

Manual Section 2	Issue Date: 08/01/2026	Revision Date:	Policy Number LLCP-130
	Air Quality Management (Outdoor)		

1 PURPOSE

- 1.1 GIS and its family of companies recognize that environmental exposures involving air quality have a significant impact on employee health and safety. Therefore, it is the responsibility of GIS and its family of companies to protect all employees, subcontractors, and visitors or any individuals who conduct work for or under the control of GIS or its family of companies from known air quality hazards at work or outdoors.

2 SCOPE

- 2.1 This policy applies to all employees, contractors, visitors, and individuals who conduct work for or under the control of GIS or its family of companies; hereafter referred to as COMPANY. This policy shall apply across all operations, locations, and activities.
- 2.2 This policy shall not supersede any governmental regulation that applies more stringent requirements than the minimum requirements set forth in this policy.

3 TYPES OF ENVIRONMENTAL EXPOSURES

- 3.1 Environmental exposure refers to contact with physical, chemical, biological, and thermal substances in air, water, food, or soil that can impact an employee's health.
 - 3.1.1 Physical Exposures: Physical environmental exposures are contact with natural or man-made physical forces and surroundings, primarily including air pollution, noise, and radiation.
 - 3.1.2 Chemical Exposures: Chemical environmental exposures happen when people contact harmful synthetic or natural substances in air, water, soil, food, or products
 - 3.1.3 Biological Exposures: Biological environmental exposures are contacts with living or naturally derived agents—such as bacteria, viruses, fungi, and allergens—that can cause harm or trigger immune responses in the human body.
 - 3.1.4 Thermal Exposures: Thermal environmental exposures involve contact with extreme temperatures, driven by air temperature, humidity, radiant heat, and physical activity. These conditions can cause severe health risks like heat exhaustion and heat stroke, or cold stress if temperatures drop too low.

4 ROUTES OF EXPOSURE

- 4.1 Routes of exposure are the specific pathways through which a substance (such as a chemical, toxin, or pathogen) enters the human body. The four primary routes are inhalation, ingestion, dermal absorption, and injection.
 - 4.1.1 Inhalation: Inhalation exposures occur by breathing in gases, vapors, fumes, aerosols, or airborne dust through the nose and mouth and is the most common and rapid route of exposure in occupational settings.

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Because the lungs have a massive surface area and a rich blood supply, inhaled substances enter the systemic circulation almost immediately, bypassing the liver's initial filtration.

- 4.1.2 Ingestion: Ingestion occurs by swallowing a substance. This can occur directly (eating/drinking contaminated food or water) or indirectly (hand-to-mouth transfer after handling chemicals or contaminated soil). Substances absorbed through the gastrointestinal tract travel directly to the liver via the portal vein, where they are often broken down or metabolized before reaching the rest of the body.
- 4.1.3 Dermal and Mucosal Absorption: Dermal and mucosal absorption occurs when contaminants pass directly through the skin or mucous membranes (eyes, nose, mouth). Intact skin is an excellent barrier, but many chemicals, especially fat-soluble ones, can penetrate it and enter the bloodstream. Thin-skinned areas and mucous membranes absorb substances much faster.
- 4.1.4 Injection: Injection occurs when a substance is forced directly into the body through a puncture, cut, or tear in the skin. This route bypasses all natural barriers and delivers the contaminant straight into the tissue or bloodstream, often leading to immediate local and systemic effects.

5 ROUTES OF EXPOSURE

- 5.1 In toxicology, evaluating the risk of an exposure route involves looking at several factors:
- 5.1.1 Duration: Whether the exposure is acute (short-term) or chronic (long-term, cumulative).
- 5.1.2 Dose/Concentration: How much of the substance enters the body.
- 5.1.3 Toxicity: The inherent harmfulness of the specific substance.

6 OUTDOOR AIR QUALITY INFORMATION

- 6.1 High concentrations of airborne contaminants can cause adverse health effects. Poorly controlled dust and odors can irritate eyes and airways, affecting workers. The most common causes of pollutants affecting outdoor air quality are:
- Particulate Matter: Tiny solid or liquid pieces like dust, dirt, soot, or smoke floating in the air.
 - Gasses: Harmful substances like carbon monoxide, sulfur dioxide, and nitrogen oxides.
 - Ground-level Ozone: A reactive gas created when sunlight hits chemical pollution from vehicles, machinery, or byproducts of industrial facilities, forming smog.
- 6.2 There are several factors that can affect air quality including:
- Weather: Extreme dry heat, extreme cold, humidity, and wind chill.

