



Government of **Western Australia**  
Department of **Mines, Industry Regulation and Safety**  
**Resources Safety**

## **Surface atmospheric contaminant management audit – guide**

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## **Introduction**

This document was reformatted in November 2015. At this time no material changes were made to the content of the guide, which was originally published in June 2009 under the title *Guide to surface atmospheric contaminant management HIF audit 2009*.

*Note: The Safety Regulation System (SRS) has replaced the AXTAT system and all reporting is done online through SRS.*

# 1 Ventilation Management Plan

## Ventilation Management Plan

Point	Standard	Guideline
1.1	The principal employer has developed and implemented a ventilation management plan.	<p><b>Intent:</b> To verify that a plan has been developed for the identification and control of atmospheric contaminants.</p> <p><b>Personnel:</b> Surface ventilation officer.</p> <p><b>Method:</b> Verify by sighting the ventilation management plan. Refer to MSIR rr. 7.25, 7.27 and 9.12.</p>
1.2	The ventilation management plan identifies the atmospheric contaminants present.	<p><b>Intent:</b> To ensure that every work environment has been assessed for the presence of potentially hazardous atmospheric contaminants.</p> <p><b>Personnel:</b> Surface ventilation officer.</p> <p><b>Method:</b> View the risk assessment document which should comprehensively identify the location and type of contaminant source and the likely level of risk exposure. Refer to MSIR rr. 7.27, 7.28 and 9.12.</p>
1.3	The ventilation management plan identifies the contaminant control methods for each atmospheric contaminant present.	<p><b>Intent:</b> To verify that adequate controls are in place in every work environment to manage the contaminant hazards present.</p> <p><b>Personnel:</b> Surface ventilation officer.</p> <p><b>Method:</b> View the risk assessment document which should specify the type of ventilation control to be utilised. Refer to MSIR rr. 7.28 and 9.12.</p>
1.4	The ventilation management plan includes the appropriate PPE to be worn for each atmospheric contaminant where peak or STEL exposures are likely.	<p><b>Intent:</b> To verify that the PPE worn at the mine is suitable and has been selected to protect employees from contaminants potentially injurious to health.</p> <p><b>Personnel:</b> Surface ventilation officer.</p> <p><b>Method:</b> View the standard of PPE provided. Verify that it is suitable for the type of contaminant and level of exposures encountered in accordance with AS 1715. Refer to MSIR r. 9.12(3).</p>

1.5	<p>The ventilation management plan requires that exposure assessment results are reported to all relevant personnel in an effective, timely and documented manner.</p>	<p><b>Intent:</b> To ensure that a commitment is made that individual employees are informed of their individual sample results.</p> <p><b>Personnel:</b> Surface ventilation officer.</p> <p><b>Method:</b> View the methodology of reporting and informing employees of their results. Ensure that the system of reporting is confidential to protect privacy.</p> <p>Refer to MSIR r. 9.13.</p>
1.6	<p>The ventilation management plan includes a programme for the monitoring and assessment of the atmospheric contaminant exposure of significantly exposed employees on a routine basis.</p>	<p><b>Intent:</b> To verify that individual employees are monitored on an ongoing basis where significantly exposed to atmospheric contaminants potentially injurious to health.</p> <p><b>Personnel:</b> Surface ventilation officer.</p> <p><b>Method:</b> View the monitoring programme established. (Note CONTAM sampling on a quarterly basis is not sufficient to comply with this standard).</p>
1.7	<p>The ventilation management plan includes a system for the identification, reporting, rectification and employee notification requirements of all ventilation and atmospheric contaminant defects.</p>	<p><b>Intent:</b> To verify that management provides a commitment to rectify ventilation defects in a timely manner.</p> <p><b>Personnel:</b> Mine manager, ventilation officer, supervisors, employees.</p> <p><b>Method:</b> View the methods established for the reporting of ventilation and atmospheric contaminant defects, the assigning of responsibilities and the notifications of completion of repairs in the ventilation log book.</p> <p>Refer to MSIA ss. 11, 11A and MSIR rr. 9.6, 9.7, 9.8 and 9.12.</p>

## 2 Ventilation Personnel

### Ventilation Personnel

Point	Standard	Guideline
2.1	The manager has appointed a surface ventilation officer or the mine is exempt by written directive issued by the district inspector.	<p><b>Intent:</b> To verify, that where required, a person is appointed by the Manager to be the surface ventilation officer.</p> <p><b>Personnel:</b> Mine manager and surface ventilation officer</p> <p><b>Method:</b> Verify by examination of the letter of appointment and entry in record book or a written exemption issued by the district inspector. The letter of appointment should include the summary of responsibilities, the area of responsibility and be signed with an acknowledgement of appointment to achieve compliance. Refer to MSIR 9.3(1) and MSIA s 44.</p>
2.2	The district inspector was notified in writing of the appointment.	<p><b>Intent:</b> To verify that the district inspector has been informed in writing of the appointment.</p> <p><b>Personnel:</b> Mine manager and surface ventilation officer.</p> <p><b>Method:</b> Verify by examination of the letter of appointment and cross reference with Department files. Refer to MSIR 9.3(3).</p>
2.3	The surface ventilation officer is appropriately trained and qualified.	<p><b>Intent:</b> To verify that the surface ventilation officer has the qualifications, training and experience to perform the required duties.</p> <p><b>Personnel:</b> Mine manager and surface ventilation officer.</p> <p><b>Method:</b> Verify by interview and sighting qualifications and training records. Refer to with MSIR 9.4(2).</p>

2.4	<p>The surface ventilation officer has the authority in consultation with management to close down operations in areas where dangerous atmospheric contaminant levels are identified.</p>	<p><b>Intent:</b> To ensure that the ventilation officer has the authority that is commensurate with the duties of the position.</p> <p><b>Personnel:</b> Registered manager, quarry manager and surface vent officer.</p> <p><b>Method:</b> Interview personnel, view position description for surface vent officer and documentary records of surveys, inspections carried out etc. associated with the vent officer's duties.</p>
2.5	<p>Ventilation technicians undertaking measurements of air and atmospheric contaminants are adequately trained.</p>	<p><b>Intent:</b> To ensure that the ventilation technicians have the qualifications, training and experience to perform the required duties.</p> <p><b>Personnel:</b> Mine Manager, ventilation officer.</p> <p><b>Method:</b> Verify by interview and sighting qualifications such as attendance at the surface ventilation officers course.</p>
2.6	<p>Mine supervisors, employees and contractors receive basic training in atmospheric contaminant control, suppression and respiratory protection requirements.</p>	<p><b>Intent:</b> To ensure that persons involved in daily operations and activities where atmospheric contaminants are present are trained in the control of contaminant emissions, the use of suppression equipment and the wearing of PPE.</p> <p><b>Personnel:</b> Training officers, supervisors employees and contractors.</p> <p><b>Method:</b> Interview personnel and view training documentation for examples of training in the use of dust suppression, fume extraction and containment equipment, procedures and wearing of PPE.</p>

2.7	<p>Where gas monitoring equipment is installed, mine supervisors, employees and contractors receive training in the identification, control, awareness of alarms and PPE requirements for normal and emergency situations.</p>	<p><b>Intent:</b> To ensure that persons involved in daily operations and activities where toxic, asphyxiant and explosive gas monitoring equipment is installed are trained in the identification, control, awareness of alarms and PPE requirements for normal and emergency situations.</p> <p><b>Personnel:</b> Training officers, supervisors, employees and contractors.</p> <p><b>Method:</b> Interview personnel and view training documentation for examples of training in the gas monitoring equipment, awareness of alarms and actions to be taken in an emergency.</p>
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### 3 Measuring Equipment

#### Measuring Equipment

Point	Standard	Guideline
3.1	The mine has ventilation instrumentation in house, or provided by an external provider, to conduct the required air pressure and flow measurements.	<p><b>Intent:</b> To ensure airflow measurements can be carried out on extraction systems (crushers, laboratory fume cupboards etc).</p> <p><b>Personnel:</b> Surface ventilation officer.</p> <p><b>Method:</b> Verify that the mine has air flow measurement equipment suitable for the air speeds and pressures generated by the ventilation equipment. (If external provider's equipment used, copies of certificates required for each set of results used). Refer to MSIR 9.6 and 9.12.</p>
3.2	The mine has measuring equipment in house, or provided by an external provider, to measure the atmospheric contaminants anticipated to occur.	<p><b>Intent:</b> To verify that equipment is available or a monitoring programme has been established to measure the atmospheric contaminants (respirable dust, inhalable dust, asbestos fibres, organic vapours etc.) present.</p> <p><b>Personnel:</b> Surface ventilation officer.</p> <p><b>Method:</b> Verify that the mine has routine monitoring equipment for all contaminants including dust, asbestos etc. (If external provider's equipment used, copies of certificates required for each set of results used). Refer to MSIR 9.13 and 9.33.</p>
3.3	The mine has equipment to measure the levels of oxygen and gases where any toxic, asphyxiant or explosive gases are anticipated to occur.	<p><b>Intent:</b> To verify that equipment is available to monitor the levels of oxygen and any toxic, asphyxiant or flammable gases present.</p> <p><b>Personnel:</b> Surface ventilation officer.</p> <p><b>Method:</b> Verify that the mine has monitoring equipment which should include an Oxygen monitor, a flammable gas indicator and may include testing equipment for other gases such as: Carbon monoxide, carbon dioxide, cyanide, sulphur dioxide, hydrogen sulphide, ammonia etc. Refer to MSIR 9.11, 9.13 and 9.29.</p>

