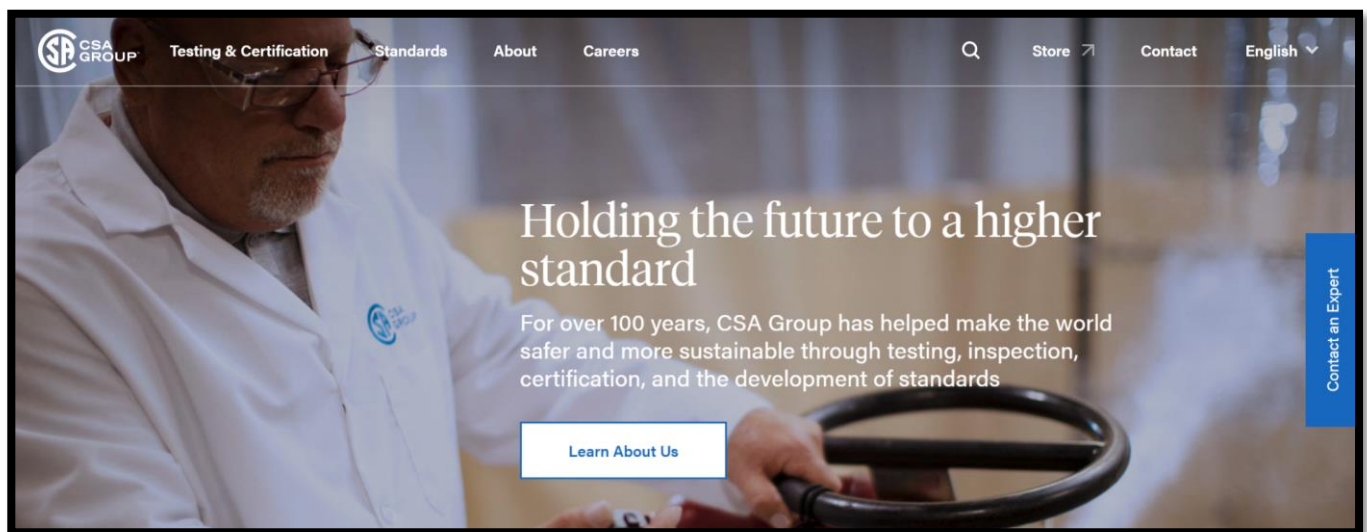
When assessing occupational exposure limits for various chemicals e.g., Threshold Limit Values (“TLVs”) recommended by the American Conference of Governmental Industrial Hygienists (“ACGIH”) are intended as a guide to prevent illness or certain effects in industrial situations as opposed to office/indoor settings.

Occupational exposure limits use dose-response data which show the health effects of repeated exposure to one specific chemical. In the office/indoor setting this type of data is not available for long-term, low-level exposures to a combination of contaminants, which include more than just chemicals e.g. mould, pollen, etc.

Employers may also have to abide by any applicable building codes which generally refer to the American Society of Heating, Refrigerating, and Air Conditioning Engineers (“ASHRAE”) Standard 62.1-2010 - Ventilation for Acceptable Indoor Air Quality (or previous versions), or other acceptable standards.

Please note that most IAQ standards and guidelines are established to ensure the comfort of workers versus actual health and safety. Therefore, the standards and guidelines are often lower than OHS Regulation levels that are set to protect workers from possible health based hazards.

See the Canadian Standards Group website for resources as well.



“Air pollution exposure doubled the risk of death in those who had the SARS-CoV-1 virus.”⁴

⁴ University of British Columbia. Faculty of Medicine. School of Population and Public Health. March 30, 2020.



II. Affected Workers:

Many different workers are affected. Inside workers may be exposed to photocopier toner or mould. Outside workers may be exposed to smoke or pesticides. Examples of workers affected include:

- Municipal workers e.g. streets, recycling, refuse collection, horticulture, Bylaw Officers, lifeguards, etc.
- Workers with pre-existing conditions e.g. allergies, hypertension, heart disease, asthma or other respiratory conditions such as COPD, for example.
- Workers who may be exposed to poor air quality during pandemics or epidemics.

The definition and application of who is affected should be as broad as possible. Indoor workers in a school may be seriously affected by the ventilation system drawing in air from the outside when a forest fire is several kilometers away. Paramedics may be affected by continuously being exposed to poor air quality both within the vehicle and while attending to the public.

What is meant by due diligence?

Due diligence is the level of judgement, care, prudence, determination, and activity that a person would reasonably be expected to do under particular circumstances.

Applied to occupational health and safety, due diligence means that employers shall take all reasonable precautions, under the particular circumstances, to prevent injuries or incidents in the workplace. This duty also applies to situations that are not addressed elsewhere in the occupational health and safety legislation. Reasonable precautions are also referred to as reasonable care. It refers to the care, caution, or action a reasonable person is expected to take under similar circumstances.

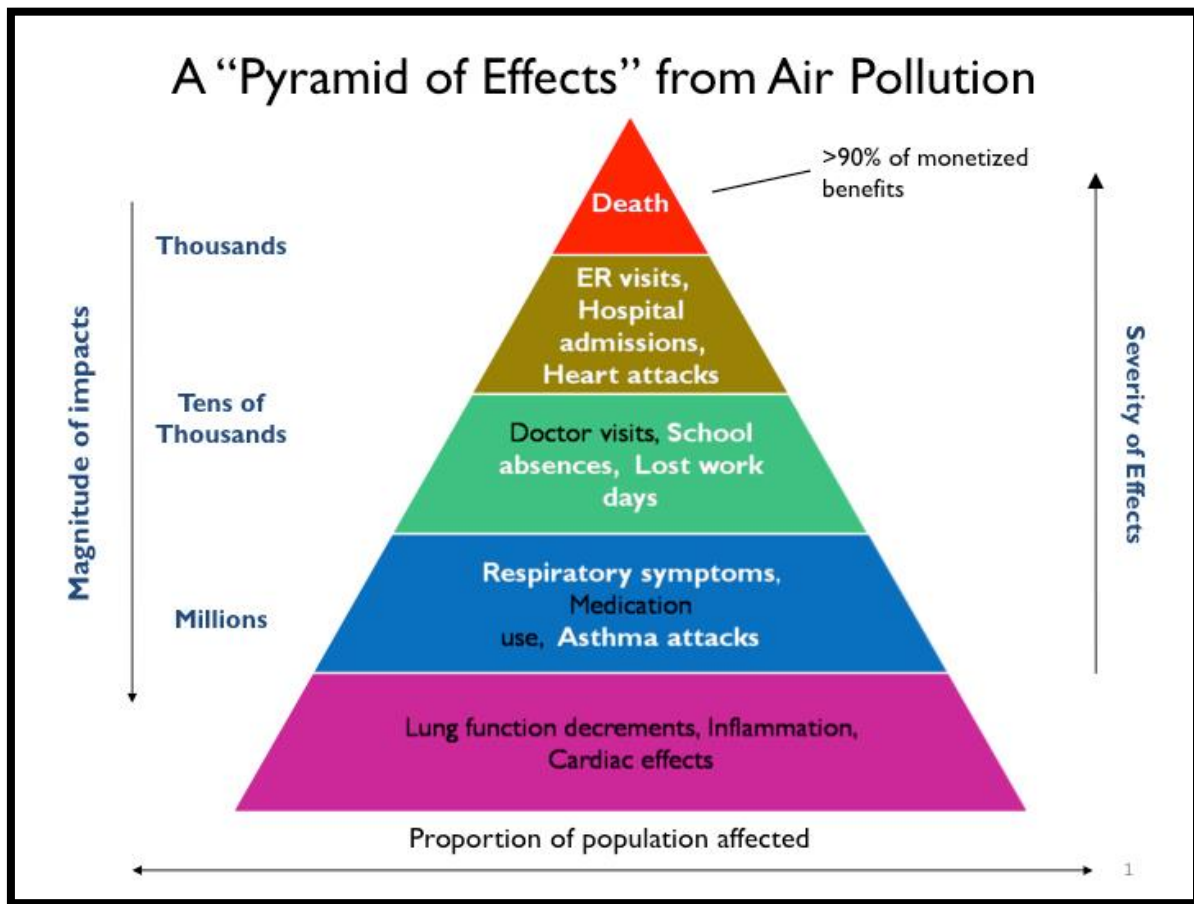
Another term used is employers must do what is "reasonably practicable". Reasonably practicable has been described by the Labour Program (Canada) as taking precautions that are not only possible, but that are also suitable or rational, given the particular situation. Determining what should be done is usually done on a case by case basis.

To exercise due diligence, an employer must implement a plan to identify possible workplace hazards and carry out the appropriate corrective action to prevent incidents or injuries arising from these hazards.

III. Questions from Workers Regarding OHS, Protection, Employer Obligations:

Questions and concerns from both indoor and outdoor workers may include:

- Do workers have to work outside if there is poor air quality? What if they disagree?
- Is there a Right to Refuse?
- Can workers request reassignment to a different job? When?
- Can workers file a WCB claim if a pre-existing condition was aggravated? How?
- Does the Employer have to accommodate if they have a WCB claim due to an air quality issue or if they have a disability?
- What kind of protections, such as Personal Protective Equipment, do Employers have to provide?
- Do Employers have to conduct risk assessments?
- Do Employers have to have Exposure Control Plans?
- What is the role of the Joint Health and Safety Committee ("JHSC")?
- What Occupational Health and Safety Regulations apply?



IV. Common Initial Symptoms Following Short Term Exposure – **Indoor** and **Outdoor** Air Quality (for those without pre-existing conditions):

Workers may initially have minor symptoms when exposed to poor air quality. These can worsen quickly or become life threatening. Every air quality issue should be taken seriously. Here are some examples of common initial symptoms (also see I.III. below):

- irritated eyes
- coughing
- throat irritation
- headaches
- difficulty breathing or shortness of breath
- bronchitis
- asthma like symptoms

How reduced air quality affects health depends on factors such as: duration of exposure, concentration of contaminants, age, current health state, pre-existing conditions, multiple contaminants, the type of contaminants. The following graphic shows the most common indoor contaminants. Note that while the graphic refers to “allergens” many contaminants may cause severe injuries or death e.g. asbestos. The graphic refers to a typical home but there are many contaminants that can also occur in the workplace.



B. Addressing **Indoor** and **Outdoor** Air Quality Concerns:

I. **Indoor** Air Quality:

I.I. Is indoor air quality a health and safety concern?

Indoor air quality has become an important health and safety concern. As per the Centers for Disease Control and Prevention and as per the National Institute for Occupational Health and Safety (“NIOSH”), there are numerous contaminants found in many workplace items, most of which workers are not aware of. Outdoor air quality may affect the indoor air quality.

I.II. What are common causes of indoor air quality problems?

Examples of contaminants include:

- ❖ Caulks, sealants, and coatings
- ❖ Adhesives
- ❖ Paints, varnishes and/or stains
- ❖ Wall coverings
- ❖ Cleaning agents
- ❖ Fuels and combustion products
- ❖ Carpeting
- ❖ Vinyl flooring
- ❖ Fabric materials & furnishings e.g. gases, vapours, odours, off-gas emissions from furniture, carpets, and paints
- ❖ Air fresheners and other scented products



- ❖ Personal products of employees like perfume, shampoos, etc.
- ❖ Carbon dioxide (CO₂)
- ❖ Tobacco smoke
- ❖ Perfume
- ❖ Dust
- ❖ Fiberglass
- ❖ Asbestos
- ❖ Formaldehyde
- ❖ Solvents
- ❖ Pesticides
- ❖ Disinfectants
- ❖ Glues
- ❖ Dust mites from carpets, fabric, and foam chair cushions
- ❖ Microbial contaminants
- ❖ Fungi
- ❖ Moulds
- ❖ Bacteria
- ❖ Ozone -- from photocopiers, electric motors, electrostatic air cleaners



Volatile organic compounds (“VOCs”) are common chemical contaminants found in office and home. VOCs are organic (containing carbon) chemicals that can easily evaporate into the air.

Many products found in the office environment may have the potential to release VOCs. VOCs, carbon monoxide and ozone have certain minimum acceptable thresholds which vary by province. As per the Occupational Health Clinics for Ontario Workers “Doing Something About Indoor Air Quality” (Oudyk, 2014):

Contaminants (VOC's):

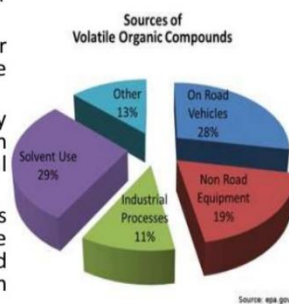
Volatile Organic Compounds (VOC's)

- VOC's can aggravate allergy/asthma and upper respiratory infections
- exposure standards
 - IAQ (Möhlave & EPA)
 - no problem <0.2 mg/m³
 - possible problem 0.2-3.0 mg/m³
 - probable problem 3.0-25 mg/m³
 - problem >25 mg/m³
 - TLV's 250-1000 mg/m³



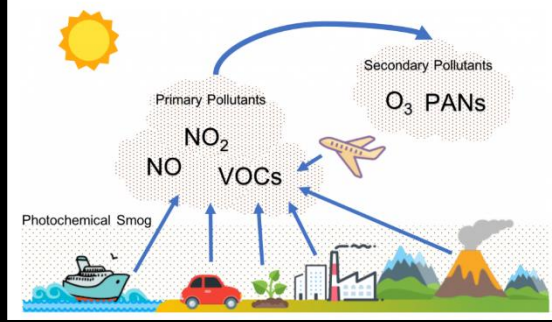
Volatile organic compounds

- VOCs are a well-known outdoor air pollutant.
- They are categorized as either methane (CH) or non-methane (NMVOCs)
- Methane is an extremely efficient greenhouse gas which contributes to enhanced global warming.
- The aromatic NMVOCs benzene, toluene and xylene are suspected carcinogens and may lead to leukemia with prolonged exposure.



