



Caledon

CC Pty Limited

ABN: 15 121 024 271

CWP Inquiry
Sub No. 019

Mrs Jo-Ann Miller MP

16 November 2016

Chair – Coal Workers’ Pneumoconiosis Select Committee

Parliament House

George Street

Brisbane QLD 4000

Dear Mrs Miller,

Submission to the Coal Workers’ Pneumoconiosis Select Committee

Caledon Coal Pty Limited (Caledon) welcomes the invitation to make this submission to the Coal Workers’ Pneumoconiosis (CWP) Select Committee of the Queensland Parliament. Caledon operates the Cook Colliery in Central Queensland and recently introduced an underground longwall mining system after a long history of predominantly bord and pillar mining.

Caledon’s submission provides a mine operator’s perspective of the topics included in the Committee’s terms of reference along with an example of contemporary dust control practices. The content of this submission is predominantly based on experience at the Cook Mine over the past 12 months during which period I have been the Chief Executive Officer of Caledon. I trust that this information assists the Committee in its deliberations.

Yours sincerely,

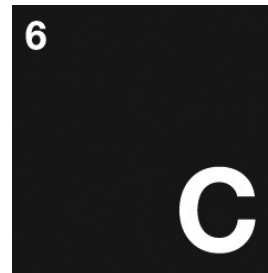
Dr Peter Trout

Chief Executive Officer

Caledon Coal Pty Limited

**Submission to the
Coal Workers'
Pneumoconiosis
Select Committee of
the Queensland
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Table of Contents

1	Introduction	3
2	Legislative and Other Regulatory Arrangements in Queensland.....	4
3	Adequacy of Legislative and Other Regulatory Arrangements.....	7
3.1	Coal Mine Workers’ Health Scheme	7
3.2	Principal Hazard Emphasis	7
3.3	Notification of Prescribed Diseases to SSE and Employer	7
4	Roles of Parties in Legislative and Other Regulatory Arrangements	8
4.1	Mine Operators.....	8
4.2	Government Departments and Agencies	9
4.3	Industry Safety and Health Representatives.....	10
4.4	Designers, Manufacturers and Suppliers of Equipment	11
5	Findings from the Monash University and the Senate Select Committee on Health Reports	11
6	Methodologies and Processes for Coal Mine Dust Measurement and Mitigation	11
6.1	Risk Assessment.....	12
6.2	Airborne Dust Principal Hazard Management Plan	12
6.3	Risk Treatment	14
6.3.1	Elimination	14
6.3.2	Substitution.....	14
6.3.3	Engineering Controls.....	15
6.3.4	Administrative Controls	16
6.3.5	Personal Protective Equipment (PPE).....	16
6.4	Communicate and Consult.....	17
6.5	Monitor and Review.....	17
6.5.1	Airborne Respirable Dust Sampling	17
6.5.2	Respiratory Health Surveillance.....	19
6.5.3	Management Oversight	19
7	Other Occupational Health Conditions.....	19
8	References	19
	Appendix A - Excerpt from Cook Mine’s Airborne Dust TARP	21
	Appendix B - Letter from Underground Coal Industry Representatives to Minister Lynham	23

1 Introduction

Caledon Coal Pty Limited (Caledon) operates the Cook Mine (Cook) which is located approximately 30 km south of Blackwater in central Queensland. Caledon secured the right to operate the Cook Mine in late 2006, became mine operator in 2008 and was subsequently acquired by the Guangdong Rising Assets Management (GRAM) group in 2011.

The Cook Mine was established in 1975 as a bord and pillar mining operation. The operation comprises an underground colliery and coal handling and preparation plant (CHPP) located approximately 14 km north of the mine. Cook produces predominantly coking coal which is railed for export through the Wiggins Island Coal Export Terminal (WICET) at Gladstone.

Both bord-and-pillar and longwall mining methods have been used during the operating history of Cook. A new longwall mining system was installed in late 2014 and a CHPP upgrade was commissioned in 2015 as part of an expansion and modernisation program. The Cook Mine produced 1.3 Mt of raw coal in 2015 as the expansion project was commissioned.

Approximately 420 employees and contractors work at the Cook Mine. Caledon believes that coal worker's pneumoconiosis (CWP) is a preventable occupational disease and has devoted considerable effort at improving dust controls to protect the health of coal mine workers at Cook. Caledon is not aware of any Cook Mine workers being diagnosed with CWP.

A brief chronology of recent events relating to airborne dust management at Cook Mine is provided in Table 1 as context for the content of this submission to the CWP Select Committee.

Table 1: Chronology of recent airborne dust activities at Cook Mine

Timeframe	Event
September 2014	The Chief Inspector of Coal Mines requested personal dust monitoring results from all Queensland underground coal mines for analysis and review by the Mines Inspectorate.
November 2014	Production commenced from Cook's new longwall system and associated infrastructure.
April 2015	A Directive was received from the Mines Inspectorate to "Develop and Implement an Effective Personal Monitoring Regime for Respirable Dust" and establish baseline data to understand the effectiveness of airborne dust controls following the introduction the longwall mining system.
May 2015	The frequency of personal respirable dust sampling increased to fortnightly intervals.