3.4	All measuring equipment is calibrated and maintained to manufacturers' specifications.	<p><b>Intent:</b></p> <p>To verify that ventilation measurement equipment is being maintained and calibrated in accordance with manufacturers' specifications.</p> <p><b>Personnel:</b></p> <p>Surface ventilation officer.</p> <p><b>Method:</b></p> <p>Verify by sighting the calibration certificates etc. (If external provider's equipment used, copies of certificates required for each set of results used). Refer to MSIR 9.6.</p>
3.5	When ventilation or gas measuring equipment is sent for calibration or repair, alternative equipment is made available.	<p><b>Intent:</b></p> <p>To ensure that the measurement capability is maintained during periods when equipment is sent away for calibration.</p> <p><b>Personnel:</b></p> <p>Surface ventilation officer.</p> <p><b>Method:</b></p> <p>Interview personnel, observe equipment.</p>
3.6	A record is kept of each item of calibrated equipment that includes the latest date of calibration, the calibration factors and the next due date.	<p><b>Intent:</b></p> <p>To verify that a system is in place to maintain equipment in calibration.</p> <p><b>Personnel:</b></p> <p>Surface ventilation officer.</p> <p><b>Method:</b></p> <p>View records. Refer to MSIR 9.6.</p>
3.7	A procedure exists to ensure that where indicator tubes are used, the tubes are stored as recommended by the manufacturer and the use-by-date has not expired.	<p><b>Intent:</b></p> <p>To ensure that indicator tubes are maintained within the use by date for each individual gas present.</p> <p><b>Personnel:</b></p> <p>Surface ventilation officer.</p> <p><b>Method:</b></p> <p>Sight a sample of tubes.</p>

## 4 Ventilation Record Keeping

### Ventilation Record Keeping

Point	Standard	Guideline
4.1	The surface ventilation officer has a copy of the latest Mines Safety and Inspection Act 1994, the Mines Safety and Inspection Regulations 1995 and amendments.	<p><b>Intent:</b> To ensure that the surface ventilation officer is aware of the duties, obligations and statutory responsibilities in current legislation.</p> <p><b>Personnel:</b> Surface ventilation officer.</p> <p><b>Method:</b> Verify by sighting a web link or copy of the current Mines Safety and Inspection Act and Regulations in the surface ventilation officers room. Check that the legislation is up to date.</p>
4.2	A copy of the current National Exposure Standards NOHSC: 1003 is available.	<p><b>Intent:</b> To ensure that access is available to the current exposure standards for each contaminant</p> <p><b>Personnel:</b> Surface ventilation officer.</p> <p><b>Method:</b> Verify by sighting a web link or copy of the National exposure Standard NOHSC: 1003.</p>
4.3	The surface ventilation officer has access to the latest applicable Australian Standards.	<p><b>Intent:</b> To ensure that documentation is available or there is web access to the current Australian Standards that provides information on compliance for each contaminant monitoring requirement.</p> <p><b>Personnel:</b> Surface ventilation officer.</p> <p><b>Method:</b> Verify by sighting a web link or copy of the Australian Standards (AS 2985, AS 2986, AS 3640).</p>
4.4	The surface ventilation officer has access to the latest version of the Australia Safety and Compensation Council (ASCC) "Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres".	<p><b>Intent:</b> To ensure that documentation is available or there is web access to the current ASCC "Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Dust 1988".</p> <p><b>Personnel:</b> Surface ventilation officer.</p> <p><b>Method:</b> Verify by sighting a web link or copy of the ASCC "Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres" 2nd Edition [NOHSC: 3003 (2005)].</p>

4.5	A ventilation log book has been established.	<p><b>Intent:</b></p> <p>To verify that a log book has been established in which all the mine ventilation measurements, airborne contaminants, gas measurements, defect records and actions taken, are recorded and kept up to date.</p> <p><b>Personnel:</b></p> <p>Surface ventilation officer</p> <p><b>Method:</b></p> <p>Sight ventilation log book. Refer to MSIR 9.7.</p>
4.6	The records indicate that inspections occur at regular intervals for the presence and control of atmospheric contaminants in workplaces.	<p><b>Intent:</b></p> <p>To verify that monitoring occurs in all operating areas at an appropriate frequency.</p> <p><b>Personnel:</b></p> <p>Surface ventilation officer.</p> <p><b>Method:</b></p> <p>Verify by examination of ventilation records. The frequency of inspection should be relevant to the hazard ranging from daily for immediately life threatening hazards to weekly for non life threatening hazards. Refer to MSIR 9.6(a).</p>
4.7	The records indicate the Contam quarterly sampling quota is carried out and reported in accordance with the statutory requirements.	<p><b>Intent:</b></p> <p>To verify that inspectorate monitoring quotas are completed in all operating areas to identify the level of contaminants present.</p> <p><b>Personnel:</b></p> <p>Surface ventilation officer.</p> <p><b>Method:</b></p> <p>Verify by examination of ventilation records. Refer to MSIR 9.6(b).</p>
4.8	The records indicate that the monitoring and assessment of the contaminant exposure of significantly exposed employees occurs on a routine basis.	<p><b>Intent:</b></p> <p>To verify that individual employees are monitored on an ongoing basis where significantly exposed to contaminants potentially injurious to health.</p> <p><b>Personnel:</b></p> <p>Surface ventilation officer.</p> <p><b>Method:</b></p> <p>View the monitoring programme established. (Note CONTAM sampling on a quarterly basis is not sufficient to comply with this standard). Refer to MSIR 9.13.</p>

4.9	<p>Sampling and personal exposure assessment results are reported to all relevant personnel in an effective, timely and documented manner.</p>	<p><b>Intent:</b> To ensure that individual employees are informed of their individual sample results and any area contaminant level results.</p> <p><b>Personnel:</b> Surface ventilation officer.</p> <p><b>Method:</b> View the display of anonymous results on area noticeboards and the method of informing individual employees of their results. Ensure that the system of reporting is self explanatory, easy to understand and is confidential to protect privacy.</p>
4.10	<p>Contaminant sampling results taken over the last year to evaluate operator exposure are all below the exposure standard for both normal and extended shifts.</p>	<p><b>Intent:</b> To verify operators are not being exposed to contaminant levels above the exposure standard for either normal or extended shifts. (Employees working extended shifts are subject to an adjusted exposure standard).</p> <p><b>Personnel:</b> Ventilation officer.</p> <p><b>Method:</b> Check CONTAM results prior to site visit. Verify with site records for each contaminant. Note any exceedances. Refer to MSIR 9.11.</p>
4.11	<p>Sampling for respirable dust is carried out in accordance with the required method.</p>	<p><b>Intent:</b> To verify that respirable dust samples are collected and analysed in accordance with AS 2985.</p> <p><b>Personnel:</b> Surface ventilation officer.</p> <p><b>Method:</b> Verify by examination of documented sampling procedures. Refer to MSIR 9.13(1)(b).</p>
4.12	<p>Sampling for organic vapours is carried out in accordance with the required method.</p>	<p><b>Intent:</b> To verify that organic vapour samples are collected and analysed in accordance with AS 2986.</p> <p><b>Personnel:</b> Surface ventilation officer.</p> <p><b>Method:</b> Verify by examination of documented sampling procedures. Refer to MSIR 9.13(1)(b).</p>

4.13	Sampling for inhalable dust is carried out in accordance with the required method.	<p><b>Intent:</b> To verify that inhalable dust samples are collected and analysed in accordance with AS 3640.</p> <p><b>Personnel:</b> Surface ventilation officer.</p> <p><b>Method:</b> Verify by examination of documented sampling procedures. Refer to MSIR 9.13(1)(b).</p>
4.14	Sampling for asbestos fibres is carried out in accordance with the required method.	<p><b>Intent:</b> To verify that asbestos fibre samples are collected and analysed in accordance with the ASCC “Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres”.</p> <p><b>Personnel:</b> Surface ventilation officer.</p> <p><b>Method:</b> Verify by examination of documented sampling procedures. Refer to MSIR 9.13(1)(b).</p>
4.15	The records include reports on the means and effectiveness of all dust suppression and collection equipment.	<p><b>Intent:</b> To verify that checks are carried out on the effectiveness of dust suppression and collection equipment at the mine.</p> <p><b>Personnel:</b> Surface ventilation officer.</p> <p><b>Method:</b> Verify by examination of ventilation reports and/or records. Refer to MSIR 9.6(c).</p>
4.16	The records include reports on the means and effectiveness of all fume hoods and fume extraction equipment.	<p><b>Intent:</b> To verify that checks are carried out on the effectiveness of fume collection equipment at the mine.</p> <p><b>Personnel:</b> Surface ventilation officer.</p> <p><b>Method:</b> Verify by examination of ventilation reports and/or records. Refer to MSIR 9.30.</p>
4.17	Ventilation and contaminant measurements are documented and retained.	<p><b>Intent:</b> To verify that all airflow and contaminant measurements taken are documented and are available for examination or scrutiny.</p> <p><b>Personnel:</b> Surface ventilation officer.</p> <p><b>Method:</b> View ventilation log book and field records. Refer to MSIR 9.7.</p>