What Is Photochemical Smog?

Photochemical smog occurs in sunny, dry areas and forms from the use of all fossil fuels, including gasoline, burning trees, and processing organic waste.



Contaminants (carbon monoxide):

- usually an indicator of vehicle exhaust infiltration or other combustion source
- standards (surrogate & exposure)
 - TWAEV: 25 ppm (8-hour ave)
 - STEL: 100 ppm (15 min)
 - environmental: 9 ppm (24-hour ave)
 - Health Canada >5 ppm (spot: infiltration)
 - IAQ practice: >2 ppm (spot: infiltration)

Contaminants (ozone):

Sources: photocopiers, laser printers, fax machines

Health effects: ozone is very reactive (1/2 life of 15 minutes); ages lung tissue, aggravates breathing problems, can cause asthma; heightens allergic response

Measurement: very difficult to measure but easy to detect by odour (fresh air smell; if detected probably over exposure guideline of 0.05-0.1 ppm)

Control: equipment often has a charcoal filter to absorb ozone (often not changed frequently enough – if odour, change filter); local exhaust directly to machine may be necessary for high volume usage particularly in small room



"There is no recognized threshold of health effects for outdoor PM_{2.5} regardless of where exposure occurs (i.e., indoors or outdoors), and there is evidence that adverse health effects occur at current levels of exposure."

(Health Canada 2012 <http://www.hc-sc.gc.ca/ewh-semt/pubs/air/particul-eng.php>)

- exposure standards

- IAQ (LEED, EPA, OHCOW, Health Canada)

- background* <0.010 mg/m³
 - possible problem 0.01-0.02 mg/m³
 - probable problem 0.02-0.05 mg/m³
 - problem >0.05 mg/m³

- TWAEV, TLV 3 mg/m³

- Xerox 0.4 mg/m³ (avoid alveolar accumulation)



How ozone is created

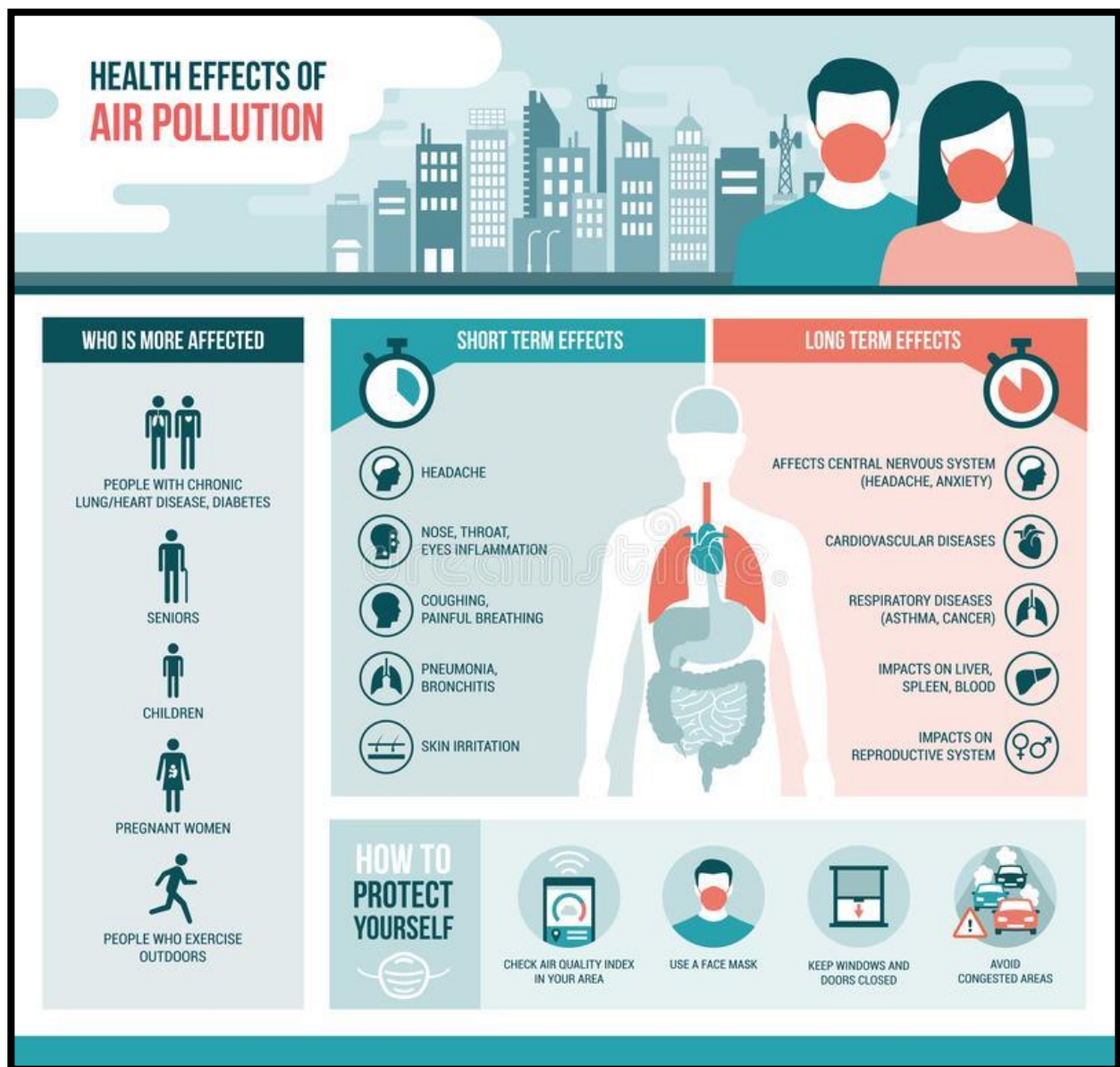
Ozone is formed in the atmosphere through chemical reactions between pollutants emitted from vehicles, factories and other industrial sources, fossil fuels combustion, consumer products, evaporation of paints, and many other sources.

Hydrocarbons and nitrogen oxide gases react
in the presence of sunlight to form ozone

Hot, sunny, and calm weather
promotes ozone formation



Ozone has a very characteristic pungent odor. You can sometimes detect it after lightning strikes or during electrical discharges. Individual humans vary in their ability to smell ozone. Some can smell it at levels as low as 0.05 ppm.

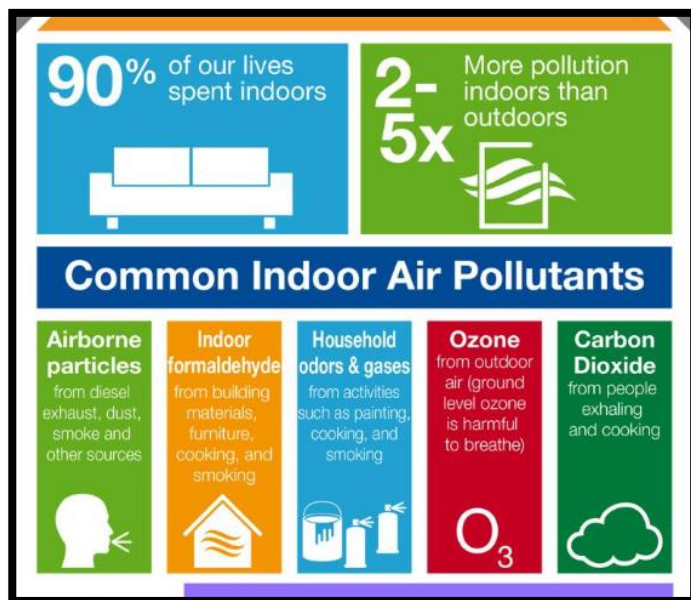


I.III. What symptoms are often linked to poor **indoor** air quality:

There are many symptoms of poor air quality. The following symptoms (which are different than medical conditions caused by contaminants) include:

- Dryness and irritation of the eyes, nose, throat, and skin
- Headache

- Fatigue
- Shortness of breath
- Hypersensitivity and allergies
- Sinus congestion
- Coughing and sneezing
- Dizziness
- Nausea



Workers may notice their symptoms after several hours at work and feel better after they have left the building or when they have been away from the building for a weekend or a vacation.

Occupants of buildings with poor indoor air quality report a wide range of health problems which are often referred to as:

- Sick Building Syndrome ("SBS")
- Tight Building Syndrome ("TBS")
- Building-Related Illness ("BRI")
- Multiple Chemical Sensitivities ("MCS").

A certain percentage of workers may react to a number of chemicals, each of which may occur at very low concentrations. See the following graphic and the Appendices for sample Health Symptom Surveys on the next several pages from the CCOHS and other organizations. Also see Appendix A.

Health Survey - Confidential	
Name:	Department/Position:
Survey Date:	Interviewer (if applicable):
Work Location / Building Area	
Background Information:	
How long have you been working for your employer? _____ Yrs.	
Where do you spend most of your time at work?	
Have there been any changes in the office recently? E.g.: new location, renovation, cleaning	
Symptoms & Patterns:	
Check all the symptoms or discomfort you are experiencing:	
<input type="checkbox"/> Headache <input type="checkbox"/> Nausea <input type="checkbox"/> Dizziness <input type="checkbox"/> Tiredness / fatigue <input type="checkbox"/> Irritation of eyes, nose, throat <input type="checkbox"/> Breathing Problems <input type="checkbox"/> Coughing <input type="checkbox"/> Sneezing <input type="checkbox"/> Wheezing <input type="checkbox"/> Shortness of Breath	<input type="checkbox"/> Blurred Vision <input type="checkbox"/> Sinus Congestion <input type="checkbox"/> Difficulty in concentrating <input type="checkbox"/> Pain and discomfort of: <input type="checkbox"/> Back <input type="checkbox"/> Neck <input type="checkbox"/> Hands <input type="checkbox"/> Wrist <input type="checkbox"/> Shoulders <input type="checkbox"/> Other _____
Do you have any other health conditions that may make symptoms worse? E.g.: allergies, immune system disorders, or chronic cardiovascular or respiratory disease	
Have you seen a doctor for these symptoms? <input type="checkbox"/> Yes <input type="checkbox"/> No (Do you wish to provide general details?)	

How often are surveys conducted?

Health Survey - Confidential		continued ...
Timing:		
When do you notice these symptoms and how often do they occur?		
On average, when you notice the symptoms, how long have you been at work? <input type="checkbox"/> Less than 1 hour <input type="checkbox"/> 2-4 hours <input type="checkbox"/> > 4 hours <input type="checkbox"/> 1 day <input type="checkbox"/> After __ days		
Has there been any change to the symptoms or patterns? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, please explain:		
When do the symptoms go away? <input type="checkbox"/> Overnight <input type="checkbox"/> After a week away <input type="checkbox"/> Rarely/Never Can you provide more information?		
Has the pain or discomfort caused you to take time off work? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Are you aware of other people with similar symptoms or concerns? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, can you provide more details?		
Suspected or Potential Causes:		
Check any of the following that are true:		
<input type="checkbox"/> Are there any unusual odours? <input type="checkbox"/> Does the air seem stuffy? <input type="checkbox"/> Is the air dry? <input type="checkbox"/> Is it dusty? <input type="checkbox"/> Do you get shocks from static electricity?	<input type="checkbox"/> Is the work area too warm? <input type="checkbox"/> Is the work area too cool? <input type="checkbox"/> Does the temperature vary from room to room? <input type="checkbox"/> Are there drafts where you work?	

Always remember to apply the Hierarchy of Controls to workplace hazards as per the following infographic.



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Indoor Air Quality: A Guide for Building Owners, Managers, and Occupants

The information in this guide will help you maintain good indoor air quality in your building, prevent air quality problems, and correct problems that may arise. It will also help you understand the indoor air quality requirements in the Occupational Health and Safety Regulation.

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Also available in: [English](#)

Publication Date: Mar 2005

File type: PDF (405 KB)

Asset type: Guide

Order: BK89

Available from the WorkSafeBC Store

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I.IV. What do the WCB Act, OHS Regulations, Guidelines and Policy say about **indoor air quality and hazardous substances exposure? The following are examples (not an exhaustive list and subject to change or amendment):**

There are many sources of information on Employer obligations to address air quality issues.

