

Headquarters
United States Forces Korea
Unit #15237
APO AP 96291-5237

United States Forces Korea
Regulation 40-6

28 January 2020

Medical Services

USFK AIR QUALITY POLICY

***This regulation supersedes USFK Regulation 40-6 dated 22 June 2017 and incorporates USFK Policy Letter #10 for Elective Use of Filtering Masks by Service Members in Uniform**

FOR THE COMMANDER:



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Summary. This regulation updates policies, responsibilities, and procedures pertaining to poor air quality caused by high levels of outdoor air pollutants regulated by United States (U.S.) and Republic of Korea (ROK) environmental authorities. Poor air quality impacts readiness, force health protection, and the health and wellness of our Service Members, Families, and civilian employees. Poor air quality is defined as an Air Quality Index (AQI)>100 for Sensitive Groups and an AQI>150 for the general public, including Service Members. At these cut-offs, personnel should modify outdoor activity. Military personnel are authorized to wear a particulate filtering mask while outdoors in uniform when the AQI is reported as Orange (101-150) or higher.

Summary of Change. This is a major revision to more than 80% of the regulation and a full review is required.

1. Describes outdoor air pollutants that are regulated to protect human health and welfare, and the U.S. Environmental Protection Agency (EPA) Air Quality Index (AQI) which is used to communicate levels of air pollution and health implications to the public.

2. Adds references and internet links for the AQI.

3. Describes the AQI color codes, air pollutant levels, health impact thresholds, and outdoor activity guidance.

4. Details responsibilities of Service Components and USFK supporting activities.

5. Updates references.

6. Updates USFK Air Quality Index Guide to Outdoor Activities, and Particle Pollution and Ozone Information Cards.

7. Makes changes to the glossary.

8. Makes administrative revisions (throughout).

Applicability. This regulation applies to the following:

a. Active duty U.S. Armed Forces personnel who are assigned to USFK or who are within the ROK while on temporary duty or assigned to rotational forces.

b. Family members who are covered under the Status of Forces Agreement (SOFA).

c. Reserve personnel who are performing annual or other training in the ROK.

d. National Guard personnel who are performing training in a Federal status in the ROK.

e. All U.S. civilian employees of the Department of Defense (DOD), Non-Appropriated Fund Instrumentalities (NAFI) supporting USFK, DOD Invited Contractors, Technical Representatives, and their family members who are subject to the SOFA.

f. ROK DOD civilian employees.

Supplementation. Further supplements to this regulation by subordinate commands are prohibited unless prior approval is obtained from Headquarters (HQ) USFK, Forces Korea Surgeon (FKSG), Unit #15237, APO AP 96205-5237.

Forms. USFK forms are available at www.usfk.mil.

Records Management. Records created as a result of processes prescribed by this regulation must be identified, maintained, and disposed of according to governing service regulations. Record titles and descriptions are available on the Army Records Information Management System website at: <https://www.arims.army.mil>.

Suggested Improvements. The proponent of this regulation is the Command Surgeon, USFK (FKSG). Users are invited to send comments and suggested improvements on DA Form 2028

(Recommended Changes to Publications and Blank Forms) to HQ USFK (FKSG), Unit #15237, APO, AP 96205-5237.

Distribution. Electronic Media Only (EMO).

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Glossary

1. Purpose. To prescribe policies and establish responsibilities and procedures pertaining to poor outdoor air quality due to high concentrations of air pollutants regulated by U.S. and ROK environmental authorities. Poor air quality is defined as an Air Quality Index (AQI)>100 for Sensitive Groups and an AQI>150 for the general public, including Service Members. These measures include directions for behavior modification during periods of poor air quality in order to safeguard the health and welfare of USFK personnel and their families and to ensure unit readiness.

2. References. Required and related publications are listed in Appendix A.

3. Explanation of Abbreviations and Terms. Abbreviations and terms used in this regulation are explained in the glossary.

4. Background

a. The U.S. EPA has established standards for six types of air pollution to protect human health and welfare. These pollutants include: ground-level ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter (PM) comprised of fine particles known as PM_{2.5} and larger particles known as PM₁₀, and lead. The EPA translates those pollutants into the AQI which is an index for reporting daily air quality. It tells how clean or polluted the air is, and what associated health effects might be a concern, especially for ground-level ozone and particle pollution. AQI values below 100 are generally thought of as satisfactory. When AQI values are above 100, air quality is considered to be unhealthy – at first for certain sensitive groups of people, then for everyone as AQI values increase. The AQI score published for a locality reflects the level of the dominant pollutant in that area.

