

**NSW  
Resources  
Regulator**

# o **Quarterly safety report**

JULY TO SEPTEMBER 2018



## ABOUT THIS REPORT

This quarterly health and safety performance report has been prepared by the NSW Resources Regulator for mining operators in NSW. It contains industry and sector specific information. Wherever possible, trends and patterns have been identified.

The report references sector information about the number of 'active mines' as well as the number of mining operations that have submitted reports to the regulator in the form of 'hours worked'. Active mines have the status: open, intermittent, mines under care and maintenance, open tourist mines, planned and small-scale titles that are current or pending. A contemporary industry view was obtained using the mandatory quarterly reporting figures for the number of 'mines that have reported hours'. Petroleum sites, underground small gemstone mines, opal mines and tourist mines are excluded from certain sector-based calculations as they are exempt from quarterly reporting requirements.

The report also contains information on matters of concern to the regulator including controls and actions that may be implemented to prevent or reduce the likelihood of future safety incidents.

Operators should use the sector specific information, emerging issues and good practice examples presented in this report to assist them in improving safety management systems and undertaking risk assessments at their sites.

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Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (November 2018). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of the NSW Department of Planning and Environment or the user's independent advisor.



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# Executive Summary

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This report was prepared by the NSW Resources Regulator to assist mine and petroleum site operators in meeting their obligations under relevant work, health and safety legislation including the *Work Health and Safety (Mines and Petroleum Sites) Act 2013*. It is also a way in which the regulator monitors progress in implementing its risk-based Incident Prevention Strategy.

As a high-hazard regulator, we focus on compliance with legislative requirements associated with principal mining hazards and other high-risk hazards including mechanical, electrical and explosives.

As well as providing an overview of incidents across the mining industry, the report looks at the safety performance and regulatory activities of six sectors defined by the regulator: coal, large (non-coal) mines and quarries, small mines and quarries (including gemstones), opal mines, petroleum and geothermal sites and exploration sites.

The report provides information on significant mining events in Australia and globally, summarises safety incident notifications, compliance activities and outcomes for quarter one in the financial year 2018-19 and across a 12 month period from October 2017 to September 2018.

In summary:

- Between July and September 2018, there was one mining related fatality in NSW.
- There has been no change in the overall number of safety incident notifications by mines in the 12 months since October 2017. On average, five incidents are reported per notifying mine for the 12 month period. For quarter one 2017-18, there were just over seven incidents per notifying mine in the coal sector compared to three and just over one in large mines (and quarries) and the small mines (and quarries) sectors respectively. This reflects the higher number of reportable incidents due to the inherent hazards associated with the underground coal sector.
- On average, just over 14% of mining operations reported safety incidents in the 12 month reporting period. The highest rate of incident notification reporting was observed in the coal and large mines sectors where 91% and 78% of mines respectively notified incidents during the 12 month reporting period. A very low rate of incident notification reporting was observed for small mines, opal, petroleum and geothermal sectors.
- In quarter one 2018-19, the regulator commenced work on four major safety investigations.
- From October 2017 to September 2018, there has been no substantial changes in the overall number and types of safety notices issued by the regulator. On average, the regulator issues one prohibition notice for every three improvement notices.
- From October 2017 to September 2018, the regulator averaged 982 safety assessments every quarter, including site-based and desktop assessments. A total of 3,929 safety assessments were performed over the 12 month reporting period, with just under two thirds of these conducted in the coal sector.



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In quarter one 2018-19, the regulator issued approximately one notice for every two site assessments conducted in the coal sector. In the large mines and small mines sectors the regulator issued approximately one notice for every site assessment. By comparison, for opal mines, the regulator issued approximately one notice for every eight assessments conducted. No safety notices were

**EXECUTIVE SUMMARY** In the uranium and geothermal sector assessments were conducted. In the exploration sector, of the four assessments conducted, the regulator issued three safety notices. **5**

**1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS** For the 12 month reporting period, approximately two thirds of the regulator’s compliance effort in high hazard mines was proactive, focusing on preventing catastrophic and multiple fatality and serious incidents rather than only responding to incidents that had already occurred. **7**

**2. INDUSTRY SAFETY PROFILE** 2018-19, 70% of assessments were proactive. **11**

- In quarter one 2018-19, 14 proactive safety assessments across four principal mining hazard areas were conducted under the Targeted Assessment Program. There were three consolidated TAP reports published this quarter.

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The NSW Resources Regulator is committed to sharing safety information about significant mining events and fatalities with a view to increasing industry awareness about mine safety and regulatory matters. This

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The information gathered as part of the regulator's ongoing publication monitoring process. Fatalities and significant events from July to September 2018 have been included.

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The relevance to equipment and processes commonly used across the NSW mining industry.

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There was one fatality in the NSW mining industry between July and September 2018. The death

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occurred in September 2018, approximately six weeks after the incident, where a contract operator suffered a head injury after falling from a scissor lift. The incident is currently under investigation by the

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Resources Regulator.

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Queensland reported a fatality on 29 July 2018. The operator of an articulated dump truck was working at

a quarry. It appears the operator lost control of the fully loaded vehicle on an access ramp. At the bottom

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of the ramp, the vehicle overturned, partially pinning the operator under the cab. Unfortunately, the

### 7. SMALL MINES AND QUARRIES 47

operator sustained injuries in the accident. ([Mine safety alert 358](#))

Western Australia reported a fatality on 15 August 2018. A haul truck driver was fatally injured after losing

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control of a Komatsu 830E A/C haul truck and crashing it into a windrow. The haul truck was descending

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a ramp with a full load of ore. The Komatsu 830E A/C is an electric drive truck; not a conventional geared

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## NSW RESOURCES REGULATOR SAFETY ALERTS AND BULLETINS

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05 Jul 2018	SA 18-08	<a href="#">Underground mine fire initiates emergency response</a>	
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10 Jul 2018	SB18-12	<a href="#">Rib failures in underground coal mines</a>	
<b>2. INDUSTRY SAFETY PROFILE</b>			<b>11</b>
16 Jul 2018	SA18-10	<a href="#">Heavy vehicle light vehicle near miss</a>	
<b>3. COMPLIANCE ACTIVITIES</b>			<b>15</b>
12 Nov 2018	SA18-12	<a href="#">Worker falls from conveyor gantry</a>	
<b>4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES</b>			<b>25</b>
10 Aug 2018	IIR18-07	<a href="#">Serious injury at Bulga Surface Operations</a>	
<b>5. COAL SECTOR</b>			<b>28</b>
20 Jul 2018	IIR18-05	<a href="#">Falling coal hits two workers underground</a>	
25 Sep 2018	SB18-14	<a href="#">Preventing fires on mobile plant responding to safety alerts</a>	
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26 Sep 2018	SB18-15	<a href="#">Light vehicles in mining operations</a>	
5.2 Coal sector - compliance activities .....			<b>30</b>
27 Sep 2018	IIR18-09	<a href="#">Two workers trapped in shaft winder conveyance</a>	
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<b>OTHER STATES</b>			
<b>6. LARGE MINES AND QUARRIES</b>			<b>38</b>
Western Australia Mines Department - In June 2018, on a surface coal mine, a D11 Dozer travelled over the crest of a highwall while ripping after dark, falling approximately 16 metres onto a lower bench. The dozer also rolled 360 degrees before coming to rest, and the dozer operator was seriously injured. An identical incident occurred at another surface coal mine approximately twelve months prior when a D11 Dozer travelled over the crest of a highwall while ripping, coming to rest about ten metres below. ( <a href="#">Significant incident report 265</a> )			<b>38</b>
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Western Australia Mines Department - In August 2018, a service crew was extending air and water services underground to connect existing lines, a worker was struck in the head when a coupling failed on the airline. The operator collapsed and lost consciousness but was transported to hospital for treatment of concussion and lacerations to his head. ( <a href="#">Significant incident report 266</a> )			<b>47</b>
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Queensland Department of Natural Resources, Mines and Energy - During charging of a perimeter hole in the rock at an underground metalliferous mine, about 11 tonnes of rock fell from the middle and upper portions of the face, trapping an operator in a Normet Charmec basket. ( <a href="#">Mines safety bulletin No. 173</a> )			<b>55</b>
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 A worker was operating an excavator on the muckpile heap. After attempting to reposition the excavator beyond the edge of the heap, the excavator fell backwards and then onto its side. The operator was

**1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS** 7  
 A worker was operating a front loader on a muckpile heap. The worker was protected from injury  
[Minex Safety Alert NZ, August 2018.](#)

**2. INDUSTRY SAFETY PROFILE** 11  
 A worker was operating a front loader under a crusher when an air hose connection came loose and flew off. The projectile narrowly missed the workers face. [Minex Safety Alert NZ, August 2018.](#)

**3. COMPLIANCE ACTIVITIES** 15

## International

**4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES** 25

## FATALITIES

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**UNITED STATES OF AMERICA**

On 31 July 2018, a forerunner was fatally injured while dismantling a portable crusher. A front-end loader operator lowered the bucket crushing the victim against the conveyor structure. [MNM Fatality Alert.](#) 28

5.2 Coal sector - compliance activities..... 30  
 On 22 August 2018, a miner was fatally injured while cleaning a snub pulley. The victim was working from an aerial lift located under the belt conveyor but became entangled in the conveyor pulley. [MSHA MNM Fatality Alert.](#) 35

**6. LARGE MINES AND QUARRIES** 38

On 7 September 2018, a haul truck operator received fatal burn injuries while attempting to escape from the cab of the truck. Unfortunately, the operator died five days later. [MSHA fatality alert.](#) 38

6.2 Large mines and quarries compliance activities..... 40  
 On 11 September 2018, a mobile bridge conveyor operator on a continuous miner, was fatally injured during the reposition process. While the continuous miner was being repositioned, the attached mobile

bridge conveyor moved, crushing the operator between it and the coal rib. [MSHA fatality alert.](#) 45

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### UNITED KINGDOM

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 A front-loading shovel driver, operating on a quarry, was banging out a bucket whilst travelling up a ramp. When the shovel driver stopped, the driver hit their head on the windscreen. See [Incident.. alert.](#) 49

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### SOUTH AFRICA

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On 15 July 2018, six mine workers in a South African underground copper mine died in a refuge chamber because of a fire on a conveyor. [Queensland Mines safety alert 357.](#) 55

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### UNITED STATES OF AMERICA

On 15 June 2018, a miner fell from a person basket while exiting an electric shovel. The weldment used to  
**EXECUTIVE SUMMARY** shovel failed causing the miner to fall approximately 15 feet to the ground below **5**  
[MNM Serious Accident Alert](#).

On 18 June 2018, a miner was seriously injured while making repairs on a rotating  
**1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS** screen plant. A chain used to lift a thrust bearing failed, knocking the miner unconscious. [MNM Serious](#)  
[Accident Alert](#). **7**

**2. INDUSTRY SAFETY PROFILE** **11**  
 On 2 July 2018, a miner in the process of dumping the contents in the vacuum truck was seriously injured  
 while chasing the truck as it began to roll away. [MNM Serious Accident Alert](#).

**3. COMPLIANCE ACTIVITIES** **15**  
 On 9 July 2018, a miner was injured while repairing a belt conveyor. When the crushing plant engine  
 unexpectedly started, activating the belt conveyor. The miner was knocked down and then discharged  
**4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES** **25**

into a feed hopper, six feet below. Fortunately, the engine was able to be shut down and the injured  
 miner was rescued from the hopper. [MSHA serious accident alert](#).

**5. COAL SECTOR** **28**  
 On 9 August 2018, a miner on a surface granite mine was injured when the pan scraper stalled, travelled  
 through a berm and rolled over a bench. The operator of the pan scraper was wearing a seatbelt and was  
**5.1 Coal sector safety profile** **28**

able to escape with a cut arm. [MSHA MNM Serious accident alert](#).  
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## 2. Industry safety profile

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This industry profile is composed of a sector breakdown of the number of active mines and information on hours worked and lost time injuries submitted on quarterly report forms for the past 12 months. 7

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#### 2. INDUSTRY SAFETY PROFILE 11

As at 5 October 2018, there were 7,220 active mines in NSW. Active mines include open, intermittent, mines under care and maintenance, open tourist mines, planned and small-scale titles that are current or pending. The chart below shows the number of active mines in each of the six mining sectors. 15

#### 3. COMPLIANCE ACTIVITIES 15

Collectively, coal and large metalliferous mines and quarries represents approximately 2% of the total number of mines. 15

#### 4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES 25

The small mines sector, which comprises metalliferous mines, quarries and other gemstones, represents just over 36%. Almost half of all active mines are opal mines. 25

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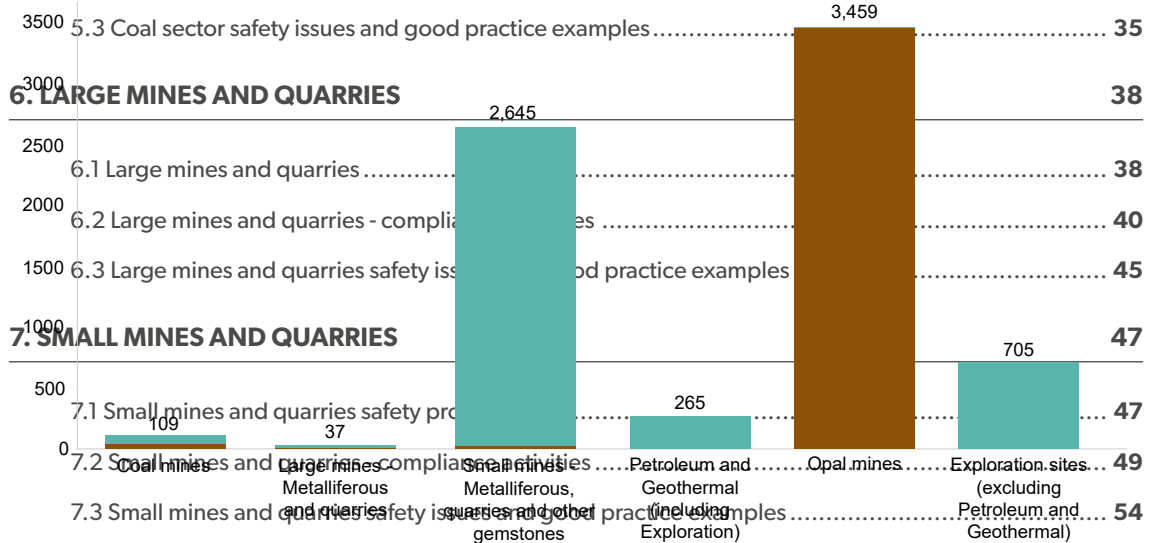
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■ Surface ■ Underground

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## SAFETY INCIDENT NOTIFICATIONS

Under the *Work Health and Safety (Mine and Petroleum Sites) Act 2013*, mine operators are required to notify the regulator about the occurrence of certain types of safety incidents.

As presented below, incident rates (numbers of incidents reported per notifying mine) have remained stable over the past 12 months. On average, five incidents per notifying mine were reported during this period. Overall, only 14% of the mines that reported hours worked notified incidents during this period.

The regulator is currently examining whether there is incident under-reporting as a priority compliance project.

### 2. INDUSTRY SAFETY PROFILE 11

**TABLE 1. SAFETY INCIDENT NOTIFICATIONS AND MINE REPORTING RATES IN NSW**

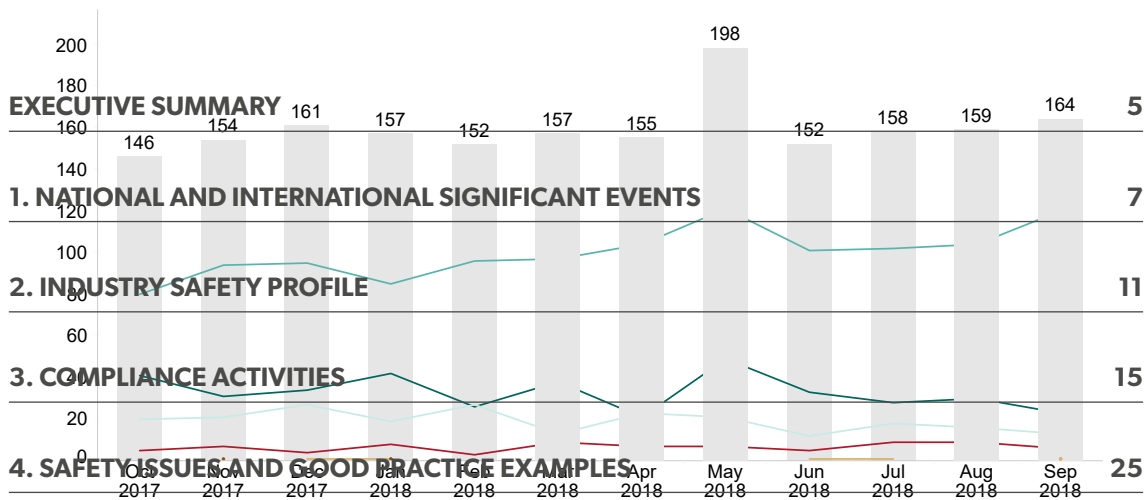
3. COMPLIANCE ACTIVITIES	Q2 2017 18	Q3 2017 18	Q4 2017 18	Q1 2018-19	AVERAGE	15
Number of notified incidents	461	466	505	481	478	25
<b>4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES</b>						
Mines that notified incidents	96	106	93	103	100	
<b>5. COAL SECTOR</b>						<b>28</b>
Incidents per notifying mine	4.8	4.4	5.4	4.7	5	
Mines that reported hours worked*	743	707	702	111**	717^	28
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Proportion of working mines reporting incidents	13%	15%	13%	NC	14%	35
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*Reported hours worked during the quarter						
**Suspected reporting lag due to six monthly reporting requirements						
^Current quarter (Q1 2018-19) excluded from calculation						
NC= Not Calculated						
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In the 12 months since October 2017, there has been no observed overall increase in the number of notifications by the clause under which they were notified (see Appendix 1).						
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As seen in Figure 3, the number of incidents reported by each mining sector has remained constant.						
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FIGURE 2 - INCIDENT NOTIFICATION BY TYPE - OCTOBER 2017 TO SEPTEMBER 2018

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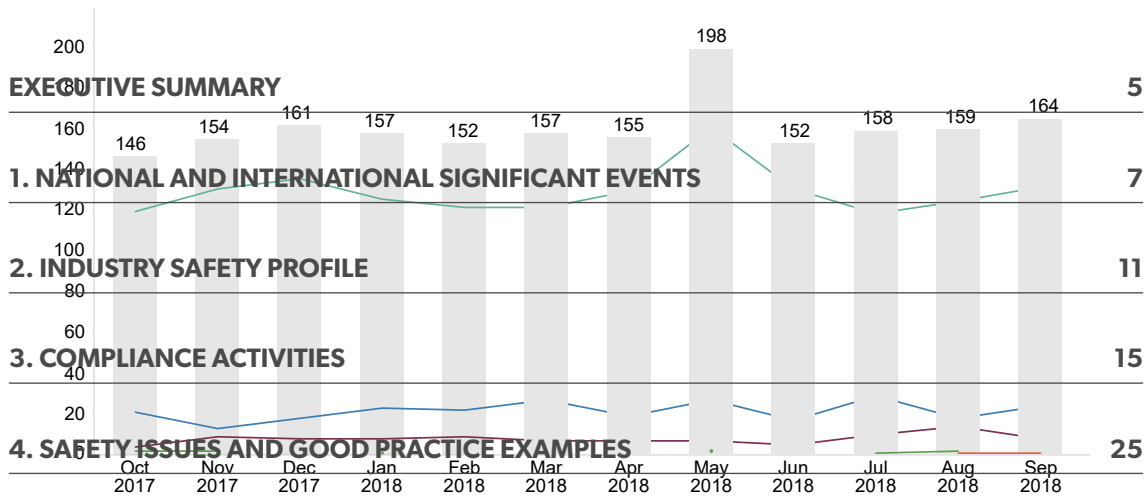
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FIGURE 3 - INCIDENT NOTIFICATION BY SECTOR - OCTOBER 2017 TO SEPTEMBER 2018

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<ul style="list-style-type: none"> <li>■ Coal mines</li> <li>■ Opal mines</li> <li>■ Small mines - Metalliferous; quarries and other gemstones</li> </ul>	
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## 3. Compliance activities

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The NSW Resources Regulator uses a range of tools to promote and secure compliance in mines in relation to the relevant work, health and safety legislation. These range from prosecutions and notices to inspectors and international significant events.	
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<b>2. INDUSTRY SAFETY PROFILE</b>	<b>11</b>
In quarter one 2018-19, the regulator commenced four safety investigations. The regulator currently has eight prosecution matters before the courts (all commenced prior to this quarter). Detailed information on prosecutions, investigations and causal investigations is published on our <a href="#">website</a> .	
<b>3. COMPLIANCE ACTIVITIES</b>	<b>15</b>
<b>4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES</b>	<b>25</b>

**TABLE 2. INVESTIGATIONS COMMENCED JULY 2018 TO SEPTEMBER 2018**

DATE OF RELEASE	DATE OF INCIDENT	MINING OPERATION	SUMMARY OF INCIDENT	
20 Jul 2018	5 Jul 2018	Clarence Coal Company Limited	A rib fall in underground coal mine caused multiple injuries to a worker and injuries to a second worker (IIR18-05).	<b>28</b>
20 Jul 2018	4 Jul 2018	Springvale Coal Pty Limited	Worker struck in face by projectile when attempting to free the jammed centre conveyor of the continuous miner in an underground coal mine (IIR18-06)	<b>30</b>
10 Aug 2018	29 Jul 2018	Bulga Coal Management Pty Limited	A worker suffered serious leg injuries from a collision of two 218-tonne rear dump trucks at an open cut coal mine. (IIR18-07)	<b>38</b>
N/A	29 Jul 2018	Evolution Mining (Cowel) Pty Ltd	A worker suffered a head injury after falling from a scissor lift while accessing pipe rack work. On 15 Sep 2018 the person later died.	<b>40</b>
		7.1 Small mines and quarries safety profile.....		<b>47</b>
		7.2 Small mines and quarries - compliance activities .....		<b>49</b>
		7.3 Small mines and quarries safety issues and good practice examples .....		<b>54</b>
		<b>8. OPAL MINES</b>		<b>55</b>
		8.1 Opal mines safety profile .....		<b>55</b>
		8.2 Opal mines - compliance activities.....		<b>55</b>

## SAFETY NOTICES ISSUED

Safety notices issued by the regulator include prohibition and improvement notices, notices of concern (written notice of matters) and non-disturbance notices.