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- Air Pollution: The contamination of indoor or outdoor air by harmful gases, dust, and smoke that change the natural makeup of the atmosphere and damage human health, animals, and plants.
- Pollen: A fine powdery, yellowish substance made by the male part of a flower or seed plant. It contains the male reproductive cells (sperm) needed to fertilize the female parts of other plants of the same type so they can make seeds and fruits. Airborne pollen gets into the nose and eyes, causing sneezing, itching, and watery eyes, most known as hay fever.
- Forest Fires: An uncontrolled fire that burns plants, trees, and brush in a natural area. It is also known as a wildfire or bushfire. Forest fires produce a dangerous mix of gases and tiny pieces of ash. These gases, also known as forest fire smoke, contain fine particles (PM2.5), which are microscopic, 30 times smaller than a human hair. They float deep into the lungs and blood of humans. Forest fire smoke also contains carbon monoxide, carbon dioxide, and nitrogen oxides. Lastly, volatile organic compounds (VOCs) also exist in forest fire smoke. These substances can irritate the nose and throat, causing coughing, soreness, difficulty breathing, and stinging eyes.

7 THE AIR QUALITY INDEX

7.1 The Environmental Protection Agency establishes an Air Quality Index for five major air pollutants regulated by the Clean Air Act. Each of these pollutants has a national air quality standard set by the EPA to protect public health:

- Ground-level Ozone
- Particle pollution (also known as particulate matter, including PM2.5 and PM10)
- Carbon monoxide
- Sulfur dioxide
- Nitrogen dioxide

7.2 The U.S. Air Quality Index (AQI) is the Environmental Protection Agency's tool for communicating about outdoor air quality and health. The AQI includes six color-coded categories, each corresponding to a range of index values. The higher the AQI value, the greater the level of air pollution and the greater the health concern. For example, an AQI value of 50 or below represents good air quality, while an AQI value over 300 represents hazardous air quality.

7.3 For each pollutant an AQI value of 100 generally corresponds to an ambient air concentration that equals the level of the short-term national ambient air quality standard for protection of public health. AQI values at or

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below 100 are generally thought of as satisfactory. When AQI values are above 100, air quality is unhealthy: at first for certain sensitive groups of people, then for everyone as AQI values get higher.

- 7.4 The AQI is divided into six categories. Each category corresponds to a different level of health concern. Each category also has a specific color. The color makes it easy for workers to quickly determine whether air quality is reaching unhealthy levels at the worksite.

7.4.1

AQI Basics for Ozone and Particle Pollution			
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 and higher	Health warning of emergency conditions: everyone is more likely to be affected.

8 PERSONAL PROTECTIVE EQUIPMENT AND THE AQI

- 8.1 The outdoor Air Quality Index (AQI) for fine particulate matter (PM_{2.5}) correlates directly with personal protective equipment (PPE) recommendations, scaling from voluntary use for sensitive individuals at an AQI of 101 up to mandatory respirator requirements or complete avoidance above 300.
- 8.2 AQI Categories and Personal Protective Equipment (PPE) Guidelines

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8.2.1 0-50 (Good – Green)

- Health Risk: Minimal or None
- PPE Required: None
- Outdoor Work: Allowable for all workers.

8.2.2 51 – 100 (Moderate – Yellow)

- Health Risk: Acceptable air quality; mild effects possible for unusually sensitive people.
- PPE Required: None required for non-sensitive workers. Sensitive individuals may consider voluntary protection during heavy exertion.
- Outdoor Work: Allowable for all workers.

8.2.3 101–150 (Unhealthy for Sensitive Groups - Orange)

- Health Risk: Aggravation of heart or lung disease in sensitive populations.
- PPE Required: Voluntary NIOSH-approved N95 or KN95 respirators recommended for sensitive groups if outdoor exposure is unavoidable.
- Outdoor Work: Allowable for non-sensitive workers. Management should consider moving sensitive workers indoors.

8.2.4 151–200 (Unhealthy - Red)

- Health Risk: Everyone may begin to experience health effects; sensitive groups experience serious effects.
- PPE Required: Voluntary N95 respirators recommended for all outdoor workers. Occupational safety standards (such as Cal/OSHA regulations) mandate that employers make N95s available for voluntary use at this threshold.
- Outdoor Work: Management should consider conducting only critical work outdoors for short periods of time conducted only by non-sensitive workers.

8.2.5 201–300 (Very Unhealthy - Purple)

- Health Risk: Health alert; risk of serious health effects increased for everyone.
- PPE Required: N95 or more protective respirators (such as P100) strongly advised for anyone required to be outdoors. Outdoor physical exertion should be avoided.

