

**NSW
Resources
Regulator**

○ **Mine safety
performance report**

2016 - 2017



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Definitions

See Appendix 1 and 2 for more information:

- Appendix 1 contains definitions of injury classifications, frequency rates, terminology, enforcement and advice notices.
- Appendix 2 contains definitions of active mines and mine types.

Executive summary

This report presents a snapshot of the health and safety performance of the NSW mining and petroleum industry as reported to the NSW Resources Regulator, in conjunction with regulatory activities for the financial year 2016-17. The information in this report is presented alongside comparable data spanning a decade (2007-08 to 2016-17).

While the report does not tell the whole story of risk management by the industry's duty holders or of regulatory oversight, it features an important suite of measures to help guide future actions to improve health and safety performance. It is important to mention that overreliance on failure data to monitor safety performance means that improvement or changes are only determined after something has gone wrong. While lag indicators have a place in understanding control failure, the regulator's proactive safety assessment program is focused on checking whether critical controls are effective and operating as intended.

Work health and safety regulatory intervention has been in place in the Australian mining industry for more than a century. While the NSW mining industry has continued to minimise the risk to health and safety of workers, in 2016-17, there were three mining fatal injuries, 102 serious injuries, 265 lost time injuries, 197 injury outcomes (lost time and restricted duties) of seven days or more and 885 total recordable injuries reported to the regulator.

While there has been a long term decrease in fatal injuries in the NSW mining coal, metalliferous and extractives sectors, over the last decade the frequency rate of fatal injuries has remained between 0.033 to 0.035 per million hours worked.

In the years since 2007-08, the rate of serious injuries (per million hours worked) in the coal, metalliferous and extractives sector fell by approximately 30% but in recent years, an increase has been observed. Since the Work Health and Safety (Mines & Petroleum Sites) Regulation 2014 commenced, the serious injury rate has more than doubled. The legislation broadened the scope of the definition, contributing to this increase.

For lost time injuries, from 2007-08 to 2016-17, the five year average frequency rate fell by almost two-thirds from 12.865 to 4.774 and for injuries with outcomes of seven days or more from 2012-13 to 2016-17 the five year average frequency rate decreased by just over one-third from 6.660 to 4.338.

In a high hazard industry, a concerted and sustained effort is required by both industry and the regulator to target not only the most common causes of fatality but to also maintain a dedicated focus on preventing catastrophic events. During 2016-17, NSW embarked on significant reforms of work health and safety regulation in the industry under the Incident Prevention Strategy. Key changes include:

- improved information collection, analysis and use
- a proactive targeted assessment program to assess control measure effectiveness for risks associated with principal hazards according to operations' risk profiles and a
- a centralised reporting process to provide a single contact point for receiving incident and high-risk activity notifications, requests for information, complaints and general inquiries.

To this end, in 2016-17, the regulator provided an appropriate level of response to 1,971 notified safety incidents. In addition, as part of the targeted assessments, interventions and investigations conducted during the year, the regulator issued 1,328 mine safety notices including 108 prohibition notices.

Key performance measures - summary

Fatal injuries

Three fatal mining accidents occurred during 2016-17 year in a coal mine, an underground metalliferous mine and an underground opal mine.

In 2016-17, the fatal injury frequency rate (FIFR) increased by almost 30% compared to 2015-16 from 0.027 to 0.035. This represents an increase in the coal sector by 30% while the metalliferous FIFR increased by 43% and the extractives decreased by approximately 3.5%.

Serious injuries

In the period since the commencement of the Work Health and Safety (Mining & Petroleum Sites) Regulation 2014, the number of serious injuries reported to the regulator by the coal, metalliferous and extractives sector increased year on year. Under the new regulation, the definition of serious injury was expanded, contributing to the increases observed.

In 2016-17, the serious injury frequency rate (SIFR) for the coal, metalliferous and extractives sector was up to 1.012 from 0.830. Compared to the previous year, this represents an increase of approximately 22%. Over the ten year reporting period, the SIFR decreased by almost 30%.

Lost time injuries

The regulator's safety performance data identified improvements in the number of lost time injuries being reported by the NSW mining industry even though the number of lost time injuries remained stable from 2015-16 to 2016-17 with 267 and 265 injuries being reported respectively.

Since 2007-08, the five year rolling average lost time injury frequency rates (LTIFR) has steadily declined. In 2016-17, LTIFRs were less than half of what was reported in 2007-08. Other factors, in addition to improved safety practices, are likely to have contributed to the observed decrease. These might include injury under reporting by industry and improved return to work and injury management practices.

Injury outcomes of seven days or more

In 2016-17, there were 197 injury outcomes (lost time /restricted duties injuries – LTI/RDI \geq 7 days or more) of one week or more. This is down 67 compared to the previous year. In the ten years since 2007-08, the number of injuries of this type has more than halved, from 426 in 2007-08 to 197 in 2016-17. Over the ten year reporting period, the frequency rate of LTI/RDI \geq 7 days or more has decreased by 53.76%.

Total recordable incidents

The number of total recordable incidents has declined year on year since 2008-09. The five year rolling average total recordable injuries frequency rate (TRIFR) decreased by approximately 12% from 2015-16 to 2016-17. In 2016-17, TRIFRs were approximately two-thirds less than what was reported in 2007-08.

Notified safety incidents

In 2016-17, safety incident notifications to the regulator were down 310 compared to the previous year from 2,281 to 1,971. For the ten years from 2007-08, almost 90% of safety incidents notified were from the coal sector.

Complaints

In 2016, the regulator streamlined and centralised its complaints reporting and incident notification processes. The regulator also changed the way it recorded complaints. As a result, the number of complaints nearly tripled compared to the previous year from 36 to 106. The increase in complaint notifications was most evident in the coal and non-mines sectors.

Safety notices

From 2016, the proportion of improvement notices relative to notices of concern (advice) increased. This reflects the regulator's renewed focus on incident prevention where it sought to clearly identify matters that necessitated the issue of an improvement notice as compared to a written notice of concern.



TABLE 1. NSW COAL, METALLIFEROUS AND EXTRACTIVES COMPARISON OF KEY PERFORMANCE INDICATORS 2015-16 AND 2016-17

Key Performance Indicators	Coal Underground		Coal Surface		Coal Total		Metalliferous Underground		Metalliferous Surface		Metalliferous Total		Extractives		Coal, Metalliferous and Extractives Total	
	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17
Million hours worked	13,494,369	13,058,476	26,259,089	28,069,253	39,753,458	41,127,729	8,993,433	6,817,788	2,659,596	5,310,540	11,653,029	12,128,328	4,218,937	5,334,385	55,625,424	58,590,442
Full time equivalent employees	6,747	6,529	13,130	14,035	19,877	20,564	4,497	3,409	1,330	2,655	5,827	6,064	2,109	2,667	27,813	29,295
Fatal injuries (FI)	0	0	0	1	0	1	1	1	0	0	1	1	0	0	1	2
FIFR 5 year average	0.022	0.024	0.014	0.021	0.017	0.022	0.057	0.083	0.000	0.000	0.042	0.060	0.086	0.083	0.027	0.035
Lost time injuries (LTI)	106	123	52	53	158	176	56	24	6	19	62	43	47	46	267	265
LTI/FR 5 year average	9.136	8.740	2.361	2.338	4.966	4.668	3.411	3.497	2.399	2.839	3.112	3.334	10.777	10.040	4.963	4.774
Restricted duty injuries (RDI)	246	187	68	68	314	255	89	87	49	24	138	111	39	17	491	383
Medical treatment injuries (MTI)	58	73	51	52	109	125	47	40	3	21	50	61	40	49	199	235
Total recordable injuries (TRI)	410	383	171	174	581	557	193	152	58	64	251	216	126	112	958	885
TRIFR 5 year average	32.932	31.179	6.777	6.479	16.712	15.471	0.000	22.031	10.982	11.428	19.113	19.050	31.724	27.974	18.290	17.189
Serious injuries (SI)	34	48	19	21	53	69	22	17	4	4	26	21	17	12	96	102
SIFR 5 year average	1.431	1.854	0.384	0.452	0.774	0.942	0.799	1.080	0.828	0.922	0.792	0.986	1.490	1.741	0.830	1.012
LTI/RDI ≥ 7 days	196	147	44	38	240	185	9	7	2	1	11	8	13	4	264	197
LTI/RDI ≥ 7 days FR 5 year average	14.082	12.772	1.761	1.609	6.441	5.673	0.606	0.661	1.098	1.010	0.732	0.759	2.444	1.865	4.933	4.338
Safety Incident notifications	1,377	1,133	514	456	1,891	1,589	165	168	72	78	237	246	146	135	2,274	1,970
Safety Complaint notifications	3	21	4	31	7	52	6	11	4	3	10	14	13	17	30	83
Safety Notices issued	450	413	260	134	710	547	87	143	39	38	126	181	544	429	1,380	1,157

Explanatory Notes

NSW mining industry data was extracted from Resources Regulator's database in 2018

This report presents health and safety performance data on injuries (fatal, serious injuries, lost time and lost time/restricted duties with outcomes of one week or more), notified safety incidents, complaints and hours worked. All information presented was either reported to the NSW Resources Regulator within the Department of Planning and Environment (the regulator) by the NSW mining and extractives industry through quarterly work health and safety reporting or through incident notification, or was information obtained from safety (enforcement and advice) notices issued by the regulator. See Appendix 1 for definitions.

Sector based chapters in the report have been included for the following mining operation types: coal, metalliferous, extractives, petroleum, opal sectors. While exploration sites are included within each relevant operation type, a stand alone sector has also been included. Appendix 2 lists further details about operation types.

Data in this report was extracted from the regulator's compliance database on 6 August 2018 and the serious injury classification data was updated on 18 November 2018. The reporting period is for ten years, from 2007-08 to 2016-17.

Rate based frequency measures are calculated using quarterly report data

In NSW, coal, metalliferous and extractives mining operations are required to submit quarterly work health and safety forms with lost time and restricted duties injury information as well as hours worked. This information was used to generate frequency rates.

It is worth noting that mandatory quarterly reporting commenced as follows for the:

- coal sector - early 2007-08
- metalliferous and extractives - second quarter of 2008-09
- coal exploration sites - 1 February 2015.

Up to 2006-07, hours worked, and lost time injury data for the coal sector were sourced from Coal Services Pty Ltd. Until 2008-09, metalliferous and extractives hours worked, and lost time injuries were compiled from several sources and included some estimation.

Frequency rates (per million hours worked) have been calculated for each injury measure. Rates were based on hours worked data submitted by the coal, metalliferous and extractives sectors as part of the quarterly reporting requirements listed above. Petroleum sites, underground small gemstone mines, opal mines and tourist mines are not required to submit quarterly reports. Frequency rates are therefore not available for the non-coal other (such as opal mines) and petroleum (onshore) sectors.

Where ever possible a rolling five year average was calculated for rate based measures. This is a statistical smoothing technique that charts the average annual value for the past five years was applied. This enables a long-term trend to be produced directly from raw data. It is particularly useful where values may vary widely from year to year. For Total Recordable Injuries, five year averages were not able to be calculated for the entire ten year reporting period. The regulator collected TRI data from the coal sector in 2007 and 2008 for the non-coal sector, hence the five year average commences at 2011-12.

EXPLANATORY NOTES

The regulator notes that it is likely that mines under-report lost time injuries for non-employees such as contractors unless the injured worker's external employer advised the mine of lost time.

All data is subject to continuous improvement due to internal audit and validation processes and updates from external sources. Incorrectly classified information from past years is sometimes found and reclassified in source databases. The regulator's reporting employs the best available data at the time of writing, which may differ from previously published figures.

While there has been a long term decrease in fatal injuries in the NSW mining coal, metalliferous and extractives sectors, over the last decade the frequency rate of fatal injuries has remained between 0.033 to 0.035 per million hours worked.



Industry overview

Industry overview statistics and performance measures 2016-17



- 3 fatal injuries
- Fatal injury frequency rate (per million hours worked) up 22.86% from 0.027 in 2015-16 to 0.035 in 2016-17
- 102 serious injuries – most common mechanism is being hit by moving object
- Serious injury frequency rate (per million hours worked) up 19.06% from 0.830 in 2015-16 to 1.012 in 2016-17
- 265 lost time injuries
- Lost time injury rate (per million hours worked) down 3.81% from 4.963 in 2015-16 to 4.774 in 2016-17
- 197 injury (lost time or restricted duty) outcomes of seven days or more
- Injury outcomes seven days or more rate (per million hours worked) down 12% from 4.993 in 2015-16 to 4.338 in 2016-17
- 885 total recordable injuries
- Total recordable injuries rate (per million hours worked) down 6% from 18.290 in 2015-16 to 17.189 in 2016-17.
- 1,971 notified safety incidents notified to the regulator where > 274 received onsite response by regulator
- 106 complaints – 33 complaints lodged in relation to underground operations
- 1,328 safety notices – 108 were prohibition notices.

Industry statistics

Mines by sector

During the twelve months covered by this report; a total of 7,463 mining operations reported as 'active' (open mines, open mines that operate intermittently, mine that are under care and maintenance and open tourist mines) to the regulator and recorded in its database.

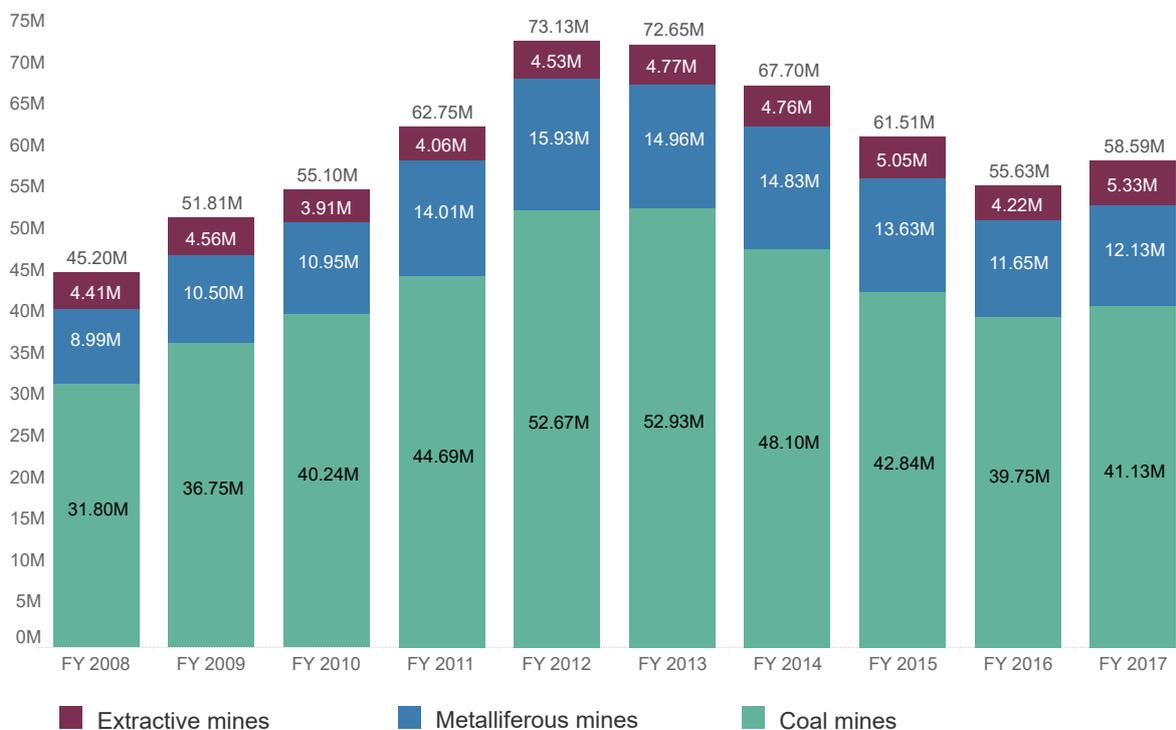
The breakdown by sector includes: 195 coal mines, 412 metalliferous mines, 2,743 extractives mines, 405 petroleum sites, 3,487 opal mines and 221 other mines (e.g. coal handling preparation plants and workshops).

Hours worked

From 2015-16 to 2016-17, work activity in the NSW mining industry an increased by 5.32% from 55.63 to 58.59 million hours. The number of hours worked in the coal and metalliferous sectors also increased by 3.60% and 4.12% respectively.

At the close of the ten year reporting period, the number of hours worked had also increased by almost 30% from 45.20 to 58.59 million hours worked. For the coal sector, hours worked increased by 29%, metalliferous by 35% and while the extractives sector increased its hours worked by 21%. The opal and petroleum sectors are not represented in NSW hours worked figures because mining operators in these sectors are not required to submit quarterly reporting data to the regulator.

FIGURE 1. COAL, METALLIFEROUS AND EXTRACTIVES HOURS WORKED BY SECTOR 2007-08 TO 2016-17



Fatal injuries

Fatal injuries during 2016-17

In 2016-17 there were three mining fatal injuries in NSW. The accidents occurred at an underground opal mine in Lightning Ridge, a surface coal mine and an underground metalliferous mine.



Spotlight: Worker at an underground opal mine in Lightning Ridge, 4 November 2016

The worker was hit by a hoist bucket that fell to the bottom of the mine shaft. The regulator's investigation identified a design flaw in the hoist where the single acting counterbalance valve created a hazard in the event of a winch cable over spool. For more information about the suspected mode of failure see the [Investigation report](#).

Working around materials hoists poses a risk to the safety of workers. Materials hoists may fail at any time. Control measures must prevent workers from working under a suspended load. The mine safety management system must set out the systems, procedures and other control measures that to ensure the safety of workers operating or working around materials hoists.