<https://www.worksafebc.com/en/resources/health-safety/books-guides/indoor-air-quality-a-guide-for-building-owners-managers-and-occupants>

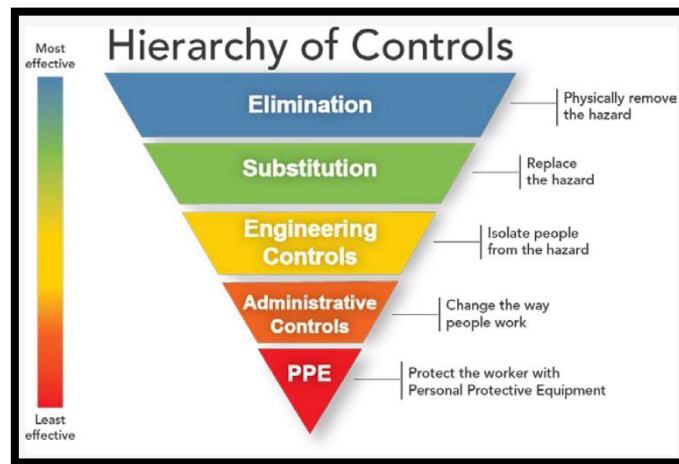
As part of the 4 Rights, Employers must take steps to improve worker safety. As per the CCOHS, the general requirements for safety in the workplace related to air quality include:

- complete a risk and hazard assessment to identify what respiratory agents (and other hazards) are present in the workplace
- the goal is to eliminate the hazard and if not possible to move control of hazards up the hierarchy of controls to minimize exposure

- Employers and supervisors should encourage workers to communicate any concerns they may have about occupational disease e.g. the Right to Know
- Employers should implement proper controls and work practices to prevent respiratory hazards and to limit exposure to below legislated or regulatory limits
- Employers should provide information, instruction and supervision to workers
- Employers should train workers on respiratory hazards specific to their workplace
- Provide training on the correct use and fit testing of any necessary personal protective equipment, including respirators as well as properly maintain personal protective equipment

As per the CCOHS, the specific actions Employers should consider taking for respiratory hazards include the following:

1. Create a Hazard Control Program that consists of all steps necessary to protect workers from exposure to a substance or system, the training and the procedures required to monitor worker exposure and their health to hazards such as chemicals, materials or substance, or other types of hazards such as noise and vibration.
2. A written workplace Hazard Control Program should outline which methods are being used to control the exposure and how these controls will be monitored for effectiveness. After elimination and substitution, well designed and maintained engineering controls are the preferred methods of controlling worker exposure to hazardous contaminants in the air. Administrative controls may be used in addition to engineering controls as they may limit workers' exposures by scheduling reduced work times in contaminant areas or by implementing other such work rules. Administrative controls are not generally preferred because they do not remove the hazard, can be



3. A respiratory protection program includes the following components:

- hazard identification
- program evaluation

- hazard control

- exposure assessment

- respirator selection

- respirator fit-testing

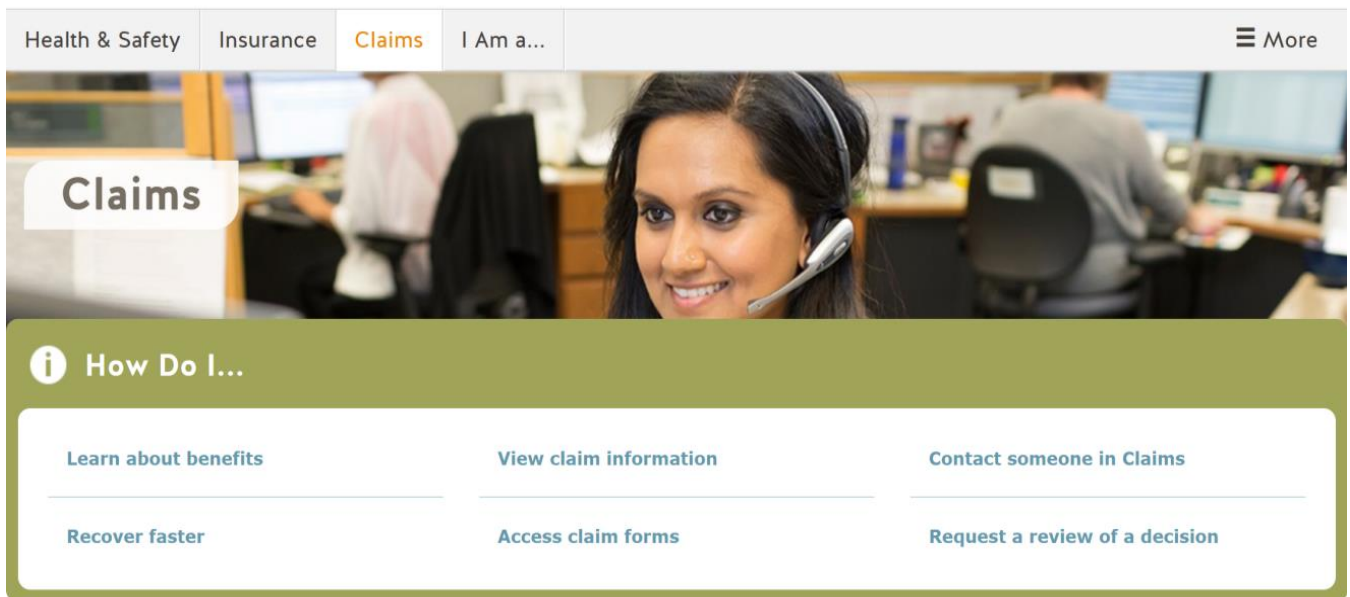
- training program

(Circle One)

		Severity of Injury or Illness Consequence				Notes
Likelihood of OCCURRENCE or EXPOSURE for a selected unit of time or activity		Negligible	Marginal	Critical	Catastrophic	
Frequent	→	Medium	Serious	High	High	
Probable	→	Medium	Serious	High	High	
Occasional	→	Low	Medium	Serious	High	
Remote	→	Low	Medium	Medium	Serious	
Improbable	→	Low	Medium	Medium	Medium	

Source: MILSTD 882

- inspection and record keeping
- cleaning and sanitizing respirators (see Appendix K as well)
- repairing and maintaining respirators (see Appendix K as well)
- proper storage of respirators (see Appendix K as well)
- health surveillance
- policies and procedures



I.IV.I. WCB Compensation Rehabilitation Services & Claims Manual Policy Items (“RSCM”):

The following are sample WCB Claims Policy items that may be relevant to a WCB claim:

- #12.00 Personal Injury
- #25.10 Legislative Requirements
- #26.10 Suffers from an Occupational Disease
- #26.20 Establishing Work Causation
- #26.21 of RSCM II, Schedule B Presumption
- #29.00 Respiratory Diseases
- #29.10 Acute Respiratory Reactions to Substances with Irritating Properties
- #29.20 Asthma
- #29.30 Bronchitis and Emphysema

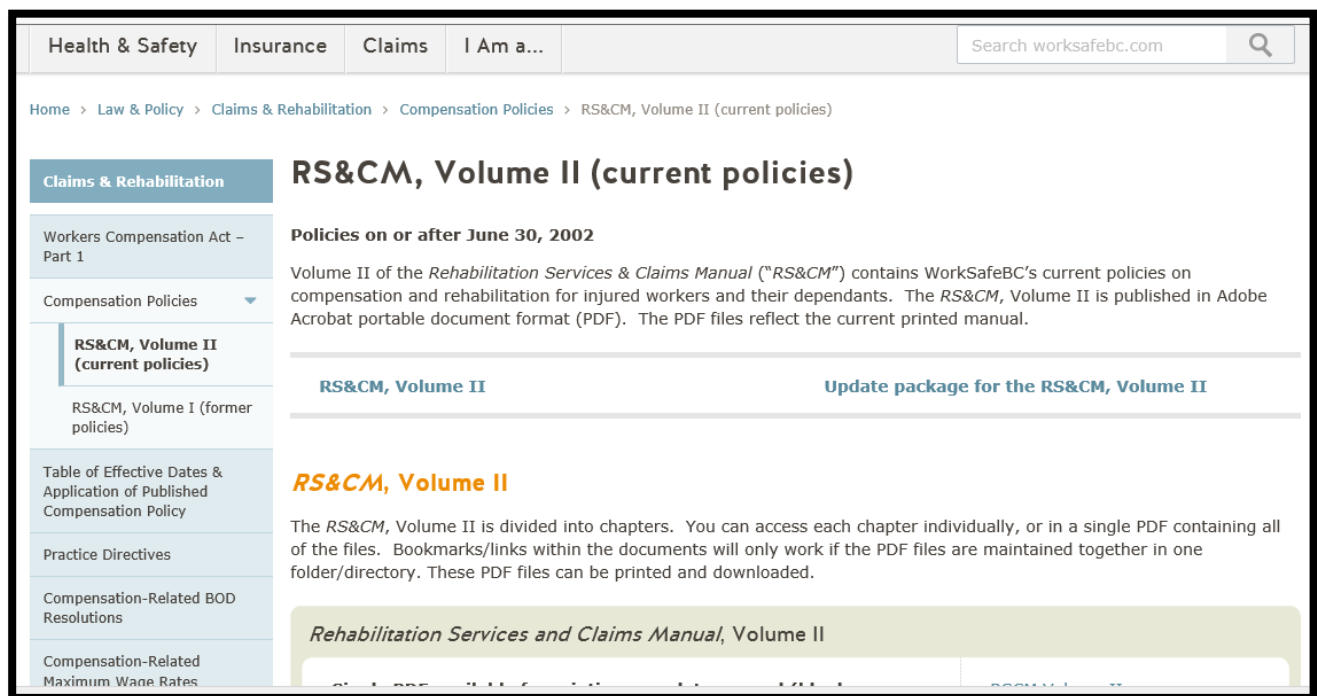
- #29.40 Pneumoconiosis and Other Specified Diseases of the Lungs
- #29.50 Presumption Where Death Results from Ailment or Impairment of the Lungs or Health
- #29.20 Dust – Red Cedar
- #29.41 Inhalation of Silica Dust
- #29.45 Pulmonary Pneumonconiosis
- #29.46 Asbestosis
- #30.20 Asbestos Exposure
- Appendix 2 Occupational Diseases Listed in Schedule B

Many Policy items are diagnosis specific. Knowing all the applicable diagnoses is required in order to see which Policies may apply. This is especially important for the Schedule of various diagnoses that fall under a different set of adjudication procedures. Sample Appendix 2 – Schedule B (**note: there are numerous Policy Consultations and revisions occurring each year**):

<p>Bookmarks</p> <ul style="list-style-type: none"> APPENDIX 1 APPENDIX 2 - OCCUPATIONAL DISEASE APPENDIX 4 TABLE OF CONTENTS REFERENCE INDEX 		<p>3. Pneumoconiosis:</p> <p>(a) Silicosis</p> <p>Where there is exposure to airborne silica dust including metalliferous mining and coal mining.</p> <p>(b) Asbestosis</p> <p>Where there is exposure to airborne asbestos dust.</p> <p>(c) Other pneumoconioses</p> <p>Where there is exposure to the airborne dusts of coal, beryllium, tungsten carbide, aluminum or other dusts known to produce fibrosis of the lungs.</p> <p>3A. Diffuse pleural thickening or fibrosis, whether unilateral or bilateral</p> <p>Where there is exposure to airborne asbestos dust and the worker has not previously suffered and is not currently suffering collagen disease, chronic uremia, drug-induced fibrosis, tuberculosis or other infection, trauma, or disease capable of causing pleural thickening or fibrosis.</p> <p>3B. Benign pleural effusion, whether unilateral or bilateral</p> <p>Where there is exposure to airborne asbestos dust and the worker has not previously suffered and is not currently suffering collagen disease, chronic uremia, tuberculosis or other infection, trauma, or disease capable of causing pleural effusion.</p>
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<p>Bookmarks</p> <ul style="list-style-type: none"> APPENDIX 1 APPENDIX 2 - OCCUPATIONAL DISEASE APPENDIX 4 TABLE OF CONTENTS REFERENCE INDEX 		<p>4. Cancer:</p> <p>(a.1) Primary carcinoma of the lung when associated with:</p> <p>(i) asbestosis</p> <p>Where there is exposure to airborne asbestos dust.</p> <p>or</p> <p>(ii) bilateral diffuse pleural thickening over 2 mm thick</p> <p>Where there is exposure to airborne asbestos dust and the worker has not previously suffered collagen disease, chronic uremia, drug-induced fibrosis, tuberculosis or other infection or trauma capable of causing pleural thickening.</p> <p>(a.2) Primary carcinoma of the lung</p> <p>Where there is exposure to airborne asbestos dust for a period of 10 years or more of employment in one or more of the following industries:</p> <ol style="list-style-type: none"> (1) asbestos mining; (2) insulation or filter material production; (3) construction (where there is disturbance of asbestos-containing materials); (4) plumbing or electrical work; (5) pulp mill work; (6) shipyard work; (7) longshoring. <p>(b) Mesothelioma (pleural or peritoneal)</p> <p>Where there is exposure to airborne asbestos dust.</p> <p>(c) Carcinoma of the larynx or pharynx associated with asbestosis</p> <p>Where there is exposure to airborne asbestos dust.</p>
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Start		rscm_ii_appx2-pdf-en.p... x
Bookmarks		
<div> <div></div> <div>APPENDIX 1</div> <div>APPENDIX 2 - OCCUPATIONAL DISEA</div> <div>APPENDIX 4</div> <div>TABLE OF CONTENTS</div> <div>REFERENCE INDEX</div> </div>		
		6. Asthma
		Where there is exposure to:
		(1) western red cedar dust; or
		(2) isocyanate vapours or gases; or
		(3) the dusts, fumes or vapours of other chemicals or organic material known to cause asthma.
		7. Extrinsic allergic alveolitis (including farmers' lung and mushroom workers' lung)
		Where there is repeated exposure to respirable organic dusts.
		8. Acute upper respiratory inflammation, acute pharyngitis, acute laryngitis, acute tracheitis, acute bronchitis, acute pneumonitis, or acute pulmonary edema (excluding any allergic reaction, reaction to environmental tobacco smoke, or effect of an infection)
		Where there is exposure to a high concentration of fumes, vapours, gases, mists, or dust of substances that have irritating or inflammatory properties, and the respiratory symptoms occur within 48 hours of the exposure, or within 72 hours where there is exposure to nitrogen dioxide or phosgene.
		9. Metal fume fever
		Where there is exposure to the fume of zinc or other metals.
		10. Fluorosis
		Where there is exposure to high concentrations of fluorine or fluorine compounds in gaseous or particulate form.
		11. Neurosensory hearing loss
		Where there is prolonged exposure to excessive noise levels.



