



San José State University
Wildfire Smoke Event & Response Program

Background

Some of the largest wildfires in California State history have impacted many CSU campuses in recent years. On multiple occasions, wildfire smoke events have resulted in curtailed activities and/or campus closure at San José State University (SJSU). While there are many chemical compounds present in wildfire smoke, the principal harmful pollutant of concern for persons not in close proximity to the wildfire is fine particulate matter with a diameter of 2.5 micrometers or smaller, known as “PM2.5”. Airborne particle size is directly linked to the potential for causing health risks and microscopic PM2.5 pose the greatest risk because they penetrate deep into the lungs and can enter the bloodstream. Health effects include increased lung and systemic inflammation as well as acute and chronic cardiovascular and respiratory effects. Epidemiological studies have shown wildfire smoke exacerbates asthma and chronic obstructive pulmonary disease in persons with pre-existing medical conditions.

Purpose

The goal of this program is to outline a clear and consistent methodology for campus decision-making when air quality conditions deteriorate during a wildfire smoke event. This program will demonstrate the criteria to be utilized when determining when to curtail campus operations, cancel classes and/or athletic activities or when to close campus to all but essential operations.

Regulatory Requirements

As a direct result of the 2018 catastrophic wildfires in California, the California Occupational Safety & Health (Cal/OSHA) Standards Board adopted a new emergency rule to address the potential harm posed to outdoor workers exposed to wildfire smoke (Section 5141.1).

In July 2019, Cal/OSHA issued new regulatory Section 5141.1 – Protection from Wildfire Smoke (Attachment 1). This section applies when the Air Quality Index (AQI) for PM2.5 is ‘151’ (“Unhealthy” level) or greater and there is a “reasonable anticipation” that employees may be exposed to wildfire smoke.

Exemptions to the new Cal/OSHA rule:

- Enclosed buildings with indoor air filtered by a mechanical ventilation system
- Enclosed vehicles with interior air filters and windows/doors that are kept closed (note that campus shuttle buses do not meet this standard due to constantly opening doors)
- Campus demonstrates that AQI is <151 by measuring PM2.5 levels on site
- Staff is exposed to AQI >151 or greater for a total of one hour or less during a shift

- Staff conducting emergency operations including rescue and evacuation or other operations directly aiding firefighting or emergency response

The new Section requires the following measures be taken to reduce employee exposure to AQI for PM2.5 to an acceptable level (<151) including:

- **Engineering Controls** – provide enclosed buildings, structures, or vehicles with filtered air whenever feasible; if insufficient, reduce employee exposures as much as feasible.
- **Administrative Controls** – whenever engineering controls are insufficient, SJSU shall implement administrative measures, if practicable, such as relocating work to location with acceptable AQI level; changing work schedules; reducing work intensity; or providing additional rest periods.
- **Respiratory Protective Equipment (PPE)** – for AQI levels (151-500), SJSU shall provide (N95 filtering facepiece respirators) to employees designated as outdoor workers for voluntary use. SJSU shall use ‘Appendix A’ to this 6 section for training regarding voluntary use of respirators. If AQI>500, respirator use is required in accordance with Section 5144 (that requires fit testing and medical evaluations of each employee).

Non-University Employees

Contractors working at SJSU locations should follow the advice of their own employer. However, for any work where the non-University worker may not be aware of conditions to which the employee could be exposed that could present a greater hazard than anticipated (e.g., a plumbing contractor expects its employee to work exclusively inside buildings, but the University’s needs require that the employee work on the roof of a building for multiple hours during a wildfire smoke event), the University should consider as a best practice providing notice to the relevant entity in a contractual relationship with the University (e.g., to the general contractor rather than to a subcontractor) of the actual work to be performed and the air quality to which that employee might be exposed, particularly if the employee appears not to be taking precautions that University staff would take under similar circumstances. In the event that respiratory protection is needed and the non-University employee does not have it, SJSU may provide it if the work is unable to be rescheduled to a time when the air quality is improved.