When work is undertaken in a shaft, the material hoist bucket must be secured, either at the bottom of the shaft or at the surface, with the hoist system isolated and protective guarding installed to prevent the bucket or other items falling down the shaft.



Spotlight: Contract company worker at Rix's Creek surface coal mine, 13 December 2016

The haulage company worker received a fatal head injury while attempting to clean residual material out of the trailer of a truck. The worker was struck by a falling trailer tailgate which was inappropriately propped open.

Falling plant and equipment pose a serious risk to health and safety and require appropriate control measures to prevent an object from falling. Workers should not undertake any work underneath suspended and unsecured plant and equipment.

Plant and equipment should be cleaned at fit-for-purpose washing facilities that eliminate the need for persons to work underneath suspended and unsecured plant and equipment. Fit-for-purpose access and egress points should be used to access plant and equipment. Trailers and truck trays should have safe access points.

Persons who conduct a business or undertaking; and design manufacture or supply plant and equipment have a duty to prevent objects from falling in the workplace.

Related investigation Release: [Investigation report](#)



**Spotlight: Contract company worker at Peak Gold mine,
3 April 2017**

A 36-year-old worker, employed by contract mining services company, reported feeling unwell at an underground metalliferous mine while operating a mobile rock drill in a development road. The worker lost consciousness while being transported to the surface but unfortunately was unable to be resuscitated. The regulator's investigation is ongoing.

The incident highlights the risks of working in hot and humid environments. The risks to health and safety regarding hot and humid working environments are well known. Working in intense heat can raise normal body temperature and lead to serious dehydration, heat stroke and possible death.

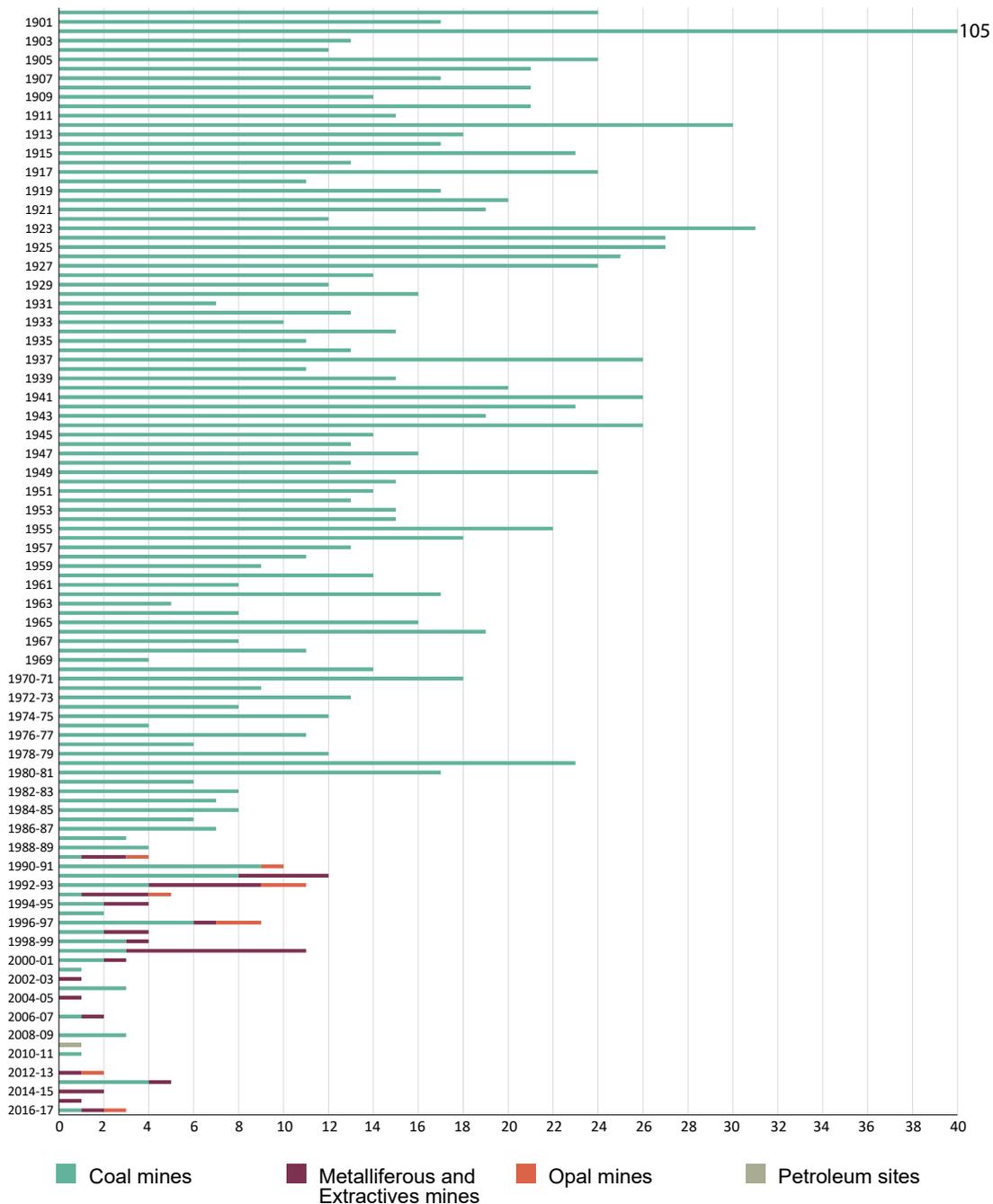
The management and control of atmospheric conditions in underground mines is vital. If risks associated with extreme heat exist at an underground mine, adequate control measures must be implemented to manage heat stress (heat-related illness) in places where people work or travel where the wet bulb temperature exceeds 27° Celsius.

Heat stress management plans should make provision for pre-shift and during-shift temperature testing of workplaces and dehydration testing of workers. Workers should be adequately supervised and actively monitored for signs of dehydration and heat-related illnesses. Regular crib and rest breaks should be taken to ensure workers can be adequately rehydrated. Heat stress management plans should also prescribe circumstances for the withdrawal of workers from hot and humid conditions, which should be supported by the regular testing of workplace conditions. [See IIR 17-04](#)

Fatal injuries in NSW mining since 1900

There has been a long term decrease in the number of NSW mining fatal injuries in the coal, metalliferous and extractives sectors. It is important to note that from 1989, fatal injury data for all sectors became available.

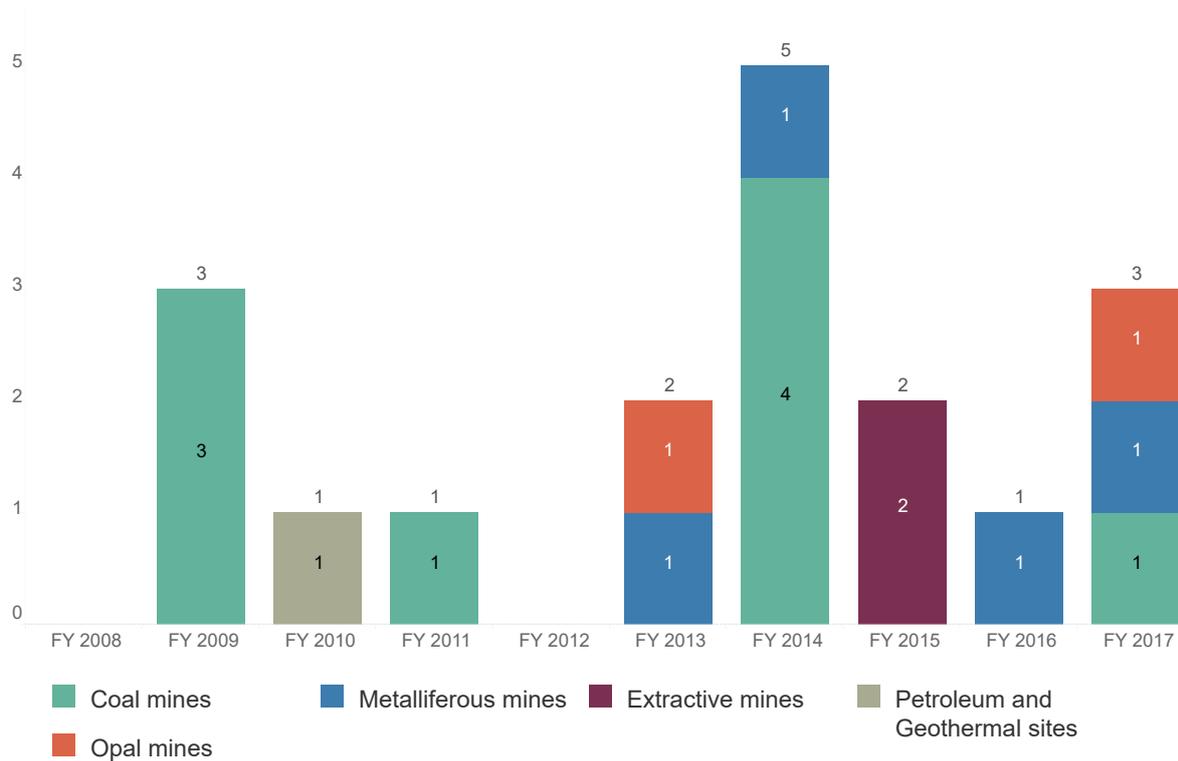
FIGURE 2. FATAL INJURIES BY SECTOR 1900 TO 2016-17



Fatal injuries by sector

For the NSW mining industry, in the ten years since 2007-08, half of all fatal injuries occurred in the coal sector. It is worth noting that the size of the industry (as denoted by the hours worked by sector in Figure 1 above) is likely to be reflected in the fatal injury statistics. Of the nine fatal injuries that occurred in the coal sector, six occurred in underground mines. All four of the fatal injuries that occurred in the metalliferous sector in the ten years since 2007-08 occurred in underground mines.

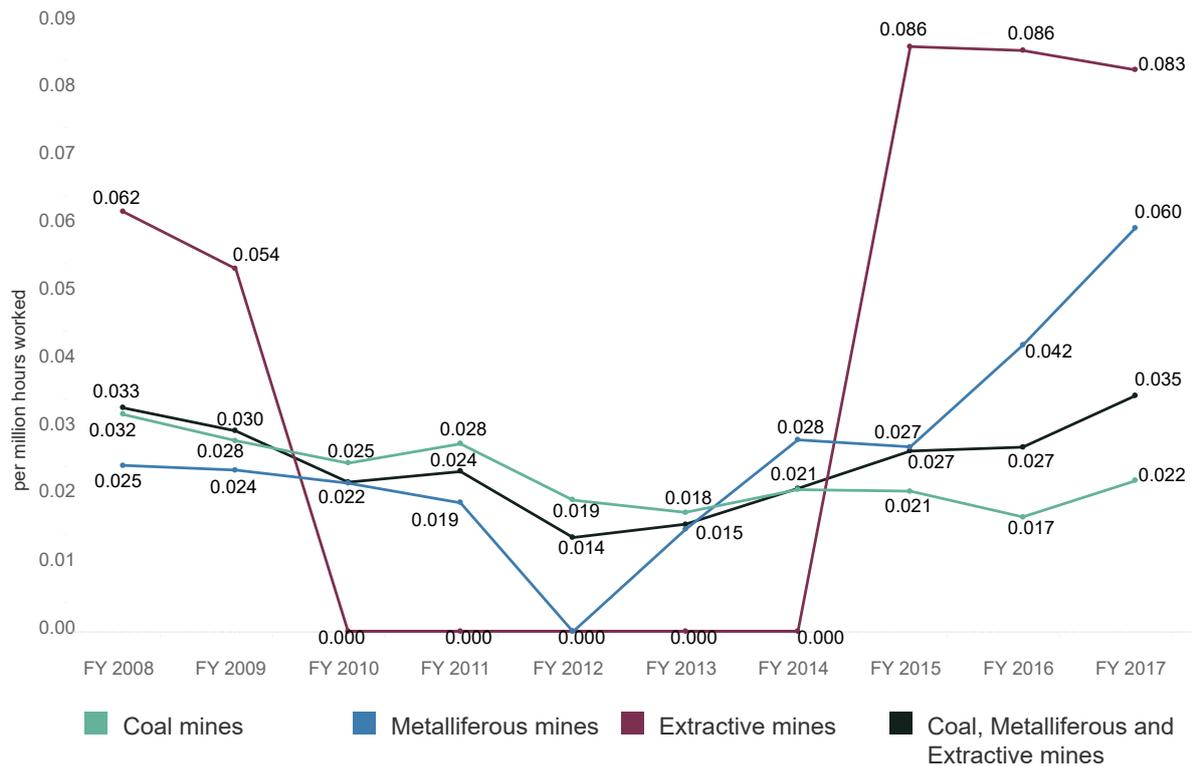
FIGURE 3. FATAL INJURIES BY SECTOR 2007-08 TO 2016-17



Fatal injury frequency rate

While there has been a long term decrease in the number of NSW mining fatal injuries in the coal, metalliferous and extractives sectors since 1900, the rolling five year average fatal injury frequency rate (FIFR) has remained between 0.033 to 0.035 in the tens years since 2007-08.

FIGURE 4. COAL, METALLIFEROUS AND EXTRACTIVES FIVE YEAR AVERAGE FIFR 2007-08 TO 2016-17

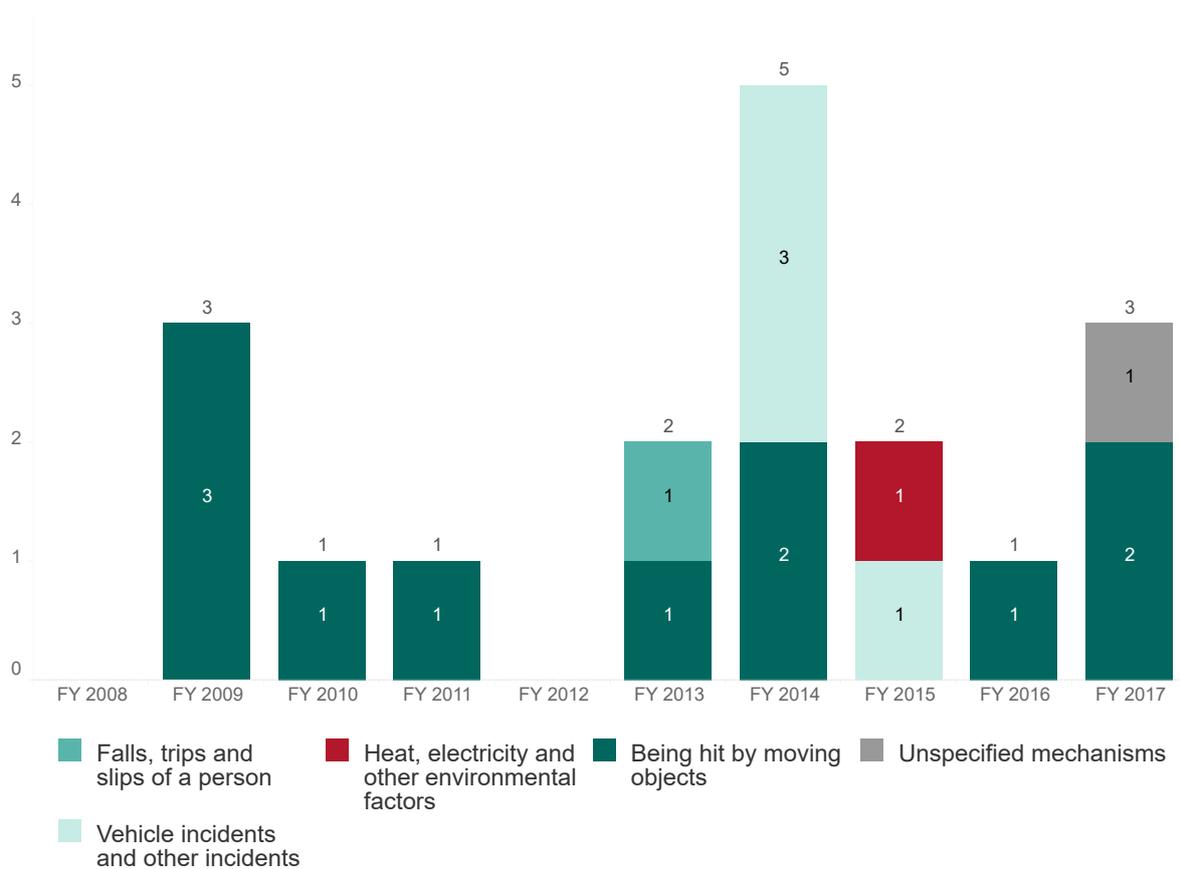


For the NSW mining industry, in the ten years since 2007-08, half of all fatal injuries occurred in the coal sector.

Fatal hazards

The most common fatal hazard for coal mines and metalliferous and extractives mines in the period 2007-08 to 2016-17 is being hit by a moving object followed by vehicle incidents. Of the nine fatal injuries that occurred in the coal sector, six occurred in underground mines. All four of the fatal injuries that occurred in the metalliferous sector in the ten years since 2007-08 occurred in underground mines.

