

April 2023

MMQ Quarterly Report

High Potential Incidents and Serious Accident Summary
Queensland Mineral Mines and Quarries Inspectorate
January – March 2023 quarter



Resources Safety & Health
Queensland



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Unless otherwise stated, all data displayed is the financial quarter FY23Q3





From the Chief



Hermann Fasching, Chief Inspector Mineral Mines and Quarries

Tragically in the last quarter two workers have lost their lives in a serious accident in the mineral mine and quarry sector. I extend my condolences to their family, friends and co-workers.

On 15 February 2023, a light vehicle and a drill rig fell approximately 15 metres into a stope void. The drill rig operator was rescued with minor injuries but sadly when the light vehicle was recovered from the stope, it was confirmed that two workers in the light vehicle were deceased.

Disappointingly the hazards that contributed to this fatal accident are well known and understood as are the controls necessary for prevention.

The Inspectorate published a [Safety Alert 425](#) with recommendations to industry in relation to this incident. I encourage everyone to take the time to read it.

In the 2021/22 year 36 people were admitted to hospital for treatment because of injuries they sustained working in the MMQ sector and for the first two quarters this year its 27.

The inspectorate, when conducting reviews of the serious accidents and high potential incidents, continues to find SSEs not implementing higher level, sustainable, critical controls for the prevention of these well known hazards.

Operators and SSEs must remain focused on implementing effective critical controls for the prevention of serious accidents and high potential incidents.



Introducing: Sunil Peddi, Data Analytics Manager, Central Assessment and Performance Unit

Central Assessment and Performance Unit (CAPU) provides dashboards, trend reports, data analysis and performance reports to MMQ inspectorate. These automated dashboards simplified the reporting process and provide the data for metrics like Serious Accidents, High Potential Incidents, SAFR, HPIFR, Inspections, Audits etc with out the need to look at the source database. CAPU team also provides Industry Reports that are designed to provide quarterly insights regarding inspectorate actions, trends, industry performance, upcoming events and key safety information.

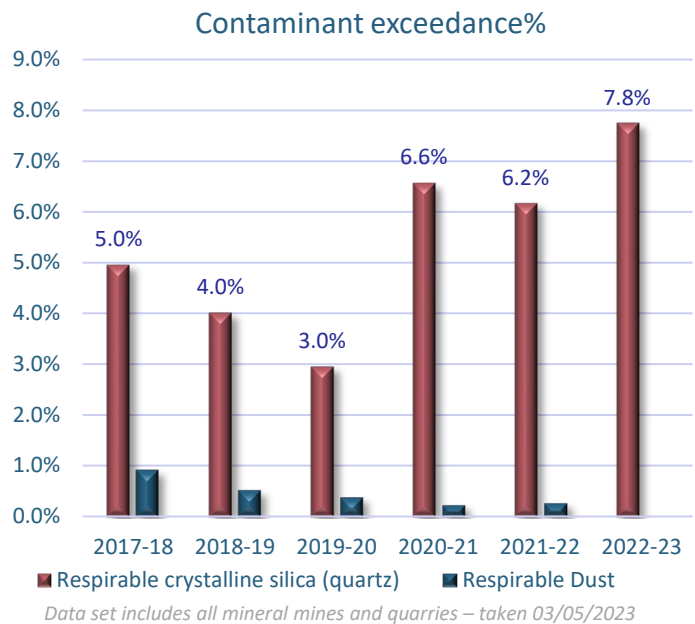
During the last quarter CAPU team developed dashboard for South region inspection project implemented using Microsoft project planner for MMQ inspectorate. As part of this project, a project schedule was developed and updated regularly for the south region mine site inspections. And the status report for the inspection schedule forecast vs actuals was built using Power BI dashboard.

 News and updates from RSHQ



Trevor Brown, Deputy Chief Inspector Mineral Mines and Quarries

Since August 2017, the Mineral Mines and Quarry (MMQ) inspectorate has had a significant increase of focus on worker exposure to respirable dust (RD) and respirable crystalline silica (RCS). This has seen an increase in personal worker exposure monitoring and initially showed a steady decrease in exceedances reported by industry in the first 3 financial years. In 2020, a halving of the occupational exposure limit (OEL) for RCS resulted in a subsequent anticipated increase in exceedances.



The number of RD exceedances across all industry sectors continues to decrease, which is to be commended, however RCS exceedances continue trending upwards. The trend of RCS exceedances is of significant concern, along with the large number of operations still failing to do personal exposure monitoring as required by [QGL02 Guideline for management of respirable dust in Queensland mineral mines and quarries](#); and implement effective controls will see a review of regulatory strategies by the inspectorate to reduce worker exposure to RCS.

As at September 2022 all MMQ workers must undergo a health surveillance prior to commencing work. The requirement for this surveillance is outlined in QGL04 - Guideline for respiratory health surveillance of workers in Queensland mineral mines and quarries (QGL04).