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- Outdoor Work: Management should consider halting all outdoor work operations including critical work task for all workers.

8.2.6 301–500 (Hazardous - Maroon)

- Health Risk: Emergency conditions; entire population is likely to be affected.
- PPE Required: Mandatory respirator protocols under emergency workplace rules if outdoor exposure cannot be eliminated; workers should remain indoors with filtered air.
- Outdoor Work: Management should not allow outdoor work.

8.3 PPE Notes

8.3.1 Effective Filters: Standard cloth, fashion, or single-strap paper/surgical masks do not filter fine particulate matter (PM_{2.5}) effectively. Only properly sealed, NIOSH-approved N95, KN95, or P100 respirators capture microscopic smoke and pollution particles

8.3.2 Pollutant Limitations: N95/P100 respirators protect against particulate pollution (PM_{2.5}) and (PM₁₀) from wildfire smoke or smog, but they do not filter out gaseous pollutants like ground-level ozone (O₃). When ozone drives the high AQI, staying indoors is the only effective defense

9 MITIGATING OUTDOOR AIR QUALITY HAZARDS

9.1 In areas where outdoor air quality is a known hazard or has the potential to become one, managers or supervisors should check the Air Quality Index before beginning work. <https://www.airnow.gov/> is the COMPANY's preferred method for obtaining Air Quality Index information.

9.2 In areas where outdoor air quality is a known hazard or has the potential to become one, managers or supervisors should ensure that this hazard is accurately captured on the hazard analysis worksheet (L.A.W.) and in the job safety and environmental analysis (JSEA), with the proper control measures identified and listed.

9.3 In areas where outdoor air quality is a known hazard or has the potential to become one, managers or supervisors should perform a toolbox talk with all employees who have the potential for exposure and review high-risk and sensitive groups and the physical signs and symptoms of potential exposure.

9.3.1 High-Risk and Sensitive Groups

- People with asthma, COPD, or chronic bronchitis.
- Individuals with heart disease or diabetes.
- Older adults, usually age 60 and older.

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- Pregnant individuals.
- Workers with physically demanding job task.

9.3.2 Physical Signs and Symptoms

- Coughing or a scratchy throat.
- Shortness of breath or wheezing.
- Chest tightness or mild pain.
- Itchy, watery eyes or a runny nose.
- Unusual fatigue or tiredness.
- Headaches or dizziness.

9.4 All employees should understand the requirements of the recommended respiratory personal protective equipment before use.

9.4.1 For N95 and K95 respirators:

- Medical Evaluation: You must complete a health questionnaire before your first use.
- Fit Testing: A qualitative or quantitative fit test is required to verify the seal.
- PFT Exception: Under the OSHA Respiratory Protection Standard, workers need a medical evaluation and a fit test, but a PFT is only ordered if the examining health care professional decides it is necessary based on your medical questionnaire or exam.

9.4.2 For full-face or half-mask respirators:

- Respirator Fit Test (Mandatory): Under OSHA Standard 1910.134, anyone wearing a tight-fitting facepiece (like a half-mask or full-face respirator using P100 filters) must pass an annual qualitative or quantitative fit test.
- Medical Evaluation (Mandatory): Before wearing the respirator, you must complete a medical questionnaire or evaluation to see if you are healthy enough to wear it.
- Pulmonary Function Test (Conditional): A PFT (such as spirometry) is only required during the medical evaluation if mandated by specific substance exposure standards (like asbestos or formaldehyde) or if the attending physician decides it is necessary based on your health.

9.4.3 For N95, K95, full-face, and half-mask respirators you must be clean shaven.

- Facial hair, stubble, or beard growth in the sealing area creates tiny gaps that let unfiltered air leak inside.

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- Small mustaches or sideburns that do not cross the sealing edge of the mask are typically allowed.

9.5 Other best practices to improve outdoor air quality include:

- 9.5.1 Store bulk cement and chemicals in silos.
- 9.5.2 Keep surfaces that can generate dusts, wet.
- 9.5.3 Low speed limits to reduce dust generation.
- 9.5.4 Store fine powders or materials in buildings with adequate wind protection.
- 9.5.5 Make sure that suppression systems are working and working effectively on any machinery it is installed on.
- 9.5.6 Cover trucks transporting dry materials to and from the site.
- 9.5.7 Minimize drop heights into containers or trailers.
- 9.5.8 Ensure any cutting or grinding work is wetted.