

October 2022

# MMQ Quarterly Report

High Potential Incidents and Serious Accident Summary  
Queensland Mineral Mines and Quarries Inspectorate  
*July – September 2022 quarter*



**Resources Safety & Health**  
Queensland



## Contents

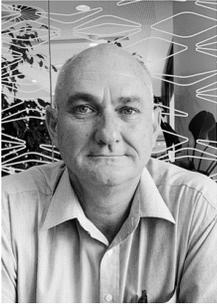
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*Unless otherwise stated, all data displayed is the financial quarter FY23Q1*





## From the Chief



### Hermann Fasching, Chief Inspector Mineral Mines and Quarries

One of the recommendations of the Brady review was that industry should adopt the principles of High Reliability Organisational (HRO) theory to reduce the rate of serious accidents and fatalities.

HROs have a preoccupation with failure or chronic unease and consider minor incidents, errors and small failures as warning signs or indicators that things may be about to go disastrously wrong.

As a result, HROs are obsessed with reporting minor incidents and near misses as these events are recognised as having the potential for significant adverse outcomes. Recognising the potential consequences of an incident focuses their investigation, analysis, and implementation of controls to remove hazards before they can do harm.

In the last quarterly report I said that one of the key initiatives for the regulator was to improve the reporting of High Potential incidents and I was encouraged to see that there was an increase in reporting of incidents across the mineral mines and quarry sector.

While its great to see increased reporting I am concerned that, when reporting, some sites are using minimising language - that is, the description of the incident is framed to downplay the actual result or the potential consequences. I am concerned that this will result in sites focusing on the outcome of an incident rather than the potential outcome which could have been far more serious and required a more detailed investigation and implementation of associated controls.

## 5 Principles of a High Reliability Organisation

### Preoccupation with Failure

#### Process Failures are Addressed Immediately and Completely

Some organisations can ignore or work around small process failures or deviations. HROs can't. HROs do not ignore any failure, no matter how small, because any deviation from the expected result can snowball into tragedy. It is necessary, therefore, for HROs to address any level of technical, human, or process failure wholly and immediately. In fact, in an HRO even potential process breakdowns are identified and addressed. HROs are somewhat fixated on how things could fail - even if they have not.

### Reluctance to Simplify

#### Complex Problems Get Complex Solutions

High-Reliability Organisations are complex by definition, and they accept and embrace that complexity. HROs do not explain away problems; instead, they conduct root cause analysis and reject simple diagnoses.

### Sensitivity to Operations

#### Every Voice Matters

HROs understand that the best picture of the current situation, especially an unexpected one, comes from the front line. Because front line employees are closer to the work than executive leadership, they are better positioned to recognize the potential failure and identify opportunities for improvement. There are no assumptions in an HRO. A consistent concentration on processes leads to observations that inform decision-making and new operational initiatives.

### Commitment to Resilience

#### Recovery is Swift

Resilience in High-Reliability Organisations means the ability to anticipate trouble spots and improvise when the unexpected occurs. The organisations must be able to identify errors that require correction while at the same time innovating solutions within a dynamic environment. They prepare in advance for emergencies and have clear means of communication and control.

### Deference to Expertise

#### Experts are Trusted

Expertise, rather than authority, takes precedence in an HRO. When conditions are high-risk, and circumstances change rapidly, on-the-ground subject matter experts are essential for urgent situational assessment and response.



# News and updates from RSHQ



## Trevor Brown, Deputy Chief Inspector Mineral Mines and Quarries

1 September 2022 saw a significant change to health surveillance requirements for all Mineral Mine and Quarry (MMQ) workers. All workers are now required to undertake respiratory health surveillance (RHS) prior to commencing work at a mine or quarry and at regular intervals to monitor their exposure to respiratory health hazards.

The MMQ inspectorate, as part of its 22/23 Business Plan, is committed to undertaking targeted inspections to monitor how mines and quarries have implemented the required RHS. Early findings indicate a high implementation rate among full time mine and quarry workers, while contractors and other temporary workers are falling well short of RHS requirements. Of note is a trend by Site Senior Executives (SSE) and employers to try to justify certain contractors and temporary workers not requiring RHS. This is of considerable concern to the inspectorate as RHS applies to all workers and only rare exceptions would meet the 'opt out of RHS risk assessment' criteria.

The MMQ inspectorate is beginning to look for opportunities to promote High Reliability Organisational (HRO) behaviours within the MMQ sector. It has been refreshing to hear the HRO concept becoming widely recognised as an opportunity to improve incident reporting.

A HRO organisation recognises that as Safety and Health Management Systems (SHMS) age, they tend to become more complex as processes, reviews and initiatives are applied to the system. This creates excess complexity and ambiguity due to differences in how work is actually done versus how it should be done. Only through good, open communication and reporting can these gaps be discovered and addressed. Planned SHMS effectiveness audits and high potential incident reviews by the inspectorate will focus on key hazards to identify any gaps and to ensure effective controls are implementation.



## Meet: Lionel Smith, Incident Response Inspector, Central Assessment and Performance Unit

After many years of discussion about changing RSHQ's internal database, a decision was made in 2020 to commit to replacing the department's 20+ year old incident reporting system and I bought my 14+ years' experience as an Inspector of Mines, and Regional Inspector of Mines onboard to develop a new way of thinking about the topic.

Subject Matter Experts in incident reporting - from the initial notification through to conclusion - were bought together to challenge our current processes and frame a new incident management reporting solution which is due to be rolled out to industry in 2023.

This solution will replace the current Form 5A process and Monthly Summary Reports and data entry will be made through a portal to reduce data duplication and aid in analytics. Suggested reference data will be provided, and the number of free text fields will be limited to help with data entry. The safety conversation incident reporting will include:

- gathering evidence associated with the incident
- analysis of the contributing preventative and mitigating controls to the incident
- developing, documenting and implementing corrective actions to prevent reoccurrence.

By analysing the data submitted through the various steps, RSHQ and industry can partner together to better capture data about incidents and their resolution as we all continue to strive for Zero Serious Harm.