Air Quality Monitoring

Official AQI Data Source

AirNow.gov is an official source that uses high quality air monitors that are designed to monitor air quality on a regional basis. This website provides average air quality over a 24-hour period, as well as forecasts for future air quality. The Cal/OSHA Protection from Wildfire Smoke Rule specifically refers to the AirNow site. Reporting the “official U.S. Air Quality Index (AQI)”, AirNow is a partnership of the U.S. Environmental Protection Agency (EPA), National Oceanic and

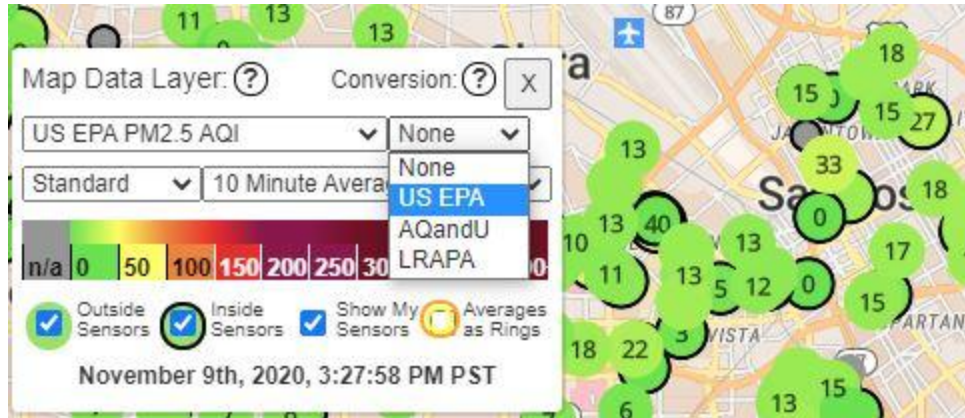
Atmospheric Administration (NOAA), National Park Service, NASA, Centers for Disease Control, and the Bay Area Air Quality Management District (BAAQMD).

The U.S. Air Quality Index is EPA's tool for reporting air quality. The AQI is divided into six categories. Each category corresponds to a different level of health concern and is designated a specific color indicator. The AQI is as follows:

Daily AQI Color	Levels of Concern	Values of Index	Description of Air Quality
Green	Good	0-50	Air quality is satisfactory, and air pollution poses little or no risk.
Yellow	Moderate	51-100	Air quality is acceptable. However, there may be a risk for some people, particularly those who are unusually sensitive to air pollution.
Orange	Unhealthy for Sensitive Groups	101-150	Members of sensitive groups may experience health effects. The general public is less likely to be affected.
Red	Unhealthy	151-200	Some members of the general public may experience health effects; members of sensitive groups may experience more serious health effects.
Purple	Very Unhealthy	201-300	Health alert: The risk of health effects is increased for everyone.
Maroon	Hazardous	>301	Health warning of emergency conditions: everyone is more likely to be affected.

Unofficial AQI Data Source

PurpleAir.com is a source that provides more granular details on air quality via a network of ad-hoc sensors that community members link to the website. It is not an official source monitored by the government and will not be used to make operational decisions. However, the website can provide more location specific information that may capture variations due to microclimates and topography. Given the unofficial nature of PurpleAir, caution should be exercised in relying upon this information as an exclusive source. If utilizing PurpleAir for wildfire smoke monitoring, the user should use the US EPA Conversion as the site default. The feature can be toggled from the conversion drop down box on the PurpleAir website as shown below:



Cal/OSHA and US EPA both recommend using the current Air Quality Index (or 'Current Conditions AQI') posted on the US EPA AirNow website as the official source of AQI information.

PurpleAir monitors should be considered a supplement to a larger package of information when compared to nearby EPA reference air monitors, forecasts and model projections, as well as weather forecasts and satellite imagery data. This 'multiple lines of evidence' provides for a comprehensive and holistic approach to assessing both current and future smoke conditions in order to make better informed decisions.

Personal Protective Equipment

N95 masks are special face coverings with respirators that are designed to filter out particles before the air is breathed. The N95 means that it is certified to filter out 95% of particles 0.3 microns or larger when worn properly. During air quality events when there is a significant amount of PM 2.5 in the air (AQI > 150), N95 respirators are made available to employees and students who voluntarily request them, depending on the level of PM 2.5 present, and the amount of time the employee or student is required to be outdoors.

