QUARTERLY REPORT

Extractives industry

2021/22 Q1

July to September

Te Kāwanatanga o Aotearoa
New Zealand Government

WORKSAFE
Mahi Haumaru Aotearoa

Foreword

Our mission is to transform New Zealand's health and safety performance towards world-class. To achieve this requires the commitment not just of WorkSafe New Zealand, but of businesses, workers and a wide range of other players in the health and safety system.

This quarter I would like to update you on a few issues which will be important for all of us in 2022.

The new Mining and Quarrying Regulations are very likely to come into force in May, and I have talked about the key changes in the regulations previously. In this report I wanted to give Industry some idea about the plans for introduction of the new regulations after they come into force. Although the regulations essentially change overnight, their implementation has phases that industry should understand.

There will be transitional arrangements in the new regulations that will give operators time to meet the new requirements sometime after the regulations come into force. A simple example might be that currently a quarry of 20 persons, with no explosives being used, has appointed a manager who holds a B-grade CoC. This would currently be compliant under the regulations, but in the new regulations a quarry of this size would require the appointed manager to hold an A-grade CoC. The transitional arrangements mean that the operator would not be in breach of the regulations overnight – rather there will be a transition period of a year or more for the operator to allow the incumbent B-grade manager to upskill to an A-grade CoC, or for the appointment of an alternative A-grade CoC holder.

This time allowance will be part of what are called transitional arrangements – there will be several new requirements that need to be transitioned in:

- meeting of the new CoC regime
- a written health and safety management system aligned to the regulations
- development of the relevant principal hazard management plans for those operations that require them.

Currently MBIE are considering what they think will be reasonable times for each of the new regulations to be met and the best way for time for transition to be included in the regulations.

During this transition time, a significant focus for WorkSafe will be to educate Industry about what is required.

We will undertake to attend industry forums and, if required, will convene workshops for industry participation.

Most of the significant changes to the regulations affect only quarries and alluvial mines, with only minor impacts for mines and tunnels.

Therefore, we believe there will be limited interest from the sectors of the extractives industry that will continue to work under the same regime as previously with only minor changes. But we are expecting much more interest from the quarry sector. Therefore, we are already discussing how to attend industry convened meetings. For instance, we will target local IoQ branch meetings, so we get to spend good quality time giving as much explanation and introduction as required to a group who will have common interest.

We will also make ourselves available to the larger industry operators for meetings with their key staff members, such as their Quarry Managers, to enable them to get a firsthand explanation of the regulator's expectations and for us to give advice.

The key message here is that getting updated as soon as possible after the regulations come into force is important to allow yourselves time to meet the new requirements.

WorkSafe will be available to assist you with understanding the new regulations and to assist if we can. We want operators to get it right first time – to avoid additional and unnecessary work and make the transition as smooth as possible.

Paul Hunt
Chief Inspector Extractives

About this report

This quarterly health and safety performance report has been prepared by WorkSafe to provide extractives-specific information to mining, tunnelling and quarrying operations in New Zealand.

The information is derived from a variety of sources but the predominant source is industry itself, through notifiable incident reporting and mining and tunnelling sector quarterly reporting.

The report also contains information on the activities of the regulator, as well as commentary on industry performance and focus areas for regulation.

Operators should use the information presented in this report to assist them in improving safety management systems and undertaking risk assessments at their sites.

CONTENTS

tables

figures

1.0
Industry profile

IN THIS SECTION:

1.1 Operations

3

Metalliferous opencast mines
Includes one mine under care and maintenance and one mine under rehabilitation

22

Coal opencast mines
Includes four mines under care and maintenance, and one undertaking rehabilitation

6

Metalliferous underground mines
Includes two mines under care and maintenance and two operating tourist mines

2

Coal underground mines
Includes one tourist mine under care and maintenance

6

Tunnels
Does not include tunnels that notified commencement but did not begin operating in the quarter

1

Coal exploration
One notification of drilling commencement in the quarter

71

Alluvial mines
Number of mines that have been verified (65) or have notified of an Appointed Manager to WorkSafe (6) (includes 2 iron sands mines)

966

Quarries
Number of quarries that have been verified (857) or have notified of an Appointed Manager to WorkSafe but not yet verified (109)

An important aspect of understanding the health and safety performance of the extractives industry is to understand its makeup in terms of the number and scale of operations and the number and competency of workers involved.

There were 1,077 active operations in New Zealand as at the end of September 2021.

Active mining operations include those that are operating, intermittently operating, under care and maintenance, or undertaking rehabilitation, as well as tourist mines. Active quarries and alluvial mine numbers include operations that have been verified as actively or intermittently operating (that is, visited by WorkSafe), or have notified WorkSafe of an Appointed Manager.

The numbers of operations will vary from quarter to quarter. In these first quarterly reports, many of the changes are due to verification of sites by our inspectors, rather than actual changes to operations.

1.2 People

753

Metalliferous opencast mines
557 FTEs employed by mine operators and 196 FTEs employed by contractors

656

Coal opencast mines
549 FTEs employed by mine operators and 107 FTEs employed by contractors

447

Metalliferous underground mines
384 FTEs employed by mine operators and 63 FTEs employed by contractors

17

Coal underground mines
12 FTEs employed by mine operators and 5 FTEs employed by contractors

590

Tunnels
426 FTEs employed by mine operators and 164 FTEs employed by contractors

<1

Coal exploration
1 worker employed by mine operators worked 20 hours and 2 workers employed by contractors worked 50 hours

278

Alluvial mines
Number of workers is known for 30 of the 71 alluvial mines that are verified and/or have notified of an Appointed Manager. The total number of workers has been extrapolated for the remaining 41 operations

3,404

Quarries
Number of workers is known for 719 of the 966 quarries that are verified and/or have notified of an Appointed Manager. The total number of workers has been extrapolated for the remaining 247 operations

There were 6145 Extractives FTEs in New Zealand as at the end of September 2021. The numbers of workers will also vary from quarter to quarter. Changes in the number of quarry and alluvial mine workers largely reflect the changes in the number of active operations verified by inspectors. Part of those verifications includes determining the number of workers at each operation.

A notable change is anticipated in the number of tunnel workers with two large tunnel operations in Auckland going operational in 2020. Thousands of different types of workers will be exposed to these operations over the duration of the projects. The number of tunnel workers reported this quarter decreased by 113 from last quarter, likely due to COVID-19 lockdown restrictions on work activities.

Figure 1 shows the total hours worked by the mining and tunnelling sectors in Q1 2021/22. The hours are separated into Employees and Contractors.

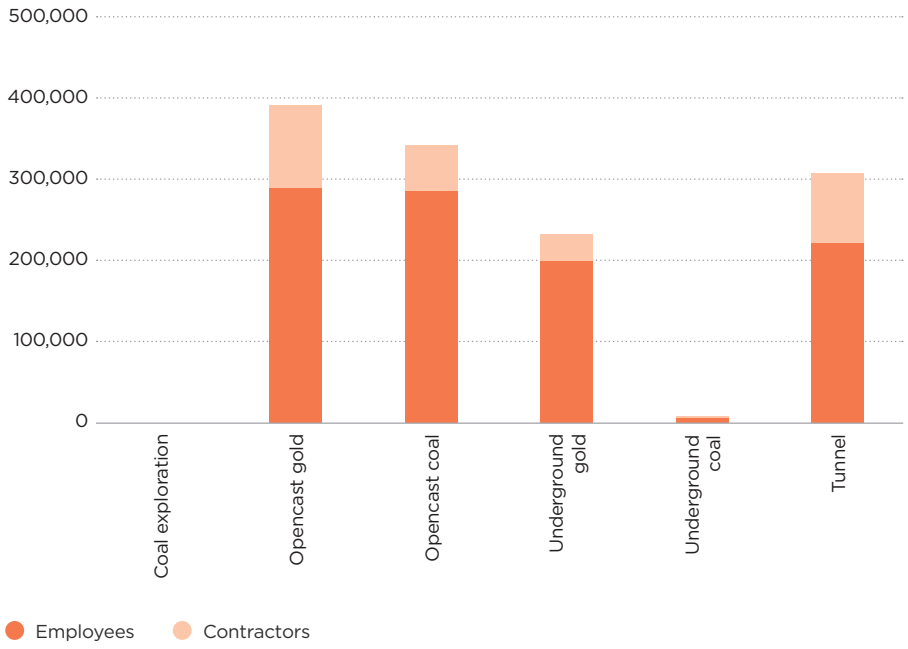

FIGURE 1:
Total hours worked by sector 2021/22 Q1

Figure 2 shows the number of Full Time Equivalents (FTEs) calculated from total hours worked for the mining and tunnelling sectors in Q1 2021/22. The hours are separated into Employees and Contractors.