4.18	<p>Each entry in the ventilation record book is dated, signed and kept in area chronological order.</p>	<p><b>Intent:</b> To ensure that each entry made is documented, dated, signed and kept in work location chronological order for comparison purposes.</p> <p><b>Personnel:</b> Surface ventilation officer.</p> <p><b>Method:</b> Verify by examination of ventilation records.</p>
4.19	<p>There is a procedure for the reporting and rectification of ventilation and contaminant issues.</p>	<p><b>Intent:</b> To verify that ventilation and contaminant issues in excess of the peak or STEL exposure standard are brought to the manager's attention, area isolation procedures are implemented, instructions are issued to correct the defects and employees are informed of the hazard and actions taken to control the situation.</p> <p><b>Personnel:</b> Manager, surface ventilation officer and mine personnel.</p> <p><b>Method:</b> Establish by inspection whether there are any contaminant issues at the mine and use any example to verify whether the current matters are being identified and raised for rectification in the ventilation record book. View the records and procedures to verify that any current and historic contaminant issues have been identified, recorded and rectified in the ventilation record book and there is evidence of the manager being informed of the issues. Refer to MSIA s11, s11A &amp; MSIR 9.6, 9.7, 9.8 and 9.12.</p>

## 5 Atmospheric Contaminant Control

### Atmospheric Contaminant Control

Point	Standard	Guideline
5.1	Each dust suppression system is operated and maintained in an effective operating condition.	<p><b>Intent:</b> To verify that the dust suppression system is operating as it was designed to operate and is maintained in an effective operating condition.</p> <p><b>Personnel:</b> Surface ventilation officer, maintenance staff, supervisors, drill operators, crusher and screening plant operators.</p> <p><b>Method:</b> Check maintenance records. Check all dust suppression equipment is operating effectively and is not blocked. Refer to MSIR 9.17 and 9.19.</p>
5.2	Each dust extraction system is operated and maintained in an effective operating condition.	<p><b>Intent:</b> To verify that each dust extraction system is operating as it was designed to operate and is maintained in an effective operating condition.</p> <p><b>Personnel:</b> Surface ventilation officer, maintenance staff, supervisors, drill operators, crusher and screening plant operators.</p> <p><b>Method:</b> Check maintenance records. Check all extraction draw points are extracting. Check that the duct blank off points are used correctly to maximise extraction at draw points in use. Check by tapping (for sound) the extraction ducting to determine if there is any dust build-up within the ducting. Observe outlet of dust extractor as noticeable dust to the atmosphere is a sign of ineffective dust collection e.g. bags in the bag house needing replacing. Check maintenance schedule or when the system was last serviced. Refer to MSIR 9.17 and 9.19.</p>

5.3	<p>Each dust enclosure system is operated and maintained in an effective operating condition.</p>	<p><b>Intent:</b> To verify that each installed dust enclosure system is operating as it was designed to operate and is maintained in an effective operating condition.</p> <p><b>Personnel:</b> Surface ventilation officer, maintenance staff, supervisors, drill operators, crusher and screening plant operators.</p> <p><b>Method:</b> Check maintenance records. Check all extraction draw points are extracting. Check that the duct blank off points are used correctly to maximise extraction at draw points in use. Check by tapping (for sound) the extraction ducting to determine if there is any dust build-up within the ducting. Observe outlet of dust extractor as noticeable dust to the atmosphere is a sign of ineffective dust collection e.g. bags in the bag house needing replacing. Check maintenance schedule or when the system was last serviced. Refer to MSIR 9.17 and 9.19.</p>
5.4	<p>Each contaminant extraction system is operated and maintained in an effective operating condition.</p>	<p><b>Intent:</b> To verify that each contaminant extraction system is operating as it was designed to operate and is maintained in an effective operating condition to protect employees from exposure to chemical fumes.</p> <p><b>Personnel:</b> Surface ventilation officer, maintenance staff, supervisors, process plant operators.</p> <p><b>Method:</b> Check maintenance records. Check all extraction systems are efficiently removing contaminants at each draw point. Carry out contaminant measurements to verify that contaminants are not escaping from the system into the workplace and/or employee breathing zone.</p>
5.5	<p>All hoods and appliances fitted to vessels used for the chemical treatment of minerals or mineral substances are operated and maintained in an effective operating condition.</p>	<p><b>Intent:</b> To verify the chemical containment system is operating as it was designed to operate and is maintained in an effective operating condition.</p> <p><b>Personnel:</b> Surface ventilation officer, maintenance staff, supervisors, process plant operators.</p> <p><b>Method:</b> Check maintenance records. Check all chemical capture systems are efficiently removing contaminants at each draw point. Carry out contaminant measurements to verify that contaminants are not escaping from the system. Refer to MSIR 9.30.</p>

5.6	<p>All hoods and appliances fitted to capture hot gases from smelting operations are operated and maintained in an effective operating condition.</p>	<p><b>Intent:</b> To verify the gas hoods and appliances provided for each smelting operation are operating as designed to operate and are maintained in an effective operating condition.</p> <p><b>Personnel:</b> Surface ventilation officer, maintenance staff, supervisors, process plant operators, laboratory technicians.</p> <p><b>Method:</b> Check Maintenance records. Check all gas capture systems are efficiently removing contaminants at each draw point. Carry out contaminant measurements to verify that contaminants are not escaping from the system.</p>
5.7	<p>Where hoods and appliances are installed to remove atmospheric contaminants the discharge outlet is at a sufficient height to avoid contamination of other workplaces.</p>	<p><b>Intent:</b> To ensure that extracted atmospheric contaminants do not pose a health risk in other workplaces when released.</p> <p><b>Personnel:</b> Surface ventilation officer, maintenance staff, supervisors, process plant operators, laboratory technicians.</p> <p><b>Method:</b> Check each fume hood outlet point to confirm workplaces in the vicinity of the pipework are not being contaminated by the extracted atmospheric contaminants. Ensure that all discharge outlets are extended a safe vertical distance above the highest workplace or platform.</p>

## 6 Dust Management

### Dust Management

Point	Standard	Guideline
6.1	Exploration and mine production drilling equipment is fitted with dust control devices which effectively control the emission of dust at each source during drilling operations.	<p><b>Intent:</b> To verify each drill is fitted with a dust control appliance and that dust produced during drilling is effectively controlled.</p> <p><b>Personnel:</b> Drill operator.</p> <p><b>Method:</b> Inspect all exploration and mine drilling equipment. (Drills must be fitted with and utilise the water injection system and/or dust extraction system to control, extract and contain the dust from all sources during drilling operations at the workplace) Refer to MSIR 9.17(2) and 9.19.</p>
6.2	Precautions are taken to protect samplers from exposure to dust during drilling and sampling operations.	<p><b>Intent:</b> To verify the drill sampler is protected from breathing in dust.</p> <p><b>Personnel:</b> Drill operator. Sampler.</p> <p><b>Method:</b> Check PPE supplied and in use by sampler. Is it suitable? Observe sampler in action. Can improvements be made to work procedure to reduce exposure to dust? (E.g. Design of sampling equipment, disposal of extra fines, ensure hose pipes etc. are not leaking) Refer to MSIR 9.12(1)(b).</p>
6.3	The emission of dust is effectively controlled during truck loading operations.	<p><b>Intent:</b> To verify there is some form of dust control in use during the loading of broken material into trucks.</p> <p><b>Personnel:</b> Loader operator. Truck driver.</p> <p><b>Method:</b> This is dependent on the material being handled, its moisture content, availability of water, weather conditions and the ability of the material to be dampened. Is each bucket load being dropped into the truck tray causing unnecessary dust generation? Should each bucket load be placed carefully in the truck tray? Is there sufficient moisture content in the broken material being handled? Should the broken material be wet down prior to handling? Refer to MSIR 9.12.</p>

6.4	<p>The emission of dust is effectively controlled along each open pit road and vehicle operating area.</p>	<p><b>Intent:</b></p> <p>To verify dust is controlled on open pit roadways and vehicle operating areas to ensure that dust does not pose a health or safety hazard to mobile equipment operators.</p> <p><b>Personnel:</b></p> <p>Line manager / supervisor, truck drivers' mobile equipment operators.</p> <p><b>Method:</b></p> <p>Check to establish water is used on unsealed open pit haulage roadways and other vehicle operating areas at the mine. Binding agents are often used to reduce the water requirement. Question truck drivers and other mobile equipment operators. Observe vehicle traffic movements on open pit roadways, pit benches, ROM pads including crusher and stockpile areas Refer to MSIR 9.12 and 13.7(3).</p>
6.5	<p>The emission of dust is effectively controlled during dumping operations.</p>	<p><b>Intent:</b></p> <p>To verify there is some form of dust control in use during the dumping of broken material from trucks.</p> <p><b>Personnel:</b></p> <p>Truck driver.</p> <p><b>Method:</b></p> <p>This is dependent on the material being handled, its moisture content, availability of water, weather conditions and the ability of the material to be dampened. Is each load being dumped causing unnecessary dust generation? Should each load be paddock dumped and/or dumped on the side directly opposite to the wind direction where strong winds are present? Is there sufficient moisture content in the broken material being dumped to minimise dust being released? Will dust from dumping operations affect and/or generate complaints from other mine workplaces, nearby communities or external business organisations? Refer to MSIR 9.12.</p>
6.6	<p>The emission of dust is effectively controlled at all stockpile areas, stockpile stacking operations, stockpile tunnels and material reclaim operations.</p>	<p><b>Intent:</b></p> <p>To verify dust is controlled at the stockpile area.</p> <p><b>Personnel:</b></p> <p>Line manager / supervisor, process operators.</p> <p><b>Method:</b></p> <p>Dust is usually dependent on weather conditions. Is there evidence of the surrounding area being covered in dust? Is dust control needed? If control is needed water sprays in most cases is the easiest control method. Where water is a problem a cover over the stockpile may be needed. Check the tunnel is regularly cleaned or washed out. Check for ventilation. The main source of dust will be feeders on to the conveyor.</p>

