BC Athletics Extreme Environmental Conditions
Guidelines for Training and Competition

This guideline has been created by BC Athletics to assist Meet Directors and Technical Officials to make a suitable choice when the Field of Play is affected by extreme environmental conditions, such as ***air quality, heat, or thunder and lightening.***

SECTION 1: AIR QUALITY

LOW VISIBILITY

- Low visibility is generally caused by fog/mist or darkness.
- Track & field, running and throwing events, should not start until the entire field of play and the track is visible.
- Road and cross country running, should not be started until visibility is more than 100m.

AIR QUALITY HEALTH INDEX

Overview

The Air Quality Health Index (AQHI) is normalized across Canada and gives a number from 1 to 10+ to demonstrate the degree of wellbeing hazard related with nearby air quality. Infrequently, when the measure of air contamination is unusually high, the number may surpass 10. The AQHI provides a local air quality current value as well as a local air quality maximum forecast for today, tonight and tomorrow and provides associated health advice.

Low degrees of air contamination can trigger inconvenience for some people, the index has been created as a continuum: The higher the number, the more prominent the wellbeing danger and need to take safeguards. The index depicts the degree of wellbeing hazard related with this number as 'low', 'moderate', 'high' or ‘very high', and proposes steps that can be undertaken to decrease exposure.

Health Risk	Air Quality Health Index	Health Messages for At-Risk Population	Health messages for General Population
Low	1-3	Enjoy your usual outdoor activities.	Ideal air quality for outdoor activities
Moderate	4-6	Consider reducing or rescheduling hard activities outdoors if you are experiencing symptoms.	No need to change usual outdoor activities unless you experience symptoms such as coughing and throat irritation.
High	7-10	Reduce or reschedule hard activities outdoors. Children and the elderly should also take it easy.	Consider reducing or rescheduling hard activities outdoors if you experience symptoms such as coughing and throat irritation.
Very high	Above 10	Avoid hard activities outdoors. Children and the elderly should also avoid outdoor physical exertion.	Reduce or reschedule hard activities outdoors, especially if you experience symptoms such as coughing and throat irritation.

FOREST FIRE SMOKE

Particulates are the primary concern in forest fire smoke. The size of the particles we inhale influences their capability to affect our wellbeing.

Particle contamination may contain substances like carbon, sulfur and nitrogen compounds, metals and organic chemicals. The AQHI computation utilizes coarse particles in the scope of 2.5-10 microns in diameter. Fine particles, with measurements under 2.5 microns are regularly connected to wellbeing effects. Particles in this size range are delayed clearing from lungs when they are inhaled.

Particles from smoke in general are minuscule, with a size range close to the frequency of visible light (0.4 to 0.7 microns). At this size range, smoke particles proficiently dissipate light and make it hard to see and can be breathed into the lungs. This is the reason the smoke conceived fire related particles are a more prominent worry than bigger particles.

Risk Assessment of Smoke Conditions

Not all zones have persistent authority checking for AQHI or, Race Directors and Technical Officials might not have accessible admittance to official observing station information, so a method of building up particulate levels noticeable all around has been created by NOAA. A visibility index gives a speedy, elective approach to estimate smoke levels.

Appropriate Message and Actions Based on The Air Quality Category

Air Quality Category	Visibility in KM	Message	Actions for Events
Good AQHI 1-3	15 kms and up	Ideal air quality for outdoor activities	Ideal conditions for an event
Moderate / Unhealthy for Sensitive Groups AQHI 4 - 6	5 - 14kms	Be aware of health effects of smoke and related symptoms	Be aware of health effects of smoke and related symptoms
Unhealthy AQHI 7 - 8	2.5 - 4kms	Reduce or re-schedule strenuous activities, especially if you experience symptoms	Consider reduction of length of events and / or cancellation of junior events. Provide warning to competitors with respiratory issues e.g. Asthma
Very Unhealthy AQHI 9 - 10	1.5 - 2kms	Avoid prolonged strenuous activities and stay indoors if possible	Consider reduction in length of events. Cancel or postpone event. Cancel Junior Events.
HAZARDOUS AQHI 10+	< 1.0km	Avoid all strenuous activities and stay indoors	Cancel all events and outdoor training

SECTION 2: INCLEMENT WEATHER

THUNDER & LIGHTENING

It is important to plan for a safe lightening shelter and evacuation method when thunder and lightening is a possibility. A safe area for thunder and lightening includes metal vehicles with windows closed and buildings. During an event of lightening, avoid outdoor metals such as flagpoles, fences, gates, light poles, metal bleachers etc.

When there is thunder, it means lightening is about to hit (usually 6-8 miles away). Suspend training and competition immediately and direct participants to a safe spot to avoid lightening. If there has been lightening, wait at least 30 minutes from the last struck of thunder and lightening before resuming outdoor activities.

SECTION 3: HEAT CONSIDERATIONS

EXTREME HEAT TEMPERATURES

The heat index is the perceived temperature equivalent of air temperature, relative humidity and wind speed. It is important to monitor both temperature and relative humidity to ensure safety for participants. Health and safety considerations should be made for the following temperatures once the relative humidity exceeds **40%.** **In extreme temperatures, it is important to have a first aid attendant on site who is familiar with the signs and symptoms of heat exhaustion or heat stroke.**

Children are more susceptible to dehydration and heat exhaustion, so it is important to encourage regular water breaks in shaded areas when the heat index rises above 27*C and 40% humidity.

Heat Index	Athletic Activity Guidelines
Less than 27*C	• Unlimited activity with standard rest and water breaks every 30 minutes throughout the duration of the activity. • For prolonged activity, encourage time in the shade when possible.
27-32*C (CAUTION)	• Fatigue possible with prolonged exposure and activity. • Closely monitor new or unconditioned athletes during extreme exertion. • Schedule mandatory rest and water breaks every 25 minutes. • Have cold water accessible to all participants and areas of shade provided throughout the facility. • Schedule longer endurance events either in the early morning and late evening.
32-41*C (EXTREME CAUTION)	• Extreme caution: heat cramps and heat exhaustion are possible. Prolonged exposure could result in heat stroke. • Monitor participants for signs of heat exhaustion or heat stroke. • New or unconditioned athletes should not practice or compete. Well conditioned athlete

	should have more frequent rest and hydration, scheduled every 20 minutes. • Have cold water accessible to all participants and areas of shade provided throughout the facility. • Officials should have access to shaded areas and should work shorter officiating shifts. • Schedule longer endurance events either in the early morning and late evening.
41-54*C (DANGER)	• Heat cramps and heat exhaustion are likely, heat stroke is probable with continued activity. Proceed with extreme caution. • Training and competitions blocks should be kept short with frequent rest and water breaks, scheduled every 15 minutes. • Have cold water accessible to all participants and areas of shade provided throughout the facility. • Consider having cold tubs available. • Officials should have access to shaded areas when officiating, and should work shorter shifts to avoid prolonged exposure to the heat. • Schedule longer endurance events either in the early morning and late evening.
Over 54*C (EXTREME DANGER)	• SUSPEND TRAINING AND COMPETITION

REFERENCES

http://lightningsafety.com/nlsi_pls/ncaa.html

http://www.phsa.ca/search?k=smoke

Heat Guidelines.pdf (nchsaa.org)

https://www.calculator.net/heat-index-calculator.html