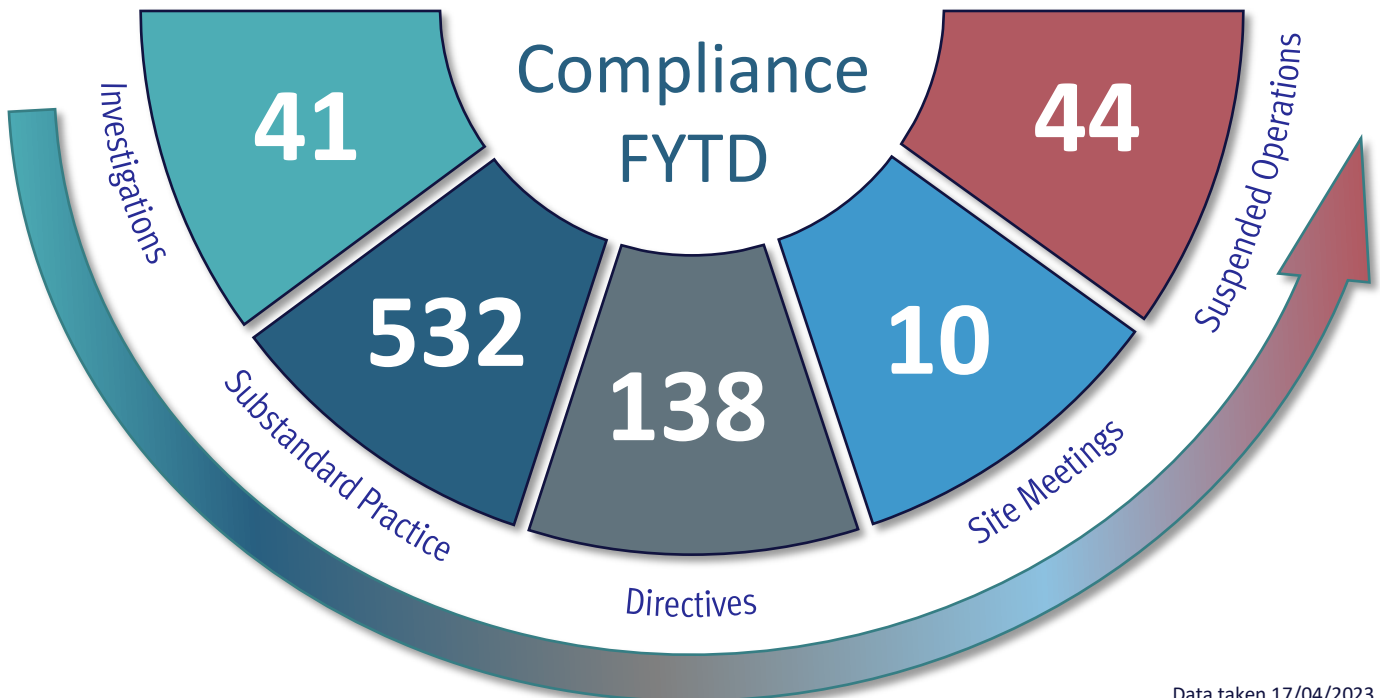
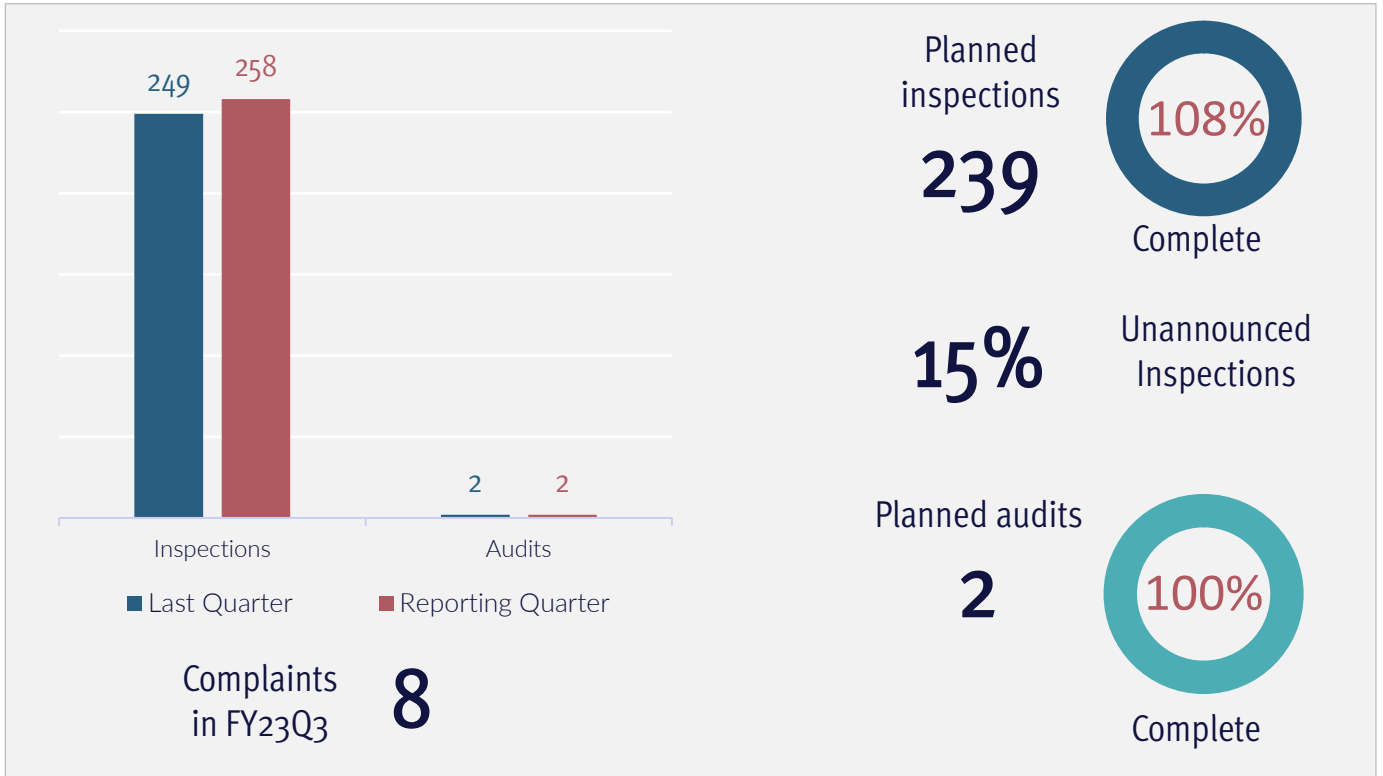
<https://www.rshq.qld.gov.au/resources/documents/occupational-health-and-hygiene/qgl04-guideline.pdf>

This change of legislation had a two-year lead in period where operations had time to ensure all existing workers underwent the required surveillance. A targeted campaign has been under way to evaluate industry compliance to the requirements of QGL04. To date 39 operations have been inspected, 11 Surface Mines, 6 Underground Mines, 22 quarries, with a number of compliance requirements being issued.