Timeframe	Event
August 2015	The Chief Inspector of Coal Mines notified coal mine Senior Site Executives (SSEs) of a rising trend in respirable coal dust concentrations based on the results of personal respirable dust monitoring. The Mines Inspectorate requested the results of personal respirable dust monitoring for earlier periods.
September 2015	Longwall production was suspended due to operational issues.
March 2016	Longwall production resumed.
April 2016	Elevated respirable dust levels were identified from the results of personal respirable dust monitoring. Action was initiated to improve dust controls.
	A team-based risk analysis was performed to identify pathways for the development of CWP in coal mine workers at the Cook Mine.
May 2016	A draft Principal Hazard Management Plan (PHMP) for Airborne Dust was prepared for internal review.
June 2015	A Level 3 ¹ compliance meeting was held with the Mines Inspectorate followed by a Directive to: <ul style="list-style-type: none"> (a) monitor coal mine workers exposure to respirable coal dust in development and longwall operations (b) review the mine's safety and health management system (SHMS) with respect to respirable dust.
	The PHMP for Airborne Dust was implemented.
July 2015	An Airborne Dust Trigger Action Response Plan (TARP) was implemented.
July – October 2015	Weekly dust sampling was performed using personal and static dust monitoring devices. One exceedance was recorded from 157 respirable dust monitoring samples.
October 2015	The respirable dust Directive was removed after personal monitoring results showed respirable dust concentrations below 50% of the occupational exposure limit at a 95% confidence level.
	Cook Mine commits to a further sampling program over four sequential weeks when longwall production commences in the next panel.

2 Legislative and Other Regulatory Arrangements in Queensland

The Cook Mine operates under the *Coal Mining Safety and Health Act 1999* (CMSHA) and the *Coal Mining Safety and Health Regulation 2001* (CMSHR). The CMSHA was developed through a tripartite

¹ A Level 3 compliance meeting under the *Mines Inspectorate Compliance Policy (2009)* involves a site management accountability meeting at a regional office with the Deputy Chief Inspector/Manager Safety and Health/Regional Inspector.

process involving representatives from employee and employer organisations and from Government.

The objects of the CMSHA are to:

- a) protect the safety and health of persons at coal mines and persons who may be affected by coal mining operations,
- b) require that the risk of injury or illness to any person resulting from coal mining operations be at an acceptable level, and
- c) provide a way of monitoring the effectiveness and administration of provisions relating to safety and health under the Act and other mining legislation.

The CMSHA provides for inspectors and other officers to monitor the effectiveness of risk management and control at coal mines, and to take appropriate action to ensure adequate risk management. These activities are funded by a levy on all operations regulated by the CMSHA. The levy is based on the number of workers in the industry and the budgeted cost of services.

The CMSHA establishes numerous obligations including:

- a) a risk based approach to manage coal mine safety and health hazards,
- b) an allowance for regulation to prescribe the way an acceptable level of risk of injury or illness can be achieved,
- c) a requirement for site-specific safety and health management systems (SHMSs) to manage risk effectively. This requirement recognises that the nature of hazards and the corresponding risk controls will vary between coal mines and includes the development of Principal Hazard Management Plans (PHMPs) to address hazards that have the potential to cause multiple fatalities,
- d) a role for employee safety and health representatives to represent the safety and health interests of coal mine workers,
- e) powers for inspectors and other officers, including the role of union funded full-time Industry Safety and Health Representatives (ISHRs), to monitor the effectiveness of risk management and control at coal mines, and to take appropriate action to ensure adequate risk management, and

- f) the right of the coal mine operator, the mine's Site Senior Executive, ISHRs, site safety and health representatives, coal mine workers, inspectors or inspection officers to evacuate persons at a coal mine to a safe location and act to reduce the risk to an acceptable level.

These provisions provide an appropriate framework to manage respirable dust and prevent CWP. Requirements for the control of coal mine worker's dust exposure are prescribed in Section 89 of the CMSHR. In particular, Section 89(1) describes the obligations to control respirable dust exposure through the coal mine's SHMS to ensure:

- a) each coal mine worker's exposure to respirable dust at the mine is kept to an acceptable level, and
- b) the worker does not breathe an atmosphere at the mine containing respirable dust exceeding an average concentration, calculated under AS 2985-2009 (Standards Australia, 2009a), equivalent to the following for an eight hour period:
 - i) for coal dust – 3 mg/m³ air
 - ii) for free silica - 0.1 mg/m³ air.

The new *Mining Safety and Health Legislation (Coal Workers' Pneumoconiosis and Other Matters) Amendment Regulation 2016* introduces, from 1 January 2017, additional obligations relating to:

- a) the reporting of conditions including CWP as a prescribed disease,
- b) health assessments including for retiring coal mine workers,
- c) submission of dust monitoring results to the Chief Inspector of Coal Mines,
- d) a staged escalation process for the notification of respirable dust monitoring exceedances, investigation, further monitoring and corrective action(s),
- e) designation of respirable dust sampling at a coal mine as a prescribed task which requires certain competencies of persons performing this duty, and
- f) requirements for the more effective implementation of the Coal Mine Workers' Health Scheme (Health Scheme).