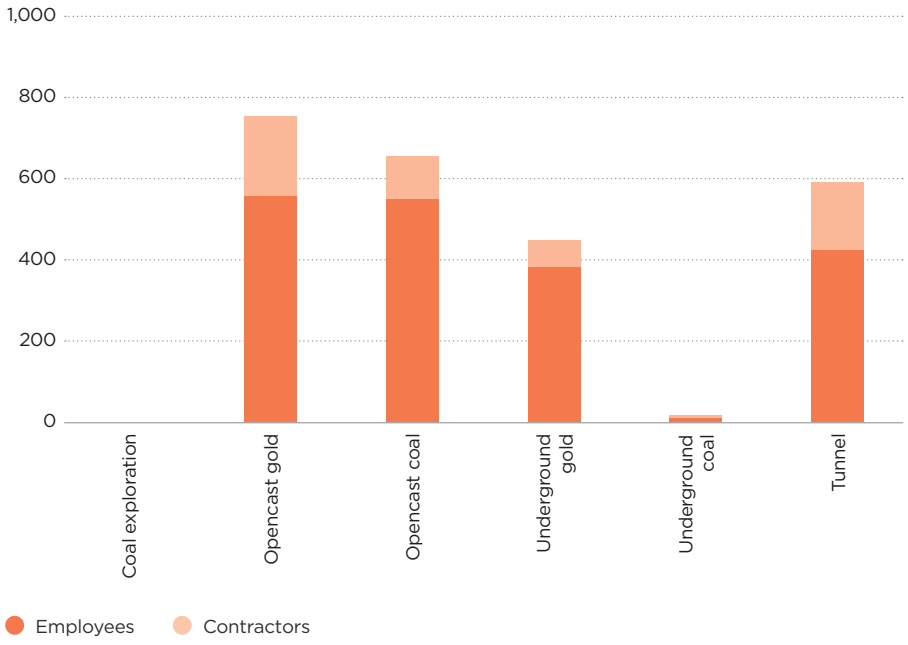

FIGURE 2:
Number of FTEs by sector 2021/22 Q1

1.3 Developing competence

WorkSafe has responsibility for setting the competency standards in the Extractives Industry. Improving the competence of the people in the industry is one of the most important aspects of improving health and safety performance. WorkSafe appoints the New Zealand Mining Board of Examiners (BoE) to recommend competency requirements, conduct oral examinations and to issue, renew, cancel or suspend Certificates of Competence (CoCs).

In July 2020 the first CoCs issued under the new regulations began to expire and those wishing retain a CoC were required to submit a renewal application with CPD log books.

The table below uses the 31 June 2020 date as a benchmark. This is the date when we stopped just issuing new CoCs, but also started to have expired or renewed CoCs.

The table shows an increase in CoCs in circulation from last quarter.

Last quarter there were 1115 CoCs in circulation, and this quarter it has risen to 1179 CoCs, which is a net increase of 64 CoC holders. This total number of CoCs in circulation is still 114 down from the 30 June 2020 peak but it is a positive sign that this quarter renewals and new CoCs being issued has exceeded those that have expired.

Note that this table does not take into account a number of renewal applications that have been slow due to numbers and lack of supporting evidence on first application. The BoE has almost caught up on these applications and by the Q2 Sept–Dec 2021 report the volatility in the CoC renewals and industry numbers are expected to settle to an industry normal.

Table 1 provides a summary of all CoC's issued up to 30 June 2020 and current number of CoCs in circulation at the end of Q1 2021/22.

COC TYPE	TOTAL NUMBER OF COCs ISSUED (2015 to 30 Jun 2020)	TOTAL NUMBER OF CURRENT COCs (as at 30 Sep 2021)	CHANGE IN NUMBER OF CURRENT COCs 1 Jul 2020 to 30 Sep 2021
A Grade Quarry Manager	315	288	-27
B Grade Quarry Manager	482	442	-40
A Grade Opencast Coal Mine Manager	71	62	-9
B Grade Opencast Coal Mine Manager	64	55	-9
A Grade Tunnel Manager	32	39	+7
B Grade Tunnel Manager	74	76	+2
Site Senior Executive	62	61	-1
First Class Coal Mine Manager	21	14	-7
First Class Mine Manager	31	22	-9
Coal Mine Deputy	44	31	-13
Coal Mine Underviewer	35	22	-13
Mechanical Superintendent	25	25	0
Electrical Superintendent	17	23	+6
Ventilation Officer	3	4	+1
Mine Surveyor	13	12	-1
Site Specific	1	3	+2
Winding Engine Driver	3	0	-3
Total	**1293**	**1179**	**-114**

TABLE 1: Certificates of Competence in circulation

2.0 Health and safety performance

IN THIS SECTION:

2.1 Notifiable events

Notifiable events are required to be reported to WorkSafe under S23(1), S24(1) and S25(1) of the Act, and for mining and tunnelling operations, under Schedule 5 of the Regulations. Notifiable events include any notifiable incidents, notifiable injuries or illnesses, or fatalities.

The tables below show the number of notifiable events and the number of operations that notified events for the previous three years and for Q1 2021/22 mines and tunnels (Table 2) and quarries and alluvial mines (Table 3).

MINES AND TUNNELS	2018/19 QUARTERLY AVERAGE	2019/20 QUARTERLY AVERAGE	2020/21 QUARTERLY AVERAGE	2021/22 Q1
Number of notifiable events	18	20	18	20
Number of operations that notified events	9	11	9	11

TABLE 2: Mines and tunnels – notifiable events and operations that notified events

Nineteen individual mines and tunnels from a total of 41 reported notifiable events in the past 12 months.

QUARRIES AND ALLUVIAL MINES	2018/19 QUARTERLY AVERAGE	2019/20 QUARTERLY AVERAGE	2020/21 QUARTERLY AVERAGE	2021/22 Q1
Number of notifiable events	14	18	16	10
Number of operations that notified events	13	15	12	9

TABLE 3: Quarries and alluvial mines – notifiable events and operations that notified events

Forty-five individual quarries and alluvial mines from a total of 1,037 reported notifiable events in the past 12 months.

Figure 3 shows the number of notifiable events reported to WorkSafe by sector from October 2019 to September 2021.

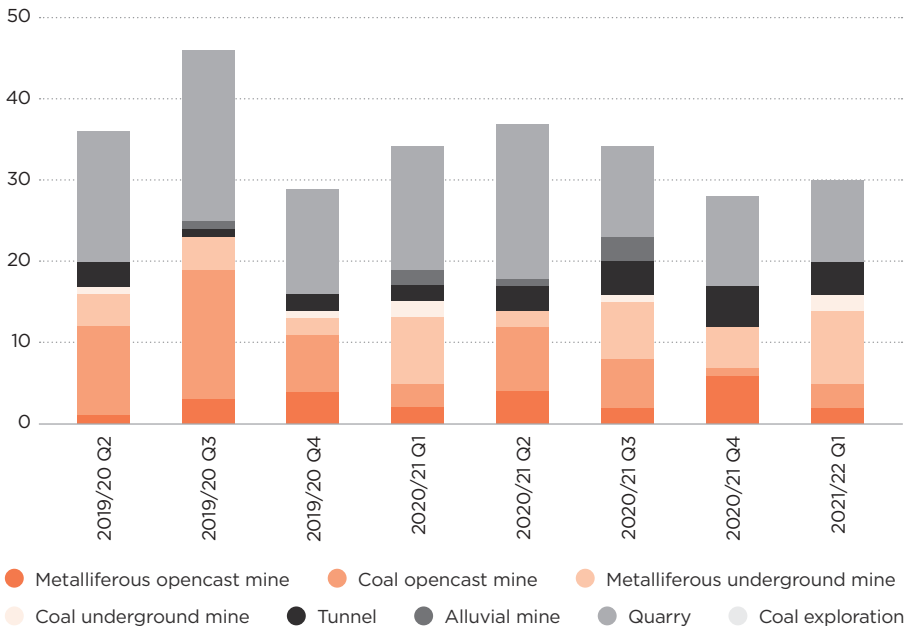

FIGURE 3: Notifiable events by sector

2.2 Injuries

Additional information about injuries is reported to WorkSafe for mining and tunnelling operations in the form of Quarterly Reports and Records of Notifiable Events under Schedules 6 and 8 of the Regulations. Figure 4 shows the number of injuries by injury type reported to WorkSafe by the mining and tunnelling sectors from October 2018 to September 2021. The graph also shows the rolling 12-month average for the Total Recordable Injury Frequency Rate (TRIFR), the rate of recordable injuries that occurred per million hours worked. The current TRIFR is 7.0. Rates have fluctuated over past two years without any clear trend – this is a higher rate than average.