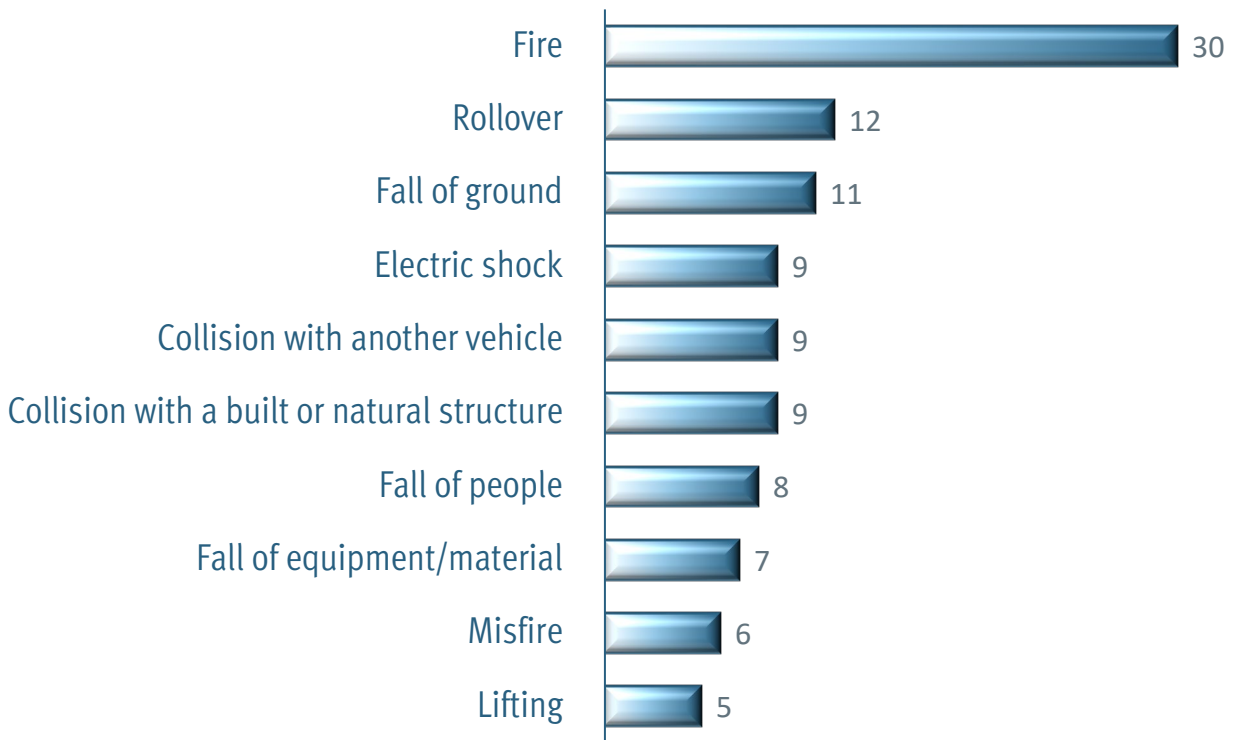
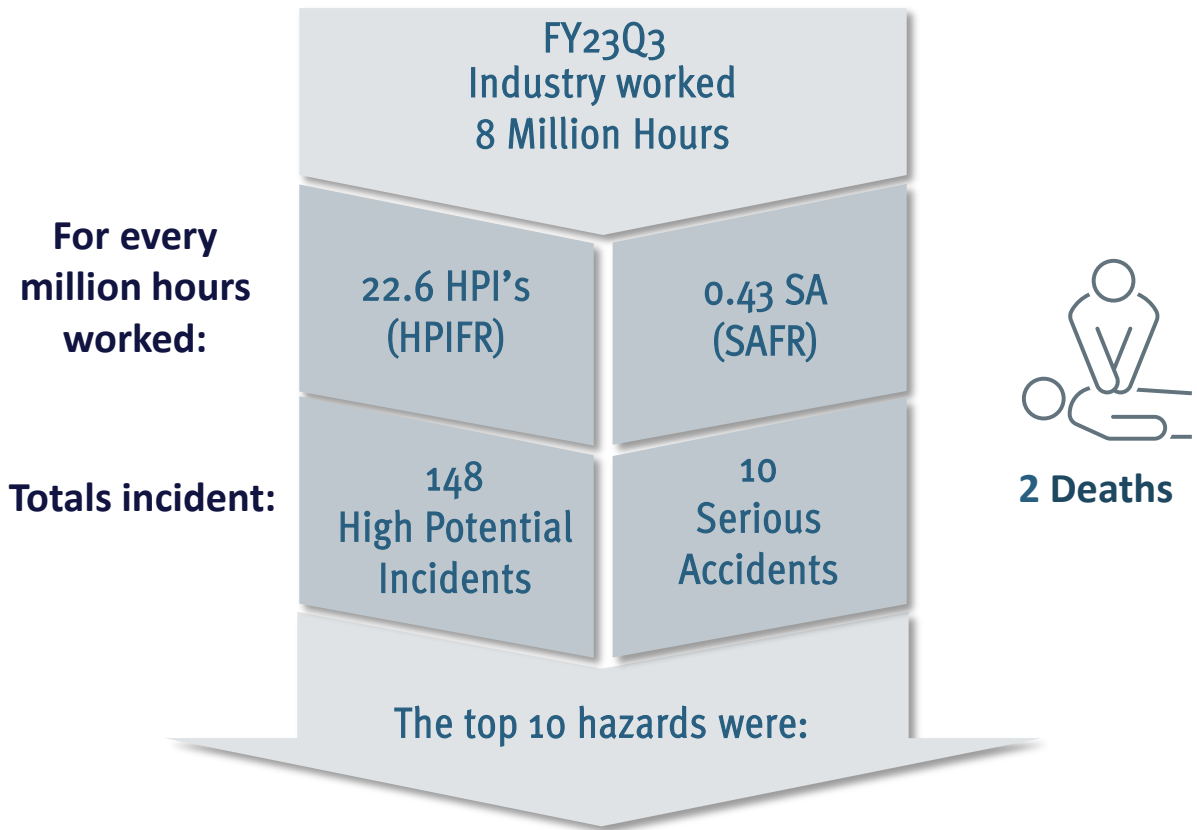
Only one of the 39 sites was found to be in full compliance to the requirements of QGL04. These health surveillance requirements are critical to understanding and managing worker health in Queensland Mineral Mines and Quarries. Suitable health surveillance of mine and workers will remain a key focus of the inspectorate with a view to increasing compliance to QGL04.