Relevant to the CWP Select Committee's terms of reference is the Health Scheme regulated under Chapter 2, Part 6, Division 2 of the CMSHR. The Health Scheme includes requirements for pre-employment and periodic health assessments and monitoring for coal mine workers who are (to be) engaged in tasks other than low risk tasks. The health assessment includes the requirement for chest x-ray (CXR) and respiratory function tests to detect respiratory diseases at an early stage.

3 Adequacy of Legislative and Other Regulatory Arrangements

Caledon considers that, with the addition of the recent *Mining Safety and Health Legislation (Coal Workers' Pneumoconiosis and Other Matters) Amendment Regulation 2016*, the legislative framework relating to respirable dust is generally adequate and appropriate. Several observations are offered for the CWP Select Committee's consideration with emphasis on the implementation of legislation.

3.1 Coal Mine Workers' Health Scheme

The implementation and effectiveness of some legislative provisions has, with the benefit of hindsight, been demonstrated to be inadequate. In particular, the failure of the Health Scheme to detect cases of CWP has contributed to a belief by industry participants that the risk of CWP was being appropriately managed. Clearly this was not the case. The recommendations of the Monash Review (Monash University and University of Illinois at Chicago, 2016) provide the roadmap to improve the Health Scheme. Caledon supports activities to strengthen the respiratory health surveillance components of the Health Scheme and has contributed to the development and application of several protocols recommended by the Monash Review.

3.2 Principal Hazard Emphasis

It may be pertinent to recognise that the regulatory environment for underground coal mining in Queensland has been heavily influenced by several catastrophic events that resulted in multiple fatalities. This history contributed to a strong emphasis on the management of hazards that have the potential to cause disastrous outcomes, such as gas explosions, and manifest from a single initiating event. A focus by coal industry participants on the prevention of these events may have contributed to diminished emphasis on latent occupational health hazards, such as CWP, that typically result from long term exposures. It may therefore be appropriate to elevate respiratory and other occupational health hazards to a level that is comparable with single initiating event principal hazards through the use of PHMPs.

3.3 Notification of Prescribed Diseases to SSE and Employer

The *Mining Safety and Health Legislation (Coal Workers' Pneumoconiosis and Other Matters) Amendment Regulation 2016* introduces a requirement to report prescribed diseases, including CWP, to the Mines Inspectorate and ISHR. Section 198(6) of the CMSHA places this obligation upon the coal mine SSE. However there is no apparent obligation for the SSE to be advised of a diagnosis

of CWP because the Nominated Medical Advisor's (NMA) role is confined to giving advice about appropriate duties for the worker. Similarly there is no legislated obligation for the SSE to be informed of a coal mine worker's CWP diagnosis made by a medical professional outside the Health Scheme. This arrangement prevents a SSE from discharging their obligation to notify of a prescribed disease and limits the SSE's ability to act to prevent or limit further loss of the worker's respiratory function.

A similar situation exists for an employer who can be unaware of an employee's diagnosis with CWP or another prescribed disease.

It is recommended that both the coal mine SSE and employer be formally notified of a coal mine worker's diagnosis of CWP or other prescribed disease. Such notification should be made with due consideration of privacy obligations and irrespective of the diagnosis being made by a NMA under the Health Scheme or by a medical professional through another process. Emphasis must be placed upon the protection of the coal mine worker's health.

4 Roles of Parties in Legislative and Other Regulatory Arrangements

4.1 Mine Operators

Caledon as the operator of the Cook Mine recognises its legislated obligation to act to reduce workplace risk to an acceptable level. Workplace risk arises from a multitude of hazards including those that are inherent in underground coal mining. Cook Mine's SHMS describes the manner in which these risks will be managed and controlled. The SHMS is reviewed and updated from time to time to reflect risk assessment outcomes, legislative change, industry practices, and findings from monitoring, audits and investigations.

Effective leadership is an essential element in the management of workplace safety and health. Caledon has, through selection of people for management and supervisory roles, sought to appoint individuals who demonstrate visible safety leadership and display a genuine commitment to their personal wellbeing and that of their subordinates. In recent times, there has been a strong emphasis on compliance with improved workplace standards including those for the control of airborne dust. Compliance actions have included management instructions to suspend mining activities until the approved dust controls for coal cutting equipment are installed and functional.

Caledon has participated in various industry initiatives, principally through the Queensland Resources Council (QRC). The company's contributions have included feedback during consultation on draft regulations and recognised standards, and the sharing of information with other underground coal mines.

4.2 Government Departments and Agencies

Cook Mine's interaction with government departments and agencies primarily occurs through the Department of Natural Resources and Mines (DNRM) and, more routinely, the Mines Inspectorate.

Caledon is aware of recent public statements of concern regarding the Mines Inspectorates independence and the effectiveness of its enforcement practices. These statements do not accord with Caledon's experience at Cook Mine.

It is Caledon's view that the Mines Inspectorate has been active in its legislated monitoring and enforcement role at the Cook Mine. Mines Inspectors have made 18 visits to Cook Mine from January to October 2016 (inclusive) including two unannounced inspections. Sixteen inspections were made in 2015, one of which was unannounced. These visits have encompassed structured audits, underground workplace inspections, compliance action, investigation of serious accidents and enquiries following concerns raised anonymously by coal mine workers. A Mine Record Entry is received following each visit. Instructions to rectify or correct substandard conditions and/or practices are also issued by the Mines Inspectorate.