While TRIFR is not the only measure indicating the health of the industry, it is a useful indicator of how workers are being injured and should be interpreted in conjunction with other data such as notifiable event information.

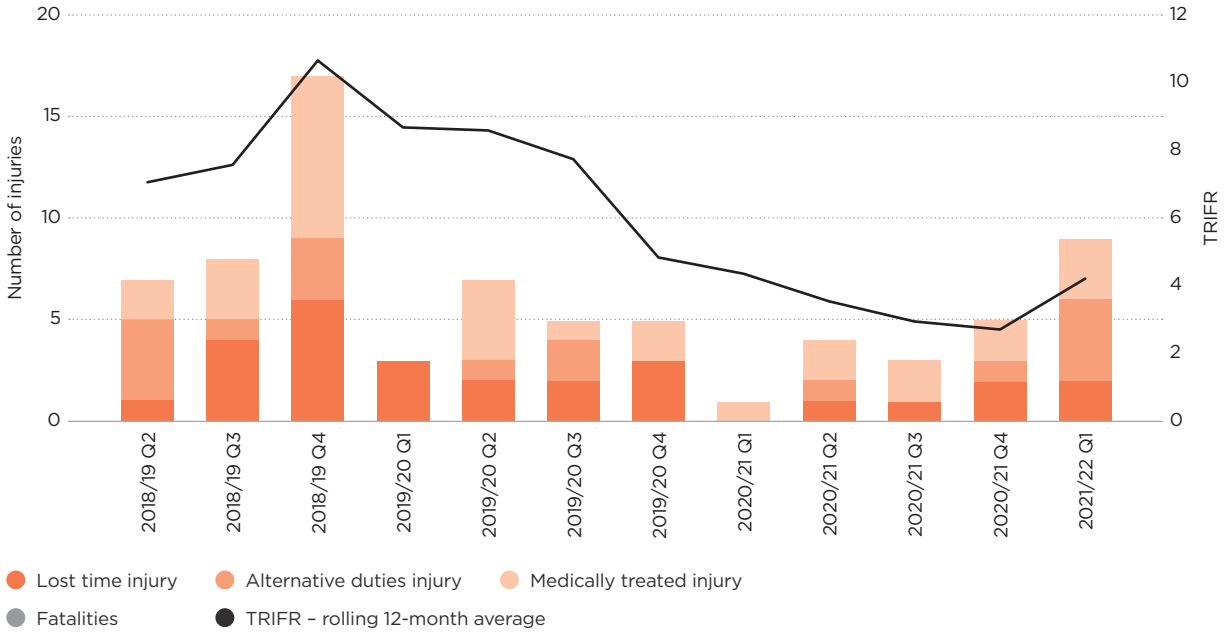

FIGURE 4: TRIFR – mines and tunnels

The following injury definitions are taken from Schedule 8 of the Regulations:

- **Lost-time injuries** are events that involved injury or illness of a mine worker that resulted in the inability of the worker to work for 1 day or more (not including the day of the event) during the reporting period (whether the worker is rostered on that day or not).
- **Alternative duties injuries** are events that involved injury or illness of a mine worker that resulted in the worker being on alternative duties during the reporting period.
- **Medical treatment injuries** are work-related injuries to mine workers that required medical treatment during the reporting period but did not require a day lost from work or alternative duties (other than the day of the event).

Figures 5 and 6 show the number of injuries resulting in more than a week away from work (WAFW), and the sum of the claims costs for those WAFW injuries for the mining and quarrying sectors from September 2018 to March 2021. It is important to note that the number of WAFW injuries for previous quarters may increase over time as ACC can grant claims up to 12 months after an injury has occurred. The claims costs for WAFW injuries for previous quarters will also continue to increase over time as the true costs of those injuries are realised. It may take two years or more for the true costs to be realised. The average cost of extractives sector WAFW injuries between September 2018 and March 2021 was over $19,000 per injury.

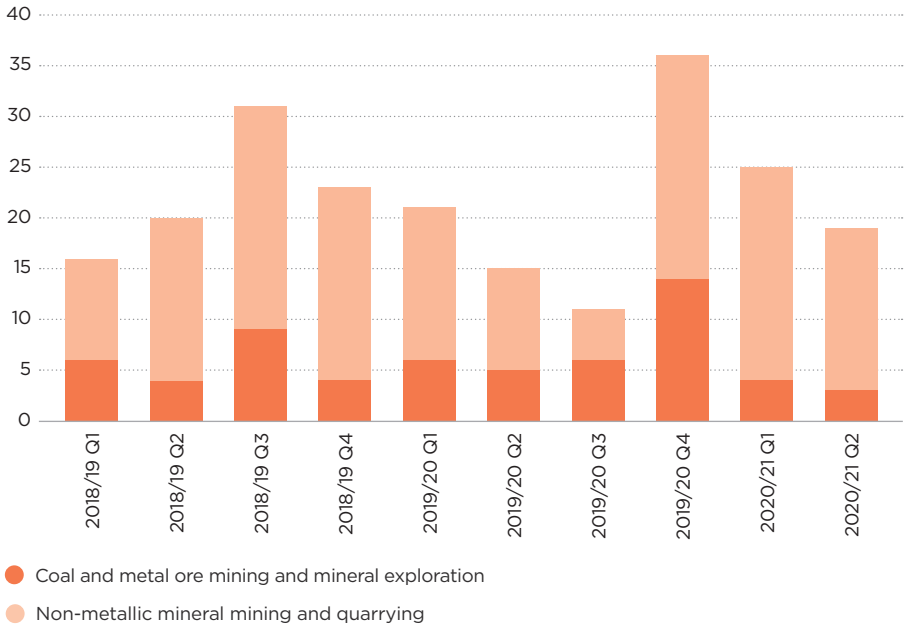

FIGURE 5:
Number of injuries resulting in more than a week away from work

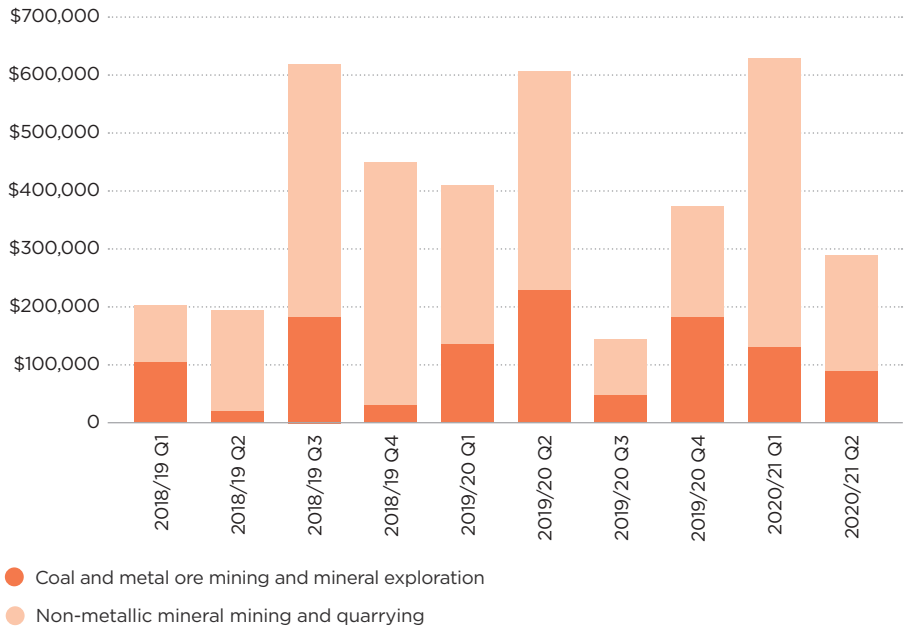

FIGURE 6:
Sum of claims cost (excluding GST) for injuries resulting in more than a week away from work

The data for these graphs comes from our System for Work-related Injury Forecasting and Targeting (SWIFT) database. It includes ACC data on approved work-related injury claims that resulted in more than a week away from work (WAFW). There is a seven month lag applied to the data to allow time for the claim information to stabilise, so data for the past two quarters is not yet available. While SWIFT data draws on ACC data, differences in counting criteria mean it may not match ACC counts, and should not be considered official ACC data.

