CS Health

# Guidelines for managing identified lung disease in the coal mining environment

**Guidelines for managing identified lung disease in the coal mining environment**

Published by Coal Services Pty Limited
July 2024

www.coalservices.com.au

# Introduction

Coal mine workers may be exposed to a range of respiratory hazards in the mine atmosphere, including not only coal dust, but also silica, diesel exhaust particulate and other contaminants. In some coal mine workers, these exposures collectively comprising coal mine dust may cause coal mine dust lung disease (CMDLD), a spectrum of chronic lung diseases resulting from cumulative exposure to these respiratory hazards.

CMDLD includes not only the “classic” pneumoconioses of coal workers’ pneumoconiosis (CWP), mixed-dust pneumoconiosis, and silicosis, but also obstructive lung diseases including emphysema and chronic bronchitis; lung function decline; and pulmonary fibrosis, known as dust-related diffuse fibrosis.

It is critical that the health of coal mine workers is protected, both by controlling exposure to airborne contaminants in the workplace and where workers have developed CMDLD it must be closely monitored to preserve health and quality of life.

Mining, Exploration and Geoscience within the New South Wales Department of Regional NSW, released the "Review of the New South Wales Health Surveillance Scheme for Coal Mine Workers" in September 2023. This contained 16 recommendations, including:

**Recommendation 14:**

***Establish formal criteria to return workers with early CMDLD or other non-occupational lung diseases to work, or removal from exposure for those with more advanced disease.***

There is currently a guideline document published by Queensland Workers’ Compensation Regulatory Services (WCRS) titled *Returning workers with mine dust lung disease to the workplace* (2022). This is a valuable resource for guidance on monitoring requirements and trigger points for dust exposure restrictions and removal.

The NSW review has effectively expanded the scope of the Queensland WCRS guidance material. The NSW reviewers noted that “regardless of the putative underlying cause(s) of a worker’s lung disease, the severity of lung function abnormalities should, by themselves, prompt consideration for reducing future dust exposure.”

Thus, the focus is on preserving remaining lung function once a certain level of impairment or abnormality is identified. The Queensland WCRS document has been extensively drawn on and followed in many parts of this document.

The return of coal mine workers with early CMDLD will be governed primarily by the *Workplace Injury Management and Workers Compensation Act 1998*.

The *Guidelines for Managing Identified Lung Disease in the Coal Mining Environment* (the guideline) has been prepared to provide guidance to the industry and may be utilised by persons conducting a business or undertaking (PCBU) to guide the return to work process for these coal mine workers. It is also relevant for coal mine workers with non-occupational lung disease.

This guideline should be used in conjunction with the *Coal Services Clinical Pathways for Coal Mine Dust Lung Disease (CMDLD) Monitoring*.

**Why is this important?**

Returning to work with a CMDLD is different to traditional return to work arrangements. This is because a coal mine worker with a CMDLD will require ongoing and enhanced health monitoring, as well as additional health and safety measures to mitigate dust exposure and to understand these measures are working effectively.

These expert medical guidelines provide a best practice and evidenced-based framework taking into account the individual circumstances of the coal mine worker's CMDLD, including the severity of their disease and the best outcome that can be achieved.

The guidelines are best used as a tool to facilitate discussion about return to work between a coal mine worker and their family, and their employer, insurer and medical specialists. It is also important to recognise any decision about return to work is made in consultation between these parties and under the guidance of an occupational physician and/or respiratory physician.

The guidelines do not change existing rehabilitation and return to work obligations or health and safety duties that apply to workers, employers, mine operators and workers' compensation insurers.

## Workplace occupational dust exposures

- The site is required to have a process in place that determines if a coal mine worker complies with assigned restrictions. This should include:
  - A review of airborne dust sampling results for similar exposure group(s) (SEG) that the coal mine worker is assigned. The review needs to determine if the exposure profile is adequate including:
    - if there are sufficient results to determine an exposure profile
    - if those results are below the restriction levels assigned.
  - A review of the coal mine worker's normal tasks to determine whether there are any high dust exposure tasks and whether the allocated SEG is appropriate.
- A competent person should undertake the review of the exposure data, this may be an occupational hygienist.
- The coal mine worker should have a periodic review of their work tasks and dust sampling results which should be made available to the relevant approved medical practitioner.