From July through September 2018 (quarter one 2018-19) the regulator issued a total of 411 notices. **5**

The figure below shows the number and types of notices the regulator issued in the 12 months since

October 2017. No obvious trends are evident as the overall volume of notices varies month to month. The variability seen across months is, in part, a reflection of inspection activity. **7**

In quarter one 2018-19 (July – September 2018), the regulator issued on average one prohibition notice for

approximately every four improvement notices. **11**

**FIGURE 3 SAFETY ACTIVITIES BY TYPE - OCTOBER 2017 TO SEPTEMBER 2018** **15**

**4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES** **25**

**5. COAL SECTOR** **28**

**5.1 Coal sector safety profile** **28**

**5.2 Coal sector compliance activities** **30**

**5.3 Coal sector safety issues and good practice examples** **35**

**6. LARGE MINES AND QUARRIES** **38**

**6.1 Large mines and quarries** **38**

**6.2 Large mines and quarries compliance activities** **40**

**6.3 Large mines and quarries safety issues and good practice examples** **45**

**7. SMALL MINES AND QUARRIES** **47**

**7.1 Small mines and quarries safety profile** **47**

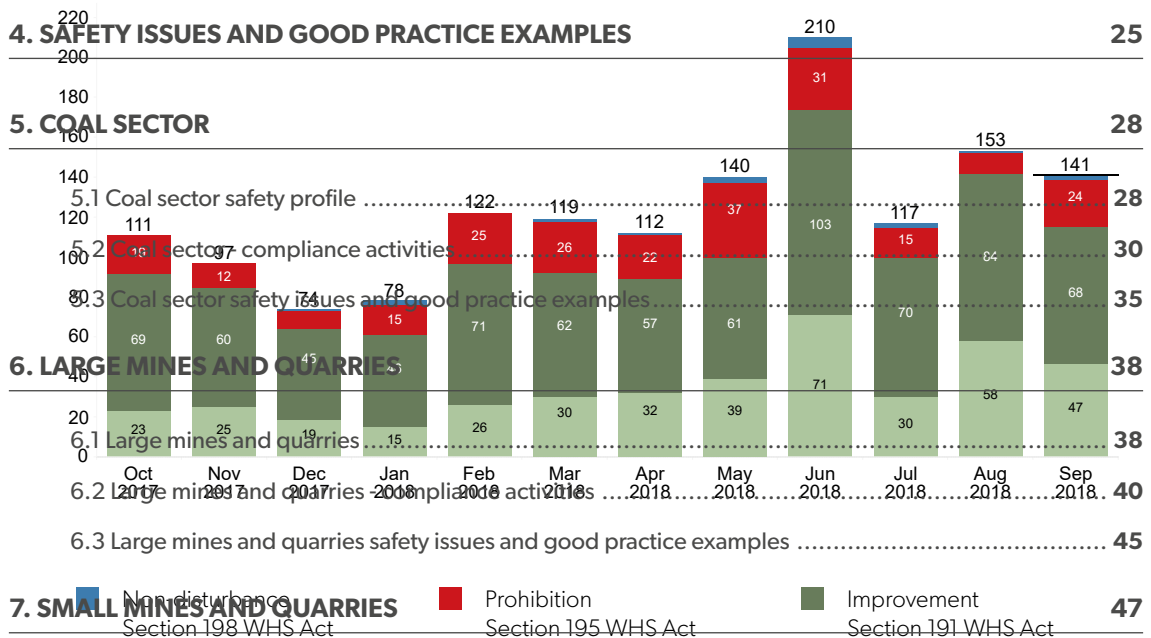
**7.2 Small mines and quarries - compliance activities** **49**

**7.3 Small mines and quarries safety issues and good practice examples** **54**

**8. OPAL MINES** **55**

**8.1 Opal mines safety profile** **55**

**8.2 Opal mines - compliance activities** **55**





## SAFETY NOTICES AND ASSESSMENTS CONDUCTED

Table 3 lists the number of safety notices issued by the regulator and the assessments conducted by sector for quarter one 2018-19. In the coal sector, one notice was issued for approximately every three safety assessments. In comparison, in the large mines and small mines sectors, almost every assessment resulted in a notice.

**EXECUTIVE SUMMARY** 5

In the opal sector one notice was issued for every eight assessments. For the petroleum and geothermal sector, 32 assessments did not result in any notices being issued.

**1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS** 7

**2. INDUSTRY SAFETY PROFILE** 11

TABLE 3. SAFETY NOTICES AND ASSESSMENTS BY SECTOR - JULY TO SEPTEMBER 2018

3. COMPLIANCE ACTIVITIES	SAFETY ASSESSMENTS	NOTICES ISSUED	NO. OF ASSESSMENTS CONDUCTED PER NOTICE	15
All mines	847	411	2.06	
<b>4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES</b>				<b>25</b>
Coal mines	501	157	3.19	
<b>5. COAL SECTOR</b>				<b>28</b>
Large mines and quarries	117	112	1.04	
Small mines and quarries	131	137	0.96	
Coal sector safety profile				<b>28</b>
Opal mines	16	2	8	
Coal sector - compliance activities				<b>30</b>
Coal sector safety issues and good practice examples				<b>35</b>
Petroleum/geothermal	32	0	-	
<b>6. LARGE MINES AND QUARRIES</b>				<b>38</b>
Exploration	4	3	1.33	
Non-mine	46	0	-	
Large mines and quarries				<b>38</b>
Large mines and quarries - compliance activities				<b>40</b>
Large mines and quarries safety issues and good practice examples				<b>45</b>
<b>7. SMALL MINES AND QUARRIES</b>				<b>47</b>
Small mines and quarries safety profile				<b>47</b>
Small mines and quarries - compliance activities				<b>49</b>
Small mines and quarries safety issues and good practice examples				<b>54</b>
<b>8. OPAL MINES</b>				<b>55</b>
Opal mines safety profile				<b>55</b>
Opal mines - compliance activities				<b>55</b>

## SAFETY ASSESSMENTS AND INVESTIGATIONS

### Contents

The regulator’s [Incident Prevention Strategy](#) shifts the focus of its compliance activity from incident investigation (reactive) to preventing incidents through planned, risk-based interventions (preventative).

Targeted Assessment Program (TAPs) and Planned Inspections (PIs) are considered preventative in nature. Their purpose is to identify potential compliance weaknesses which could lead to an incident or injury.

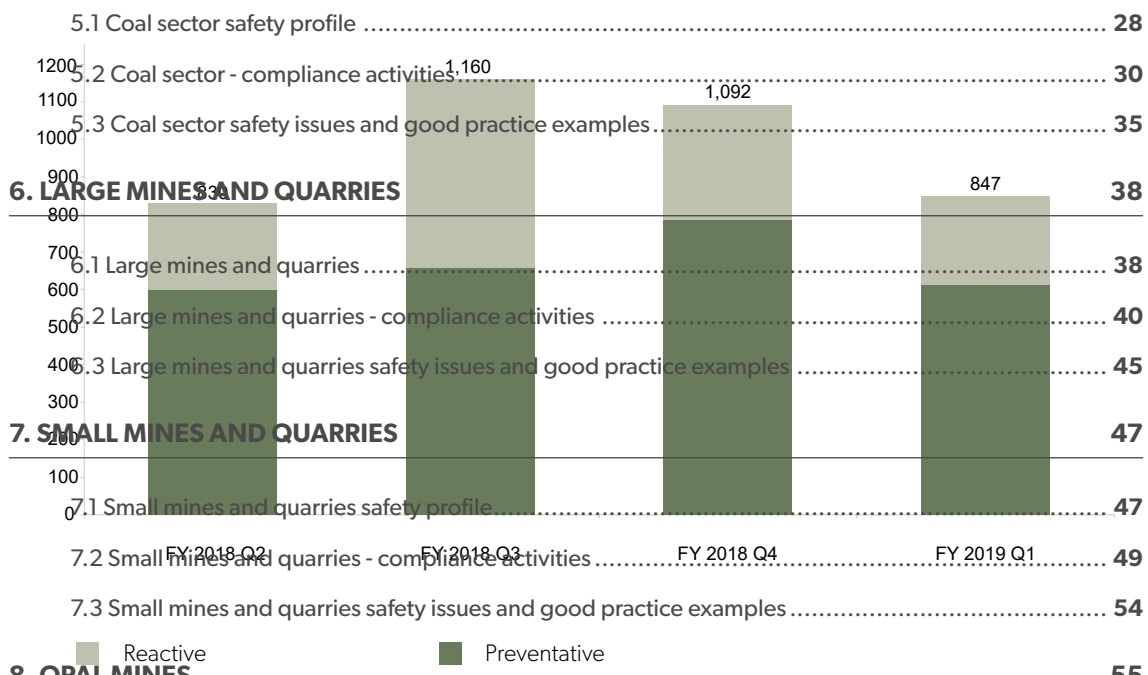
Both follow a pre-prepared plan focusing on principal mining hazards. TAPs focus closely on one mining hazard per assessment. PIs also focus on a specific hazard including principal control plans. Explosion suppression assessments in underground coal mines represent another preventative program of work.

The figure below shows that for each quarter since October 2017, regulatory effort across all sectors focussed on preventative programs. In the 12 months since October 2017, the regulator conducted, on average, 11 preventative assessments (activities not related to incidents and complaints) each quarter.

This represents approximately two thirds of all assessments. In quarter one 2018-19, just over 70% of all assessments were preventative in nature.

**FIGURE 5. PREVENTATIVE AND REACTIVE SAFETY ASSESSMENTS - OCTOBER 2017 TO SEPTEMBER 2018**

<b>3. COAL SECTOR</b>	<b>28</b>
5.1 Coal sector safety profile .....	28
5.2 Coal sector - compliance activities .....	30
5.3 Coal sector safety issues and good practice examples .....	35
<b>6. LARGE MINES AND QUARRIES</b>	<b>38</b>
6.1 Large mines and quarries .....	38
6.2 Large mines and quarries - compliance activities .....	40
6.3 Large mines and quarries safety issues and good practice examples .....	45
<b>7. SMALL MINES AND QUARRIES</b>	<b>47</b>
7.1 Small mines and quarries safety profile .....	47
7.2 Small mines and quarries - compliance activities .....	49
7.3 Small mines and quarries safety issues and good practice examples .....	54
<b>8. OPAL MINES</b>	<b>55</b>
8.1 Opal mines safety profile .....	55
8.2 Opal mines - compliance activities .....	55

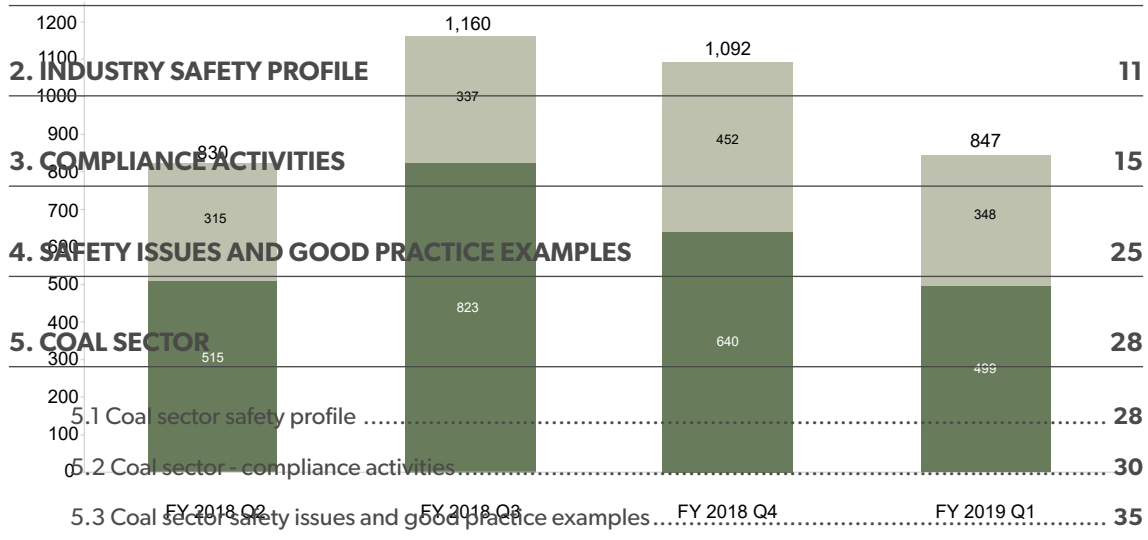


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Visiting workplaces and undertaking desktop reviews of documents are important regulatory tools. Desktop work includes reviews of control measures following an incident, review of standing dust committee reports, assessment of high risk activity notifications, applications for exemptions from work health and safety laws, subsidence management plans and preparation for site work. The figure below shows the number of desktop assessments for each quarter since October 2017.

**EXECUTIVE SUMMARY** 5

**FIGURE 6. SITE-BASED AND DESKTOP SAFETY ASSESSMENTS - OCTOBER 2017 TO SEPTEMBER 2018**  
**1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS** 7



**2. INDUSTRY SAFETY PROFILE** 11

**3. COMPLIANCE ACTIVITIES** 15

**4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES** 25

**5. COAL SECTOR** 28

5.1 Coal sector safety profile ..... 28

5.2 Coal sector - compliance activities ..... 30

5.3 Coal sector safety issues and good practice examples ..... 35

**6. LARGE MINES AND QUARRIES** 38

■ Site assessments ■ Desktop assessments

6.1 Large mines and quarries ..... 38

6.2 Large mines and quarries - compliance activities ..... 40

6.3 Large mines and quarries safety issues and good practice examples ..... 45

**7. SMALL MINES AND QUARRIES** 47

7.1 Small mines and quarries safety profile ..... 47

7.2 Small mines and quarries - compliance activities ..... 49

7.3 Small mines and quarries safety issues and good practice examples ..... 54

**8. OPAL MINES** 55

8.1 Opal mines safety profile ..... 55

8.2 Opal mines - compliance activities ..... 55



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The figure below shows that for the 12 months since October 2017, almost two thirds of all assessments were conducted in the coal sector. In quarter one 2018-19, just under 60% of assessments were in the coal sector. See the sector profile sections of this report for more details.

## EXECUTIVE SUMMARY

FIGURE 7. SAFETY ASSESSMENTS BY MINING SECTOR - OCTOBER 2017 TO SEPTEMBER 2018

### 1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS 7

### 2. INDUSTRY SAFETY PROFILE 11

### 3. COMPLIANCE ACTIVITIES 15

### 4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES 25

### 5. COAL SECTOR 28

#### 5.1 Coal sector safety profile 28

#### 5.2 Coal sector - compliance activities 30

#### 5.3 Coal sector safety issues and good practice examples 35

### 6. LARGE MINES AND QUARRIES 38

#### 6.1 Large mines and quarries safety profile (excluding Petroleum and Geothermal) 38

#### 6.2 Large mines and quarries - compliance activities 40

#### 6.3 Large mines and quarries safety issues and good practice examples 45

### 7. SMALL MINES AND QUARRIES 47

#### 7.1 Small mines and quarries safety profile 47

#### 7.2 Small mines and quarries - compliance activities 49

#### 7.3 Small mines and quarries safety issues and good practice examples 54

### 8. OPAL MINES 55

#### 8.1 Opal mines safety profile 55

#### 8.2 Opal mines - compliance activities 55



## TARGETED ASSESSMENT PROGRAM

The regulator’s targeted assessment program (TAP) establishes a risk-based and proactive approach for assessing the extent to which critical controls for managing principal mining hazards have been implemented. Each TAP is performed by a team of inspectors from various disciplines. The team works with the mining operation’s management team to ensure a thorough assessment is conducted.

**EXECUTIVE SUMMARY** ..... 5

The figure below shows the number of TAPs conducted and safety notices issued under the *Work Health & Safety Act 2011* by principal mining hazard and mining sector for the 12 months since October 2017.

**1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS** ..... 7

In quarter one 2018-19, three consolidated TAP reports were published on our website:

**2. INDUSTRY SAFETY PROFILE** ..... 11

- [Emergency management in underground mines](#)

- [Airborne contaminants in underground metalliferous mines](#)

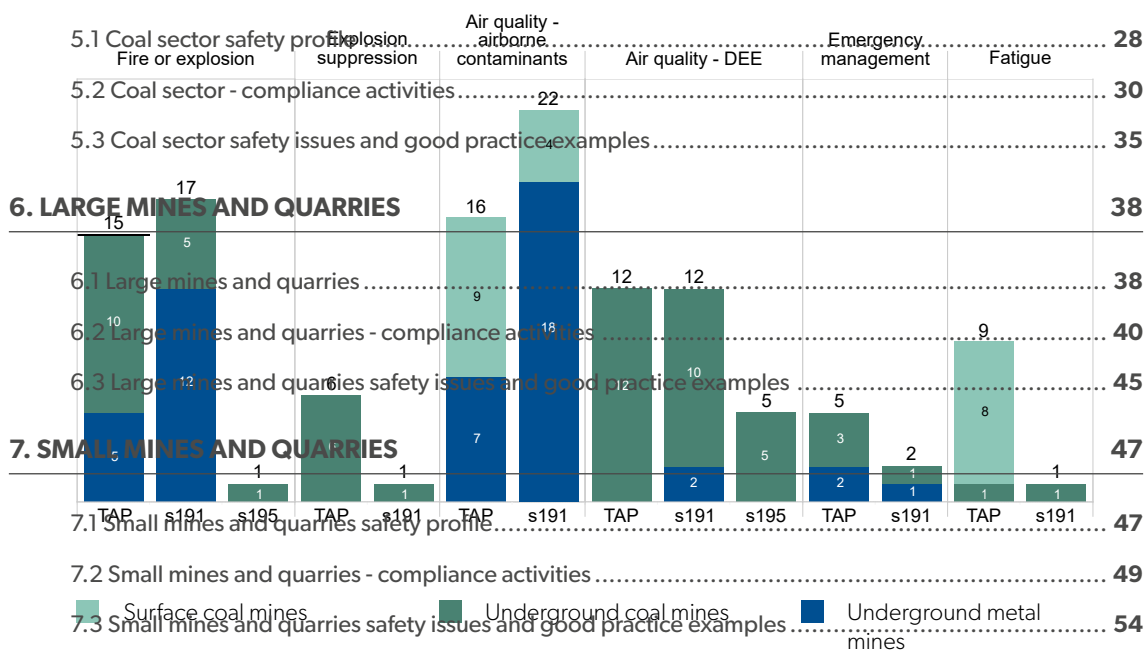
**3. COMPLIANCE ACTIVITIES** ..... 15

- [Dust and other airborne contaminants in open-cut coal mines](#)

**4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES** ..... 25

**FIGURE 8. TAPS AND NOTICES BY SECTOR - OCTOBER 2017- SEPTEMBER 2018**

**5. COAL SECTOR** ..... 28



**8. OPAL MINES** ..... 55

8.1 Opal mines safety profile ..... 55

8.2 Opal mines - compliance activities ..... 55

**SECTION // 3. COMPLIANCE ACTIVITIES**

In quarter one 2018-19, the regulator conducted 14 TAPs across high risk rated coal and metalliferous mines. The table below presents a summary of assessments conducted by sector and notices issued.