Cook Mine has also received several Directives that prescribe actions to reduce risk to an acceptable level. Two Directives relating to the control of airborne dust have been received in 2016. The most significant of these Directives, received in June 2016, resulted from a Level 3 compliance meeting with the Mines Inspectorate. The Directive required Cook Mine to:

- a) establish and implement an interim program to monitor coal mine workers personal exposure to respirable coal dust in development and longwall operations, and
- b) review the mine's SHMS with respect to the management of respirable dust.

Cook Mine's response to this Directive is described in Section 6 of this submission. An extensive work program and a sustained period of compliant personal dust monitoring results led to the Directive being removed in October 2016.

It is also recognised that the Mines Inspectorate has a role in providing advice and guidance to industry in relation to safety and health matters. This function extends to the sharing of good practice across mine sites through site visits and seminars. Cook Mine has benefitted from the Inspectorate's advice including information on pick configuration that expedited the development and implementation of standards to reduce coal dust generation from coal cutting equipment.

4.3 Industry Safety and Health Representatives

ISHRs have a legitimate and legislated role to represent coal mine workers on safety and health matters. Section 167 of the CMSHA provides the ISHR with the authority to issue a directive to any person to suspend operations in all or part of the mine if the ISHR believes that the risk from coal mining operations is not at an acceptable level. This provision provides the ISHR with the equivalent power of a mines inspector and inspection officer. The ISHR role allows the exercise of this power when evidence of an unacceptable level of risk exists from airborne dust exposure. In effect, the ISHR role provides another independent avenue to assess the level of risk and regulatory compliance in a coal mine.

Cook Mine received one visit from ISHRs in the period from January to October 2016 (inclusive). This July visit focussed on respirable dust and involved an inspection of the underground mine workings and receipt of Cook Mine's documents relating to personal dust monitoring and dust controls. No concerns or Mine Record Entry were raised as a result of this visit.

Cook Mine has also received written requests from ISHRs for information relating to airborne dust monitoring and respiratory health assessments. Since December 2015, these communications related to:

- a) the currency of coal mine worker's assessments under the Health Scheme,
- b) an industry wide directive to suspend any operations where coal mine workers are exposed to an atmosphere at the mine exceeding the levels of the CMSHR,
- c) an inquiry into coal mine workers complaints relating to the introduction of a clean shaven policy and questioning the application and use of PPE as a control measure, and
- d) the methodology for determining the adjusted occupational exposure limit for respirable dust.

It is Caledon's view that the implementation of safety and health initiatives is best achieved through a collaborative approach from employers, regulatory officials and unions representing coal mine

workers. ISHRs can play an important role in this multipartite approach through their support for industry initiatives to improve safety and health at coal mines and the dissemination of safety and health information to coal mine workers.

4.4 Designers, Manufacturers and Suppliers of Equipment

Designers, manufacturers and suppliers of equipment fulfil an important and perhaps understated role in the control of respirable dust especially in relation to engineering controls. Designers and suppliers often have experience across multiple jurisdictions and mining conditions which, combined with research and development outcomes, provides them with a unique opportunity to reduce dust generation and improve the effectiveness of dust controls fitted to their equipment.

Industry and government must collaborate with and encourage equipment designers, manufacturers and suppliers to innovate, develop, trial and supply robust engineered solutions that help to reduce dust exposure. Innovations such as longwall shield and shearer automation provides good examples of the contribution that can be made through this collaborative approach.

5 Findings from the Monash University and the Senate Select Committee on Health Reports

Caledon endorses the response to the findings of the Monash Review (2016) and the Senate Select Committee on Health (Parliament of Australia, 2016) reports as provided in the QRC's submission to the CWP Select Committee (QRC, 2016).

6 Methodologies and Processes for Coal Mine Dust Measurement and Mitigation

Cook Mine has applied a risk based approach to airborne dust management consistent with the risk management process illustrated in Figure 1. An Airborne Dust PHMP and additional control measures were developed using this approach and provide an example of contemporary industry practice that is recommended for consideration by the CWP Select Committee.

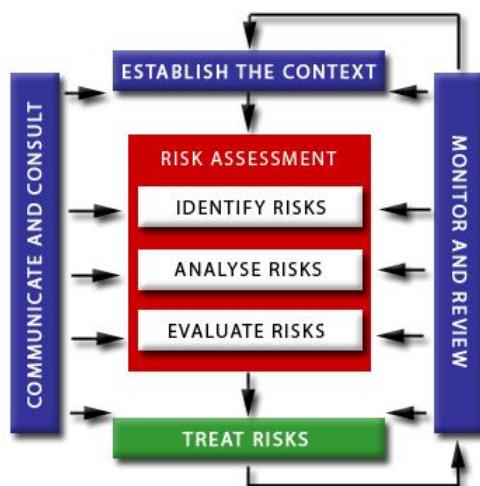


Figure 1: Risk management process (after Standards Australia, 2009b)

6.1 Risk Assessment

A team-based risk assessment was undertaken using the Fault Tree Analysis (FTA)² method to analyse and display the logical combination of events and situations (causes) that could lead to the undesired event of exposure to respirable and inhalable dust causing a coal mine worker to develop CWP. The risk assessment determined that for a person to develop CWP:

- a) a source of dust must exist, and
- b) the person must be exposed to the dust produced, and
- c) the exposure must be of sufficient time to exceed acceptable levels (over exposure).