6.7	The emission of dust is effectively controlled at all crushing and screening plant.	<p><b>Intent:</b></p> <p>To verify dust is effectively controlled during dumping into the primary crusher feed hopper and through the crushing and screening equipment).</p> <p><b>Personnel:</b></p> <p>Truck / loader operator. Crusher operator.</p> <p><b>Method:</b></p> <p>Check that all installed appliances are working. Observe material being dumped into hopper by truck or loader and determine whether dust is effectively controlled during the crushing and screening process Refer to MSIR 9.10 and 9.12(1)(a).</p>
6.8	Spillage and dust build up around the crushing and screening plant and on equipment surfaces is kept under control.	<p><b>Intent:</b></p> <p>To verify spillage and dust build-up on and around the crushing and screening plant and equipment is regularly cleaned up and kept under control as operating conditions require.</p> <p><b>Personnel:</b></p> <p>Line manager / supervisor, process operators.</p> <p><b>Method:</b></p> <p>Observe conditions throughout the crushing and screening area. Note any spillage or excessive dust-build up on or around any plant and equipment. Use personal judgement to determine if conditions are acceptable.</p>
6.9	The emission of dust is effectively controlled along all conveying equipment.	<p><b>Intent:</b></p> <p>To verify dust is effectively controlled at all sources along the conveying equipment transfer points.</p> <p><b>Personnel:</b></p> <p>Line manager / supervisor, process operators.</p> <p><b>Method:</b></p> <p>Check the effectiveness of dust suppression controls at all points where material is transported along the conveying equipment in the crushing and screening plant. Depending on the type of material and the moisture content dust can be produced at transfer points, lime addition points, along wind exposed sections of conveying equipment and conveyor belts, at belt wiper locations, on the return belt etc. Methods of control can be water sprays, connection to a dust extraction system and/or enclosure of conveyors and/or transfer points.</p>

6.10	<p>Spillage and dust build up around the conveyors and on equipment surfaces is kept under control.</p>	<p><b>Intent:</b> To verify spillage and dust build-up on and around the conveyors and equipment is regularly cleaned up and kept under control as operating conditions require.</p> <p><b>Personnel:</b> Line manager / supervisor, process operators.</p> <p><b>Method:</b> Observe conditions throughout mill. Note any spillage or excessive dust- build up on or around any plant and equipment. Use personal judgement to determine if conditions are acceptable.</p>
6.11	<p>The emission of dust is effectively controlled within all process operations.</p>	<p><b>Intent:</b> To verify dust is effectively controlled within the process plant.</p> <p><b>Personnel:</b> Line manager/ supervisor, process plant operators.</p> <p><b>Method:</b> Check that all installed appliances are working. Observe material process flow and determine whether dust is effectively controlled during processing operations Refer to MSIR 9.10 and 9.12(1)(a).</p>
6.12	<p>Spillage and dust build up around plant and on equipment surfaces is kept under control.</p>	<p><b>Intent:</b> To verify spillage and dust build-up on and around plant and equipment is regularly cleaned up and kept under control as operating conditions require.</p> <p><b>Personnel:</b> N/A</p> <p><b>Method:</b> Observe conditions throughout mill. Note any spillage or excessive dust- build up on or around any plant and equipment. Use personal judgement to determine if conditions are acceptable.</p>
6.13	<p>The emission of dust is effectively controlled within sample preparation and analysis areas.</p>	<p><b>Intent:</b> To verify there is effective dust control during the crushing and sample preparation of samples.</p> <p><b>Personnel:</b> Supervisor. Operators.</p> <p><b>Method:</b> Observe the sample preparation equipment in use and note where any dust is escaping. Check the extraction points have sufficient draw. Could the dust capture or dust containment be improved? Check the sample collection box below the crusher is closely fitted to the outlet to minimise dust escape. Check each workstation is connected to the dust extraction system and/or has an adequate dust capture enclosure Refer to MSIR 9.10 and 9.12.</p>

6.14	<p>Spillage and dust build up in the sample preparation area and on equipment surfaces is kept under control.</p>	<p><b>Intent:</b> To verify the general housekeeping of the sample preparation area with regard to dust and spillage is of an acceptable standard.</p> <p><b>Personnel:</b> Line manager. Supervisor. Operators.</p> <p><b>Method:</b> Carry out a visual inspection throughout the sample preparation area. Check for any build up of spillage and fine dust. Check with operators and management to determine if a regular program for clean up exists. Is the frequency of clean up sufficient for the sample preparation area?</p>
6.15	<p>The air pressure in hand held airguns used for cleaning is adequately reduced to prevent excessive dust generation.</p>	<p><b>Intent:</b> To ensure the extent of dust generation is minimised when a handheld airgun is used to clean off dust contamination during sample processing. The air pressure should be less than 300 kPa. There is no regulatory requirement on air pressure but the usual plant air pressure of 650 kPa is too severe and causes overload of most dust extraction capture points. This results in dust escaping into the workplace. The figure of 300 kPa was deemed acceptable after trials with several laboratories.</p> <p><b>Personnel:</b> Supervisor.</p> <p><b>Method:</b> Check in line regulators to ensure pressure is set below 300 kPa. A separate circuit or regulators are needed as ring grinders and other equipment run at the high plant pressure of at least 650 kPa. Refer to Safety Bulletin 49 and MSIR 4.12(2).</p>
6.16	<p>Compressed air for cleaning is used carefully within the dust capture enclosure so as not to generate dust in the workplace.</p>	<p><b>Intent:</b> To verify where compressed air is used for cleaning purposes dust is extracted at the source and does not escape into the workplace.</p> <p><b>Personnel:</b> Supervisor, sample preparation operators.</p> <p><b>Method:</b> Observe operator using airgun to clean off dust during sample handling. Is dust being extracted at source? Is dust escaping into the workplace? Refer to MSIR 4.12(2).</p>

6.17	<p>Observe operator using airgun to clean off dust during sample handling. Is dust being extracted at source? Is dust escaping into the workplace? Refer to MSIR 4.12(2).</p>	<p><b>Intent:</b> To verify compressed air is not used for cleaning purposes where high risk hazardous substances are handled in the workplace.</p> <p><b>Personnel:</b> Laboratory manager, supervisor.</p> <p><b>Method:</b> Check there are no airguns at the workstation where high risk hazardous substances are handled e.g. Mercury, lead, vanadium etc.</p>
6.18	<p>Compressed air is not used for cleaning the body or clothing of employees.</p>	<p><b>Intent:</b> To verify employees have been trained and informed of the dangers associated with the use of compressed air.</p> <p><b>Personnel:</b> Laboratory manager, supervisor, sample preparation operators.</p> <p><b>Method:</b> Check work procedures, written questionnaires and assessment documentation for the prohibition of the use of compressed air for cleaning the body or clothing. Interview employees. Refer to MSIR 4.12(4).</p>
6.19	<p>The emission of dust is effectively controlled within product bagging and packaging areas.</p>	<p><b>Intent:</b> To verify dust is effectively controlled at each bagging and packaging area at the mine (bagging and packaging refers to the sealing and containment of dry materials for sale or disposal).</p> <p><b>Personnel:</b> Machine operator.</p> <p><b>Method:</b> Observe bagging / packaging machine in operation. Use personal judgement to determine if dust is controlled effectively. Check post dust-sampling results. Are there different grades/types of material being bagged or packaged? What grade/type is being bagged / packaged during observation? Are other grades/types likely to be a greater dust problem? Is there adequate seal between bag and feeder tube? Is there adequate dust extraction? Check for leaks at bagging / package machine. Refer to MSIR 9.10 and 9.12(1)(a).</p>