FIGURE 5. FATAL INJURIES BY HAZARD MECHANISM 2007-08 TO 2016-17

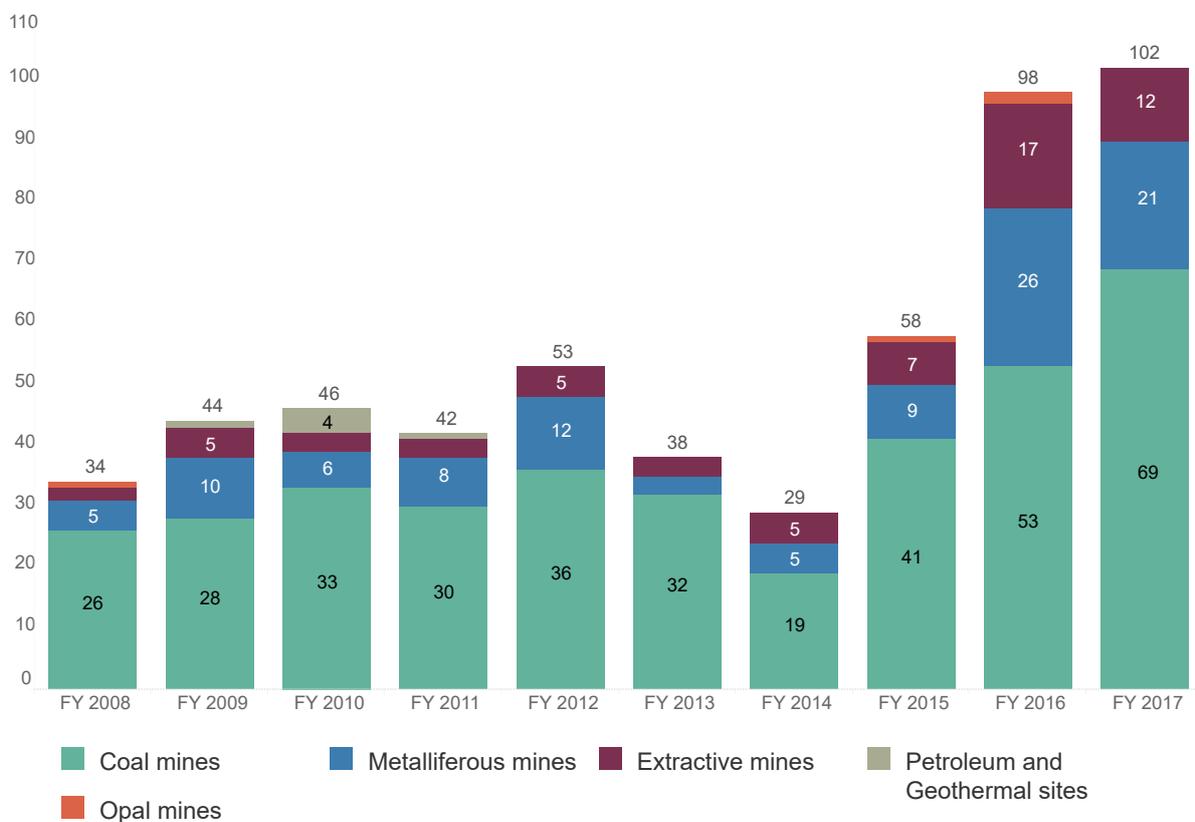


Serious injuries

Serious injuries by sector

There were 102 serious injuries reported in the mining industry during 2016-17. In the two year period since the Work Health and Safety (Mining & Petroleum Sites) Regulation 2014 commenced, the number of serious injuries reported to the regulator by the coal, metalliferous and extractives sector has more than doubled. Since February 2015, the definition of a serious injury was expanded and also includes any injury that results in immediate treatment as an in-patient at a hospital, irrespective of the nature of injury. This broadening of the legislated definition of serious injury has contributed to the observed increase.

FIGURE 6. SERIOUS INJURIES BY SECTOR 2007-08 TO 2016-17

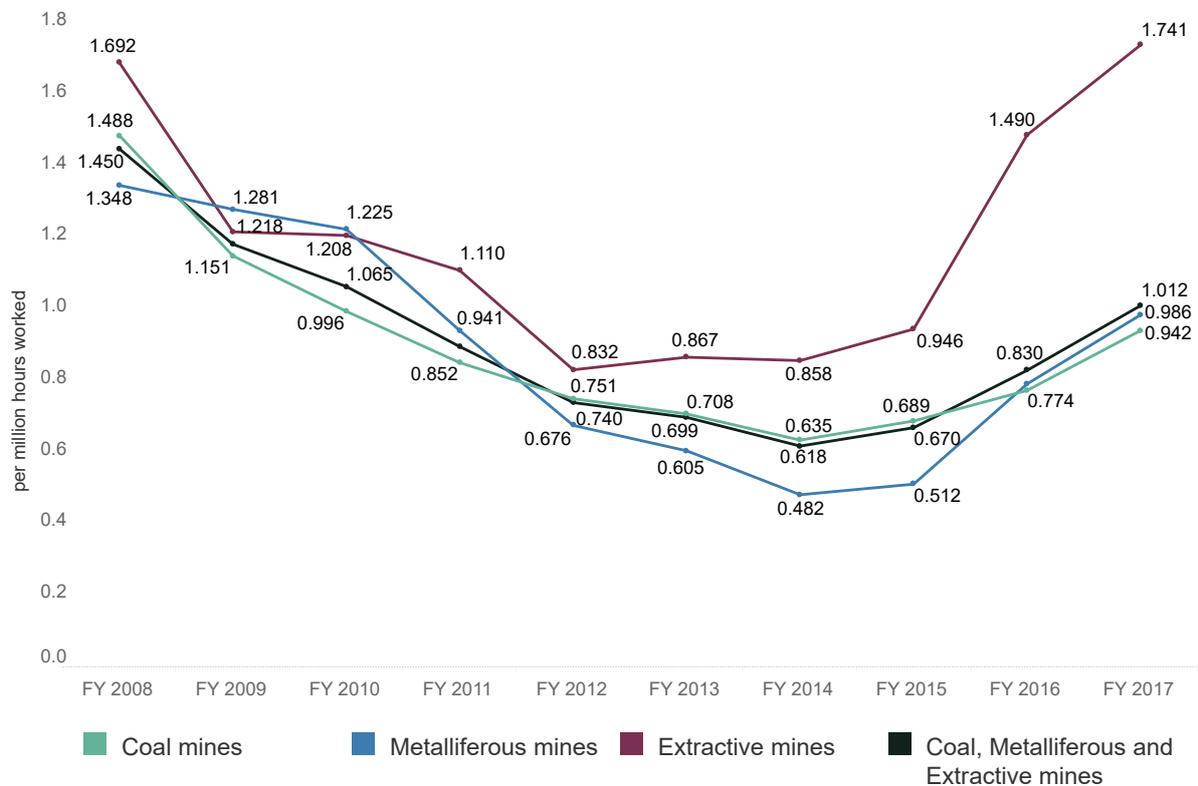


Since February 2015, the definition of a serious injury was expanded and also includes any injury that results in immediate treatment as an in-patient at a hospital, irrespective of the nature of injury.

Serious injury frequency rates

For the coal, metalliferous and extractives sectors, the rolling five year average serious injury frequency rate (SIFR) to 2016-17 was 1.012. Compared to the previous year, this represents an increase of approximately 22%. It is important to note that in the ten years since 2007-08, despite the recent increase, the industry has experienced a 30% decrease in the frequency rate of serious injuries.

FIGURE 7. COAL, METALLIFEROUS AND EXTRACTIVES FIVE YEAR AVERAGE SIFR 2007-08 TO 2016-17

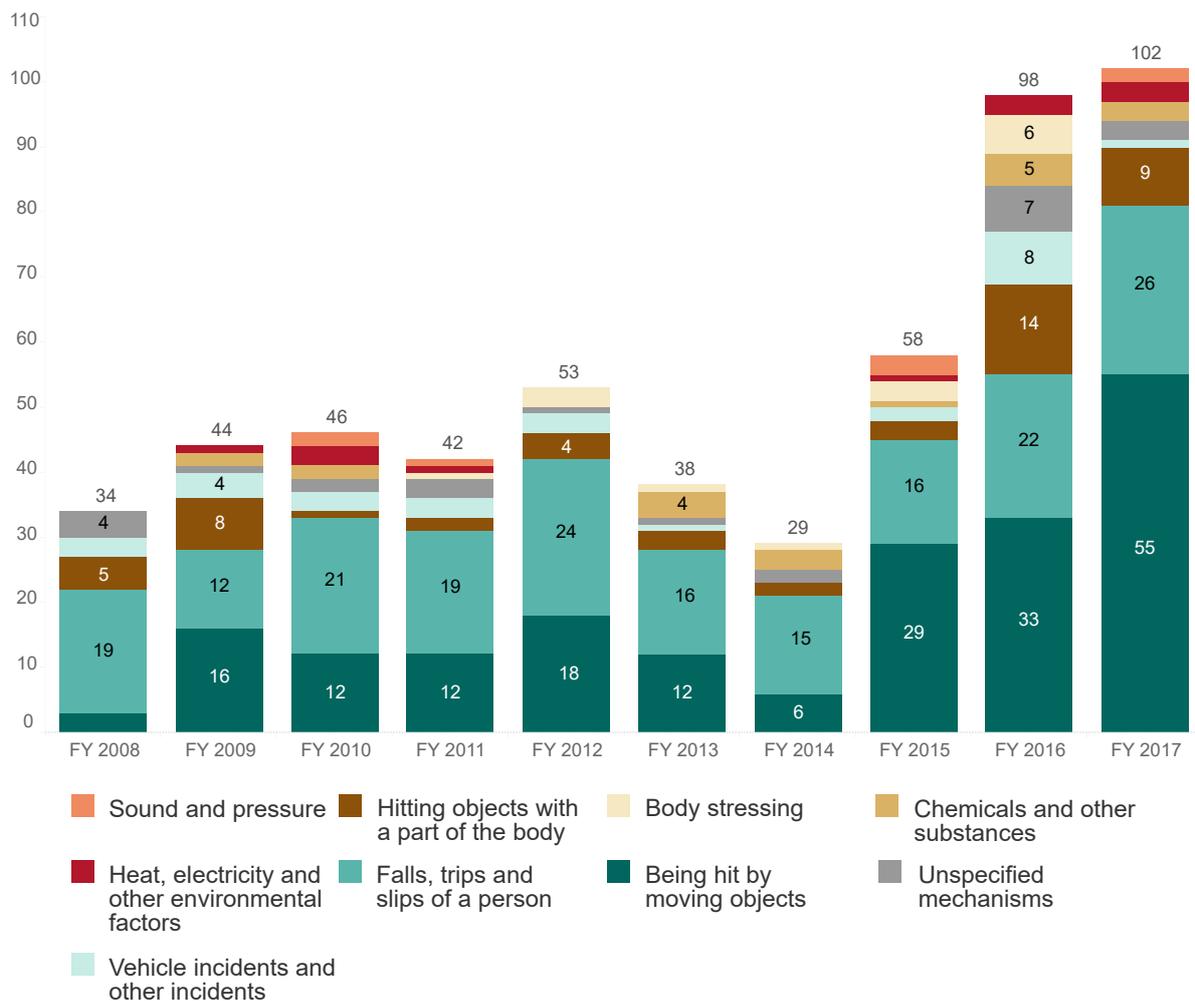


Serious injuries hazards

The most common serious injury hazard for coal mines and metalliferous and extractives mines in the period 2007-08 to 2016-17 is being hit by a moving object followed by slips, trips and falls. It follows that the agency of injury was most likely to be environmental and mobile plant / transport.

During this period, the nature of serious injury was likely to be fractures, wounds, lacerations, amputations and internal organ damage. Most frequent body location for serious injuries were upper limbs, lower limbs and trunk.

FIGURE 8. SERIOUS INJURIES BY HAZARD MECHANISM OF INJURY 2007-08 TO 2016-17



During this period, the nature of serious injury was likely to be fractures, wounds, lacerations, amputations and internal organ damage.

FIGURE 9. SERIOUS INJURIES BY NATURE OF INJURY 2007-08 TO 2016-17

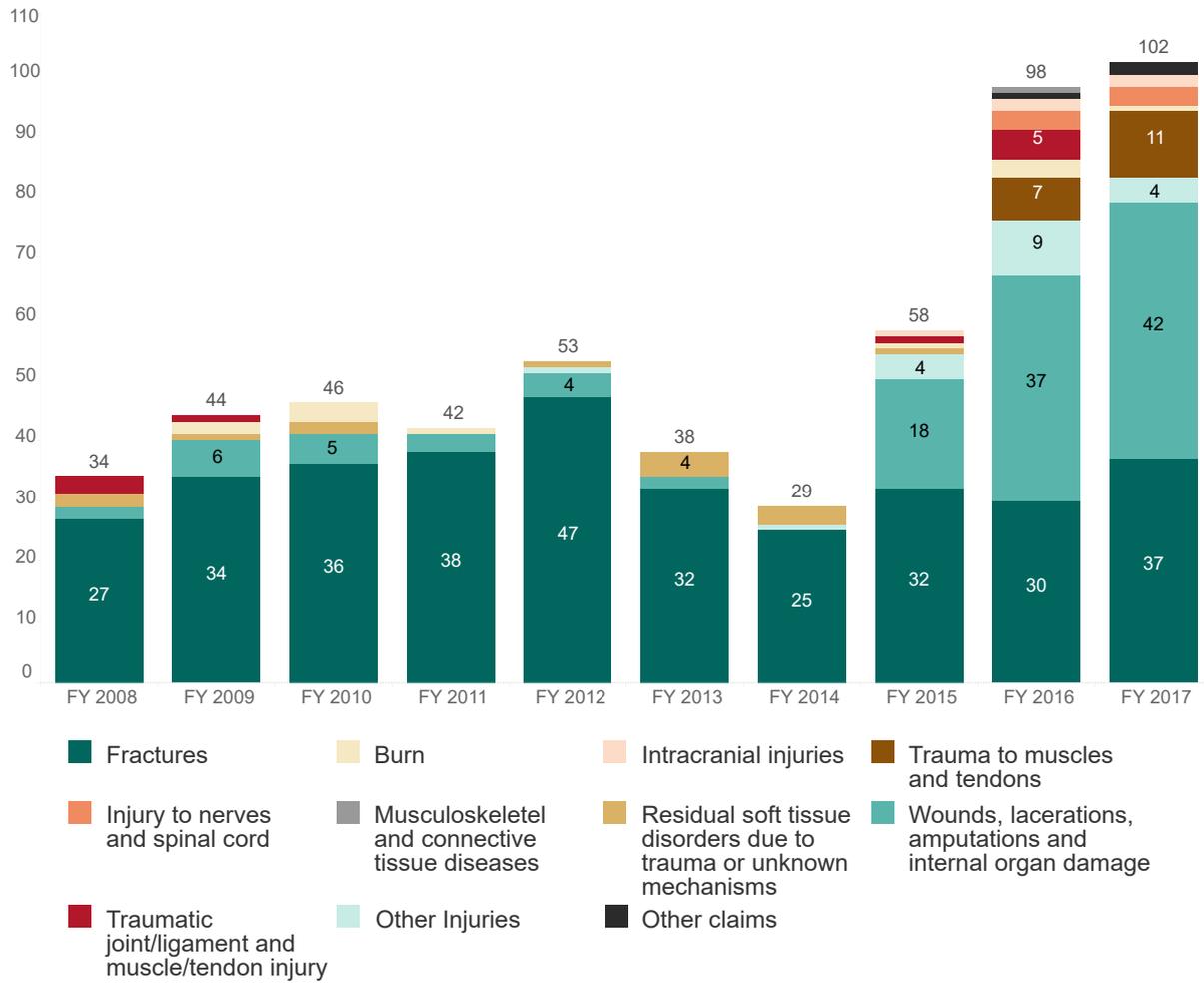
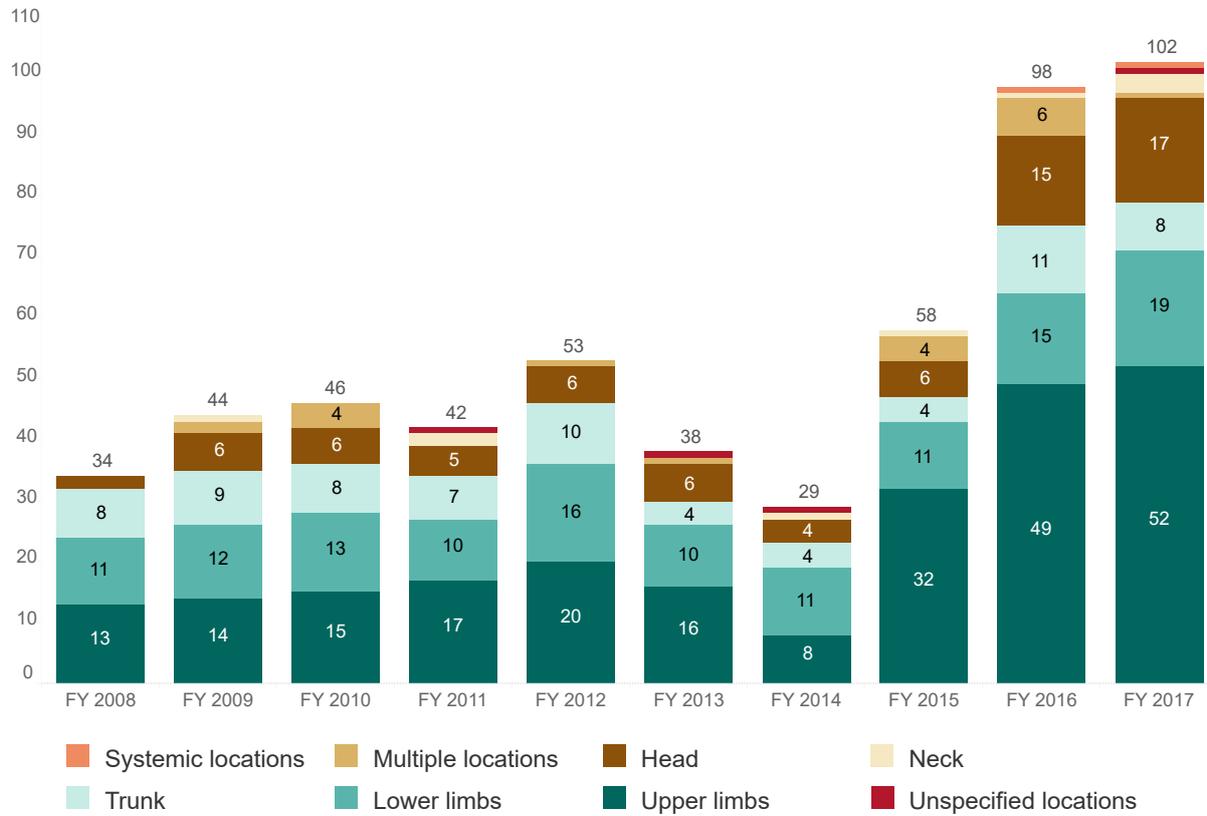
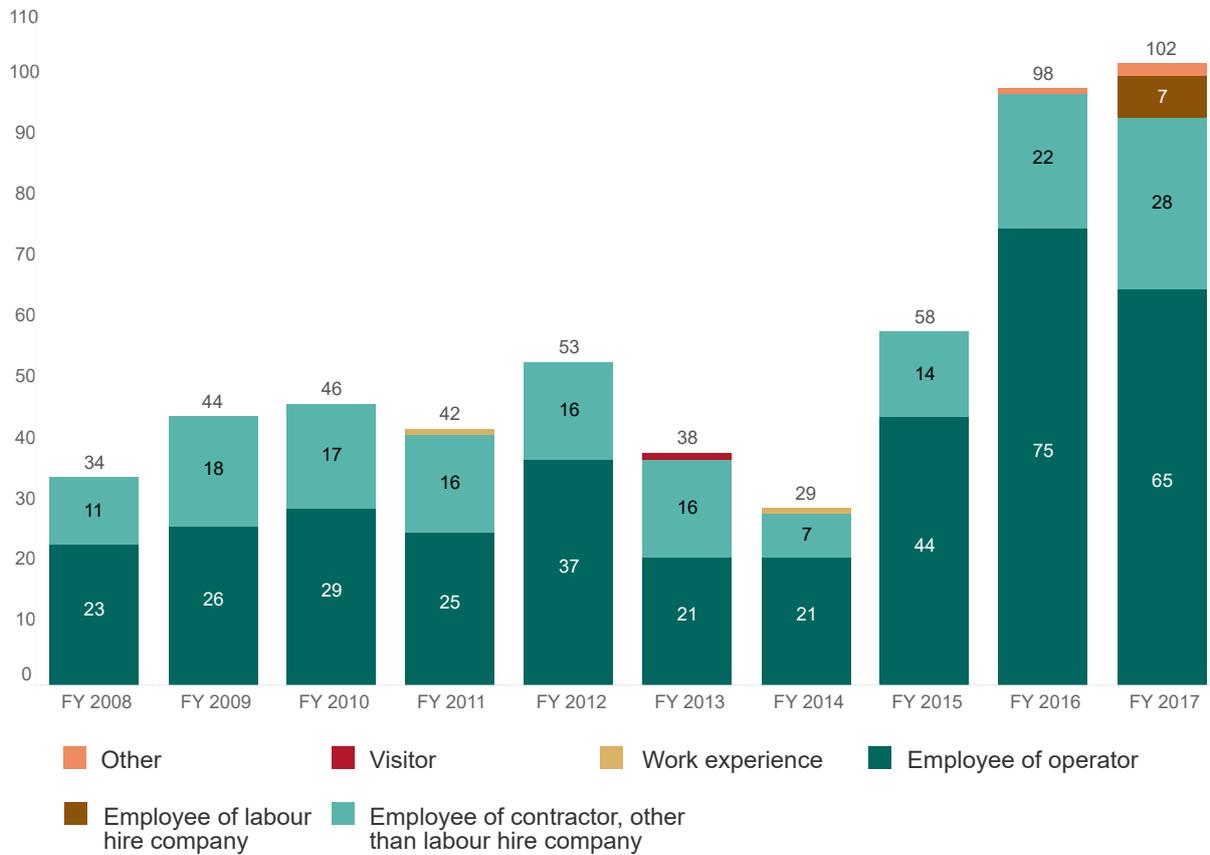