b. Depending on the season and environmental conditions, the dominant air pollutants in the ROK are PM_{2.5} and ground level O₃. In ROK, PM_{2.5} originates from manmade sources in East Asia and the ROK including industry, vehicles, power generation, and waste management as well as seasonal release of PM from deserts in central Asia known as “Yellow Sand” or “Asian Dust”. Ground-level O₃ results from the interaction of combustion exhaust gases and atmospheric oxygen in the presence of sunlight. AQI in the ROK is often elevated from October through June with peaks in late winter and early spring due primarily to PM_{2.5}. According to the Army Public Health Center’s 2018 Health of the Force report, air pollution levels near U.S. bases in the ROK exceeded EPA air quality standards (AQI>100) approximately 100 days per year between 2015-2017. The majority of these poor air quality days were due to high levels of PM_{2.5}, although ground level O₃ and PM₁₀ contributed to a lesser extent.

c. Current scientific evidence identifies elevated PM as a contributor to heart and lung disease including heart attack, heart failure, stroke, asthma, and other respiratory symptoms. The EPA defines Sensitive Groups as people with heart or lung disease, older adults (who may have undiagnosed heart or lung disease), and children. Sensitive Groups may experience worsening of pre-existing health conditions or may be at risk for development or progression of health conditions. Unless previously diagnosed by a medical provider, Service Members generally do not belong to a Sensitive Group and are considered members of the general public for purposes of AQI activity recommendations. Members of the general public may or may not experience symptoms due to elevated PM depending on their individual health status and the magnitude and duration of exposure to elevated PM.

d. The EPA directs personal awareness and behavior modification when the AQI score is greater than 100. The two most effective methods to decrease exposure to outdoor air pollution are: 1) limit the duration of time spent outdoors; and 2) decrease the intensity of outdoor activities.

Sensitive Groups should modify outdoor activity when the AQI>100. The general public should modify outdoor activity when the AQI>150. For the purpose of managing population health, the U.S. Department of Health and Human Services characterizes the energy needed to conduct physical activity in units known as Metabolic Equivalent of Tasks (METs). Light-intensity physical activities (such as walking 2 miles per hour) require less than 3.0 METs of energy. Moderate-intensity physical activities (such as walking 3 miles per hour) require 3.0-6.0 METs of energy. Vigorous-intensity physical activities (such as running a 10-minute mile) require greater than 6.0 METs of energy. When activity modification is recommended due to the AQI, outdoor physical activity should be limited to light- or moderate-intensity activities, or a combination of activities and rest periods that require no more than 6.0 METs. A list of common physical activities and military duties with corresponding MET levels are shown in **Appendix C**.

e. The U.S. EPA makes no recommendation regarding the use of filtering masks in elevated PM environments, but states that individuals who are outside for extended periods in smoky environments (like those resulting from wildfires) may benefit from wearing an N95 respirator (mask). When sized and worn according to manufacturer's guidelines, an N95 mask may be effective at blocking 95% of PM_{2.5} particles, but may also restrict airflow and increase the labor necessary to breathe. N95 masks provide no protection against gaseous forms of air pollution (e.g., O₃, CO, NO₂, and SO₂).

5. Policy.

a. USFK commanders, administrators, and leaders will monitor the AQI in order to take appropriate measures to protect personnel from poor air quality. The World Air Quality Index website (<http://aqicn.org/map/southkorea/>) is the official source for AQI information for this policy. Commanders will employ risk management principles to mitigate the dangers caused by poor air quality levels. Individuals who experience physical symptoms such as coughing, chest pain, shortness of breath, fatigue, palpitations, or other related symptoms while exposed to poor air quality environments should seek immediate medical attention.

b. The USFK Air Quality Index Guide to Outdoor Activity is found in **Appendix B**. USFK Commands and Service Members will follow recommendations for behavior modification in elevated AQI environments for non-mission critical activities. All USFK personnel and their families should abide by the following restrictions for outdoor activities:

(1) **Good.** AQI is Green (0-50). No limitations to outdoor activities.

(2) **Moderate.** AQI is Yellow (51-100).

(a) General Public and Military Non-Mission Critical Activities: No limitations.

(b) Sensitive Groups: Individuals who are *unusually sensitive* to poor air quality should consider reducing prolonged or heavy exertion and monitor themselves for symptoms such as coughing or shortness of breath.

(c) Schools (DODEA), Child Development Centers (CDC), and Child and Youth Services (CYS):

1. Recess and Other Outdoor Activities: No limitations.

2. Physical Education (PE) Class: Monitor sensitive individuals and limit their vigorous activities.

3. Athletic Practice and Training: Monitor sensitive individuals and limit their vigorous activities.

4. Scheduled Athletic Event: Monitor sensitive individuals and limit their vigorous activities.

(3) **Unhealthy for Sensitive Groups.** AQI is Orange (101-150).

(a) General Public and Military Non-Mission Critical Activities: No limitations.

(b) Sensitive Groups: Reduce prolonged or heavy exertion. Take more breaks and reduce intensity of activities. Watch for symptoms such as coughing, chest pain, or difficulty breathing. Follow individual treatment care plan.

(c) DODEA, CDC, and CYS:

1. Recess and Other Outdoor Activities less than 30 minutes: It's OK to be active outside for short periods. Watch for symptoms such as coughing, chest pain, or difficulty breathing. Monitor students with chronic medical conditions and follow treatment care plans.

