



Major Health Hazard Management

Why is this Group Standard important?	<p>The health and wellbeing of our people is a key priority, and it is our objective to provide workplaces which are free from work-related injuries, incidents, and illnesses. It sets out the <i>critical controls</i> that we implement for managing <i>major health hazards</i> as we seek to eliminate or minimise the likelihood of work-related ill-health, disease or fatalities.</p> <p>This standard must be read in conjunction with the <i>Health Hygiene and Wellbeing Standard Group Standard</i>, which sets out AGA's occupational exposure limits (OELs) and monitoring methodologies.</p>	
Audience	Anyone who is working at an AngloGold Ashanti work site, including directors, employees, contractors and consultants.	
Legend	<p><i>Glossary terms</i> are in italics.</p> <p>Hyperlink to another document or to an intranet site or website.</p> <p><i>Reference</i> to another AGA document without a hyperlink.</p>	
Glossary	<i>Airborne pollutant</i>	Contamination of outdoor and indoor environments by any chemical, physical or biological agent that modifies the natural characteristics of the atmosphere. In particular, dusts that are released during mechanical disintegration of matter caused by activities such as grinding, polishing, drilling, crushing or handling materials.
Glossary	<i>Critical control</i>	<p>Control that, if compromised, may lead to the top event occurring or significantly increase the potential consequences of the event and will include:</p> <ul style="list-style-type: none"> • Those controls that if compromised to any extent may render all other controls in the same pathway or multiple pathways ineffective, which may lead to the top event occurring. • Those controls which independently are likely to prevent the top event occurring, even on failure of other controls in the same or multiple pathways.
Glossary	<i>Fatigue</i>	Fatigue is more than simply feeling tired or drowsy. It is caused by prolonged periods of physical and/or mental exertion without enough time to rest and recover. Fatigue is associated with multiple factors which among others include spending long periods of time awake and having an inadequate amount and/or quality of sleep over an extended period

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	<i>Heat stress</i>	Heat stress occurs when the body's cooling mechanisms are unable to maintain a healthy temperature, leading to heat-related illnesses such as heat exhaustion and heatstroke.
	<i>Major health hazard</i>	A hazard that has a consequence classification of high, major (fatalities or occupation disease that leads to premature death or irreversible permanent disability with significant reduction in quality of life) or extreme (multiple fatalities or widespread, fatal hazardous occupational exposures).

You must comply with AGA Group-wide Standards to the extent they apply

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Major health hazard management

We prevent diseases and fatalities in the workplace, especially *major health hazards* that can lead to premature death or irreversible permanent life altering disability with significant reduction in quality of life. We conduct quantitative risk assessments to identify high risk workplaces, by implementing and monitoring the *critical controls* set out in this document as far as reasonably practicable including enforcement of appropriate PPE in demarcated high-risk areas. In accordance with the **Health, Hygiene and Wellbeing Group Standard**, we routinely monitor occupational health hazard exposures and conduct periodic risk-based medical surveillance to monitor potential adverse effects from health hazard exposures; as well as provide induction, training and awareness on the prevention and control of these hazards.

Airbourne pollutants

While the critical controls outlined below are aimed at reducing exposure to a variety of airborne pollutants, AGA puts specific focus on seeking to eliminate and control exposures to airborne pollutants that have a carcinogenic effect on a worker, such as crystalline silica dust, welding fumes and diesel particulate matter (DPM). See [Appendix 1](#) for the occupational exposure limits for these airborne pollutants.

- **Critical control 1:** Enclose (with sealed doors and windows) all operator cabins on drilling equipment and heavy mobile equipment where the equipment design allows.
- **Critical control 2:** Mitigate dust emissions at the feed and discharge points of chutes and bins through the use of rubber seals between stationary and moving components and enclosing these points where reasonably practicable.
- **Critical control 3:** Where drilling methodology allows, use wet drilling methods to prevent dust liberation for underground drilling equipment.
- **Critical control 4:** Ensure that the dust filtration system on drill rigs is operational, for all drilling machinery that do not use water for drilling.
- **Critical control 5:** Provide adequate ventilation in enclosed operational mining areas where *airborne pollutants* are liberated, to adequately dilute or remove pollutants from workplaces.
- **Critical control 6:** Install (fine mist) spray systems or fogger sprays along main ore transfer points/ conveyor belts, main transfer points and underground mining tips.
- **Critical control 7:** Use dust suppressing chemical surfactants, hygroscopic salts, films, or water trucks/bowsers to treat the road surface in haul ways, tram ways and roadways used to transport ore.
- **Critical control 8:** Issue welders with portable flammable gas detection device, when welding is not conducted in a dedicated welding bay (for example, in confined spaces or in poorly ventilated areas).
- **Critical control 9:** Minimise DPM emissions by completing regular maintenance on all diesel operated machinery to ensure they operate at their optimal efficiency.
- **Critical control 10:** Retrofit diesel oxidation catalysts (DOC) or diesel particulate filters onto the exhaust of tier 1 and 2 diesel equipment and machinery.