Here is a key RSCM II (Policy) Excerpt for WCB claims related to air quality:

#29.10 Acute Respiratory Reactions to Substances with Irritating or Inflammatory Properties

“Schedule B lists “Acute upper respiratory inflammation, acute pharyngitis, acute laryngitis, acute tracheitis, acute bronchitis, acute pneumonitis, or acute pulmonary edema (excluding any allergic reaction, reaction to environmental tobacco smoke, or effect of an infection)” as an occupational disease. The process or industry listed opposite to it is “Where there is exposure to a high concentration of fumes, vapours, gases, mists, or dust of substances that have irritating or inflammatory properties, and the respiratory symptoms occur within 48 hours of the exposure, or within 72 hours where there is exposure to nitrogen dioxide or phosgene”.

There are many agents used in industry and commerce in the province which have irritating or inflammatory properties, and which in sufficient concentrations can produce respiratory symptoms if inhaled. Symptoms associated with the inhalation of such substances can vary from mild transient symptoms (such as a mild burning sensation affecting the eyes, nose and throat) to significant symptoms throughout the respiratory tract (such as dyspnea and respiratory distress).

Significant exposure to some substances may result in persistent respiratory symptoms.

Onset of symptoms can occur within a few minutes or several hours of the exposure, depending on the substance. For the presumption in section 6(3) of the *Act* to apply, the symptoms must appear within 48 hours of the exposure, unless the exposure is to nitrogen dioxide or phosgene, in which case the onset of symptoms must occur within 72 hours.

A claim for compensation made by a worker who has developed persistent or chronic respiratory symptoms considered to be due to exposure to a substance with irritating or inflammatory properties, must be considered on its own individual merits without the benefit of a presumption in favour of work causation (unless the claim meets the requirements of one of the other items of Schedule B). This includes claims for chronic bronchitis, emphysema, chronic obstructive pulmonary disease, obliterative bronchiolitis, reactive airways dysfunction syndrome (RADS), chronic rhinitis, and conditions considered to be due to exposure to tobacco smoke.

The same is true of a claim made by a worker with acute respiratory symptoms where the requirements of section 6(3) of the *Act* are not met (see policy item #26.23). Where a worker who develops an acute reaction to a substance with irritating or inflammatory properties subsequently develops a persistent or chronic respiratory condition, a decision will be made based on the merits and justice of that claim on whether the chronic condition is a compensable consequence of the acute reaction.

A claim made by a worker who has inhaled a vapour or gas which was at a temperature high enough to cause thermal injury (such as inhaling steam) will be treated as a claim for a personal injury and will be adjudicated in accordance with the policies set out in Chapter 3.

Use of the words “high concentration” in Schedule B is a recognition that the amount of the particular substance in the air must be significant for the presumption to apply. The manner in which an exposed individual will react will depend on the properties of the substance inhaled (e.g., acidity/alkalinity, chemical reactivity, water solubility, asphyxiating potential) and the amount inhaled. Individual judgment must be exercised in each case to determine whether there was a “high concentration” of the particular substance having regard to the medical and scientific evidence available, including evidence as to the irritating and/or inflammatory properties of that substance.”









I.IV.II. Sample Workers' Compensation Appeal Tribunal Decisions (always see the most recent decisions):

There are numerous decisions from the second level of appeal – the BC Workers' Compensation Appeal Tribunal ("WCAT"). These can be found at http://www.wcat.bc.ca/search/advanced_decision_search.aspx#results

The WCAT is the second formal level of appeal after the internal (WorkSafeBC) Review Division. The WCAT is not part of WorkSafeBC – that is why the decisions from the WCAT are included as opposed to the Review Division or other internal appeal processes such as the 75 day Reconsideration (WorkSafeBC). There are also WCAT Reconsiderations of WCAT decisions and judicial reviews which are not addressed in this Guide.

Sample list of WCAT decisions:

Displaying Results: 1 - 8 (Use the arrows to view more search results)			
Decision #	Date	Excerpt	Category
A1900912	2019-07-16	The issue to be decided in the appeal is whether the worker suffered a compensable aggravation of her preexisting asthma. Size: 30.28k  A1900912	compensation
A1900776	2019-10-21	Whether the worker sustained an aggravation of her COPD on or around July 9, 2018 due to either a work-related personal injury or a work-related occupational disease. Size: 44.19k  A1900776	compensation
A1900421	2020-02-26	The issue in this appeal relates to the worker's entitlement to temporary disability wage loss benefits beyond the ten days identified by the review officer, pursuant to the Act and applicable Board policy. Size: 28.68k  A1900421	compensation
A1900359	2019-08-14	The issue is whether the worker is entitled to additional compensation benefits under his 1990 claim. Size: 19.64k  A1900359	compensation
A1802993	2019-05-13	Were the worker's sinusitis, vertigo, and/or allergic rhinitis due to, or were aggravated by, the nature of the worker's employment because he works near a dock where allergens, including soybean dust, exist? Size: 26.62k  A1802993	compensation
A1802106	2019-07-03	Did the worker develop an occupational disease due to the nature of his employment in June 2017? Size: 28.25k  A1802106	compensation



I.IV.III. **Workers Compensation Act (Claims) (the Regulations change very frequently):**

There are two primary Sections to apply to air WCB quality claims (**in addition to potentially other applicable Sections of the Act**). Section 6 sets out that claims for certain occupational diseases may be the subject of a presumption in favour of causation under section 6(3) of the Act. Where such a presumption does not apply, the claim will still need to be adjudicated under section 6(1). Asthma is a condition to which the section 6(3) presumption may apply.

Section 6(3) of the Act states that if a worker contracts an occupational disease in the first column of Schedule B of the RSCM Policies (which must be read in conjunction with the Act), and was employed in a process or industry in the second column of the same row at or immediately before the date of disablement, the disease is presumed to be due to the nature of that employment unless the contrary is proven.

See <https://www.worksafebc.com/en/law-policy/workers-compensation-law>

Note: **the BC Workers Compensation Act is currently being reviewed. Changes may occur. The following excerpts are for illustration purposes only.**

Division 2 — Compensation

Compensation for personal injury

- 5** (1) Where, in an industry within the scope of this Part, personal injury or death arising out of and in the course of the employment is caused to a worker, compensation as provided by this Part must be paid by the Board out of the accident fund.
- (2) Where an injury disables a worker from earning full wages at the work at which the worker was employed, compensation is payable under this Part from the first working day following the day of the injury; but a health care benefit only is payable under this Part in respect of the day of the injury.
- (3) Where the injury is attributable solely to the serious and wilful misconduct of the worker, compensation is not payable unless the injury results in death or serious or permanent disablement.
- (4) In cases where the injury is caused by accident, where the accident arose out of the employment, unless the contrary is shown, it must be presumed that it occurred in the course of the employment; and where the accident occurred in the course of the employment, unless the contrary is shown, it must be presumed that it arose out of the employment.
- (5) Where the personal injury or disease is superimposed on an already existing disability, compensation must be allowed only for the proportion of the disability following the personal injury or disease that may reasonably be attributed to the personal injury or disease. The measure of the disability attributable to the personal injury or disease must, unless it is otherwise shown, be the amount of the difference between the worker's disability before and disability after the occurrence of the personal injury or disease.

Occupational disease

6 “(1) Where

(a) a worker suffers from an occupational disease and is thereby disabled from earning full wages at the work at which the worker was employed, or the death of a worker is caused by an occupational disease; and

(b) the disease is due to the nature of any employment in which the worker was employed, whether under one or more employments,

compensation is payable under this Part as if the disease were a personal injury arising out of and in the course of that employment. A health care benefit may be paid although the worker is not disabled from earning full wages at the work at which he or she was employed.

(2) The date of disablement must be treated as the occurrence of the injury.

(3) If the worker at or immediately before the date of the disablement was employed in a process or industry mentioned in the second column of Schedule B, and the disease contracted is the disease in the first column of the schedule set opposite to the description of the process, the disease is deemed to have been due to the nature of that employment unless the contrary is proved.

(4) [Repealed 2002-56-3.]

(4.1) The Board may, by regulation,

(a) add to or delete from Schedule B a disease that, in the opinion of the Board, is an occupational disease,

(b) add to or delete from Schedule B a process or an industry, and

(c) set terms, conditions and limitations for the purposes of paragraphs (a) and (b).

(4.2) Despite subsection (4.1), the Board may designate or recognize a disease as being a disease that is peculiar to or characteristic of a particular process, trade or occupation on the terms and conditions and with the limitations set by the Board.”

“(7) **"Silicosis"** means a fibrotic condition of the lungs caused by the inhalation of silica dust...”

“(10) When a worker has sustained pulmonary injury by a disabling form of pneumoconiosis as a result of exposure to dust conditions that are deemed by the Board to have contributed to the development of the disease in employment in the Province in an industry in which that disease is an occupational disease under this Part, the worker or the worker's dependants is or are entitled to compensation only if the worker was free from pneumoconiosis and tuberculosis before being first exposed to those dust conditions in the Province, and if the worker's residence and exposure to the dust conditions have been of the duration required to entitle a worker to compensation for silicosis under subsection (8), and the cost of compensation may be apportioned in the manner provided by subsection (9).

(11) Where a deceased worker was, at the date of his or her death, under the age of 70 years and suffering from an occupational disease of a type that impairs the capacity of function of the lungs, and where the death was caused by some ailment or impairment of the lungs or heart of non-traumatic origin, it must be conclusively presumed that the death resulted from the occupational disease.”

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This Act is current to March 25, 2020	
See the Tables of Legislative Changes for this Act's legislative history, including any changes not in force.	
WORKERS COMPENSATION ACT	
[RSBC 1996] CHAPTER 492	
<i>[Note: the dollar amounts shown in sections 3, 17, 18, 22, 29, 33 (5), 35, 73, 75, 77, 196, 196.1, 217 and 225 may not reflect the current consumer price index adjustments referred to in section 25.2, and the maximum wage rate shown in section 33 (10) may not be current. Current information may be found on the Workers' Compensation Board website at www.worksafebc.com/en/law-policy/claims-rehabilitation/claims-related-consumer-price-index or may be obtained by calling your WorkSafeBC regional office.]</i>	
Contents	
1 Definitions	
Part 1 – Compensation to Workers and Dependents	
Division 1 – Scope of this Part	
2 Application	
3 Extending application	
4 Fishing industry	
Division 2 – Compensation	
5 Compensation for personal injury	
5.1 Mental disorder	
6 Occupational disease	

Claims - WorkSafeBC

More info: Health & safety, Industry safety (Agriculture, Construction, Forestry, Health care, Manufacturing, Retail, Transportation); **Claims**. Revised Workers ...

View claim information

Health care providers can check the status of a client's claim ...

Report a workplace injury

Report a workplace injury or disease. When someone suffers ...

Contact someone in Claims

More info: Health & safety, Industry safety (Agriculture, Construction ...

[More results from worksafebc.com »](#)

How workers report

How workers report a workplace injury or disease. If you have a ...

Manage a claim

Create an online account to view information about your claim or ...

Determining eligibility

Determining eligibility. Once we receive reports from an injured ...

Report a workplace injury or disease

How workers report

How employers report ▶

How health care providers report

Reporting serious incidents and fatalities

Critical incident response

Claims in special circumstances ▶

How workers report a workplace injury or disease

If you have a work-related injury or disease, we want to help you as soon as possible. Be sure to seek medical attention and report your injury to your employer. If you miss work or seek medical attention, be sure to contact us. We'll need some information from you to start your claim for services and benefits.

How to report an injury

Teleclaim
(recommended if you've missed work)

1-888-WORKERS (1.888.967.5377)
See the [information you'll need to make your report](#).

