



AIR QUALITY POLICY FOR ORIENTEERING EVENTS

2025

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1.0 REASON FOR THIS POLICY

When air quality is compromised by contaminants in the air a person's health can be adversely affected. Smoke from forest fires and emissions from other sources can have a profound impact on air quality.

The Alberta Orienteering Association (AOA) recognizes the potential short- and long-term health effects of engaging in physical activity outdoors when the air quality is poor. The AOA is fully committed to reducing the risk posed to orienteers from poor air quality.

2.0 PURPOSE AND SCOPE

The purpose of this policy is to provide Alberta orienteering officials (coaches and event organizers) with guidelines that aim to reduce the health-related risk of poor air quality on people attending, helping at, and organizing orienteering events in Alberta.

3.0 SUMMARY OF THE POLICY

Due to the increasing frequency of poor air quality from forest fires, the AOA has developed a policy regarding orienteering during smoke incidents.

3.1 Decision making for orienteering events (C , B , and Canada Cup)

- Decisions related to air quality will be made at the event site, at the start time of the event.
- If possible AQI PM_{2.5} will be measured at the event site using portable monitors.
- Decision makers should also consider real time air quality data. Two examples of on-line resources are:
 - [IQAir air quality map](#)
 - [The World Air Quality Index Project: maps and more](#)
- If AQI PM_{2.5} at the event site is greater than 200 the event will be modified to remove all competitive elements, or if air quality shows an improving trend the start may be delayed provided the event can be completed during daylight.
- If AQI PM_{2.5} at the event site is greater than 300 the event will be cancelled, or if air quality shows an improving trend the start may be delayed provided the event can be completed during daylight.
- If, during an event, the AQI PM_{2.5} goes above 300, no further starts will be allowed. As well, any competitor observed, who is still on the course (e.g. passing through an arena), will be told that due to the extremely hazardous air quality, the event is now cancelled, and that they should report to the download station at the finish area. No results will be published.
- Events may also be cancelled, or postponed if poor air quality prevents organizers from setting up the event. In this case, notification must be posted on all relevant websites as soon as possible.
- For Canada Cup events cancellation or postponement decisions will be made by at least two of the following major officials: event director, controller, event advisor, jury member, course planner.
- For Canada Cup events where participants may have travelled long distances to the event, contingency plans may include rescheduling, or possibly alternate venues for the event.
- For local B and C events, the air quality decisions will be made by one, but preferably two, event officials.

- When poor air quality conditions seem likely, local event (C and B) organizers are encouraged to include possible rescheduling in their contingency planning.

3.2 Decision making for training events and youth programs

The program director or coach will follow the Coaching Association of Canada recommendations that at AQI PM_{2.5} greater than 200 the exercise must be either moved indoors, rescheduled, or cancelled.

4.0 BACKGROUND ON AIR QUALITY IMPACTS ON OUTDOOR SPORTS

4.1 Understanding air quality measurements

The **Air Quality Health Index (AQHI)** is a scale used to measure air quality and its associated health risks. It is important for athletes and event organizers to understand and monitor the AQHI wherever data is available (mostly in urban centers).

The **Air Quality Index AQI - PM_{2.5}** (US EPA air quality index for particulate matter less than 2.5 μ) can be used to monitor wildfire smoke impact. These data are easily obtainable at an orienteering event location and help to assess local conditions at the time of the competition.

- **AQHI values** range from 1 (low risk) to 10+ (very high risk). The AQHI is calculated from measured concentrations of nitrogen dioxide, ground-level ozone, and particulate matter less than 2.5 μ (PM_{2.5})
- **AQI PM_{2.5}** (fine particulate matter) measurements can be used when AQHI is not available. Values range from 0 (low risk) to 301+ (very high risk). We will rely on AQI PM_{2.5} for orienteering forest events because AQHI is often not readily available close to our events. Devices that determine AQI PM_{2.5} are reasonably priced and reasonably accurate.
- There are many resources from which one can learn about air quality, the air quality health index (AQHI), AQI PM_{2.5}, and poor air quality as it impacts outdoor sports. Educational links can be found on the AOA website and Appendix A.

The following table is commonly used to describe the AQHI and AQI PM_{2.5}, and states what people should do given a specific value. The most important thing to remember from an orienteering official's perspective is that, according to Health Canada, **anyone participating in an outdoor sport is considered to be part of the at-risk population.**

Air quality can change rapidly and the AQHI (or AQI PM_{2.5}, whichever is being used) can also be quite different depending on one's location – even adjoining neighborhoods can have differing values. This makes it difficult to determine “rules” regarding the management of orienteering events, and so in this policy, some discretion is being given to the orienteering officials in charge of an event.