2. PE Class: It's OK to be active outside for short periods. Watch for symptoms such as coughing, chest pain, or difficulty breathing. Monitor students with chronic medical conditions and follow treatment care plans.

3. Athletic Practice and Training: Take more breaks and reduce intensity of activities. Watch for symptoms such as coughing, chest pain, or difficulty breathing. Monitor individuals with chronic medical conditions and follow treatment care plans.

4. Scheduled Athletic Event: Increase rest periods and substitutions for all participants to lower breathing rates. Watch for symptoms such as coughing, chest pain, or difficulty breathing. Monitor individuals with chronic medical conditions and follow treatment care plans.

(4) **Unhealthy.** AQI is Red (151-200).

(a) General Public and Military Non-Mission Critical Activities: Reduce prolonged or heavy exertion. Take more breaks and reduce intensity of outdoor activities.

(b) Sensitive Groups: Avoid prolonged or heavy exertion. Consider moving activities indoors or rescheduling.

(c) DODEA, CDC, and CYS:

1. Recess and Other Outdoor Activities: Keep all students indoors.

2. PE Class: Conduct PE indoors in an environment with good air quality.

3. Athletic Practice and Training: Conduct practice and training indoors in an environment with good air quality.

4. Scheduled Athletic Event: Consider rescheduling event. If outdoor event is held, have emergency medical support immediately available. Increase rest periods and substitutions for all participants to lower breathing rates. Monitor individuals with chronic medical conditions and follow treatment care plans.

(5) **Very Unhealthy.** AQI is Purple (201-300).

- (a) General Public and Military Non-Mission Critical Activities: Avoid prolonged or heavy exertion. Consider moving activities indoors or rescheduling.
- (b) Sensitive Groups: Avoid all physical activity outdoors. Move activities indoors or reschedule.
- (c) DODEA, CDC, and CYS:
 - 1. Recess and Other Outdoor Activities: Keep all students indoors.
 - 2. PE Class: Conduct PE indoors in an environment with good air quality.
 - 3. Athletic Practice and Training: Conduct practice and training indoors in an environment with good air quality.
 - 4. Scheduled Athletic Event: Reschedule event.

(6) **Hazardous.** AQI is Maroon (301-500).

- (a) General Public and Military Non-Mission Critical Activities: Avoid all physical activity outdoors. Move activities indoors or reschedule.
- (b) Sensitive Groups: Avoid all physical activity outdoors.
- (c) DODEA, CDC, and CYS:
 - 1. Recess and Other Outdoor Activities: Keep all students indoors.
 - 2. PE Class: Conduct PE indoors in an environment with good air quality.
 - 3. Athletic Practice and Training: Conduct practice and training indoors in an environment with good air quality.
 - 4. Scheduled Sporting Event: Reschedule event.

c. Military Physical Training (PT). Regular PT is critical to the health, fitness, readiness, and well-being of Service Members, and to the readiness, mission, and esprit d 'corps of military units. Commanders are responsible for the safety, well-being, and readiness of their units and the Service Members who serve within them. For the purposes of this policy, PT is considered a non-mission critical activity. When air quality is Unhealthy (AQI>150), Commanders and unit leaders should adjust the timing, location, intensity, duration, and type of PT to mitigate the health threat of poor air quality with an emphasis to perform PT indoors if possible. When outdoor activity modification is recommended, outdoor exercise intensity should be limited to light- or moderate-

intensity activities or a combination of activities and rest periods that require no more than 6.0 METs as outlined in **Appendix C**.

d. Military Physical Fitness Test (PFT). The PFT is a critical measure of an individual Service Member's physical fitness and a unit's PT program and requires the Service Member's maximal performance. While the PFT is a semi-annual training requirement for Service Members, it is considered a non-mission critical activity for the purpose of this policy. Prolonged or heavy exertion in poor air quality environments may be hazardous to a Service Member's health or may lead to suboptimal performance in the PFT. The PFT should not be conducted outdoors if the AQI is reported as Red (151-200) or higher. Commanders should reschedule the PFT to periods of better air quality unless exceptional circumstances exist or perform the test indoors.

e. Elective Use of Filtering Masks by Service Members in Uniform during Elevated PM Air Pollution Levels:

(1) Policy. As an adjunct to behavior modification and to allow Service Members maximal control over their personal health and wellness, military personnel are authorized to wear a particulate filtering mask while outdoors in uniform when the AQI is reported as Orange (101-150) or higher for PM. Elective wear of masks indoors is not authorized. Military personnel may monitor local AQI via the World Air Quality Index website (<http://aqicn.org/map/southkorea/>) and may elect to wear masks when the AQI > 100 in the vicinity closest to their location. Members with medical conditions worsened by exposure to PM may wear a mask in uniform during periods when AQI is less than Orange (101-150) and indoors with an approved medical exemption from their provider.