Regulator activity

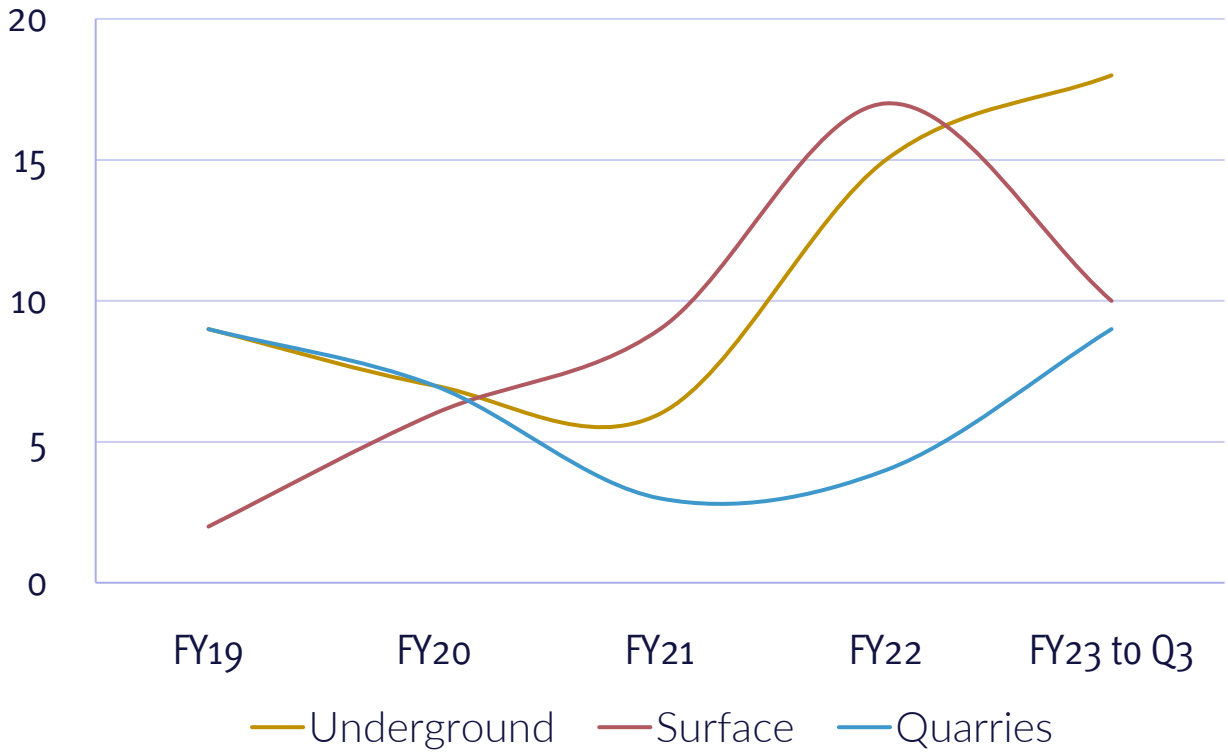


 The numbers

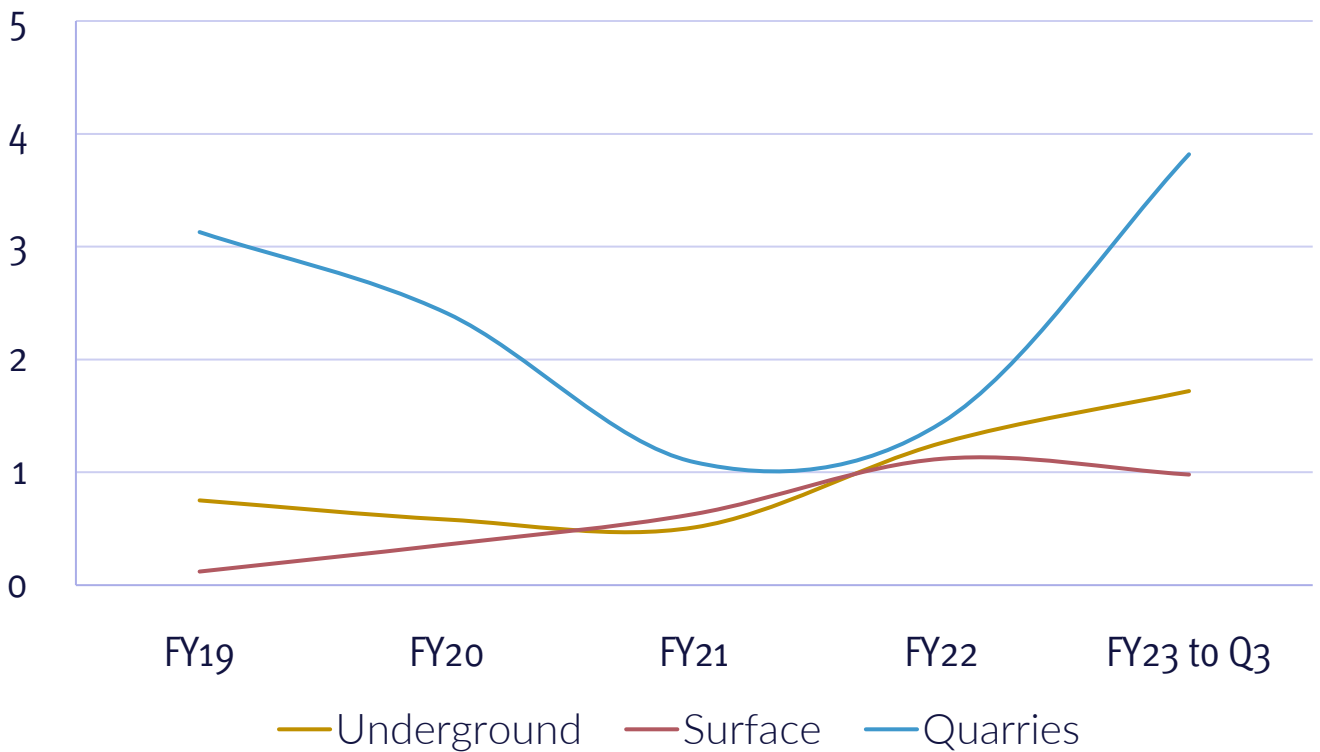


Trends

Serious Accidents FY 2019 to FY 2023 Q3

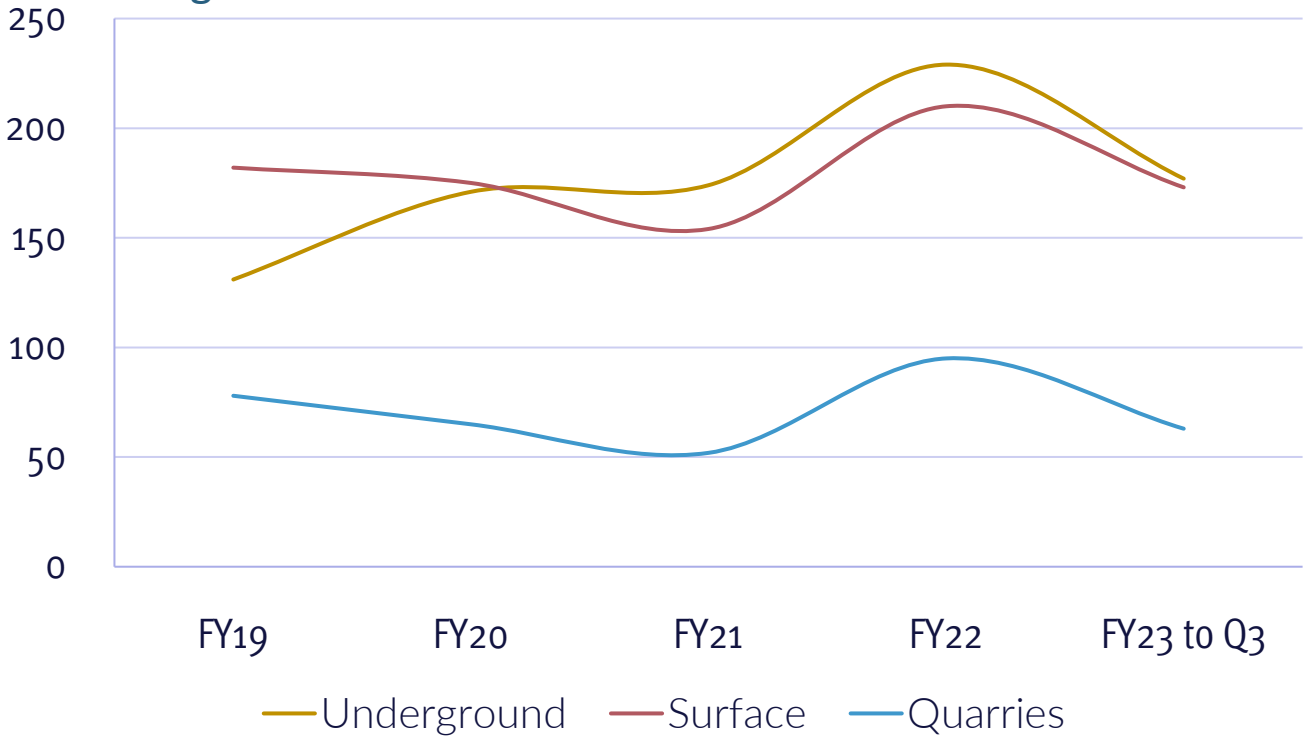