FIGURE 10. SERIOUS INJURIES BY BODILY LOCATION 2007-08 TO 2016-17



As compared to contractors, employees of mining operators account for the majority of serious injuries over the ten year period.

FIGURE 11. SERIOUS INJURIES BY EMPLOYMENT TYPE 2007-08 TO 2016-17

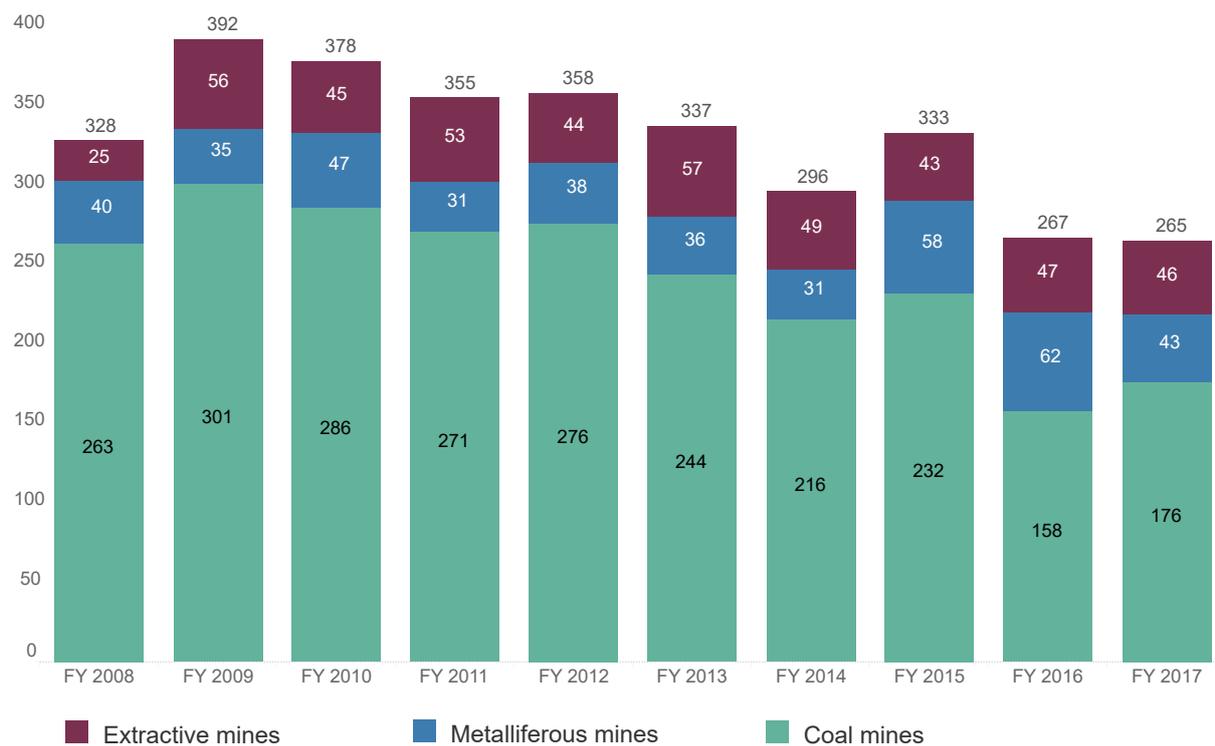


Lost time injuries

Lost time injuries by sector

The number of lost time injuries has remained stable for the past two years at 265 in 2016-17. This was down two compared to the previous year.

FIGURE 12. COAL, METALLIFEROUS AND EXTRACTIVES LOST TIME INJURIES BY SECTOR 2007-08 TO 2016-17

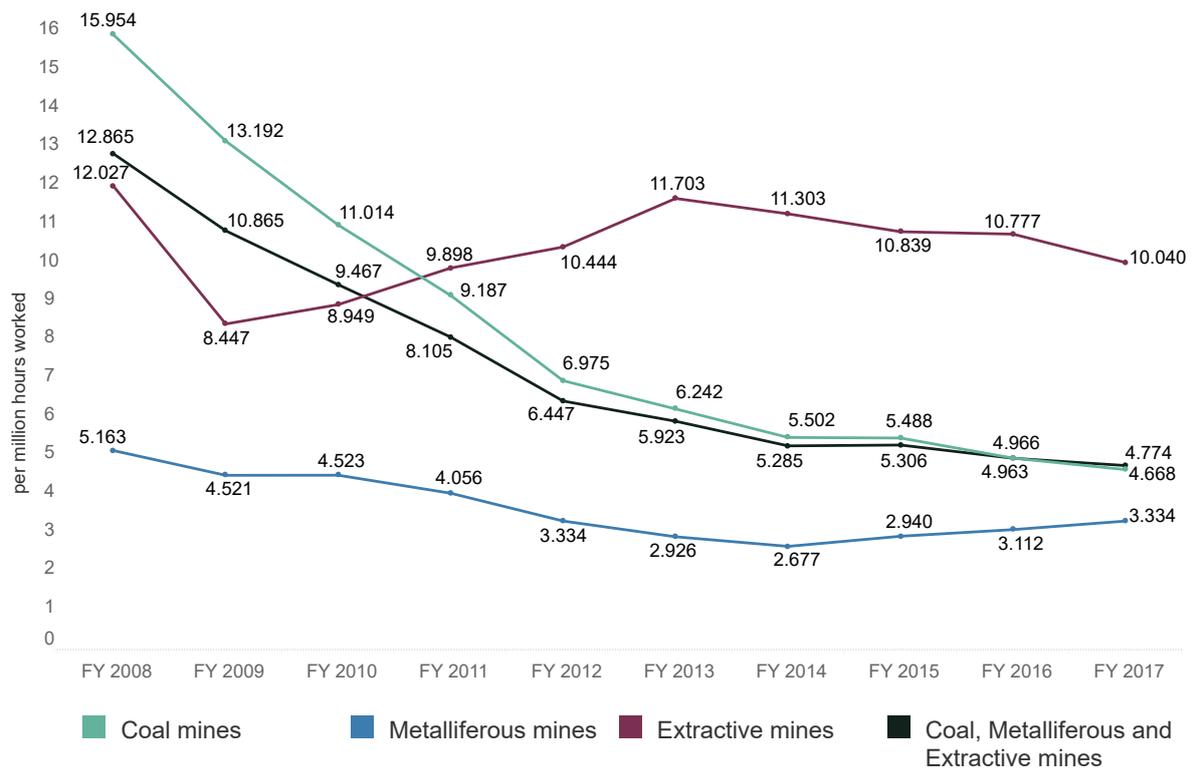


The number of lost time injuries has remained stable for the past two years at 265 in 2016-17.

Lost time injury frequency rates

The lost time injury frequency rate (LTIFR) has also continued to decrease. For the coal, metalliferous and extractives sectors, the rolling five year average LTIFR in 2016-17 was 4.668, down almost 4% compared to the previous year. There has been a steady downward trend in LTIFR for coal, metalliferous and extractives over the ten years since 2007-08 so that the LTIFR has decreased by approximately two thirds from 12.865 in 2007-08 to 4.774 in 2016-17.

FIGURE 13. COAL, METALLIFEROUS AND EXTRACTIVES FIVE YEAR AVERAGE LTIFR 2007-08 TO 2016-17

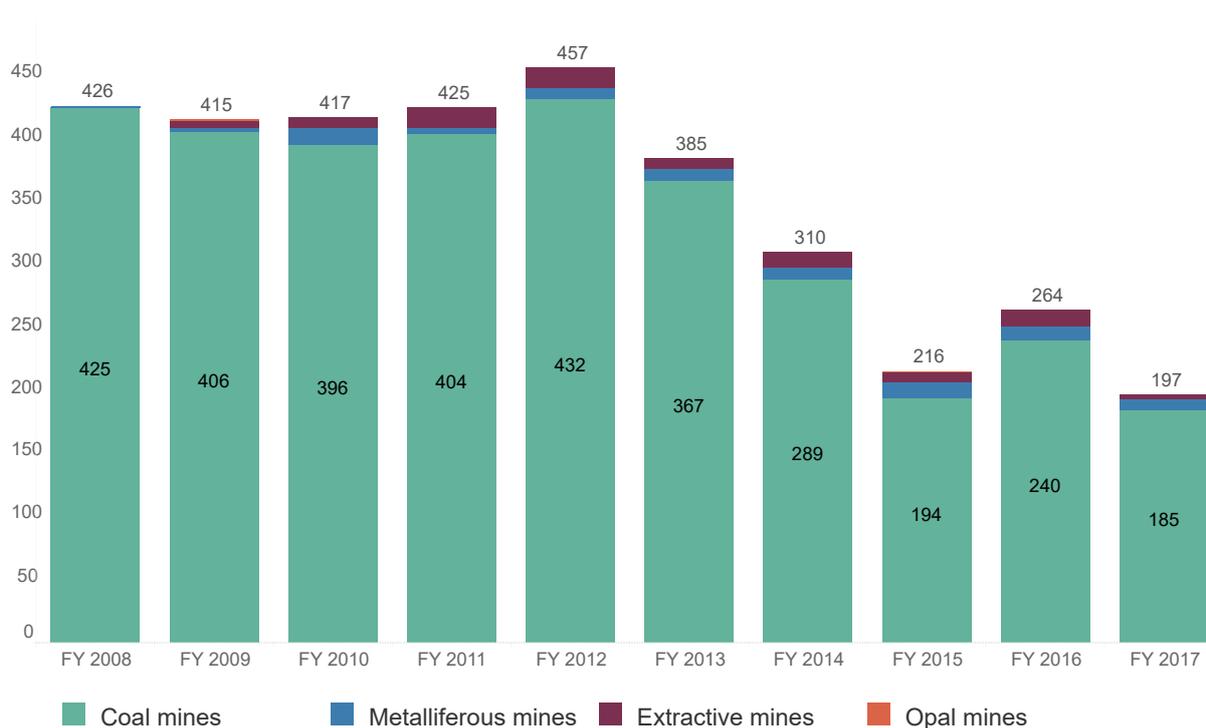


Injury outcomes of seven days or more

Injury outcomes of seven days or more by sector

In 2016-17, there were 197 injury outcomes (lost time and restricted duties injuries) of one week or more (LTI / RDI \geq 7 days). This is down 67 compared to the previous year. In the ten years since 2007-08, the number of injuries of this type has almost than halved, from 426 in 2007-08 to 197 in 2016-17.

FIGURE 14. LTI / RDI \geq 7 DAYS 2007-08 TO 2016-17

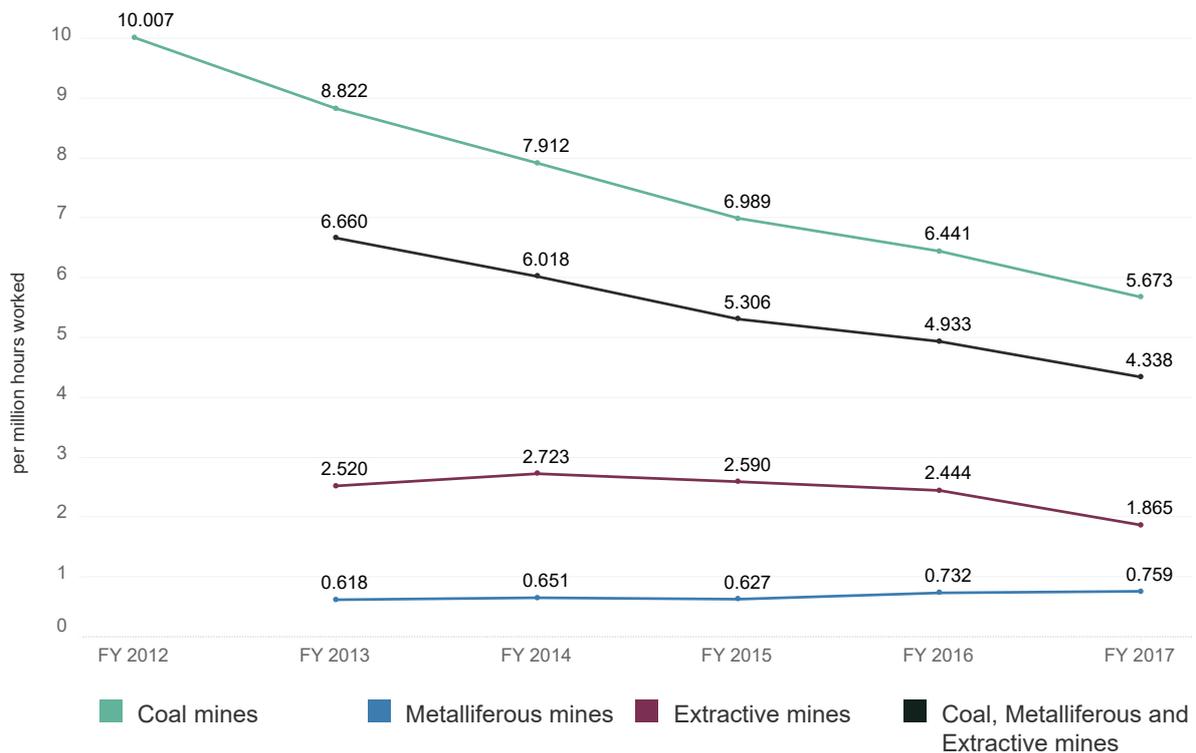


In 2016-17, there were 197 injury outcomes (lost time and restricted duties injuries) of one week or more.