With an account

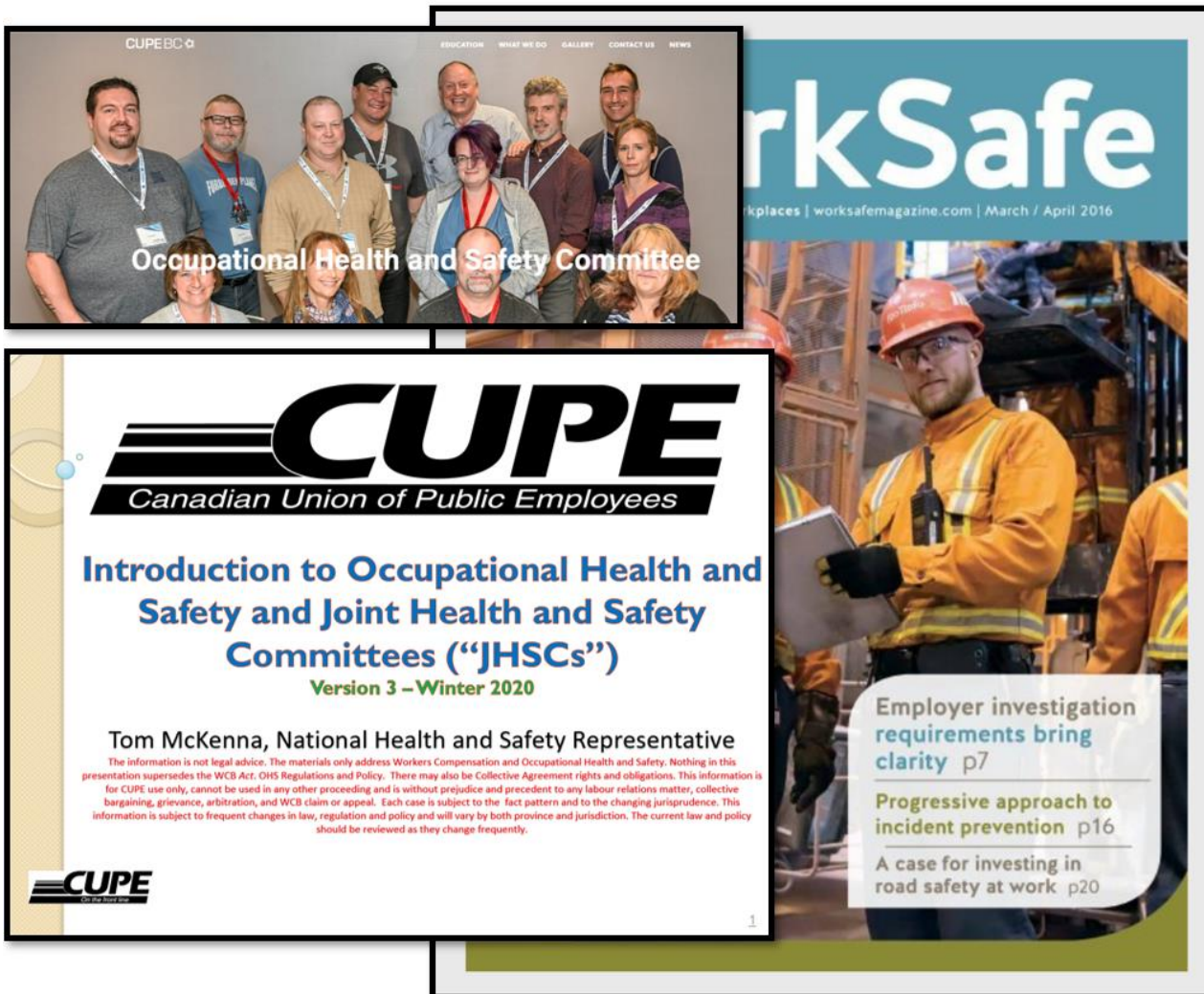
[Log on or create an account ▶](#)

Without an account

[Report without creating an account](#)

Form (fax or mail)

Use [Application for Compensation and Report of Injury or Occupational Disease \(Form 6\)](#)



I.IV.IV.OHS Regulations:

There are many different OHS Regulations and Guidelines that interpret the OHS Regulations. Sample OHS Regulations include the following:

See <https://www.worksafebc.com/en/health-safety/hazards-exposures/mould>

Note: there are frequent annual Policy, Regulation and Guidelines Consultations each year. The OHS Regulations may change.

- Right to Refuse Part 3.12
- General Conditions Part 4
- Emergency Preparedness and Response Part 4
- Indoor Air Quality Parts 4.70 to 4.80 (sample below per the OHS Regulations)
- Environmental Tobacco Smoke and E-Cigarette Vapour Part 4.80.1 to 4.83
- Chemical Agents and Biological Agents Part 5
- Containers and Storage Part 5
- Flammable and Combustible Substances Part 5
- Controlling Exposure Part 5
- Substance Specific Requirements Part 6

Note: for the following Exposure Control Plans there are many different substances. The following are examples only.

- Exposure Control Plan Part 6.3 – Asbestos
- Exposure Control Plan Part 6.34 – Biological Agents
- Exposure Control Plan Part 6.43 – Cytotoxic Drugs
- Risk Assessment Part 6.59.1
- Exposure Control Plan Part 6.60 – Lead
- Risk Assessment Part 6.112
- Exposure Control Plan Part 6.112.1 – Crystalline Silica and Rock Dust

- Risk Assessment – Part 6.118
- Exposure Control Plan Part 6.119 – Toxic Process Gases
- Table of Exposure Limits, Part 5.48
- Personal Protective Equipment Part 8
- WHMIS
- Guidelines Part 4 - Indoor air quality
- G4.79 Moulds and indoor air quality

INDOOR AIR QUALITY

- 4.70 Application
- 4.71 Submitting plans
- 4.72 Design and operation
- 4.73 Building modifications
- 4.74 Distribution
- 4.75 Balancing
- 4.76 Ventilation openings
- 4.77 Discharged air
- 4.78 Preventive maintenance
- 4.79 Investigation
- 4.80 Temperature and humidity

ENVIRONMENTAL TOBACCO SMOKE AND E-CIGARETTE VAPOUR

- 4.80.1 Definitions
- 4.81 Controlling exposure
- 4.82 Exceptions
- 4.83 Public entertainment facilities [Repealed]



Excerpts from 4.70 to 4.80:

“Indoor Air Quality

4.70 Application

Sections 4.71 to 4.80 apply to indoor or enclosed areas when occupied by workers,
Except

- (a) a controlled atmosphere enclosure,
- (b) a confined space, and
- (c) when clearly impracticable, such as during some construction or renovation projects.

4.71 Submitting plans

An employer or the employer's agent must submit to the Board drawings and specifications for an existing or proposed ventilation system when requested by the Board.

4.72 Design and operation

- (1) An employer must ensure that a ventilation system for the supply and distribution of air and removal of indoor air contaminants is designed, constructed and operated in accordance with
 - (a) established engineering principles, and
 - (b) *ASHRAE Standard 62-1989, Ventilation for Acceptable Indoor Air Quality.*
- (2) An adequate supply of outdoor air must be provided to the workplace in accordance with Table 2 of *ASHRAE Standard 62-1989.*

(3) For a building ventilation system installed prior to 1989, an adequate supply of outdoor air must be provided in accordance with the ASHRAE standard in place at the time the ventilation system was designed.

[Amended by B.C. Reg. 312/2003 effective October 29, 2003.]

* See also section [4.4](#) of the OHS Regulation.

Note: If workers occupying a building exhibit signs or report symptoms of illness the circumstances must be investigated as required by [Part 5 \(Chemical Agents and Biological Agents\)](#). If such signs or symptoms are attributed to an inadequate supply of outdoor air, the Board will, under subsection (3), consider a standard other than the ASHRAE standard in place at the time the ventilation system was designed where necessary to address the circumstances.

4.73 Building modifications

The owner of a building must permit an employer to install a ventilation system when required by this Part, provided that all such work is subject to the approval of the owner, acting reasonably.

4.74 Distribution

Outdoor air must be effectively distributed throughout the workplace.

4.75 Balancing

The ventilation system must be balanced to

- (a) ensure that each space within the building receives an adequate allotment of outdoor air, and
- (b) accommodate the actual or the normally anticipated occupancy of each space.

4.76 Ventilation openings

- (1) A ventilation system must not be obstructed by material or equipment placed in front of the ventilation air intakes or discharge points.
- (2) Outdoor air intakes must be located so that outdoor air entering the ventilation system does not contain any contaminant in a concentration greater than normal outdoor ambient air in that locality.

4.77 Discharged air

A ventilation system that discharges air from the work area must be designed to minimize the likelihood of exposing any worker at a workplace, including an adjacent workplace

- (a) to an air contaminant in a concentration which exceeds either 10% of its applicable exposure limit in [Part 5 \(Chemical Agents and Biological Agents\)](#), or an acceptable ambient air quality standard established by an authority having jurisdiction over environmental air standards, whichever is greater, and
- (b) where practicable, to an objectionable odour.

4.78 Preventive maintenance

- (1) To maintain acceptable air quality, the employer, or if the employer is not responsible for maintenance of the ventilation system, the owner of the ventilation system must establish an effective preventive maintenance program for the ventilation system.
- (2) Preventive maintenance must include
 - (a) regular inspections
 - (i) of all critical components of the ventilation system, such as

dampers, fans, belts, baffles, ductwork, diffusers and control systems, and

(ii) for conditions which would promote the growth of micro-organisms, such as water leaks or stagnant water pools,

(b) correction of any deficiencies found during the inspections carried out under paragraph (a),

(c) repair or replacement of malfunctioning and consumable components, such as filters and belts, and the cleaning of air distribution systems, ducts and dampers when necessary to correct an indoor air quality deficiency,

(d) adequate treatment of open water systems associated with ventilation equipment such as cooling towers and humidifiers, to control biological growth, and

(e) maintenance of combustion sources, such as furnaces, space heaters and water heaters to assure proper burning and exhausting of waste gases so that recirculation of gases to the workplace will not occur.

4.79 Investigation

(1) The employer must ensure that the indoor air quality is investigated when

(a) complaints are reported,

(b) occupancy in the space changes substantially, or

(c) renovations involving significant changes to the ventilation system occur.

(2) An air quality investigation must include

(a) assessment of the ventilation rate, unless the indoor carbon dioxide

level is less than 650 ppm above ambient outdoor levels,

(b) inspection of the ventilation system as required in section 4.78(2),

(c) sampling for airborne contaminants suspected to be present in concentrations associated with the reported complaints, and

(d) a record of the complaint, the findings of the investigation, and any actions taken.

Note: In subsection (2)(a) carbon dioxide is considered a marker indicator of sufficient outdoor air, not as a toxic air contaminant for which the exposure limit established by [section 5.48](#) would apply. Normally, ambient levels are approximately 350 ppm, but may be higher in locations such as urban areas or during weather conditions such as inversions. Ambient levels may be assumed to be 350 ppm unless sampling establishes otherwise.”

There are also requirements for Exposure Control Plans. As per the British Columbia Municipal Safety Association:

“Employers are required under Section 5.54 of the Occupational Health and Safety Regulation (OHSR) to develop an exposure control plan (ECP) when workers are or may be exposed to airborne silica dust in excess of 50% of the exposure limit.

To assist occupational health and safety professionals with this task, WorkSafeBC has posted the following sample documents (in editable Microsoft Word format), which can be used to help create an employer’s ECP. Note that these sample documents are not sufficient to constitute an ECP; a WorkSafeBC occupational hygiene officer would have to make a determination as to whether or not a completed ECP meets the requirements of the OHSR.

Developing a Silica Exposure Control Plan WSBC developing a silica ECP.doc

The following Exposure Control Plans are from WorkSafeBC’s website.

Exposure Control Plans for:

- Carbon Monoxide ECP - Carbon Monoxide
- Cutting concrete WSBC - ECPCuttingConcrete.doc
- Chipping Concrete ECPChippingConcrete.doc
- Cutting Fibre Cement Board ECP fibre cement board.doc
- Cutting, Grinding and Polishing stone containing silica (quartz) ECP cutting, grinding, polishing quartz.doc

Work-Related Asthma

Two types:

Occupational asthma

Asthma caused by something in the workplace

Enzymes
(in detergents or laboratories) and moulds

Proteins from animals, plants, foods, insects, fish and shellfish

Wheat or other flour and enzyme exposures

Western red cedar dust

Isocyanates in spray paints, some glues, foundry moulds, polyurethane foam

15% Internationally, up to 15% of adult onset asthma may be related to the workplace.

Work-exacerbated asthma

Something in the workplace aggravates existing asthma

Perfumes

Dusts
(construction, grains)

Ozone
(some swimming pools, bottling plants, photocopiers)

Ammonia
(farming environments such as barns)

Fumes, vapours, smoke and gases
(metalworking fluids, paint fumes, cleaning chemicals)

Environment
(cold, heat and humidity)

What employers can do...

- Read and be aware of safety data sheet information about respiratory health effects.
- Replace substances with less harmful ones.
- Minimize exposure (ventilation, enclosures).
- Develop administrative controls (such as changing the job or tasks).
- Educate workers on proper handling, avoiding spills and good housekeeping practices.
- Provide personal protective equipment. This should be the last option.