The outcomes from the risk assessment informed the development of the Airborne Dust PHMP.

6.2 Airborne Dust Principal Hazard Management Plan

Cook Mine maintains ten PHMPs (Table 2) several of which are mandated for underground coal mines by the CMSHR. There is no statutory requirement for a PHMP that specifically addresses hazards relating to respiratory health. Caledon's management determined that it was appropriate to develop an Airborne Dust PHMP in light of CWP diagnosis in the Queensland coal industry and the change in risk exposure from the resumption of longwall production at the Cook Mine. Whilst it is arguable whether respirable dust constitutes a principal hazard, the preparation of a PHMP elevates this hazard and its treatment in the Cook Mine's SHMS hierarchy.

² FTA is a top-down deductive analysis approach for resolving an undesired event into its causes.

Table 2: Principal Hazard Management Plans for Cook Mine

Principal Hazard
Emergency Response
Gas Management
Ventilation
Spontaneous Combustion (Surface and Underground)
Strata Control
Major Fire (Surface and Underground)
Inrush
Airborne Dust
Transport
Winder Operations (in preparation)

The Airborne Dust PHMP identifies the hazards arising from airborne dust and documents the systems required to manage those hazards to protect the safety and health of coal mine workers.

The Airborne Dust PHMP incorporates:

- a) hazard identification using the FTA method to analyse and display the logical combination of events and situations (causes) that could lead to the undesired event of exposure to respirable and inhalable dust,
- b) identification of dust generation sources and controls in development, longwall and outbye activities,
- c) sampling programs to establish a baseline data set and monitor the effectiveness of dust controls on a regular basis including an investigation and corrective action process in response to exceedances identified from monitoring,
- d) actions relating to airborne dust sampling, consultation, training and education, engineering controls, revisions to mine standards and development of procedures,
- e) roles and responsibilities for implementing the PHMP,
- f) retention of documentation generated from implementation of the PHMP, and
- g) audits and reviews in response to nominated events.

6.3 Risk Treatment

The treatment of airborne dust risk was addressed through the selection, application and maintenance of suitable control measures. The Hierarchy of Control model (Figure 2) depicts the relative effectiveness of five categories of risk control measures. Elimination, the uppermost control in the hierarchy, is the most effective measure while Personal Protective Equipment (PPE) is considered the least effective form of control.

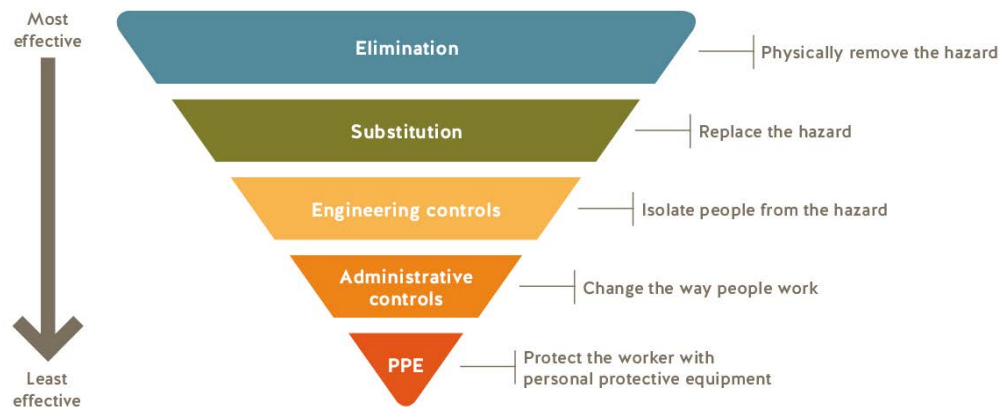


Figure 2: Hierarchy of hazard controls (after WorkSafeBC, 2016)

A combination of controls from different Hierarchy of Control categories is usually required to form an effective risk treatment strategy, especially when the higher level controls are not available. This approach provides “defence in depth” whereby several layers of control measures act as successive barriers to limit the concentration, and prevent the inhalation, of airborne dust.

Airborne dust controls at the Cook Mine are summarised in this submission under the corresponding Hierarchy of Control category. The list of controls highlights the inherent challenge associated with managing the hazard associated with coal dust because the most effective control categories, Elimination and Substitution, are not available with current technology.

6.3.1 Elimination

Elimination or physical removal of coal dust is not possible using the industry standard coal cutting equipment at Cook Mine. Full removal of coal mine workers from coal cutting activities through the use of equipment automation is a control that might be available in the future.

6.3.2 Substitution

No methods of replacing coal dust were identified.

6.3.3 Engineering Controls

Engineering controls act to separate people from the airborne dust hazard. Existing dust controls at Cook Mine were subject to an engineering review to identify their effectiveness and make recommendations around targeted improvement opportunities.