Streamline data collection

Efficient process

Better analysis

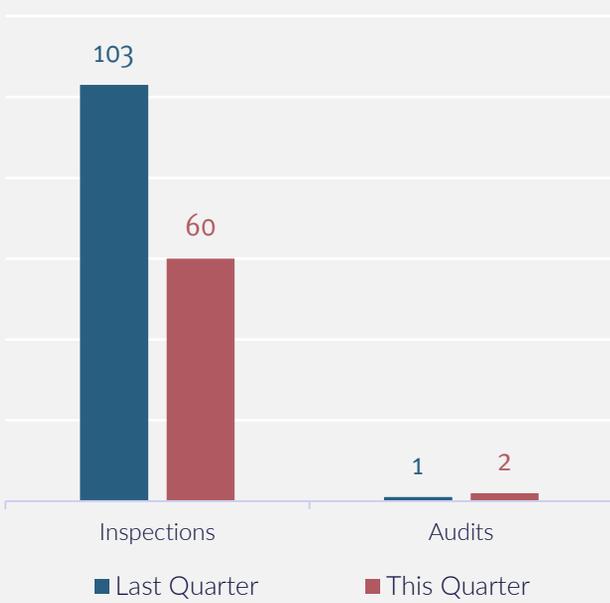
Improved reporting

Greater understanding

Predict & learn

Zero Serious Harm

# Regulator activity



Complaints in FY23Q1 **4**

Planned inspections

**242**



Complete

**25%**

Unannounced Inspections

Planned audits

**1**



Complete

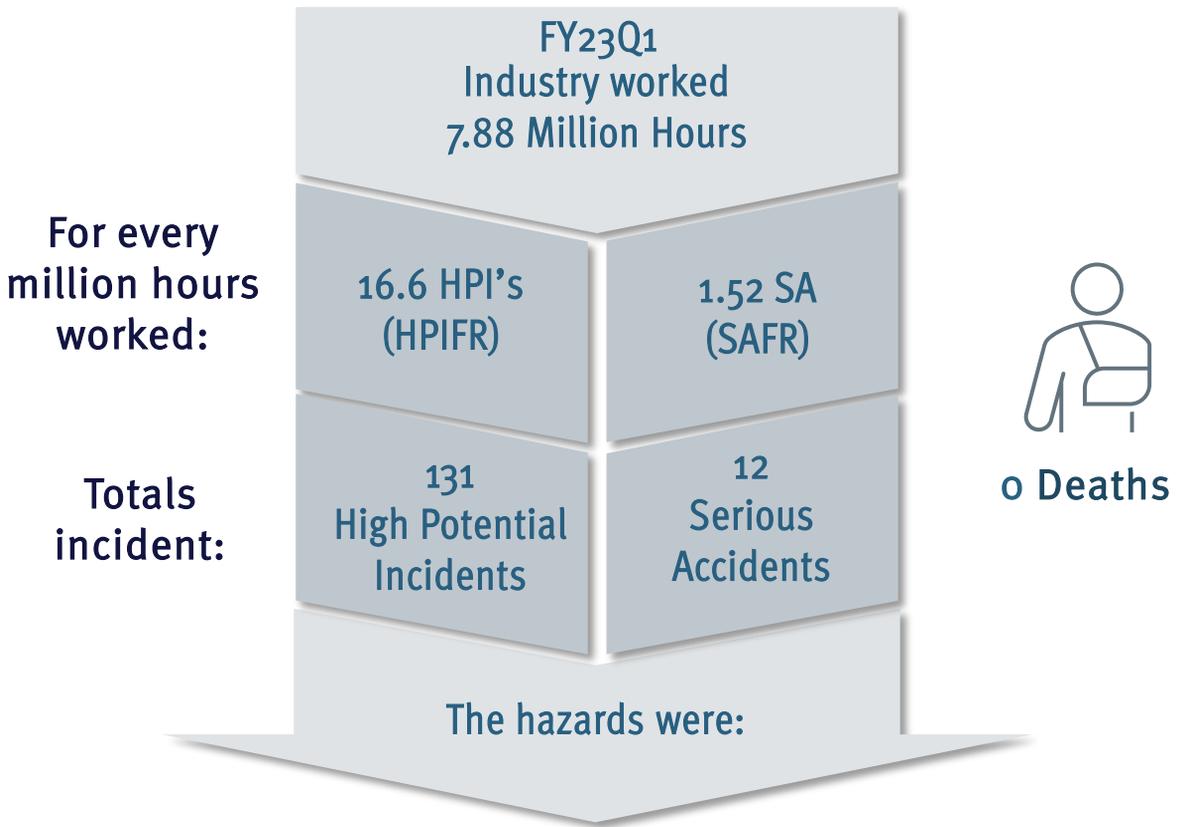
Displayed data taken 6/10/2022



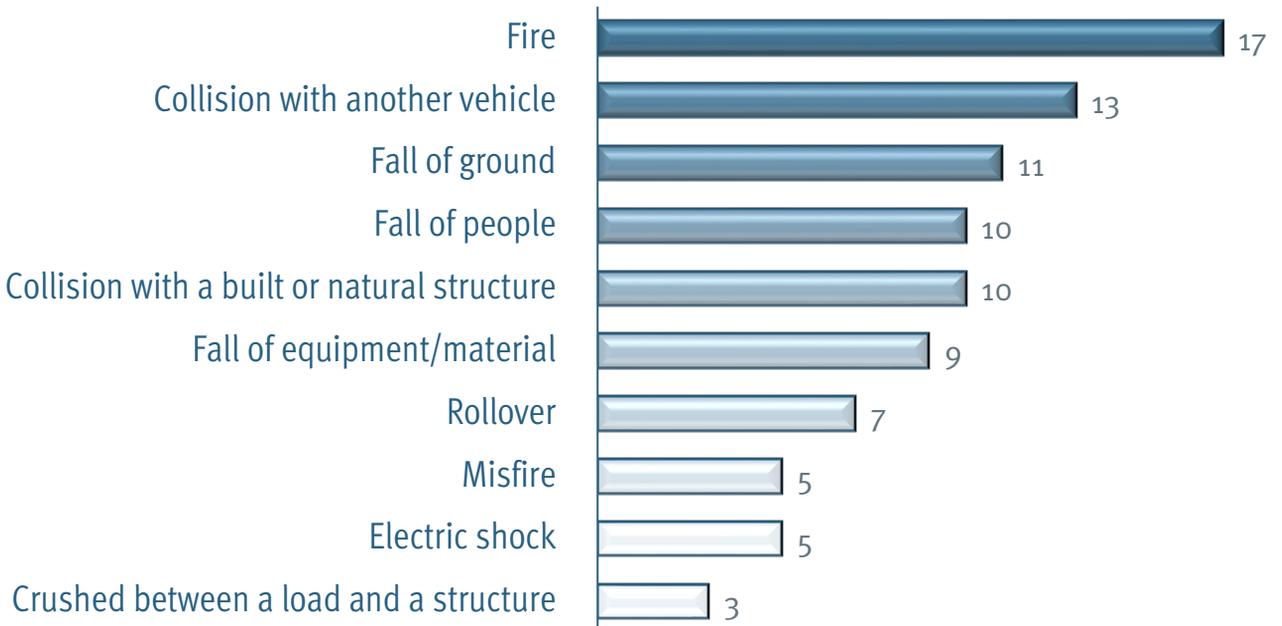
Data taken 6/10/2022



 **The numbers**



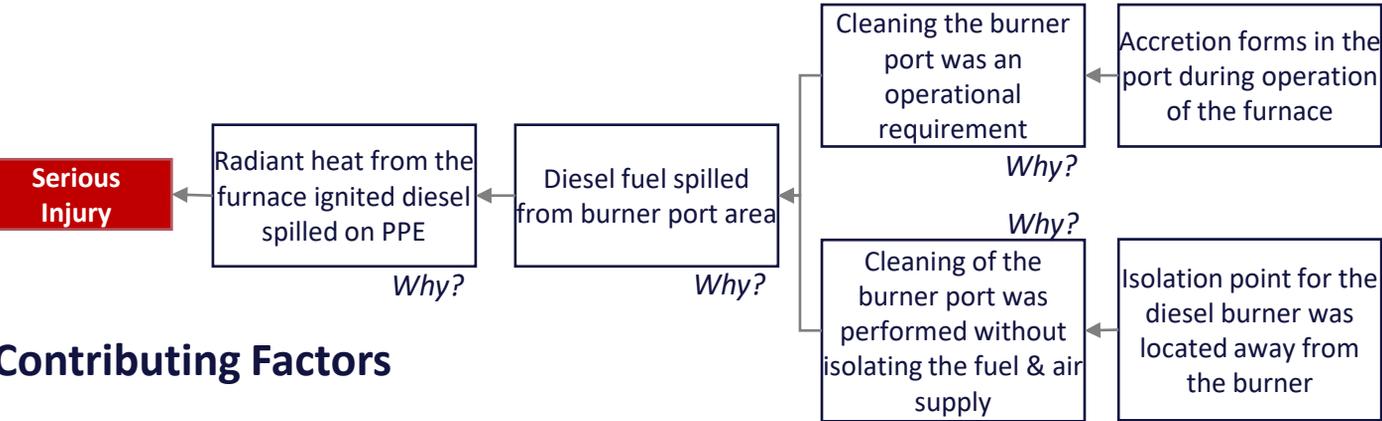
Top 10 hazards for FY23Q1



# Incident Focus

## Worker sustained burns after radiant heat ignited fuel

While cleaning the port for a diesel burner used for maintaining heat to the weir portion of a smelter furnace, radiant heat ignited the fuel spilled on the worker's PPE. After unsuccessfully attempting to extinguish the fire, the worker was moved to the safety shower by nearby colleagues.



## Contributing Factors

**Safety & Health Management System (SHMS):**  
No documented procedure or SWI was in place for regular burner port cleaning.

**Organisational Culture:**  
Cleaning of the burner port without isolation of the fuel and air supply was the accepted practice.