2.3 Types of events

Figures 7 and 8 show the notifiable event categories for events notified to WorkSafe in the previous 12 months, by the mining and tunnelling sectors and the quarrying and alluvial mining sectors, respectively. The data shows that 42 percent of notifiable events in the mining and tunnelling sectors in the past 12 months have occurred in relation to vehicles and plant (24%), and fire, ignition, explosion or smoke (18%). These two categories are broken down in more detail in the following section. Fifty-four percent of notifiable events in the quarrying and alluvial mining sectors in the past 12 months involved the collapse, overturning, failure or malfunction of, or damage to plant (38%) and an implosion, explosion or fire (16%).

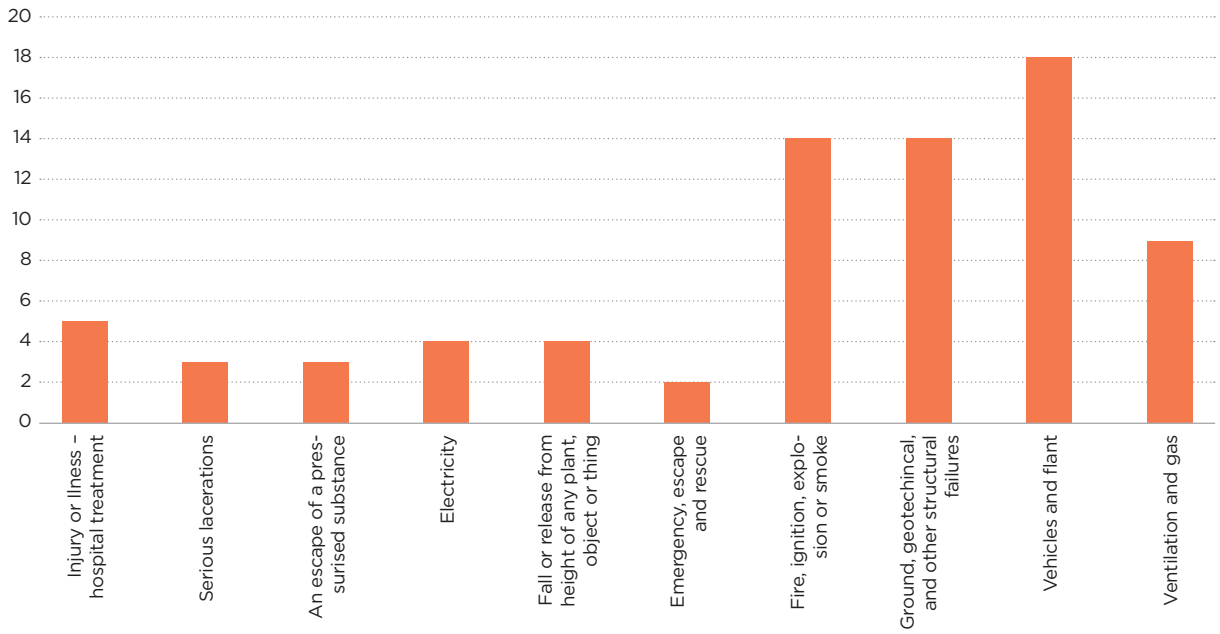

FIGURE 7: Mines and tunnels notifiable event categories for the previous 12 months

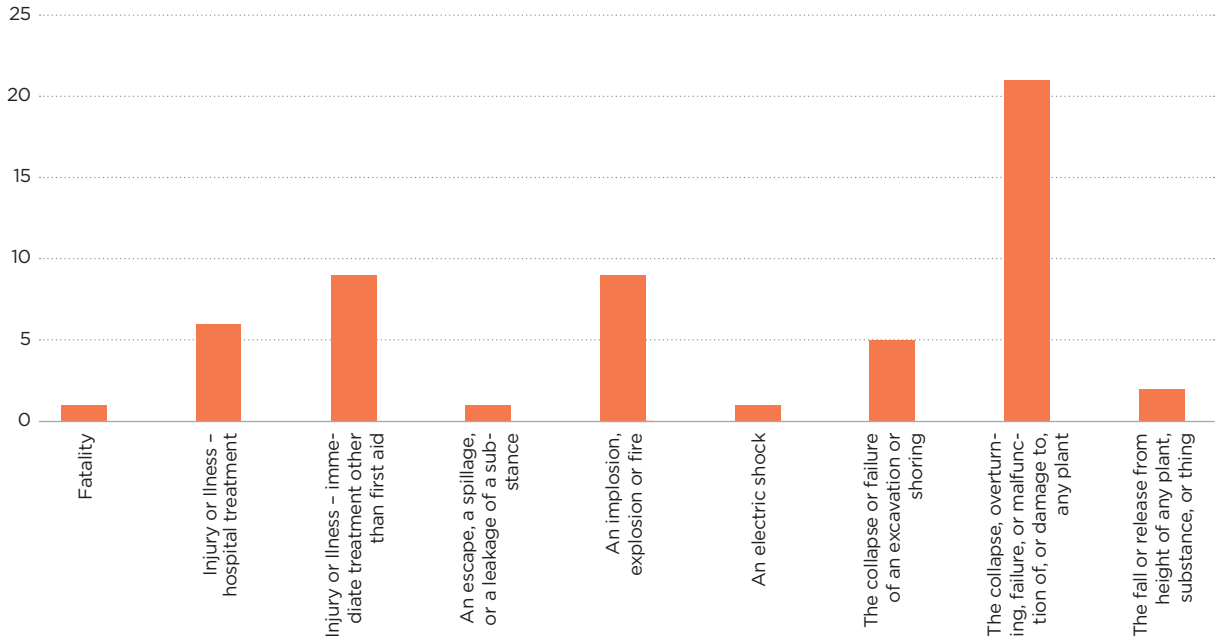

FIGURE 8: Quarries and alluvial mines notifiable event categories for the previous 12 months

2.4 Mine and tunnel focus areas

Where there is a high frequency of notifiable events in any Schedule 5 category, we have broken these events down in more detail to identify key focus areas. We will target our inspections to ensure that operators have adequate controls in place to address these risks.

Figures 9 and 10 break down the two largest notifiable event categories for mines and tunnels in the past 12 months into the corresponding Schedule 5 sub-categories. The data shows that for notifiable events related to fire, ignition, explosion or smoke, 79% involve fires on plant, mobile plant or in buildings associated with mining or tunnelling activities, and 14% involves spontaneous combustion, and 7% involves the outbreak of a fire on the surface or underground. The vehicle and plant-related notifiable events involve collision of mobile plant with other plant (39%), overturning of mobile plant (50%), and unintended movement or brake failure (11%).

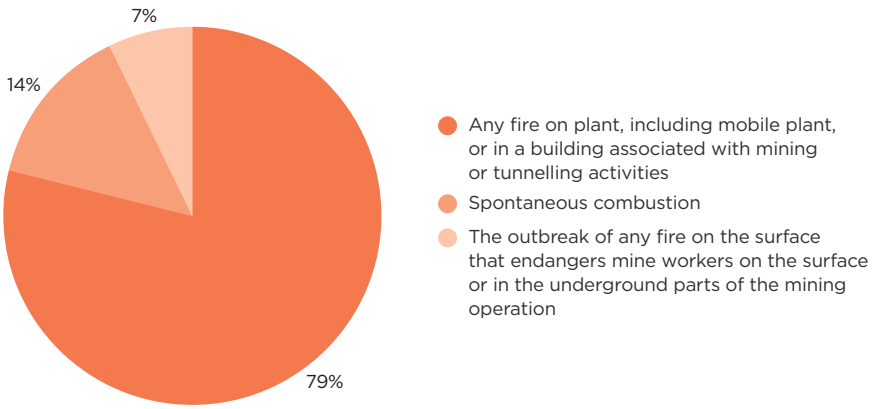

FIGURE 9: Fire, ignition, explosion or smoke-related notifiable event sub-categories

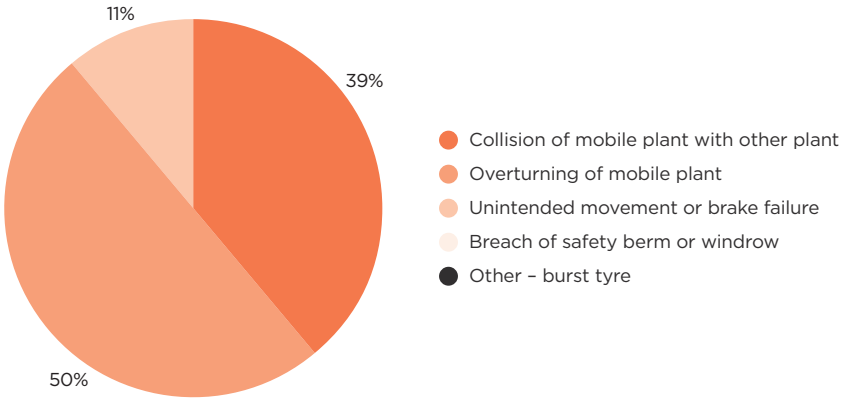

FIGURE 10: Vehicles and plant-related notifiable event sub-categories

Consistency of reporting

Mining and tunneling data are received from a high proportion of those operations and are considered to be accurate. Notifiable events were reported by 46.3% of operations in the past 12 months, and quarterly reports were submitted by 95% of operations this quarter.