**TABLE 4. TARGETED ASSESSMENT AND NOTICES ISSUED - JULY TO SEPTEMBER 2018**

SECTOR	HAZARD	MONTH	NOTICES
Surface Coal	Airborne contaminants	Jul 2018	Nil notices issued
		Aug 2018	Nil notices issued
		Sep 2018	1 x s23 notice - hazard management plan does not stipulate is PPE for certain higher risk tasks
	Fatigue	Sep 2018	Nil notices issued
Underground coal	Airborne contaminants	Jul 2018	1 x s23 notices - inadequate ventilation measurement, DPM filter waste is not being managed as per DEE Management Plan
		21-22 Aug 2018	2 x s23 notices <ul style="list-style-type: none"> <li>• lack of a formal systems for diesel exhaust gas monitoring and testing of underground vehicles</li> <li>• missing filter housing seals</li> </ul>
	Fire or explosion	Jul 2018	3 x s23 notices <ul style="list-style-type: none"> <li>• ignition source breaches</li> <li>• ventilation and firefighting issues</li> <li>• rubbish dump adjacent to high voltage switching yard</li> </ul>
		Aug 2018	1 x s191 notice - management of combustible liquids and other hazardous or volatile material not referenced in hazard management plan
	Fatigue	Sep 2018	1 x s191 notice - no specific risk assessment to identify the hazards associated with worker fatigue or appropriate controls



<b>Contents</b>			
		Jul 2018	1 x s23 notice - increased risk of worker contacting concentrated solution of caustic/cyanide solution
<b>EXECUTIVE SUMMARY</b>			5 x s191 notices • excessive dust on decline walls <b>5</b>
<b>1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS</b>			• no risk assessment for magazine design • magazine walls and backs are not painted white <b>7</b>
<b>2. INDUSTRY SAFETY PROFILE</b>			• risk assessment does not consider bushfire risk • return air rather than fresh in escape <b>11</b>
<b>3. COMPLIANCE ACTIVITIES</b>		Jul 2018	4 x s23 notices • poorly ventilated workshop <b>15</b>
<b>4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES</b>			• excessive dust within manually operated substation/magazine fire suppression system <b>25</b>
<b>5. COAL SECTOR</b>			• inadequate risk assessment of air compressor • heat shielding blanket fitted to the fuel tank in underground workshop out of position and in poor repair <b>28</b>
Underground metal	Fire or explosion safety profile .....		
5.1 Coal sector			
5.2 Coal sector	- compliance activities .....		5 x s191 notices <b>30</b>
5.3 Coal sector	safety issues and good practice examples .....		• housekeeping (x 2) obstructed walkways and fuel bay <b>35</b>
<b>6. LARGE MINES AND QUARRIES</b>		Aug 2018	• compressor operating without fire suppression <b>38</b>
6.1 Large mines and quarries .....			• failure to provide adequate supervision to ensure housekeeping standards <b>38</b>
6.2 Large mines and quarries - compliance activities .....			• no risk assessment for the operation of the air compressor <b>40</b>
6.3 Large mines and quarries safety issues and good practice examples .....			1 x s191 notices <b>45</b>
<b>7. SMALL MINES AND QUARRIES</b>			• non-compliant explosives magazine <b>45</b>
		Sep 2018	3 x s23 notices <b>47</b>
7.1 Small mines and quarries safety profile .....			• dust control not effective <b>47</b>
7.2 Small mines and quarries - compliance activities .....			• poor housekeeping creates ignition source <b>47</b>
7.3 Small mines and quarries safety issues and good practice examples .....			• multiple documents not linked to PHMD <b>49</b>
<b>8. OPAL MINES</b>		Sep 2018	1 x s191 notice - fire alarm not operational <b>54</b>
<b>8.1 Opal mines safety profile .....</b>			<b>55</b>
<b>8.2 Opal mines - compliance activities .....</b>			<b>55</b>

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## Targeted intervention program

Targeted intervention programs (TIPs) are conducted in response to identified safety incidents or issues. In the 12 months since October 2017, five TIPs were conducted.

**EXECUTIVE SUMMARY** **5**

**TABLE 5. TARGETED INTERVENTIONS - OCTOBER 2017 TO SEPTEMBER 2018**

**1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS** **7**

PRINCIPAL MINING HAZARD	QUARTER	MINE	
<b>2. INDUSTRY SAFETY PROFILE</b>	Q3 2017-18	Metropolitan	<b>11</b>
Winders/shafts and elevated work	Q3 2017-18	Perilya*	
<b>3. COMPLIANCE ACTIVITIES</b>			<b>15</b>
Lithgow seam rib failure	Q4 2017-18	Springvale underground operations	
<b>4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES</b>			<b>25</b>
Emergency management	Q1 2018-19	Hera mine*	
<b>5. COAL SECTOR</b>			<b>28</b>
Coal sector management	Q1 2018-19	Mt Arthur mine (Theiss)	

\*See spotlight case studies on the following pages  
 5.1 Coal sector safety profile ..... **28**

5.2 Coal sector - compliance activities ..... **30**

5.3 Coal sector safety issues and good practice examples ..... **35**

**6. LARGE MINES AND QUARRIES** **38**

6.1 Large mines and quarries ..... **38**

6.2 Large mines and quarries - compliance activities ..... **40**

6.3 Large mines and quarries safety issues and good practice examples ..... **45**

**7. SMALL MINES AND QUARRIES** **47**

7.1 Small mines and quarries safety profile ..... **47**

7.2 Small mines and quarries - compliance activities ..... **49**

7.3 Small mines and quarries safety issues and good practice examples ..... **54**

**8. OPAL MINES** **55**

8.1 Opal mines safety profile ..... **55**

8.2 Opal mines - compliance activities ..... **55**



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## 4. Safety issues and good practice examples

<b>EXECUTIVE SUMMARY</b>	<b>5</b>
<b>Spotlight: Emergency management</b>	<b>7</b>
<b>2. INDUSTRY SAFETY PROFILE</b>	<b>11</b>
In August 2018, the Resources Regulator published its consolidated targeted assessment program (TAP) report on <a href="#">emergency management</a> . Eleven mines were assessed as part of the program – five large (non-coal) mines and six coal mines.	
<b>3. COMPLIANCE ACTIVITIES</b>	<b>15</b>
In addition, in August 2018, a Targeted Intervention (TIP) was conducted in a metalliferous mine following a diamond drill fire. As a result, the mine was evacuated which exposed deficiencies in its emergency management plan.	
<b>4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES</b>	<b>25</b>
<b>5. COAL SECTOR</b>	<b>28</b>
Under Work Health and Safety Regulation 2017, a person conducting a business or undertaking at a workplace must prepare, maintain and implement an emergency plan for the workplace. In summary, operators are required to:	
5.1 Coal sector safety profile	28
5.2 Coal sector - compliance activities	30
5.3 Coal sector safety issues and good practice examples	35
6. LARGE MINES AND QUARRIES	38
ensure that an adequate number of people are trained in the use of rescue equipment, are available to effectively respond to an emergency.	
6.1 Large mines and quarries	38
TAP findings highlighted that for some operators, critical elements of emergency management plans were not fully implemented including:	
6.2 Large mines and quarries compliance activities	40
6.3 Large mines and quarries safety issues and good practice examples	45
• risk assessments in relation to rescue, medical and firefighting capabilities were inadequate	
7. SMALL MINES AND QUARRIES	47
adequate emergency service organisations	
• critical elements of the emergency response were not implemented such as escape signs, firelines and testing of the emergency response arrangements	
7.1 Small mines and quarries safety profile	47
• lack of clear notification procedures for control room operators and	
7.2 Small mines and quarries - compliance activities	49
• inadequate management of hazards and incidents such as regulator notifications, site manifests, safety data sheets and emergency response arrangements, including adequate personal protective equipment.	
7.3 Small mines and quarries safety issues and good practice examples	54
<b>8. OPAL MINES</b>	<b>55</b>
Good practices were identified including:	
8.1 Opal mines safety profile	55
• workers were aware of escape routes in underground mines and associated self-rescue equipment and	
8.2 Opal mines - compliance activities	55
• well maintained emergency response equipment such as firefighting and first aid equipment.	
When issues of concern are identified at a mine, a Targeted Intervention Program (TIP) assessment may be conducted. Emergency management compliance issues were identified at a metalliferous mine following an evacuation which highlighted deficiencies with emergency communications. A section 23 notice of concern was issued in relation to communications, emergency training and self-rescue and mine emergency responses.	





**Spotlight: Controls for managing airborne contamination at surface coal mines**

<b>EXECUTIVE SUMMARY</b>	5
<b>1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS</b>	7
<b>2. INDUSTRY SAFETY PROFILE</b>	11
<b>3. COMPLIANCE ACTIVITIES</b>	15
<b>4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES</b>	25
<b>5. COAL SECTOR</b>	28
<b>5.1 Coal sector safety profile</b>	28
<b>5.2 Coal sector - compliance activities</b>	30
<b>5.3 Coal sector safety issues and good practice examples</b>	35
<b>6. LARGE MINES AND QUARRIES</b>	38
<b>6.1 Large mines and quarries</b>	38
<b>6.2 Large mines and quarries - compliance activities</b>	40
<b>6.3 Large mines and quarries safety issues and good practice examples</b>	45
<b>7. SMALL MINES AND QUARRIES</b>	47
<b>7.1 Small mines and quarries safety profile</b>	47
<b>7.2 Small mines and quarries - compliance activities</b>	49
<b>7.3 Small mines and quarries safety issues and good practice examples</b>	54
<b>8. OPAL MINES</b>	55
<b>8.1 Opal mines safety profile</b>	55
<b>8.2 Opal mines - compliance activities</b>	55



This report presents sector-based mine safety data for six sectors defined by the regulator – coal, large (non-coal) mines and quarries, small mines and quarries (including gemstones), opal mines, petroleum and geothermal sites and exploration sites.

<b>EXECUTIVE SUMMARY</b>		<b>5</b>
<hr/>		
<b>1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS</b>	<b>Coal mines</b>	<b>7</b>
	Opencut, underground and coal preparation plants	
<b>2. INDUSTRY SAFETY PROFILE</b>		<b>11</b>
<hr/>		
<b>3. COMPLIANCE ACTIVITIES</b>	<b>Large mines</b>	<b>15</b>
	METALLIFEROUS AND QUARRIES	
<b>4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES</b>	Quarries that produce >900,000 tonnes pa and large opencut or underground metalliferous mines	<b>25</b>
<hr/>		
<b>5. COAL SECTOR</b>		<b>28</b>
	<b>Small mines</b>	
5.1 Coal sector safety profile	METALLIFEROUS, QUARRIES AND OTHER GEMSTONES	<b>28</b>
5.2 Coal sector compliance activities	Quarries and other mine types (e.g. sand, clay, lime) that produce <900,000 tonnes pa, opencut or underground metalliferous mines and gemstone mines	<b>30</b>
5.3 Coal sector safety issues and good practice examples		<b>35</b>
<hr/>		
<b>6. LARGE MINES AND QUARRIES</b>		<b>38</b>
	<b>Petroleum and Geothermal</b>	<b>38</b>
6.1 Large mines and quarries	Onshore petroleum and geothermal productions and exploration sites	<b>40</b>
6.2 Large mines and quarries - compliance activities		<b>45</b>
6.3 Large mines and quarries safety issues and good practice examples		<b>45</b>
<hr/>		
<b>7. SMALL MINES AND QUARRIES</b>		<b>47</b>
	<b>Opal Mines</b>	
7.1 Small mines and quarries safety profile	Opal mines at Lightning Ridge and White Cliffs	<b>47</b>
7.2 Small mines and quarries - compliance activities		<b>49</b>
7.3 Small mines and quarries safety issues and good practice examples		<b>54</b>
<hr/>		
<b>8. OPAL MINES</b>	<b>Exploration</b>	<b>55</b>
	Exploration sites (excluding petroleum)	
8.1 Opal mines safety profile		<b>55</b>
8.2 Opal mines - compliance activities		<b>55</b>
<hr/>		
	<b>Non-mine</b>	
	Includes many manufacturers (including OEMs), suppliers, designers, importers, licence holders and registration holders	

**NSW Resources Regulator**

**SECTOR REPORTING**



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## 5. Coal sector

**EXECUTIVE SUMMARY** As at 5 October 2018, there were 109 active coal mines - 68 surface and 41 underground operations (see Figure 1 p.9). At this time there were 22 'open' underground coal mines and 16 'under care and maintenance'. The remainder had a status of 'planned'. **5**

**1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS** **7**

**5.1 Coal sector safety profile** **11**  
**2. INDUSTRY SAFETY PROFILE**

**SAFETY INCIDENT NOTIFICATIONS**  
**3. COMPLIANCE ACTIVITIES** **15**

The table below shows incident rates (number of incidents reported per notifying mine) remained stable over the 12 months since October 2017. For the coal sector, on average, seven incidents per notifying

**4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES** **25**

A high rate of notification reporting was observed for the coal sector. For the 12 month reporting period, **5. COAL SECTOR** **28**  
 just over 90% of coal mines that reported working hours also reported safety incidents.

5.1 Coal sector safety profile ..... **28**  
**TABLE 6. COAL SAFETY INCIDENT NOTIFICATIONS AND REPORTING RATES OCTOBER 2017 TO SEPTEMBER 2018**

5.2 Coal sector - compliance activities ..... **30**

	Q2 2017 18	Q3 2017 18	Q4 2017 18	Q1 2018-19	AVERAGE
Number of notified incidents	384	367	419	373	386
Mines that notified incidents	57	56	53	51	54
Incidents per notifying mine	6.8	6.6	7.9	7.3	7.2
Mines that reported hours worked*	63	59	63	3**	62^

**6. LARGE MINES AND QUARRIES** **30**

6.1 Large mines and quarries ..... **38**  
 Incidents per notifying mine

Mines that reported hours worked*	63	59	63	3**	62^
-----------------------------------	----	----	----	-----	-----

**7. SMALL MINES AND QUARRIES** **47**  
 reporting incidents

7.1 Small mines and quarries safety profile ..... **47**

\*Reported hours worked during the quarter

\*\*Suspected reporting lag due to six monthly reporting requirements ..... **49**

^Current quarter (Q1 2018-19) excluded from calculation

7.3 Small mines and quarries safety issues and good practice examples ..... **54**

NC= Not Calculated

**8. OPAL MINES** **55**

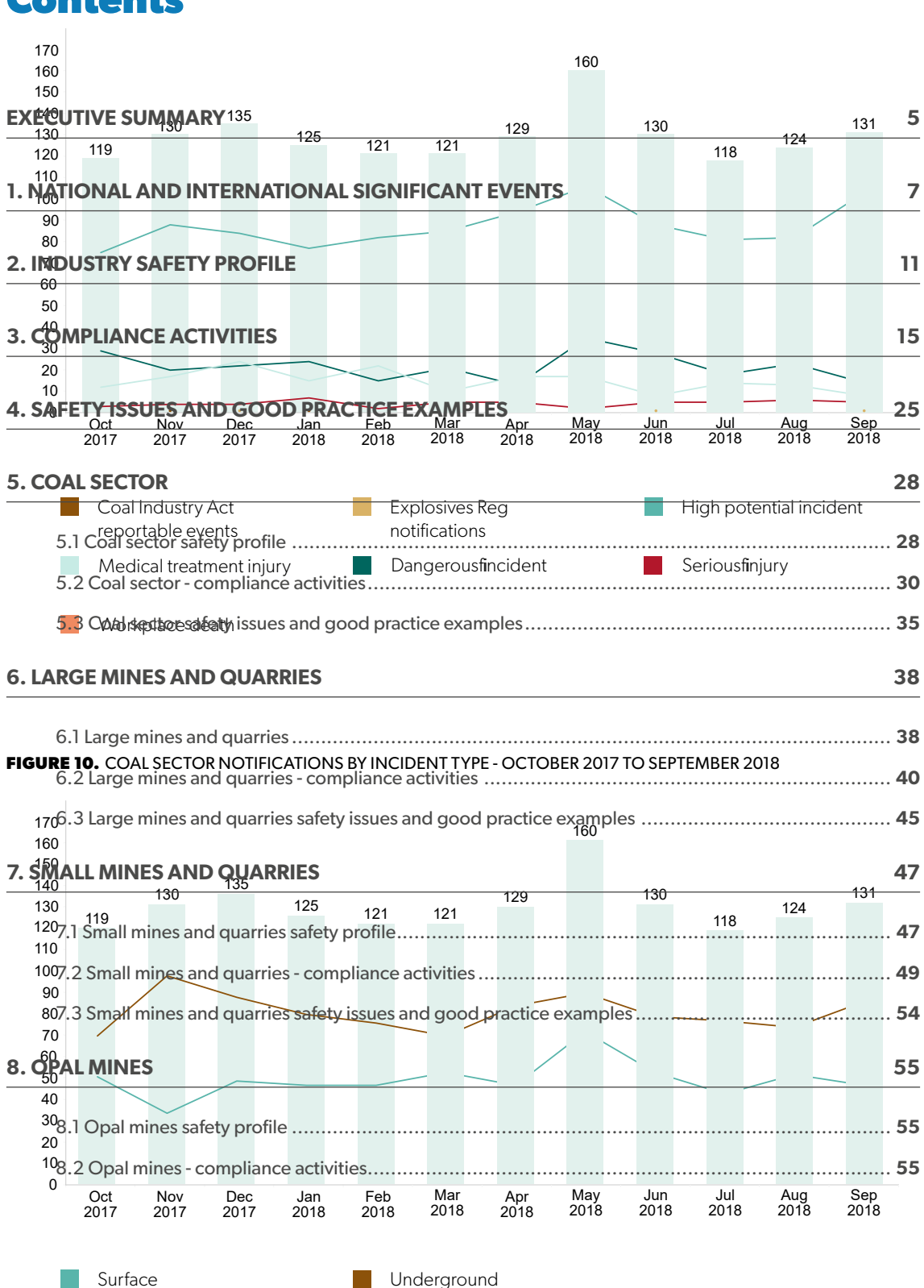
Figure 9 shows incident notifications by the clause under which they were notified (first that applied). In the 12 months since October 2017, there has been no observed change in the number of notifications by the clause under which they were notified. **55**

8.1 Opal mines safety profile ..... **55**

8.2 Opal mines - compliance activities ..... **55**

Also shown is the number of notified safety incidents by coal operation type for the same period. The number of incidents reported by the surface and underground coal sector has remained relatively stable. In November 2017 and December 2018 there were two incidents reported under s.45 of the *Coal Industry Act 2001*. These incidents relate to reportable events at a mine rescue station.