**Equipment:**  
Isolation was only possible through control valve, which was located away from the burner port. Multiple trips to control the valve would be required for air and diesel adjustment.

**Emergency Response/Training:**  
An emergency response plan for fires in the area was not in place. Attempts were made to extinguish the fire using hands, then with a bucket of water before the worker was moved to the safety shower.



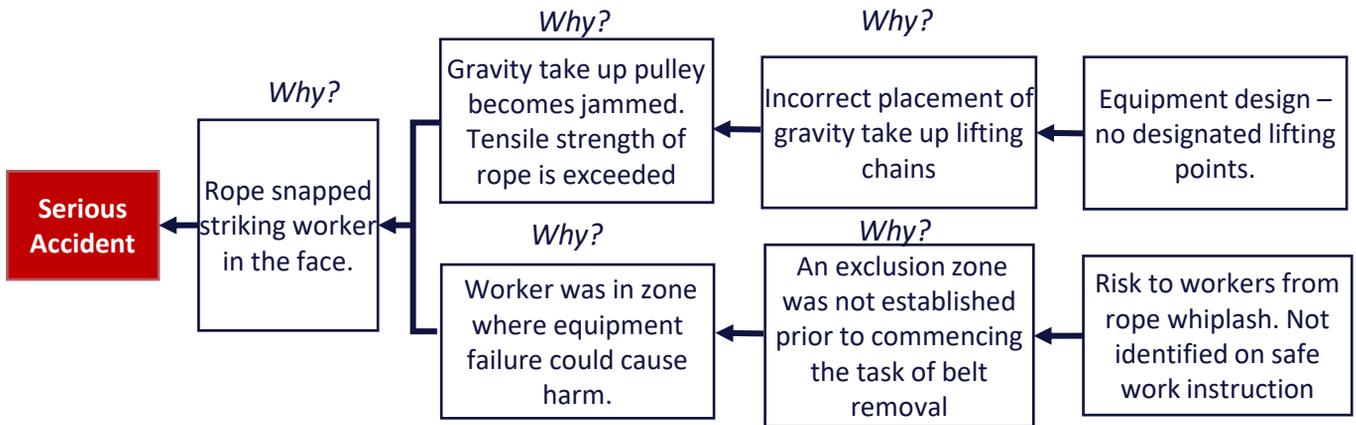
Photograph of a re-enactment of the incident

### Key takeaways

- Sites must identify fire hazards from fuel interaction with hot areas, and ensure appropriate controls are in place
- Always isolate and lock out energy sources before working on plant
- Always have emergency response plans in place for foreseeable emergencies on site

### Hauling equipment failure during conveyor belt change out

A loader was being used to pull an old conveyor belt from a conveyor structure. One end of a synthetic fibre rope was attached to a the loader and the other end was attached to a conveyor belt. During the process of removing the old conveyor belt, a gravity take up unit pulley jammed. Force needed to move the conveyor belt, resulting in the rope failing .