Health Risk	Air Quality Index PM _{2.5}	Air Quality Health Index	Health Message	
			At-Risk Population	General Population
Low Risk	0-50	1 – 3	Enjoy your usual outdoor activities.	Ideal air quality for outdoor activities.
Moderate Risk	51-200	4 – 6	Consider reducing or rescheduling strenuous activities outdoors if you are experiencing symptoms.	No need to modify your usual outdoor activities unless you experience symptoms such as coughing and throat irritation.
High Risk	201-300	7 – 10	Reduce or reschedule strenuous activities outdoors. Children and the elderly should also take it easy.	Consider reducing or rescheduling strenuous activities outdoors if you experience symptoms such as coughing and throat irritation.
Very High Risk	301+	10+ <i>means that the AQHI reading is greater than 10.</i>	Avoid strenuous activities outdoors. Children and the elderly should also avoid outdoor physical exertion.	Reduce or reschedule strenuous activities outdoors, especially if you experience symptoms such as coughing and throat irritation.

5.0 RECOMMENDATIONS FOR ORIENTEERING EVENTS WITH REGARD TO AIR QUALITY

5.1 Factors that affect decisions regarding the impact of air quality on an orienteering event

- The type of event:
 - Training
 - Competition (C-, B-, or Canada Cup event)
 - Intensity of competition (e.g. sprint vs. long, or competitive vs. recreational);
- Ability to determine the local AQHI: While the WeatherCAN app provides the AQHI for cities, towns, and villages, an orienteering B- or Canada Cup event is not often close to one of these centers. More often, an AQI PM_{2.5} value close to the site will be available.
- Duration of the event: An orienteering event often runs through a whole day (or more): placement of controls, vetting, the competition window, which can be at least four hours long, and subsequent take-down. During this time the AQHI/AQI PM_{2.5} could vary; some competitors could race during an AQHI <4, while others could experience an AQHI >7. Officials and volunteers are often present for the whole day. A consideration is that air quality can deteriorate rapidly, but usually only improves slowly.
- Pre-event day activities: Air quality can be bad before an event, including during the time organizers and volunteers would be, for example, putting out controls. This pre-event setup often happens one or more days before the event.

5.2 Recommendations

5.2.1 Overarching recommendations

1. Decisions regarding an orienteering event will be made based on the local AQI PM_{2.5} value at the start time of the event.

Our recommendation is that clubs in Alberta purchase a monitor, and measure the AQI PM_{2.5} at the event location. The local AQI PM_{2.5} value will be measured by the devices provided by the orienteering club or can be monitored from available local data.

Reasons for using local AQI PM_{2.5}:

- Concerns around orienteering event air quality mostly occur because of the potential for wildfire smoke impact, which can be estimated by AQI PM_{2.5}.
- AQI PM_{2.5} is a key indicator of air quality during wildfire smoke that can be easily measured at the event site.
- Better local accuracy: data from AQI PM_{2.5} measurements are often available closer to orienteering event sites and updated more often than AQHI, which typically is only reported for major urban centers.
- By using AQI PM_{2.5} values, orienteering event organizers can make more informed decisions based on local air quality conditions. However, AQHI values are still included in the policy as they are more familiar to the general public.

2. An orienteering event will be cancelled if the AQI PM_{2.5} is greater than 300.

If, during an event, the AQI PM_{2.5} goes above 300, no further starts will be allowed. As well, any competitor observed, who is still on the course (e.g. passing through an arena), will be told that due to the extremely hazardous air quality, the event is now cancelled, and that they should report to the download station at the finish area. No results will be published. Note that it is likely that the event was already modified (AQI PM_{2.5} was above 200; see below).

5.2.2 Recommendations for Training or Learn-to-Orienteer Events

Decisions regarding whether to modify or reschedule training or learning events will be based on the local AQI PM_{2.5} value, and will be made by the head coach or program leader. We recommend that the Coaching Association of Canada (CAC) /SIRC guidelines ([CAC/SIRC guidelines on air quality and outdoor sports](#)) be used.

US EPA AQI for PM _{2.5} ^a	Recommendation	AQHI value
0 - 50	Carry on as usual.	1 – 3
51-200	Reduce intensity and/or duration of the event; <ul style="list-style-type: none"> • The coach or leader should be aware of any pre-existing medical conditions of the participants; • Monitor all participants. 	4 – 6
201 or above	The exercise must be either moved indoors, rescheduled, or cancelled.	7 – 10+

^a This is a modification of the US EPA guideline. The full table of the US EPA AQI PM_{2.5} guideline is given in Appendix A.