(2) Authorized Masks. National Institute of Occupational Safety and Health (NIOSH)-approved masks with filtration ratings of N-95 or higher are authorized for elective wear in uniform. Masks certified by the Korean Ministry of Food and Drug Safety with filtration ratings of KF-94 or higher are also authorized. Masks must be solid black and must cover both mouth and nose at all times during wear, but may not cover ears or eyes. Military personnel electing to wear masks during elevated PM events must follow all manufacturer instructions for proper wear and maintenance of their masks. Masks must be removed when entering security checkpoints for identity verification purposes.

(3) Unit Procurement and Issuance of N95 Masks for Elective Wear. Units are not authorized to issue masks for elective wear to Service Members, and may not use operational funds to procure masks for elective wear.

f. Mission Essential Operations in Poor Air Quality Environments. When a task essential to a military mission must be executed in an Unhealthy (AQI > 150) air quality environment, Commanders should implement mitigation strategies to limit exposure to the poor air quality environment in accordance with **Appendix B**, including modification of work location (e.g. indoors), activity intensity/duration, work-rest cycles, or use of a N-95 filtering face piece in accordance with Service Respiratory Protection program requirements.

6. Responsibilities

a. USFK Service Component Commanders:

(1) Publish and enforce procedures and guidance that ensure all personnel assigned or attached to their command understand and comply with this regulation.

(2) Ensure commanders and leaders at all levels implement appropriate measures as established in **Appendix B** of this regulation to mitigate the health effects of poor air quality on personnel in their commands.

(3) Monitor AQI conditions and forecasts daily, or more frequently as needed, via the World Air Quality Index website (<http://aqicn.org/map/southkorea/>) in order to follow guidance of “USFK Air Quality Index Guide to Outdoor Activities” in **Appendix B**, and to implement modified activities as described in this regulation.

(4) Include air quality activity restrictions in Risk Management, Health Promotion, and Injury Prevention Plans in order to reduce the negative health effects caused by exposure to poor air quality and ensure unit readiness.

(5) Ensure unit personnel at all levels and their families are aware of the negative health effects caused by exposure to poor air quality, the measures that can be taken to reduce exposure, and the need to adhere to the appropriate activity restrictions.

b. Installation Commanders:

(1) During poor (AQI>100) air quality events, actively publicize mitigation recommendations to communities on appropriate command information networks in order to increase USFK personnel and families’ awareness per **Appendix B**.

(2) Assess policies, procedures, risks, and benefits regarding filter exchanges in air handling systems in government living quarters and office spaces in anticipation of seasonal increase in outdoor PM levels.

(3) Ensure DODEA schools, Child Development Centers, and Child and Youth Services monitor the local AQI and follow mitigation recommendations pertaining to outdoor activities in accordance with this regulation.

c. USFK J33: Publish daily AQI and forecasts through established command information networks in a timely manner.

d. USFK PAO and Safety Office: Publicize safety tips and air quality alert warnings on appropriate command information networks and USFK websites during periods of poor air quality to increase USFK personnel and families’ awareness.

e. Commander, Armed Forces Network (AFN)-Korea: Utilize appropriate media platforms to disseminate safety tips and poor air quality alert warnings and forecast notices in a timely manner.

f. Superintendent of DODEA Pacific-West and Coordinators of USFK CDC and CYS:

(1) Establish systems and procedures to monitor poor air quality forecasts and alerts and modify activities accordingly.

(2) Identify high-risk individuals and implement activity restriction recommendations in accordance with **Appendix B**.

g. USFK Command Surgeon: Serve as the USFK Air Quality Policy regulation proponent on individual and unit health awareness sharing activity restriction recommendations, protective procedures, and policy matters.

Appendix A References

Section I. Required Publications

AFH 10-222 VOL 4, Environmental Conditions for Overseas Contingency Operations.

AFPD 90-8, Environment, Safety, and Occupational Health Management and Risk Management.

AR 11-34, The Army Respiratory Protection Program.

AR 200-1, Environmental Protection and Enhancement.

FM 3-3.45/MCRP 4-11B, Environmental Considerations.

DOD Directive 4715.1E, Environment, Safety and Occupational Health.

DOD Directive 6200. 04, Force Health Protection.

DOD Directive 6490.02E, Comprehensive Health Surveillance.

DOD Instruction 1010.10, Health Promotion and Disease Prevention.

OPNAV M-5090.1, Environmental Readiness Program Manual.