### Contributing Factors

**Hazard Identification** – The hazard of rope failure and whiplash was not identified during the risk assessment process and as a consequence, controls such as an exclusion zone of suitable size were not considered.

**Plant and equipment** – Purpose built equipment such as winches and winders fitted with load cells were not utilised.

**Slinging of load** – Poor load slinging techniques caused the conveyor component to jam, increasing tension on the rope, resulting in rope failure.

**Personal protective equipment** – Eye protection was not being worn by the injured person at the time of the accident.



### Key takeaways

- Equipment failure during hauling and loading type operations can occur at any stage. Workers need to be aware of this and stay well clear of items such as cables, ropes, and chains when they are under tension.
- Preference should be given to purpose-built equipment such as winches, winders and reeler when installing or replacing conveyor belts.
- Monitor loads to ensure equipment load limits are not exceeded.
- Plant design should include designated lifting points where necessary.
- The most critical control in this instance is separation from the hazard.
- An exclusion zone should account for any rope or cable stretch under load, plus a significant allowance as a margin of safety, particularly when using synthetic fibre ropes.
- An exclusion zone must be clearly defined and where possible physically prevent entry into the exclusion zone.

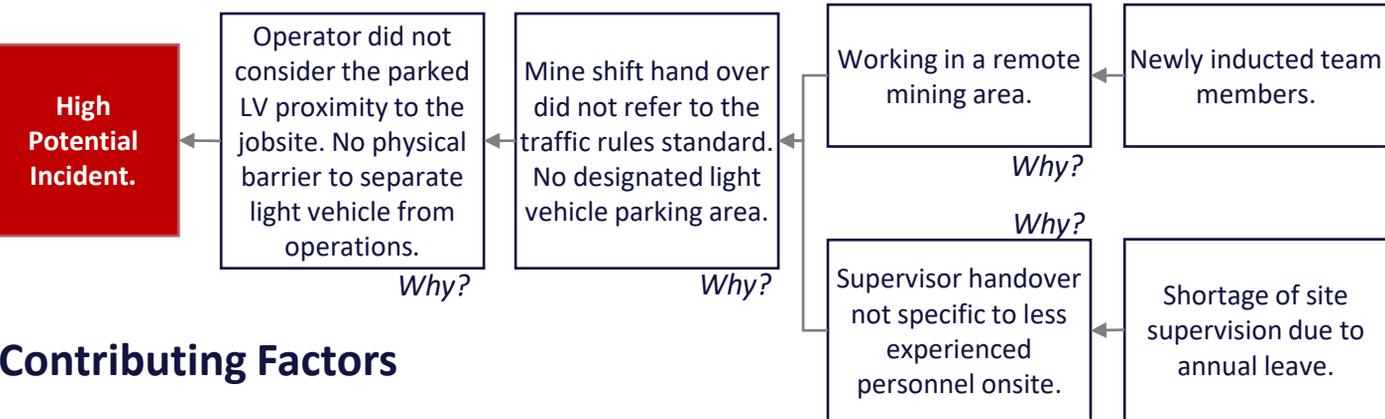
Photographs showing incident scene



# Incident Focus

## D11 T Dozer collision with unoccupied light vehicle.

Dozer operators were carrying out development work on site. The operator of a Cat D11T, reversed into the unoccupied Light Vehicle (LV). The dozer made contact with the passenger side of the LV resulting in extensive damage to the LV.



## Contributing Factors

**Organisational:**  
 Newly inducted, less experienced team members. Remote working within the mining area. Less experienced supervision coverage due to annual leave.

**Safety & Health Management System (SHMS):**  
 Workplace inspection document not specific to the mine area and task being conducted. Supervisor handover document did not contain information specific to less experienced personnel.

**Training:**  
 Less experienced supervisor coverage on site. Newly inducted team members. Light vehicle parked within the specified distance of active operations.

**Environment:**  
 New mine development areas are dusty, restricting the overall line of sight.



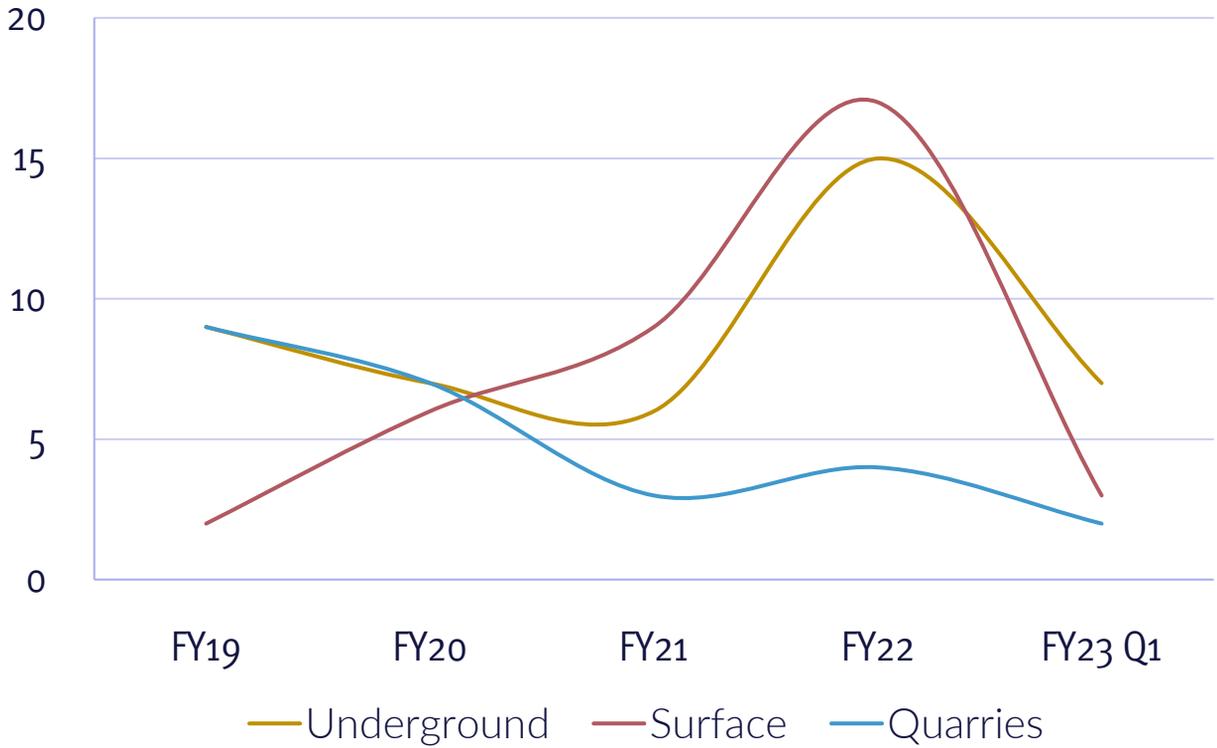
Photograph of the incident scene.