5.2.3 [Recommendations for C Events](#)

The event organizer(s) will decide whether to modify or cancel a C-event based on the on-site AQI PM_{2.5} value, or closest available published AQI PM_{2.5} data at the start time of the event. As these are local club events, often held within the city, or a minimal distance away, the recommendations are:

US EPA AQI for PM _{2.5}	Recommendation	AQHI value
0 - 50	Carry on as usual.	1 – 3
51-200	At registration notify participants of AQHI value and advise caution.	4 – 6
201-300	At registration notify participants of AQHI value, advise caution, and notify that all competitive aspects of the event (e.g. club “points”) are removed.	7 – 10
300+	The event is cancelled.	10+

Clubs are advised to notify members of this policy at the start of the orienteering season, and provide links to AQI PM_{2.5} data sites so that participants can decide, for themselves, whether to travel to an event.

A possible option in the event of cancellation is to create a MapRun file and advise members they could run the course at their convenience.

5.2.4 [Recommendations for B- and Canada Cup-events](#)

For B- and Canada Cup events, a committee of at least two people (e.g. course planner, event director, controller, jury members) will decide on any changes to an orienteering event.

Decisions regarding the event will be made based on the on- or near-site measured AQI PM_{2.5} value at the start time of the event.

Ideally, the AQI PM_{2.5} value is determined for at least two or three locations on the event map.

Event organizers must notify potential participants of this policy in event notices and event web-sites, and provide links to nearby AQI PM_{2.5} data, so these potential participants can decide for themselves whether to travel to the event.

US EPA AQI for PM _{2.5}	Recommendation	AQHI value
0 - 50	Carry on as usual.	1 – 3
51-200	Notify participants of AQHI value and advise caution.	4 – 6
201-300	Notify participants of AQHI value, advise caution, and let all participants know that all competitive aspects of the event (e.g. posted results, medals) are removed.	7 – 10
300+	The event is cancelled.	10+

If the air quality has been improving (i.e. measurements recorded over a period of time are decreasing), the committee has the option to postpone starts, as long as competitors can still finish during daylight hours.

It is recommended that the host club also post information as to whether refunds will be offered if the event is re-scheduled or cancelled outright.

5.2.5 [Recommendations for Pre-Event Activities](#)

What to do in the day or two before an event, and on the morning of the event, when air quality is bad, is more problematic.

- A possible scenario is that the AQI PM_{2.5} is 200, or even 300 or more at the site leading up to an event, when volunteers would normally be putting out controls. **We recommend that event organizers be granted the authority to cancel an event if their volunteers do not have a window to safely put out controls.**
- When air quality is rated as very high risk (AQI PM_{2.5} greater than 300) early on the morning of an event, when volunteers would be doing set-up, some may be willing to carry on, wearing N95 or N99 masks, but others, understandably, may not be willing to even drive to the event site. We recommend that event organizers determine WELL ahead of time what to do in this case, and talk with their volunteers to determine what they would be willing to do, and adjust their plans accordingly.
- An event may be cancelled the day before. In this case, notification must be posted on all relevant websites as soon as possible.

6.0 GENERAL RECOMMENDATIONS WHEN ORGANIZING AN ORIENTEERING EVENT WHEN POOR AIR QUALITY IS POSSIBLE

Many of the following are common sense.

- An advisory must be placed on club and event-specific websites, and in other communications such as registration information, competitor newsletters, or information bulletins, that events could be cancelled, re-scheduled, or modified, in the event of poor air quality. Potential participants must be informed that the decision will be made at the event site, at the start time of the event. An event may be cancelled the day before. In this case, notification must be posted on all relevant websites as soon as possible.
- A link to AQI PM_{2.5} data from as close to the event site as possible must be provided, so potential **participants can make their own decision whether to travel to an event**, given the possibility of cancellation, or modification of the event. They should be informed that AQI PM_{2.5} of 200 or above at the event site means that there will be no publication of results or medals given, and when above 300, the event will be cancelled.
- Impacts on health of poor air quality must be posted to club and event-specific web sites (the AQHI/ AQI PM_{2.5} table should be posted, at a minimum).
- Course planners and other volunteers should modify their field work when the AQI PM_{2.5} is 200 or above: either go another time or wear a well-fitting mask that can block PM_{2.5} particles (e.g. N95 or N99 masks).

The bottom line is that orienteering officials should always keep the welfare of participants and volunteers in mind, and base their decisions accordingly.