- Campus should work with procurement in advance of wildfire incidents to maintain an emergency supply.
- Cal / OSHA requires provision of voluntary use respirators (such as N95 filtering facepiece respirators) where the PM 2.5 AQI equals or exceeds 151 (but does not exceed 500) for employees working outside for more than an hour while exposed to wildfire smoke.
- When feasible, it is also a good practice to make N95 masks available to students and those with medical needs who may be required to be on campus.
- The Chancellor's Office procurement team maintains a supply of N95 masks that can be requested from campuses in emergency situations.
- Where the PM 2.5 AQI exceeds 500, respirator use is required in accordance with Title 8 section 5144 and the campus respiratory protection program.
- N95s for voluntary use can be obtained from the Student Wellness Center front desk or Work Control front desk located at Corporation Yard Building A.

- For Facilities, Development & Operations employees working outside when the AQI is greater than 150, N95s can be obtained from Central Stores in Corporation Yard Building B.
- Anyone using an N95 for voluntary use must be provided the information described in [Appendix A](#) of this document.

Building Heating Ventilation and Air Conditioning Systems

During a wildfire smoke event (or other such event negatively impacting regional air quality) outside air intake into campus buildings should be reduced to the maximum extent possible in order to reduce occupant impacts to poor air quality.

Buildings on HVAC Control systems should reduce outside air intake to the maximum extent practicable to maintain safe CO2 levels when the AQI reaches 151 or higher. Some older buildings on campus require manual adjustment to outside air dampers and will take longer to modify. Operable windows should be closed.

During the COVID-19 pandemic, public health recommendations were to increase outside air intake into buildings in order to reduce the potential airborne transmission of the virus. However, when the outside air quality is hazardous, there is a direct conflict between COVID-19 related HVAC precautions and Cal/OSHA regulations regarding protection from wildfire smoke as well as MRB-reviewed EPA recommendations on protecting people and buildings from wildfire smoke.

In these circumstances, FD&O will take action to modify the operation of our HVAC systems to protect people and facilities from wildfire smoke until the AQI improves.

Training

The CSU has established a training module for awareness of AQI and appropriate actions for employees to take during poor air quality incidents. It is called [Protection from Wildfire Smoke \(CSU\)](#) and can be accessed through the CSU Learn system. This training can be utilized to meet the requirement to train outdoor employees on wildfire smoke per CalOSHA 5141. It can also be used as a learning resource for any other employee.

Decision Making Matrix

The Decision Making Matrix was developed utilizing input from the *CSU CO Wildfire Smoke Guidance* and the *UC Systemwide Air Quality Working Group Report*. Key personnel involved in the decision making process regarding campus operations during a hazardous air quality event may include members from the following groups:

- President, Cabinet
- Emergency Managers and Public Safety
- Campus Risk Management

- Environmental Health and Safety
- Academic Affairs,
- Student Affairs,
- Athletics
- University Marketing and Strategic Communications
- University Personnel

Decisions will be guided by using the decision making matrix outlined in Table 1 with the Campus Environmental Health & Safety Department taking the lead for ensuring continuing operations are carried out in a manner consistent with prevailing health and safety guidance.

Table 1: Decision Making Matrix During Regional Air Quality Events	
AQI Value 0-50 PM2.5 (24hr avg; ug/m3): 0-12	
Health Advisory: Good Normal Operation	
Community Impacts	Actions
None Expected	None
AQI Value 51-100 PM2.5 (24hr avg; ug/m3): 12.1 - 35.4	
Health Advisory: Moderate Unusually sensitive individuals (people with lung and heart disease) may be affected. Individuals in this group should consider reducing prolonged or heavy exertion.	
Community Impacts	Actions
Outdoor Workers/Volunteers	Unusually sensitive people may require work accommodations
Academic Classes	No action anticipated
Campus Operations	No action anticipated
Health System Operations	In patient care areas should consider modifying filtered mechanical ventilation systems and/or implementing other controls to reduce outdoor air intake.
Athletics & Outdoor Recreation	No action anticipated
Outdoor Camps/Events	No action anticipated