## Key takeaways

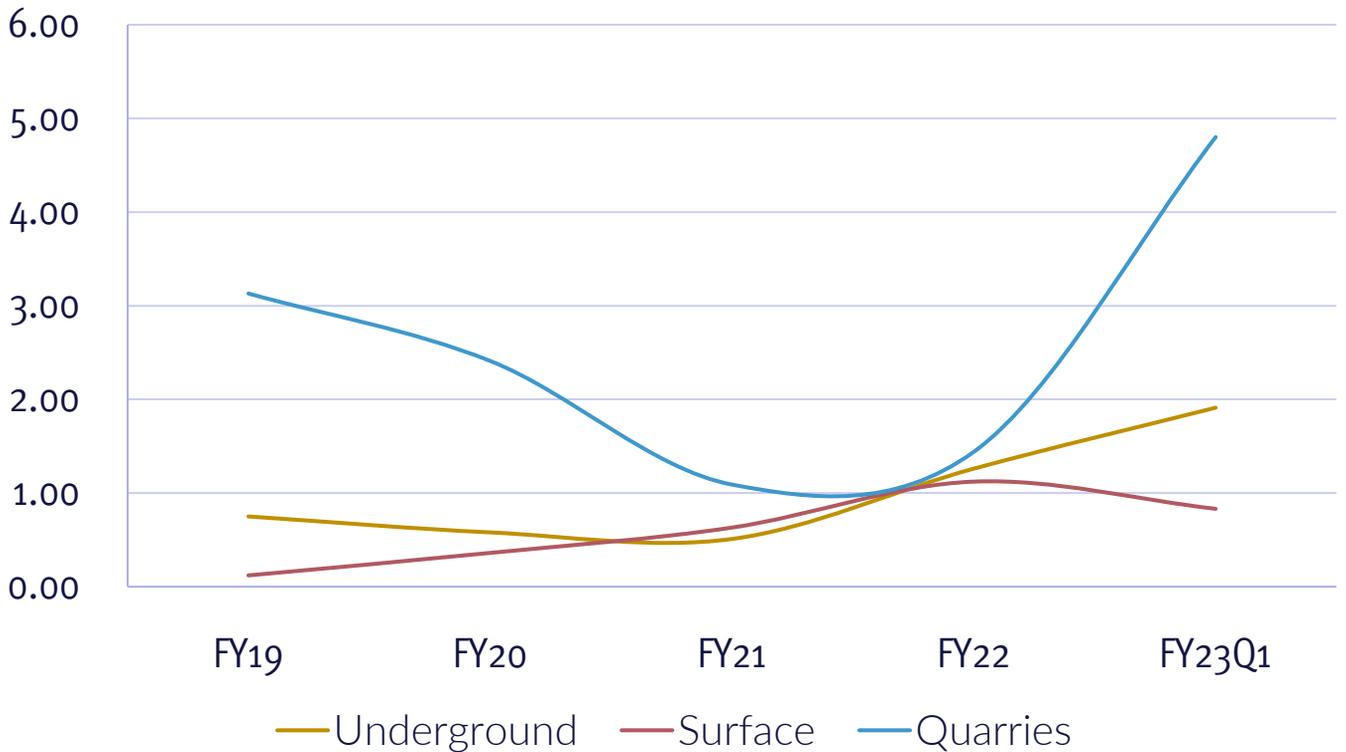
- Ensure a designated light vehicle parking area - with a physical barrier - is part of the site controls.
- Update the traffic standard rules for site, to reflect the light vehicle parking standards required.
- Contractor management to verify competencies and an understanding of site rules.
- Validate adherence to SHMS and legislation requirements.
- Identify leadership and experience gaps, to control exposure to unacceptable levels of risk.