Serious Accident Frequency Rate FY 2019 to FY 2023 Q3

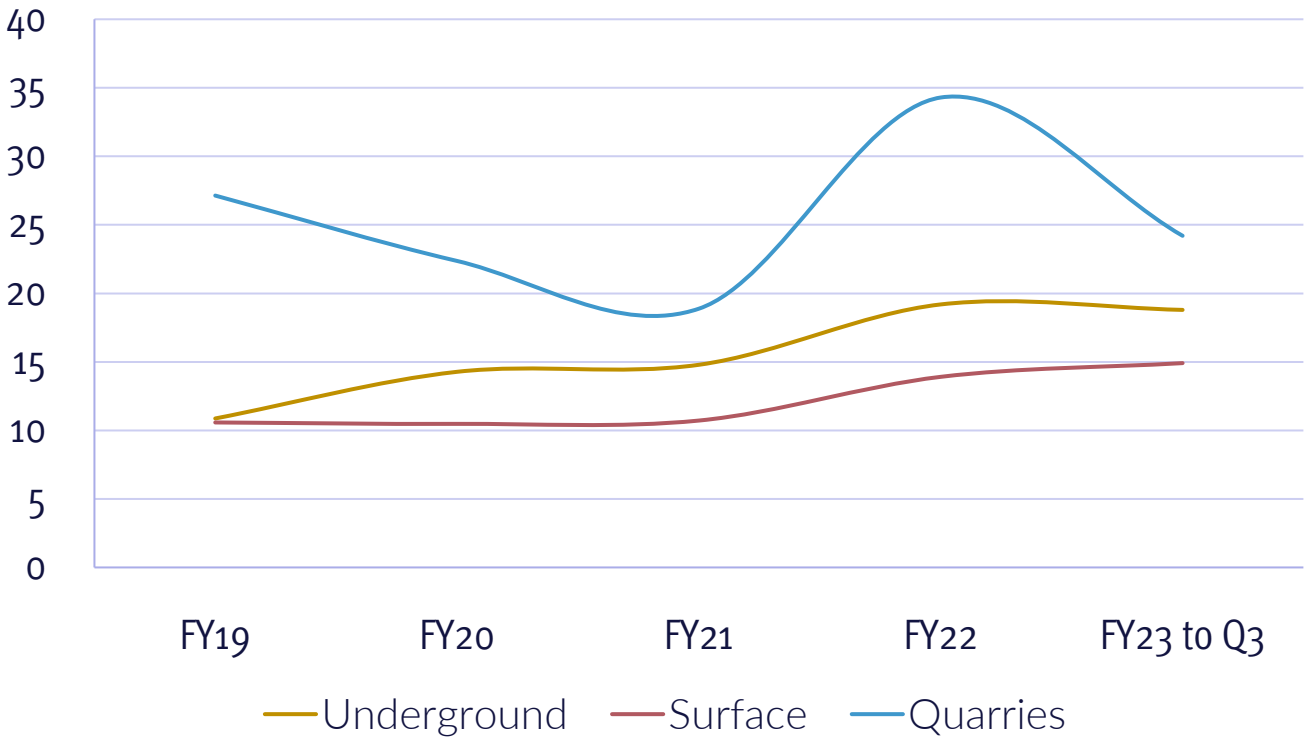


Trends

High Potential Incidents FY 2019 to FY 2023 Q3



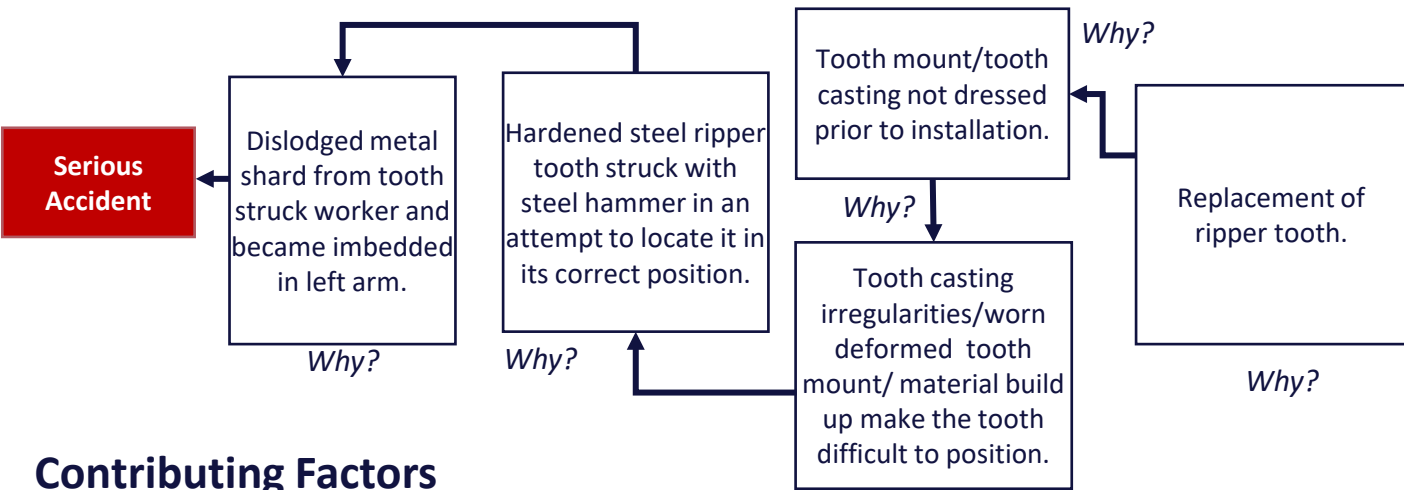
High Potential Incident Frequency Rate FY 2019 to FY 2023 Q3