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- *Critical control 11:* Make use of Ad-blue fluid on diesel machinery to reduce the nitrous oxide emissions.
- *Critical control 12:* Ensure that appropriate PPE is issued and used when working in a dusty environment (see [Appendix 1](#)). Clearly identify, demarcate and use appropriate signage in all areas where PPE is required to mitigate the risk of exposure.
- *Critical control 13:* Conduct respiratory fit testing for workers required to use respiratory protection to ensure correct fit and prevention of inhalation of *airborne pollutants*.

Noise

- *Critical control 1:* Provide enclosed cabins with sound absorbing material (fibreglass or mineral wool) on mobile equipment with operator cabins emitting high levels of noise more than 98dB.
- *Critical control 2:* Fit equipment that emits an average noise greater than 98dB noise with silencers or mufflers, as far as reasonably practicable.
- *Critical control 3:* Segregate workers from compressors and plan the layout of compressors to minimize noise propagation to work areas or other occupied spaces.
- *Critical control 4:* During procurement processes, choose equipment with lower noise emissions (105dB and lower) where reasonably practicable.
- *Critical control 5:* Conduct area noise monitoring to identify noisy areas and use signage to clearly demarcate operational areas where the 8hr time weighted average noise levels exceed 85dB.
- *Critical control 6:* Ensure that appropriate PPE is issued and used when working in environments with more than 85dB noise exposure. The Hearing Protection Device/s selected and used should reduce/attenuate personal noise exposure (see [Appendix 1](#)) to less than 85dB.

Heat stress

- *Critical control 1:* Ensure that there is a comprehensive *heat stress* management plan in place, with adequate risk assessments, monitoring procedures, and specific control measures tailored to the conditions of all operations.
- *Critical control 2:* Establish protocols for the immediate evacuation and treatment of affected workers and ensure that the emergency treatment and communication facilities are available and functional. Have on-site medical personnel to recognize and treat heat-related illnesses promptly.
- *Critical control 3:* Ensure that appropriate PPE is issued and used, such as lightweight, breathable clothing, reflecting gloves, body cooling garments and wide-brimmed hats, while ensuring that it does not compromise safety requirements.
- *Critical control 4:* Implement and monitor participation in an acclimatization program for new workers and those returning from extended absences to gradually build tolerance to hot conditions.
- *Critical control 5:* Implement mechanical cooling systems such as refrigeration for underground operations as far as reasonably practicable. Provide shaded rest areas and cooling devices,

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such as misting fans or portable air-conditioning units, to reduce ambient temperatures for surface operations.

- *Critical control 6:* Provide sufficient air to ventilate underground workplaces to meet the air dilution requirements prescribed by the ventilation department.
- *Critical control 7:* Use screens made of aluminium, perspex or other reflexive material to prevent employee exposure to radiant heat where excessive exposure primarily results from radiant heat (for example, near furnaces-process plants).
- *Critical control:* Encourage frequent drinking of water or electrolyte-replacement beverages (hypotonic fluids) and provide access to cool water stations throughout the mine site. Ensure that workers are tested for hydration levels on a regular basis.
- *Critical control 9:* Schedule regular rest breaks in shaded or air-conditioned areas to allow workers to cool down and recover from heat exposure.
- *Critical control 10:* Plan physically demanding tasks during cooler parts of the day if possible and rotate workers to minimize prolonged exposure to heat.
- *Critical control 11:* Install *heat stress* monitoring devices to measure environmental factors like temperature, humidity, and heat index and implement early warning systems to alert workers and supervisors when conditions become hazardous. Practice emergency drills to entrench workers' response to warnings (have a triggered action and response plan for *heat stress*).

Fatigue

- *Critical control 1:* Ensure that there is a *fatigue* management procedure in place, with adequate workflow and indicators.
- *Critical control 2:* Ensure that tasks are scheduled and resourced adequately and that there are shift arrangements and commuting plans that allow employees adequate time to rest.
- *Critical control 3:* Implement a programme to improve the physical wellbeing and lifestyle of employees; also ensuring that employees maintain a balanced diet; they drink fluids regularly and engage in physical activity.
- *Critical control 4:* Conduct mandatory pre-shift screening for alertness, stress and ill-health prior to employees engaging in demanding tasks. Ensure that there is a mandatory alcohol testing prior to operating heavy mobile equipment.
- *Critical control 5:* Make use of *fatigue* monitoring and intervention technologies for alertness in high-risk areas (for example, heavy mobile equipment operators) to avoid acute sleep.
- *Critical control 6:* Ensure that workplaces are sufficiently illuminated and ventilated to prevent *fatigue*. Plan activities to avoid monotonous tasks, repetitive activities and inertia.