FIGURE 9. COAL SECTOR NOTIFICATIONS BY INCIDENT TYPE - OCTOBER 2017 TO SEPTEMBER 2018





# Contents - compliance activities

## PROSECUTIONS AND INVESTIGATIONS

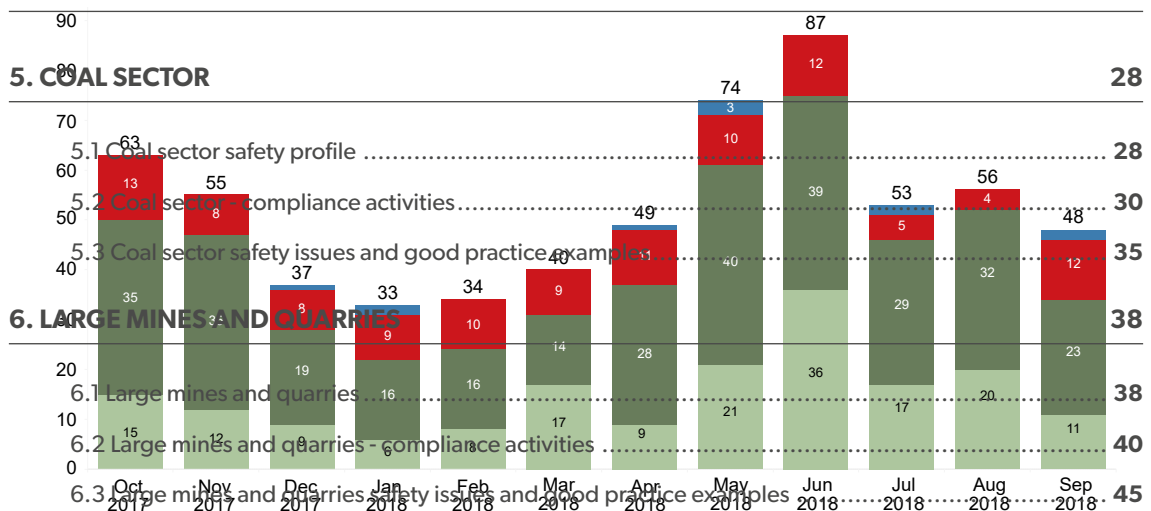
**EXECUTIVE SUMMARY** In quarter one 2018-19, the regulator commenced three new coal investigations and no prosecution proceedings. Further details are available in [investigation information releases page](#) on our website. **5**

**1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS** **7**  
**SAFETY NOTICES ISSUED**

The figure below shows the number and types of notices the regulator issued in the 12 month reporting period. In quarter one 2018-19, the regulator issued, on average, 52 notices per month. This was consistent with the average for 12 month reporting period. No obvious trends are evident. Inspection activity contributes to the differences observed in the number of notices issued every month. **11**

**2. INDUSTRY SAFETY PROFILE**  
**3. COMPLIANCE ACTIVITIES** **15**

**FIGURE 11. COAL SECTOR SAFETY NOTICES ISSUED - OCTOBER 2017 TO SEPTEMBER 2018** **25**  
**4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES**



**5. COAL SECTOR** **28**  
 5.1 Coal sector safety profile ..... **28**  
 5.2 Coal sector - compliance activities ..... **30**  
 5.3 Coal sector safety issues and good practice examples ..... **35**  
**6. LARGE MINES AND QUARRIES** **38**  
 6.1 Large mines and quarries ..... **38**  
 6.2 Large mines and quarries - compliance activities ..... **40**  
 6.3 Large mines and quarries safety issues and good practice examples ..... **45**  
**7. SMALL MINES AND QUARRIES** **47**  
 7.1 Small mines and quarries safety profile ..... **47**  
 7.2 Small mines and quarries - compliance activities ..... **49**  
 7.3 Small mines and quarries safety issues and good practice examples ..... **54**

**8. OPAL MINES** **55**  
 8.1 Opal mines safety profile ..... **55**  
 8.2 Opal mines - compliance activities ..... **55**



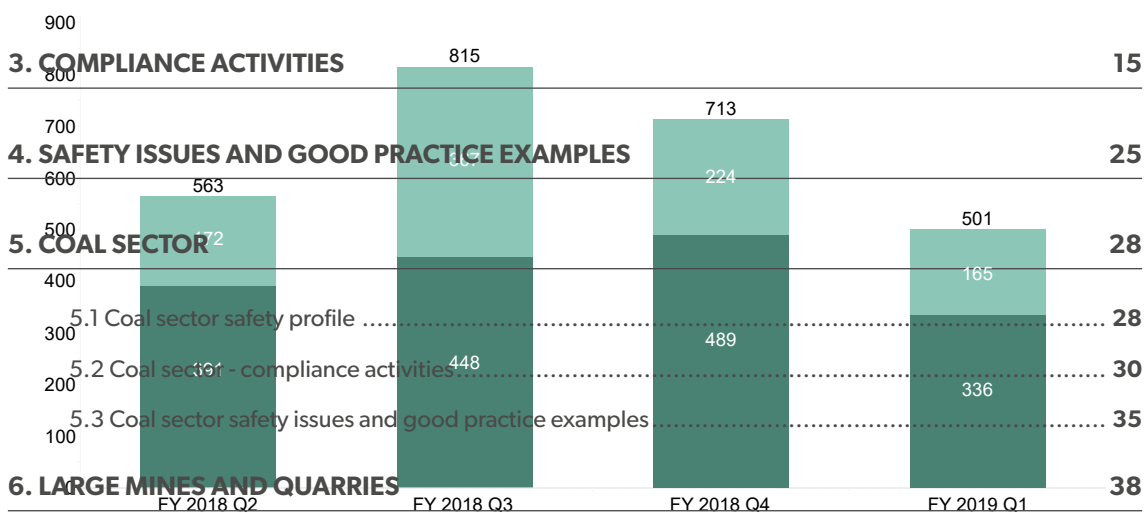
## SAFETY ASSESSMENTS AND INVESTIGATIONS

# Contents

The figure below shows that for each of the quarters since October 2017, the regulator’s effort was focussed on preventative programs. On average, 416 preventative assessments (activities not related to incidents and complaints) were conducted each quarter, representing just over 60% of all assessments. In quarter one 2018-19, 67% of assessments were preventative in nature.

Note: The higher proportion of reactive assessments conducted in quarter three 2017-18 reflects the compliance focus during the period on closing out aged matters.

**FIGURE 12 – COAL ASSESSMENTS BY NATURE - OCTOBER 2017 TO SEPTEMBER 2018**



6.1 Large mines and quarries	38
6.2 Large mines and quarries - compliance activities	40
6.3 Large mines and quarries safety issues and good practice examples	45
7.1 Small mines and quarries safety profile	47
7.2 Small mines and quarries - compliance activities	49
7.3 Small mines and quarries safety issues and good practice examples	54

The figure below shows site-based assessments for each quarter since October 2017. In quarter one 2018-19, almost 30% of assessments were site-based. This is slightly higher than the average for the 12 month reporting period where almost a quarter were site-based assessments.

Desktop assessments include reviews of mine reports on their review of control measures following an incident, dust report reviews and other desktop assessments.

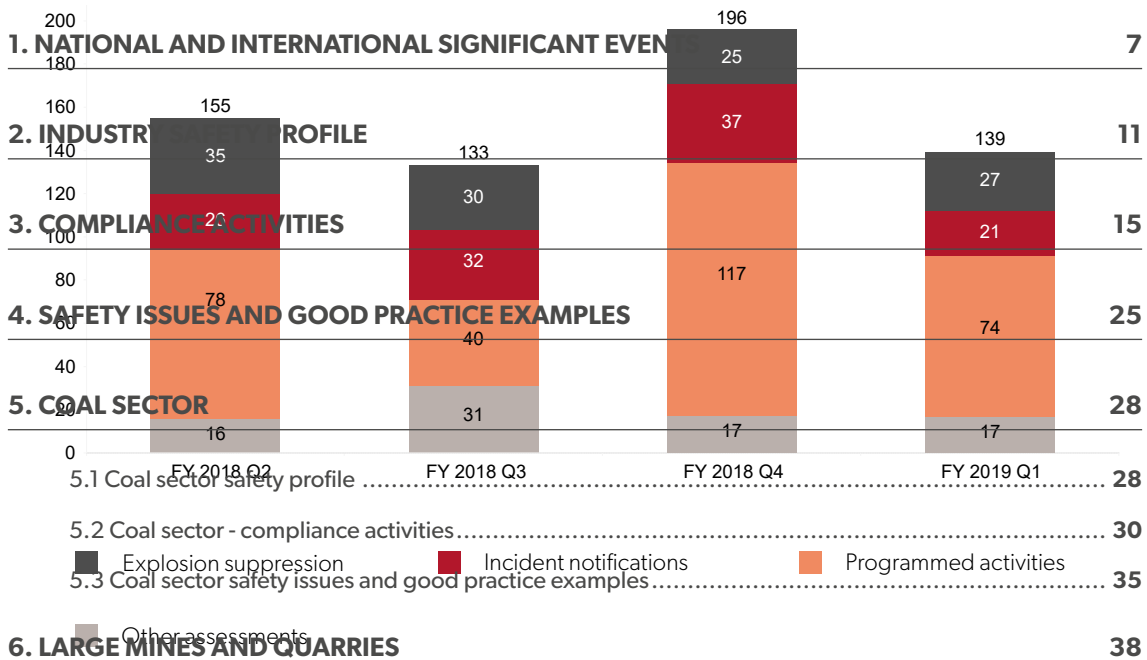
Other desktop assessments include the regulator’s review incident notifications, review of high risk activity notifications, applications for exemptions from work health and safety laws, subsidence management plans, authorisations and preparation for site-based work.

# Contents

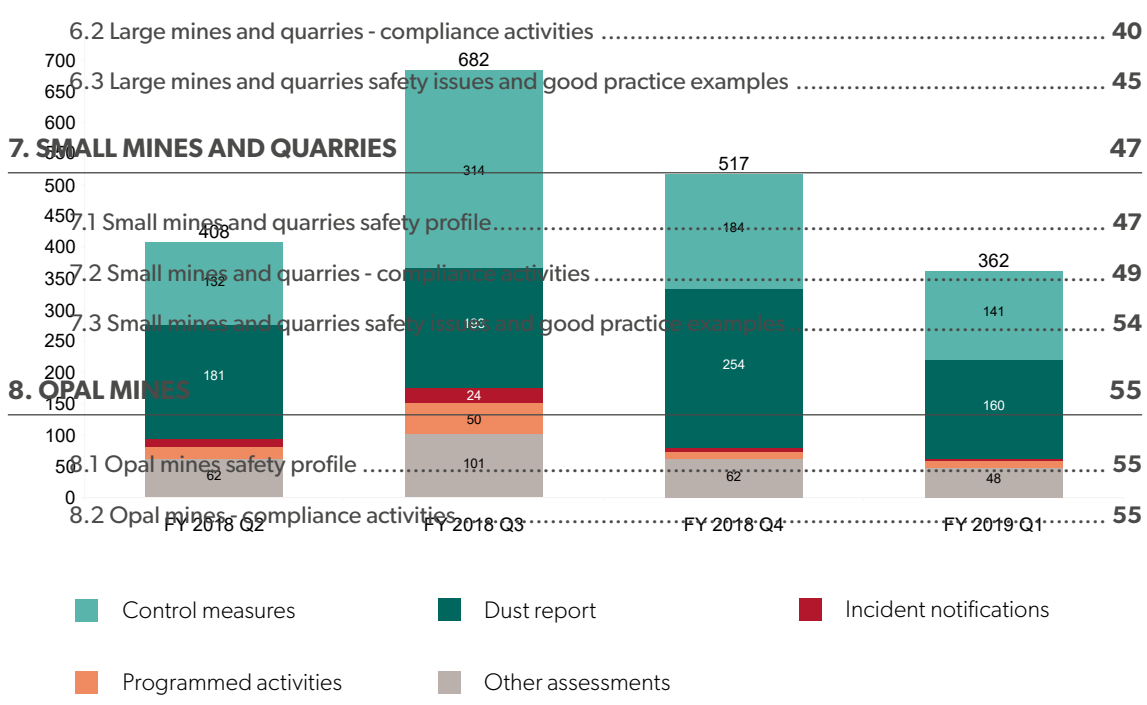
In Quarter one 2018-19, 44% of desktop assessments were reviews of Coal Services, personal airborne dust exposure monitoring results. A further 40% were assessments of mine 'review of control measures' following an incident.

**EXECUTIVE SUMMARY** **5**

**FIGURE 13. COAL SITE-BASED ASSESSMENTS - OCTOBER 2017 TO SEPTEMBER 2018**



**FIGURE 14. COAL SITE-BASED ASSESSMENTS - OCTOBER 2017 TO SEPTEMBER 2018**



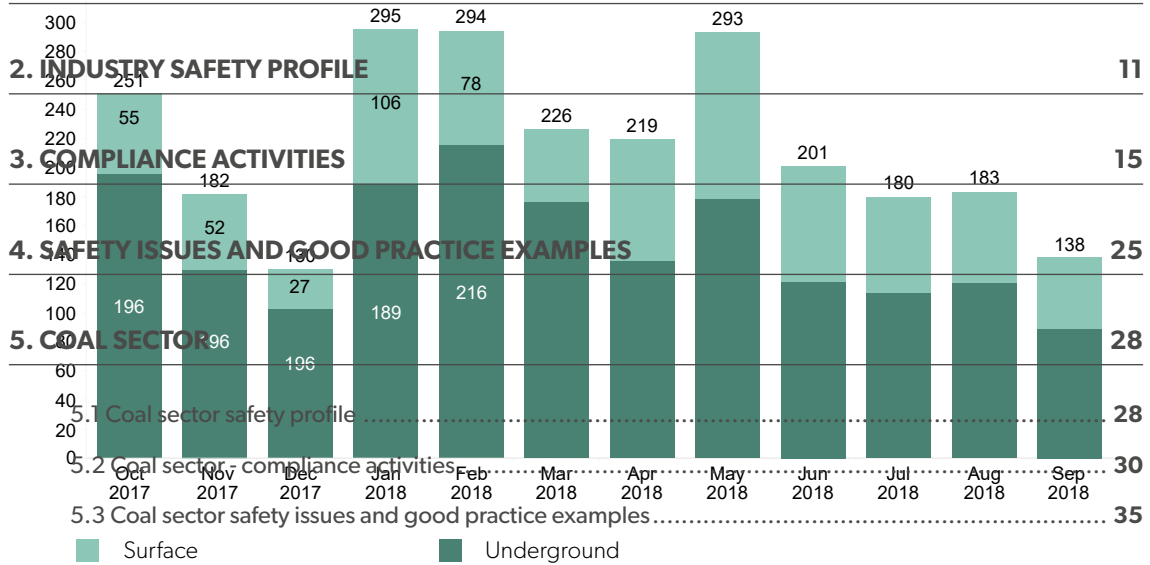
## SAFETY ASSESSMENTS BY COAL OPERATION TYPE - UNDERGROUND AND SURFACE

Figure 15 shows that in the 12 months since October 2017, two thirds of coal sector assessments conducted were in underground compared to surface operations. In quarter one 2018-19, 65% of all coal assessments were in underground operations.

### EXECUTIVE SUMMARY 5

### FIGURE 15. COAL SECTOR ASSESSMENTS BY OPERATION TYPE - OCTOBER 2017 TO SEPTEMBER 2018

#### 1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS 7



#### 2. INDUSTRY SAFETY PROFILE 11

#### 3. COMPLIANCE ACTIVITIES 15

#### 4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES 25

#### 5. COAL SECTOR 28

#### 5.1 Coal sector safety profile ..... 28

#### 5.2 Coal sector compliance activities ..... 30

#### 5.3 Coal sector safety issues and good practice examples ..... 35

#### 6. LARGE MINES AND QUARRIES 38

#### 6.1 Large mines and quarries ..... 38

#### 6.2 Large mines and quarries - compliance activities ..... 40

#### 6.3 Large mines and quarries safety issues and good practice examples ..... 45

#### 7. SMALL MINES AND QUARRIES 47

#### 7.1 Small mines and quarries safety profile ..... 47

#### 7.2 Small mines and quarries - compliance activities ..... 49

#### 7.3 Small mines and quarries safety issues and good practice examples ..... 54

#### 8. OPAL MINES 55

#### 8.1 Opal mines safety profile ..... 55

#### 8.2 Opal mines - compliance activities ..... 55

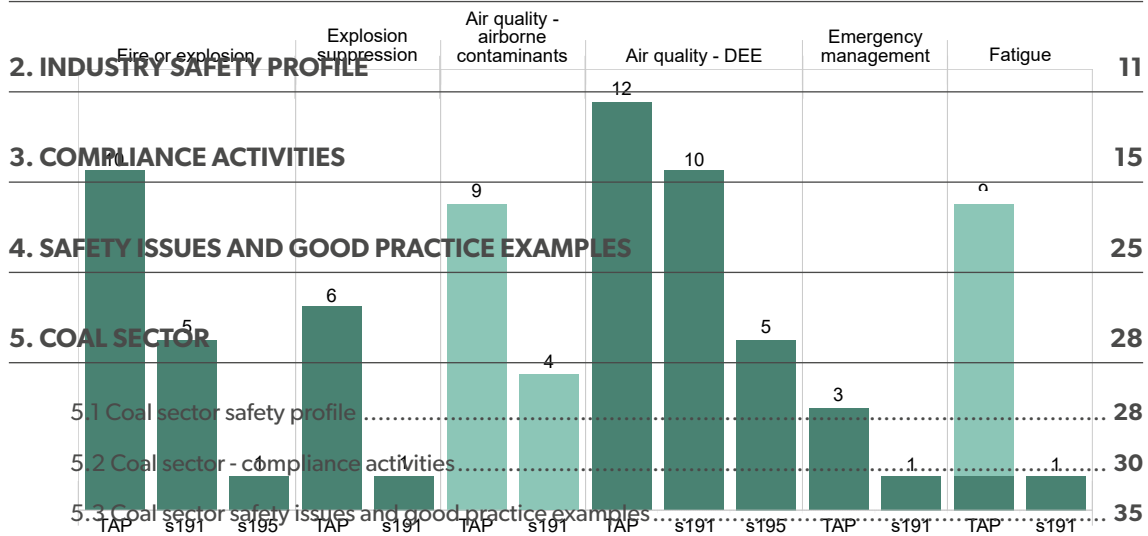


## CONTENTS

The figure below shows the TAPs conducted and notices issued over the 12 month reporting period. Since October 2017, the regulator conducted 49 TAPs in the coal sector. Just over half of the TAPs conducted were in underground mines.

**EXECUTIVE SUMMARY** 5

**FIGURE 16. COAL TAPS AND NOTICES BY OPERATION TYPE - OCTOBER 2017 TO SEPTEMBER 2018**  
**1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS** 7



**6. LARGE MINES AND QUARRIES** 38

■ Surface coal mines ■ Underground coal mines

6.1 Large mines and quarries 38

6.2 Large mines and quarries - compliance activities 40

The table below shows the compliance activities in quarter one 2018-19 by principal mining hazard.

The regulator conducted nine TAPs across four hazard programs and issued two s191 improvement notices and no s195 prohibition notices.


