

Compliance priority report

Airborne contaminants – ventilation metalliferous underground mines

July 2024 to December 2024



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Executive summary

A crucial part of the Resources Regulator’s incident prevention strategy for mines and petroleum sites involves:

- targeted assessments and planned inspection programs – focusing on assessing an operation’s control of critical risks by evaluating the effectiveness of control measures in the mine’s safety management system
- priority programs – proactively assessing a topic that is an emerging risk throughout the industry, which is determined primarily from incident data as well as evolving industry trends. Although these topics may also be contained within the Regulator’s planned inspection programs, the aim of compliance priority programs is to gather further information and knowledge about how the industry is managing and controlling a specific issue.

The compliance priority program for airborne contaminants – ventilation in underground metalliferous mines was conducted between July 2024 and December 2024.

This program reviewed how operators of underground metalliferous mines were implementing principal hazard management plans dealing with air quality, dust and other airborne contaminants in underground work environments.

The key objective of this program was to ensure that mine operators were taking appropriate action to achieve compliance with the legislation and the mine’s own safety management system.

This compliance priority program assessed 15 underground metalliferous mines. Some the site assessments were unannounced and included tasks undertaken outside of production areas and targeted plant or machine shut-down work tasks.

This report provides information on the assessment findings and recommendations for operators of underground metalliferous mines. Some of the notices issued related to other matters identified during the assessment.

In summary, of the 15 underground metalliferous mines assessed, 37 compliance notices were issued to 14 mines during the program. Twenty-five of the 37 notices issued related specifically to the topic of airborne contaminants – ventilation in underground metalliferous mines.

Explanatory notes on the assessment system are listed in Appendix A.

Assessment criteria for all assessments

Assessment criteria were identified by the Regulator to review how operators of underground metalliferous mines were implementing principal hazard management plans dealing with air quality, dust and other airborne contaminants in underground work environments.

A tabulation of the assessment criteria for airborne contaminants – ventilation at underground metalliferous mines is provided in Table 1.

Table 1. Criteria for airborne contaminants – ventilation at underground metalliferous mines

Criteria number	Criteria
01	Does the mine have an inspection document for supervisors when conducting ventilation checks in the workplace?
02	What documentation and equipment is provided for the supervisor to record the ventilation and atmospheric measurements?
03	Confirm competence of shift supervisor to complete ventilation checks and what training has the mine provided?
04	What ventilation controls have been identified and implemented to manage heat?
05	Is ventilation adequate for the number of pieces of equipment/mobile plant working on a level or mining area?
06	Inspection of a ventilation control in the field for operation and condition, and do supervisors inspect on their rounds of the mine?
07	Can workers explain the controls to manage heat?
08	Inspect refuge chamber for operational readiness
09	Inspect escapeways entrances, to ensure access is not impeded and signs are in place
10	When returning to surface check availability of mines rescue teams numbers available to respond

Assessment findings for underground metalliferous mines

Overall, the assessment findings for underground metalliferous mines were:

- 15 underground metalliferous mines assessed
- 150 individual findings for the assessed criteria
- 64 assessment findings with enforcement action recorded
- 37 compliance notices issued to 14 mines during the program.
- 25 of the 37 notices issued related specifically to the topic of airborne contaminants – ventilation in underground metalliferous mines.

In summary, the overall assessment findings by criteria were found to be variable across the 10 individual criteria topics reviewed as shown in Figure 1.