Injury outcomes of seven days or more frequency rates

For the coal, metalliferous and extractives sectors, the rolling five year average injury outcomes (lost time and restricted duties injuries) of one week or more (LTI / RDI \geq 7days) frequency rate to 2016-17 was 4.338, down 12% on the previous year. Since 2011-12, an overall steady downward trend for LTI / RDI \geq 7daysFR was observed across each of the sectors. In 2016-17, the total frequency rate was one third less than the rate in 2012-13.

FIGURE 15. COAL, METALLIFEROUS AND EXTRACTIVES FIVE YEAR AVERAGE LTI / RDI \geq 7DAY FR 2011-12 TO 2016-17

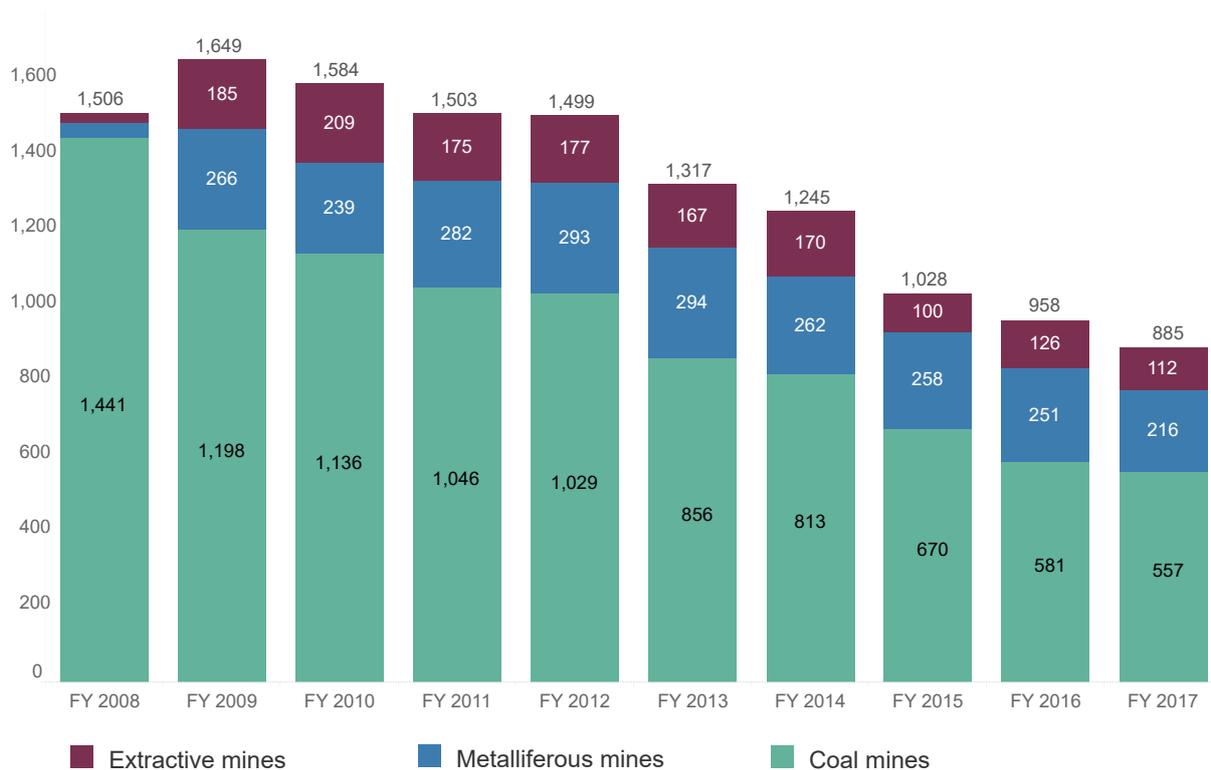


Total recordable injuries

Total recordable injuries by sector

Since 2007-08, total recordable injuries (TRI) have decreased year on year for the coal, metalliferous and extractives sectors. In 2016-17, total recordable injuries were down 73 on the previous year, from 958 to 885.

FIGURE 16. COAL, METALLIFEROUS AND EXTRACTIVES TOTAL RECORDABLE INJURY AND HOURS WORKED 2007-08 TO 2016-17



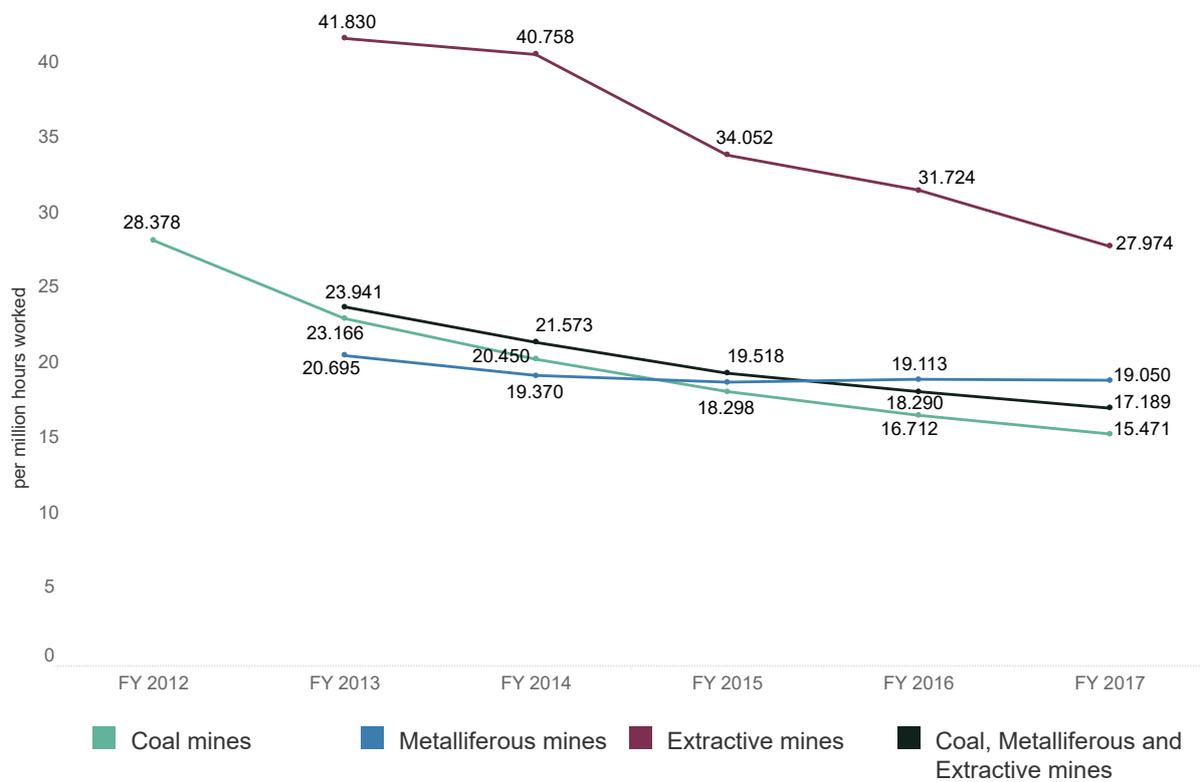
In 2016-17, total recordable injuries were down 73 on the previous year, from 958 to 885.

Total recordable injury frequency rates

For the coal, metalliferous and extractives sectors, the rolling five year average total recordable injury frequency rate (TRIFR) to 2016-17 was 17.189, down 6% on the previous year.

Since 2011-12, an overall steady downward trend in the total recordable injury frequency rates (TRIFR) was observed for coal, metalliferous and extractives sectors. A rolling five year average TRIFR was unable to be calculated for the ten year period as this information was collected in quarterly reports from 2008-09.

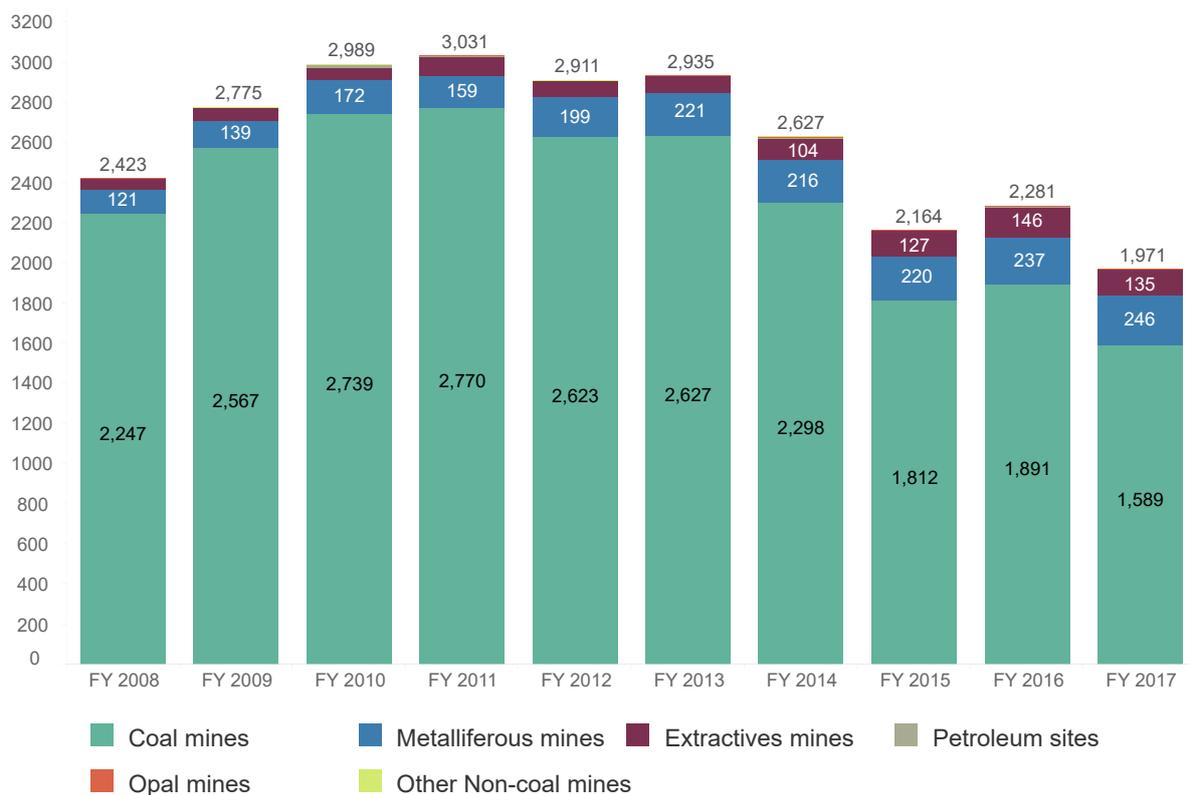
FIGURE 17. COAL, METALLIFEROUS AND EXTRACTIVES FIVE YEAR AVERAGE TRIFR 2007-08 TO 2016-17



Notified safety incidents

In 2016-17, safety incident notifications were down 310 compared to the previous year from 2,281 to 1,971. Across the reporting decade, the coal sector accounts for almost 90% of all notified safety incidents. Note that multiple gas trips that were reported to the Regulator in a single incident notification have been included as individual incident notifications in this report. See the Annual Activity Report 2016-17 for more details about the safety incident notifications received by the regulator in 2016-17.

FIGURE 18. NOTIFIED SAFETY INCIDENTS BY SECTOR 2007-08 TO 2016-17

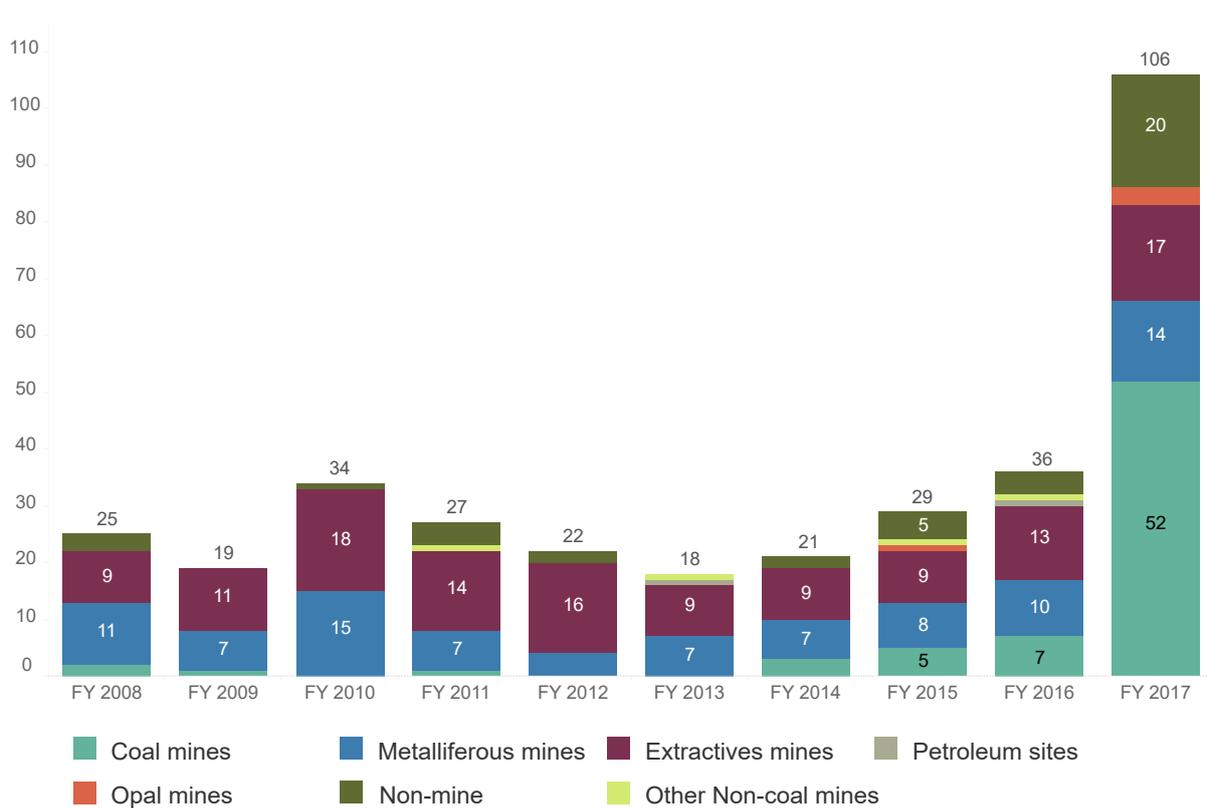


Across the reporting decade, the coal sector accounts for almost 75% of all notified safety incidents.

Complaints

In 2016, the regulator streamlined its complaints reporting and notifications processes. As a result, the number of complaints more than doubled compared to the previous year from 36 to 106. The increase in complaint notifications was more evident in the coal and non-mines sectors.

FIGURE 19. COMPLAINTS BY SECTOR 2007-08 TO 2016-17



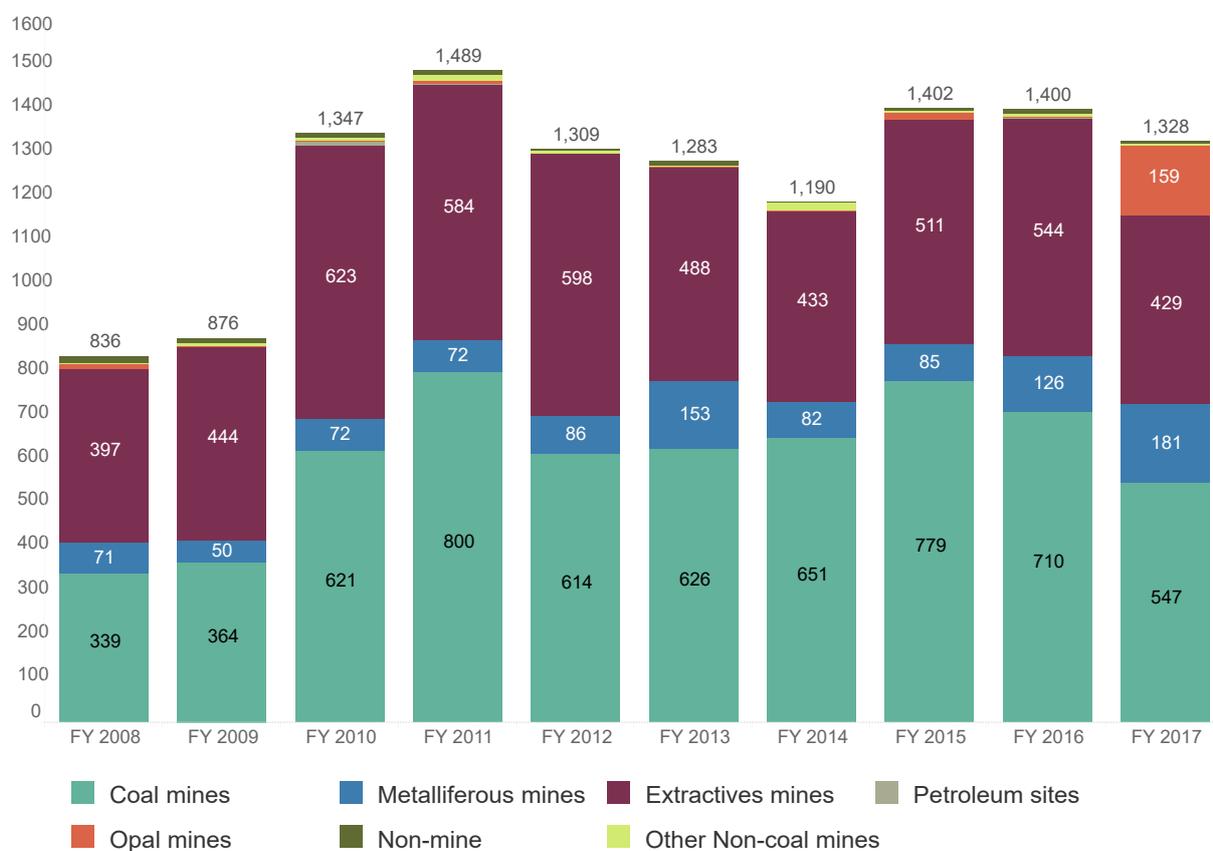
Safety notices

Safety notices by sector

Notices issued by the regulator include notices of concern (advice notices), improvement, prohibition, investigation and explosives enforcement notices.

