

## Consolidated report

# Air quality or, dust or other airborne contaminants – stage 1 – underground coal mines

January 2024 to October 2024



**Published by the Department of Primary Industries and Regional Development**

Title: Consolidated report – air quality or, dust or other airborne contaminants – stage 1 – underground coal mines  
Subtitle: January 2024 to October 2024  
First published: February 2025  
Department reference number: RDOC25/20123

**More information**

Amendment schedule		
Date	Version	Amendment
February 2025	1	First published

© State of New South Wales through the Department of Primary Industries and Regional Development 2025. You may copy, distribute, display, download and otherwise freely deal with this publication for any purpose, provided that you attribute the Department of Primary Industries and Regional Development as the owner. However, you must obtain permission if you wish to charge others for access to the publication (other than at cost); include the publication in advertising or a product for sale; modify the publication; or republish the publication on a website. You may freely link to the publication on a departmental website.

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (February 2025) and may not be accurate, current or complete. The State of New South Wales (including the Department of Primary Industries and Regional Development), the author and the publisher take no responsibility, and will accept no liability, for the accuracy, currency, reliability or correctness of any information included in the document (including material provided by third parties). Readers should make their own inquiries and rely on their own advice when making decisions related to material contained in this publication.

# Table of Contents

Executive summary .....	4
Assessment criteria for all assessments .....	4
Assessment findings for underground coal mines .....	6
Assessment overall ratings for underground coal mines.....	7
Notices issued to underground coal mines.....	10
Recommendations for underground coal mines.....	10
Further information .....	11
Appendix A – Assessment criteria rating.....	12

## 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.

The planned inspection program in underground coal mines for air quality or, dust or other airborne contaminants – stage 1 was conducted between January 2024 and October 2024.

A bowtie identified the following 4 threats for the material unwanted event (MUE) of unplanned exposures to hazardous atmospheres: low oxygen environment, dust raised in suspension, hazardous chemicals in the atmosphere and carcinogens in the atmosphere.

As part of the planned assessment activities, Regulator inspectors attended 18 underground coal mines with a focus on critical controls including ventilate workplace, hygiene monitoring and health monitoring.

This planned inspection program was part of an ongoing effort by the Regulator to reduce the potential risks associated with human exposures to hazardous atmospheres in underground coal mines.

This report provides information on assessment findings and recommendations for underground coal mine operators.

In summary, of the 18 underground coal mines assessed, 33 compliance notices were issued to 13 of the 18 underground coal mines.

11 of the 33 compliance notices issued related specifically to the assessment of human exposure to hazardous atmospheres in underground coal mines.

Twenty-two of the 33 compliance notices issued related to other types of non-compliance issues.

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

## Assessment criteria for all assessments

Assessment threats and consequences, critical controls and control supports were identified by the Regulator in a bowtie to review how mine operators manage the MUE of unplanned exposures to hazardous atmospheres. This assessment program reviewed three critical controls identified in the bowtie (PC1.3, MC1.2 and MC1.3).

A tabulation of the threat/consequence and critical controls for the MUE is provided in Table 1.

Table 1. Threats-consequence, critical control for the MUE unplanned exposures to hazardous atmospheres

	Threat/Consequence	Critical control
Threat	<ol style="list-style-type: none"> <li>1. Low oxygen environment</li> <li>2. Dust raised into suspension</li> <li>3. Hazardous chemicals in the atmosphere</li> <li>4. Carcinogens in the atmosphere</li> </ol>	Ventilate workplace (PC 1.3)
Consequence	One or more fatalities	Hygiene monitoring (MC 1.2)
		Health monitoring (MC1.3)

A tabulation of the critical controls and control supports for the MUE is provided in Table 2.

Table 2. Critical controls and control supports for the MUE unplanned exposures to hazardous atmospheres

Critical control		Control support
Ventilate workplace (PC 1.3)	01	The ventilation controls have been implemented to the specified design.
	02	Talk with a person who completes ventilation control inspections and maintenance to verify their knowledge of the control performance requirements.
	03	Validate a recently completed inspection of a ventilation control in the field with that person.
	04	The implemented ventilation control operates as designed.
	05	Ventilating air is drawn from a pure source.
	06	Airborne contaminants are being diluted or drawn away from the breathing zones of people in the area.
	07	People can explain the airborne contaminant hazards in their workplace, the health impacts of exposure to those hazards, the ventilation controls and action required of them when controls are ineffective.
	08	Workers confirm ventilation controls are effective during production and maintenance processes.
	09	Workers confirm ineffective ventilation controls are rectified in a timely manner.
Hygiene monitoring (MC 1.2)	01	Workers participating in hygiene monitoring recall the sample period being representative of exposure during the shift.
	02	Workers participating in hygiene monitoring recall the activity they conducted during the shift being recorded by the person conducting the sampling.
	03	Workers participating in hygiene monitoring recall receiving a copy of the hygiene monitoring results.
	04	Workers recall being informed about the overall results of the hygiene monitoring program.

