

20. Wildfire Smoke and Harmful Air Quality Exposure Prevention Program

Health Effects of Wildfire Smoke

Although there are many hazardous chemicals in wildfire smoke, the main harmful pollutant for people who are not very close to the fire is particulate matter (PM_{2.5}), the tiny particles suspended in the air. Particulate matter can irritate the lungs and cause persistent coughing, phlegm, wheezing, or difficulty breathing. Particulate matter can also cause more serious problems, such as reduced lung function, bronchitis, worsening of asthma, heart failure, cancer, and early death. People who are at higher risk of experiencing adverse health effects because of exposure to wildfire smoke include those with preexisting health conditions, those with increased duration of exposure, and those whose work results in an increased breathing rate, including outdoor workers.

Common Symptoms of Wildfire Smoke Exposure

- Coughing and hoarseness
- Burning in eyes or vision problems
- Headache
- Throat irritation
- Mucus
- Nasal discharge
- Ear pain
- Sinus pain or pressure
- Phlegm
- Irritation of mucus membranes

Symptoms requiring immediate medical attention include, but are not limited to:

- Asthma attacks, wheezing, shortness of breath, or other difficulty breathing
- Cardiovascular abnormalities, including fast or irregular heartbeat, pain or discomfort in the jaw, chest, neck, or back, or cardiac arrest
- Nausea or vomiting
- Loss of consciousness
- Sudden numbness or weakness in the face, arm, or leg
- Sudden confusion, trouble speaking, or difficulty understanding speech
- Sudden trouble seeing in one or both eyes,
- Sudden trouble with dizziness or balance
- Sudden severe headache with no known cause

When the AQI is 301 or more, the City requires that employees who experience any symptoms of wildfire smoke exposure that warrant immediate medical attention be moved to a location with sufficient clean air.

Sensitive Groups

Although everyone is impacted by wildfire smoke exposure, sensitive groups are among those most likely to experience health problems from exposure to wildfire smoke. This policy complies with the requirements of the Wildfire Smoke Emergency Rule ([WAC 296-62-085](#)).

Examples of sensitive groups include:

- People with lung diseases such as asthma or chronic obstructive pulmonary disease (COPD), including bronchitis and emphysema, and those who smoke
- People with respiratory infections, such as pneumonia, acute bronchitis, bronchiolitis, colds, flu, or those with, or recovering from COVID-19
- People with existing heart or circulatory problems, such as irregular heartbeat, congestive heart failure, coronary artery disease, angina, and those who have had a heart attack or stroke
- Children under 18 years old, and adults over age 65
- People who are pregnant
- People with diabetes
- People with other medical or health conditions that can be exacerbated by exposure to wildfire smoke as determined by a physician
- Outdoor workers

Identification of Harmful Exposures

The employer shall determine employee exposure to PM_{2.5} for worksites covered by this section before each shift and periodically thereafter, as needed to protect the health of the employee. Supervisors and managers can find this information on the following websites:

- Puget Sound Clean Air Agency - pscleanair.gov
- AirNow.gov
- WA Dept of Ecology Air Monitoring Network - enviwa.ecology.wa.gov

EXCEPTION: The employer does not have to determine employee exposure as required by this subsection if the employer assumes the NowCast AQI exceeds 151 (PM_{2.5} exceeding 55.5 µg/m³) and uses that assumption to comply with the requirements in WAC 296-62-085.

Air Quality Index

Air Quality Index (AQI) Values	Levels of Health Concern	Health Effects
0 to 50	Good	Little or no risk
51 to 100	Moderate	Acceptable quality
101 to 150	Unhealthy for Sensitive Groups	General Public not likely affected
151 to 200	Unhealthy	All may experience some effects
201 to 300	Very Unhealthy	All may experience more serious effects
301 to 500	Hazardous	Emergency conditions

Informing Employees

A designee of the Public Works Department will send a city-wide email to inform all staff when any of the following conditions are met:

- At least two consecutive NowCast AQI readings are 69 or higher
- The NowCast AQI is 101 or higher
- The NowCast AQI is 301 or higher
- The AQI is 500 or higher
- Conditions exceed the AQI scale

These conditions will cause the wildfire smoke protections detailed below to go into effect. To communicate this information with field staff who do not regularly access their email, managers are required to contact their field staff directly (via text, video chat, phone call, in-person meeting, etc.) to communicate this information to those personnel who do not access their email regularly. Field staff must have a functioning phone, radio, or other means of communication at each work site at all times that can be used to contact supervisors or emergency medical services.

Employees are encouraged to report wildfire smoke hazards, symptoms, and issues with availability or effectiveness of exposure controls or PPE to their supervisor and will not be retaliated against for doing so.

Exposure Controls

Where the **NowCast AQI is 69 (PM_{2.5} is 20.5 µg/m³) or higher**, an effective combination of the following exposure controls is recommended. Where the **NowCast AQI is 101 (PM_{2.5} is 55.5 µg/m³) or higher**, they become required when working outdoors or inside spaces that do not have filtered ventilation systems.