Incident Focus

Ripper wear component replacement

A contractor was changing the ripper boot on a ripper attachment when he struck the boot with a steel hammer in an effort to locate it in its correct position. Striking the boot with the hammer caused a shard of steel to snap off the boot and penetrate the workers forearm. The shard required surgical removal.



Contributing Factors

- Contractor changed the style of ripper boot being used, which incorporated a different locking system that the contractor was not familiar with (Change management process, lack of experience, unfamiliarity of task).
- The finish of the Ripper Boot was poor which led to the Ripper boot not allowing for proper install – Radius required buffing to install.
- No visual inspection of Ripper Boot prior to the task being completed.
- Contractor hit boot with hammer (steel on steel).
- Contact was made on the edge of the boot – the weakest part of the boot.
- Soft hammer (copper) not used



Key takeaways

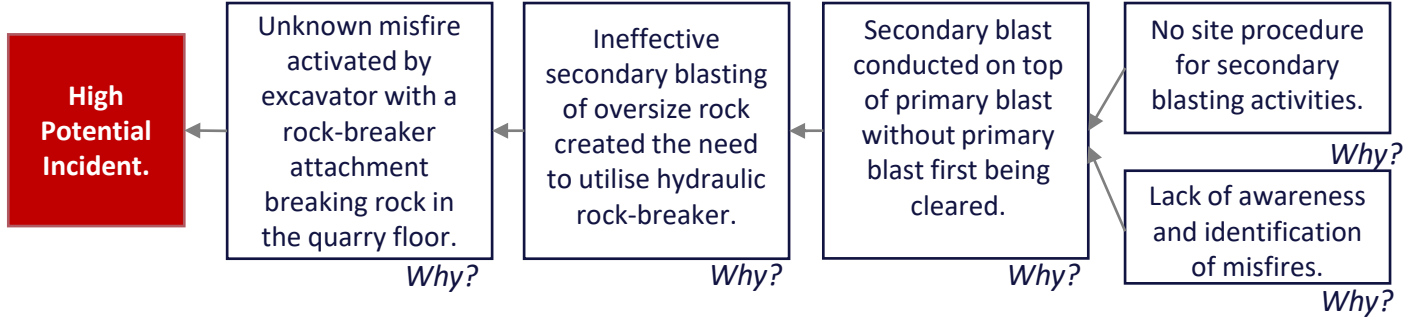
- Clean and deburr component housings and mounts prior to installing the component.
- Avoid striking components to set them in their correct position. Where an interference fit exists, consider the use of a hydraulic press to assist . Other fitting techniques such as heating or cooling to reduce component interference fits temporarily during the installation process may be appropriate(when fitting bearings for example). Remember to consult with the component manufacturer before extreme heating or cooling, as these activities may introduce additional hazards if not performed correctly.
- If there is no alternative other than to strike a hardened steel component, always use a soft faced hammer (copper or nylon insert) to do so.
- Repeated striking of a component in order to correctly position it will likely indicate a problem. Take the time to investigate reasons for the component not fitting easily or correctly.



Incident Focus

Unplanned Detonation of Explosives During Rock Breaking Activity

An unplanned detonation of explosives occurred while using an excavator fitted with a rock-breaker attachment, to break rock in the floor of a quarry.



Contributing Factors

Organisational:

Drill and blast activities were conducted by a contractor. The Contractor’s drill and blast records were not adequate to ensure the requirements of AS 2187.2

Safety & Health Management System (SHMS):

Deficiencies found with the SHMS post incident included:

- No procedure for secondary blasting of oversize material.
- No procedure for hydraulic breaking of oversize material.
- No procedure for identifying misfires.
- SSE failed to ensure the blasting records were adequate as per AS2187.2.

Training:

Lack of explosives awareness and identification of misfires training for workers.

Key takeaways

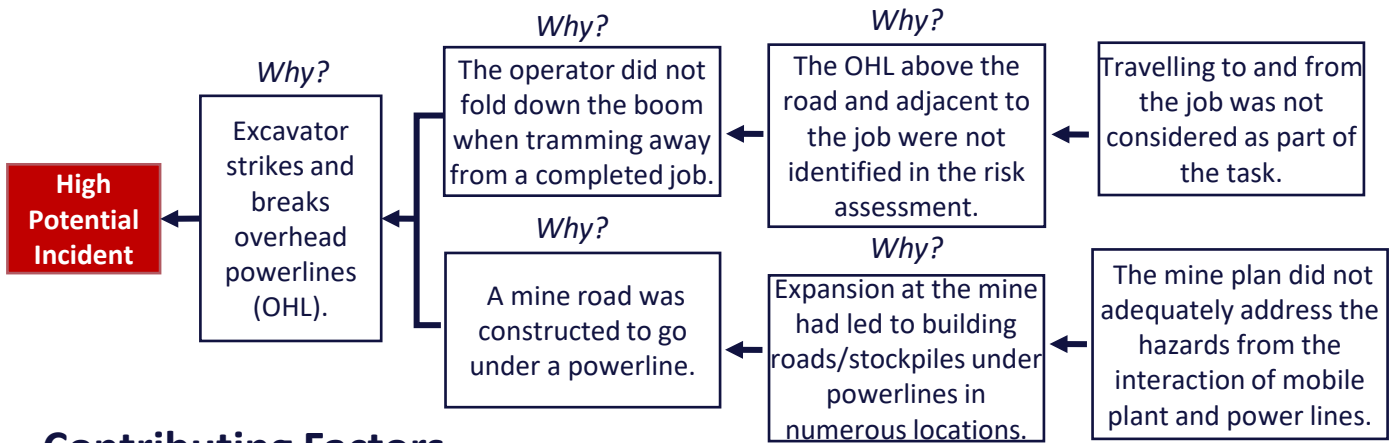
- Ensure all blasts are cleared for misfires prior to work recommencing in the area.
- Ensure the blast management plan meets or exceeds the requirements under AS 2187.2.
- Never work on top of blasted ground that has not been cleared.