Critical control		Control support
	05	Workers recall revised controls being implemented as a result of poor sample results.
Health monitoring (MC 1.3)	01	Confirm with a selection of workers that they are required to attend health monitoring. Refer to the requirements outlined in the health control plan for their similar exposure group.
	02	Confirm with a selection of workers that they were informed of the results of any health monitoring they participated in. Examples may include the results of a chest x-ray, lung function test or a blood test.

## Assessment findings for underground coal mines

Overall, the assessment findings for underground coal mines were:

- 18 underground coal mines were assessed
- 288 individual findings for the assessed criteria,
- 12 assessment findings with enforcement action recorded,
- 33 compliance notices were issued to 13 of the 18 underground coal mines assessed

Figure 1 provides a summary assessment of the overall results by critical control.

Figure 1. Summary assessment findings of overall results by critical control

Threat	Consequence		Grand Total
1. Low oxygen environment 2. Dust raised into suspension 3. Hazardous chemicals in the atmosphere 4. Carcinogens in the atmosphere	One or more fatalities		
PC1.3	MC1.2	MC1.3	
Ventilate workplace	Hygiene monitoring	Health monitoring	

- Green (=100%)
- Yellow (>= 80% and <100%)
- Orange (>= 65% and <80%)
- Red (<65%)

In summary, the overall assessment findings by critical control were assessed in total as 99%.

The assessment overall findings by critical control ranged from 97% to 100% (two critical control assessment topic findings were in the yellow colour category).

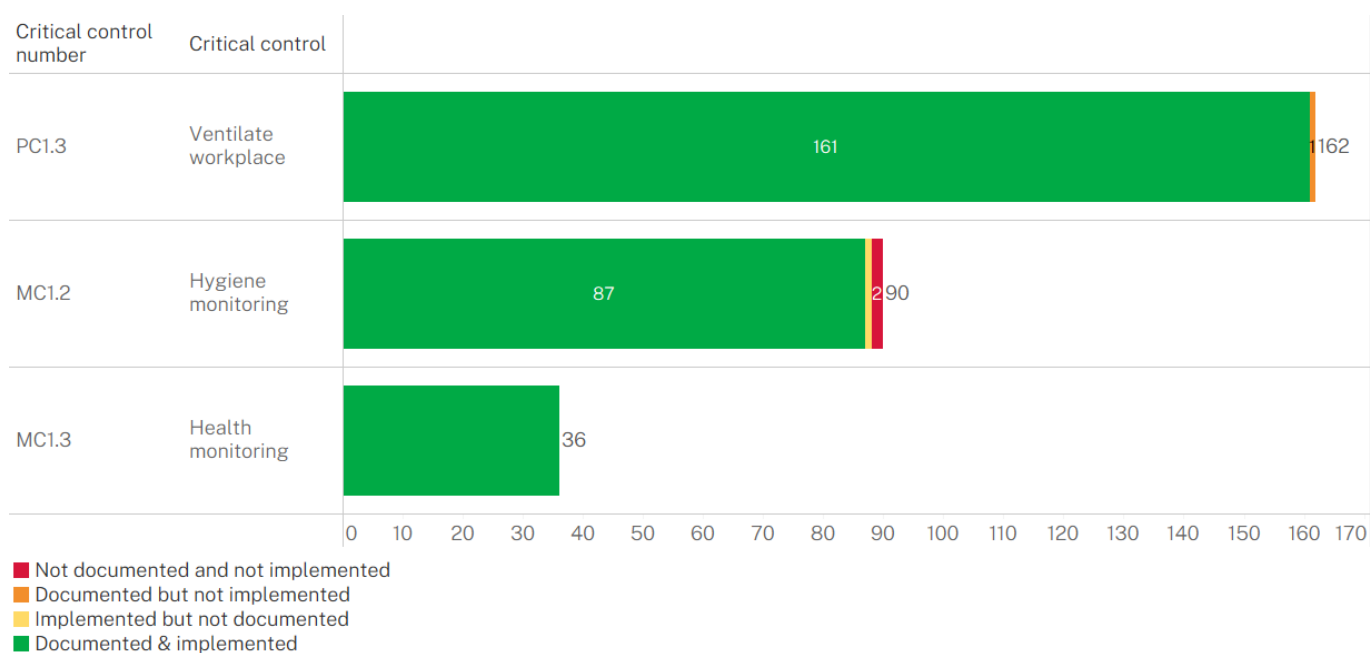
# Assessment overall ratings for underground coal mines