If there is one worker with asthma symptoms, it may warrant a closer look at the air quality of the workplace and its ventilation controls.

Symptoms

Asthma is a respiratory disease
It creates a narrowing of the air passages that makes it difficult to breathe.

Tightness of the chest **Difficulty breathing** **Wheezing** **Coughing**

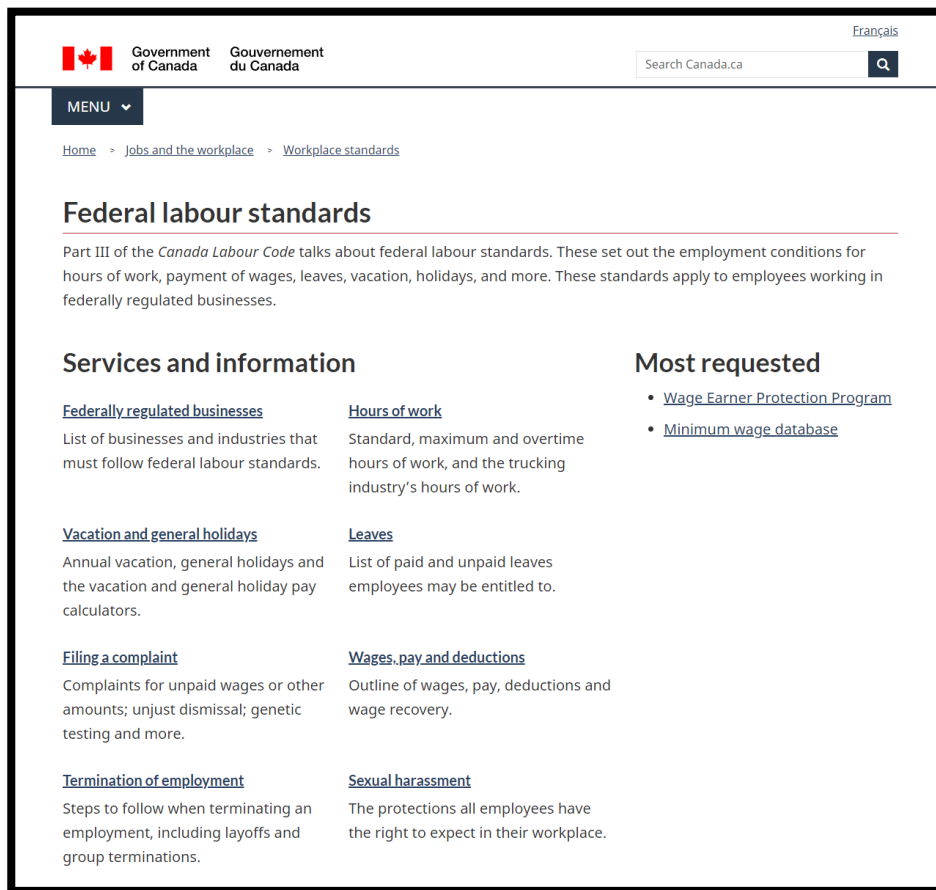
Symptoms are usually worse on work days and improve when away from the workplace.

Industries affected

- Cleaning and janitorial services • Bakeries • Healthcare • Manufacturing • Construction
- Agriculture • Automobile spray painting • Insulation and polyurethane work
- Fisheries and fish processing • Forestry

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Canadian Centre for Occupational Health and Safety



I.IV.V. Federal - Part II of the Canada Labour Code:

<https://www.canada.ca/en/employment-social-development/services/health-safety/reports/summary.html>

The preventive measures of the Code consist of the minimization and elimination of hazards and the provision of personal safety equipment, clothing, devices or materials, with the goal of ensuring the health and safety of workers.

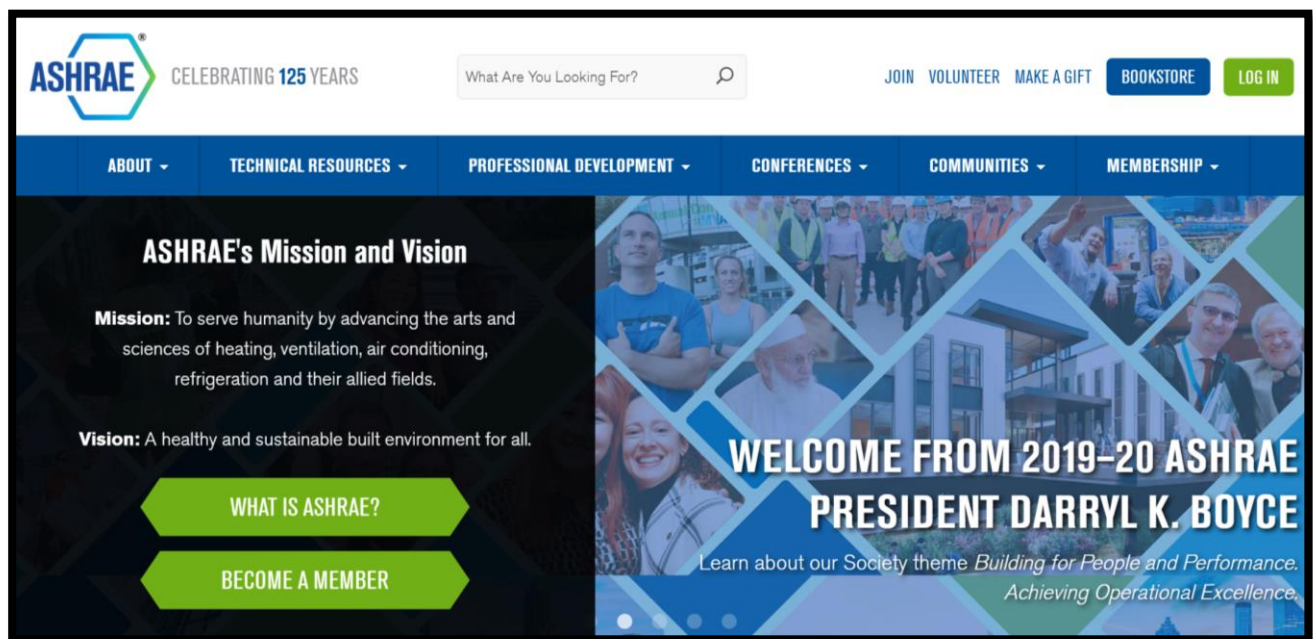
Part II covers:

- Duties of Employers and employees
- Duties and responsibilities of safety committees

- Duties and responsibilities of managers
- Analysis of potential job hazards
- Preventing violence
- Who is covered under the Code

Workers and areas covered by the Federal Code include:

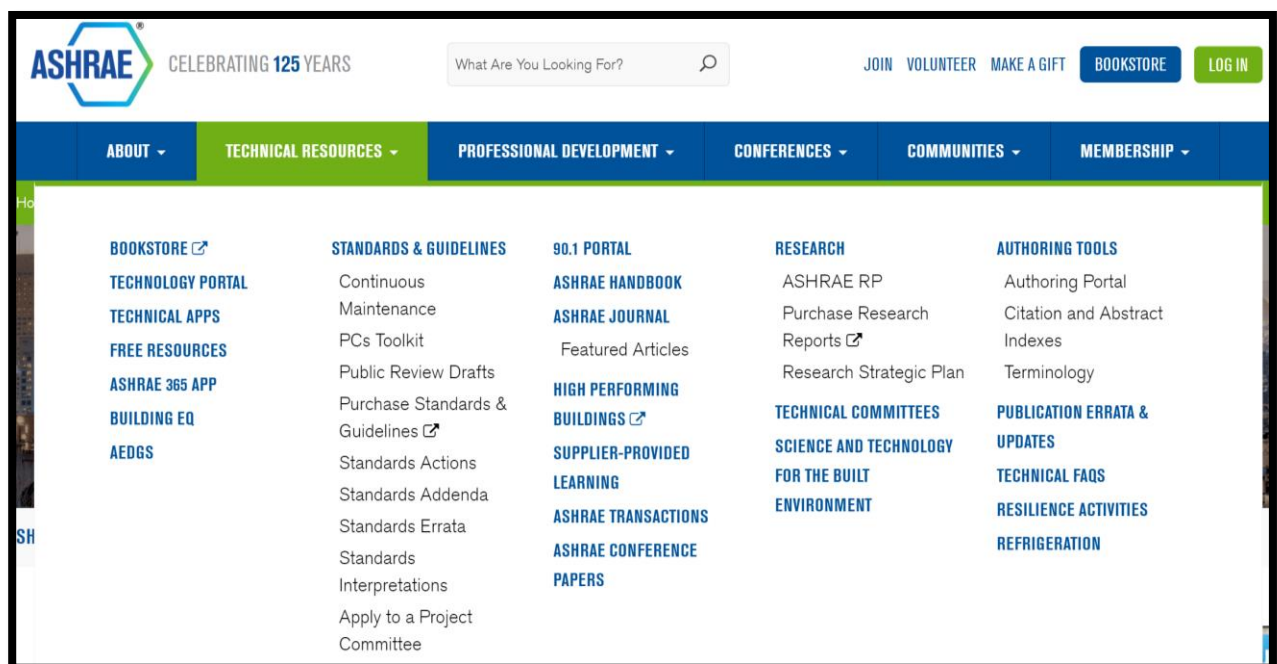
- Banks
- Marine shipping, ferry and port services
- Air transportation, including airports, aerodromes and airlines
- Railway and road transportation that involve crossing provincial or international borders
- Canals, pipelines, tunnels and bridges
- Telephone, telegraph and cable systems
- Radio and television broadcasting
- Grain elevators, feed and seed mills
- Uranium mining and processing
- Many First Nation activities
- Most federal crown corporations
- Private businesses necessary to the implementation of a federal act



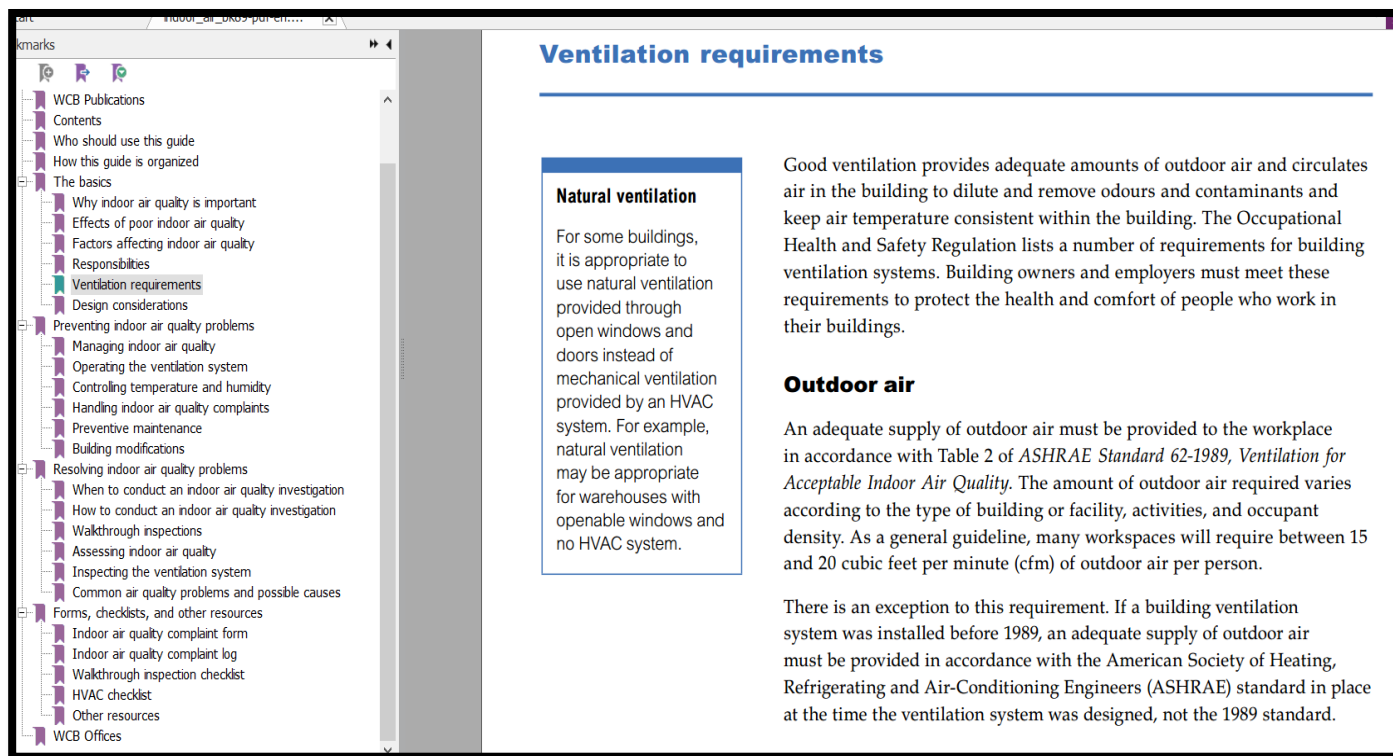
I.VI.VI. ASHRAE Standard 62-1989, CSA Group Standards, and CCOHS Information:

ASHRAE has a number of resources that may assist workers.