Incident Focus

Mobile Plant strikes overhead high voltage power line, breaking the lines and causing a fire when the power lines arced on the ground.

While leaving a completed job and travelling on a mine road, an excavator struck High Voltage overhead power lines (OHL), breaking the power lines and causing a fire from the lines arcing on the ground.



Contributing Factors

OHL visibility – There was no signs on the road identifying powerlines above and there were no markers on the lines to highlight the difficult to see lines.

Mine Planning – The Mine planning and design process did not adequately address keeping Mobile plant operations separated from powerlines.

Safety and Health Management System – The SHMS relied on administrative controls. Higher level controls such as elimination, separation or engineering should have been used to keep plant away from powerlines.

Reliance on operator competency as a control – Recent incidents show that to expect trained and experienced operators to remember the presence of power lines is an unreliable way of preventing further similar incidents.

Key takeaways

- Eliminate the need to travel/work under OHL's.
- Determine if any mobile plant is capable of breaching the minimum clearances required below the OHL. If the mobile plant cannot avoid breaching the minimum clearance, the power must be disconnected to allow the plant to travel under it safely.
- Mandate that mobile plant must travel around the site in the travel position at all times.
- Create designated travel-ways away from OHL and install effective barriers to prevent alternate travel-ways being used.
- Separation of mobile plant from OHL must form a part of Mine Planning and be incorporated into the Safety and Health Management System.

Danger from Overhead Powerlines:

- **Three electrical deaths in 10 days, 4 electrical deaths in 3 months**, in the United States mining industry, from mobile plant contacting overhead power lines is a reminder of the ever present danger from power lines.
 - <https://www.msha.gov/electrical-safety-alert-0>
 - <https://www.msha.gov/data-reports/fatality-reports/2021/november-17-2021-fatality/fatality-alert>
- RSHQ guidance information can be referenced in Mines safety bulletin no. 188-
 - <https://www.rshq.qld.gov.au/safety-notice/mines/mobile-plant-contacting-energised-overhead-powerlines>



Interstate and around the world

Location	What has been happening
	<p>An operator of an MT4400 haul truck left the cabin and descended the main stairs to isolate the truck in response to alarms, and walked in front of the truck to the main isolator on the off driver’s side front bumper.</p> <p>The truck was not parked on level ground and started to roll forward when the battery isolator was turned off. The operator ran back in front of the rolling truck and up the main stairs to the cabin to apply the service (foot) brake. The incident occurred on 19 February 2023. NSW Safety Alert</p>
	<p>The use of lithium-based chemistries in battery design is rapidly increasing. There has been a corresponding increase in incidents involving equipment fitted with these batteries.</p> <p>In addition to the risk of fire, LiBs may also pose a risk of explosion resulting from the generation of explosive vapours from the chemical reactions which occur during thermal runaway of the battery cells. Read more NSW Safety Bulletin</p>
	<p>An unoccupied fuel truck recently descended 8 metres and crashed into a mobile stacker despite the park brake already having been applied. The employee had reversed the heavy vehicle up a grade and parked it with the wheels turned. Investigators suggested the truck was not parked on a level surface, and its wheels were not chocked. Further information.</p>
	<p>A structural failure recently killed multiple mine employees. About 8am local time the trio were inspecting an “interior area” about 900 metres beneath the surface when the tunnel caved in at ICL Group’s Cabanasses de Suria mine, 80km northwest of Barcelona. Work was suspended and a total of 240 employees were evacuated from the scene. The rescue crew took several hours to reach the Spaniards who were aged 31, 29 and 28 – none survived.</p> <p>Further information Richard Szabo – Mine Safety Journal</p>
	<p>WorkSafe is issuing a reminder about keeping children who are not employees safe in workplaces. A child was recently injured while visiting a workplace. Further information</p>



Positive Outcome Focus

Small Wedge Failure

Mining activity was occurring in the open cut pit involving a double bench mining technique using a 250t backhoe excavator. A phone call was received from the remote geotechnical monitoring team notifying the Mining Supervisor of a progressive deformation pattern developing in the radar monitoring data.

The Mining Supervisor notified the mining crew and instructed the area to be evacuated and barricaded. Twenty minutes after the call a small wedge failure occurred whereby ~61 tonne of material fell from 18 metres above onto the area where mining activities were recently active.



1



2

The remote monitoring service is situated outside of Australia and provides continuous observation of active slope movement radars and immediate escalation protocols to site personnel. This service provides 24 hours a day coverage.

The remote monitoring service was implemented six months prior to the event to increase consistency and confidence to the slope monitoring system and allowing the site Geotechnical Engineers to focus on proactive risk management activities.

Success Factors

- 24/7 continuous remote monitoring of slope movement radars.
- Clear and defined trigger, action, and response protocols in place between remote monitoring team, onsite supervision, and active mining operations.
- Operational awareness of geotechnical hazard identification and response protocols



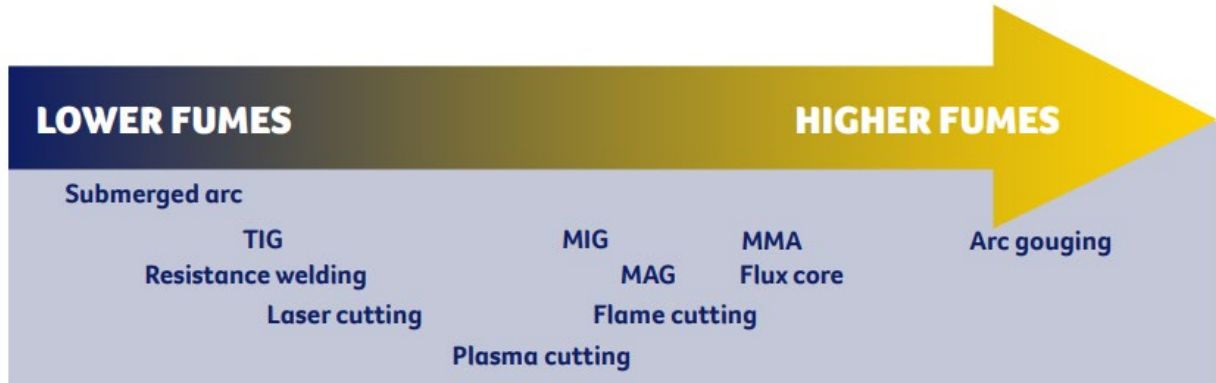


Welding – potential for health issues

All welding processes generate fume. The plume may not be visible to the welder or in some cases, to the observer.