Quarrying and alluvial mining data are received from a much lower proportion of those operations and are likely to be less accurate. Notifiable events were reported by just 4.3% of operations in the past 12 months. The SWIFT data on WAFW injuries consistently shows higher numbers of injuries in the quarry sector, suggesting under-reporting of events. More accurate reporting from the quarry sector is expected when the requirements for reporting under Schedules 5 and 8 are implemented for quarries.

2.5 Regulator comments

Following on from last quarter's discussion about what visible leadership looked like, the topic this quarter is adequate supervision.

The revised regulations will clarify operator and manager responsibilities to ensure that there is adequate supervision on a site, rather than it being the manager's direct responsibility to always supervise. It has been acknowledged that no one person can supervise 24-hours, 7-days per week in some cases and that the intention of the regulations had not actually been that this would be the case in practice. There will be guidance on this when the new regulations are introduced.

But in this section some description and several important considerations about what adequate supervision looks could be useful to current operations and into the future.

Supervision can generally be thought of as a front-line role. Usually, supervisors look after small groups of workers. The supervisor should control and coordinate work rather than carrying out tasks themselves. If they are working supervisors, an important consideration is whether the person delegated to supervise work actually has the time and focus to supervise others as well – that trying to undertake their own tasks does not reduce the control of supervision on a site to an unsafe or inadequate situation.

Supervisors are often the most important source of information for a worker. They are often the first person workers see and they should be the most accessible person to workers to seek advice from when they have concerns.

Supervisors should understand and be able to communicate to workers the health and safety management systems on a site. They should understand all legal obligations that are relevant to the work they are supervising. They should be able to recognise hazards and respond appropriately, including being delegated and comfortable to halt production or maintenance work at any time for safety concerns.

As a regulator, our judgement of adequate supervision is often related to the complexity of the work tasks and the experience and ability of the workers. The regulations recognise the need for direct supervision of untrained and inexperienced workers at all times. The supervision arrangements set up at operations should take this into account.

Supervisors do not need to be the expert at every task – but they do need to understand how work should be completed and who the expert is if that is who is required. In general, they must be able to ensure workers are trained to complete the work they are allocated safely – they must be able to access information such as training records.

Often supervisors will be required to react to changed circumstances. In the Extractive industry any supervisor should be able to undertake basic risk assessment – complete JSAs or other front line risk assessment tools. They should always be able to understand the limits of the supervisor's decision making – that many issues should be escalated to Managers and technical staff, and this recognition of higher hazards is an essential skill for any supervisor. Not just getting the job completed.

All operators must assess what levels and types of supervisors will be required for all work. In the mining situation CoC holders have the experience, qualifications and knowledge to supervise extractive related tasks. But consideration may need to be given to other tasks such as supervision in a mechanical workshop, supervision of a civil infrastructure type project, work involving hazardous substances or other work where the CoC holder's knowledge or experience is not likely to be adequate for the situation.

Always ensuring there is adequate supervision and that there are always good supervisors available to workers are key controls in accident prevention.

2.6 High potential incidents

A high potential incident at a mine, quarry or tunnel is an event, or a series of events, that causes or has the potential to cause a significant adverse effect on the safety or health of a person.

High potential incidents – 2021/22 Q1

Table 4 provides a summary of high potential incidents notified to WorkSafe in Q1 2021/22. The summaries are an abridged version from the operator's notification report.

INCIDENT DATE	SUMMARY	CONSIDERATIONS
Jul 21	While lowering flexible ventilation bag via a crane into a cylindrical steel ventilation cassette from a work platform the hooks on the bag separated causing approx. 8m of ducting to fall from that height, glancing the injured person on the neck/shoulder. Person taken to doctor for review, immediately returned to work on restricted duties.	– Job planning – Risk assessment – Supervision – Training

INCIDENT DATE	SUMMARY	CONSIDERATIONS
Jul-21	The workers were connecting 2 x 100mm flexible pipes to fixed steel pipelines. The first line had been connected to the steel pipe. When going to connect the second flexible line a closed valve was being removed by a worker from the end of this line, when the valve suddenly released as it was an energised line. The line was believed to be non-energised. Subsequently, the valve struck one person and flexible pipe struck the other. Three workers injured.	– Job planning – Risk assessment – Supervision – Training – Isolation
Jul 21	An underground Agi truck driver reported a fault with the unit and called the mechanic to inspect. When the mechanic was checking the truck the diesel engine has 'run away', hydraulic oil has leaked onto the hot components of the exhaust causing large amounts of smoke. The smoke entered the mine ventilation system and triggered the mine emergency procedure. All personnel that were underground at the time were evacuated to refuge chambers. No personnel were injured or became ill due to the event.	– Fire or explosion – Equipment selection and design – Equipment maintenance – Emergency management
Jul 21	Production drilling rig back wheel slumped into backfilled pass approximately 2m. Progressive slumping then occurred to about 5m depth.	– Ground and strata – Tips, ponds and voids – Design – Risk assessment
Jul 21	While trying to line up a beam from a digger to a mobile conveyor, the load moved and connected with the cab of the digger. No one was in the cab as an exclusion zone was in place at the time.	– Job planning – Risk assessment – Supervision – Training
Jul 21	An ADT was travelling with a full load towards the quarry on a haul road, when, it appears, a bolt sheared and the tray overturned.	– Roads and operating surfaces – Equipment selection and design – Equipment maintenance
Aug 21	A crew were installing breather pipe and wadding in the collar of cable bolts in preparation to grout the cables. The basket being 2.5-3m back from the face of the decline, elevated and articulated to the left-hand shoulder of the decline. The operator in the basket placed a scaling bar that he was using to tamp the wadding into the hole collars, horizontally on top of a stack of cement bags in the left rear corner of the work basket whilst he handled additional wadding to put in the last hole. In the meantime, the shift supervisor/jumbo operator has received permission to proceed past the IT and basket to the area of the face to retrieve a roll of polythene breather pipe that had been dropped to the ground after inserting breather and fill lines in the cable holes. Whilst he was rolling up the poly pipe the scaling bar has slid off the cement bags, through the bars in the front basket and dropped on its end once it has cleared the basket, striking the shift supervisor/jumbo operator on the outside of the left foot immediately behind the steel cap. It has punctured the top of the supervisor's gumboot, his sock, and passed cleaned through his foot in the vicinity of the fourth and fifth metatarsals. It has also punctured the insole of the boot and stopped somewhere in the sole of the boot.	– Job planning – Risk assessment – Supervision – Training – Fall from height
Aug 21	A leak developed in a block on the side of a hydraulic filter housing, spraying atomised hydraulic oil in the direction of the engine exhaust on a Jacon HiAb underground stores truck. The operator noticed smoke, made an emergency radio call, and on attempting to release the onboard AFFF noticed that it had already released automatically. He saw AFFF coming from the bottom of the vehicle, and on inspecting the engine bay via a hatch has sighted flame and extinguished the remaining fire with a 9kg dry powder fire extinguisher. He has subsequently retreated to a refuge chamber. The first response team on arriving at the scene has determined the fire to be out. All personnel underground were accounted for in refuge chambers prior to the incident being cleared. Maintenance personnel inspected the vehicle immediately following the incident and noted hydraulic oil leaking from the aforementioned filter housing, determining this to be the fuel source for the fire.	– Fire or explosion – Equipment selection and design – Equipment maintenance – Emergency management