Engineering controls at Cook Mine include:

- a) regular maintenance of travel roads in primary intake airways by grading, watering and application of dry salt granules to prevent the accumulation of fine dust,
- b) the provision of adequate ventilation airflow to dilute dust concentrations and remove airborne dust from active work areas,
- c) the use of auxiliary fans to exhaust air from the face directly to a return airway. Flexible curtains and ducting is fitted to continuous miner units to contain and extract airborne dust generated during coal cutting,
- d) the application of stonedust, an explosion inhibitor, to excavated surfaces on a campaign basis to assist in dust suppression,
- e) the mounting of water sprays in various locations on continuous miners to contain dust at the face by preventing “roll back” and add moisture to the coal product to minimise dust liberation during transport,
- f) trials of a water surfactant to improve the suppression capability of sprays fitted to coal cutting equipment,
- g) trials of hybrid picks on continuous miners to reduce the generation of fine dust,
- h) automation of longwall shield advance to remove the need for an operator to be positioned downwind of coal cutting activities,
- i) configuration of the longwall shearer to automatically shut down in the event of insufficient dust suppression water volume and/or pressure at the shearer drums,
- j) operation of the longwall shearer in uni-directional mode to reduce the need for coal mine workers to be positioned downwind of coal cutting activities,
- k) installation of washdown hoses on longwall shields to allow the removal of accumulated dust,
- l) sprays, curtains, skirting and neoprene flaps at the entry and exit of the beam stage loader (BSL) to minimise the movement of dust from inside the BSL to the intake ventilation to the longwall face,

- m) water sprays mounted over conveyors to add moisture to the product coal and reduce dust generation at transfer points,
- n) the fitment of standardised dust suppression sprays at conveyor transfer points, and
- o) scrapers (and associated sprays) to remove material from the carry side of conveyor belts so as to prevent dust from becoming airborne through contact with the conveyor return rollers.

6.3.4 Administrative Controls

Administrative controls specify the manner in which coal mine workers perform their duties. The overarching form of administrative control is the Trigger Action Response Plan TARP-026 Airborne Dust (Caledon Coal, 2016) developed specifically for the conditions at the Cook Mine. The TARP was developed from the Airborne Dust PHMP and contains a documented set of conditions and events that require continuous monitoring. A remedial process is triggered when specified conditions or events occur. The response escalates the issue to the level of responsibility required to manage and control the risk. The TARP includes a requirement to cease operations if prescribed conditions and events are identified. An excerpt from the Airborne Dust TARP is provided in Appendix A.

The Airborne Dust TARP was communicated to coal mine workers and twice reinforced to build understanding. Implementation of the TARP initially resulted in a 14 hour delay to longwall production and 30 hour delay to one continuous miner.

Other administrative controls include:

- a) development and use of a pre-start checklist for coal cutting equipment to verify that picks and sprays meet the nominated standard,
- b) Safe Standing Zones for workers operating coal cutting equipment. These zones were developed using airborne dust monitoring results and designate positions that afford the best protection to coal mine workers during coal cutting operations, and
- c) a site-wide ban on smoking.

6.3.5 Personal Protective Equipment (PPE)

Respiratory PPE is the least effective means of controlling airborne dust hazards but, when properly fitted, does prevent respirable dust inhalation by coal mine workers. The use of PPE in isolation is not considered as a suitable long term control however it does provide a control measure that can be readily deployed.

Respiratory PPE controls at the Cook Mine encompass:

- a) a clean shaven policy to improve the effectiveness of respiratory protection facial fitment,
- b) free issue of P2 particulate filter masks to be carried by all coal mine workers, and
- c) supply of full face powered air purifying respirators for longwall personnel as an additional form of dust protection during coal cutting operations.

An alternative style of powered air purifying respirator is being trialled to accommodate different individual preferences for respiratory protection.

6.4 Communicate and Consult

A significant communication and consultation program was conducted to inform coal mine workers of the hazards associated with airborne dust and to seek their views on the identification and implementation of control measures. Communication and consultation actions included:

- a) engagement of a specialist external provider to deliver a site-wide education package that explained the cause of CWP and methods by which coal mine workers could protect themselves from airborne dust hazards,
- b) training in the application of the Airborne Dust TARP across multiple sessions, and
- c) establishment of an Airborne Dust Committee from a cross section of the workforce to provide a consultative forum, seek ideas for improvement opportunities and oversee progress against the Airborne Dust PHMP action plan.

In October 2016, Cook Mine participated in an industry workshop organised by the QRC on the control and mitigation of respirable coal mine dust. This forum allowed Cook Mine to share its experience with other coal mine operators and identify learnings from other operations that could be applied at the Cook Mine.

6.5 Monitor and Review

The Airborne Dust PHMP incorporates a program to monitor and review the effectiveness of the nominated controls.

6.5.1 Airborne Respirable Dust Sampling

Airborne respirable dust concentrations cannot be assessed visually which makes it problematic to actively manage the exposure of coal mine workers. Cook Mine's monitoring program includes the stipulation of airborne dust sampling by personal gravimetric sampling devices attached to coal mine workers. An experienced occupational hygienist was engaged to conduct personal sampling across all coal cutting equipment. Personal dust monitoring at the coal face was found to be most effective

because it provided coal mine workers with an opportunity to seek direct feedback from the monitoring hygienist during the course of the worker's activities.