Figure 1. Summary of assessment findings by criteria



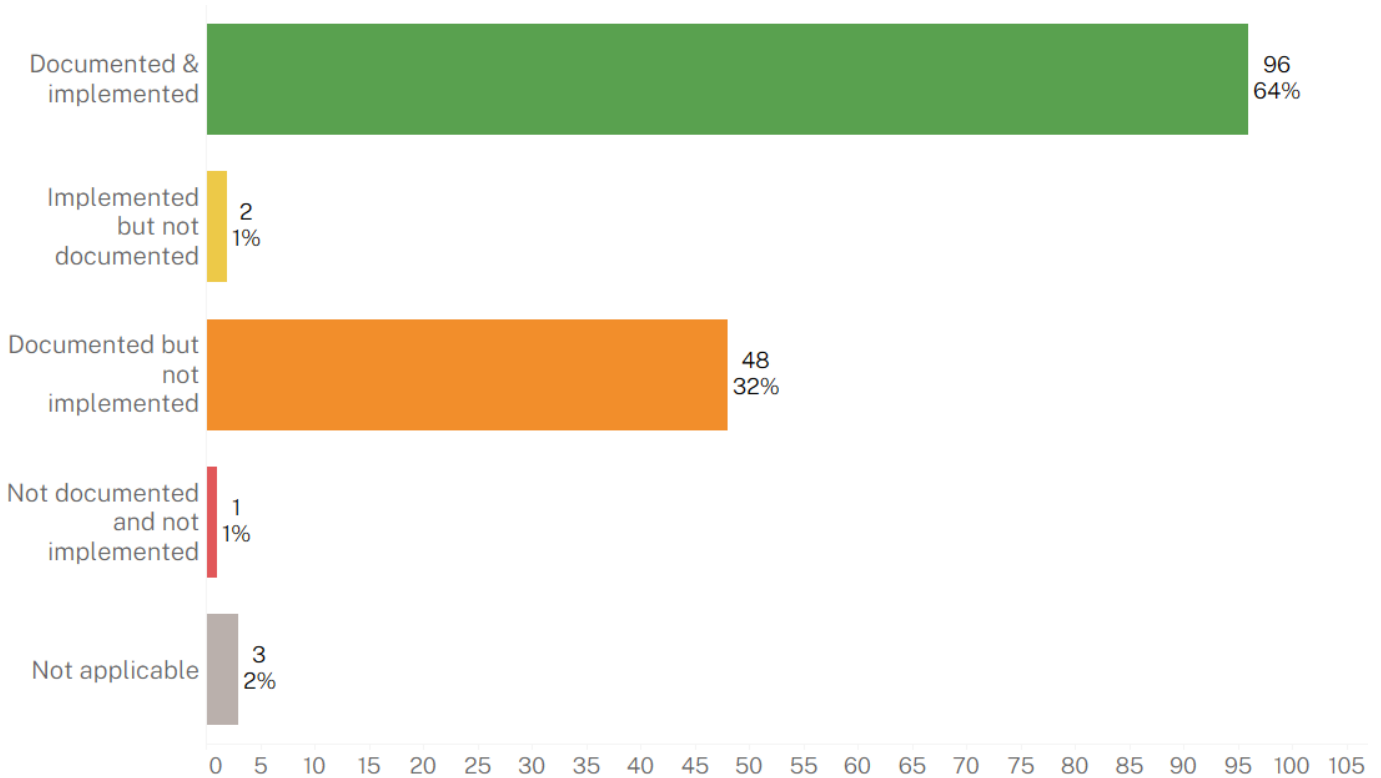
Assessment overall ratings for underground metalliferous mines

In summary, the overall assessment ratings for underground metalliferous mines were:

- 64% rating for documented and implemented finding
- 1% rating for implemented but not documented
- 32% rating for documented but not implemented finding
- 1% rating for not documented and not implemented finding.

The overall assessment findings ratings for underground metalliferous mines is shown in Figure 2.

Figure 2. Overall assessment findings ratings for surface coal mines



Notices issued to underground metalliferous mines

In total, there were 15 assessments conducted at underground metalliferous mines.

In summary, there were 37 compliance notices issued to 14 of the 15 mines assessed:

- 25 of the 37 notices issued related specifically to the topic of airborne contaminants – ventilation in underground metalliferous mines

Compliance notices comprised of:

- 2 x section 195 prohibition notices (both notices related to the principal hazard - ground or strata failure)
- 15 x section 191 improvement notices related to airborne contaminants – ventilation

- 7 x section 191 improvement notices related to other principal hazards or control plan topics
- 10 of the 13 section 23 cause for concern notices issued related to airborne contaminants – ventilation.