6.20	Spillage and dust build up in the bagging and packaging area and on equipment surfaces is kept under control.	<p><b>Intent:</b></p> <p>To verify the general housekeeping of the bagging and packaging area with regard to dust and spillage is of an acceptable standard.</p> <p><b>Personnel:</b></p> <p>Line manager. Supervisor. Operators.</p> <p><b>Method:</b></p> <p>Carry out a visual inspection throughout the bagging and packaging area. Check for any build up of spillage and fine dust. Check with operators and management to determine if a regular program for clean up exists. Is the frequency of clean up sufficient for the area?</p>
6.21	The emission of dust is effectively controlled at truck loading and unloading areas.	<p><b>Intent:</b></p> <p>To verify dust is controlled during the loading and unloading of materials into and from trucks.</p> <p><b>Personnel:</b></p> <p>Truck loading operator.</p> <p><b>Method:</b></p> <p>Check to see if dust enclosure, extraction or water sprays systems are installed and are being maintained and used effectively. Observe loading and unloading of vehicles. Decide if an adequate level of dust control is being achieved. Refer to MSIR 9.10 and 9.12(1)(a).</p>
6.22	Spillage and dust build up in the truck loading and unloading areas and on equipment surfaces is kept under control.	<p><b>Intent:</b></p> <p>To verify the general housekeeping of the truck loading and unloading areas with regard to dust and spillage is of an acceptable standard.</p> <p><b>Personnel:</b></p> <p>Line manager. Supervisor. Operators.</p> <p><b>Method:</b></p> <p>Carry out a visual inspection throughout the truck loading and unloading area. Check for any build up of spillage and fine dust. Check with operators and management to determine if a regular program for clean up exists. Is the frequency of clean up sufficient for the area?</p>
6.23	The emission of dust is effectively controlled at train loading and unloading areas.	<p><b>Intent:</b></p> <p>To verify dust is controlled during the loading and unloading of materials into and from rail cars.</p> <p><b>Personnel:</b></p> <p>Line manager, supervisor train load operator.</p> <p><b>Method:</b></p> <p>Check to see if dust enclosure, extraction or water sprays systems are installed and are being maintained and used effectively. Observe loading and unloading of rail cars. Decide if an adequate level of dust control is being achieved. Refer to MSIR 9.10 and 9.12(1)(a).</p>

6.24	Spillage and dust build up in the train loading and unloading areas and on equipment surfaces is kept under control.	<p><b>Intent:</b></p> <p>To verify the general housekeeping of the train loading and unloading area with regard to dust and spillage is of an acceptable standard.</p> <p><b>Personnel:</b></p> <p>Line manager, supervisor, operators.</p> <p><b>Method:</b></p> <p>Carry out a visual inspection throughout the train loading and unloading area. Check for any build up of spillage and fine dust. Check with operators and management to determine if a regular program for clean up exists. Is the frequency of clean up sufficient for the area?</p>
6.25	The emission of dust is effectively controlled at road train loading and unloading areas.	<p><b>Intent:</b></p> <p>To verify dust is controlled during the loading and unloading of materials into and from road trains.</p> <p><b>Personnel:</b></p> <p>Line manager, supervisor, road train operator.</p> <p><b>Method:</b></p> <p>Check to see if dust enclosure, extraction or water sprays systems are installed and are being maintained and used effectively. Observe loading and unloading of road trains. Decide if an adequate level of dust control is being achieved. Refer to MSIR 9.10 and 9.12(1)(a).</p>
6.26	Spillage and dust build up in the road train loading and unloading areas and on equipment surfaces is kept under control.	<p><b>Intent:</b></p> <p>To verify the general housekeeping of the road train loading and unloading area with regard to dust and spillage is of an acceptable standard.</p> <p><b>Personnel:</b></p> <p>Line manager, supervisor, operators.</p> <p><b>Method:</b></p> <p>Carry out a visual inspection throughout the road train loading and unloading area. Check for any build up of spillage and fine dust. Check with operators and management to determine if a regular program for clean up exists. Is the frequency of clean up sufficient for the area?</p>

6.27	<p>The emission of dust is effectively controlled at ship loading and unloading operations.</p>	<p><b>Intent:</b> To verify dust is controlled during the loading and unloading of materials into and from ships.</p> <p><b>Personnel:</b> Ship loading operator.</p> <p><b>Method:</b> Check to see if dust enclosure, extraction or water sprays systems are installed and are being maintained and used effectively. Observe loading and unloading of ships. Decide if an adequate level of dust control is being achieved. Refer to MSIR 9.10 and 9.12(1)(a).</p>
6.28	<p>Spillage and dust build up in the ship loading and unloading operations and on equipment surfaces is kept under control.</p>	<p><b>Intent:</b> To verify the general housekeeping of the ship loading area with regard to dust and spillage is of an acceptable standard.</p> <p><b>Personnel:</b> Line manager. Supervisor. Operators.</p> <p><b>Method:</b> Carry out a visual inspection throughout the ship loading and unloading area. Check for any build up of spillage and fine dust. Check with operators and management to determine if a regular program for clean up exists. Is the frequency of clean up sufficient for the area?</p>
6.29	<p>Spillage and dust build up on all internal building structures is kept under control.</p>	<p><b>Intent:</b> To verify that as far practicable dust build up on the internal building structures is kept to a minimum. This reduces the possibility of dust becoming airborne as it is shaken or falls from the structure.</p> <p><b>Personnel:</b> N/A</p> <p><b>Method:</b> Observe amount of dust built up on handrails and internal building structures. Is it excessive? When was it last cleaned down? Check if it is regularly cleaned down. Use personal judgement.</p>
6.30	<p>Measures are taken to minimise dust pick up during strong winds.</p>	<p><b>Intent:</b> To verify dust is controlled and minimised on any open surface during adverse weather conditions.</p> <p><b>Personnel:</b> Operators.</p> <p><b>Method:</b> Check if a control measure is in place. E.g. water sprays, sprinkler system, sealing agent, physical cover or plant regrowth programmes established.</p>

6.31	Water of acceptable quality is used for dust suppression.	<p><b>Intent:</b> To verify that any water used for dust suppression is not polluted by any noxious substance likely to affect the health of any employee at the mine.</p> <p><b>Personnel:</b> Surface ventilation officer, mechanical engineer, drillers, process plant operators, operators.</p> <p><b>Method:</b> Verify that water utilised for dust suppression at the mine is obtained from a good quality water source. Examine water quality records for drilling operations, loading operations, crushing operations etc. Refer to MSIR 9.18.</p>
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## 7 Naturally Occuring Hazardous Gases

### Naturally Occuring Hazardous Gases

Point	Standard	Guideline
7.1	A hazardous gas management plan has been developed and implemented.	<p><b>Intent:</b> To verify that the formation and emission of toxic, asphyxiant and explosive gases is adequately monitored, managed and controlled.</p> <p><b>Personnel:</b> Registered manager, quarry manager, surface ventilation officer, shift supervisor, operators.</p> <p><b>Method:</b> Examine the management plans and monitoring records to verify that the controls are adequate Refer to MSIR 9.29(1).</p>
7.2	The District Inspector of Mines is notified in writing of the precautions taken to monitor and control the presence of the hazardous gases.	<p><b>Intent:</b> To verify that the District Inspector is notified of the safety precautions taken to control the dangers associated with the hazardous gas present.</p> <p><b>Personnel:</b> Registered manager, quarry manager, surface ventilation officer, shift supervisor, operators.</p> <p><b>Method:</b> Examine any written correspondence sent to the District Inspector and cross reference with Department files Refer to MSIR 9.29(2).</p>
7.3	Employees are notified of the precautions taken to monitor and control the formation and emission of the hazardous gases present.	<p><b>Intent:</b> To verify that employees have been notified of the safety precautions taken to control the dangers associated with the hazardous gases present.</p> <p><b>Personnel:</b> Registered manager, quarry manager, surface ventilation officer, training officer, shift supervisor, operators.</p> <p><b>Method:</b> Examine any documentation confirming employees have been trained and informed of the monitoring and management controls at the mine. Interview employees. Refer to MSIR 9.29(2).</p>

7.4	<p>Monitoring devices are installed which give a warning when the peak or STEL level of any hazardous gas is being approached.</p>	<p><b>Intent:</b> To verify that continuous monitoring equipment with a system of alarm is installed to warn employees of the emission of toxic, asphyxiant and explosive gases when the peak or STEL level is approached.</p> <p><b>Personnel:</b> Registered manager, quarry manager, surface ventilation officer, shift supervisor, operators.</p> <p><b>Method:</b> Examine the management plans and inspect gas emission areas for the installation of suitable monitoring equipment Refer to MSIR 9.29(4).</p>
7.5	<p>There is a register of all hazardous substances used or produced at the mine.</p>	<p><b>Intent:</b> To verify that all hazardous substances present at the mine are identified.</p> <p><b>Personnel:</b> Surface ventilation officer, safety officer, radiation officer, occupational hygienist, maintenance staff, supervisors, operators.</p> <p><b>Method:</b> View register and determine it is readily available to all employees. Refer to MSIR 7.25.</p>

## 8 Process Atmospheric Contaminants

### Process Atmospheric Contaminants

Point	Standard	Guideline
8.1	There is a register of all hazardous substances used or produced at the mine.	<p><b>Intent:</b> To verify that all hazardous substances present at the mine are identified.</p> <p><b>Personnel:</b> Surface ventilation officer, safety officer, radiation officer, occupational hygienist, maintenance staff, supervisors, operators.</p> <p><b>Method:</b> View register and determine it is readily available to all employees. Refer to MSIR 7.25.</p>
8.2	View register and determine it is readily available to all employees. Refer to MSIR 7.25.	<p><b>Intent:</b> To verify that safety information is available for every hazardous substance and associated airborne atmospheric contaminant including the final products of the process operation.</p> <p><b>Personnel:</b> Registered manager, quarry manager, process plant manager, surface ventilation officer, shift supervisor, operators.</p> <p><b>Method:</b> Examine the material safety data sheets. Confirm that there is an MSDS available for every hazardous substance observed and they are readily accessible to all employees at risk of exposure Refer to MSIR 7.21 and 7.25.</p>