A formal letter is provided to coal mine workers to inform them of the results of personal dust monitoring. Each exceedance identified from personal dust monitoring is investigated in accordance with the process prescribed in the Airborne Dust PHMP.

Static dust sampling and real time monitoring techniques were also used at specific locations to understand background dust levels and the respirable dust concentration at various operator locations.

Real time monitoring of respirable dust offers a significant advantage over personal dust sampling which typically has a two week lag between the collection of samples and the reporting of results. Real time monitoring allows active management of respirable dust exposures and high impact educational opportunities. The widespread introduction and use of this technology is encouraged.

The reported results from personal dust monitoring are presented in Figure 3 as both the number of valid sampling results and the proportion of results that exceeded the adjusted occupational exposure level derived from Section 89(1)(b)(i).

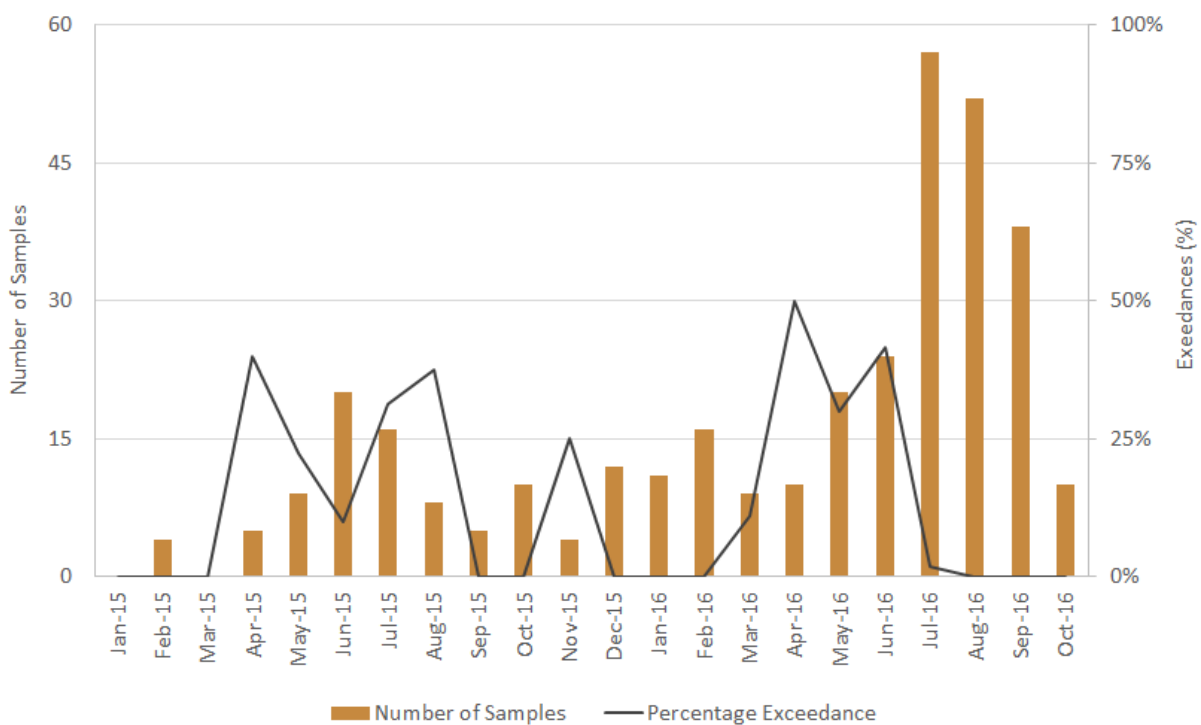


Figure 3: Cook dust sampling results from July 2014 to October 2016 inclusive

The data in Figure 3 shows that after the alarming sampling results from April to June, the implementation of the controls in the Airborne Dust PHMP has resulted in one sampling result that exceeded the adjusted occupational exposure limit. This occurred in the longwall production area and was investigated and corrected by the implementation of task rotation and equipment automation.

The need for additional controls is assessed on the basis of results from the ongoing airborne dust monitoring program.

6.5.2 Respiratory Health Surveillance

Pending revisions to the Health Scheme, respiratory health surveillance at Cook has been addressed by:

- a) ensuring that all coal mine workers hold current health assessments per the requirements of the Health Scheme, and
- b) committing to an interim protocol for the conduct and review of CXRs for concerned coal mine workers (Appendix B). At the end of October 2016, 5% of coal mine workers at the Cook Mine had elected to undergo a new CXR under this arrangement.

6.5.3 Management Oversight

The implementation of the Airborne Dust PHMP action plan was reviewed fortnightly by a management steering committee that included Caledon's Chief Executive Officer.

7 Other Occupational Health Conditions

The current focus on CWP should not distract coal industry participants from the prevention of other occupational health conditions including those associated with exposures to respirable crystalline silica, diesel particulate matter, noise and chemicals. Similar to CWP, health conditions associated with these hazards are cumulative in nature and typically have a long latency. The Queensland coal industry's recent experience with CWP serves to heighten awareness of these hazards. A coordinated effort by mine operators, the Mines Inspectorate and coal mine workers and their representatives is required to actively manage these hazards.