In summary the overall assessment ratings for underground coal mines were:

- 98.6% rating for documented and implemented finding
- 0.3% rating for implemented but not documented finding
- 0.3% rating for documented but not implemented finding
- 0.7% rating for not documented and not implanted

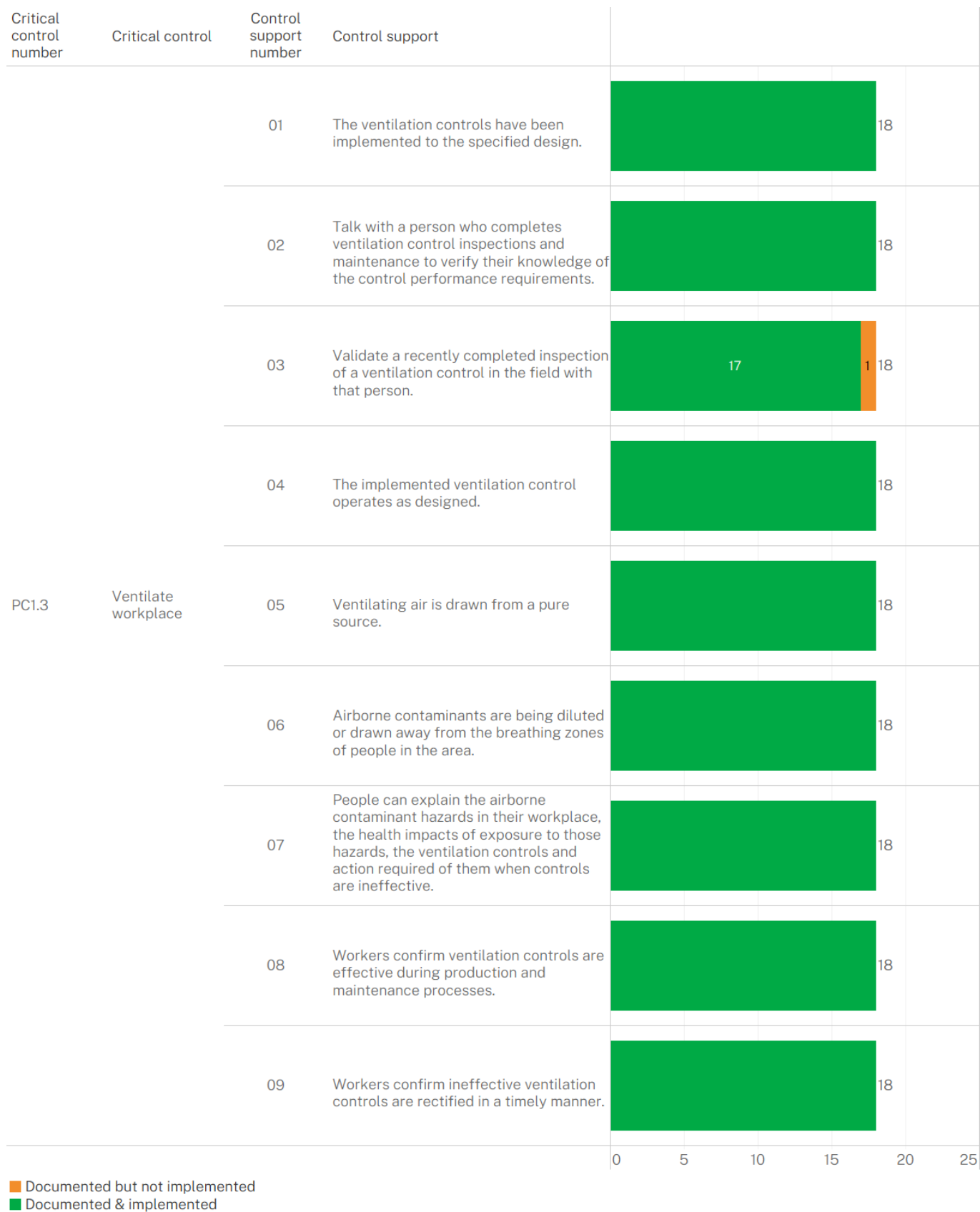
The overall assessment findings ratings by critical control for underground coal mines is shown in Figure 2.