**Trends**

Serious Accidents FY 2019 to FY 2023 Q1

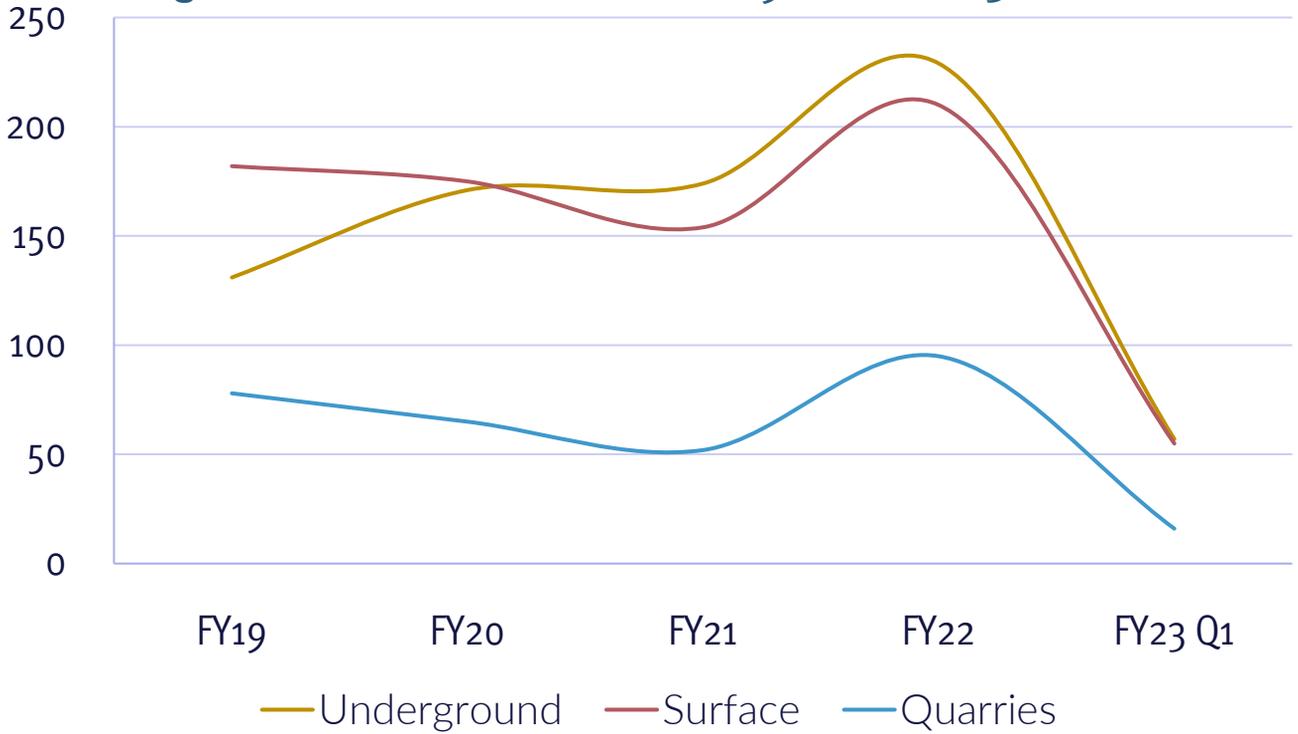


Serious Accident Frequency Rate FY 2019 to FY 2023 Q1

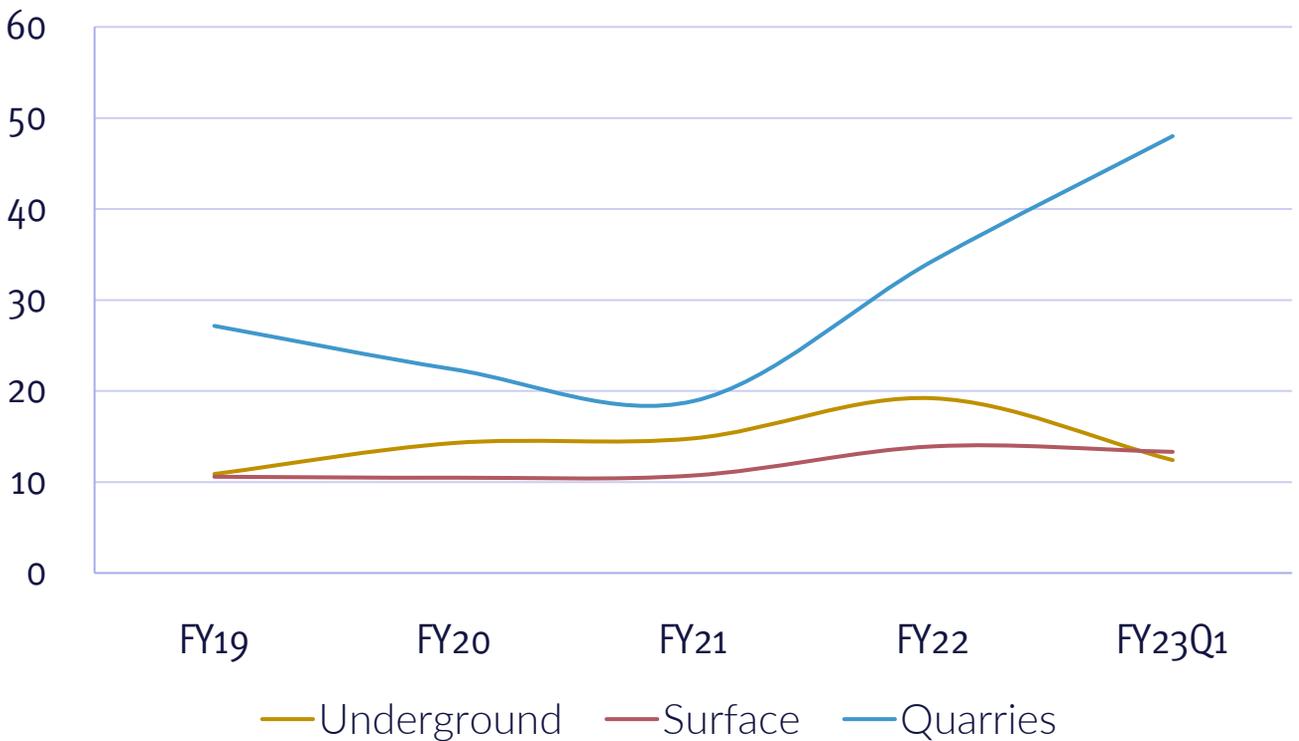


**Trends**

High Potential Incidents FY 2019 to FY 2023 Q1



High Potential Incident Frequency Rate FY 2019 to FY 2023 Q1





## Interstate and around the world

Location	What has been happening
	<p>The NSW Resources Regulator recently identified 2 incidents involving fires on mobile plant that have occurred on explosives mobile manufacturing unit (MMU) trucks.</p> <p>While the fires were very small and quickly extinguished, explosives and oxidising agents such as ammonium nitrate present a high risk with potentially severe consequences in the event of being involved in a fire. The MMU fires were both at bulk explosives storage and reload facilities. <a href="#">NSW Safety Bulletin</a></p>
	<p>A 14-tonne amphibious excavator became immobilised about 200 m offshore on an active tailings dam, leaving the operator stranded for 7 hours on 29 June 2022. The incident occurred at Ravensworth coal preparation plant, in the NSW Hunter Valley. The emergency procedure relied on an all-terrain vehicle (ATV) as the sole means of rescuing people from the dam but when needed to be used, the ATV could not be driven on the dam. <a href="#">NSW Safety Alert</a></p>
	<p>On 4 August 2022, a side discharge conveyor on a screening plant at a quarry collapsed suddenly while operating. The supporting structure failed at the midpoint, instantly causing the discharge end of the conveyor to collapse. A steel diversion chute had been retro-fitted to the discharge end of the conveyor several months before the incident. Clay material had also built up inside the chute. The extra weight of the steel chute and built up material caused the failure. <a href="#">Further information</a></p>
	<p>On the 26 of July 2022 an articulated dump truck (ADT) was in the process of dumping a load of overburden on a tip when the ground underneath the truck gave way beneath it. The ADT operator was approaching an edge bund when the failure occurred. The ADT and flowing ground material cascaded to the quarry floor below. The cab of the ADT rolled over however the operator was wearing their seatbelt and was not seriously harmed. <a href="#">Further information</a></p>
	<p>In February 2021, a damaged recoil spring assembly for an excavator had been removed from the track arrangement and stored outside a heavy mobile plant workshop. The following morning, a fragment of the spring separated while under compression and travelled approximately 28 metres across the yard and through a workshop wall, coming to rest in a walkway beside a workbench. The fragment, weighing 9 kilograms, penetrated the shed wall at approximately 6.5 metres above floor level. While employees located at the opposite end of the workshop heard a loud bang when the spring fragment impacted the wall, no persons were present in the areas where the fragment came to rest or outside where the spring was being stored. <a href="#">Further Information</a></p>