Pre-K-12 or child development centers	No action anticipated
AQI Value 101 - 150 PM2.5 (24hr avg; ug/m3): 35.5 - 55.4	
Health Advisory: Unhealthy for Sensitive Groups People with heart or lung disease, older adults and children should reduce prolonged or heavy exertion	
Community Impacts	Actions
Outdoor Workers/Volunteers	Workers in sensitive groups may require work accommodations.
Academic Classes	No action anticipated
Campus Operations	<ul style="list-style-type: none"> • Close building doors and windows to reduce outdoor air intake. • If AQI forecast indicates "Unhealthy" begin reducing outside air intake on air handling units with manual dampers.
Health System Operations	As feasible, modify filtered mechanical ventilation systems to reduce outdoor air intake in patient care areas.
Athletics & Outdoor Recreation	Medical/athletic staff/outdoor recreation staff should consult with individuals who fall into the sensitive groups about participation in practice, competition, and/or outdoor events.
Outdoor Camps/Events	At higher end of range, move activities indoors.
Pre-K-12 or child development centers	Engage in less intense outdoor activities. At higher end of range, move outdoor activities indoors.
AQI Value 151 - 200 PM2.5 (24hr avg; ug/m3): 55.5 - 150.4	
Health Advisory: Unhealthy People with heart or lung disease, older adults and children should avoid prolonged or heavy exertion. Everyone else should reduce prolonged or heavy exertion.	

Community Impacts	Actions
Outdoor Workers/Volunteers	<ul style="list-style-type: none"> Limit outdoor work and prolonged or heavy exertion where practicable. Reassign employees who work outdoors for more than one hour or provide N95 respirators for voluntary use. <p>If the AQI is sustained above 175, suspend outdoor work.</p>
Academic Classes	<ul style="list-style-type: none"> Academic accommodations for students and faculty with pre-existing health conditions may be needed. Cancel or move outdoor classes indoors. At higher end of range, suspend class activities.
Campus Operations	<ul style="list-style-type: none"> Make N95 respirators and use/care guidance available for voluntary use. Increase campus-managed shuttle/bus service. As feasible, modify filtered mechanical ventilation systems to reduce outdoor air intake to the maximum extent practicable in order to maintain safe CO2 levels indoors.
Health System Operations	<ul style="list-style-type: none"> Make N95 respirators and use/care guidance available for voluntary use.
Athletics & Outdoor Recreation	<ul style="list-style-type: none"> Medical/athletic training staff should closely monitor the health of all athletes in practice and competition. Shorten/modify outdoor recreational activity to limit prolonged or heavy exertion.
Outdoor Camps/Events	Cancel outdoor activities or move them indoors if feasible.
Pre-K-12 or child development centers	<ul style="list-style-type: none"> Reduce or cancel outdoor activities. Where feasible, move outdoor activities indoors or rescheduling them to another day or time.

AQI Value 201 - 300
PM2.5 (24hr avg; ug/m3): 150.5 - 250.4

Health Advisory: Very Unhealthy
 People with heart or lung disease, older adults and children should avoid all physical activity outdoors.. Everyone else should avoid all prolonged or heavy exertion.

Community Impacts	Actions
Outdoor Workers/Volunteers	Suspend outdoor work. If work is absolutely necessary, provide N95 respirators for voluntary use.
Academic Classes	Cancel or restructure classes if current AQI levels have maintained in this range and are expected to continue (academic activities that support clinical operations or research may be excluded from cancellation).
Campus Operations	<ul style="list-style-type: none"> To the extent feasible, curtail campus operations.
Health System Operations	<ul style="list-style-type: none"> To the extent feasible, curtail health system operations.
Athletics & Outdoor Recreation	<ul style="list-style-type: none"> Outdoor athletic activities should be moved indoors or delayed, postponed, or relocated. Cancel or move indoors outdoor recreational activities.
Outdoor Camps/Events	<ul style="list-style-type: none"> Cancel outdoor events involving activity (e.g., sports). Consider cancellation of outdoor events that do not involve activity (e.g.,concerts).
Pre-K-12 or child development centers	Close school if current AQI levels have maintained in this range and are expected to continue.

Health Advisory: Unhealthy

AQI Value > 301
PM2.5 (24hr avg; ug/m3): > 250.5

Health Advisory: Hazardous

Community Impacts	Actions
All are impacted	Suspend all but essential campus operations.

Campus Communication

As a general example, communications need to reference actions being taken, groups affected and areas affected. Communications will originate within the Environmental Health and Safety Department in conjunction with University Marketing and Strategic Communications. If a decision is made to curtail or close campus operations, communication of these actions need to be delivered to the campus community via normal means of communication (i.e. email, SJSUAlert, social media, etc.).