INCIDENT DATE	SUMMARY	CONSIDERATIONS
Aug 21	An underground drive was on hold with weekly geotechnical inspections and pump inspections only occurring. At some stage following the last geotechnical engineering inspection, one or more plates have popped off the overlap between four sheets of mesh allowing the mesh to separate, dropping a section of shotcrete skin and attached scats onto the drive floor below. The correct barricade signage was absent when the drive was closed.	– Ground and strata – Workplace inspection – Design – Risk assessment
Aug 21	A light vehicle has rolled back approximately 10m, made contact with the decline wall and came to rest. Operator error: 1. exited the vehicle whilst vehicle running (on a decline gradient) 2. not turned into the wall 3. not in gear (reverse or first) 4. unsure if park brake applied (relied on opening door to activate SIBS).	– Roads and operating surfaces – Job planning – Risk assessment – Supervision – Training
Aug 21	During a Monday morning pre-start inspection, it was found that a sizable rock had dislodged from a quarry face over the weekend and rolled about 10 meters contacting the side of the portable crusher. No one was injured and the plastic diesel tank was split with some diesel escaping to ground.	– Ground and strata – Workplace inspection – Design – Risk assessment
Sep 21	Quarry truck operating on normal quarry roads travelled with the bin raised, which struck an overhead conveyor damaging both the conveyor and truck	– Roads and operating surfaces – Job planning – Risk assessment – Supervision – Training
Sep 21	A slope failed on Saturday night after re-activation of a previous failure. The failure resulted in displacement of the water in the sump to the next higher level which partially flooded two excavators, a pump and a lighting tower.	– Ground and strata – Workplace inspection – Design – Risk assessment
Sep 21	The Leyland truck is a static coal screening platform (approx 10 tonne) and was being fed coal by a 12 tonne digger. At 4pm the neighboring workshop staff heard a noise and on inspection observed smoke coming from the truck and four tyres on the right-hand rear of the truck were on fire. They then phoned the Mine Manager who unsuccessfully tried to extinguish the fire. The local Fire Brigade were then called who put the fire out.	– Fire or explosion – Spontaneous combustion – Emergency management
Sep 21	Occurred in workshop – worker was doing work, someone came along to ask him to gas cut the top of a drum, it caught fire and burnt him.	– Fire or explosion – Job planning – Risk assessment – Supervision – Training
Sep 21	A loader clearing material at extra fines tip head has reversed and made contact with position two wheel of a haul truck that was stationary and awaiting to dump.	– Roads and operating surfaces – Tips, ponds and voids – Job planning – Risk assessment – Supervision – Training
Sep 21	Contractor got out of his cab to go to the office reception and did not engage park brake, truck then started to move and came up against safety bund.	– Roads and operating surfaces – Job planning – Risk assessment – Supervision – Training
Sep 21	After a night of heavy rain an uncontrolled slope movement occurred. No personnel were working under or in the slip area, however, a light vehicle which was parked on the bench was pushed up and over an edge protection bund with the force of the moving material onto the next bench.	– Ground and strata – Workplace inspection – Design – Risk assessment – Roads and operating surfaces

INCIDENT DATE	SUMMARY	CONSIDERATIONS
Sep 21	A slip approx. 40m high, involving three benches, 8–10m wide, occurred directly above the working pit. The area has been closed off. A Geotech has completed an assessment and is preparing a report.	– Ground and strata – Workplace inspection – Design – Risk assessment
Sep 21	An articulated dump truck was carting ripped quarry rock to a temporary stockpile on a bench close to the entrance of the quarry. The operator backed in too close to a previously tipped load. The left back wheels of the dump truck went onto the previously tipped material. The tray of the dump truck tilted and tipped over on its right hand side.	– Roads and operating surfaces – Tips, ponds and voids – Job planning – Risk assessment – Supervision – Training
Sep 21	An articulated dump truck was carting general landfill waste from the landfill tip-off area to the landfill tip head. As the dump truck operator backed towards the tip head, the operator reached to an RT to clarify the dumping location with the compactor operator. The dump truck operator pressed the wrong button on the RT. He then took his eyes off the mirrors of the dump truck to look at the RT. The dump truck veered off direction into a bank. The left back wheels went up the bank. The dump truck tray tilted and tipped over on its right-hand side.	– Roads and operating surfaces – Tips, ponds and voids – Job planning – Risk assessment – Supervision – Training

TABLE 4: High potential incidents – 2021/22 Q1

Table 5 and figure 11 shows the number of high potential incidents per quarter during the last year for all extractives operations.

QUARTER	Q3 JAN-MAR 2020	Q4 APR-JUN 2020	Q1 JUL-SEP 2020	Q2 OCT-DEC 2020	Q3 JAN-MAR 2021	Q4 APR-JUN 2021	Q1 JUL-SEP 2021	TOTAL PREVIOUS 12 MONTHS
Number of high potential incidents per quarter	34	15	20	24	23	16	21	**84**

TABLE 5: High potential incidents per quarter

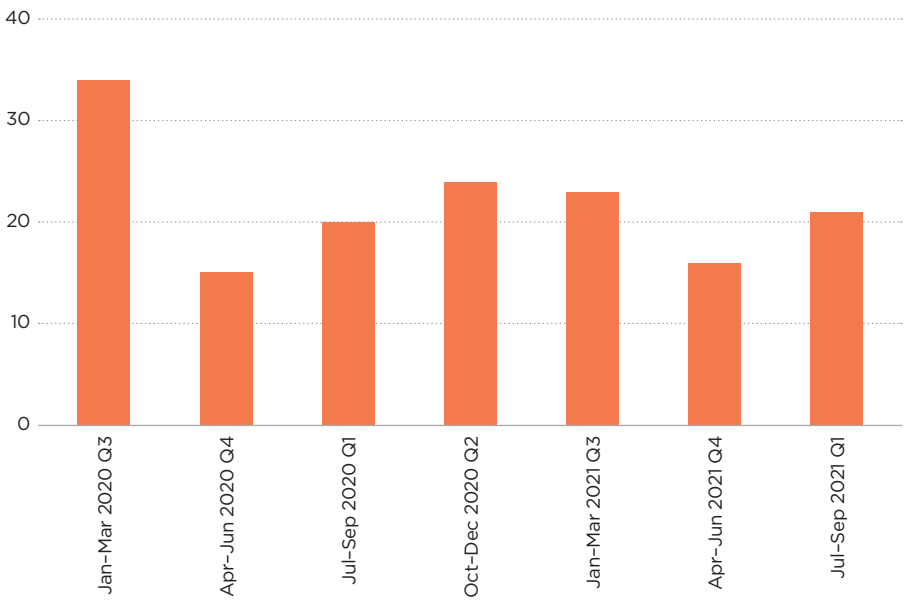

FIGURE 11: High potential incidents per quarter

2.7 High potential incidents – investigation outcomes

High potential incident case study

INCIDENT DATE	SUMMARY	CONSIDERATIONS
Sep 21	Quarry truck operating on normal quarry roads travelled with the bin raised, which struck an overhead conveyor damaging both the conveyor and truck.	– Roads and operating surfaces – Job planning – Risk assessment – Supervision – Training

TABLE 6: High potential incident – investigation outcomes case study

FIGURE 12: Incident scene photograph

THE INCIDENT

A quarry tip truck driver was delivering product from the quarry stockpiles to the plant via an internal road between two adjacent sites. The operator undertook this job daily and could make the trip up to 50 times a day. The work was being undertaken during Level 4 and Level 3 due to demand.

As the operator was preparing to tip the load of product off in the bin at the plant, they received a personal phone call which was answered via Bluetooth in the truck. The operator continued to undertake the task of tipping off the product whilst having a conversation with the caller. On completion of the task, they drove back to the quarry whilst still on a call via Bluetooth, forgetting to put the deck down. They travelled approximately 500m along their normal route, finished the phone call on Bluetooth but then received a text message which they decided to read whilst driving under the conveyor of the fixed crushing plant, where the truck deck has struck the conveyor (height approximately 6–7m). The operator was travelling at 21kmph at the time of impact – verified by E-roads in the vehicle.

THE INVESTIGATION IDENTIFIED

The cause of the incident was attributed to:

- the operator taking a personal phone call while still undertaking the task of driving
- the operator did not have good quality sleep over the previous few nights, potentially causing fatigue
- the fitted deck alarm was not designed to alarm the operator of when the deck is up, and the truck is travelling. The fitted alarm only alerted whilst the deck hoist is going up and down and is audible from outside the cab to warn people in the vicinity that the truck is tipping off
- no over height early warning detection (similar to low bridge) on the conveyor structure
- site risk assessment did not identify the overhead conveyor as being at risk from being struck.

The truck was in good working order, and the prestart had been completed, although it was noted during Level 4 that the fitted deck alarm had stopped working. The alarm is audible outside of the cab; the purpose of the fitted alarm was to warn people in the vicinity that the truck was tipping off. A decision was made to continue using the vehicle, as it was assessed as low risk by the Quarry Manager because:

- It was a controlled environment where there is on one on the ground or working around the vehicle whilst undertaking its tasks.
- The alarm was factory fitted and prior to this new truck arriving onsite, the quarry had been operating without one for the previous seven years due to the risk being assessed as low.
- A discussion was held between the operator and Manager when the alarm was reported as not working and both agreed that given the environment, its working served no purpose. No other tasks were required to be undertaken around people. It was planned to get the alarm repaired in Level 2.
- The alarm was not considered to be a safety critical device and was not part of Cert Safe requirements.