8.3	<p>There is a written procedure to minimise and control the level of each hazardous substance and associated airborne atmospheric contaminant released into the workplace.</p>	<p><b>Intent:</b> To verify that the use of hazardous substances is managed in a safe consistent manner to minimise employee exposure.</p> <p><b>Personnel:</b> Surface ventilation officer, safety officer, radiation officer, occupational hygienist, maintenance staff, supervisors, operators.</p> <p><b>Method:</b> Examine written procedures. Check area ventilation monitoring records, biomedical records, hygiene assessments, clean up procedures, equipment maintenance records etc. Check that each ventilation control device, enclosure, extraction system and HEPA vacuum system is operating as it was designed to operate and is maintained in effective operating condition. .Check the maintenance schedule or when the system and equipment was last cleaned or serviced. Inspect each workplace to confirm that the standards are good Refer to MSIR 3.40, 7.28, 9.11 and 9.12.</p>
8.4	<p>The procedure for handling, usage and storage of hazardous substances is in accordance with the instructions contained in the Material Safety Data Sheets.</p>	<p><b>Intent:</b> To ensure that employees minimise their exposure to hazardous substances in accordance with the material safety data sheet instructions.</p> <p><b>Personnel:</b> Registered manager, quarry manager, process plant manager, surface ventilation officer, shift supervisor, operators.</p> <p><b>Method:</b> Select an individual example. Examine the procedure and compare with the material safety data sheets. Confirm that the safety instructions in the MSDS are include in the method of work to minimise the risk of exposure Refer to MSIR 7.21 and 7.25.</p>

8.5	<p>The method used to reduce exposure to each hazardous substance is in accordance with the recognised hierarchy of control.</p>	<p><b>Intent:</b></p> <p>To verify that management utilise adequate controls appropriate to the risk exposure of each hazardous substance and associated airborne atmospheric contaminant.</p> <p><b>Personnel:</b></p> <p>Registered manager, quarry manager, process plant manager, safety officer, surface ventilation officer, shift supervisor, operators.</p> <p><b>Method:</b></p> <p>Inspect all hazardous substance controls. Determine whether a high level or low level hierarchy of control has been utilised. Review any justification which indicates it is impracticable to utilise high level controls in favour of procedural controls or PPE. e.g. is PPE utilised in preference to engineering controls in cyanide tails screen areas Refer to MSIR 7.28.</p>
8.6	<p>The presence of a hazardous substance and associated atmospheric contaminant in an enclosed system is identified to all employees exposed to the risk.</p>	<p><b>Intent:</b></p> <p>To verify that employees are informed of the presence of hazardous substances and contaminants in each enclosed system.</p> <p><b>Personnel:</b></p> <p>Registered manager, quarry manager, process plant manager, safety officer, surface ventilation officer, shift supervisor, operators.</p> <p><b>Method:</b></p> <p>Inspect all hazardous substance enclosed system locations e.g. building containing CO2 fire suppression systems or chlorine etc. Confirm that adequate warnings are displayed and maintained in a legible condition at each entry point to the enclosed system area Refer to MSIR 7.26.</p>
8.7	<p>Smoking is prohibited in all workplaces where organic or volatile solvents are used.</p>	<p><b>Intent:</b></p> <p>To verify that employees are informed of the dangers associated with smoking in any workplace where solvents are used.</p> <p><b>Personnel:</b></p> <p>Registered manager, quarry manager, process manager, surface ventilation officer, training officer.</p> <p><b>Method:</b></p> <p>Examine procedures, training records or any written instructions confirming compliance with this legal requirement. Inspect work areas for warning signage. Refer to MSIR 4.10 and 9.31(b)(ii).</p>

8.8	<p>Smoking is prohibited in all workplaces where flammable vapours are present.</p>	<p><b>Intent:</b> To verify that employees are informed of the dangers associated with smoking in any workplace where flammable vapours are present.</p> <p><b>Personnel:</b> Registered manager, quarry manager, process manager, surface ventilation officer, training officer.</p> <p><b>Method:</b> Examine procedures, training records or any written instructions confirming compliance with this legal requirement. Inspect work areas for warning signage. Refer to MSIR 9.31(b)(iii).</p>
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## 9 Asbestos

### Asbestos

Point	Standard	Guideline
9.1	Restrictions are placed on the use of asbestos and asbestos products.	<p><b>Intent:</b> To verify that asbestos is not used or brought on to the mine except in accordance with the regulatory requirements.</p> <p><b>Personnel:</b> Registered manager, surface ventilation officer, safety officer, purchasing officer, storekeeper.</p> <p><b>Method:</b> Check to see that the principal employer, individual employers and stores purchasing and site entry procedures prohibit asbestos being used or brought on to the mine except in accordance with the omissions set out in regulatory requirements Refer to MSIR 9.32A.</p>
9.2	There is a register of asbestos containing material on site.	<p><b>Intent:</b> To verify that all asbestos containing material on site has been identified and recorded.</p> <p><b>Personnel:</b> Registered manager, geologist, quarry manager, surface ventilation officer, maintenance manager.</p> <p><b>Method:</b> Check if a separate asbestos register exists or the hazardous substances register includes asbestos containing materials. MSIR 7.25.</p>
9.3	A system is established to identify the presence of naturally occurring asbestos contamination.	<p><b>Intent:</b> To ensure that the presence of contaminant asbestos encountered during mining or exploration activities is immediately identified.</p> <p><b>Personnel:</b> Geologist, quarry manager, surface ventilation officer.</p> <p><b>Method:</b> Check to see that geological records from exploration drilling and mining operations are being assessed by geologists for the presence of contaminant asbestos.</p>

9.4	<p>An asbestos management plan has been developed and implemented.</p>	<p><b>Intent:</b> To verify that the contaminant asbestos is adequately managed, controlled and monitored.</p> <p><b>Personnel:</b> Registered manager, quarry manager, surface ventilation officer.</p> <p><b>Method:</b> Examine the management plans and monitoring records to verify that the controls are adequate Refer to MSIR 9.33(1)(a).</p>
9.5	<p>The District Inspector of Mines is notified in writing of the presence of contaminant asbestos.</p>	<p><b>Intent:</b> To verify that the District inspector is notified of the presence of contaminant asbestos.</p> <p><b>Personnel:</b> Registered manager, quarry manager, surface ventilation officer.</p> <p><b>Method:</b> Examine any written correspondence sent to the District Inspector and cross reference with Department files. Refer to MSIR 9.33(1)(b).</p>
9.6	<p>Asbestos removal work is carried out in accordance with the procedures specified in the Code of Practice for the Safe Removal of Asbestos (NOHSC:CP002-1988) published by the ASCC.</p>	<p><b>Intent:</b> To verify that the removal of asbestos is adequately managed, controlled and monitored.</p> <p><b>Personnel:</b> Registered manager, quarry manager, surface ventilation officer.</p> <p><b>Method:</b> Examine the management plans and monitoring records to verify that the controls are adequate and in accordance with the procedures specified in the Code of Practice for the Safe Removal of Asbestos (NOHSC:CP002-1988) published by the ASCC. Refer to MSIR 9.32(a).</p>
9.7	<p>The District Inspector of Mines is notified in writing of the removal of asbestos prior to the work commencing.</p>	<p><b>Intent:</b> To verify that the District inspector is notified of the removal of asbestos.</p> <p><b>Personnel:</b> Registered manager, quarry manager, process manager, surface ventilation officer.</p> <p><b>Method:</b> Examine any written correspondence sent to the District Inspector and cross reference with Department files. Refer to MSIR 9.32(b).</p>

9.8	<p>Smoking is prohibited in all workplaces where the air is likely to contain asbestos.</p>	<p><b>Intent:</b> To verify that employees are informed of the dangers associated with smoking where the air contains asbestos.</p> <p><b>Personnel:</b> Registered manager, quarry manager, process manager, surface ventilation officer, training officer.</p> <p><b>Method:</b> Examine procedures, training records or any written instructions confirming compliance with this legal requirement. Refer to MSIR 9.31(b).</p>
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# 10 Biological Monitoring

## Biological Monitoring

Point	Standard	Guideline
10.1	Biological monitoring is undertaken where employees who are engaged in specified occupational exposure work are exposed to hazardous substances and there is a reasonable likelihood that accepted values might be exceeded.	<p><b>Intent:</b></p> <p>To verify that biological monitoring is undertaken where employees who are engaged in specified occupational exposure work with hazardous substances and there is a reasonable likelihood that accepted values might be exceeded.</p> <p><b>Personnel:</b></p> <p>Surface ventilation officer, safety officer, occupational hygienist, maintenance staff, supervisors, operators.</p> <p><b>Method:</b></p> <p>Examine the hazardous substance register to determine whether any specified occupational exposure work is being undertaken. Confirm that biological monitoring and risk based health surveillance is taking place where required for each employee undertaking specified occupational exposure work. Refer to MSIR 3.28.</p>
10.2	There is an adequate health surveillance procedure in place for each specified occupational exposure work to regularly monitor those employees requiring biological monitoring.	<p><b>Intent:</b></p> <p>To verify there is a documented health surveillance procedure in place where biological monitoring is required to be undertaken.</p> <p><b>Personnel:</b></p> <p>Manager, occupational hygienist, medical staff, ventilation officer.</p> <p><b>Method:</b></p> <p>Confirm the applicable health surveillance procedure utilised is in accordance with the requirements specified in the DOCEP Biological Monitoring Guideline. Refer to MSIR 3.28.</p>
10.3	The arrangement and cost of the biological monitoring is organised and borne by the employer.	<p><b>Intent:</b></p> <p>To verify that the cost of biological monitoring is borne by the employer.</p> <p><b>Personnel:</b></p> <p>Surface ventilation officer, safety officer, radiation officer, occupational hygienist, maintenance staff, supervisors, operators.</p> <p><b>Method:</b></p> <p>Examine the method of payment. Interview employees. Refer to MSIR 3.30.</p>