6.3 Large mines and quarries safety issues and good practice examples 45

**7. SMALL MINES AND QUARRIES** 47

**TABLE 7. COAL SECTOR - ANALYSIS OF TARGETED ASSESSMENT NOTICES - JULY 2018 TO SEPTEMBER 2018**

7.1 Small mines and quarries safety profile					47
7.2 Small mines and quarries - compliance activities					49
<b>TARGETED ASSESSMENT PROGRAM</b>	<b># TAP</b>	<b>OPERATION TYPE</b>	<b>NOTICE</b>		
7.3 Small mines and quarries safety issues and good practice examples			<b>S.191</b>	<b>S.195</b>	54
Fire or explosion	2	Underground	1	0	55
<b>8. OPAL MINES</b>					
Air quality - diesel exhaust emission	2	Underground	0	0	
8.1 Opal mines safety profile					55
Air quality - airborne contaminants	3	Surface	0	0	
8.2 Opal mines - compliance activities					55
Fatigue	2	Underground/surface	1	0	

## Contents for safety issues and good practice examples

	<b>Spotlight: Coal burst or rock burst in underground mines</b>	
<b>EXECUTIVE SUMMARY</b>		<b>5</b>
<b>1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS</b>	Over the last century ground or strata failure events have been responsible for several multiple fatality events. The regulator released a fact sheet in August 2018 to provide guidance to industry on mining induced seismic activity and what types of events are reportable under clause 179(j) of the Work Health and Safety (Mines and Petroleum Sites) Regulation 2014.	<b>7</b>
<b>2. INDUSTRY SAFETY PROFILE</b>	Recent incidents in both underground coal and metalliferous mines and have highlighted the risks associated with mining at depths greater than 400 metres and close to geological structures. The 2014 coal burst in a longwall development roadway at Austar Coal Mine, which resulted in the death of one worker, occurred at a depth of 555 metres vertically below the surface in an area of the mine subject to disturbed structural geology. At this depth, the sidewall (rib) and roof strata of the coal seam was subject to significant stress. While mining at this depth is a relatively recent development in Australia, overseas experience indicates that in these conditions coal bursts are known to occur in these conditions.	<b>11</b>
<b>3. COMPLIANCE ACTIVITIES</b>	Contributing factors to a coal burst may include but are not limited to:	<b>15</b>
<b>4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES</b>	5.2 Coal sector - compliance activities	<b>25</b>
<b>5. COAL SECTOR</b>	5.3 Coal sector safety issues and good practice examples	<b>28</b>
	5.1 Coal sector safety profile	<b>28</b>
	5.2 Coal sector - compliance activities	<b>30</b>
	5.3 Coal sector safety issues and good practice examples	<b>35</b>
	5.4 Coal sector - compliance activities	<b>35</b>
<b>6. LARGE MINES AND QUARRIES</b>	6.1 Large mines and quarries	<b>38</b>
	6.2 Large mines and quarries - compliance activities	<b>40</b>
	6.3 Large mines and quarries safety issues and good practice examples	<b>45</b>
<b>7. SMALL MINES AND QUARRIES</b>	7.1 Small mines and quarries safety profile	<b>47</b>
	7.2 Small mines and quarries compliance activities	<b>49</b>
	7.3 Small mines and quarries safety issues and good practice examples	<b>54</b>
<b>8. OPAL MINES</b>	8.1 Opal mines safety profile	<b>55</b>
	8.2 Opal mines - compliance activities	<b>55</b>







**Spotlight: Enforceable undertaking for safety incident where excavator cabin detaches and falls**

<b>EXECUTIVE SUMMARY</b>	5
Operations Pty Ltd, following its investigation into a workplace incident at the Mangoola Open Cut Mine in 2016.	
<b>1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS</b>	7
On 10 October 2016, a worker was injured when the cabin of an excavator dislodged and tipped off the side of the excavator, with the operator still inside.	
<b>2. INDUSTRY SAFETY PROFILE</b>	11
Following the regulator’s investigation, the company submitted a proposal for an enforceable undertaking, a legally binding agreement proposed by a company following an alleged breach, which may be considered as an alternative to prosecution.	
<b>3. COMPLIANCE ACTIVITIES</b>	15
The undertaking will provide training of all Mangoola maintenance workers and staff in human organisational factors in maintenance. Resources developed during the undertaking will also be made available to the broader mining industry to share the lessons learnt and enhance industry safety. Further details are available on our <a href="#">website</a> .	
<b>4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES</b>	25
<b>5. COAL SECTOR</b>	28
<b>Causes and contributing factors</b>	28
5.1 Coal sector safety profile	28
5.2 Coal sector compliance activities	30
5.3 Coal sector safety issues and good practice examples	35
As part of its investigation, the regulator conducted non-destructive testing on the cab riser where evidence of cracking at several locations. Metallurgical analysis found that the bolt failures were attributable to a fatigue-related fracture of the front vertically installed bolt, resulting in loss of pre-load.	
<b>6. LARGE MINES AND QUARRIES</b>	38
The regulator investigation found that the mine did not consult with the original equipment manufacturer (OEM) and no qualified engineer or statutory mechanical engineer was involved in the assessment of the quarries repairs. The excavator was returned operation with four out of six bolts broken and temporarily repaired.	
6.1 Large mines and quarries	38
6.2 Large mines and quarries compliance activities	40
6.3 Large mines and quarries safety issues and good practice examples	45
The regulator’s investigation concluded that:	
<b>7. SMALL MINES AND QUARRIES</b>	47
• where OEMs have designed connections that use bolts of grade 8.8 or above, they should be considered as a structural connection (unless the OEM or a qualified professional engineer has stated otherwise).	
7.1 Small mines and quarries safety profile	47
• 7.2 Small mines and quarries - compliance activities	49
the statutory mechanical engineer has a statutory function to supervise the installation;	
7.3 Small mines and quarries safety issues and good practice examples	54
the statutory mechanical engineer must be involved in the design of the mine and must be involved with any repair to the plant’s structural components (see <a href="#">IIR17-06</a> for details).	
<b>8. OPAL MINES</b>	55
The regulator issued a notice for Mangoola to develop an interim repair Trigger Action Response Plan. This was communicated to key personnel. In consultation with the OEM a design and	
8.1 Opal mines safety profile	55
8.2 Opal mines - compliance activities	58



**Spotlight: Enforceable undertaking for safety incident where excavator cabin detaches and falls (continued)**

<b>EXECUTIVE SUMMARY</b>	<b>5</b>
maintenance strategy was prepared on Cab Riser maintenance.	
<b>Terms of the enforceable undertaking</b>	
<b>1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS</b>	<b>7</b>
Mangoola has committed to spend \$464,710 (inclusive of regulator investigation cost recovery) to implement strategies that will deliver benefit to worker safety and contribute to the local community.	
<b>2. INDUSTRY SAFETY PROFILE</b>	<b>11</b>
The mine undertakes to:	
• engage the Maintenance Technology centre at Monash University to undertake an assessment and prepare a report on the causes and contributing factors to be shared with workers and the industry with a view to preventing similar incidents	
<b>3. COMPLIANCE ACTIVITIES</b>	<b>15</b>
<b>4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES</b>	<b>25</b>
The mine has implemented measures to address metal fatigue issues associated with mobile plant	
<b>5. COAL SECTOR</b>	<b>28</b>
The mine will implement a training package on human and organisational factors in maintenance for apprentices and maintenance workers and	
• 5.1 Coal sector safety profile	<b>28</b>
• purchase a modified transport vehicle for residents of a local retirement village.	
5.2 Coal sector - compliance activities	<b>30</b>
5.3 Coal sector safety issues and good practice examples	<b>35</b>
<b>6. LARGE MINES AND QUARRIES</b>	<b>38</b>
6.1 Large mines and quarries	<b>38</b>
6.2 Large mines and quarries - compliance activities	<b>40</b>
6.3 Large mines and quarries safety issues and good practice examples	<b>45</b>
<b>7. SMALL MINES AND QUARRIES</b>	<b>47</b>
7.1 Small mines and quarries safety profile	<b>47</b>
7.2 Small mines and quarries - compliance activities	<b>49</b>
7.3 Small mines and quarries safety issues and good practice examples	<b>54</b>
<b>8. OPAL MINES</b>	<b>55</b>
8.1 Opal mines safety profile	<b>55</b>
8.2 Opal mines - compliance activities	<b>55</b>

# Contents

## 6. Large mines and quarries

**5.1 EXECUTIVE SUMMARY** **5**  
**6.1 Large mines and quarries**

As at 5 October 2018, there were 37 active large mines and quarries; 20 surface operations and 17 underground mines (see Figure 1 p.9).  
**1 NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS** **7**

**2.1 NATIONAL AND INTERNATIONAL NOTIFICATIONS** **11**

As seen in the table below, incident rates (number of incidents reported per notifying mine) remained stable in the 12 months since October 2017.  
**3 COMPLIANCE ACTIVITIES** **15**

On average, over the 12 month reporting period, 78% of large mines that reported hours worked also reported incidents.  
**4 SAFETY ISSUES AND GOOD PRACTICE EXAMPLES** **25**

**TABLE 1: NATIONAL INCIDENT NOTIFICATIONS AND REPORTING RATES IN LARGE MINES AND QUARRIES** **28**

	Q2 2017 18	Q3 2017 18	Q4 2017 18	Q1 2018-19	AVERAGE	
Number of notified incidents	52	72	63	71	65	<b>30</b>
Mines that notified incidents	20	24	22	19	21**	
<b>6.1 LARGE MINES AND QUARRIES</b>	2.5	3.0	2.9	3.7	3.0	<b>38</b>
Mines that reported hours worked*	30	27	27	1**	28^	
6.2 Large mines and quarries - compliance activities						<b>40</b>
Proportion of working mines reporting incidents	66%	89%	81%	NC	78%^	<b>45</b>
6.3 Large mines and quarries safety issues and good practice examples						<b>45</b>

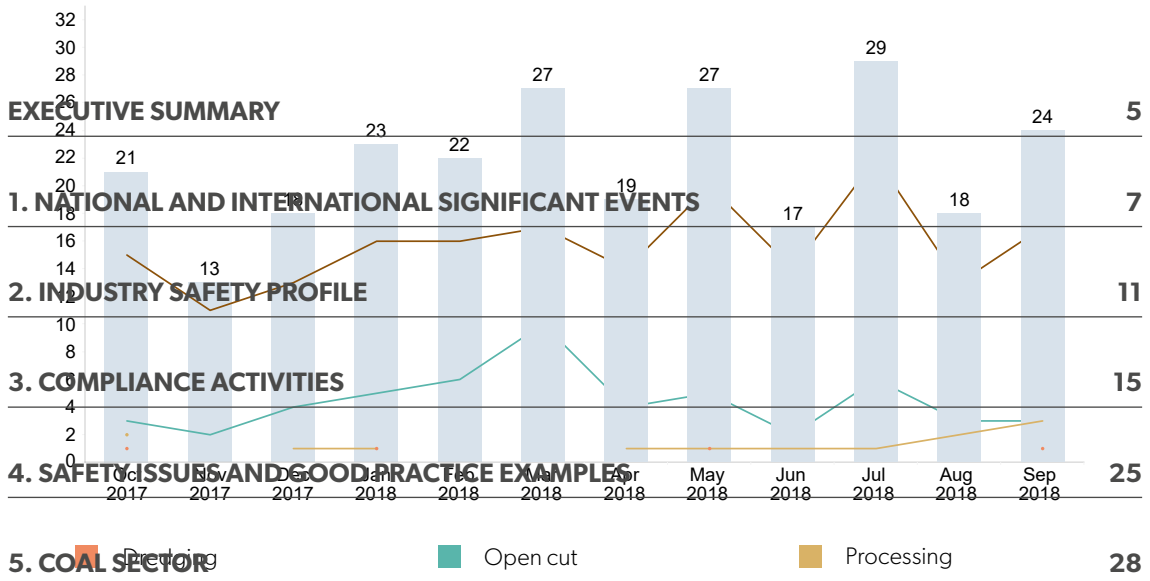
**7 SMALL MINES AND QUARRIES** **47**

Reported hours worked including quarries  
 \*\*Suspected reporting lag due to six monthly reporting requirements  
 ^Current quarter (Q1 2018-19) excluded from calculation  
 NC= Not Calculated  
**7.1 Small mines and quarries safety profile** **47**  
**7.2 Small mines and quarries - compliance activities** **49**

Figure 7.1 Small mines and quarries safety issues and good practice examples large mines and quarries. The number of incidents reported by either underground or surface operations (dredging, open cut mining and processing) has remained relatively stable in the 12 months since October 2017.  
**8. OPAL MINES** **55**

8.1 Opal mines safety profile **55**  
 8.2 Opal mines - compliance activities **55**

**FIGURE 17. LARGE MINES AND QUARRY NOTIFICATIONS BY OPERATION - OCTOBER 2017 TO SEPTEMBER 2018**



**5. COAL SECTOR** **28**

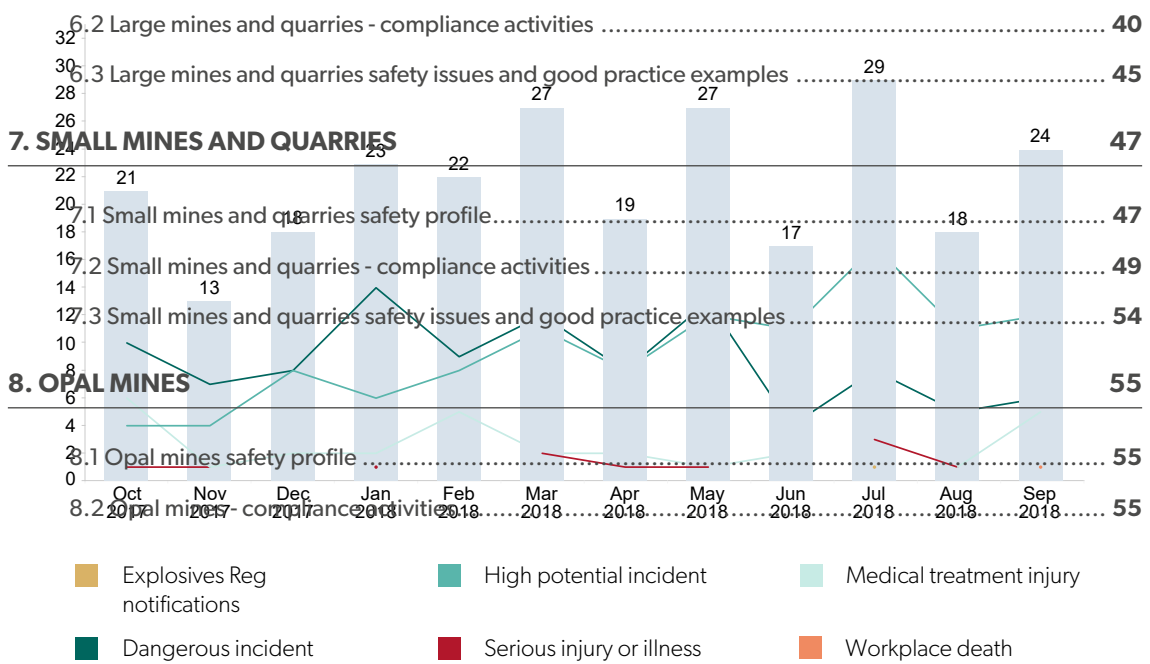
- 5.1 Coal sector safety profile ..... **28**
- 5.2 Coal sector - compliance activities ..... **30**

Figure 18 shows incident notifications by the clause under which they were notified (first that applied)... **35**

There are no obvious trends in the numbers of notifications by the clause under which they were notified.

**6. LARGE MINES AND QUARRIES** **38**

**FIGURE 18. LARGE MINES AND QUARRY NOTIFICATIONS BY INCIDENT TYPE - OCTOBER 2017 TO SEPTEMBER 2018** **38**



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### PROSECUTIONS AND INVESTIGATIONS

In quarter one 2018-19 the regulator commenced an investigation into an incident where a worker fell from a scissor lift. The incident became a fatality approximately six weeks after the event. No prosecution proceedings commenced this quarter. Further details are available in investigation information releases on our [website](#).

<b>EXECUTIVE SUMMARY</b>	<b>5</b>
<b>1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS</b>	<b>7</b>

<b>2. INDUSTRY SAFETY PROFILE</b>	<b>11</b>
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The figure below shows the number and types of notices the regulator issued in the 12 month reporting period.

<b>3. COMPLIANCE ACTIVITIES</b>	<b>15</b>
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The number of improvement notices and notices of concern has increased in the 12 months since October 2017, but numbers of prohibition notices has remained stable. On average, the regulator issued two prohibition notices per month this quarter. This is slightly lower than the average (three per month) over the 12 month reporting period.

<b>4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES</b>	<b>25</b>
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<b>5. COAL SECTOR</b>	<b>28</b>
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In quarter one 2018-19 there was approximately one prohibition notice was issued for approximately every nine improvement notices.

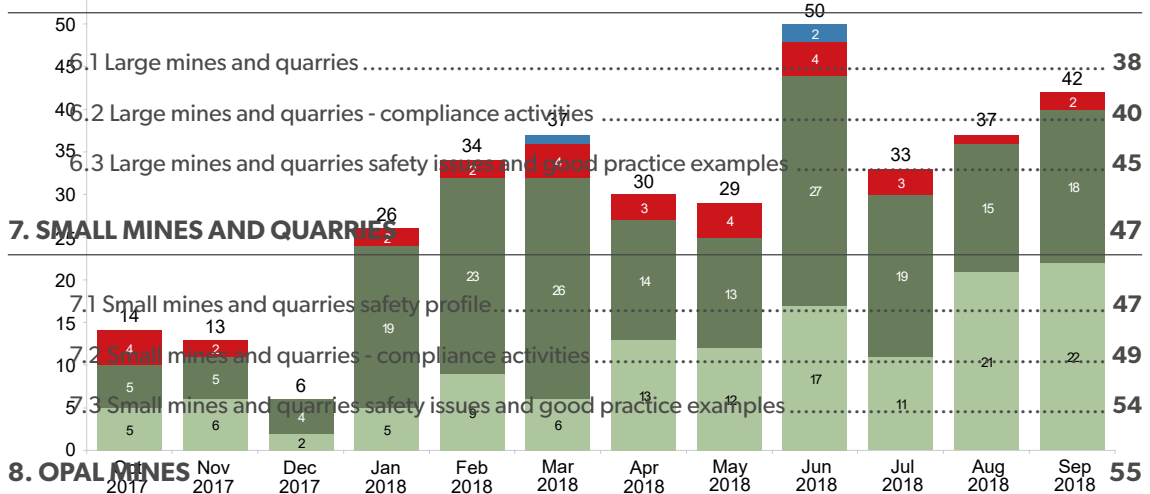
5.1 Coal sector safety profile	28
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5.2 Coal sector - compliance activities	30
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5.3 Coal sector safety issues and good practice examples	35
--	----

**FIGURE 19. LARGE MINES SAFETY NOTICES ISSUED - OCTOBER 2017 TO SEPTEMBER 2018**

<b>6. LARGE MINES AND QUARRIES</b>	<b>38</b>
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<b>7. SMALL MINES AND QUARRIES</b>	<b>47</b>
------------------------------------	-----------

7.1 Small mines and quarries safety profile	47
---	----

7.2 Small mines and quarries - compliance activities	49
--	----

7.3 Small mines and quarries safety issues and good practice examples	54
---	----

<b>8. OPAL MINES</b>	<b>55</b>
----------------------	-----------

8.1 Opal mines safety profile	55
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8.2 Opal mines compliance activities - Section 198 WHS Act	55
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8.2 Opal mines compliance activities - Section 191 WHS Act	55
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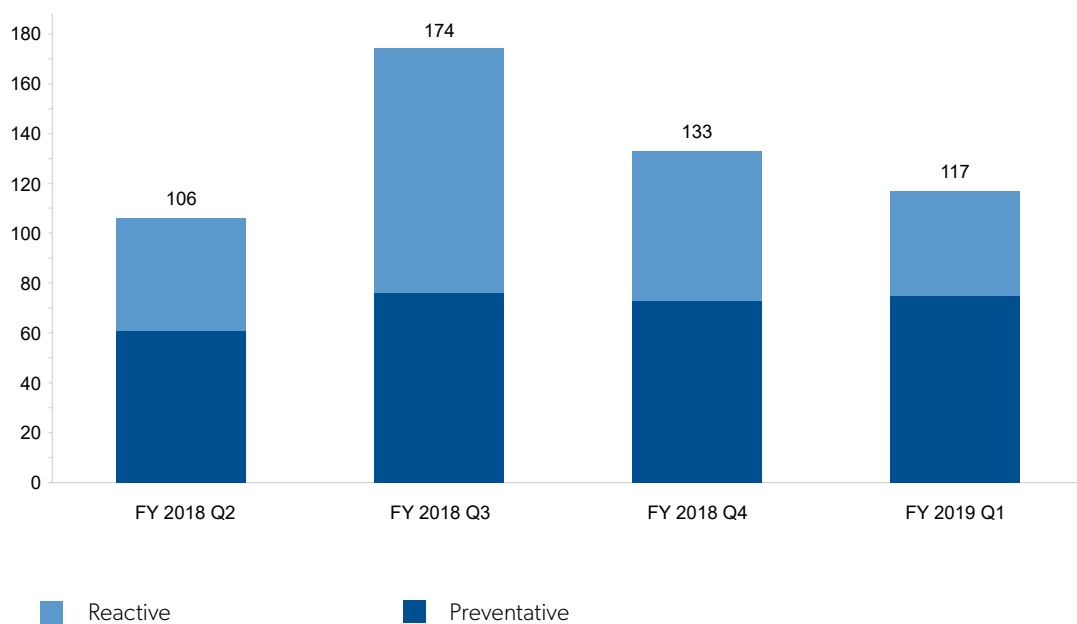


### SAFETY ASSESSMENT INVESTIGATIONS

The figure below shows that for the 12 month reporting period, over half of the regulator's compliance effort was focussed on preventative programs rather than reactive ones. On average, 70 preventative assessments (activities not related to incidents and complaints) in this sector were conducted each quarter, representing just over half of all assessments.

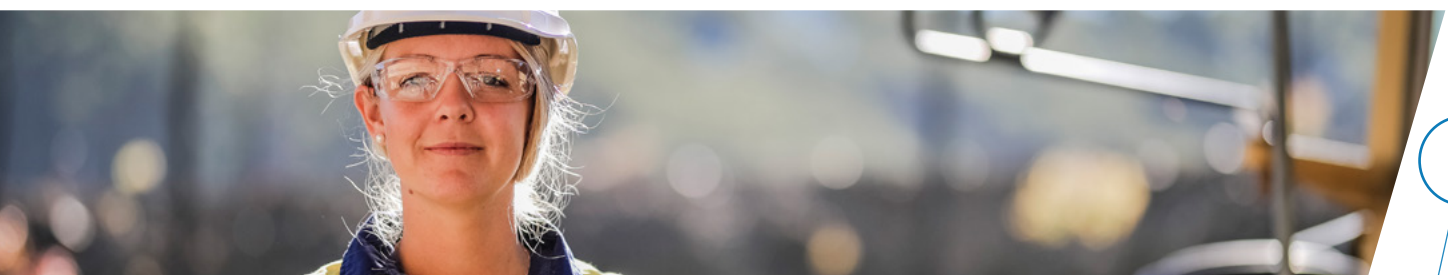
The increased number of reactive assessments conducted in quarter three 2017-18 reflects the compliance focus at the time on closing out aged matters.