8 References

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Appendix A - Excerpt from Cook Mine's Airborne Dust TARP



TRIGGER LEVELS AND ACTION RESPONSE PLANS			
TARP-026 – Airborne Dust			
LONGWALL OPERATIONS			
Area/Position	Normal State	Level 1	Level 2
Ventilation	<ul style="list-style-type: none"> • Brattice screen in place and effective between no.1 shield and chain pillar rib 	<ul style="list-style-type: none"> • Brattice screen not effective between no.1 shield and chain pillar rib 	<ul style="list-style-type: none"> • Brattice screen not in place between no.1 shield and chain pillar rib
Face Conditions	<ul style="list-style-type: none"> • Minimal stone cut due to horizon control or geological structure • Roof conditions do not require shield advance over shearer or double-chocking 	<ul style="list-style-type: none"> • Abnormal amount of stone cut due to horizon control or geological structure • Roof conditions require shield advance over shearer • Roof conditions require double-chocking 	
Water Supply	<ul style="list-style-type: none"> • General water supply pressure greater than 8 to 14 bar 	<ul style="list-style-type: none"> • General water supply pressure between 6 and 8 bar 	<ul style="list-style-type: none"> • General water supply pressure less than 6 bar and equipment not automatically shut down
	<ul style="list-style-type: none"> • Shearer water supply pressure greater than 60 bar 	<ul style="list-style-type: none"> • Shearer water supply pressure between 40 and 60 bar 	<ul style="list-style-type: none"> • Shearer water supply pressure less than 40 bar and equipment not automatically shut down
Shearer <i>Refer to Appendix for cutter drum pick location definitions</i>	<ul style="list-style-type: none"> • No picks worn or missing on each drum 	<ul style="list-style-type: none"> • Less than 6 total picks worn or missing on each drum 	<ul style="list-style-type: none"> • 6 or more total picks worn or missing on each drum
	<ul style="list-style-type: none"> • No sprays blocked or missing on each drum 	<ul style="list-style-type: none"> • Less than 4 total sprays blocked or missing on each drum 	<ul style="list-style-type: none"> • 4 or more total sprays blocked or missing on each drum
	<ul style="list-style-type: none"> • No worn or missing picks on the leading point of the vane 		<ul style="list-style-type: none"> • 1 or more worn or missing picks on the leading point of the vane
	<ul style="list-style-type: none"> • No blocked or missing sprays on the leading point of the vane 		<ul style="list-style-type: none"> • 1 or more blocked or missing sprays on the leading point of the vane
	<ul style="list-style-type: none"> • No adjacent picks worn or missing in the pick line, on the vane, or in any other configuration 		<ul style="list-style-type: none"> • 2 or more adjacent picks worn or missing in the pick line, on the vane, or in any other configuration

SHMS No.	Revision	Effective Date	Authorised By:	Page
2.2	2	5/08/2016	Underground Mine Manager	2 of 25

Appendix B - Letter from Underground Coal Industry Representatives
to Minister Lynham



12 July 2016

Hon Dr Anthony Lynham MP
Minister for State Development and
Minister for Natural Resources and Mines
PO Box 15216
CITY EAST QLD 4002

Dear Minister Lynham

As representatives of Queensland's eight underground coal mining businesses, we share your concerns about the re-emergence of coal workers' pneumoconiosis.

We reaffirm our commitment to providing our employees with a safe workplace and transitioning to an improved Coal Mine Workers' Health Scheme informed by the outcomes of the Monash Review.

We will continue to work with you, the Queensland Government, and medical experts to inform our workplace protocols.

In order to provide ongoing reassurance to our current workforce, we commit to the following interim protocol for the conduct and review of chest x-rays (CXR) whilst longer-term health assessment processes are established and legislated.

We will:

1. Offer any of our underground coal mine workers who has a concern about their respiratory health:
 - A review of their existing CXR, read to the International Labour Organisation (ILO) classification, by a radiologist nominated on the Royal Australian and New Zealand College of Radiologists (RANZCR) endorsed list, or by a "B" reader physician certified by the USA National Institute for Occupational Safety and Health (NIOSH), where they have a digital CXR that is less than two years old.
 - A new digital CXR read to the ILO classification by a radiologist nominated on the RANZCR-endorsed list, or by a "B" reader physician certified by NIOSH, where they have a CXR that is more than two years old, and/or on an analogue film.
2. All new chest x-rays taken as part of new coal mine worker medicals are to be digital x-rays, read to the ILO classification, by a radiologist nominated on the RANZCR-endorsed list, or by a "B" reader physician certified by NIOSH.

3. Adopt a two reader chest x-ray screening protocol, once an appropriate model is established.

Yours sincerely

David Diamond
Anglo American

Rag Udd
BHP Billiton

Peter Trout
Caledon Resources

Ian Cribb
Glencore

Steve Kovac
Idemitsu

Charles Meintjes
Peabody Energy

Ivan Vella
Rio Tinto Coal Australia

Rob Bishop
Vale