10.4	<p>Examine the method of payment. Interview employees. Refer to MSIR 3.30.</p>	<p><b>Intent:</b> To verify that the records of biological monitoring are retained confidentially by the employer.</p> <p><b>Personnel:</b> Surface ventilation officer, safety officer, radiation officer, occupational hygienist, maintenance staff, supervisors, operators.</p> <p><b>Method:</b> Examine the medical records filing area. Confirm that the records are kept in a locked container. Examine the method of notification of the results. Interview employees. Refer to MSIR 3.35 and 3.38.</p>
10.5	<p>Where biological monitoring identifies employee exposure levels are near or above prescribed safe limits remedial action is taken.</p>	<p><b>Intent:</b> To verify that action is taken in a consistent manner where elevated levels of exposure are identified.</p> <p><b>Personnel:</b> Surface ventilation officer, safety officer, occupational hygienist, maintenance staff, supervisors, operators</p> <p><b>Method:</b> Examine the ventilation logbook and any biological monitoring rectification procedure. Confirm that the rectification work addresses the issues and is being carried out in accordance with DOCEP guidelines. Refer to MSIR 3.40.</p>

# 11 Thermal Comfort

## Thermal Comfort

Point	Standard	Guideline
11.1	All production drilling equipment is fitted with a fully enclosed air conditioned cabin.	<p><b>Intent:</b> To verify that the operator is protected from exposure to extremes of weather, temperature and contaminants during drilling operations.</p> <p><b>Personnel:</b> Operators.</p> <p><b>Method:</b> Check to see that production drilling equipment is fitted with an enclosed cabin and an operational air conditioner is installed. Refer to MSIR 9.12, 9.15 and 9.25.</p>
11.2	All mobile equipment is fitted with a fully enclosed air conditioned cabin.	<p><b>Intent:</b> To verify that the operator is protected from exposure to extremes of weather, temperature and contaminants during the operation of mobile equipment.</p> <p><b>Personnel:</b> Operators.</p> <p><b>Method:</b> Check to see that each category of mobile equipment is fitted with an enclosed cabin and an operational air conditioner is installed Refer to MSIR 9.12, 9.15 and 9.25.</p>
11.3	Crusher and screening plant control cabins are equipped with a means of heating and cooling.	<p><b>Intent:</b> To verify that the operator is protected from exposure to extremes of weather, temperature and contaminants during the operation of crusher and screening plant.</p> <p><b>Personnel:</b> Operators. Line manager. Supervisor.</p> <p><b>Method:</b> Check crusher and screening plant to determine if operators are provided with an enclosed control cabin and an operational air conditioner is installed. Make sure the operator can operate the crusher and screening plant from within the cabin and is not required to stand outside. Refer to MSIR 9.15.</p>

11.4	Process plant rooms and cabins are equipped with a means of heating and cooling.	<p><b>Intent:</b></p> <p>To verify that the operator is protected from exposure to extremes of weather, temperature and contaminants during the operation of the processing plant.</p> <p><b>Personnel:</b></p> <p>Operators. Line manager. Supervisor.</p> <p><b>Method:</b></p> <p>Check the process plant area to determine if operators are provided with a control cabin and an operational air conditioner is installed. Make sure the operator can operate the process plant from within the cabin and is not required to stand outside. Refer to MSIR 9.12, 9.15 and 9.25.</p>
11.5	The climate control equipment is working effectively in vehicle and fixed enclosed cabins.	<p><b>Intent:</b></p> <p>To ensure that the air conditioner in each operational cabin is operating effectively and of sufficient power to cool the cabin to enable the door and windows to be kept shut.</p> <p><b>Personnel:</b></p> <p>Drilling equipment operators, mobile equipment operators, crushing and screening plant operators, process plant operators.</p> <p><b>Method:</b></p> <p>Check vehicle specifications and maintenance records to find if air conditioning equipment is not provided or working in any enclosed cabin. Examine the cabin physical comfort with regard to temperature within each type of cabin. Feel if the air coming from the air conditioner is cool. Question vehicle operators and process operators on effectiveness of air conditioners. Any fixed cabin or mobile equipment not fitted with air conditioning fails this standard.</p>
11.6	Air conditioner filters are regularly checked and cleaned.	<p><b>Intent:</b></p> <p>To verify the filter fitted to an air conditioner is kept in a clean condition to stop the recycling of airborne contaminants.</p> <p><b>Personnel:</b></p> <p>Drilling equipment operators, mobile equipment operators, crushing and screening plant operators, process plant operators.</p> <p><b>Method:</b></p> <p>Check maintenance records for each category. Remove air conditioner filter from a sample of each category and check condition. Determine from operator if the filter is cleaned regularly. Refer to MSIR 9.25(1).</p>

11.7	Vehicle and fixed enclosed rooms/cabins are effectively sealed to prevent the entry of contaminants.	<p><b>Intent:</b> To ensure that each enclosed room/cabin is effectively sealed to prevent entry of contaminants.</p> <p><b>Personnel:</b> N/A.</p> <p><b>Method:</b> Check the door fits correctly and closes properly. Check condition of seals around the door. Check the windows are sealed. Check there are no open holes in the floor or walls and there is adequate seal around the air conditioner.</p>
11.8	Adequate ventilation air changes are provided to each enclosed operator control room and cabin.	<p><b>Intent:</b> To ensure adequate ventilation is provided in each control cabin.</p> <p><b>Personnel:</b> Operators, supervisors, maintenance staff.</p> <p><b>Method:</b> Check that sufficient filtered air is being supplied to the inside of the control cabin to prevent CO<sub>2</sub> build up.</p>
11.9	The interior of each vehicle and fixed enclosed rooms / cabin is in a clean condition.	<p><b>Intent:</b> To ensure the inside of each enclosed room/cabin is kept in a clean condition free from contaminants.</p> <p><b>Personnel:</b> Operators.</p> <p><b>Method:</b> Check inside a sample from each category of enclosed room/cabin. Note condition of floors and surfaces. Is it being kept in a clean condition? Check with operator on frequency of cleaning.</p>
11.10	Stockpile tunnel temperatures and air velocities are monitored and controlled.	<p><b>Intent:</b> To verify adequate ventilation is provided in each stockpile tunnel.</p> <p><b>Personnel:</b> Ventilation officer, supervisors, operators, maintenance staff.</p> <p><b>Method:</b> Check the wet bulb temperature inside each stockpile tunnel. Where the wet bulb temperature exceeds 25° C there is a minimum air velocity of 0.5m/s flowing. Refer to MSIR 9.15(3).</p>

11.11	<p>Where employees are required to work for extended periods exposed to the elements, safe systems of work have been developed.</p>	<p><b>Intent:</b> To verify that each employee is protected from exposure to extremes of weather i.e. sun, temperature, wind, rain etc.</p> <p><b>Personnel:</b> Employees.</p> <p><b>Method:</b> Confirm procedures have been developed to minimise exposure to any harsh weather conditions. Determine if work is re-organised to be carried out early in the morning or at night to avoid high temperatures, job rotation is used, heaters, fans overhead shade and windbreaks are provided, shade hats, long sleeved shirts and trousers, cool packs and / or heavy weather clothing are provided. Interview employees about the methods utilised. Refer to MSIR 9.15.</p>
11.12	<p>Cooling towers, evaporative condensers, warm water systems or other plant or devices which promote the growth of micro organisms have sufficient controls to prevent the growth of those organisms.</p>	<p><b>Intent:</b> To verify that sufficient controls are in place to identify and prevent the growth of micro organisms.</p> <p><b>Personnel:</b> Surface Ventilation Officer.</p> <p><b>Method:</b> Examine management procedures and water analysis records. Identify any exceedances and controls in place to manage and eliminate the growth of micro organisms. Refer to MSIR 9.25(2) and AS 3666.</p>
11.13	<p>Refrigeration Plants of a size greater than 100kW(R) have management procedures and are fitted with monitoring devices to detect and deal with the leakage of refrigerant.</p>	<p><b>Intent:</b> To verify that the mine has sufficient controls and devices to manage the dangers associated with the leakage of refrigerant.</p> <p><b>Personnel:</b> Surface ventilation officer.</p> <p><b>Method:</b> Examine management procedures and monitoring records. Identify any exceedances and controls in place to manage and control the leakage of any refrigerant. Refer to MSIR 9.25(3).</p>