## Improvements and innovation



A local quarry has installed specialised fasteners to ensure machinery guarding remains in place and effective. The idea was formulated by the quarry manager, and the fasteners are manufactured by maintenance workers on site. It's a simple, effective and low-cost initiative. At least one tamper proof fastener is used on each guard panel, ensuring only suitably competent workers with access to special tools can remove the guards.





## Health topics: naturally occurring asbestos in mines and quarries



Exposure to naturally occurring asbestos (NOA) is a potential risk to the health of workers.

Breathing in dust containing asbestos fibres can result in damage to the lungs and airways. Prolonged and excessive exposure can cause mine dust lung diseases such as asbestosis, lung cancer and mesothelioma. There is also evidence showing an association between exposure to asbestos fibres and cancers of the throat, stomach, colorectum and ovaries.

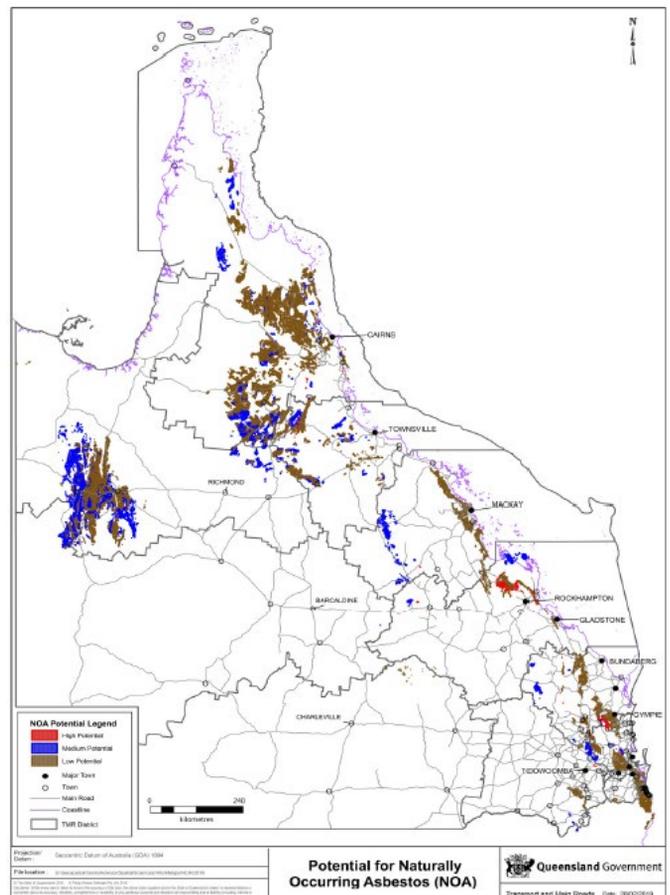
NOA may be encountered in rock, sediment or soil during mining and quarrying operations or when civil or construction earthworks occur at a mine or quarry. The risk of small deposits and occurrences of NOA are relatively common in certain metamorphic mafic and ultramafic rocks<sup>1</sup>. The most common occurrence of asbestos in eastern Australia is in ultramafic rocks that have been altered (metamorphosed) to produce serpentinite. Mafic rocks such as basalts (greenstones) and gabbro are also potential hosts where alteration has occurred<sup>3</sup>.

All known deposits of NOA in Queensland occur as discrete planes or veins of asbestos rather than distributed throughout the rock volume<sup>3</sup>.

Under Queensland mining legislation, asbestos refers to the asbestiform varieties of mineral silicates, including:

- a. actinolite asbestos;
- b. grunerite (or amosite) (brown) asbestos;
- c. anthophyllite asbestos;
- d. chrysotile (white);
- e. crocidolite (blue);
- f. tremolite asbestos;
- g. a mixture containing 1 or more of the minerals mentioned in paragraphs (a) to (f).

It should be noted that a), b), c) and f) above mention mineral silicates that use the same mineral term for both the asbestiform and non-asbestiform varieties. The word 'asbestos' has been included when listing these minerals to emphasise that only the asbestiform habit of these minerals is regulated as asbestos.



### Location of NOA

A review of the potential locations of NOA was completed by the Pavement Materials and Geotechnical Division within the Department of Transport and Main Roads in 2019 using geological data held by the Department of Resources<sup>3</sup>.