In 2018, the International Agency for Research on Cancer published Monograph 118, in which welding fumes were evaluated, and reclassified as Group 1 (Carcinogenic to humans)¹. This change was primarily associated with the effects of UV exposure on the skin and eyes, for lung cancers and limited evidence for kidney cancer from welding fume exposures.

Health effects Exposure to these fumes or UV radiation can increase your risk of developing melanoma of the eye, lung and other cancers. Health effects occur when the fumes and gases generated during welding are breathed in. Effects can include irritation of the upper respiratory tract (nose and throat), tightness in the chest, asphyxiation, asthma, wheezing, metal fume fever, lung damage, bronchitis, cancer, pneumonia or emphysema². In 2014, medical experts testified in a compensation case that former welders were 44 per cent more likely to contract lung cancer compared to people who have never worked in the field³. Exposure to UV radiation that is reflected off hard and smooth surfaces around you can cause eye melanoma, ‘welder’s flash’ or ‘arc eye’ (painful inflammation of the cornea), cataracts (clouding on the lens of the eye), and burns to exposed skin³.



Different types of welding processes produce different amounts of welding fume [Welding | Cancer Council](#) accessed 27/4/2023. Can you use a welding process to make less fume?

Risk management – apply risk management processes

Identifying Hazards A person who has an obligation under the Act to manage risk at a mine must identify hazards in the person’s own work and activities at the mine⁴.

Analysing Risk The SSE must ensure that the identified welding hazards are analysed to decide whether risk to workers is at an acceptable level. If it is appropriate consider personal exposure monitoring to determine the workers level of risk. This may also include worker self monitoring and biological monitoring to determine health effects on the worker⁴.

1. IARC Monographs Volume 118: Welding, Molybdenum Trioxide, and Indium Tin Oxide, 30 July 2018
2. Weld Australia Technical Guidance Note Fume minimisation guidelines : Welding, cutting, brazing & soldering
3. Door Opens For Welders’ Cancer Compensation, theage.com.au, 2014
4. Mining and Quarrying Safety & Health Regulation 2017 available <https://www.legislation.qld.gov.au/view/pdf/inforce/current/sl-2017-0166>





Welding – potential for health issues

Reducing Risk - apply hazard controls A person managing risk at a mine must apply hazard controls in the following order^{1,2,3}

- Elimination of hazard If possible – eliminate need for welding or eliminate risk from welding, prepare surface and remove any paints or coatings, automate welding process
- Substitution with lesser hazard, process modification – change/modify the process to produce less fume, change power settings to reduce flame
- Separation of person from hazard – remove workers/observers from location of weld area, use welding screens
- Engineering controls – capture the fume with extraction e.g. on tool, forced dilution ventilation
- Administrative – rotate jobs to lessen time welding, signage and training
- Personal protective equipment – fitted for each worker individually, air purifying or air supplied respirator⁴, including eye protection, wear protective clothing of long trousers and long-sleeved shirts without cuffs in non-flammable material, covering all exposed skin; welding leathers are recommended. Wear insulated, flame resistant welding gloves and steel toe leather boots.



Monitoring Risk – review the risk periodically Consider personal exposure monitoring to determine and reduce the workers level of risk. Personal monitoring may be required to check on effectiveness of implemented control measures and reduce worker exposure to as low as reasonably practicable

Health surveillance Health surveillance is the monitoring or testing of a person's health to identify changes in their health because of exposure to a hazard.

Skin and eye checks should be considered as part of specific health surveillance for boilermakers or other workers who undertake significant amounts of welding as part of their work.

Respiratory health surveillance is required unless the workers' current and previous exposure to respiratory hazards is shown to be so minimal that any risk can be managed without respiratory health surveillance. The SSE must ensure that respiratory health surveillance has been arranged for all workers as per QGL04 Guideline for respiratory health surveillance of workers in Queensland mineral mines and quarries

Undertaking health surveillance does not remove the requirement to implement and constantly review control measures to prevent or reduce exposure. These control measures should be applied in accordance with the hierarchy of controls.

1. Mining and Quarrying Safety & Health Regulation 2017 available <https://www.legislation.qld.gov.au/view/pdf/inforce/current/sl-2017-0166>
2. Weld Australia Technical Guidance Note Fume minimisation guidelines : Welding, cutting, brazing & soldering
3. Safework Australia Model Code of Practice: Welding Processes July 2020
4. AS1715 Selection, use and maintenance of respiratory protective equipment
5. QGL04 - Guideline for respiratory health surveillance of workers in Queensland mineral mines and quarries, April 2021



Key engagement & activities

KEY ENGAGEMENTS FY23Q4



QLD 2023 Quarrying & Mining Safety & Health Conference, Brisbane 2 June 2023



Mine Electrical Safety (MESA) Conference, Brisbane 7 June



IQA North Queensland Quarrying and Mining Conference, Townsville 14 July 2023



Underground Mine Managers & Site Senior Executives Conference, Townsville 20-21 July 2023



Queensland Mining Industry Health & Safety Conference, Gold Coast 20-23 August 2023



Minister for Resources Safety Reset 2023 - October

KEY TRAINING – BOE LAW EXAM SCHEDULE FY23Q4



April	Brisbane	Monday 3	9:00AM
	Dysart	Friday 14	9:00AM
	Mackay	Wednesday 19	9:00AM
	Moranbah	TBA	9:00AM
	Rockhampton	Thursday 6	9:00AM
May	Brisbane	Monday 8	9:00AM
	Dysart	Friday 12	9:00AM
	Mackay	Wednesday 17	9:00AM
	Moranbah	Thursday 11	9:00AM
	Rockhampton	Thursday 4	9:00AM
June	Brisbane	Monday 5	9:00AM
	Dysart	Friday 12	9:00AM
	Mackay	Wednesday 21	9:00AM
	Moranbah	Thursday 1	9:00AM
	Rockhampton	Thursday 1	9:00AM

Bookings must be received at least one week prior to the session date. BOESecretary@rshq.qld.gov.au



Contact



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.



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