## Enhanced medical surveillance

Coal mine workers with identified lung abnormalities will require more frequent health monitoring. The frequency may vary with the condition and severity but should be at no greater intervals than 12 monthly.

- Standardised respiratory questionnaire
- Chest examination
- Complex lung function testing
- Low dose HRCT at the direction of the respiratory physician or in response to test results
- Review of work tasks and monitoring data.

Ongoing exposure to coal mine dust is not recommended if subsequent monitoring indicates progression:

- a decline of ≥15% in spirometry values, or
- a 10 – 15% decline in DLCO, or
- radiological progression by more than 1 ILO subcategory in 5 years, or an increase in the ICOERD score for small opacities by two or more points to an ICOERD score of 4 or greater, or
- the development of progressive massive fibrosis (PMF).

# Exposure guidelines - transitional arrangements

The recommended inhalable mine dust (IMD) limit will be assessed by an expert panel. Until the findings of that review are available, a transitional level of 5mg/m$^3$ (IMD) should be used. This will be reviewed at a minimum 12-monthly interval until the findings of the expert panel are available.

1. **Radiological evidence of mine dust lung disease – ILO category 1/0 1/1 & 1/2 or ICOERD score 1-7**
   - Should aim, as far as reasonably practicable, to comply with a reduced 8-hour time weighted average exposure level of less than 0.5mg/m$^3$ RCD, 0.025mg/m$^3$ RCS and 5mg/m$^3$ IMD.
   - Will require enhanced medical surveillance in not more than 12 months.
   - PCBU actions - should be part of enhanced dust monitoring with periodic review of work tasks.
2. **Radiological evidence of mine dust lung disease – ILO category 2/1 or ICOERD score 8-9**
   - Should aim, as far as reasonably practicable, to comply with reduced 8-hour time weighted average exposure level of less than 0.5mg/m$^3$ RCD, 0.025mg/m$^3$ RCS and 5mg/m$^3$ IMD.
   - Will require enhanced medical surveillance in not more than 12 months.
   - PCBU actions - should be part of enhanced dust monitoring with periodic review of work tasks.
3. **Radiological evidence of mine dust lung disease – ILO category ≥ 2/2 or ICOERD score ≥ 10, and Category A, B, C PMF**
   - Case by case assessment, usually should avoid further exposure to inhalable and respirable mine dust.
4. **Lung function abnormalities**

| Spirometry FEV1 values (pre-bronchodilation % predicted) | DLCO values (% predicted) | Dust exposure limits (time weighted average) | Enhanced medical surveillance |
|---|---|---|---|
| Rapid decline in FEV1 defined as >15% fall in reference value even if FEV1 >LLN | | Should aim, as far as reasonably practicable, to comply with reduced 8-hour time weighted average exposure level of **<1mg/m$^3$ RCD, 0.025mg/m$^3$ RCS and 5mg/m$^3$ IMD.** | Should be part of enhanced dust monitoring with periodic review of work tasks.<br><br>Requires at least annual respiratory review and CLFT. |
| >70% and <LLN (mild) | 60% and <LLN (mild) | Should aim, as far as reasonably practicable, to comply with reduced 8-hour time weighted average exposure level of **<1mg/m$^3$ RCD, 0.025mg/m$^3$ RCS and 5mg/m$^3$ IMD.** | |
| 60 – 69% (moderate) | 40 – 60% (moderate) | Should aim, as far as reasonably practicable, to comply with reduced 8-hour time weighted average exposure level of **<0.5mg/m$^3$ RCD, 0.025mg/m$^3$ RCS and 5mg/m$^3$ IMD.** | |
| 50 – 59% (moderately severe) | <40% (severe) | Case by case: usually exclude from dust exposure. | |
| 35 – 49% (severe) | | Usually not fit for work – exclude from dust exposure. | |