7.0 PRACTICAL CONSIDERATION IN APPLYING THIS POLICY (LESSONS LEARNED)

- It is CRITICAL that organizers, club members, and event participants be told about the club policy regarding air quality. Things to emphasise:
 - Poor air quality is not just a temporary inconvenience, but can lead to long-term health impacts, including cancer;
 - Anyone, no matter how healthy, participating in outdoor sport is considered by Health Canada, to be in the “at risk” category;
 - That it will be up to the potential participant to decide whether to travel to an event, as based on this policy.
- A common issue that participants raised was that the air quality information they had (whatever the source) said the air was fine. Our recommendation to address this is for a club to purchase a monitor and measure the AQI PM_{2.5} at the event location, which value will determine the event status (good-to-go, modified, or cancelled).
- There will still be club members who will ignore any warnings, so at this point, as long as all efforts have been made to make them aware of the health risks, and organizers have applied the recommendations as described in section 5.2, organizers have done their best.

8.0 APPENDIX A

8.1 Air Quality Health Index (AQHI)

The AQHI is a scale used to measure air quality and its associated health risks. It is important for athletes and event organizers to understand and monitor the AQHI.

AQHI values range from 1 to 10+ (very high risk). The AQHI is calculated from measured concentrations of nitrogen dioxide, ground-level ozone, and particulate matter less than 2.5 μ .

8.2 How to monitor AQHI

- [Urban AQHI in Canada](#)
- Download the [WeatherCAN app](#) to your phone (provides the AQHI for urban areas)

8.3 How to monitor AQI PM_{2.5} - PM_{2.5} Measurement Data and Devices

- Use your own sensor, e.g. PurpleAir ([Portable Air Quality Monitor](#))
- There are many different sites that provide real time AQI PM_{2.5} data from sensors in an area. A few examples are:
 - [Purple Air Real Time Map](#)
 - [AQI Map Alberta](#)
 - [IQAir Alberta map](#)

8.4 Educational materials

- Alberta government website: [Alberta Gov: AQHI information](#)
- Health Canada, with the Sport Information Resource Centre (SIRC) [Health Canada/SIRC: Clearing the Air Around Air Quality and Outdoor Sport Safety](#)
- SIRC, Health Canada, and the Coaching Association of Canada (CAC) developed a free e-learning module: *Air Quality and Outdoor Sport Safety*: [CAC/SIRC: air quality learning module](#). Videos on this page provide excellent information on air quality and outdoor activities.
- Health Canada: [Health Canada: Air Quality and Health](#)
- The Environment and Climate Change Canada weather app 'WeatherCAN' has an AQHI section. The app is available for both Android and iOS smart phones; a user can set up alerts.
- The US EPA AQI categories for PM_{2.5} ([US EPA AQI for PM_{2.5}](#)) are given in the following table

Air Quality Index	Who Needs to be Concerned?	What Should I Do?
<p style="text-align: center;">Good (0-50)</p>		<p style="text-align: center;">It's a great day to be active outside.</p>
<p style="text-align: center;">Moderate (51-100)</p>	<p>Some people who may be unusually sensitive to particle pollution.</p>	<p>Unusually sensitive people: Consider making outdoor activities shorter and less intense. Watch for symptoms such as coughing or shortness of breath. These are signs to take it easier.</p> <p>Everyone else: It's a good day to be active outside.</p>
<p style="text-align: center;">Unhealthy for Sensitive Groups (101-150)</p>	<p>Sensitive groups include people with heart or lung disease, older adults, children and teenagers, pregnant people, minority populations, and outdoor workers.</p>	<p>Sensitive groups: Make outdoor activities shorter and less intense. It's OK to be active outdoors, but take more breaks. Watch for symptoms such as coughing or shortness of breath.</p> <p>People with asthma: Follow your asthma action plan and keep quick relief medicine handy.</p> <p>People with heart disease: Symptoms such as palpitations, shortness of breath, or unusual fatigue may indicate a serious problem. If you have any of these, contact your health care provider.</p>
<p style="text-align: center;">Unhealthy (151-200)</p>	<p>Everyone</p>	<p>Sensitive groups: Avoid long or intense outdoor activities. Consider rescheduling or moving activities indoors.*</p> <p>Everyone else: Reduce long or intense activities. Take more breaks during outdoor activities.</p>
<p style="text-align: center;">Very Unhealthy (201-300)</p>	<p>Everyone</p>	<p>Sensitive groups: Avoid all physical activity outdoors. Reschedule to a time when air quality is better or move activities indoors.*</p> <p>Everyone else: Avoid long or intense activities. Consider rescheduling or moving activities indoors.*</p>
<p style="text-align: center;">Hazardous (301-500)</p>	<p>Everyone</p>	<p>Everyone: Avoid all physical activity outdoors.</p> <p>Sensitive groups: Remain indoors and keep activity levels low. Follow tips for keeping particle levels low indoors.*</p>