In 2016-17, the regulator issued 72 fewer safety notices compared to the previous year. The opal sector saw the biggest change where 159 safety notices were issued in response to the regulator’s targeted safety operation.

FIGURE 20. SAFETY NOTICES BY SECTOR 2007-08 TO 2016-17

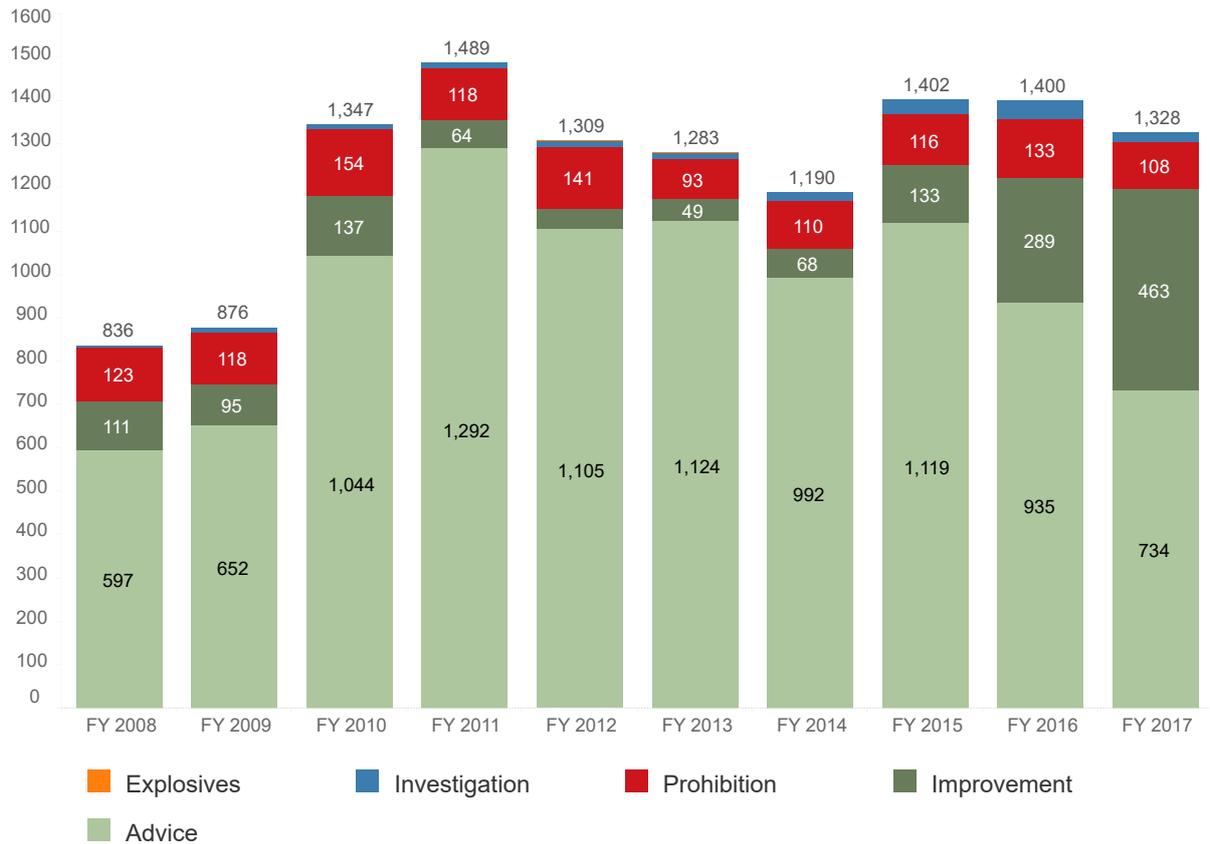


The opal sector saw the biggest change where 159 safety notices were issued in response to the regulator’s targeted safety operation.

Safety notices by notice type

From 2016-17, the proportion of improvement notices relative to notices of concern (advice) increased. This reflected the regulator’s renewed focus on incident prevention where it sought to clearly identify matters that necessitate the issue of an improvement notice as compared to a written notice of concern.

FIGURE 21. NOTICES BY NOTICE TYPE 2007-08 TO 2016-17



Coal sector

Coal sector statistics and performance measures 2016-17



- One fatal injury surface coal mine - 13 December 2016 - fall of unsecured plant (Investigation release IIR 1608)
- Fatal injury frequency rate (per million hours worked) up 29% from 0.017 in 2015-16 to 0.022 in 2016-17
- 69 serious injuries – most common mechanism is being hit by moving object
- Serious injury frequency rate (per million hours worked) up 22% from 0.774 in 2015-16 to 0.942 in 2016-17
- 176 lost time injuries
- Lost time injury rate (per million hours worked) down 6% from 4.966 in 2015-16 to 4.668 in 2016-17
- 185 injury outcomes (lost time and restricted duties seven days or more)
- Injury outcome rate (lost time and restricted duties of seven days or more) (per million hours worked) down 12% from 6.441 in 2015-16 to 5.673 in 2016-17
- 557 total recordable injuries
- Total recordable injury rate (per million hours worked) down approximately 7% from 16.712 in 2015-16 to 15.471 in 2016-17.
- 1,589 notifiable safety incidents
- 52 complaints – 31 complaints lodged by surface coal operations
- 547 safety notices issued – 56 prohibition notices

Fatal injuries

Fatal injuries and hours worked

In 2016-17 one mining fatality occurred in a surface coal operation. In the ten years since 2007-08 there have been nine fatal injuries in the coal sector - six in underground and three in surface operations.

Figure 2 above presenting fatal injuries in NSW mines from 1900 to 2016-17, shows the sustained long term decrease in coal mining fatal injuries in NSW.

FIGURE 22. COAL FATAL INJURIES AND HOURS WORKED 2007-08 TO 2016-17

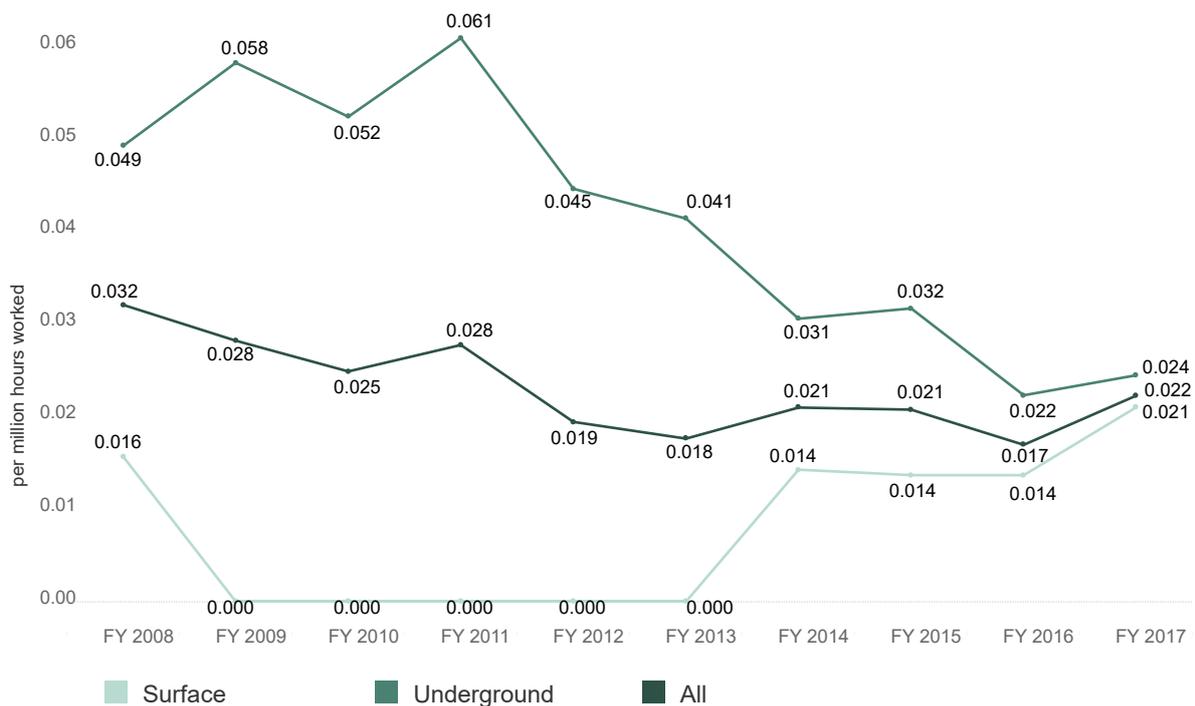


Fatal injury frequency rates

In the overall coal mining sector, the rolling five year average fatal injury frequency rate (FIFR) to 2016-17 was up almost 29% compared to previous year (from 0.017 in 2015-16 to 0.022 in 2016-17).

For the ten years since 2008, the FIFR has steadily decreased, especially in the underground coal sector.

FIGURE 23. COAL FIVE YEAR AVERAGE FIFR 2007-08 TO 2016-17



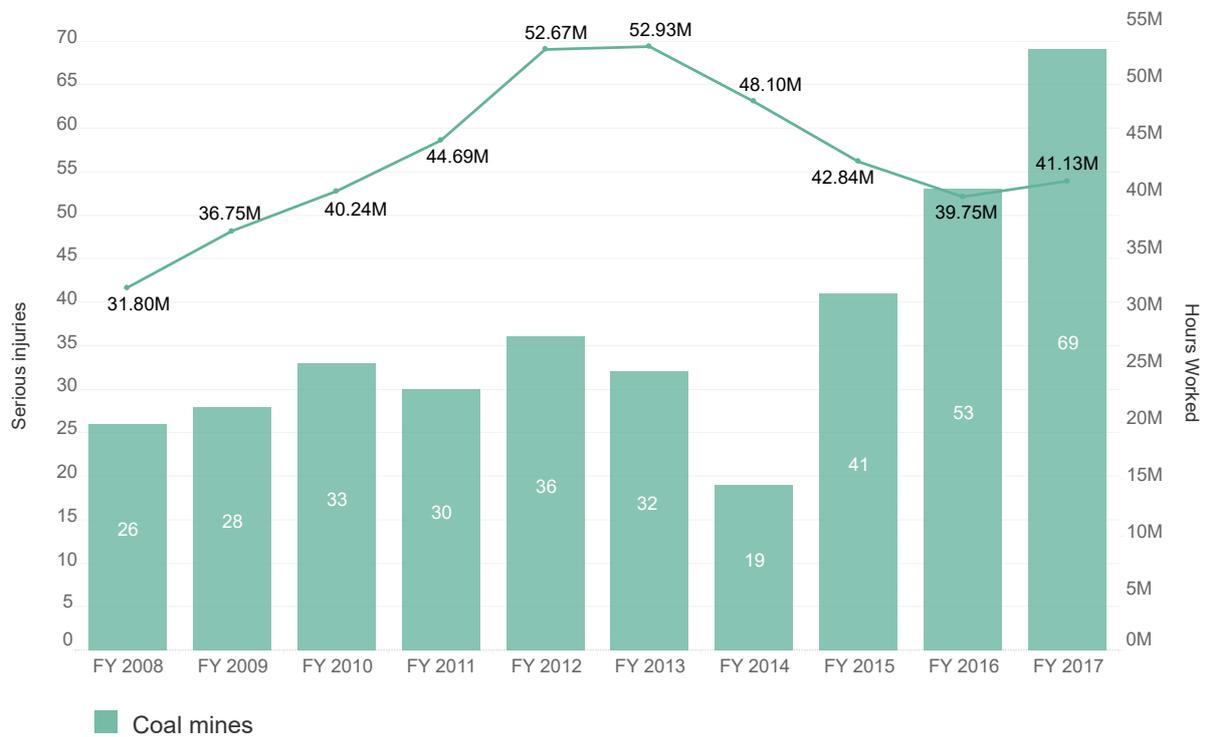
For the ten years since 2008, the fatal injury frequency rate has steadily decreased, especially in the underground coal sector.

Serious injuries

Serious injuries and hours worked

There were 69 serious injuries reported in the coal sector during 2016-17 this is up 16 compared to the previous year. In the two year period since the Work Health and Safety (Mining & Petroleum Sites) Regulation 2014 commenced, the number of serious injuries reported to the regulator by the coal sector has increased year on year. The broadened definition of serious injuries in 2015 has contributed to the observed increase.

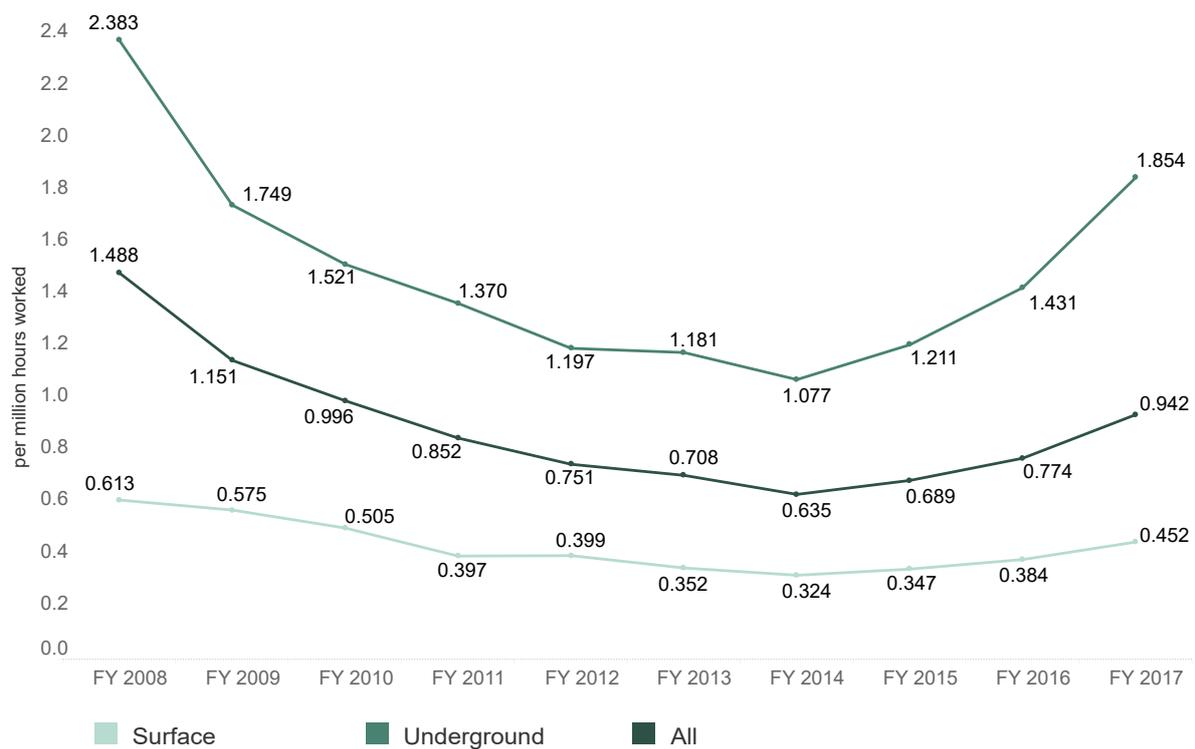
FIGURE 24. COAL SERIOUS INJURIES AND HOURS WORKED 2007-08 TO 2016-17



Serious injury frequency rates

For the coal sector, the rolling five year average serious injury frequency rate (SIFR) was up approximately 22% from 0.774 in 2015-16 to 0.942 in 2016-17. The recent amendment to the definition in 2015 of serious injury has contributed to this recent increase. However, in the ten years since 2007-08, the coal industry five year average SIFR decreased by approximately 37%.