# Radiological abnormalities

| ILO CXR Classification | HRCT ICOERD Classifications | Dust exposure limits (time weighted average) | Enhanced medical surveillance |
|---|---|---|---|
| ≥1/0 and <2/1 or<br><br>1/0, 1/1 and 1/2 | ≥1 through 7 | Should aim, as far as reasonably practicable, to comply with reduced 8-hour time weighted average exposure level of **<0.5mg/m³ RCD, 0.025mg/m³ RCS and 5mg/m³ IMD.** | Should be part of enhanced dust monitoring with periodic review of work tasks.<br><br>Requires at least annual respiratory review, HRCT and CLFT. |
| 2/1 | 8 - 9 | Should aim, as far as reasonably practicable, to comply with reduced 8-hour time weighted average exposure level of **<0.5mg/m³ RCD, 0.025mg/m³ RCS and 5mg/m³ IMD.** | |
| ≥2/2 and Category A, B or C PMF | ≥10 and Category A, B or C PMF | Case by case: usually exclude from dust exposure. | |

### Radiological lung disease without lung function impairment

Screening may identify that a coal mine worker has non-pneumoconiosis changes such as emphysema without abnormal spirometry or DLCO measurements. In these cases, follow the exposure guidelines in the lung function abnormalities section (point 4 above) for mild abnormalities.

### Dust-related diffuse fibrosis

Follow the recommendations based on the profusion of small irregular opacities and any lung function abnormalities.

### Mixed radiological and lung function abnormalities

Follow up should be based on both sets of requirements.

### Other factors

- Non-standard work cycles – time weighted exposures are based on an 8-hour day and 40-hour week. They should be adjusted using the Quebec Model by the occupational hygienist when assessing dust exposures in the workplace.
- Psychological factors – the investigation process and identification of these diseases frequently causes significant anxiety and distress in coal mine workers. This often relates to the possible disease itself and the consequences of ongoing exposure. There is also often a significant fear for how it may affect their job. Many employers offer support services and the best outcomes for health and work come from early discussions involving all the affected parties to manage all the arising issues.

# Review of Respiratory Health Standard

A complete review of the Respiratory Health Standard will occur five years from the date of first release.

### Review of transitional arrangements

A review of transitional arrangements will occur on a 12-monthly basis until an outcome of the proposed NSW coal industry assessment of inhalable mine dust thresholds has been completed. This assessment will inform the ongoing exposure thresholds in NSW coal mining.

### Evidence base

The evidence base referenced in the Respiratory Health Standard will be reviewed on a yearly basis to ensure that it remains current. Amendments will be made if the clinical evidence base changes or is updated.

# Abbreviations

| | |
|---|---|
| CLFT | Complex lung function testing |
| CMDLD | Coal mine dust lung disease |
| CWP | Coal workers pneumoconiosis |
| DLCO | Diffusing capacity of lung for carbon monoxide |
| FEV1 | Forced expiratory volume in the first second |
| HRCT | High resolution computed tomography |
| ICOERD | International Classification of HRCT for Occupational and Environmental Respiratory Diseases |
| ILO | International Labour Organization |
| IMD | Inhalable mine dust |
| PCBU | Person conducting a business or undertaking |
| PMF | Progressive massive fibrosis |
| RCD | Respirable coal dust |
| RCS | Respirable crystalline silica |
| SEG | Similar exposure group |
| WCRS | Workers' Compensation Regulatory Services |

**Coal Services Pty Limited**
A.B.N. 98 099 078 234

## Corporate Office

**T** +61 2 8270 3200
**F** +61 2 9262 6090

Level 21, 44 Market Street
SYDNEY NSW 2000

PO Box Q1895
Queen VIctoria Building NSW 1230

**www.coalservices.com.au**