Example communication

SJSU campus community,

After reviewing monitoring station observations throughout the day and the air quality forecast from the Bay Area Air Quality Management District, the San José State University campus will be CLOSED [\[insert date\]](#). Online classes and services will continue as scheduled. In-person classes are canceled.

Due to the campus closure, all buildings will be closed with the exception of:

[list buildings that remain open and hours of operation, e.g. campus housing and Dining Commons]

The Moss Landing Marine Laboratories will be [\[CLOSED or OPEN depending on the AQI in the region\]](#).

Only those whose presence is deemed essential by your supervisor should be on campus.

We will update the campus community by email, Twitter and on the SJSU Newsroom site as we continue to assess the air quality in the area.

We send our heartfelt gratitude to all first responders battling these fires and we encourage you to keep those directly impacted by the fire in your thoughts.

Providing Indoor Clean Air Space

If needed, designate at least one building with good air filtration (one of our MERV 13 buildings, such as the Student Union) to provide students with a safe place to study during poor air quality events.

Off-Campus Activities

As smoke events are regional, these types of activities may not be impacted by an air quality event on main campus. Conversely, they may be directly impacted when main campus is not. During a wildfire smoke event, campus leaders who oversee off campus activities (i.e.; nursing clinical placements, student teaching, internships, service learning, field trips, events, etc.) will need to check in with these groups to ensure they have the resources needed to continue their off-campus activities safely. Follow the decision making matrix to determine if activity curtailment is needed. Environmental Health and Safety monitors activities in Santa Clara and Monterey Counties. Administrators of programs outside of these regions will be responsible for implementing safeguards as they apply to their relevant locations and air quality conditions.

Post Event Recovery

Cleanup and Odor Removal

HVAC filters may need to be replaced more frequently following wildfire smoke events. In advance of the wildfire season, FD&O should increase filter stock as supply chain constraints and shipping delays can occur during and directly after a wildfire event. Once the air quality event passes, buildings should be flushed with fresh outside air. Buildings on controls should begin the flushing campaign at 4:00AM on the day the building is scheduled to be reoccupied. EH&S will conduct industrial hygiene assessments for areas of concern. HVAC technical staff will determine if filters need to be replaced.

Report ash clean up requests to FD&O customer service center. EH&S will then review these requests. Safe management of ash may require use of respiratory protection, safety glasses, skin protection and disposable overalls (tyvek) should be worn if performing bulk ash removal. Surface ash and dust clean up should be performed using wet methods in order to reduce surface ash from becoming airborne.

Documentation of Expenses

Document expenses that otherwise would not have been incurred for potential reimbursement of funds via CSU's property insurance, FEMA or other potential sources of funds should be reported to University Risk Management.

Event	Date	Author
Document Creation	11/17/2020	Matt Nymeyer
Edits & updates	11/3/2023	Matt Nymeyer

Appendix A

Information for Voluntary Respirator Use

This information must be provided to any employee voluntarily using a respirator, including N95 respirators.

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

You should do the following:

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirators limitations.
2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designated to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors or very small solid particles of fumes or smoke.
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

Source: Appendix D to Section 5144: (Mandatory) Information for Employees Using Respirators When Not Required Under the Standard

Appendix B

Air Quality Index Thresholds for Mountain West Competition



Air Quality Index Thresholds for MW Competition – Recommended Guidelines

Breathing for those afflicted with seasonal allergies, asthma or upper respiratory illness or other conditions can be difficult at times due to various environmental factors. High pollen counts, smoke, dust, etc. along with temperature extremes and humidity can play a significant role in athletic performance and recovery. Being aware of the conditions in which a student-athlete is participating is significant and should be monitored by all necessary personnel such as a team's physician, assigned athletic trainer, facilities personnel and/or coach.

Special attention will be given to those in acute distress from a respiratory problem by medical personnel as needed. However, all involved should be aware of or informed by a team's medical personnel that they may be affected temporarily. Awareness by all involved is necessary to ensure successful outcomes.

General NCAA parameters are as follows:

- Specifically, at an AQI of 100 or higher, institutions should consider removing sensitive athletes from outdoor practice or competition venues and should closely monitor all athletes for respiratory difficulty. Reduce heavy or prolonged exertion in sensitive individuals.
- At AQIs of over 150, outdoor activities should be shortened for all participants, and exertion should be minimized by decreasing the intensity of activity. Sensitive athletes should be moved indoors.
- At AQIs of 200 or above, serious consideration should be given to rescheduling the activity or moving it indoors. Prolonged exposure and heavy exertion should be avoided. Avoid all outdoor physical activity for sensitive individuals.