Control assessment and monitoring

- Complete a compliance self-assessment and specific risk analysis against each *major health hazard* annually, by 31 December.
- Use the iSIMS software package to monitor *critical controls*.

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Appendix 1: Occupational exposure limits for major health hazards

Airborne pollutants that have a carcinogenic effect on the worker (refer to the requirements in the <i>Health, Hygiene and Wellbeing Group Standard</i> for other airborne pollutants)			
Health hazard	Occupational exposure limit	Monitoring and analysis	Personal protective equipment (PPE)
Respirable crystalline silica	Exposure to respirable crystalline silica concentration equal to or more than 0.05mg/m ³ over a time-weighted average of an 8-hour work-shift or a 40-hour work-week equivalent.	<ul style="list-style-type: none"> Periodic sampling and chemical analysis of samples to be carried out by a nationally or internationally-accredited laboratory. 	FFP2 masks or full face-piece masks with filtration capacity of 95% or higher
Welding fumes <small>(fumes generated by the manual metal arc or oxy-acetylene welding of iron, mild steel or aluminium)</small>	Exposure to 5 mg/m ³ over a time-weighted average of an 8-hour shift or 40-hour work week equivalent, with the provision that none of the constituent elements exceed their respective OELs, measured as total particulate in the welder's breathing zone.	<ul style="list-style-type: none"> Monitor welding fume emissions to ascertain welders are not excessively exposed to welding fumes. Chemical analysis of samples to be carried out in a nationally or internationally-accredited laboratory. Ensure that the employees adhere to set evacuation alarms associated with any workplace emission levels exceeding set limits. 	FFP2 masks or full face-piece masks with filtration capacity of 95% or higher
Diesel engine exhaust <small>(a mixture of toxic gases and particulates produced from the combustion of diesel fuel)</small>	Exposure to less than 100 µg/m ³ elemental carbon over a time-weighted average of an 8-hour shift or 40-hour work week equivalent. <ul style="list-style-type: none"> Regulation of diesel particulate has used as a measure either total carbon, which is made up of organic carbon plus elemental carbon, or elemental carbon alone. Elemental carbon is believed to be the best measure of diesel particulate matter, as it makes up the bulk of diesel particulate emissions and is less susceptible to interference from other particulate sources in the workplace. 	<ul style="list-style-type: none"> Monitor personal exposure of diesel particulate matter (DPM). Chemical analysis of samples to be carried out in a nationally or internationally-accredited laboratory 	FFP3 masks or full face-piece masks with filtration capacity of 99% or higher

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Other major health hazards			
Health hazard	Occupational exposure limit	Monitoring and analysis	Personal protective equipment (PPE)
Noise	<p>Excessive occupational noise levels (above 85dB) over a time-weighted average of an 8-hour shift or 40-hour work week equivalent, where exposure to such noise has been documented to cause occupational noise-induced hearing loss, tinnitus, disturbance in speech communication and increased risks of accidents.</p> <p>To calculate level of attenuation achieved by available hearing protection device/s (HPD), use the noise reduction rating (NRR) specified by the original equipment manufacturer (OEM), as well as the measured workplace noise exposure levels.</p> <p>The level of attenuation is calculated as (NRR -7 db) ÷2</p> <p><i>Example:</i></p> <p>If workplace noise exposure levels = 93dB and NRR of available HPD = 29dB, then noise reduction/attenuation rating = (29 dB - 7 dB) ÷2 = 11 dB</p> <p>So, with HPD, the noise exposure is reduced to: 93 dBA - 11 dB = 82dB</p>	<ul style="list-style-type: none"> Carry out noise measurement/sampling to identify areas where controls should be put in place, to identify noise zones, mark, demarcate and erect the noise warning signages and for communication. Employees and contractors must notify their supervisor if they are affected by symptoms of hearing loss. 	<ul style="list-style-type: none"> Re-usable or disposable hearing protective devices. The device should have a noise reduction rating that will be sufficient to reduce the equivalent noise exposure level of the user below 85dB.
Heat stress	<p>An abnormally hot environment is any environment where:</p> <p>For underground operations</p> <ul style="list-style-type: none"> dry bulb > 37.0 °C and /or wet bulb temperature > 32.5 °C <p>For surface operations</p> <ul style="list-style-type: none"> wet bulb globe temperature > 30.0 °C in the working environment over a time-weighted average of one hour. 	<ul style="list-style-type: none"> <i>Heat stress</i> management should be a dynamic process, adapting to changing weather conditions and workload demands. Regularly review the effectiveness of control measures, gather feedback from workers, and make necessary adjustments to ensure a safe and healthy work environment. 	<p>Employees and contractors must notify their supervisor if they are affected by symptoms of <i>heat stress</i>.</p>

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