Figure 2. Overall assessment findings ratings by critical control for underground coal mines



The overall assessment findings ratings by critical control and control support for underground coal mines is shown in Figure 3.

Figure 3. Overall assessment findings ratings by critical control and control support for underground coal mines





Consolidated report – air quality or, dust or other airborne contaminants – stage 1 – underground coal mines - January 2024 to October 2024

Critical control number	Critical control	Control support number	Control support	
MC1.2	Hygiene monitoring	01	Workers participating in hygiene monitoring recall the sample period being representative of exposure during the shift.	18
		02	Workers participating in hygiene monitoring recall the activity they conducted during the shift being recorded by the person conducting the sampling.	18
		03	Workers participating in hygiene monitoring recall receiving a copy of the hygiene monitoring results.	18
		04	Workers recall being informed about the overall results of the hygiene monitoring program.	15 1 2 18
		05	Workers recall revised controls being implemented as a result of poor sample results.	18
MC1.3	Health monitoring	01	Confirm with a selection of workers that they are required to attend health monitoring. Refer to the requirements outlined in the health control plan for their similar exposure group.	18
		02	Confirm with a selection of workers that they were informed of the results of any health monitoring they participated in. Examples may include the results of a chest x-ray, lung function test or a blood test.	18

0 5 10 15 20 25

■ Not documented and not implemented  
■ Implemented but not documented  
■ Documented & implemented

## Notices issued to underground coal mines

In total, 18 assessments were conducted at underground coal mines.

In summary, there were 33 compliance notices issued to 13 of the 18 underground coal mines assessed comprising:

- 14 x section 191 improvement notices
- 19 x section 23 cause for concern notices.

Note: 11 of the 33 compliance notices issued related specifically to human exposure to hazardous atmospheres in underground coal mines.

22 of the 33 compliance notices issued related to other types of non-compliance issues.

The compliance notices issued for underground coal mines were reviewed and Table 3 lists the notices issued by type and number.

Table 3: Notices issued for underground coal mines

NOTICE TYPE	TOTAL ISSUED	NUMBER OF SITES
s.191 improvement notice	14	8
s.23 notice of concern	19	13
<b>Total</b>	<b>33</b>	<b>13</b>

**Note: some mine sites were issued multiple notices**

## Recommendations for underground coal mines

Based on the findings outlined in this report and in relation to the numbers and types of compliance notices issued during the assessment of human exposures to hazardous atmospheres in underground coal mines it is recommended that the following topics should be reviewed by operators of underground coal mines:

Review of the site principal hazard management plan for air quality or dust or other airborne contaminants, in particular:

- assessment of the risks and controls for biological contaminants and hazardous atmospheres present in underground roadways
- appropriate and accurate up-to date hazardous atmosphere information provided on Deputies notice boards notifying workers of the current state of any hazardous atmospheres within the part of the mine about to be entered
- management of dust on travelling roads and accumulations of coal dust on conveyors and coal transfer points to reduce the potential for airborne coal dust moving into inbye roadways where workers are present
- welding fume atmospheric contaminant levels maintained below exposure standards
- information and training provided to workers who are likely to be exposed to welding fume atmospheric contaminants

- management of appropriate storage after removal from mobile plant and the disposal of used diesel engine particulate filters
- ensuring diesel engine particulate filters are not runover and damaged by mobile plant exposing workers to airborne diesel particulate contaminants.

## Further information

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

CONTACT TYPE	CONTACT DETAILS
Email	<a href="mailto:cau@regional.nsw.gov.au">cau@regional.nsw.gov.au</a>
Incident reporting	To report an incident or injury call 1300 814 609 or log in to the <a href="#">Regulator Portal</a>
Website	<a href="http://www.resources.nsw.gov.au">www.resources.nsw.gov.au</a>
Address	Resources Regulator 516 High Street Maitland NSW 2320

## 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 <b>Compliant</b>	4	4
Implemented but not documented <b>Improvement needed</b>	3	2
Documented but not implemented <b>Significant improvement needed</b>	2	1
Not documented and not implemented <b>Non compliant</b>	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