Air Quality Index (AQI)

The AQI is an index for reporting daily air quality. It tells you how clean or polluted your air is, and what associated health effects might be a concern for you. The AQI focuses on health effects you may experience within a few hours or days after breathing polluted air. EPA calculates the AQI for five major air pollutants regulated by the Clean Air Act: ground-level ozone, particle pollution (also known as particulate matter), carbon monoxide, sulfur dioxide, and nitrogen dioxide. For each of these pollutants, EPA has established national air quality standards to protect public health. Ground-level ozone and airborne particles are the two pollutants that pose the greatest threat to human health in this country.

In the Mountain West, the AQI shall be the determining factor upon which decisions to start or continue competition shall be based. The determination whether to initiate or continue competition is to be made based upon the on-site air quality situation and the sport in question.

Mountain West Thresholds

In conjunction with the Conference office, institutions should consider shortening or canceling outdoor athletic events (practices and competitions) in accordance with AQI guidance. Exposure should be managed more conservatively for student-athletes with pre-existing pulmonary or cardiac conditions, which may exacerbate the complications of these conditions and lead to an acute medical emergency.

When poor air quality exists:

- Chief Medical Officers (e.g., head team physicians) from each institution shall consult to evaluate the air quality conditions.

NOTE: For Olympic sports, if a Chief Medical Officer is not on site at the event, they must be available to consult with the team medical personnel who are on site. Host institution Chief Medical Officer, presuming the visiting team does not have a CMO on site, shall have primary responsibility.

- Once a consensus is reached, the CMO's shall make a recommendation to the athletics directors (or designee(s)) regarding the AQI levels as it relates to starting or continuing competition.
- The Athletics Directors must take all available information to collaborate on a going-forward plan in consultation with the Conference office. Should institutions be unable to come to a consensus, the Conference office will have the final say on a plan for competition.
- Athletics Directors are responsible for keeping their institutional president informed.

The PurpleAir sensors provided by the MW shall be operational at the facility, connected to Wi-Fi and will be the primary data source utilized to measure AQI and inform decisions. Other available AQI measuring sources may be consulted to provide the best possible picture of the situation at that location (e.g., [AirNow.gov](https://airnow.gov), local monitoring stations that may be available in the area or on the campus, <https://airquality.weather.gov/#>, etc.).

Attentive monitoring of local AQI and associated air quality alerts, especially during times of extreme environmental conditions, is required. This monitoring is best performed by the primary athletics healthcare providers trained to monitor environmental impacts on student-athlete health and safety. However, schools may choose to delegate this responsibility to another staff member with knowledge and training about environmental monitoring. Because of the variability of the AQI (e.g. local weather conditions, wind direction, temperature, precipitation), generally decisions to cancel a competition cannot be made in advance of the scheduled start time.

- Should air quality levels remain in the acceptable ranges outlined by the NCAA's Sport Science Institute (AQI reading under 200), competition may be started or continued.
- If the air quality crosses the 200 threshold, it is recommended competition be suspended before it begins. To reduce the likelihood of repeated stopping and starting of a contest once it has begun, decisions to suspend play after the contest has started shall be made at quarter breaks and/or halftime of a contest. **Depending upon unique on-site considerations, activity could be halted at a lower level.**
- If the AQI readings eclipse 250, competition shall be halted immediately, regardless of the time in the game.
- Before competition is to resume, institutions shall work together to develop a mutually-agreed upon warm-up time.
- There is no predetermined length of time that a contest can be suspended. Those decisions will be made by the Conference office considering all factors including, but not limited to, student-athlete welfare.

Institutions should develop a clear understanding of air quality dynamics in their location and develop individual plans to manage events outside of competitions throughout the year. School emergency action plans should guide decisions to conduct events and emergency care response in these circumstances. Institutional medical staffs should rehearse emergency plans a minimum of once a year.

The Commissioner or his designee has the sole authority to declare a contest cancelled, postponed, rescheduled or terminated.

Sources: NCAA Sport Science Institute, AirNow.Gov, selected NCAA Playing Rules; Mountain West Handbook

JRH 7/3/19