## 12 Personal Protective Equipment

### Personal Protective Equipment

Point	Standard	Guideline
12.1	A site wide risk assessment has established the tasks which require respiratory protection devices to be used.	<p><b>Intent:</b> To verify that the tasks where employees are exposed to airborne contaminants have been identified.</p> <p><b>Personnel:</b> Employees.</p> <p><b>Method:</b> Inspect locations where respiratory equipment is used. Verify by interviews. Refer to MSIA S 9(1)(d).</p>
12.2	There is a program to select the appropriate respiratory protection for a person.	<p><b>Intent:</b> To verify the existence of a standard operating procedure which provides for the selection of respirators in accordance with AS 1715 and AS 1716.</p> <p><b>Personnel:</b> Surface ventilation officer, safety officer, employees.</p> <p><b>Method:</b> Confirm by examining operating procedures or equivalent document. All respirators must conform to AS 1716. Respirator selection should be based on recommendations and limitations available from relevant recognised standards. Selection process needs to consider the contaminant, the task and the operator. Where practicable, there should be provision for respirators to be issued on a personal basis. Refer to MSIR 4.1 and 9.12(1)(b).</p>
12.3	Respiratory protection devices are freely available and employees are aware of where and how to obtain the correct device.	<p><b>Intent:</b> To ensure employees have been instructed on methods of acquiring respiratory protection.</p> <p><b>Personnel:</b> Employees.</p> <p><b>Method:</b> Confirm by interview and inspection of each workplace for the availability of PPE.</p>
12.4	Employees are fit tested for the type of respirator issued to them.	<p><b>Intent:</b> To verify the respirator is properly fitted to the individual to whom it is assigned.</p> <p><b>Personnel:</b> Ventilation officer. Safety officer. Employees.</p> <p><b>Method:</b> Examine records of fit tests carried out. Verify by interviews. Refer to MSIR 4.1(1)(b), 4.13 and AS 1715.</p>

12.5	<p>Employees are required to be clean shaven where required to wear a half, full or disposable face piece respiratory protection equipment (RPE)</p>	<p><b>Intent:</b> To ensure personnel have an adequate facial seal with the respirator to prevent ingress of contaminants.</p> <p><b>Personnel:</b> Ventilation officer. Safety officer. Employees.</p> <p><b>Method:</b> Examine procedures, training records or any written instructions confirming compliance with this requirement. Inspect work areas for facial hair compliance in compulsory RPE areas. Verify by interviews.</p>
12.6	<p>Employees are trained in the use of the respirator provided.</p>	<p><b>Intent:</b> To verify the existence of a training program in which employees can become familiar with the respirator.</p> <p><b>Personnel:</b> Ventilation officer. Safety officer. Employees.</p> <p><b>Method:</b> Examine training program. Program should include the proper use, cleaning and maintenance, and the limitations of the equipment. Training should occur at the commencement of employment and at routine intervals thereafter (i.e. at least annually). Verify by interviews. Refer to MSIR 4.1(1)(b), 4.13 and AS 1715.</p>
12.7	<p>There is a maintenance program for non disposable respiratory protection.</p>	<p><b>Intent:</b> To ensure there is a maintenance program in existence which ensures a readily available supply of clean functional respirators.</p> <p><b>Personnel:</b> Ventilation officer. Safety officer. Employees.</p> <p><b>Method:</b> Examine the maintenance program. Program should follow the manufacturer's instructions and provisions for the storage, inspection, repair, cleaning and disinfection of the respiratory equipment. These aspects are particularly important for non-disposable respirators. Verify by interview and inspection of equipment. Refer to MSIR 4.1(2) and AS 1715.</p>

12.8	<p>Respirators are cleaned, maintained and stored as specified in the maintenance program.</p>	<p><b>Intent:</b> To ensure there is a maintenance program in existence which ensures a readily available supply of clean functional respirators.</p> <p><b>Personnel:</b> Ventilation officer. Safety officer. Employees.</p> <p><b>Method:</b> Examine the maintenance program. Program should follow the manufacturer's instructions and provisions for the storage, inspection, repair, cleaning and disinfection of the respiratory equipment. These aspects are particularly important for non-disposable respirators. Verify by interview and inspection of equipment. Refer to MSIR 4.1(2) and AS 1715.</p>
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## 13 Confined Spaces

### Confined Spaces

Point	Standard	Guideline
13.1	The confined space entry procedure requires atmospheric testing to be carried out prior to and during entry into the confined space where atmospheric contaminants are present or likely to be introduced into the confined space.	<p><b>Intent:</b> To verify that confined spaces do not have hazardous levels of atmospheric contaminants prior to and during employee entry into the confined space.</p> <p><b>Personnel:</b> Registered manager, surface ventilation officer, safety officer, shift Supervisor, operator.</p> <p><b>Method:</b> Examine the procedure document for the atmospheric testing requirements. Verify that the levels of oxygen and contaminants present are being checked prior to and during entry. Interview sentries to confirm that the atmospheric testing requirements are carried out in compliance with procedures. Refer to MSIR 4.2.</p>
13.2	The permit to dig procedure requires atmospheric testing to be carried out prior to and during employee entry into a narrow surface excavation or trench where the presence of high specific gravity hazardous atmospheric contaminants in the ground is suspected or known.	<p><b>Intent:</b> To verify that narrow surface excavations and trenches do not have hazardous levels of atmospheric contaminants prior to or during employee entry into the confined space.</p> <p><b>Personnel:</b> Registered manager, surface ventilation officer, safety officer, shift supervisor, operator.</p> <p><b>Method:</b> Examine the procedure document for the atmospheric testing requirements. Verify that the levels of oxygen and contaminants present are being checked prior to and during entry. Refer to MSIR 4.2.</p>

## 14 Abrasive Blasting

### Abrasive Blasting

Point	Standard	Guideline
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14.1	<p>Abrasive blasting work is carried out in accordance with the WorkSafe Western Australian Commission code of practice for abrasive blasting.</p>	<p><b>Intent:</b> To ensure that abrasive blasting work is carried out in a safe consistent manner.</p> <p><b>Personnel:</b> Manager, Contractor manager, Supervisor, Operator.</p> <p><b>Method:</b> Examine the site abrasive blasting procedure. Confirm if the procedure has been developed in accordance with guidelines contained in the WorkSafe Western Australian Commission code of practice for abrasive blasting.</p>
14.2	<p>Material used for abrasive blasting contains less than 5% silica by weight.</p>	<p><b>Intent:</b> To verify material used for abrasive blasting contains no more than 5% silica by weight.</p> <p><b>Personnel:</b> Supervisor, Operator.</p> <p><b>Method:</b> Examine abrasive blasting procedures to ensure it specifies that materials used must not contain more than 5% silica by weight. Also check material analysis and records of previous work done to verify that this is actually the case. Verify by interviews with supervisors. Refer to MSIR 9.9(2)(a).</p>
14.3	<p>Material used for abrasive blasting contains less than 1% of any one of the following - arsenic, beryllium, lead, cadmium, nickel, antimony, cobalt, chromium or tin.</p>	<p><b>Intent:</b> To verify material used for abrasive blasting contains no more than 1% of any one of the listed materials.</p> <p><b>Personnel:</b> Supervisor, Operator.</p> <p><b>Method:</b> Examine abrasive blasting procedures to ensure it specifies that materials used must not contain more than 1% by weight of any of the materials listed. Also check material analysis and records of previous work done to verify that this is actually the case. Verify by interviews with supervisors. Refer to MSIR 9.9(2)(b).</p>

14.4	<p>Material used for abrasive blasting contains no radioactive substance as defined in the Radiation Safety Act 1975.</p>	<p><b>Intent:</b> To verify material used for abrasive blasting contains no radioactive substance.</p> <p><b>Personnel:</b> Supervisor. Operator.</p> <p><b>Method:</b> Examine abrasive blasting procedures to ensure it specifies that materials used must not contain any radioactive substance. Also check material analysis and records of previous work done to verify that this is actually the case. Verify by interviews with supervisors. Refer to MSIR 9.9(2)(c).</p>
14.5	<p>Recycled dry abrasive blasting material is treated to remove respirable dust or other adverse material.</p>	<p><b>Intent:</b> To verify respirable dust or other adverse material is removed from recycled dry abrasive blasting material.</p> <p><b>Personnel:</b> Supervisor. Operator.</p> <p><b>Method:</b> Examine abrasive blasting procedures to ensure it specifies that recycled dry abrasive blasting material is treated to remove respirable dust Refer to MSIR 9.9(d).</p>
14.6	<p>The person operating the abrasive blasting machine wears an airline respirator of the hood or helmet type and the appropriate PPE.</p>	<p><b>Intent:</b> To verify the operator of an abrasive blasting machine wears suitable respiratory equipment and PPE to undertake the work safely.</p> <p><b>Personnel:</b> Supervisor. Operator.</p> <p><b>Method:</b> Carry out a visual check of the respirator to verify an operator using abrasive blasting equipment wears a properly maintained air-fed helmet conforming to AS 1716. Check that the respirator is fitted with an inner bib and shoulder cape, jacket or protective suit. Examine the adequacy of skin and foot protection. Refer to MSIR 9.9(3).</p>
14.7	<p>The air supply to the airline respirator is of acceptable breathable quality, pressure and temperature.</p>	<p><b>Intent:</b> To ensure the operator is being supplied with safe breathable air when wearing an airline respirator.</p> <p><b>Personnel:</b> Supervisor, operator, contractor.</p> <p><b>Method:</b> Inspect air quality documentation or air analysis measurements. Refer to WorkSafe code of Practice – Abrasive Blasting. Part 3.4.</p>

14.8

The abrasive blasting machine is fitted with an automatic cut-off device.

**Intent:**

To ensure the machine stops blasting if the operator drops or loses control of the blast nozzle.

**Personnel:**

Operator, contractor, supervisor.

**Method:**

Check cut-off device is fitted and it operates.