Section II. Related Publications

U.S. Army Public Health Center, 2018. 2018 Health of the Force, [<https://phc.amedd.army.mil/topics/campaigns/hof>]

U.S. Department of Health and Human Services, 2018. Physical Activity Guidelines for Americans, 2nd edition. Washington, DC: U.S. Department of Health and Human Services. [https://health.gov/paguidelines/second-edition/pdf/Physical_Activity_Guidelines_2nd_edition.pdf]

U.S. Environmental Protection Agency, 2014. Air Quality Index: A Guide to Air Quality and Your Health, EPA-456/F-14-002, Office of Air Quality Planning and Standards, Outreach and Information Division, Research Triangle Park, NC. [https://www3.epa.gov/airnow/aqi_brochure_02_14.pdf]

U.S. Environmental Protection Agency, 2015. Air Quality Guide for Particle Pollution, EPA-456/F-15-005, Office of Air Quality and Radiation. [https://www3.epa.gov/airnow/air-quality-guide_pm_2015.pdf]

U.S. Environmental Protection Agency, 2015. Air Quality Guide for Ozone, EPA-456/F-15-006, Office of Air Quality and Radiation. [https://www3.epa.gov/airnow/ozone/air-quality-guide_ozone_2015.pdf]

DOD Instruction 6055.01, DOD Safety and Occupational Health Program.

DOD Instruction 6055.05, Occupational and Environmental Health.

The 2011 Compendium of Physical Activities.

Appendix B: USFK Air Quality Index Guide to Outdoor Activities

Korea CAI	US EPA AQI	Recommended Behavioral Guidelines and Activity Modifications						
		General Public and Military Non-Mission Critical Activities		Sensitive Groups****		Schools, Child Development Centers, and Child and Youth Services		
		Recess and Other Outdoor Activities (typically <30 minutes)		Physical Education (P.E) Class (typically <1 hour)		Athletic Practice and Training (typically <4 hours)		Scheduled Athletic Event (typically <4 hours)
Good (0-50)	Good (0-50)	No limitations to outdoor activities. It's a great day to be active outside!						
Moderate (51-100)	Moderate (51-100)	No limitations	Unusually Sensitive Individuals: Consider reducing prolonged or heavy exertion. Watch for symptoms such as coughing or shortness of breath.	No limitations	Monitor sensitive individuals and limit their vigorous activities.	Monitor sensitive individuals and limit their vigorous activities.	Monitor sensitive individuals and limit their vigorous activities.	Increase rest periods and substitutions for all participants to lower breathing rates. Watch for symptoms such as coughing, chest pain, or difficulty breathing. Monitor individuals with chronic medical conditions & follow treatment care plans.
Unhealthy (101-250)	Unhealthy for Sensitive Groups (101-150)	No limitations	Reduce prolonged or heavy exertion. Take more breaks and reduce intensity of activities. Watch for symptoms such as coughing, chest pain, or difficulty breathing. Follow individual treatment care plan.	It's OK to be active outside for short periods. Watch for symptoms such as coughing, chest pain, or difficulty breathing. Monitor students with chronic medical conditions and follow treatment care plans.	It's OK to be active outside for short periods. Watch for symptoms such as coughing, chest pain, or difficulty breathing. Monitor students with chronic medical conditions and follow treatment care plans.	Take more breaks and reduce intensity of activities. Watch for symptoms such as coughing, chest pain, or difficulty breathing. Monitor individuals with chronic medical conditions and follow treatment care plans.	Consider rescheduling event. If outdoor event is held, have emergency medical support immediately available. Increase rest periods and substitutions for all participants to lower breathing rates. Monitor individuals with chronic medical conditions and follow treatment care plans.	
	Unhealthy (151-200)	Reduce prolonged or heavy exertion. Take more breaks and reduce intensity of outdoor activities.	Avoid prolonged or heavy exertion. Consider moving activities indoors or rescheduling.	Keep all students indoors.	Conduct P.E indoors in an environment with good air quality.	Conduct practice and training indoors in an environment with good air quality.		
Very Unhealthy (251-500)	Very Unhealthy (201-300)	Avoid prolonged or heavy exertion. Consider moving activities indoors or rescheduling.	Avoid all physical activity outdoors. Move activities indoors or reschedule.	Keep all students indoors.	Conduct P.E indoors in an environment with good air quality.	Conduct practice and training indoors in an environment with good air quality.	Reschedule event.	
	Hazardous (301-500)	Avoid all physical activity outdoors. Move activities indoors or reschedule.	Avoid all physical activity outdoors.	Keep all students indoors.	Conduct P.E indoors in an environment with good air quality.	Conduct practice and training indoors in an environment with good air quality.	Reschedule event.	

****Sensitive Groups include people with heart or lung disease, older adults (who may have undiagnosed heart or lung disease), and children.

Appendix C

Metabolic Equivalent of Tasks (METs) for Various Activities

(→ annotates activities ≤ 6.0 METs)