The following improvements were identified to reduce the consequences/ impacts of a similar incident:

- install audible/visual alarm or alert in the cab of truck to advise operator of truck when the deck is up whilst travelling
- review installation of a driver fatigue monitoring camera in the truck cab
- review quarry traffic management plan to see if the need to travel under conveyors can be eliminated
- if vehicle movements under the conveyor cannot be eliminated, review installation of a over height early warning detector on the structure
- issue safety alert for the PCBU's other quarry sites to fit bin up devices to quarry trucks and to review traffic management plans.
- if a call needs to be taken or made, even via Bluetooth, stop the task you are undertaking until the call is complete.

REGULATOR COMMENTS AND RECOMMENDATIONS

This incident and investigation report is very typical of what we receive. It is very apparent that this incident occurred as a direct result of a mobile plant operator error – failure to lower the tray, and which may have included some breach of rules around the taking of phone calls while operating equipment. Many would think that those factors alone were the most significant contributors to the incident, that the operator was the only problem.

What is important to remember is that people will make mistakes. That even when completing simple repetitive tasks there is a probability (high probability) that at some point in time a mistake will occur. It is often due to distractions or the fact that alarms, warning signs, visual hazards or routine breaches of rules have become normalized. But errors can occur through an inexplicable gap in concentration, fatigue, basic memory lapse etc, all of which we have experienced from time to time.

What is important when designing methods of work is that you should consider the potential interaction of environmental features, fixed plant, mobile plant and people (including staff and others) and ensure the work is resilient to human error. Ensure that if a human error does occur, then the system has capacity to mitigate or prevent/absorb the consequences without harm occurring.

Always remember: higher level controls are more effective.

- In this case the site layout and the need to travel under conveyors was a factor. No roads under overhead plant would be a better elimination or isolation control.
- Plant with raised trays lower than any overhead structure.
- More effective and responsive alarm systems: interlocked tray alarm – speed restriction to 1st gear until tray lowered. Alarm increases in pitch with truck movement or engaging of gears.
- Over height warning devices to protect overhead structures.

Regulator recommendations – other high potential incidents

Beginning this quarter, in addition to the full case study, we will select a few HPIs to highlight. These HPIs involve hazards that most Extractives operators should consider and address. We will share recommendations for controls and actions that PCBUs should consider in relation to the hazards associated with each incident.

ISOLATION

INCIDENT DATE	SUMMARY
Jul 21	The workers were connecting 2x100mm flexible pipes to fixed steel pipelines. The first line had been connected to the steel pipe. When going to connect the second flexible line a closed valve was being removed by a worker from the end of this line, when the valve suddenly released as it was an energised line. The line was believed to be non-energised. Subsequently, the valve struck one person and flexible pipe struck the other. Three workers injured.

REGULATOR RECOMMENDATIONS

- Always assume the circuit to be worked on is energised (in this case, pressurised).
- Have safe and effective lockout and energy isolation procedures in place.
- Always: isolate, lock, de-energised, verify.
- Make sure your workers are trained in the procedures or are supervised when they carry out the procedure.
- Correctly identify and label energised lines and hoses where practical.
- Your lockout procedure should take into account when plant is locked out for more than one day or one shift.

Cutting of metal drums

INCIDENT DATE	SUMMARY
Sep 21	Occurred in workshop – worker was doing work, someone came along to ask him to gas cut the top of a drum, it caught fire and burnt him.

REGULATOR RECOMMENDATIONS

- Use metal drums with removable lids for storing or disposing materials.
- Issue a company policy that prohibits the cutting of metal drums.
- If it is necessary to cut metal drums, conduct a risk assessment and develop written safe work procedures that includes effective cleaning and neutralizing of contents before cutting.
- Test for flammable residues before performing hot work.
- Ensure workers are instructed, trained and supervised in safe work procedures.
- Ensure suitable PPE is worn when performing hot works such as flame-resistant clothing.
- Check precautions within Safety Data Sheets and the label on the drum or tank before performing hot work.
- Consider other methods instead of hot work such as cold cutting techniques.
- Conduct a risk assessment to identify and mitigate hazards associated with cutting into drums or tanks.

Ground instability and rainfall events

INCIDENT DATE	SUMMARY
Sep 21	After a night of heavy rain an uncontrolled slope movement occurred. No personnel were working under or in the slip area, however a light vehicle which was parked on the bench was pushed up and over an edge protection bund with the force of the moving material onto the next bench.

REGULATOR RECOMMENDATIONS

- Avoid working near, or parking vehicles and equipment under, or on the edge of highwalls during and post wet weather events.
- Install and maintain water drainage to prevent the pooling of water.
- Install pumps and ensure they are operational where required, prior to wet weather events occurring, to assist in water management.
- Complete thorough inspections of highwalls and dumps prior to starting, and during excavation activities, with the results of inspections recorded and communicated at pre-start meetings.
- Workers should monitor conditions in their work areas for the condition of highwalls during drilling, blasting and excavation operations and report any changes to their supervisor.

3.0
The regulator

IN THIS SECTION:

3.1 Our activities

The Extractives Specialist Health and Safety Inspectors at WorkSafe use a range of interventions to undertake their duties. Inspectors strive to achieve the right mix of education, engagement and where required enforcement. This section of the report includes a summary of the interventions used by the Extractives Inspectors during the quarter.

3.2 Assessments

Proactive assessments aim to prevent incidents, injuries and illness through planned, risk-based interventions. Reactive activities are undertaken in response to reported safety concerns or notifiable events. Assessments can be either site- or desk-based in nature.

For proactive site-based assessments, the objectives of each visit are agreed and the appropriate inspection tool is selected. Targeted assessments and regulatory compliance assessments can take several days on site with a team of inspectors attending. These multi-day inspections may be 'targeted' to assess the controls in place for a particular principal hazard (for example, WorkSafe has been targeting 'roads and other vehicle operating areas' as a result of the high number of notifiable events in this area), or they may involve a more general assessment of 'regulatory compliance'. Site inspections and targeted inspections are generally completed in a one day site visit but can also focus on specific topics.

As well as site-based assessments, the Inspectors spend considerable time undertaking desk-based assessments. Proactive desk-based assessments include the review of Principal Hazard Management Plans (PHMPs), Principal Control Plans (PCPs), mine plans, and high risk activity notifications. Responding to notifiable events and safety concerns may involve a site-based or desk-based assessment, or both.

Table 7 shows the range of assessments undertaken in Q1 2021/22 by sector.

		ASSESSMENTS	MINE	TUNNEL	ALLUVIAL MINE	QUARRY
Preventative	Site-based	Targeted assessments				
		Regulatory compliance assessments				
		Site inspections	15	7	1	52
		Targeted inspections	3			1
	Desk-based	PHMP/PCP review		19		
		Mine plan review	9	1		
		High risk activity	3			
		COVID-19 assessment		1		
Reactive	Site-based	Concerns – inspection	1		1	2
		Notifiable events – inspection	7	1		1
	Desk-based	Concerns – desk-based				
		Notifiable event – desk-based	14	5	4	3

TABLE 7: Proactive and reactive site and desk based assessments conducted in Q1 2021/22

Figure 13 shows the number of proactive and reactive site- and desk-based assessments undertaken by the regulator in Q1 2021/22. This quarter 58% of our activities were site-based, and 74% of activities were proactive.

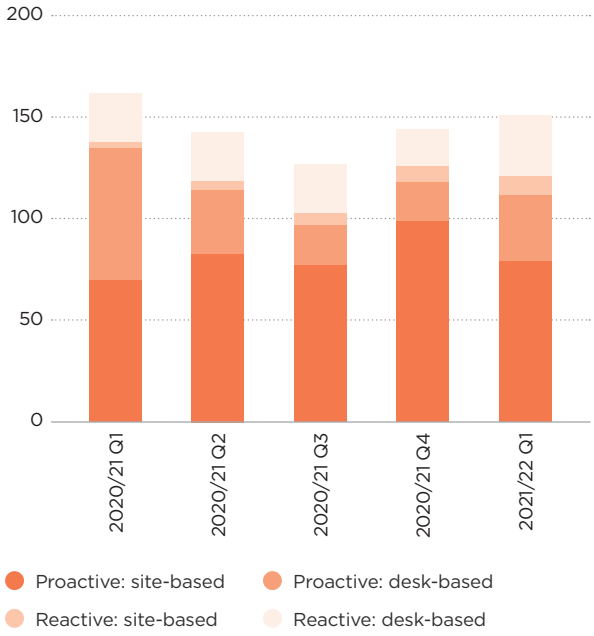

FIGURE 13:
Proactive and reactive site and desk-based assessments

Figure 14 shows the number of assessments undertaken by the regulator in Q1 2021/22 by sector. This quarter, 38% of our assessments were for quarries, 34% for mines, 38% for tunnels and 5% for alluvial mines.