See <https://www.ashrae.org/>



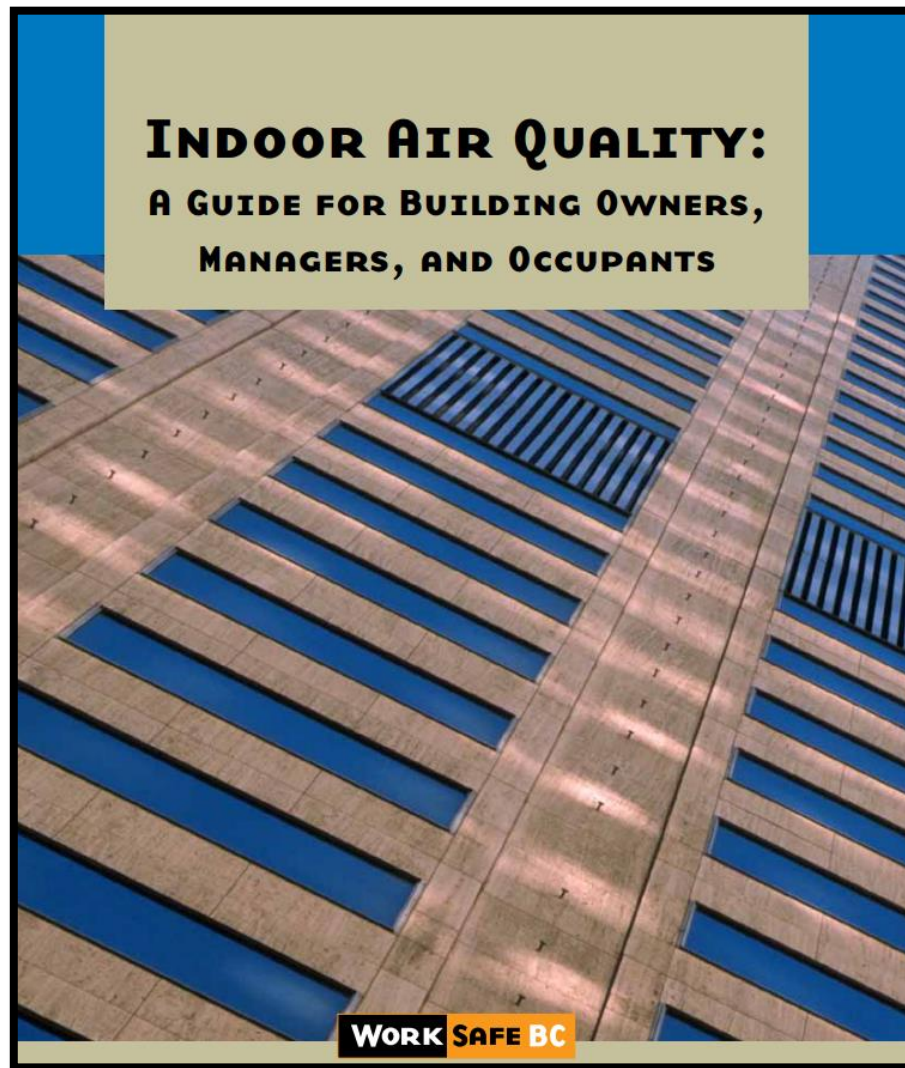
It is very important to ensure that any non-WorkSafeBC resources comply with provincial legislation (for non-Federally regulated workers such as airlines). WorkSafeBC has numerous resources as per the following screenshot:



Additional supplementary resources can be obtained from the Canadian Centre for Occupational Safety as per the following infographic:

See <https://www.ccohs.ca/topics/legislation/duediligence/>





**I.V. How to investigate both indoor and outdoor air quality problems.
Also see Appendices D, E and F:**

Here are some basic initial steps to address air quality issues (both indoor and outdoor):

- Is there an Exposure Control Plan as required by the WCB OHS Regulations?
- Investigate the ventilation system to make sure it is operating properly (e.g., the right mix of fresh air, proper distribution, filtration systems are working, etc.).
- Look for possible causes (e.g., source of a chemical, renovations, mould, etc).

- Contact the JHSC and request that an investigation occur. Is this a formal investigation as per Form 52E40, Section 4.79 etc or an information investigation?

See <https://www.worksafebc.com/en/resources/health-safety/forms/incident-investigation-report-form-52e40?lang=en> and <https://www.worksafebc.com/en/resources/health-safety/books-guides/indoor-air-quality-a-guide-for-building-owners-managers-and-occupants> Indoor Air Quality: A Guide for Building Owners, Managers, and Occupants.

- Conduct a survey of worker symptoms (see sample surveys in the Appendices as well as the CCOHS graphic above and included as a graphic).
- Conduct a survey to look for sources and causes (see sample surveys in the Appendices as well as the CCOHS graphic above and included as a graphic).
- If there are overlapping WCB Claims/Compensation and OHS/Prevention issues, see the CUPE (BC Region) OHS & WCB Claims Process Overview in the Appendices and graphic below.
- Consider help and/or air testing by a qualified professional.

OHS Regulation & Guidelines

OHS Regulations

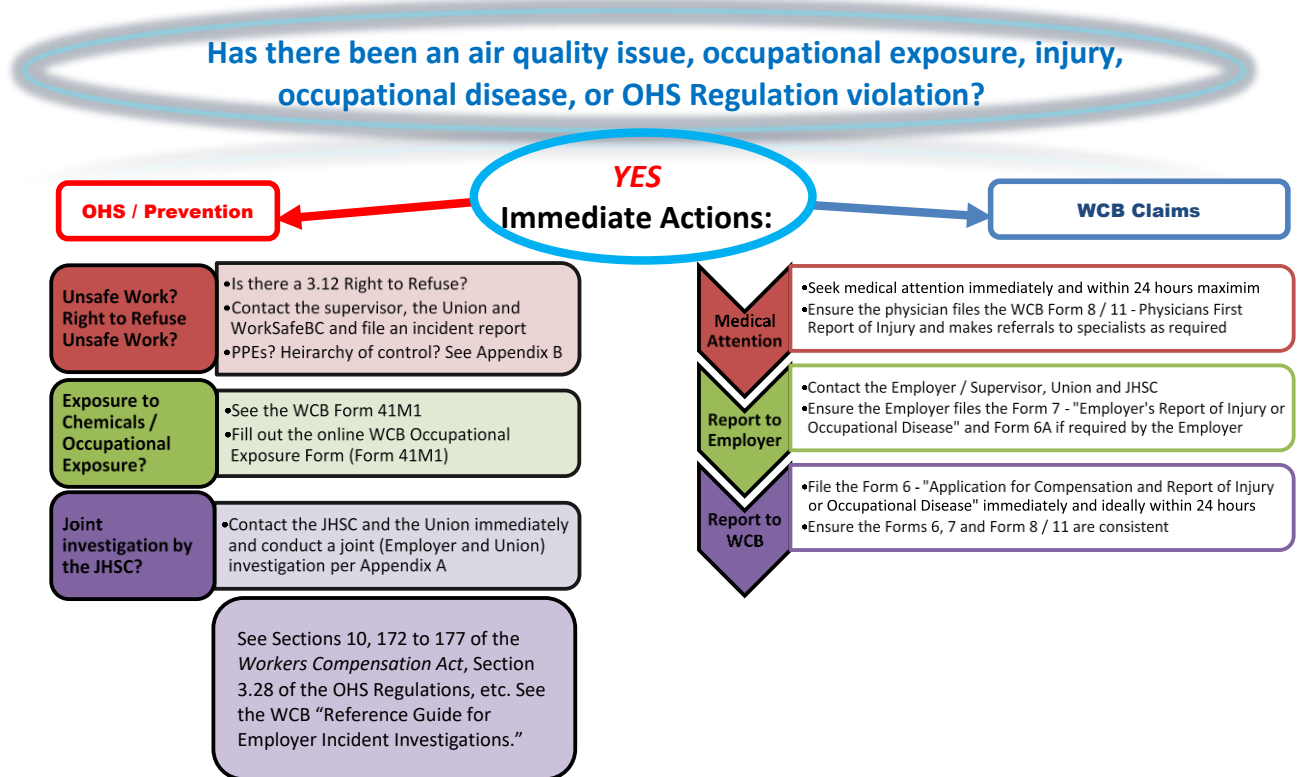
- Part 4 General Conditions - Indoor Air Quality
- Part 5 Chemical Agents and Biological Agents - Ventilation
- Part 5 Chemical Agents and Biological Agents

OHS Guidelines

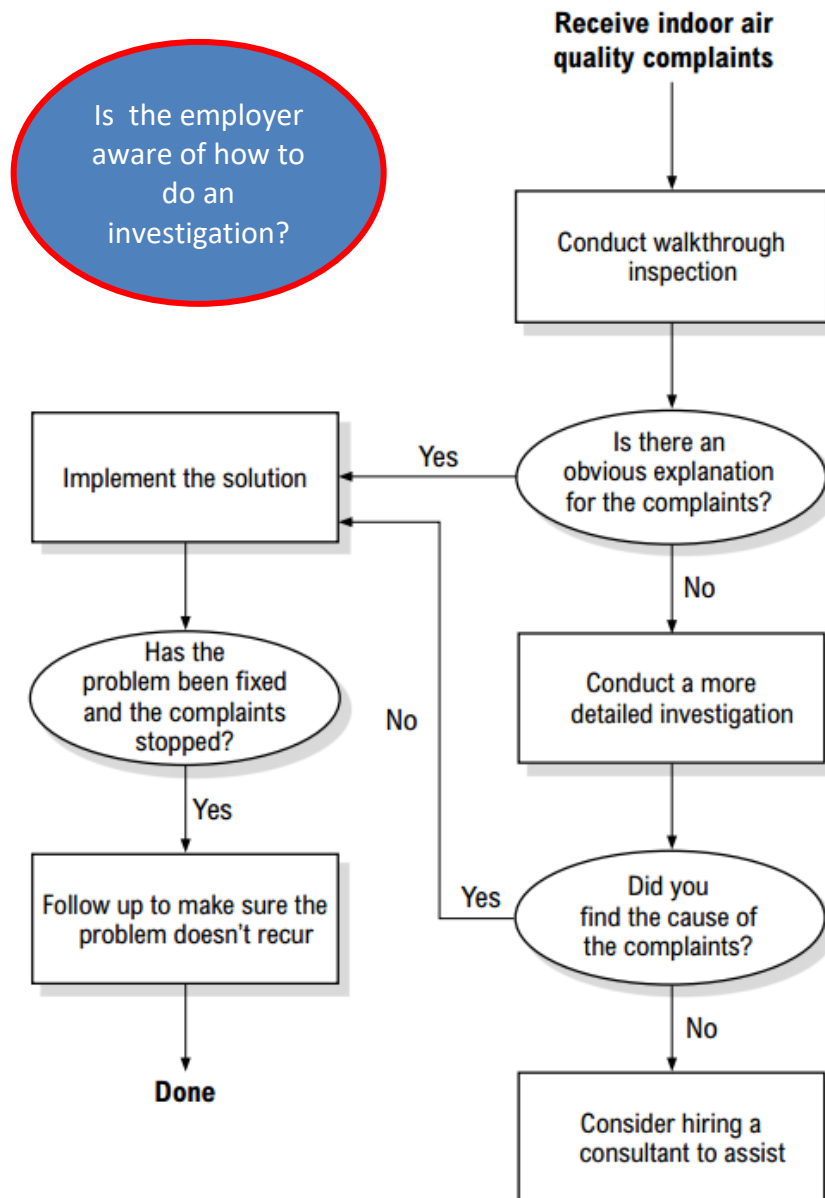
- Guidelines Part 4 General Conditions - Indoor Air Quality
- Guidelines Part 5 Chemical Agents and Biological Agents - Ventilation
- Guidelines Part 5 Chemical Agents and Biological Agents

AIR QUALITY OHS & WCB CLAIMS PROCESS OVERVIEW CHART

This Flow Chart is an overview of the basic steps for addressing **OHS Prevention** issues and for filing a **WorkSafeBC (WCB)** claim where there are air quality issues. Always refer to the most current online WCB Policy, Regulations, Practice Directives, Forms and *Workers Compensation* at the WorkSafeBC website. **Please refer to the main CUPE Guide "Air Quality Addressing Indoor and Outdoor Air Quality Occupational Health & Safety Issues and Filing WorkSafeBC Claims".**



The investigation process



It is important to ensure that the persons needed for an investigation are included. For example:

- The Union
- The JHSC
- The Employer
- The building owner if applicable
- The property manager if applicable
- Are there contractors or other Employers in the workplace?
- Are there other Unions in the workplace?
- The WCB Prevention Officer e.g. in cases such as Right to Refuse, etc.

Why? The process of addressing issues such as mould can be very complex as per the following sample Table.

See next page.