METs	Military Activities	METs	Conditioning
→ 3.8	Calisthenics, moderate effort	→ 5.0	Aerobics, low impact
8.0	Calisthenics, vigorous effort	7.3	Aerobics, high impact
→ 5.0	Carrying Load, <50#	7.5	Aerobics, 8" step
6.5	Carrying Load, load 50-74#	9.5	Aerobics, 12" step
7.5	Carrying Load, load 75-99#	→ 4.3	Circuit Training, moderate effort
8.5	Carrying Load, load >100#	8.0	Circuit Training, vigorous effort
8.0	Carrying Load, load <50#, upstairs	→ 5.0	Elliptical Trainer, moderate effort
→ 6.0	Marching, cross country	→ 3.0	Pilates
→ 4.5	Marching, no pack, moderate speed	→ 3.5	Resistance Training, weight lifting, moderate
5.0	Military Obstacle Course	→ 6.0	Resistance Training, weight lifting, vigorous
→ 2.5	Shooting, pistol or rifle	8.8	Rope Jumping <100 skips/min
		11.8	Rope Jumping 100-120 skips/min
		12.3	Rope Jumping >120 skips/min
		→ 4.8	Rowing, stationary, moderate
		7.0	Rowing, stationary, 100 watts
		8.5	Rowing, stationary, 150 watts
		12.0	Rowing, stationary, 200 watts
		9.0	Stairmaster
		→ 5.8	Swimming (freestyle laps), moderate effort
		9.8	Swimming (freestyle laps), vigorous effort
		→ 4.0	Yoga (power)
METs	Walk-Run	METs	Sports
→ 3.5	Walking 3 mph	→ 5.5	Badminton, general
→ 4.3	Walking 3.5 mph	→ 5.0	Baseball or Softball
→ 5.0	Walking 4 mph	→ 4.5	Basketball, shooting baskets
7.0	Walking 4.5 mph	→ 6.0	Basketball (non-game), general
8.3	Walking 5 mph	8.0	Basketball (game), general
→ 6.0	Jog/Walk Combination (jogging <10 min)	→ 2.8	Canoeing <4 mph
→ 6.0	Running 15 min/mile	→ 5.8	Canoeing 4-6 mph
8.3	Running 12 min/mile	12.5	Canoeing >6 mph
9.8	Running 10 min/mile	→ 4.0	Football (flag or touch), light effort
10.5	Running 9 min/mile	8.0	Football (flag or touch), competitive
11.5	Running 8 min/mile	→ 4.8	Golf
12.3	Running 7 min/mile	→ 5.0	Kayaking, moderate
14.5	Running 6 min/mile	8.0	Lacrosse
19.0	Running 5 min/mile	→ 5.3	Martial Arts, practice
23.0	Running 4.3 min/mile	10.3	Martial Arts, moderate effort
		7.0	Racquetball, general
		→ 5.8	Rock Climbing, moderate difficulty
		7.5	Rock Climbing, high difficulty
		7.5	Rollerblading, 9 mph
		11.0	Rollerblading, 11 mph
		12.3	Rollerblading, 13 mph
		6.3	Rugby
		8.3	Rugby, competitive
		7.0	Skating, ice
		→ 4.3	Skiing, alpine/snowboard, light
		→ 5.3	Skiing, alpine/snowboard, moderate
		8.0	Skiing, alpine/snowboard, vigorous
		9.0	Skiing, cross-country, <5 mph
		12.5	Skiing, cross-country, 5-8 mph
		15.0	Skiing, cross-country, >8 mph
		7.0	Soccer
		10.0	Soccer, competitive
		7.3	Squash
		7.3	Tennis
		→ 4.0	Volleyball
		→ 6.0	Volleyball, competitive
		8.0	Volleyball, beach
METs	Bicycling		
→ 4.0	Bicycling <10 MPH		
6.8	Bicycling 10-11.9 MPH		
8.0	Bicycling 12-13.9 MPH		
10.0	Bicycling 14-15.9 MPH		
12.0	Bicycling 16-19.9 MPH		
15.8	Bicycling >20 MPH		
→ 4.8	Bicycling (stationary) <90 watts		
6.8	Bicycling (stationary) 90-100 watts		
8.8	Bicycling (stationary) 101-160 watts		
11.0	Bicycling (stationary) 161-200 watts		
14.0	Bicycling (stationary) >200 watts		
METs	Work		
→ 4.0	Automobile Repair		
→ 6.0	Carpentry		
→ 4.0	Construction		
→ 3.8	Custodial Work, moderate effort		
→ 5.0	Digging or Shoveling Sand, moderate effort	→ 4.3	Skiing, alpine/snowboard, light
7.8	Digging or Shoveling Sand, vigorous effort	→ 5.3	Skiing, alpine/snowboard, moderate
8.0	Firefighting	8.0	Skiing, alpine/snowboard, vigorous
→ 4.5	Home Repair, moderate effort	9.0	Skiing, cross-country, <5 mph
→ 6.0	Home Repair, vigorous effort	12.5	Skiing, cross-country, 5-8 mph
→ 4.3	Household Tasks (mopping, sweeping, etc)	15.0	Skiing, cross-country, >8 mph
→ 4.5	Manual Labor (general), moderate effort	7.0	Soccer
→ 6.5	Manual Labor (general), vigorous effort	10.0	Soccer, competitive
→ 5.5	Mowing Lawn	7.3	Squash
→ 5.3	Shoveling Snow, moderate effort	7.3	Tennis
7.5	Shoveling Snow, vigorous effort	→ 4.0	Volleyball
→ 4.0	Yard Work, moderate effort	→ 6.0	Volleyball, competitive
→ 6.0	Yard Work, vigorous effort	8.0	Volleyball, beach

Appendix D Air Quality Particle Pollution Information Card

Key Facts to Know About Particle Pollution:

- Particle pollution can cause serious health problems – including asthma attacks, heart attacks, strokes and early death.
- Particle pollution can be a problem at any time of the year, depending on where you live.
- You can reduce your exposure to pollution and still get exercise! Use daily Air Quality Index (AQI) forecasts at www.airnow.gov to plan your activity.