FIGURE 25. COAL FIVE YEAR AVERAGE SERIOUS INJURY FREQUENCY RATE (SIFR) 2007-08 TO 2016-17



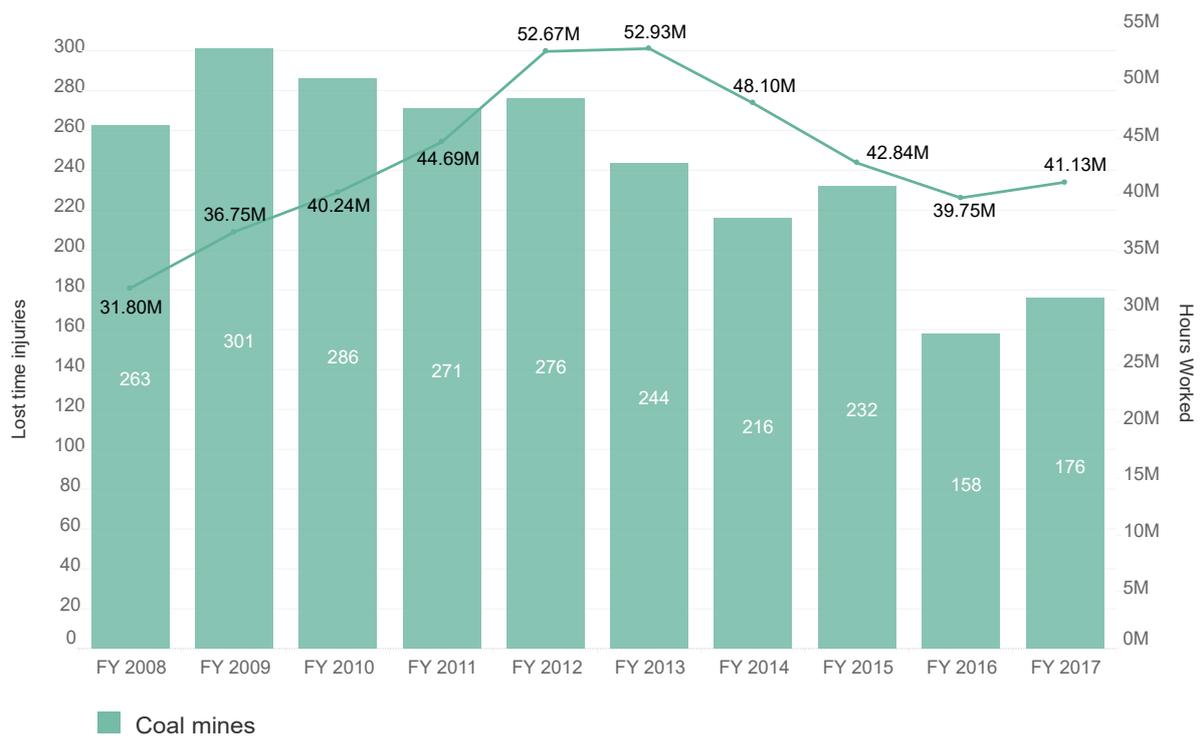
For the coal sector, the rolling five year average serious injury frequency rate was up approximately 22% from 0.774 in 2015-16 to 0.942 in 2016-17.

Lost time injuries

Lost time injuries and hours worked

In 2016-17, the number of lost time injuries reported to the regulator was 176, up 18 compared to the previous year. In the ten years since 2007-08, lost time injuries decreased by approximately a third. Overall, underground operations account for approximately 70% of all lost time injuries for the sector.

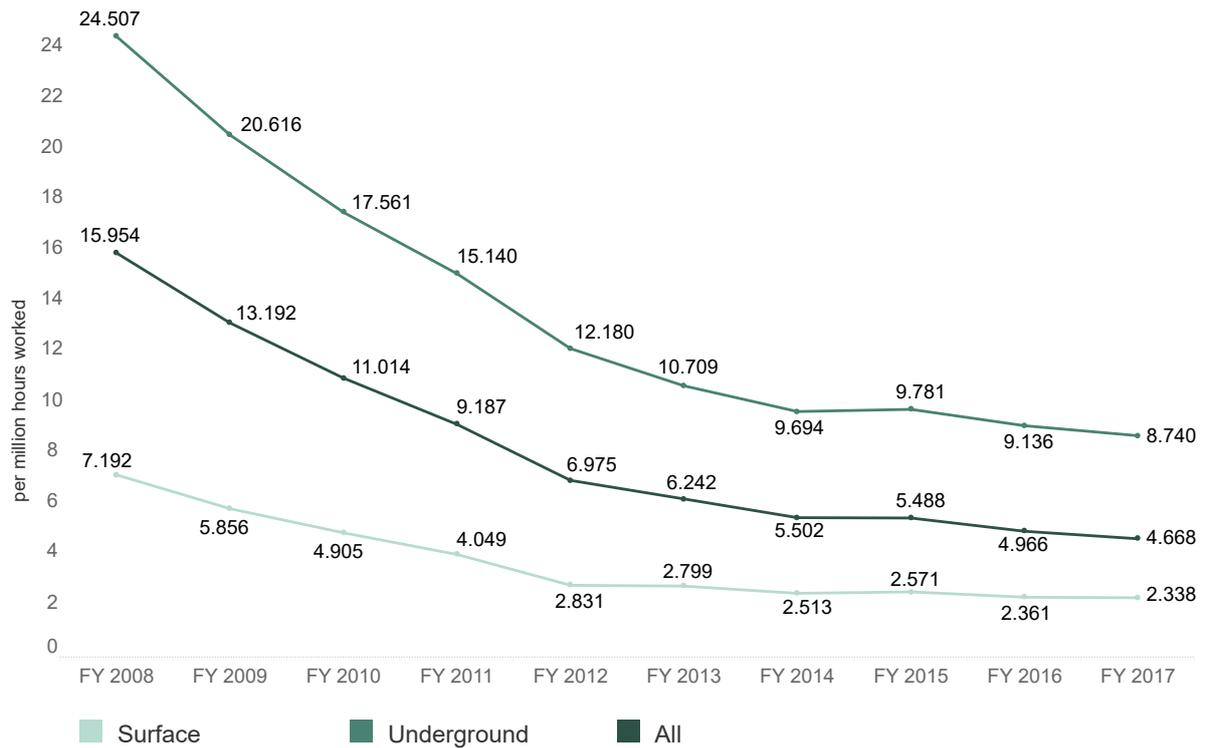
FIGURE 26. COAL LOST TIME INJURIES AND HOURS WORKED 2007-08 TO 2016-17



Lost time injury frequency rates

The lost time injury frequency rate (LTIFR) for the coal sector has continued to decrease. The rolling five year average LTIFR in 2016-17 was 4.668 compared to 4.966 in 2015-16. This represented a 6% decrease. In 2016-17, the underground sector saw the largest decrease in the rate of lost time injuries. Over the ten year since 2007-08, the coal sector experienced a decrease in LTIFR by approximately 70%.

FIGURE 27. COAL FIVE YEAR AVERAGE LTIFR 2007-08 TO 2016-17



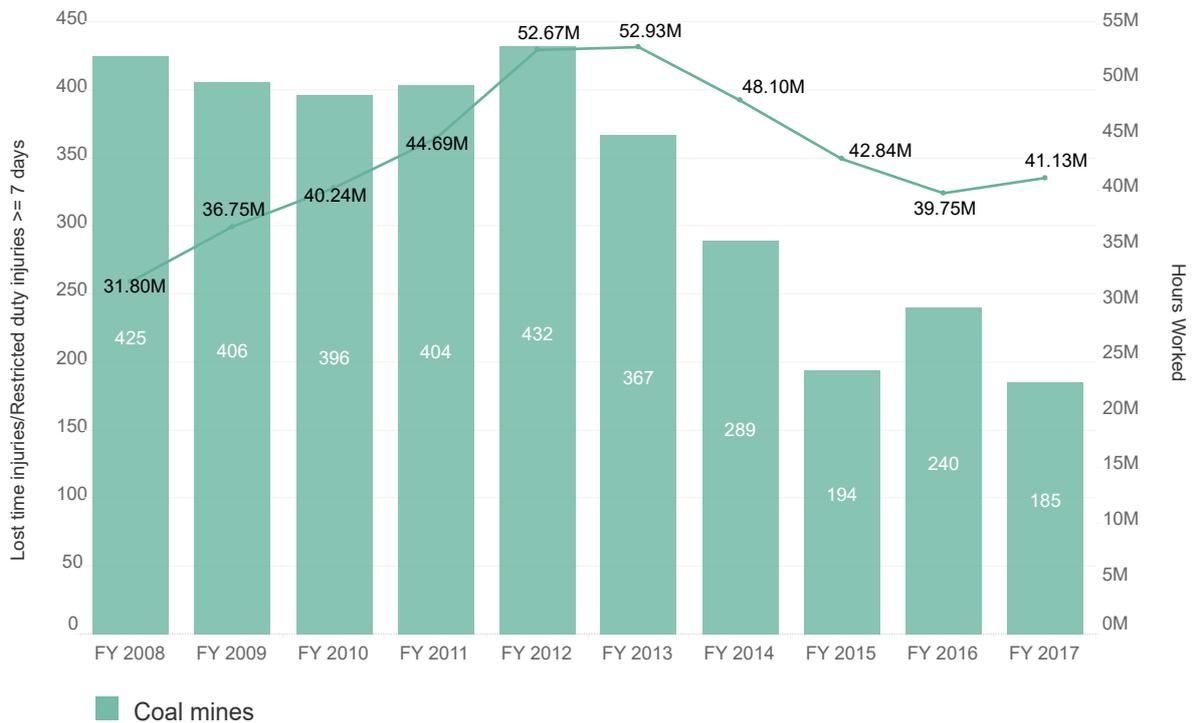
In 2016-17, the underground sector saw the largest decrease in the rate of lost time injuries.

Injury outcomes of seven days or more

Injury outcomes of seven days or more and hours worked

In 2016-17, there were 185 coal injury outcomes (lost time and restricted duties injuries) of seven days or more (LTI / RDI \geq 7days). This is down to 55 compared to the previous year. Over the ten year reporting period, the number of injuries of this type has almost than halved, from 425 in 2007-08 to 185 in 2016-17.

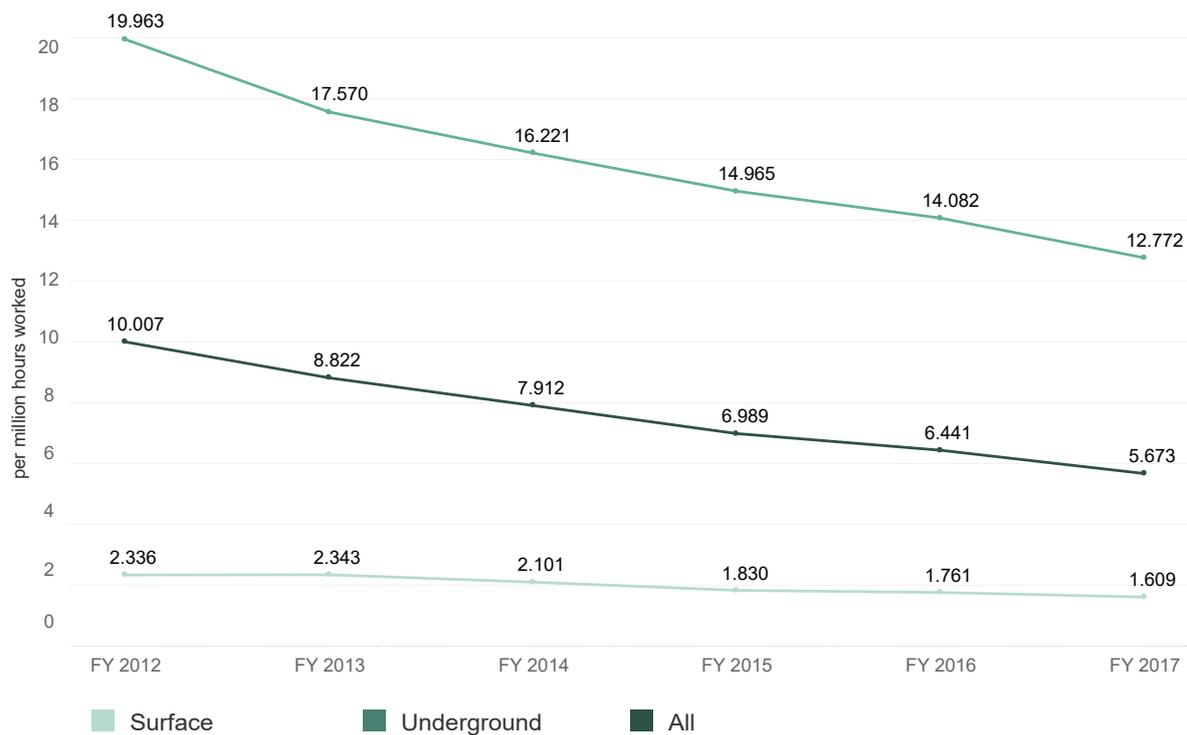
FIGURE 28. COAL LTI / RDI \geq 7 DAYS AND HOURS WORKED 2007-08 TO 2016-17



Injury outcomes of seven days or more frequency rates

For the coal sector, the rolling five year average injury outcome (lost time and restricted duties injuries) of one week or more (LTI / RDI \geq 7days) frequency rate to 2016-17 was 5.673, down 12% on the previous year. Since 2011-12, an overall steady downward trend for LTI / RDI \geq 7days frequency rates was observed for underground coal. In 2016-17, coal LTI / RDI \geq 7days frequency rates were about 40% less than the 2011-12 rate.

FIGURE 29. COAL FIVE YEAR AVERAGE LTI / RDI \geq 7 DAYS FREQUENCY RATES 2011-12 TO 2016-17



Since 2011-12, an overall steady downward trend for LTI / RDI \geq 7days frequency rates was observed for underground coal.

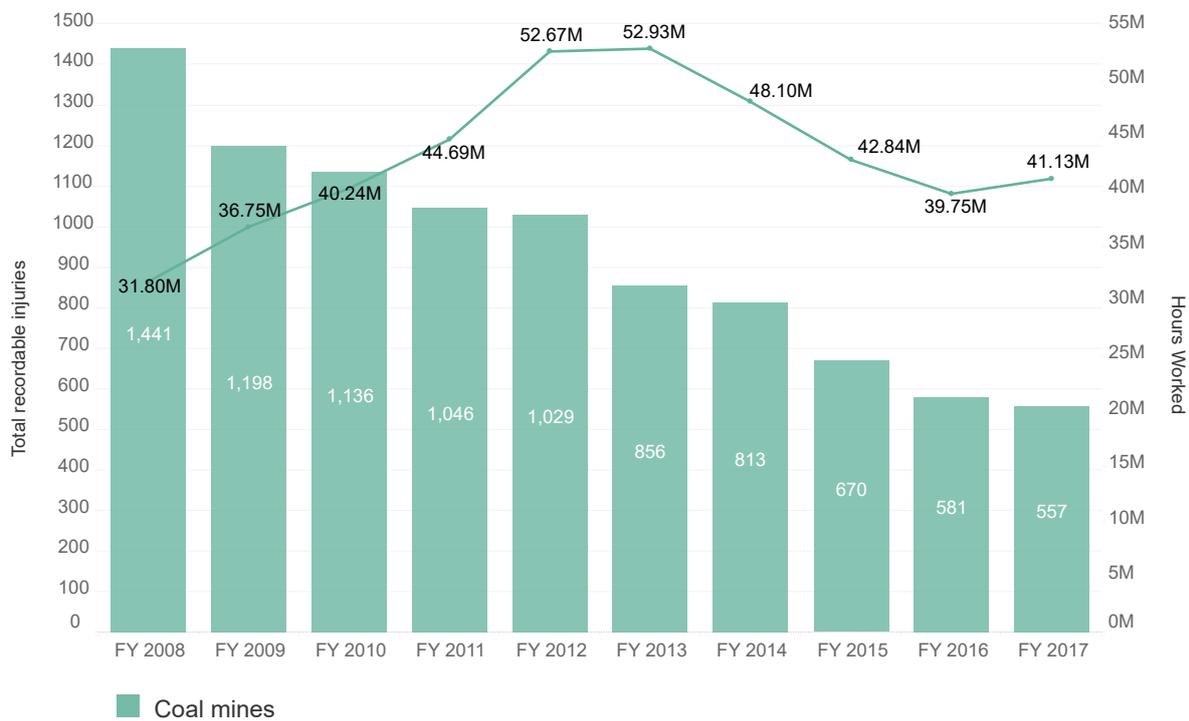
Total recordable injuries

Total recordable injuries by hours worked

In the ten years since 2007-08, total recordable injuries (the total number of fatal injuries and injuries resulting in lost time, restricted duties or medical treatment) has decreased year on year.

In 2016-17, the number of total recordable injuries was down 4% on the previous year, from 581 in 2015-16 to 557 in 2016-17.