1. M Hendrickx, Naturally occurring asbestos in eastern Australia: A review of geological occurrence, disturbance and mesothelioma risk, *Environmental Geology*, vol. 57, 2009, p. 912.
2. Hendrickx, p. 912.
3. A G B Vanderstaay, The naturally occurring asbestos potential of TMR registered quarries and quarry products in Queensland, Department of Transport and Main Roads, 2019, p. 16.





# Health topics: naturally occurring asbestos

A person with an obligation under the Act to manage risk during an operation's planning and design, or when operations start or during operations, can use the Department of Transport and Main Roads map to identify the probability that NOA may be present during operations and to identify the need to undertake further investigations to confirm its presence.

Where exposure cannot be eliminated, all reasonable steps must be taken to minimise exposure to a level well below the exposure limit. Additional advice on interpretation of the standards is available in the [Guidance on the interpretation of workplace exposure standards for airborne contaminants](#).

## Exposure limits for asbestos in mineral mines and quarries

Substance	[CAS #]	TWA
Amosite	[12172-73-5]	0.1 f/mL
Chrysotile	[12001-29-5]	1.0 f/mL
Crocidolite	[12001-28-4]	0.1 f/mL
Other forms	[ - ]	0.1 f/mL
Any mixture of these, or where the composition is unknown	[ - ]	0.1 f/mL

## Management, control, and monitoring

Where NOA is found to be present in rock, sediment or soil at a mine or quarry; and could be disturbed during mining and quarrying operations or when civil or construction earthworks occur at a mine or quarry, the site senior executive must have a documented way of managing NOA and a strict monitoring program to ensure NOA exposure is kept to an acceptable level and statutory exposure standards are met. Records of this monitoring must be kept for at least 30 years due to the long latency of asbestos-related disease and their serious health implications.

Section 136 of the [Mining and Quarrying Safety and Health Regulation 2017](#) requires the site senior executive to monitor and regularly analyse the results of monitoring, where a hazard at a mine has the potential to exceed the exposure limit applying to a worker for the hazard or for which the level of risk may vary.

Section 142 of the [Mining and Quarrying Safety and Health Regulation 2017](#) specifies the use of [Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Dust \[NOHSC: 3003\]](#) to monitor and assess the level of airborne asbestos.

## Respiratory health surveillance

Respiratory health surveillance, that includes a chest examination, spirometry (i.e. lung function testing) and chest X-ray, is a valid technique capable of detecting the health effects associated with exposure to NOA. Where the risk of exposure to NOA exists, the site senior executive of a mineral mine or quarry worker must ensure the appropriate doctor is aware the hazard.

Under the Mining and Quarrying Safety and Health Regulation 2017, asbestosis is listed as a prescribed disease for metalliferous mines and quarries and is required to be notified to an inspector of mines and a district workers' representative as soon as practicable after receiving a report.

## Further information

Codes of practice, guidance material and other useful links available on Page 16 of MMQ Quarterly Report



## Key engagement & activities

### KEY ENGAGEMENTS FY23Q2



BOE Town Hall Information Session. Townsville, 19 October 2022



Surface EEM Conference, Mackay, 21 October 2022



Underground EEM Conference, Mackay, 24 October 2022



Mining Safety and Health Advisory Committee Meeting #77, Brisbane, 16 December 2022

### KEY TRAINING – BOE LAW EXAM SCHEDULE FY23Q2



October

Brisbane	Monday 3 <sup>rd</sup>	9:00AM
Dysart	Friday 21 <sup>st</sup>	9:00AM
Mackay	Wednesday 19 <sup>th</sup>	9:00AM
Moranbah	Thursday 13 <sup>th</sup>	9:00AM
Rockhampton	Thursday 6 <sup>th</sup>	9:00AM

November

Brisbane	Monday 7 <sup>th</sup>	9:00AM
Dysart	Friday 18 <sup>th</sup>	9:00AM
Mackay	Wednesday 16 <sup>th</sup>	9:00AM
Moranbah	Thursday 24 <sup>th</sup>	9:00AM
Rockhampton	Thursday 3 <sup>rd</sup>	9:00AM

December

Brisbane	Monday 5 <sup>th</sup>	9:00AM
Dysart	Friday 16 <sup>th</sup>	9:00AM
Mackay	Wednesday 21 <sup>st</sup>	9:00AM
Moranbah	Thursday 15 <sup>th</sup>	9:00AM
Rockhampton	Thursday 1 <sup>st</sup>	9:00AM
Brisbane	Monday 3 <sup>rd</sup>	9:00AM



Use the camera on your smart phone to scan and connect to the Mines Inspectorate where you can report an incident, locate an office or talk to an inspector.



Townsville: (07) 4447 9282

Mt Isa: (07) 4745 4117

Brisbane: (07) 3330 4273

[www.rshq.qld.gov.au](http://www.rshq.qld.gov.au)

## Further Information: naturally occurring asbestos



### Codes of practice

- [Workplace Health and Safety Queensland, Code of Practice - How to manage and control asbestos in the workplace.](#)
- [Workplace Health and Safety Queensland, Code of Practice – How to safely remove asbestos.](#)

### Guidance material

- [Western Australia Department of Mines and Petroleum – Resources Safety, Guideline – Management of fibrous minerals in Western Australian mining operations 2nd Ed.<sup>1</sup>](#)
- [Western Australia Department of Mines and Petroleum – Resources Safety, Presentation – Managing fibrous minerals during exploration.<sup>2</sup>](#)

### Other useful links

- [Queensland Government: Asbestos – Naturally occurring asbestos.](#)
- [NSW Government: SafeWork – Naturally occurring asbestos \(NOA\).](#)
- [Australian Government - Asbestos Safety and Eradication Agency: Asbestos in the environment.](#)
- [Asbestos Awareness.com.au – Naturally occurring asbestos \(NOA\).](#)

1. NB: Appendix 7 applies to Western Australia only. Queensland mines and quarries must use the morphology criteria set out in the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd edition [NOHSC: 3003 (2005)].

2. NB: Page 19 – Mining definition in WA applies to Western Australia only. Queensland mines and quarries must use the morphology criteria set out in the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd edition [NOHSC: 3003 (2005)].