What is particle pollution?

Particle pollution comes from many different sources. Fine particles (2.5 micrometers in diameter and smaller) come from power plants, industrial processes, vehicle tailpipes, woodstoves, and wildfires. Coarse particles (between 2.5 and 10 micrometers) come from crushing and grinding operations, road dust, and some agricultural operations.

Why is particle pollution a problem?

Particle pollution is linked to a number of health problems, including coughing, wheezing, reduced lung function, asthma attacks, heart attacks and strokes. It also is linked to early death.

Do I need to be concerned?

While it's always smart to pay attention to air quality where you live, **some people may be at greater risk from particle pollution.** They include:

- People with cardiovascular disease (diseases of the heart and blood vessels)
- People with lung disease, including asthma and COPD
- Children and teenagers
- Older adults
- Research indicates that obesity or diabetes may increase risk.
- New or expectant mothers may also want to take precautions to protect the health of their babies.

How can I protect myself?

Use AQI forecasts to plan outdoor activities. On days when the AQI forecast is unhealthy, take simple steps to reduce your exposure:

- Choose a less-strenuous activity
- Shorten your outdoor activities
- Reschedule activities
- Spend less time near busy roads

When particle levels are high outdoors, they can be high indoors – unless the building has a good filtration system.

Keep particles lower indoors:

- Eliminate tobacco smoke
- Reduce your use of wood stoves and fireplaces
- Use HEPA air filters and air cleaners designed to reduce particles
- Don't burn candles

Can I help reduce particle pollution?

Yes! Here are a few tips.

- Drive less: carpool, use public transportation, bike or walk
- Choose ENERGY STAR appliances
- Set thermostats higher in summer and lower in winter
- Don't burn leaves, garbage, plastic or rubber
- Keep car, boat and other engines tuned



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Seoul clear $PM_{2.5} < 30 \mu g/m^3$ Seoul poor $PM_{2.5} < 500 \mu g/m^3$

Appendix E Air Quality Ozone Information Card

Key Facts to Know About Ozone:

- Ozone in the air we breathe can cause serious health problems, including breathing difficulty, asthma attacks, lung damage, and early death.
- Ozone forms in the sun, usually on hot summer days. Ozone is worse in the afternoon and early evening, so plan outdoor activities for the morning.
- You can reduce your exposure to ozone and still get exercise! Use the Air Quality Index (AQI) at www.airnow.gov to plan your activity.

What is ozone?

Ozone is a colorless gas that can be good or bad, depending on where it is. Ozone in the stratosphere is good because it shields the earth from the sun's ultraviolet rays. Ozone at ground level, where we breathe, is bad because it can harm human health.

Ozone forms when two types of pollutants (VOCs and NOx) react in sunlight. These pollutants come from sources such as vehicles, industries, power plants, and products such as solvents and paints.

Why is ozone a problem?

Ozone can cause a number of health problems, including coughing, breathing difficulty, and lung damage. Exposure to ozone can make the lungs more susceptible to infection, aggravate lung diseases, increase the frequency of asthma attacks, and increase the risk of early death from heart or lung disease.

Do I need to be concerned?

Even healthy adults can experience ozone's harmful effects, but **some people may be at greater risk**. They include:

- People with lung disease such as asthma
- Children, including teenagers, because their lungs are still developing and they breathe more air per pound of body weight than adults
- Older adults
- People who are active outdoors, including outdoor workers

How can I protect myself?

Use the Air Quality Index (AQI) to plan outdoor activities. To keep the AQI handy, sign up for EnviroFlash emails, get the free AirNow app, or install the free widget on your website. Find all of these tools at www.airnow.gov.

Stay healthy: exercise, eat a balanced diet, and keep asthma under control with your asthma action plan.

When you see that the AQI is unhealthy, take simple steps to reduce your exposure:

- Choose a less-strenuous activity
- Take more breaks during outdoor activity
- Reschedule activities to the morning or to another day
- Move your activity inside where ozone levels are usually lower

Can I help reduce ozone?

Yes! Here are a few tips.