- Keep doors and windows closed in buildings or vehicles where the air is adequately filtered
- Provide portable HEPA filters in enclosed areas without adequate filtration system
- Relocate work to a location with a lower ambient air concentration of PM_{2.5}
- Change work schedules to a time with lower ambient air concentration of PM_{2.5}
- Reduce work intensity
- Provide additional rest periods
- Allow voluntary use of N95 respirators, including the employee's personal respirator or N95 respirators provided by the City of Mercer Island

Respiratory Protection

When the NowCast AQI is:

- 69 - 100** Departments are encouraged to provide N95 respirators to all outdoor workers and any employee who requests one.
- 101 - 300** Departments are required to provide N95 respirators to all outdoor workers and any employee who requests one
- 301 - 499** Departments are required to distribute N95 respirators directly to each exposed employee and must encourage respirator use.

Voluntary use of N95 respirators does not require medical clearance or fit testing. For voluntary use only, a tight-fitting respirator can be worn over facial hair that interferes with the seal. This significantly reduces the efficacy of the respirator. The Public Works warehouse is responsible for maintaining

NIOSH-approved N95 respirator stock. All respirators provided by the City must be NIOSH-approved devices.

When the NowCast PM_{2.5} is 555µg/m³ or more (beyond the AQI scale), the City will suspend all outdoor work that is not an essential or emergency service until the AQI improves.

If the NowCast PM_{2.5} is 555µg/m³ or more (beyond the AQI scale) **and** employees are required to work outdoors to perform essential or emergency services:

- Outdoor employees must be fully enrolled in the respiratory protection program. This program provides respirators, ensures workers are medically cleared for use, conducts respirator fit testing, and trains staff in respirator use. Operations staff who are required to be fitted for such equipment for use during their routine work responsibilities will be responsible for responding to outdoor city emergencies during extreme smoke or air pollution events.
- Outdoor employees are required to use one of the following types of respirators fitted with a HEPA cartridge:
 - Loose-fitting powered air purifying respirator (PAPR)
 - Full-face tight fitting air purifying respirator (APR)
 - Full-face powered air purifying respirator PAPR
 - Another respirator that is at least as effective

When employees are required to wear respirators due to an AQI of 500 or more (beyond the AQI scale), the provided respirators must have an Assigned Protection Factor (APF) of 25 or more and be equipped with P100 filters.

Exposure Symptom Response

Employees displaying symptoms of wildfire smoke exposure must be monitored to determine whether medical attention is necessary. Some symptoms that fall into the category of “irritation” may go away after the exposed employee moves to an environment with clean air.

Changes in breathing pattern, heart rate, or cognitive ability can indicate an employee has experienced dangerous levels of exposure to wildfire smoke. Employees experiencing any of these symptoms while working during smoky conditions should seek immediate medical attention and will be moved to a location that ensures sufficient clean air

Employees who experience injury or illness due to wildfire smoke exposure will not be retaliated against for seeking medical attention. Depending on the severity of hazardous smoke exposure and symptoms, supervisors should help employees seek treatment by visiting a local health clinic or dialing 911. All City vehicles are checked during regular service intervals, and any cabin air filters will be checked, and if necessary, replaced, during routine service.

Exemptions

The following workplaces and operations are exempt from this rule:

- Enclosed buildings or structures in which the employer ensures that windows, doors, bays, and other exterior openings are kept closed, except when it is necessary to open doors to enter/exit.
- Enclosed vehicles in which the air is filtered by a properly maintained cabin air filter and the employer ensures that windows, doors, and other openings are kept closed except when it is necessary to open doors to enter/exit. *Most vehicles in the City's fleet do not have cabin air filters and therefore do not qualify as workplaces exempt from this rule.*

- Employees exposed to a concentration of NowCast Air Quality Index (AQI) 69 (PM_{2.5} of 20.5 µg/m³) or higher for a total of 15 minutes or less during a 24-hour period.
- Work within the scope of chapter 296-305 WAC, Safety standards for firefighters.
- Employees performing prescribed burns.

Employee and Supervisor Training

Employees must be trained prior to being exposed to wildfire smoke resulting in an AQI of 69 or more during their workday. The City will provide an annual wildfire smoke training, compliant with L&I standards, prior to the start of wildfire season each year that addresses the following topics:

- Health effects and symptoms of wildfire smoke exposure
- The importance of informing the employer when an employee is experiencing symptoms of wildfire smoke exposure
- Right to obtain medical attention without fear of reprisal
- How to access the NowCast AQI
- How to determine the current PM_{2.5}
- Response plan and hazard communication plan (this is the “informing employees” section) to protect employees from wildfire smoke
- The importance, limitations, and benefits of using an N95 respirator to protect against wildfire smoke hazards
- How to properly don, use, and maintain N95 respirators

Supervisors will also be trained on the following topics:

- Their responsibility to know the air quality index at job locations
- How to utilize exposure controls effectively
- How to monitor employees and recognize signs of wildfire smoke exposure
- Plan for prompt and effective response to serious illness or injury related to wildfire smoke exposure, including transporting employees to an emergency medical service provider, if necessary
- How to provide ready access to N95 respirators for all outdoor workers for voluntary use