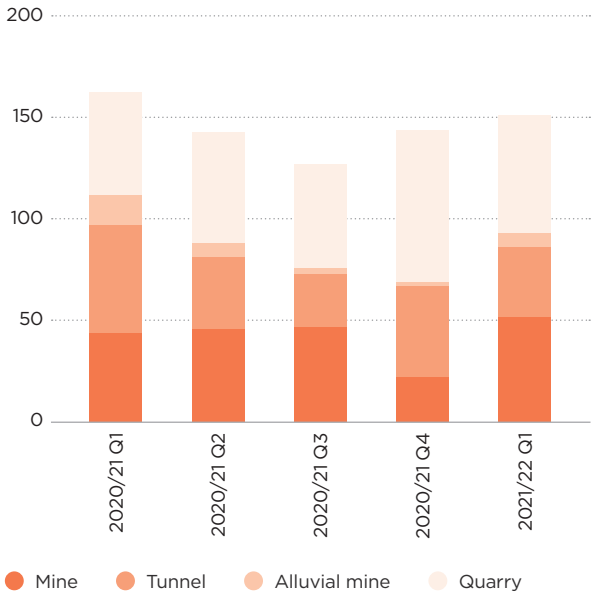

FIGURE 14:
Assessements by sector

3.3 Enforcements

Enforcement actions issued by WorkSafe include prohibition and improvement notices and directive letters. Enforcement actions are issued according to our Enforcement Decision Making (EDM) Model when health and safety issues are identified through assessments.

Figures 15 and 16 show the number of enforcement actions issued in Q1 2021/22 by notice type and by sector. This quarter, a total of 236 enforcement actions were issued. Of those, 1% of were prohibition notices, 27% were improvement notices, 70% were directives and 1% were sustained compliance letters. The majority of the enforcement actions were issued to the mining (25%) and quarrying (51%) sectors.

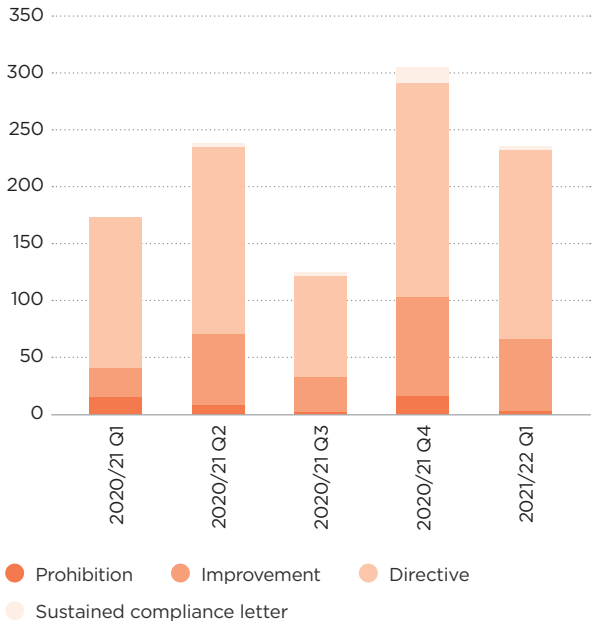

FIGURE 15: Enforcement actions issued by type

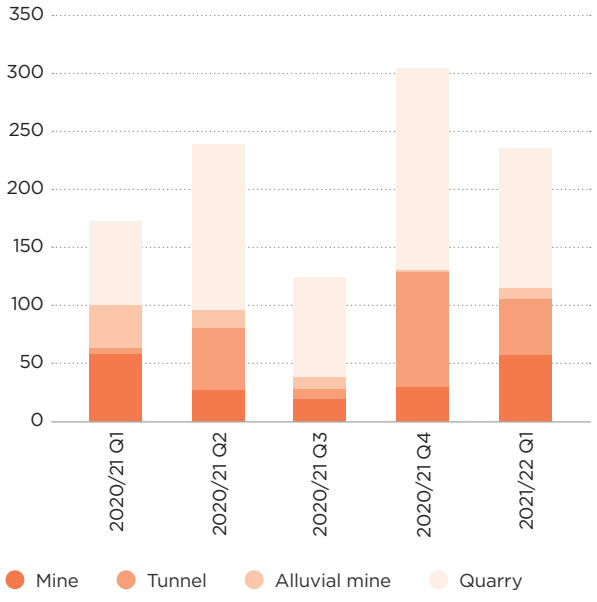

FIGURE 16: Enforcement actions issued by sector

Figure 17 shows the number of enforcement actions issued in Q1 2021/22 by category, and provides an indication of the key areas of concern to our inspectors. This quarter, the majority of enforcement actions were issued for health and safety issues relating to roads and other vehicle operating areas (19%).

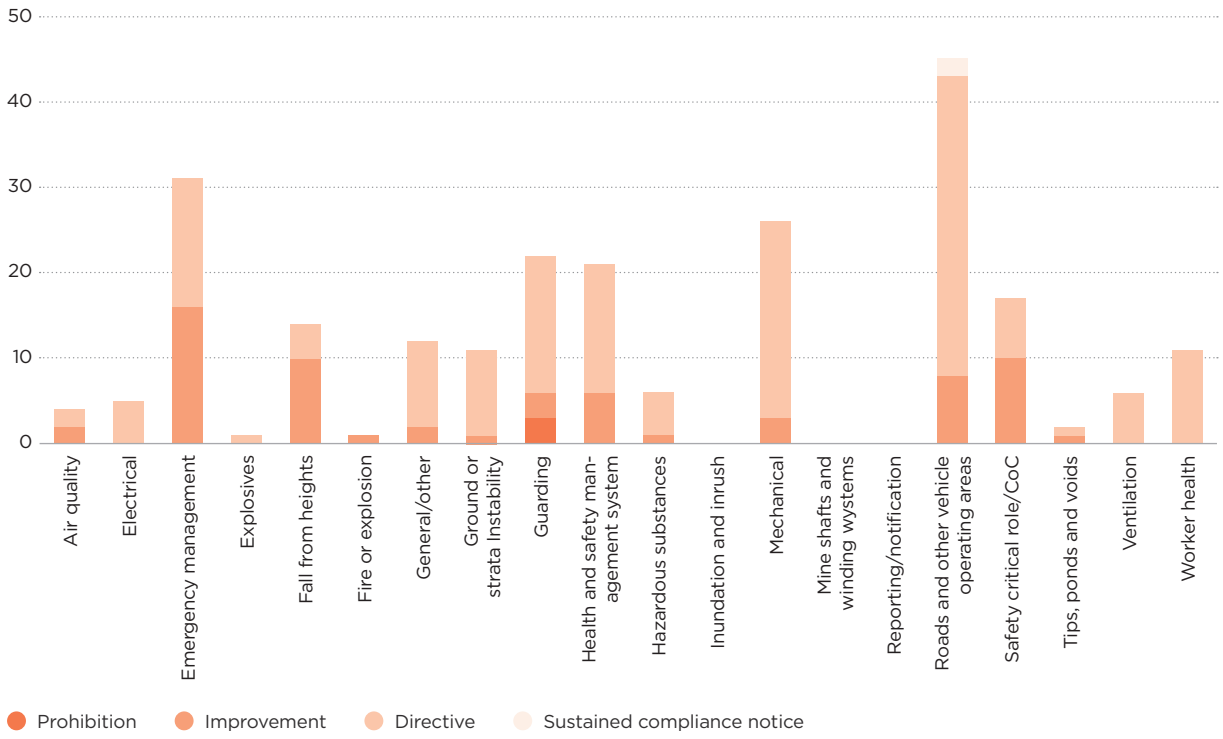

FIGURE 17: Enforcement actions issued by category 2021/22 Q1

Regulator activity comment

The inspection schedule has been impacted by the Covid-19 level changes, especially the Auckland and subsequent Waikato lockdowns. This caused the postponement or rescheduling of planned visits. This will impact on the reported assessments and enforcement actions until at least the end of Q2 this year. Generally, the proportion of enforcement actions has continued to reflect an appropriate mix of prohibition notices, improvement notices and directives across the risk categories.

The other variation to the scheduling of inspector work from Q1 this year going forward will be the implementation of our plan to attend as many HPI incidents as possible. The nature of these visits is more targeted than many of our previous scheduled inspections. This may influence the number and nature of enforcement actions. During this quarter the inspectors have often completed normal inspections in addition to the HPI enquiries, and ratios of enforcement types are similar to previous quarters.

Notes

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