- Turn off lights you are not using
- Drive less: carpool, use public transportation, bike or walk
- Keep your engine tuned, and don't let your engine idle
- When refueling: stop when the pump shuts off, avoid spilling fuel, and tighten your gas cap
- Inflate tires to the recommended pressure
- Use low-VOC paint and cleaning products, and seal and store them so they can't evaporate
- Watch for Air Quality Action Days in your area



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Glossary

Section I. Abbreviations

AFH	Army Family Housing
AFN	Armed Forces Network
AFPD	Air Force Policy Directive
AQI	Air Quality Index
AR	Army Regulation
CAI	Comprehensive Air-quality Index
CDC	Child Development Centers
CO	carbon monoxide
CYS	Child and Youth Services
FKSG	Office of the Command Surgeon
DOD	Department of Defense
DODEA	Department of Defense Education Activity
EMO	Electronic Media Only
EPA	U.S. Environmental Protection Agency
FM	Field Manual
HQ	Headquarters
MET	Metabolic Equivalent of Task
NAFI	Non-Appropriated Fund Instrumentality
NIOSH	National Institute of Occupational Safety and Health
NO ₂	nitrogen dioxide
O ₃	ozone
OPNAV	Office of the Chief of Naval Operations
PAO	Public Affairs Office
PE	Physical Education

PFT	Physical Fitness Test
PM	particulate matter
PM _{2.5}	PM with an aerodynamic diameter ≤ 2.5 micrometers
PM ₁₀	PM with an aerodynamic diameter ≤ 10 micrometers
PT	Physical Training
ROK	Republic of Korea
SOFA	Status of Forces Agreement
SO ₂	sulfur dioxide
U.S.	United States
USAF	United States Air Force
USFK	United States Forces, Korea

Section II. Terms

Air Quality Index (AQI). The AQI is an index for reporting daily air quality. It communicates how clean or unhealthy the outdoor air is, and what associated health effects might be a concern. The AQI focuses on health effects experienced within a few hours or days after breathing unhealthy air. The AQI is calculated for air pollutants regulated by the Clean Air Act including ground-level ozone, particle pollution, carbon monoxide, and sulfur dioxide. For each of these pollutants, EPA has established national air quality standards to protect public health and welfare.

Carbon Monoxide (CO). Carbon monoxide is an odorless, colorless gas. It forms when the carbon in fuels does not completely burn. Vehicle exhaust contributes roughly 75 percent of all carbon monoxide emissions nationwide, and up to 95 percent in cities. Other sources include fuel combustion in industrial processes and natural sources such as wildfires.

Metabolic equivalent of task (MET). An MET refers to the energy expenditure required to carry out a specific activity, and 1 MET is the rate of energy expenditure while sitting at rest. This generally corresponds to an oxygen uptake of 3.5 milliliters per kilogram of body weight per minute. Physical activities frequently are classified by their intensity using the MET value as a reference.

Nitrogen Dioxide (NO₂). NO₂ forms from ground-level emissions related to the burning of fossil fuels from vehicles, power plants, industrial sources, and off-road equipment, such as construction vehicles and lawn and garden equipment. In addition to contributing to ground-level ozone formation, NO₂ is linked with a number of adverse effects on the respiratory system. NO₂ reacts with ammonia, moisture, and other compounds to form small particles.

Ozone (O₃). Ozone is a colorless gas that can be good or bad, depending on where it is. Ozone in the stratosphere is good because it shields the earth from the sun's ultraviolet rays. Ozone at ground level, where we breathe, is bad because it can harm human health.

Particle Pollution. Particle pollution (also known as particulate matter) comes from many different sources. Fine particles (2.5 micrometers in diameter and smaller) come from power plants, industrial processes, vehicle tailpipes, woodstoves, and wildfires. Coarse particles (between 2.5 and 10 micrometers) come from crushing and grinding operations, road dust, sand, and some agricultural operations.

Poor Air Quality. Poor air quality is defined as an Air Quality Index (AQI)>100 for Sensitive Groups and an AQI>150 for the general public, including Service Members. Awareness and behavior modification begin when the AQI score is greater than 100.

SOFA Status Personnel. The categories of those persons, defined in Articles I and XV of the SOFA, provided status and protection under the SOFA. For purposes of this regulation, it includes those members of the United States armed forces, civilian persons of United States nationality who are in the employment of, serving with, or accompanying the United States armed forces in the Republic of Korea, and their dependents; and properly designated invited contractors and their approved employees and dependents whose presence in Korea (and by default whose travel to Korea) is solely attributed to the performance of contracts with or for the U.S. armed forces in Korea, and qualify for status and protection under the SOFA.

Status of Forces Agreement (SOFA). The international agreement between the U.S. of America and the Republic of Korea envisaged by Article IV of the U.S.-ROK Mutual Defense Treaty.

Sulfur Dioxide (SO₂). Sulfur dioxide, a colorless, reactive gas, is produced when sulfur-containing fuels such as coal and oil are burned. Generally, the highest levels of sulfur dioxide are found near large industrial complexes. Major sources include power plants, refineries, and industrial boilers.

Yellow Sand/Asian Dust. A seasonal meteorological phenomenon which affects much of East Asia periodically during the springtime months. This occurrence starts with a dust storm that originates in the deserts of Mongolia and Northern China and moves/appears as a distinct yellow cloud across the Korean peninsula.