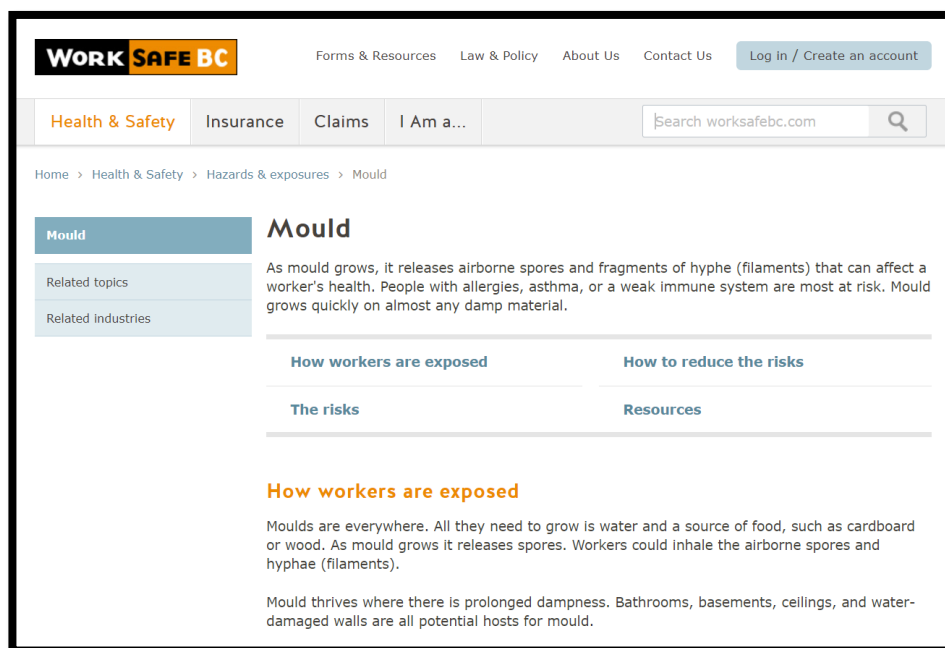
Sample Guide for Removing Visible Mould Growth in the Indoor Environment – Table 1

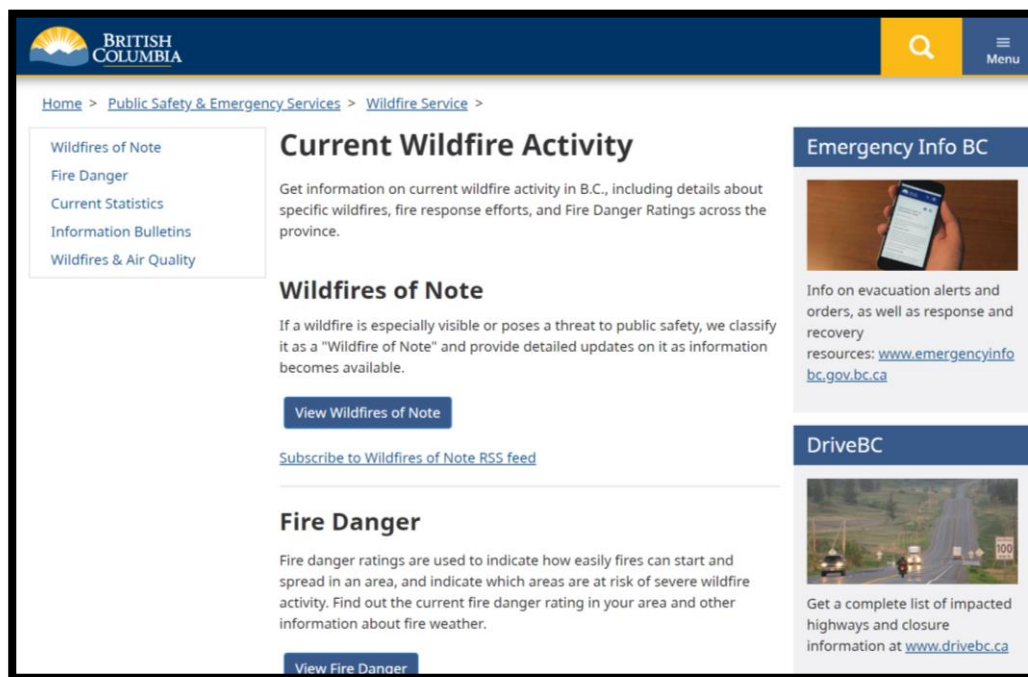
Extent of Visible and Hidden Mould Growth (surface area)	Minimum Recommended PPE ¹	Control Measures to Prevent Dust or Spore Dispersion ²
<p>Small</p> <p>Total surface area affected is less than 1 square metre (10 square feet)</p>	<p>N95 respirator or half facepiece respirator with HEPA filters, gloves, and goggles.</p>	<p>Isolation of the work area; wet wiping or misting of surfaces with water containing a surfactant (wetting agent); and the use of drop sheets to prevent dispersion of dust and spores. Material is removed with minimum of dust and spore dispersal and placed in a plastic bag and sealed.</p>
<p>Medium</p> <p>Total surface area affected is between 1 square metre and 10 square metres (10 square feet to 100 square feet)</p>	<p>N95 respirator or half facepiece respirator with HEPA filters, gloves, disposable coveralls, and goggles.</p>	<p>Limited containment: use polyethylene sheeting ceiling to floor around the affected area with a slit entry and covering flap. Maintain area under negative pressure with HEPA filtered negative air unit. Block supply and return air vents within the containment area.</p>
<p>Large</p> <p>Total surface area is greater than 10 square metres (100 square feet) or the potential for increased occupant or remediator exposure during remediation is estimated to be significant.</p>	<p>Full facepiece or powered air purifying respirator (PAPR) with HEPA filters, gloves, disposable coveralls (covering head and boots), and goggles.</p>	<p>Full containment: use of critical barriers. Maintain area under negative pressure with HEPA filtered fan unit exhausted outside the building. Block supply and return air vents within the containment area. Provide facilities and procedures for decontamination and personal hygiene.</p>

¹ Higher levels of respiratory protection should be considered for situations where the "Extent of Visible and Hidden Mould Growth" is categorized as "Small" or "Medium."

For example, full face piece powered air-purifying respirators (PAPRs) with High Efficiency Particulate Arrestor (HEPA) filter cartridges will afford protection to the eyes not available with half-facepiece respirators. As well, in situations where large numbers of spores are released and the area is not well ventilated, a higher level of respiratory protection should be selected and used. For outdoor remediation projects where mould infestation has not breached the inner vapour barrier, the guidelines in Table 1 apply without the requirement for containment when there is good natural ventilation to the outdoors. Note that for situations where the "Extent of Visible and Hidden Mould Growth" is categorized as "Large", openings and intakes into a building should be effectively sealed to prevent mould contamination from remediation activities entering the building. By using the "Extent of Visible and Hidden Mould Growth" criterion, the appropriate Personal Protective Equipment (PPE) for outdoor remediation work can still be determined.

² A health and safety professional with training and experience in conducting mould investigations and developing safe work procedures should be consulted where the "Extent of Visible and Hidden Mould Growth" is classified as "Medium" or "Large." Remediation of mould contamination should be conducted by trained remediation personnel.





II. Outdoor Air Quality:

Air quality is affected by the types and amount of pollutants released into the air, weather conditions like wind speed, precipitation (rain and snow), forest fires, topography, humidity and temperature. The Forest Fire Season in BC usually occurs from late April, early May to the end of September. This may fluctuate from year to year, and it is changing due to climate change.

Mike Flannigan of the University of Alberta stated that “The warmer it is the longer the fire season” and “The warmer it is the more lightning you see”. He stated that for every degree in warming, the number of lightning strikes goes up by about 12% with lightning causing more than 50% of forest fires in Canada. The number and severity of forest fires across Canada is increasing.⁵ This affects both indoor and outdoor workers over multiple health domains. As per the Climate Atlas of Canada:⁶

“the Canadian Forest Service analyzed the findings of almost 50 international studies on climate change and fire risk.

⁵ Wang, X., Parisien, M.A., Taylor, S.W., Candau, J.N., Stralberg, D., Marshall, G. A., Little, J.M., & Flannigan, M.D. (2017). Projected changes in daily fire spread across Canada over the next century. *Environmental Research Letters*, 12(2), 025005. Retrieved February 18, 2020 from <https://doi.org/10.1088/1748-9326/aa5835>

⁶ The Climate Atlas of Canada. Retrieved February 18, 2020 from <https://climateatlas.ca/forest-fires-and-climate-change>

They found that our future looks ‘smoky’ because climate change will worsen the three major factors that influence wildfire: having dry fuel to burn, frequent lightning strikes that start fires, and dry, windy weather that fans the flames. Another recent study by Flannigan and several other scientists predicts that western Canada will see a 50% increase in the number of dry, windy days that let fires start and spread, whereas eastern Canada will see an even more dramatic 200% to 300% increase in this kind of “fire weather.” Other studies predict that fires could burn twice as much average area per year in Canada by the end of the century as has burned in the recent past.”

And as per Climate Atlas of Canada (continued):

“Climate change can also promote forest fires in less direct ways. In BC and Alberta, warming temperatures are enabling the dramatic spread of the mountain pine beetle, which has affected more than 180,000 square kilometres of forest (an area larger than all of Greece). These beetles kill their host trees, and have created vast swaths of standing deadwood which are now huge reservoirs of wildfire fuel. The pine beetle is only one of many damaging forest pests that are likely to spread thanks to warmer winters caused by climate change.”⁷

As per Wang et al. (2017):⁸

“Our results suggest that climate change over the next century may have significant impacts on fire spread days in almost all parts of Canada's forested landmass; the number of fire spread days could experience a 2-to-3-fold increase under a high CO₂ forcing scenario in eastern Canada, and a more than 50% increase in western Canada, where the fire potential is already high.

Our results also indicate an increase in the frequency of seasons with a large number of spread days (more extreme extremes); further exploration of the influence of extreme events constitutes a future research question of great interest.”

⁷ The Climate Atlas of Canada. Retrieved February 18, 2020 from <https://climateatlas.ca/forest-fires-and-climate-change>

⁸ Wang, X., Parisien, M.A., Taylor, S.W., Candau, J.N., Stralberg, D., Marshall, G. A., Little, J.M., & Flannigan, M.D. (2017). Projected changes in daily fire spread across Canada over the next century. *Environmental Research Letters*, 12(2), 025005. Retrieved February 18, 2020 from <https://doi.org/10.1088/1748-9326/aa5835>

Forest fires are becoming a much greater air quality concern in BC. A state of emergency was declared in both 2017 and 2018 when there were two record setting years for forest fires.

Mia Rabson, Global News January 07, 2020 stated that “Climate change driving up the risk of wildfires in Canada: fore experts, in 2017, 1.22 million hectares were burned in BC. In 2018, 1.35 million hectares were burned.

This is significant for persons with pre-existing conditions and during pandemics. As per Dr. Michael Metha, professor at Thompson Rivers University, in communities with higher air pollution, the mortality rate doubled for diseases such as SARS.

The BC Ministry of Environment and Climate Change Strategy stated on March 26, 2020 that “Deterioration in air quality may lead to more COVID-19 infections overall”.

Station	Maximum AQHI Forecast*			
	Current	Today	Tonight	Tomorrow
Castlegar Aug. 22, 2018, 09:00am PDT	VERY HIGH 10+	VERY HIGH 10+	VERY HIGH 10+	HIGH 8
Comox Valley Aug. 22, 2018, 09:00am PDT	HIGH 10	VERY HIGH 10+	VERY HIGH 10+	MODERATE 5
Duncan Aug. 22, 2018, 09:00am PDT	HIGH 7	VERY HIGH 10+	VERY HIGH 10+	MODERATE 5
Fort St. John Aug. 22, 2018, 09:00am PDT	VERY HIGH 10+	VERY HIGH 10+	VERY HIGH 10+	VERY HIGH 10+
Fraser Valley (Central) Aug. 22, 2018, 08:00am PDT	HIGH 9	VERY HIGH 10+	VERY HIGH 10+	HIGH 7
Fraser Valley (Eastern) Aug. 22, 2018, 08:00am PDT	VERY HIGH 10+	VERY HIGH 10+	HIGH 10	HIGH 8
Kamloops Aug. 22, 2018, 09:00am PDT	MODERATE 4	MODERATE 6	HIGH 9	VERY HIGH 10+
Metro Vancouver (North East) Aug. 22, 2018, 08:00am PDT	HIGH 8	VERY HIGH 10+	HIGH 10	MODERATE 5
Metro Vancouver (North West) Aug. 22, 2018, 08:00am PDT	MODERATE 5	VERY HIGH 10+	HIGH 10	MODERATE 5
Metro Vancouver (South East) Aug. 22, 2018, 08:00am PDT	HIGH 10	VERY HIGH 10+	HIGH 10	MODERATE 5
Metro Vancouver (South West) Aug. 22, 2018, 08:00am PDT	VERY HIGH 10+	VERY HIGH 10+	HIGH 10	MODERATE 5
Nanaimo / Parksville Aug. 22, 2018, 09:00am PDT	VERY HIGH 10+	VERY HIGH 10+	VERY HIGH 10+	HIGH 7
Okanagan (Central) Aug. 22, 2018, 09:00am PDT	MODERATE 5	VERY HIGH 10+	VERY HIGH 10+	HIGH 7
Okanagan (North) Aug. 22, 2018, 09:00am PDT	MODERATE 6	VERY HIGH 10+	VERY HIGH 10+	HIGH 7