



**NSW
Resources
Regulator**

COMPLIANCE PRIORITY REPORT

UNDERGROUND COAL – GAS MANAGEMENT

January 2022 – March 2022



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Contents

Executive summary.....	4
Key Findings	4
Recommendations.....	5
Notices issued	6
Further information.....	8
Appendix A. Legislative requirements and published guidance relating to gas management in underground coal mines.....	9

Executive summary

A crucial part of the NSW Resources Regulator's *Incident Prevention Strategy* involves compliance priority programs for mines and petroleum sites. This involves proactively assessing a topic which is an emerging risk across the industry, that is driven primarily from incident data as well as evolving industry trends. Although these topics may also be contained within the Resources Regulator 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.

This report summarises the assessment findings from the compliance priority program that targeted gas management within underground coal mines and covered 11 mines between January 2022 and March 2022. Several key elements were assessed as part of this program and included:

- hazard identification
- risk assessment
- identify maximum acceptable gas concentrations
- gas drainage requirements
- control effectiveness monitoring
- control effectiveness review
- long term planning
- spontaneous combustion monitoring.

Legislative requirements and published guidance relating to gas management in underground coal mines are listed in Appendix A.

Key findings

The results from this assessment program were generally considered satisfactory. Mines had identified gas domains through exploration work that gave broad indication of gas content and composition. This was followed up, as required to further delineate the gas reservoir through in seam drilling and testing.

Several mines were in the planning stage for entering new gas domains with changes to gas content and/or gas composition. Planning was in place to complete studies in an appropriate time frame to manage the change over and have plans in place to allow for adequate drainage time and to develop plans for handling the changes.

Many mines reported increased drainage capacity (pre and/or post) that had been planned to work in tandem with designed ventilation quantities to handle expected gas emissions. Most mines reported excess drainage and ventilation capacity to deal with variations to the gas make and maintain ventilation methane below 2% at all times.

These findings are in line with the reduction in notifications under WH(M&PS)R cl 128 (5) (b) – the detection of a concentration of methane in the general body of the air at an underground coal mine (other than a sealed area or a goaf) that is greater than 2% by volume.

Recommendations

All mines should consider as part of their gas management strategy the following points –

Maximise the capturing of gas to reduce the burden on the mine ventilation system

Gain knowledge of potential gas sources including the coal seam being worked and any other coal seams and gas bearing strata below or overlying the seam being worked that are likely to be influenced by mining activity

Reservoir modelling including gas composition and content both in situ and post drainage

Include a means to determine which reservoir the gas is released from to confirm design and modelling assumptions

Aligning production rates with post-drainage capacity and ventilation quantity to provide returns to be maintained under 2% methane at all times and as low as reasonably practicable

Goaf falls and barometric pressure changes should be considered as capable of introducing quantities of gas into the mine workings.

Maximum acceptable gas concentrations in the mine ventilation roadways have been established for longwall tailgate or panel return and any bleed roadway to as low as reasonably practicable

Minimum ventilation quantities have been established for longwall tailgate or panel return and any bleed roadway

Where a gas drainage system has been employed, the minimum required performance of the system has been determined.

- gas flow rate
- minimum acceptable gas purity
- percentage gas capture rate
- redundancy for system trips, planned maintenance or other outages.

Gas accumulation risks associated with intersecting pre drainage holes are acknowledged and managed

Long term plans are made to provide the required capacity of the ventilation and gas drainage systems to meet planned production rates

Planned production rate increases are evaluated against the capacity of the ventilation and gas drainage systems before being implemented

Panel CO make calculations include all CO produced by the panel including CO reporting to the gas drainage system

System performance is monitored, reviewed and compared to predicted outcomes

Notices issued

Of the 11 sites assessed under the inspection program, 3 separate mines received notices relating to gas management, while some mines received notices in relation to other matters. For the purposes of this report, contraventions related to other matters have been removed from the analysis. The notices issued for gas management were examined in detail and Table 2 below lists the notices issued by type and details.

Table 1: Notices issued for the compliance priority program – Underground Coal – Gas Management

NOTICE TYPE	TOTAL ISSUED	NUMBER OF MINES
s.195 prohibition notice	1	1
s.191 improvement notice	0	0
s.23 notice of concerns	2	2
Total	3	3

Table 3 summarises the type of contraventions and identifies some trends which are of concern.

Table 3: Notices issued - prevalence of categories of concern

IDENTIFIED CONCERN CATEGORIES

- A ventilation measurement in a working heading ventilated by brattice indicated less than 0.3m³/s velocity behind the miner at the face.
- A mine was identified as having a bleed return roadway with no maximum CO₂ limits documented. This roadway has strict access restrictions.

Further information

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

CONTACT TYPE	CONTACT DETAILS
Email	cau@regional.nsw.gov.au
Incident reporting	To report an incident or injury call 1300 814 609 or log in to the Regulator Portal
Website	www.resourcesregulator.nsw.gov.au/
Address	NSW Resources Regulator 516 High Street Maitland NSW 2320

Appendix A. Published material relating to gas management in underground coal mines

The following is a list of certain publications related to the management of gas related risks referred to in this report.

- www.resourcesregulator.nsw.gov.au/sites/default/files/2021-11/Consolidated-Report-Fire-or-explosion-maintain-non-explosive-atmosphereunderground-coal-mines.pdf
- www.resourcesregulator.nsw.gov.au/sites/default/files/documents/sa18-04-crew-withdrawn-from-coal-face-after-methane-ignites.pdf
- www.resourcesregulator.nsw.gov.au/sites/default/files/documents/sa17-01-gas-outburst-on-longwall-face.pdf
- www.resourcesregulator.nsw.gov.au/sites/default/files/documents/sa16-08-workers-exposed-to-elevated-levels-of-methane.pdf
- www.resourcesregulator.nsw.gov.au/sites/default/files/documents/sa11-12-ignition-of-gas-leads-to-underground-fire.pdf
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