The compliance notices issued for underground metalliferous mines were reviewed and Table 2 lists the notices issued by type and number.

Table 2: Compliance notices issued for underground metalliferous mines

NOTICE TYPE	TOTAL ISSUED	NUMBER OF SITES
s.195 prohibition notice	2	1
s.191 improvement notice	22	9
s.23 notice of concern	13	7
Total	37	14

Note: some mine sites were issued multiple notices

Recommendations for underground metalliferous mines

Based on the findings outlined in this report and in relation to the numbers and types of compliance notices issued during the compliance priority assessment of airborne contaminants – ventilation in underground metalliferous mines, it is recommended that the following principal hazard and control plan be reviewed by operators of underground metalliferous mines:

Principal hazard – Air quality or dust or other airborne contaminants:

- Monitor exposure to dusts and airborne contaminants in excess of occupational exposure limits (OEL) and diesel exhaust emissions to less than permitted exposure standards for diesel particulates.
- Ensure supervisors have adequate information and training about the health risks associated with airborne dusts and contaminants in an underground work place including during emergency situations associated with the generation of fire gasses.
- Ensure in all secondary ventilated areas of the mine where diesel engine mobile plant operates that regular ventilation monitoring of airflow maintains cumulative diesel exhaust emissions less than permitted exposure standards for diesel particulates.

Control plan – ventilation control plan:

- Ensure signs at underground regulators, fans and ventilation doors clearly identify the location and name of the ventilation control device and provides workers with information to prevent unauthorised adjustment or removal of the ventilation control device.

- Ensure all workers are trained and competent in the mine site controls for managing thermal stress (heat or cold temperature stress).
- Ensure supervisors using air quantity and quality measuring devices are appropriately trained and deemed competent in measuring ventilation data and recording ventilation information as required by the site ventilation control plan.
- Ensure all air quantity and quality measuring devices are logged, monitored and tested as required for compliance by the mine ventilation control plan or original equipment manufacturer guidance before use in the mine.
- Ensure the mine ventilation control mine plan maintains up-to-date information relevant to the ventilation control systems operating at the mine and dissemination of the plan to all supervisors required to monitor ventilation in the mine.
- Ensure documented information transfer occurs between shifts for all supervisors and workers affected by ventilation modifications and defects and the appropriate use of a ventilation trigger action response plan (TARP) for decision-making processes for access to work place locations.
- Ensure before significant mine ventilation change (i.e. main and secondary fan air flow modifications causing significant airflow modifications in the mine) that ventilation modelling provides information for a TARP for all locations in the mine where people are required to work.

Further information

For more information on safety assessment programs, the findings outlined in this report, or other mine safety information, please contact the Regulator.

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Appendix A – Assessment criteria rating

Each assessed criteria is rated from one to 4 based on evidence supporting the expected control supports identified at the mine site.

Evidence supporting expected control supports

Expected control supports	Rating	Evidence supporting rating / comments				
	<table border="1"> <tr> <td>4</td> <td>3</td> </tr> <tr> <td>2</td> <td>1</td> </tr> </table>	4	3	2	1	
4	3					
2	1					

Assessment findings results are calculated based on the total points allocated to the assessed ratings as a percentage of the maximum possible points for each criteria group, and any findings rated as ‘Not applicable’ were excluded from the calculation.

Criteria assessed ratings and points

Assessed as	Rating	Points
Documented & implemented Compliant	4	4
Implemented but not documented Improvement needed	3	2
Documented but not implemented Significant improvement needed	2	1
Not documented and not implemented Non compliant	1	0
Not applicable (N/A)		

Findings results (points) with colours assigned as follows:

- Green (=100%)
- Yellow (>= 80% and <100%)
- Orange (>= 65% and <80%)
- Red (<65%)
- Not applicable