**FIGURE 20. LARGE MINES ASSESSMENTS BY NATURE - OCTOBER 2017 TO SEPTEMBER 2018**



In the large mines sector, the regulator conducts various purpose driven site-based assessments. The general categories are described below:

- Programmed activities follow a pre-prepared plan focusing on selected principal mining hazards
- Explosion suppression assessments – conducted by explosion suppression officers and assess compliance with clause 65 of the Work Health and Safety (Mines and Petroleum Site) Regulation 2014
- Other assessments – site assessments including assessments associated with TAPs and TIPs and assessments related to investigations.



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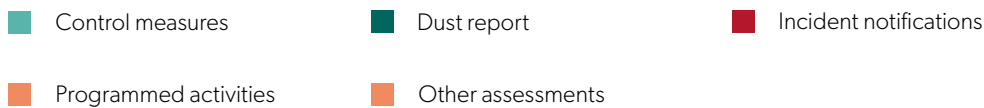
Desktop assessments include a review of mine reports on their review of control measures following an incident and other desktop assessments. Other desktop assessments include the regulator's review of incident notifications, review of high risk activity notifications and authorisations. Desktop activities are shown in the figure below.

**EXECUTIVE SUMMARY** 5  
**FIGURE 21. LARGE MINES SITE-BASED ASSESSMENTS - OCTOBER 2017 TO SEPTEMBER 2018**

<b>1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS</b>	<b>7</b>
<b>2. INDUSTRY SAFETY PROFILE</b>	<b>11</b>
<b>3. COMPLIANCE ACTIVITIES</b>	<b>15</b>
<b>4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES</b>	<b>25</b>
<b>5. COAL SECTOR</b>	<b>28</b>
5.1 Coal sector safety profile	28
5.2 Coal sector - compliance activities	30
5.3 Coal sector safety issues and good practice examples	35
<span style="display: inline-block; width: 10px; height: 10px; background-color: #444; border: 1px solid #000; margin-right: 5px;"></span> Explosion suppression <span style="display: inline-block; width: 10px; height: 10px; background-color: #800000; border: 1px solid #000; margin-left: 20px; margin-right: 5px;"></span> Incident notifications <span style="display: inline-block; width: 10px; height: 10px; background-color: #FF8C00; border: 1px solid #000; margin-left: 20px; margin-right: 5px;"></span> Programmed activities	
<b>6. LARGE MINES AND QUARRIES</b>	<b>38</b>
<span style="display: inline-block; width: 10px; height: 10px; background-color: #A9A9A9; border: 1px solid #000; margin-right: 5px;"></span> Other assessments	
6.1 Large mines and quarries	38

**FIGURE 22. LARGE MINES DESKTOP ASSESSMENTS - OCTOBER 2017 TO SEPTEMBER 2018**

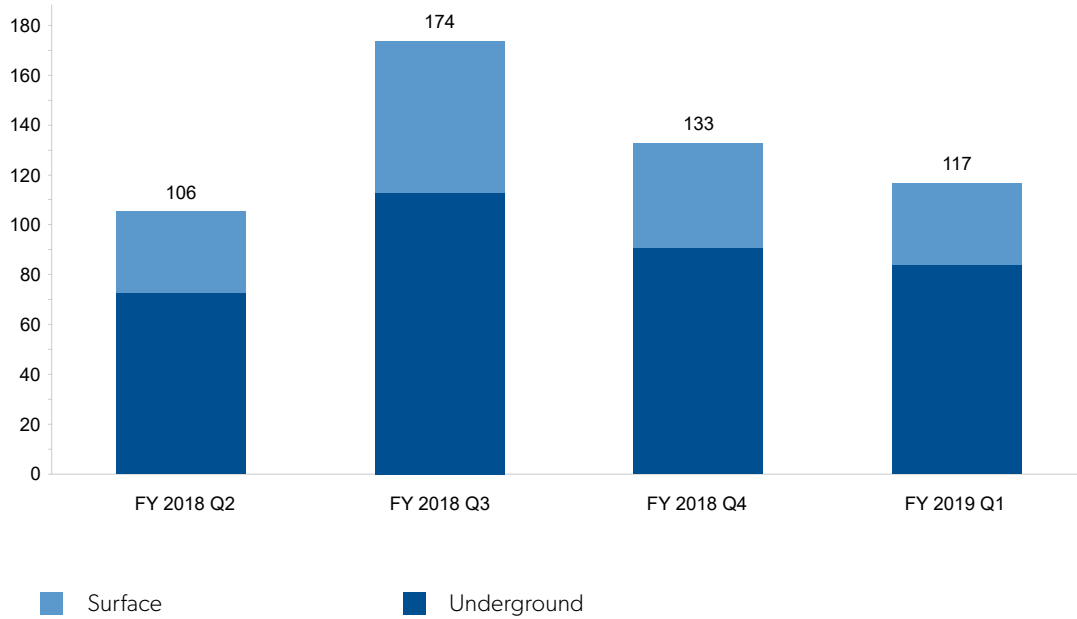
6.2 Large mines and quarries - compliance activities	40
6.3 Large mines and quarries safety issues and good practice examples	45
<b>7. SMALL MINES AND QUARRIES</b>	<b>47</b>
7.1 Small mines and quarries safety profile	47
7.2 Small mines and quarries - compliance activities	49
7.3 Small mines and quarries safety issues and good practice examples	54
<b>8. OPAL MINES</b>	<b>55</b>
8.1 Opal mines safety profile	55
8.2 Opal mines - compliance activities	55



**SECTION // 6. LARGE MINES AND QUARRIES**

The figure below shows the number of safety assessments conducted in underground and surface operations in the large mines sector for the 12 months since October 2017. In quarter one 2018-19, over 70% of all assessments were conducted in underground operations. This is slightly lower than for the 12 month reporting period, where 85% of assessments were conducted in underground mines.

**FIGURE 23. ALL LARGE MINES SAFETY ASSESSMENTS BY OPERATION - OCTOBER 2017 TO SEPTEMBER 2018**



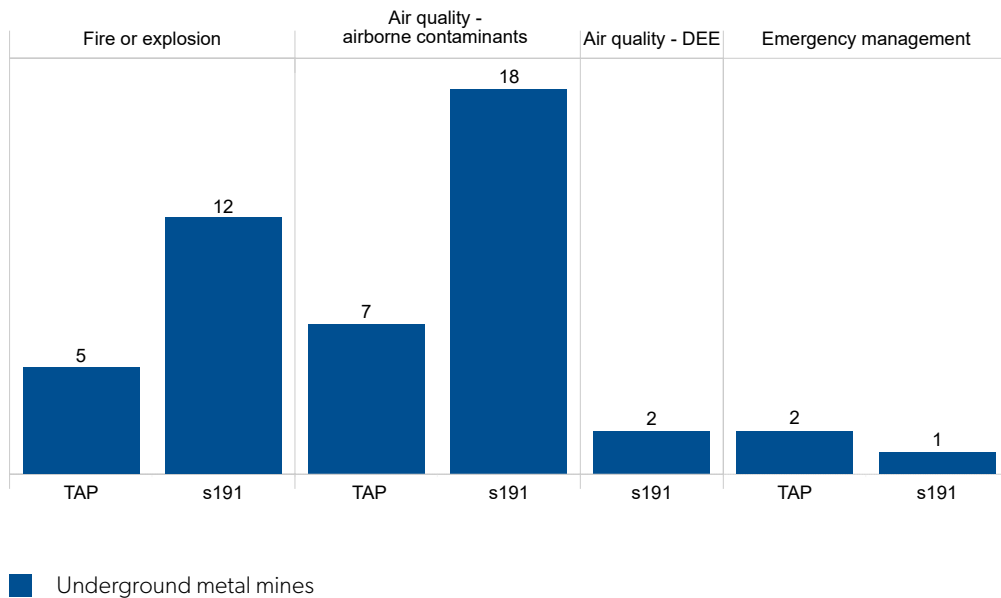
**SECTION // 6. LARGE MINES AND QUARRIES**

**TARGETED ASSESSMENT PROGRAM NOTICES ISSUED**

This figure shows TAPs conducted, and notices issued in large mines over the 12 month reporting period. All of the 14 TAPs conducted were in underground operations. Air quality – airborne contaminants and fire or explosion assessments generated approximately two improvement notices per assessment. This is twice as many as for other hazard programs. There were no prohibition notices issued for any of the four principal mining hazards assessed.

In quarter one 2018-19, the regulator conducted five targeted assessments across one principal mining hazard program, fire or explosion. As a result, 12 s191 improvement notices were issued.

**FIGURE 24.** LARGE MINES AND QUARRIES TAPS AND NOTICES - OCTOBER 2017 TO SEPTEMBER 2018



## Contents Large mines and quarries safety issues and good practice examples

<b>EXECUTIVE SUMMARY: Unsafe light and heavy vehicle interactions</b>	<b>5</b>
<b>1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS</b>	<b>7</b>
Collisions between light and heavy vehicles have the potential for fatal injuries. In the previous 12 month period there were two incidents reported in underground metalliferous mines where light vehicles were severely damaged due to interactions with heavy vehicles. Both these incidents had the potential to result in fatal injuries.	11
<b>2. INDUSTRY SAFETY PROFILE</b>	<b>11</b>
<b>3. COMPLIANCE ACTIVITIES</b>	<b>15</b>
In the last two quarters, several other light and heavy vehicle interactions have been reported in the regulator's weekly incident summaries:	
<b>4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES</b>	<b>25</b>
A collision occurred between an underground haul truck and a light vehicle on the mine access ramp. Both operators called on the two-way radio earlier but failed to make positive communication with each other when approaching a blind corner.	28
<b>5. COAL SECTOR</b>	<b>28</b>
<ul style="list-style-type: none"> <li>A haul truck hit a parked light vehicle which was parked in front of the haul truck.</li> </ul>	
<b>5.1 Coal sector safety profile</b>	<b>28</b>
An excavator was tramming underground and hit a parked light vehicle as the excavator approached a corner. The excavator was carrying a hydraulic hammer at the time and the operator did not see the parked vehicle.	30
<b>5.2 Coal sector compliance activities</b>	<b>30</b>
<b>5.3 Coal sector safety issues and good practice examples</b>	<b>35</b>
<ul style="list-style-type: none"> <li>A light vehicle, parked in a decline, rolled forward and became wedged between the Jumbo and the rib.</li> </ul>	
<b>6. LARGE MINES AND QUARRIES</b>	<b>38</b>
Factors which contributed to light/heavy vehicle interactions included:	
<b>6.1 Large mines and quarries</b>	<b>38</b>
<ul style="list-style-type: none"> <li>failure to make positive communications</li> </ul>	
<b>6.2 Large mines and quarries - compliance activities</b>	<b>40</b>
<ul style="list-style-type: none"> <li>visibility limitations of heavy vehicles</li> </ul>	
<b>6.3 Large mines and quarries safety issues and good practice examples</b>	<b>45</b>
<ul style="list-style-type: none"> <li>poor road layouts and signage</li> </ul>	
<b>7. SMALL MINES AND QUARRIES</b>	<b>47</b>
Mine transport management plans and transport rules should consider:	
<b>7.1 Small mines and quarries safety profile</b>	<b>47</b>
<ul style="list-style-type: none"> <li>the risk of heavy equipment moving around the mine while carrying loads or attachments</li> </ul>	
<b>7.2 Small mines and quarries - compliance activities</b>	<b>49</b>
<ul style="list-style-type: none"> <li>designated parking areas where light vehicles and heavy vehicles interact - marked and where possible segregated</li> </ul>	
<b>7.3 Small mines and quarries safety issues and good practice examples</b>	<b>54</b>
<ul style="list-style-type: none"> <li>pedestrian access and interactions with vehicles</li> </ul>	
<b>8. OPAL MINES</b>	<b>55</b>
<ul style="list-style-type: none"> <li>monitoring of compliance with site park-up procedures by supervisors.</li> </ul>	
<b>8.1 Opal mines safety profile</b>	<b>55</b>
<b>8.2 Opal mines - compliance activities</b>	<b>55</b>





### **Spotlight:** Tailings dam polygon alert systems for at risk workers

On 9 March 2018, an embankment slump occurred in the Northern Tailings Storage Facility (NTSF) at Newcrest's Cadia mining operation in western NSW. A 195 prohibition notice was issued by the Resources Regulator, preventing the use of the NTSF.

Since then the mine has engaged a team of international experts to investigate the cause of the embankment failure. A final report is expected in December 2018 and its findings and recommendations will inform design and planning for remedial work to repair the embankment.

Further, the mining operator remains concerned about reducing the potential magnitude of seismic events associated with the block cave mining operations. To achieve this, the mine has undertaken drilling on the 5050 mRL drive outside the orebody, from which it intends to relieve rock stress by injecting high pressure water. The expected result is more frequent but smaller magnitude seismic events.

In the interim, the mining operator has set up an automated 'polygon' alert system whereby events of a certain magnitude and duration will trigger an alarm for withdrawing workers from a defined polygon work area. The alarms are triggered at the surface control room and those within the polygon receive a communication to leave the area. Before workers can return, a geotechnical assessment is carried out. This 'polygon alarm' system provides an effective evacuation system for workers from at-risk work areas.



# Contents

## 7. Small mines and quarries

**EXECUTIVE SUMMARY** 5

### 7.1 Small mines and quarries safety profile

**1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS** 7

As at 5 October 2018 there were 2,645 active small mines and quarries in NSW. Almost 99% of small mines are surface operations. Every quarter, on average, only 520 small mines report hours of operation

**2. INDUSTRY SAFETY PROFILE** 11

From 2018-19, the Regulator will be conducting a compliance campaign to address the low rate of notification reporting.

**3. COMPLIANCE ACTIVITIES** 15

**SAFETY INCIDENT NOTIFICATIONS**

**4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES** 25

The table below lists the number of incidents notified to the regulator and the number of small mines and quarries that reported incidents and hours for each quarter. In the 12 months since October 2017 a total of 96 incidents were notified to the regulator. This represents about 3% of the total number of notifications by all sectors.

**5. COAL SECTOR** 28

Incident rates (number of incidents per notifying mine) have remained relatively stable over the 12 month reporting period.

**5.1 Coal sector safety profile** 28

**5.2 Coal sector - compliance activities** 30

Low rates of incident reporting were observed across the 12 months since October 2017. The regulator is currently addressing incident under-reporting as a priority compliance project.

**5.3 Coal sector safety issues and good practice examples** 35

**6. LARGE MINES AND QUARRIES** 38

**TABLE 9. SAFETY INCIDENT NOTIFICATIONS AND REPORTING RATES IN SMALL MINES AND QUARRIES**

**6.1 Large mines and quarries** 38

	Q2 2017 18	Q3 2017 18	Q4 2017 18	Q1 2018-19	AVERAGE
Number of notified incidents	21	24	19	32	24
Mines that notified incidents	17	23	15	28	64*
Incidents per notifying mine	1.2	1.0	1.3	1.1	1.2
Mines that reported hours worked*	556	503	502	83**	520^
Proportion of working mines reporting incidents	3%	5%	3%	NC	3.6%

**7.3 Small mines and quarries safety issues and good practice examples** 54

**8. OPAL MINES** 55

All sectors notified incidents 461 466 505 NC 478^

**8.1 Opal mines safety profile** 55

**8.2 Opal mines - compliance activities** 55

\*\*Suspected reporting lag due to six monthly reporting requirements

^Current quarter (Q1 2018-19) excluded from calculation

NC= Not Calculated

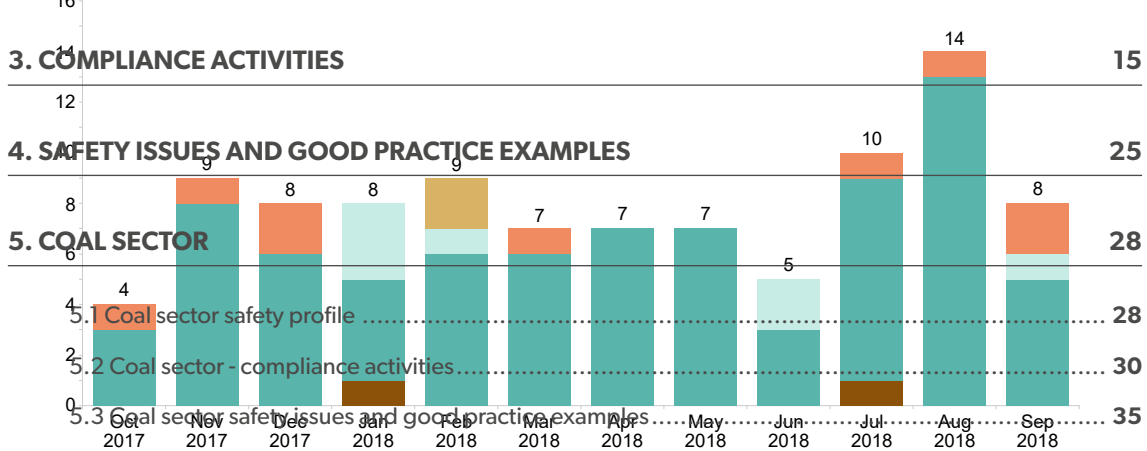
# Contents

Figure 25 shows incidents notified to the regulator by operation type for the small mines sector. In this sector there were low levels of incidents reported compared to the coal and large mines sectors. There are too few reported incidents in the small mines sector to perform a trend analysis.

Based on the 12 months since October 2017 the regulator received, on average, eight incident notifications per month. Most notifications were received from surface mines and quarries. **EXECUTIVE SUMMARY** **5**

Underground small mines made up 1% of the sector. Over the 12 month period, from October 2017 to September 2018, they accounted for 2% of all incident notifications. **1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS** **7**

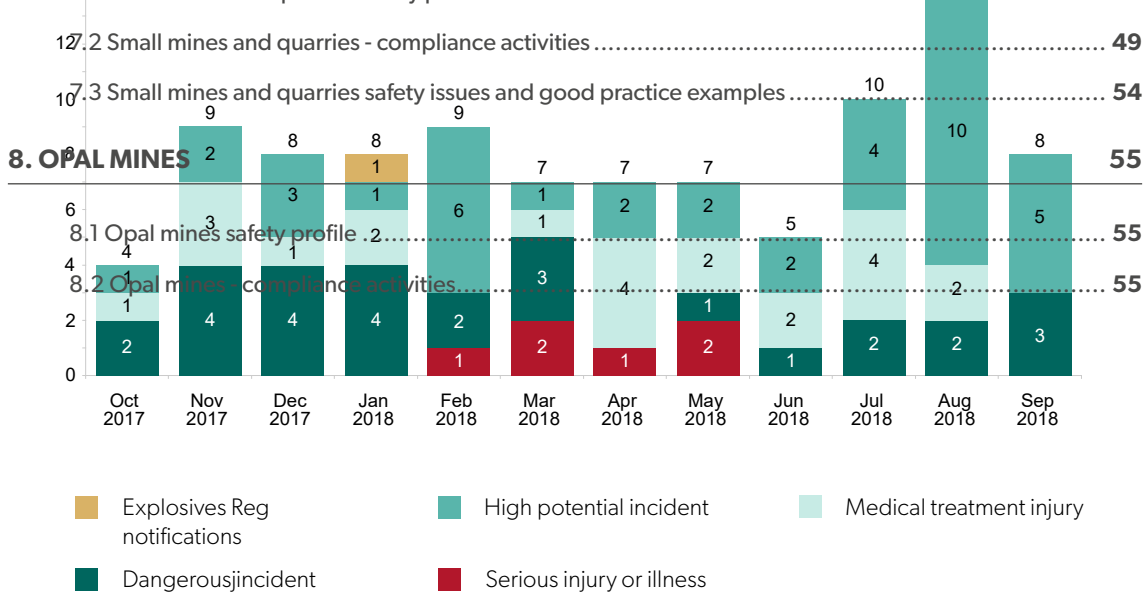
**FIGURE 25. SMALL MINES SAFETY NOTIFICATIONS BY OPERATION - OCTOBER 2017 TO SEPTEMBER 2018** **11**  
**2. INDUSTRY SAFETY PROFILE**



**3. COMPLIANCE ACTIVITIES** **15**  
**4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES** **25**  
**5. COAL SECTOR** **28**  
 5.1 Coal sector safety profile ..... **28**  
 5.2 Coal sector - compliance activities ..... **30**  
 5.3 Coal sector safety issues and good practice examples ..... **35**

**6. LARGE MINES AND QUARRIES** **38**  
 6.1 Large mines and quarries ..... **38**  
 6.2 Large mines and quarries - compliance activities ..... **40**  
 6.3 Large mines and quarries safety issues and good practice examples ..... **45**

**FIGURE 26. SMALL MINES INCIDENT NOTIFICATION BY TYPE - OCTOBER 2017 TO SEPTEMBER 2018** **47**  
**7. SMALL MINES AND QUARRIES** **47**



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### PROSECUTIONS AND INVESTIGATIONS

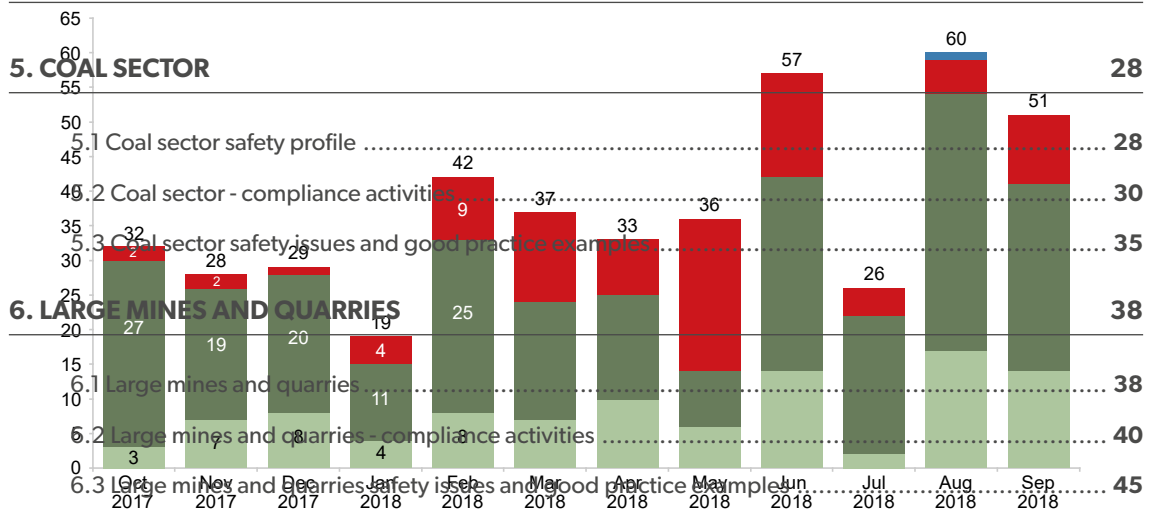
**EXECUTIVE SUMMARY** In the small mines and quarries sector, no prosecution proceedings or incident investigations were commenced in quarter one 2018-19. **5**

**1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS** **7**  
**SAFETY NOTICES ISSUED**

The figure below shows the number and types of notices by the regulator from October 2017 to September 2018. In quarter one 2018-19, the regulator issued, on average, 46 notices per month. This is slightly higher than for the 12 month reporting period where the regulator issued, on average, 38 notices per month. **11**

**2. INDUSTRY SAFETY PROFILE** **11**  
**3. COMPLIANCE ACTIVITIES** **15**

**FIGURE 27. SMALL MINES INCIDENT NOTIFICATION BY TYPE - OCTOBER 2017 TO SEPTEMBER 2018** **25**  
**4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES** **25**



**5. COAL SECTOR** **28**

**5.1 Coal sector safety profile** ..... **28**  
**5.2 Coal sector - compliance activities** ..... **30**  
**5.3 Coal sector safety issues and good practice examples** ..... **35**

**6. LARGE MINES AND QUARRIES** **38**

**6.1 Large mines and quarries** ..... **38**  
**6.2 Large mines and quarries - compliance activities** ..... **40**  
**6.3 Large mines and quarries safety issues and good practice examples** ..... **45**

**7. SMALL MINES AND QUARRIES** **47**

**7.1 Small mines and quarries safety profile** ..... **47**  
**7.2 Small mines and quarries - compliance activities** ..... **49**  
**7.3 Small mines and quarries safety issues and good practice examples** ..... **54**

**8. OPAL MINES** **55**

**8.1 Opal mines safety profile** ..... **55**  
**8.2 Opal mines - compliance activities** ..... **55**

## SAFETY ASSESSMENTS AND INVESTIGATIONS Contents

### PREVENTATIVE AND REACTIVE ASSESSMENTS

The figure below shows that for each quarter in the 12 month reporting period (October 2017

<b>EXECUTIVE SUMMARY</b>	<b>5</b>
preventative programs rather than reactive ones. On average, 87 preventative assessments were conducted each quarter, representing just over 80% of all assessments.	
<b>1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS</b>	<b>7</b>

<b>FIGURE 28. SMALL MINES PREVENTATIVE AND REACTIVE ASSESSMENTS - OCTOBER 2017 TO SEPTEMBER 2018</b>	<b>11</b>
<b>2. INDUSTRY SAFETY PROFILE</b>	

<b>3. COMPLIANCE ACTIVITIES</b>	<b>15</b>
---------------------------------	-----------

<b>4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES</b>	<b>25</b>
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<b>5. COAL SECTOR</b>	<b>28</b>
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<b>6. LARGE MINES AND QUARRIES</b>	<b>38</b>
------------------------------------	-----------

6.1 Large mines and quarries	38
6.2 Large mines and quarries - compliance activities	40
6.3 Large mines and quarries safety issues and good practice examples	45
<b>7. SMALL MINES AND QUARRIES</b>	<b>47</b>

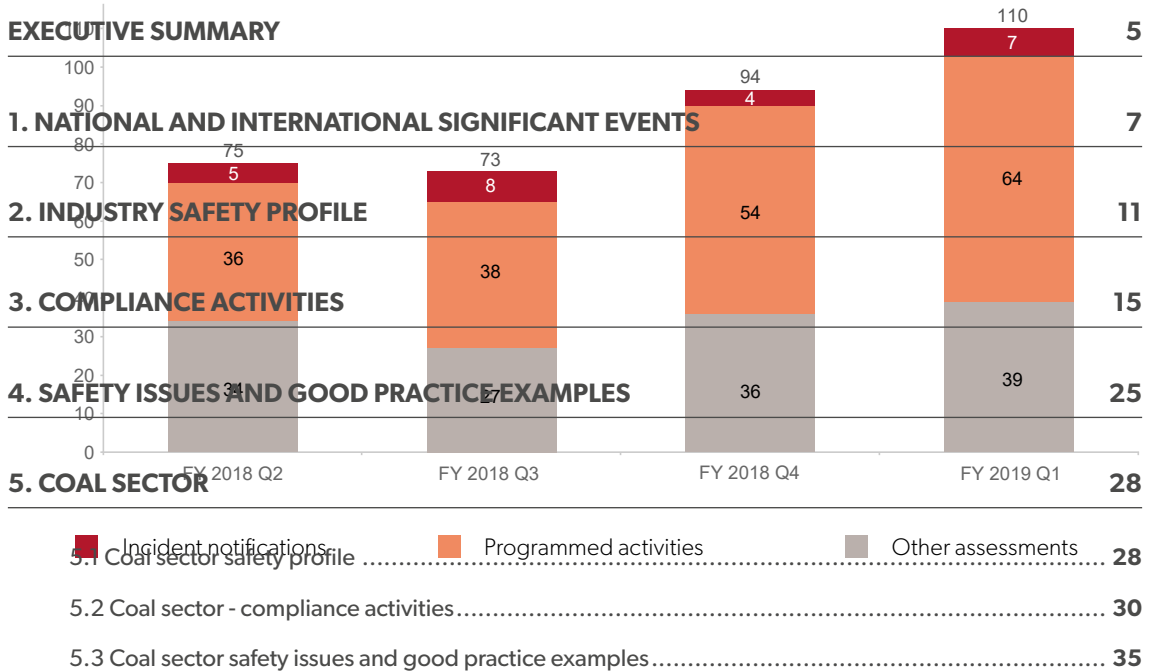
In the small mines sector, the regulator conducts various purpose driven site-based assessments. The general categories are described below:	
7.1 Small mines and quarries safety profile	47
7.2 Small mines and quarries - compliance activities	49
7.3 Small mines and quarries safety issues and good practice examples	54
<b>8. OPAL MINES</b>	<b>55</b>

Figure 29 shows that in quarter one 2018-19, almost 60% of all site-based inspections were programmed activities.	
8.1 Opal mines safety profile	55
8.2 Opal mines - compliance activities	55

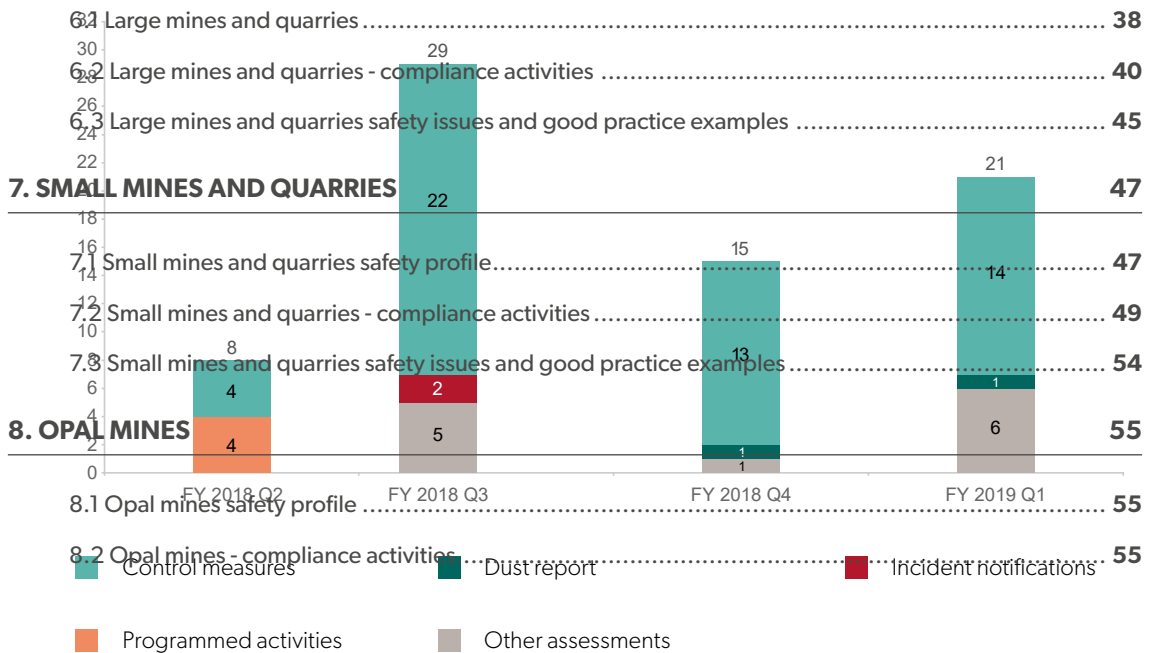


**FIGURE 29. SMALL MINES SITE-BASED ASSESSMENTS - OCTOBER 2017 TO SEPTEMBER 2018**

**Contents**



**FIGURE 30. SMALL MINES DESK-TOP ASSESSMENTS - OCTOBER 2017 TO SEPTEMBER 2018**

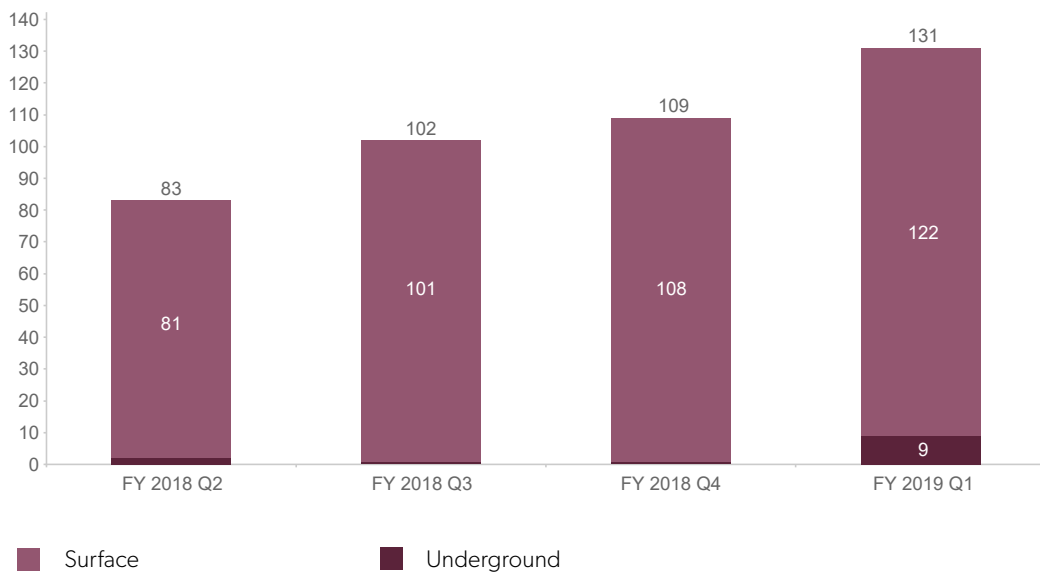


## SECTION // 7. SMALL MINES AND QUARRIES

The figure below shows the number of safety assessments the regulator conducted in small mines and quarries over the 12 month reporting period. Surface operations accounted for almost 97% of assessments in the sector.

In quarter one 2018-19, on average, 44 assessments were conducted per month. This was slightly higher than for the 12 months since October 2017 where, on average, 35 assessments were conducted per month.

**FIGURE 31. SMALL MINES SAFETY ASSESSMENTS BY OPERATION - OCTOBER 2017 TO SEPTEMBER 2018**



**PLANNED INSPECTIONS**  
**Contents**

The figure below shows the number of planned inspections the regulator conducted in quarter one 2018-19. For this quarter, planned inspections were spread across four hazard categories with just over half related to air quality, dust or other airborne contaminants.

**EXECUTIVE SUMMARY** **5**

**FIGURE 32. SMALL MINES PLANNED INSPECTIONS - OCTOBER 2017 TO SEPTEMBER 2018**

**1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS** **7**

**2. INDUSTRY SAFETY PROFILE** **11**

**3. COMPLIANCE ACTIVITIES** **15**

**4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES** **25**

**5. COAL SECTOR** **28**

5.1 Coal sector safety profile ..... **28**

5.2 Coal sector compliance activities ..... **30**

5.3 Coal sector safety issues and good practice examples ..... **35**

■ Air quality or dust or other airborne contaminants   ■ Electrical hazard - shock or arc flash   ■ Fire or explosion

**6. LARGE MINES AND QUARRIES** **38**

■ Dredging   ■ Other

6.1 Large mines and quarries ..... **38**

6.2 Large mines and quarries - compliance activities ..... **40**

6.3 Large mines and quarries safety issues and good practice examples ..... **45**

**7. SMALL MINES AND QUARRIES** **47**

7.1 Small mines and quarries safety profile ..... **47**

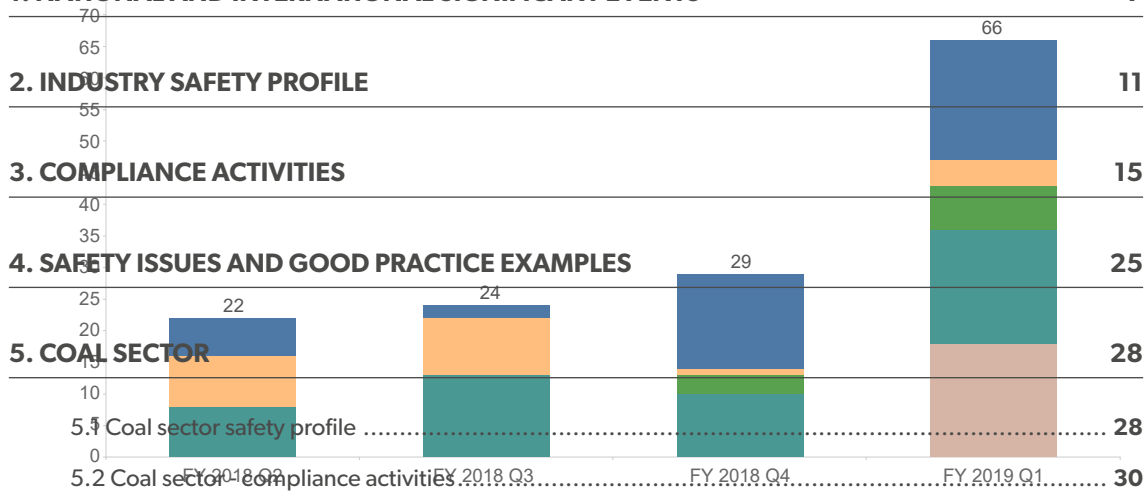
7.2 Small mines and quarries - compliance activities ..... **49**

7.3 Small mines and quarries safety issues and good practice examples ..... **54**

**8. OPAL MINES** **55**

8.1 Opal mines safety profile ..... **55**

8.2 Opal mines - compliance activities ..... **55**



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<b>EXECUTIVE SUMMARY</b>	<b>Spotlight: Safe systems of work for articulated trucks - a focus for the planned inspection program</b>	<b>5</b>
<b>1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS</b>	The regulator's planned inspection program identified an issue with safe access to mobile plant.	<b>7</b>
<b>2. INDUSTRY SAFETY PROFILE</b>	Safe systems of work associated to prevent falls from a height from mobile plant is an emerging issue for the quarrying sector (see <a href="#">SB16-06</a> ). In May 2018, a loader operator suffered three cracked ribs when he fell 1.5 metres from the top rung of the access ladder (see <a href="#">ISR18-19</a> ). In an earlier incident in 2016, a worker fell 2.7 m from the platform of an articulated dump truck and suffered serious head injuries (see <a href="#">Investigation report summary</a> ).	<b>11</b>
<b>3. COMPLIANCE ACTIVITIES</b>		<b>15</b>
<b>4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES</b>	Original Equipment Manufacturers (OEMs) and suppliers play a significant role in the design, installation and implementation of safe work systems to manage the risk of falls from height on mobile plant. Recent inspections by the regulator identified that legacy plant and some new plant have less than adequate fall from height controls. OEM safe design is a priority for the regulator.	<b>25</b>
<b>5. COAL SECTOR</b>		<b>28</b>
5.1 Coal sector safety profile		<b>28</b>
5.2 Coal sector - compliance activities		<b>30</b>
5.3 Coal sector safety issues and good practice examples		<b>35</b>
<b>6. LARGE MINES AND QUARRIES</b>	<b>Spotlight: Rock removal from dual tyre kit</b>	<b>38</b>
6.1 Large mines and quarries		<b>38</b>
6.2 Large mines and quarries compliance activities	Recently the regulator's Principal Inspector of Small Mines participated in the judging panel of the Cement, Concrete and Aggregates Australia's 2018 Innovation Awards Program. The winning safety initiative for 2018 was the 'Rock removal from dual tyre kit' developed by Boral.	<b>40</b>
6.3 Large mines and quarries safety issues and good practice examples		<b>45</b>
<b>7. SMALL MINES AND QUARRIES</b>	Rocks lodged between tyres is a common hazard. When removing rocks from between dual tyres debris can puncture tyres and be ejected at high velocity, creating a risk to both workers on site and the wider community on public roads. Previously, the practice was to pry the rock from in between the tyres using a jimmy bar. This placed the worker at risk in the event of a tyre burst.	<b>47</b>
7.1 Small mines and quarries safety profile		<b>47</b>
7.2 Small mines and quarries compliance activities		<b>49</b>
7.3 Small mines and quarries safety issues and good practice examples	The innovation utilises a nylon sling to remove rocks. The method uses a strap placed around the rock and then wrapped around an adjacent tyre. The truck movement is used to pull the rock, via the sling, from in between the tyres. The driver, located in the cabin, is removed from the risk of being hit by ejected debris.	<b>54</b>
<b>8. OPAL MINES</b>		<b>55</b>
8.1 Opal mines safety profile		<b>55</b>
8.2 Opal mines - compliance activities		<b>55</b>

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## 8. Opal mines

**EXECUTIVE SUMMARY** ..... 5  
**8.1 Opal mines safety profile** ..... 5

As at 5 October 2018, there were 3,459 active opal mines in NSW (see Figure 1 p.9). Almost all the opal mine sector is composed of underground small-scale titles. **7**

**2. INDUSTRY SAFETY PROFILE** ..... 11  
**SAFETY INCIDENT NOTIFICATIONS** ..... 11

In quarter one 2018-19, two incidents were notified to the regulator in the opal mine sector, representing just under 0.4% of the total number of 'all industry' incidents reported during that time. Both incidents resulted in serious injuries. **15**

**3. COMPLIANCE ACTIVITIES** ..... 15  
**4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES** ..... 25

The regulator is currently examining potential incident under-reporting as a priority compliance project. This report therefore sought to establish reporting benchmarks against which to measure future impacts of the project. **25**

**5. COAL SECTOR** ..... 28

5.1 Coal sector safety profile ..... 28  
**TABLE 10. NOTIFIED SAFETY INCIDENTS - OCTOBER 2017 TO SEPTEMBER 2018** ..... 28

	Q2 2017 18	Q3 2017 18	Q4 2017 18	Q1 2018-19	TOTAL
Opal sector - notified incidents	0	1	2	2	5
<b>6. LARGE MINES AND QUARRIES</b>					<b>29</b>
All sectors - total notified incidents	461	466	505	481	1,913

6.2 Large mines and quarries - compliance activities ..... 40

**8.2 Opal mines - compliance activities** ..... 45

**7. SMALL MINES AND QUARRIES** ..... 47  
**SAFETY ASSESSMENTS AND NOTICES ISSUED** ..... 47

The table below shows the number of notices issued and assessments conducted by the regulator over the 12 month reporting period. In quarter one 2018-19, the regulator issued two notices (representing 0.5% of all industry notices issued) and conducted 16 assessments (representing approximately 2% all industry assessments). **47**

7.1 Small mines and quarries safety profile ..... 47  
7.2 Small mines and quarries compliance activities ..... 49  
7.3 Small mines and quarries safety issues and good practice examples ..... 54

**8. OPAL MINES** ..... 55

Over the 12 month reporting period almost all opal mine assessments were site-based and preventative in nature. In quarter one 2018-19, just 95% of assessments were site-based, and 77% were preventative in nature. **55**

8.1 Opal mines safety profile ..... 55  
8.2 Opal mines - compliance activities ..... 55



**SECTION // 8. OPAL MINES**

**TABLE 11. OPAL SAFETY NOTICES ISSUED AND ASSESSMENTS - OCTOBER 2017 TO SEPTEMBER 2018**

	Q2 2017 18	Q3 2017 18	Q4 2017 18	Q1 2018-19	AVERAGE
Safety notices issued	3	12	5	2	22 (5.5)
Safety assessments conducted	36	11	31	16	94 (23.5)

In quarter four 2017-18, the regulator conducted four planned inspections on ground and strata in opal mines. Planned inspections are preventative in nature and their purpose is to identify potential compliance weaknesses which could lead to an incident. The inspections follow a pre-prepared plan and are focused on a principal mining hazard.

**TABLE 12. OPAL PLANNED SAFETY INSPECTIONS BY HAZARD - OCTOBER 2017 TO SEPTEMBER 2018**

Ground or strata failure	3	3	16	4	26
Work at heights	3	1	-	-	4
Ventilation	-	-	1	-	1
Other	-	-	-	1	1
Total	6	4	17	5	32





**Spotlight: Preventing falls from a height in opal mines**

<b>EXECUTIVE SUMMARY</b>	<b>5</b>
Elevated work includes workers being exposed to risk of falling from a height or being hit by falling objects. Working in opal mine shafts and operating material handling hoists in shafts both	
<b>1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS</b>	<b>7</b>
On 29 April 2018, a claim holder/mining operator suffered spinal fractures when he fell to the	
<b>2. INDUSTRY SAFETY PROFILE</b>	<b>11</b>
holder/mining operator undertaking work on the ladder in the shaft. On 11 May 2018, a claim holder/mining operator suffered compound fractures of both ankles and a femur when he fell	
<b>3. COMPLIANCE ACTIVITIES</b>	<b>15</b>
down a shaft while using the mine shaft access ladder to exit the shaft.	
<b>4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES</b>	<b>25</b>
Risk of falling must be prevented or minimised by providing a fall prevention device, a work positioning system, or a fall arrest system, so far as is reasonably practicable. If a ladder is used for access it must be fit-for-purpose and regularly inspected.	
<b>5. COAL SECTOR</b>	<b>28</b>
A fatal incident on 4 November 2016 involving a materials hoist, highlighted the importance of safe design. The investigation identified a design flaw in the Agfab Super Hoist. The single acting counterbalance valve created a hazard in the event of a winch cable over spool. For more	
5.1 Coal sector safety profile	28
5.2 Coal sector - compliance activities	30
5.3 Coal sector safety issues and good practice examples	35
In response to this incident, the regulator developed a training program targeting hoists. The	
<b>6. LARGE MINES AND QUARRIES</b>	<b>38</b>
training is to raise awareness around the installation, commissioning, safe operation and decommissioning of hoists. The program was delivered in the Lightning Ridge and White	
6.1 Large mines and quarries	38
Cliff gemstone mining areas in July 2018. It will be integrated into the ongoing Opal mining safety awareness and operators' courses.	
6.2 Large mines and quarries - compliance activities	40
6.3 Large mines and quarries safety issues and good practice examples	45
<b>7. SMALL MINES AND QUARRIES</b>	<b>47</b>
7.1 Small mines and quarries safety profile	47
7.2 Small mines and quarries - compliance activities	49
7.3 Small mines and quarries safety issues and good practice examples	54
<b>8. OPAL MINES</b>	<b>55</b>
8.1 Opal mines safety profile	55
8.2 Opal mines - compliance activities	55



### Spotlight: Falling down opal mine shafts is a known risk

Falling from height is a common cause of fatal and serious injury in the mining industry. In May 2018, the regulator issued a Safety Bulletin ([SB18-10](#)) following three incidents, highlighting the need for safe systems of work for accessing and egressing from open shafts and shaft security in general at the Lightning Ridge opal fields.

On 13 September 2018, a claim holder and mine operator climbed down an access ladder and fell approximately 2.1m from the bottom of the ladder. The worker sustained serious injuries in both legs. The vertical shaft was approximately 8m in depth and no working at height equipment was being used. The worker was alone and emergency management systems were not in place.

Falling down mine shafts is a well-known to opal miners. Mine operators must put measures in place to ensure that people are prevented from falling down mines shafts.



# Contents

## 9. Petroleum and geothermal

**EXECUTIVE SUMMARY** There were 265 active petroleum and geothermal mines in NSW. All were surface mines (see Figure 1 p.9) **5**

### 1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS **7**

#### 9.1 Petroleum and geothermal safety incident notifications

**2. INDUSTRY SAFETY PROFILE** notified incidents in the petroleum and geothermal sector in the 12 month reporting period. **11**

### 3. COMPLIANCE ACTIVITIES **15**

**TABLE 13. PETROLEUM AND GEOTHERMAL NOTIFIED INCIDENTS - OCTOBER 2017 TO SEPTEMBER 2018**

	Q2 2017 18	Q3 2017 18	Q4 2017 18	Q1 2018-19	TOTAL (AV)	
<b>5. COAL SECTOR</b>						<b>28</b>
Number of notified incidents	0	0	0	0	0	
All sectors - total notified incidents	461	466	505	481	1,913	
5.2 Coal sector - compliance activities						<b>30</b>
5.3 Coal sector safety issues and good practice examples						<b>35</b>

#### 9.2 Petroleum and geothermal - compliance activities

### 6. LARGE MINES AND QUARRIES **38**

The table below shows the safety assessments conducted and number of notices issued by the regulator over the 12 month reporting period for the petroleum and geothermal sector. In quarter one 2018-19, the regulator conducted 32 assessments (representing approximately 4% of assessments across all sectors) but issued no notices.

<b>6.1 Large mines and quarries</b>						<b>38</b>
6.2 Large mines and quarries - compliance activities						<b>40</b>
6.3 Large mines and quarries safety issues and good practice examples						<b>45</b>

### 7. SMALL MINES AND QUARRIES **47**

**TABLE 14. SECTOR ASSESSMENTS AND NOTICES - OCTOBER 2017 TO SEPTEMBER 2018**

	Q2 2017 18	Q3 2017 18	Q4 2017 18	Q1 2018-19	TOTAL (AV)	
<b>7.2 Small mines and quarries safety issues and good practice examples</b>						<b>54</b>
Safety notices issued	0	0	9	0	9	
<b>8. OPAL MINES</b>						<b>55</b>
Safety assessments conducted	12	30	49	32	123 (31)	

#### 8.1 Opal mines safety profile **55**

In quarter four 2017-18 the regulator conducted a high visibility compliance operation. The focus was on well sites within one kilometre of residential areas. A total of 27 well sites were inspected over a three day period and the regulator issued of five improvement notices and four notices of concern.

#### 8.2 Opal mines - compliance activities **55**



The improvement notices were issued for:

- by-passing critical safety hardware that would prevent the well from being shut in remotely in case of emergency
- no risk assessment conducted for wellhead change out operations

<b>EXECUTIVE SUMMARY</b>	<b>5</b>
• unkempt vegetation around well sites presenting a potential fire hazard and	

<b>1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS</b>	<b>7</b>
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<b>2. INDUSTRY SAFETY PROFILE</b>	<b>11</b>
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<b>3. COMPLIANCE ACTIVITIES</b>	<b>15</b>
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<b>4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES</b>	<b>25</b>
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<b>5. COAL SECTOR</b>	<b>28</b>
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5.1 Coal sector safety profile .....	28
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5.2 Coal sector - compliance activities .....	30
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5.3 Coal sector safety issues and good practice examples .....	35
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<b>6. LARGE MINES AND QUARRIES</b>	<b>38</b>
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6.1 Large mines and quarries .....	38
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6.2 Large mines and quarries - compliance activities .....	40
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6.3 Large mines and quarries safety issues and good practice examples .....	45
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<b>7. SMALL MINES AND QUARRIES</b>	<b>47</b>
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7.1 Small mines and quarries safety profile.....	47
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7.2 Small mines and quarries - compliance activities .....	49
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7.3 Small mines and quarries safety issues and good practice examples .....	55
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<b>8. OPAL MINES</b>	
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8.1 Opal mines safety profile.....	55
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8.2 Opal mines - compliance activities .....	55
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## 10. Exploration

**EXECUTIVE SUMMARY** There were 705 active exploration sites excluding petroleum and geothermal in NSW. All were surface exploration sites, (see Figure 1 p.9) **5**

**1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS** **7**  
**10.1 Exploration safety incident notifications**

**2. INDUSTRY SAFETY PROFILE** In quarter one 2018-19, the regulator was notified of three safety incidents in the exploration sector, representing just over 0.5% of the total number of incidents across all sectors. **11**

**3. COMPLIANCE ACTIVITIES** **15**

**TABLE 15. EXPLORATION - NUMBER OF SITES AND NOTIFICATIONS - OCTOBER 2017 TO SEPTEMBER 2018**

	Q2 2017 18	Q3 2017 18	Q4 2017 18	Q1 2018-19	TOTAL (AV)
<b>5. COAL SECTOR</b>					
5.1 Coal sector notified incidents	4	2	2	3	11 (3.75)
All sectors notified incidents	461	466	505	481	1,913

5.2 Coal sector - compliance activities ..... **30**

**10.2 Exploration safety assessment notices** **35**  
 5.3 Coal sector safety issues and good practice examples ..... **35**

In quarter one 2018-19, the regulator conducted four assessments and issued three notices in the exploration sector. Over the 12 month reporting period, 30% of assessments were site-based and 18% were preventative in nature. By comparison, in this quarter, two thirds of exploration assessments were site-based and one third were preventative in nature. **38**

**6. LARGE MINES AND QUARRIES** **38**

**6.1 Large mines and quarries** ..... **38**

6.2 Large mines and quarries - compliance activities ..... **40**

**TABLE 16. EXPLORATION ASSESSMENTS AND NOTICES, OCTOBER 2017 TO SEPTEMBER 2018** ..... **45**

<b>7. SMALL MINES AND QUARRIES</b>	Q2 2017 18	Q3 2017 18	Q4 2017 18	Q1 2018-19	TOTAL (AV)
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7.1 Small mines and quarries safety profile ..... **47**  
 Safety notices issued ..... **47**

Safety assessments conducted ..... **13 (8.75)**

7.3 Small mines and quarries safety issues and good practice examples ..... **54**

**8. OPAL MINES** **55**

8.1 Opal mines safety profile ..... **55**

8.2 Opal mines - compliance activities ..... **55**

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#### 2. INDUSTRY SAFETY PROFILE 11

INCIDENT NOTIFICATION	LEGISLATION	15
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#### 3. COMPLIANCE ACTIVITIES 15

Workplace death	<a href="#">s.14(a) Work Health and Safety (Mines and Petroleum sites) Act 2013</a>	
Serious injury or illness	<a href="#">s.14(b) Work Health and Safety (Mines and Petroleum sites) Act 2013</a>	
Dangerous incident	<a href="#">s.14(c) Work Health and Safety (Mines and Petroleum sites) Act 2013</a>	
Medical treatment injury	<a href="#">cl.128(1)(a) Work Health and Safety (Mines and Petroleum sites) Regulation 2014</a>	
High potential incident	<a href="#">cl.128(1)(b) Work Health and Safety (Mines and Petroleum sites) Regulation 2014</a>	
Explosive regulation notifications	<a href="#">cl.102 Explosives Regulation 2013</a> <a href="#">cl.103 Explosives Regulation 2013</a>	
Coal Industry Act reportable event	<a href="#">s.45 Coal Industry Act 2001</a>	

#### 7. SMALL MINES AND QUARRIES 47

7.1 Small mines and quarries safety profile.....	47
7.2 Small mines and quarries - compliance activities .....	49
7.3 Small mines and quarries safety issues and good practice examples .....	54

#### 8. OPAL MINES 55

8.1 Opal mines safety profile .....	55
8.2 Opal mines - compliance activities.....	55

# Contents Appendix 2. Data Summary

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## 1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS 7

**TABLE 17. MINES BY SECTOR, OPERATION TYPE, NUMBER OF INCIDENTS, ASSESSMENTS AND NOTICES**

Active mines*	7,455	7,438	7,220	(7,371)
Coal mines	113	111	109	(111)
Large mines and quarries	<b>MPLES</b> 36	36	37	<b>25</b> (36)
Small mines and quarries	2,705	2,695	2,645	(2,681) <b>28</b>
Opal mines	3,497	3,478	3,459	(3,478) <b>28</b>
Petroleum and geothermal	186	185	265	<b>30</b>
Exploration	918	932	705	(852)
Mines that reported hours*	743	707	702	111** 1,041***
Mines that notified incidents	96	106	93	103 182***
Number of incident notifications	461	466	505	481 1,913 (478)
Coal mines	384	367	419	373 1,543 (386) <b>47</b>
Large mines and quarries	52	72	63	71 258 (65) <b>47</b>
Small mines and quarries	21	24	19	32 96 (24) <b>49</b>
Opal mines	0	1	2	2 5 <b>54</b>
Petroleum and geothermal	0	0	0	0 0 <b>55</b>
Exploration	4	2	2	3 11 <b>55</b>
Non-mine	0	0	0	0 0 <b>55</b>
Notifications per mine that notified	4.8	4.4	5.4	4.7 (4.8) <b>55</b>

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Notices issued	830	1,160	1,092	847	3,929	(982)
Coal mines	563	815	713	501	2,592	(648)
<b>EXECUTIVE SUMMARY</b>						<b>5</b>
Large mines and quarries	106	174	133	117	530	(133)
<b>1. NATIONAL AND INTERNATIONAL SIGNIFICANT EVENTS</b>						<b>7</b>
Small mines and quarries	82	102	109	131	425	(106)
Opal mines	36	12	31	16	95	(24)
<b>2. INDUSTRY SAFETY PROFILE</b>						<b>11</b>
Petroleum and geothermal	12	30	49	32	123	(31)
<b>3. COMPLIANCE ACTIVITIES</b>						<b>15</b>
Exploration (excl. petroleum)	2	5	2	4	13	(3)
Non-mine	28	22	55	46	151	(38)
<b>4. SAFETY ISSUES AND GOOD PRACTICE EXAMPLES</b>						<b>25</b>
Notices issued	282	319	462	411	1474	(369)
<b>5. COAL SECTOR</b>						<b>28</b>
Coal mines	155	107	210	157	629	(157)
5.1 Coal sector safety profile						<b>28</b>
Large mines and quarries	33	97	109	112	351	(88)
5.2 Coal sector - compliance activities						<b>30</b>
Small mines and quarries	89	98	126	137	450	(113)
5.3 Coal sector safety issues and good practice examples						<b>35</b>
<b>6. LARGE MINES AND QUARRIES</b>						<b>38</b>
Opal mines	3	12	5	2	22	(5.5)
Petroleum and geothermal	0	0	9	0	9	(0)
6.1 Large mines and quarries						<b>38</b>
Exploration (incl. coal)	0	0	2	3	5	(0)
6.2 Large mines and quarries - compliance activities						<b>40</b>
Non-mine	0	0	0	0	0	(0)
6.3 Large mines and quarries safety issues and good practice examples						<b>45</b>
<b>7* SMALL MINES AND QUARRIES</b>						<b>47</b>
Data not available for previous quarters						
**Incomplete data as quarterly reports detailing hours worked are not due for quarter one 2017-18						
7.1 Small mines and quarries safety profile						<b>47</b>
7.2 Small mines and quarries - compliance activities						<b>49</b>
7.3 Small mines and quarries safety issues and good practice examples						<b>54</b>
<b>8. OPAL MINES</b>						<b>55</b>
8.1 Opal mines safety profile						<b>55</b>
8.2 Opal mines - compliance activities						<b>55</b>
<b>Appendix 3. Targeted Assessment Programs</b>						<b>55</b>

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## SECTION // APPENDIX 3. TARGETED ASSESSMENT PROGRAMS

SECTOR	OPERATION TYPE	TARGETED ASSESSMENT PROGRAM	Q2 17/18			Q3 17/18			Q4 17/18			Q1 18/19			ANNUAL TOTALS		
			TAP	§191	§195	TAP	§191	§195	TAP	§191	§195	TAP	§191	§195	TAP	§191	§195
Metaliferous	Underground	Air qual - DEE	0	-	-	0	-	-	0	2**	-	0	-	0	0	2**	0
		Air qual - airborne contaminants	3	7	0	1	2	0	3	9	0	0	-	7	18	0	
		Emergency management	1	1	0	1	0	0	0	-	-	0	-	2	1	0	
		Fire or explosion	0	-	-	0	-	-	0	-	-	5	12	0	5	12	0
		UG metaliferous sub total	4	8	0	2	2	0	3	11	0	5	12	0	14	33	0
	Surface	Fire or explosion	3	3	1	2	0	0	3	2	0	2	1	0	10	6	1
		Explosion suppression	3	0	0	1	0	0	2	1	0	0	-	6	1	0	
		Air qual - DEE	4	4	2*	3	2	2	3	4***	1	2	0	0	12	10	5
		Emergency management	2	1	0	1	0	0	0	-	-	0	-	3	1	0	
		Fatigue	-	-	-	-	-	-	-	-	-	1	0	0	1	0	0
Coal mines	Underground	UG coal sub total	12	8	3	7	2	2	8	7	1	5	1	0	32	18	6
		Air qual - airborne contaminants	2	1	0	2	2	0	2	1	0	3	0	0	9	4	0
	Surface	Fatigue	2	0	0	3	0	0	2	0	0	1	0	0	8	0	0
		Surface coal sub total	4	1	0	5	2	0	4	1	0	4	0	0	17	4	0
	Total		20	17	3	14	6	2	15	19	1	14	14	0	63	55	6

\* In quarter two 2017-18, two prohibition notices were issued for DEE during the fire and explosion TAP

\*\* In quarter one 2018-19, one improvement notice (UG metaliferous) was issued for DEE during the underground metaliferous airborne contaminants TAP

\*\*\* In quarter one 2018-19 one improvement notice (UG coal) was issued for DEE during the fire or explosion TAP

Note: These are included as DEE notices in Figures 8, 16 and 24.



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