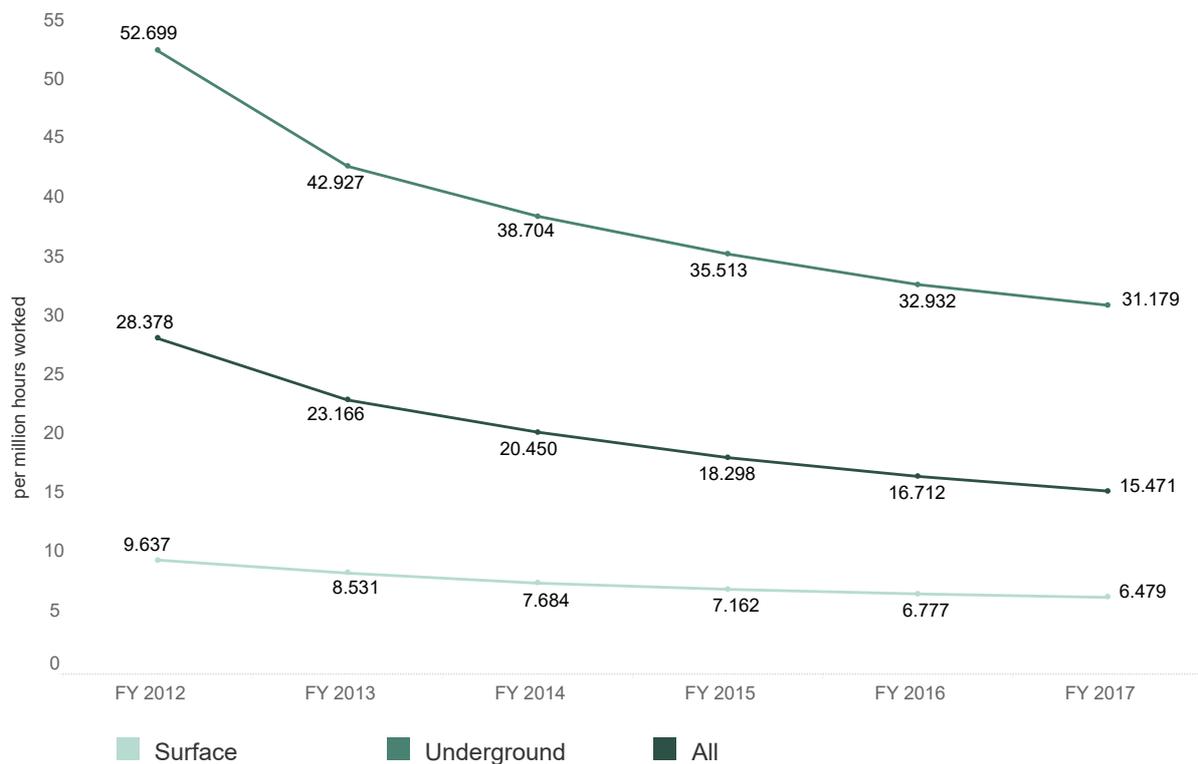
FIGURE 30. COAL TOTAL RECORDABLE INJURY AND HOURS WORKED 2007-08 TO 2016-17



Total recordable injuries frequency rates

In 2016-17, the five year rolling average total recordable injury frequency rate (TRIFR) was down approximately 7% compared to the previous year, from 16.712 to 15.471. From 2011-12, a steady decrease in the TRI frequency rates has also been observed. A rolling five year average TRIFR was unable to be calculated for the ten year reporting period as this information had only been included in coal quarterly reporting requirements from 2007.

FIGURE 31. COAL FIVE YEAR AVERAGE TRIFR 2011-12 TO 2016-17

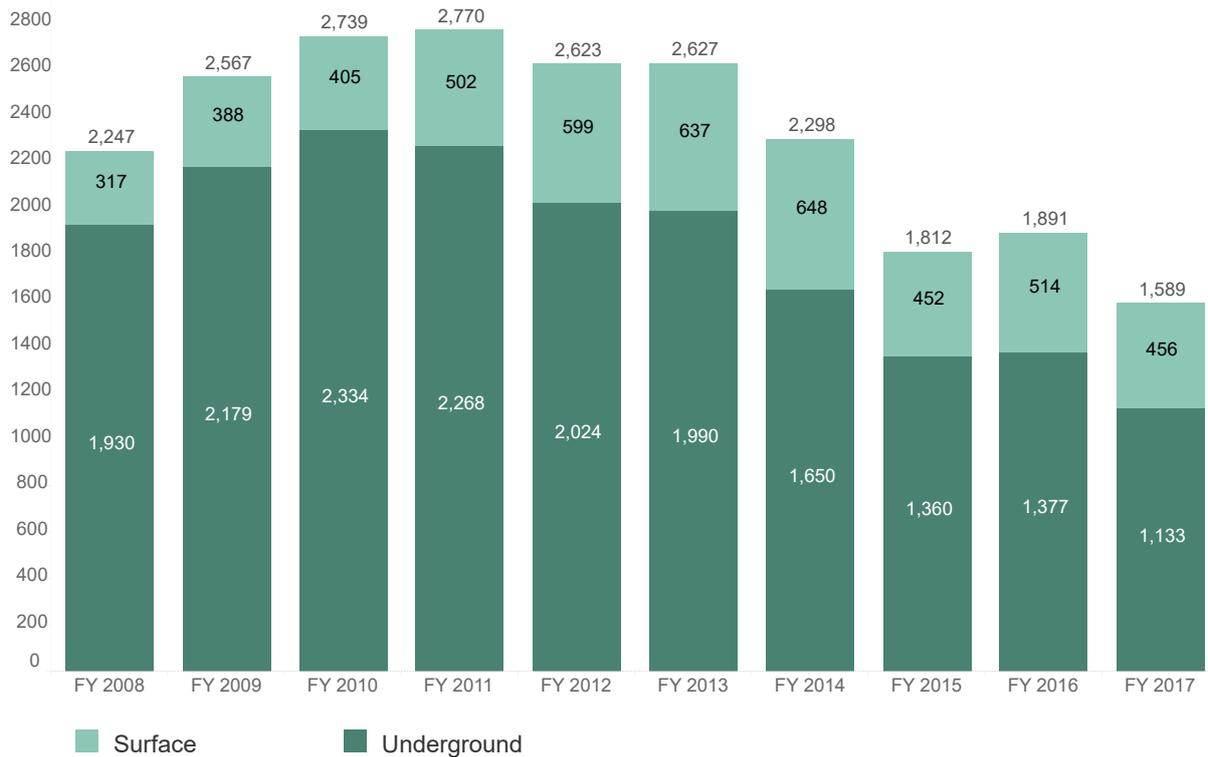


In 2016-17, the five year rolling average total recordable injury frequency rate was down approximately 7% compared to the previous year, from 16.712 to 15.471.

Notified safety incidents

In 2016-17 compared to 2015-16, notified safety incidents for the coal decreased by almost 16% despite a slight increase in hours worked. The greatest proportion of notified safety incidents are reported by underground coal sector. Note that multiple gas trips that were reported to the Regulator in a single incident notification have been included as individual incident notifications in this report.

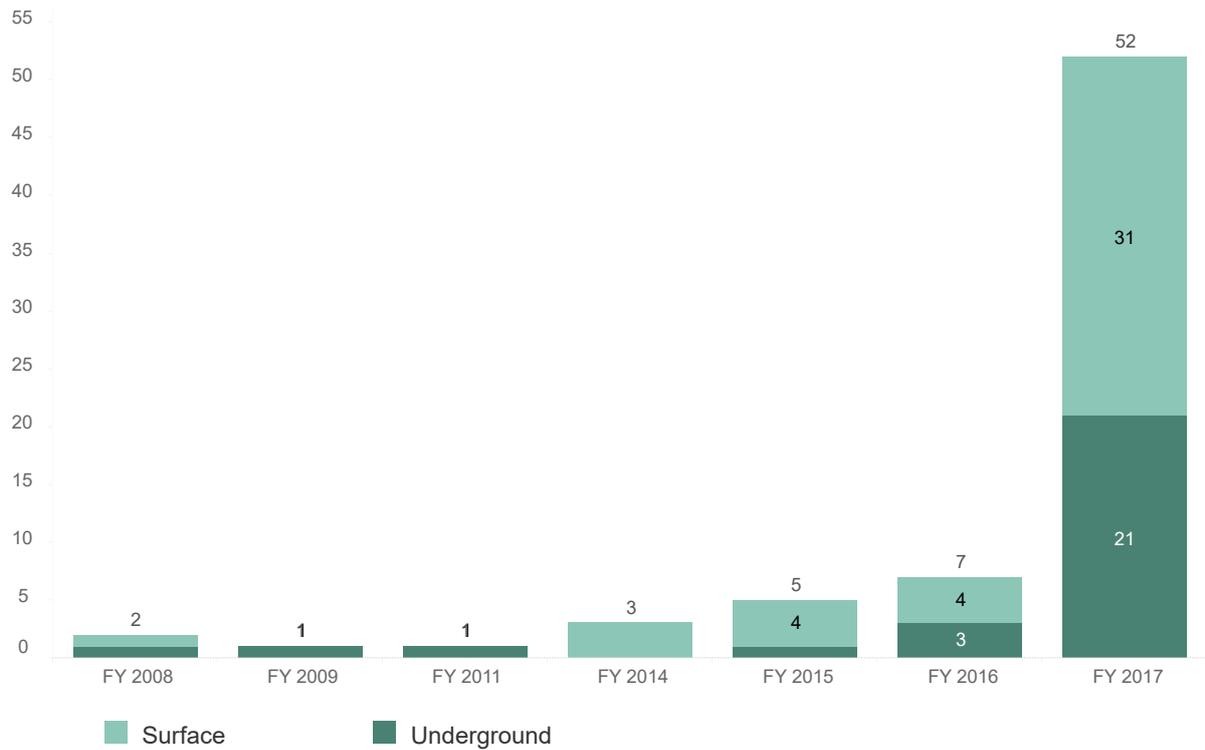
FIGURE 32. COAL NOTIFIABLE INCIDENTS BY OPERATION TYPE 2007-08 TO 2016-17



Complaints

In 2016-17, coal sector complaints increased to 52, up 45 complaints compared to the previous year. Improvements to the regulator’s complaints notification processes contributed to this increase.

FIGURE 33. COAL COMPLAINTS RECEIVED BY OPERATION TYPE 2007-08 TO 2016-17



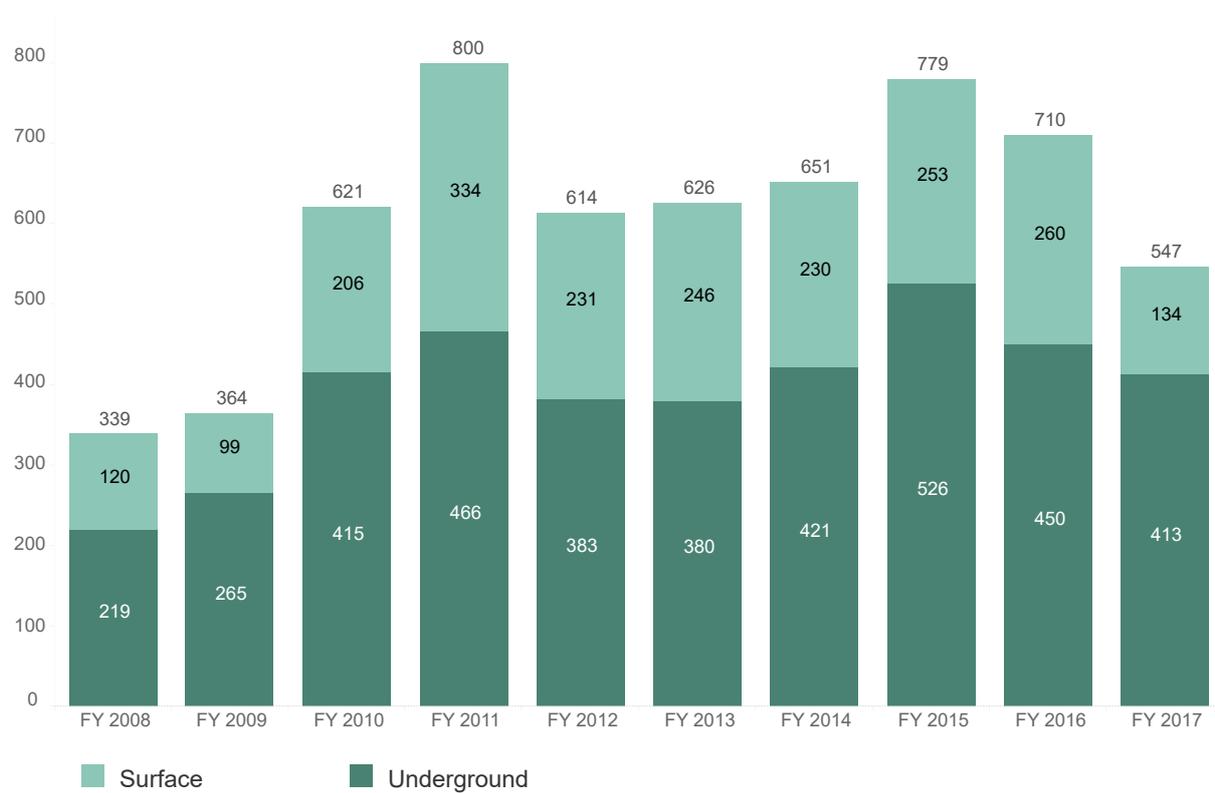
In 2016-17, coal sector complaints increased to 52, up 45 complaints compared to the previous year.

Safety notices

Safety notices by operation type

In 2016-17, the regulator issued fewer safety notices (notices of concern, improvement, prohibition, investigation and explosives enforcement notices) in the coal sector, down from 710 to 547 compared to the previous year. There are no clear increasing or decreasing trends in the number of notices issued over the ten years since 2007-08.

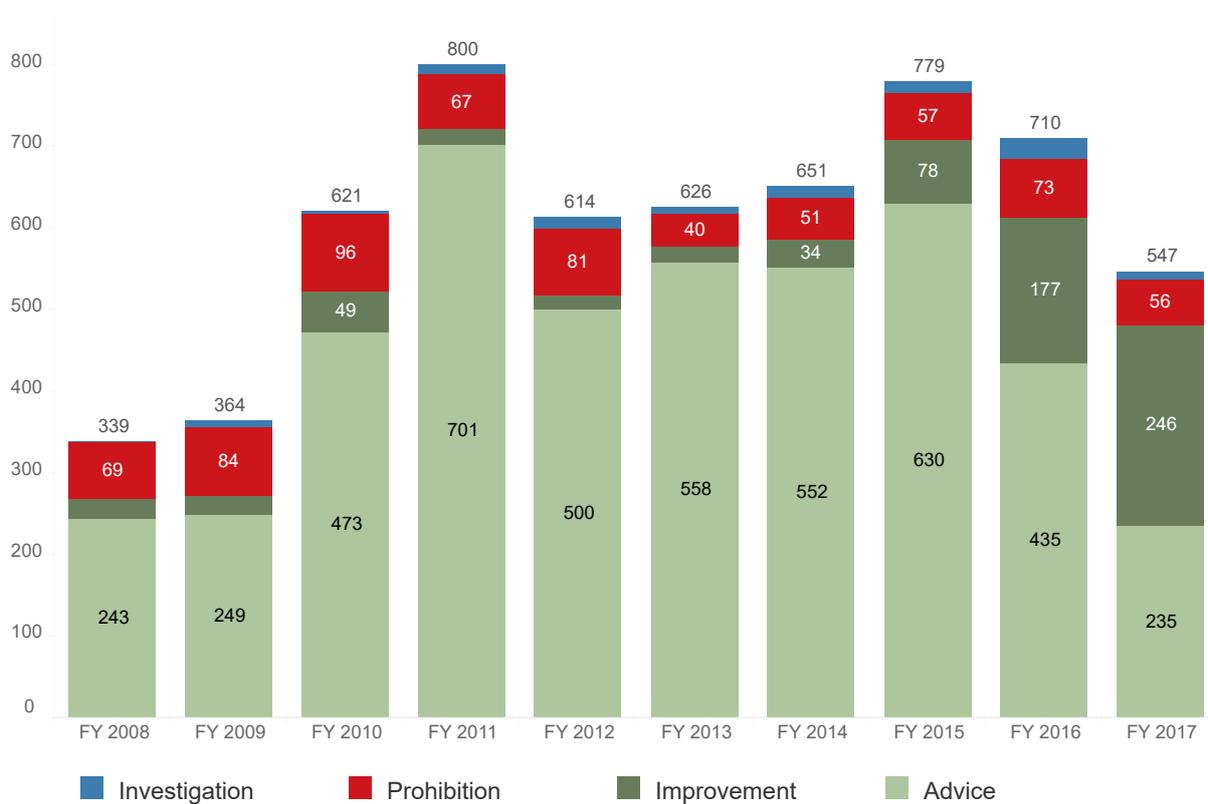
FIGURE 34. COAL NOTICES BY OPERATION TYPE 2007-08 TO 2016-17



Safety notices by notice type

In 2016-17, the overall number of notices was down 163 from 710 to 547 in the previous year. However, in 2016-17, the number of coal improvement notices has increased by almost 40% compared to the previous year from 177 in 2015-16 to 246 in 2016-17. The regulator’s renewed focus on incident prevention has contributed to this result where it sought to clearly identify matters that necessitate the issue of an improvement notices as compared with a written notice of concern.

FIGURE 35. COAL NOTICES BY NOTICE TYPE 2007-08 TO 2016-17



In 2016-17, the overall number of notices was down 163 from 710 to 547 in the previous year.

Metalliferous sector

Metalliferous sector statistics and performance measures for 2016-17



- One fatal injury underground metalliferous operation – 3 April 2017 – investigation ongoing (IIR 17-04)
- Fatal injury frequency rate (per million hours worked) up 43% from 0.042 in 2015-16 to 0.060 in 2016-17
- 21 serious injuries
- Serious injury frequency rate (per million hours worked) up 24.49% from 0.792 in 2015-16 to 0.986 in 2016-17
- 43 lost time injuries
- Lost time injury rate (per million hours worked) up 7.13% from 3.112 in 2015-16 to 3.334 in 2016-17
- 8 injury outcome (lost time and restricted duties of seven days or more)
- Injury outcome rate (lost time and restricted duties of seven days or more) (per million hours worked) up 4% from 0.732 in 2015-16 to 0.759.
- 216 total recordable injuries
- Total recordable injury rate (per million hours worked) down less than 1% from 19.11 in 2015-16 to 19.050 in 2016-17.
- 246 notifiable safety incidents notified to the regulator
- 14 complaints – 11 complaints lodged in relation to underground metalliferous operations
- 181 safety notices issued – 143 issued in underground operations, 22 were prohibition notices.

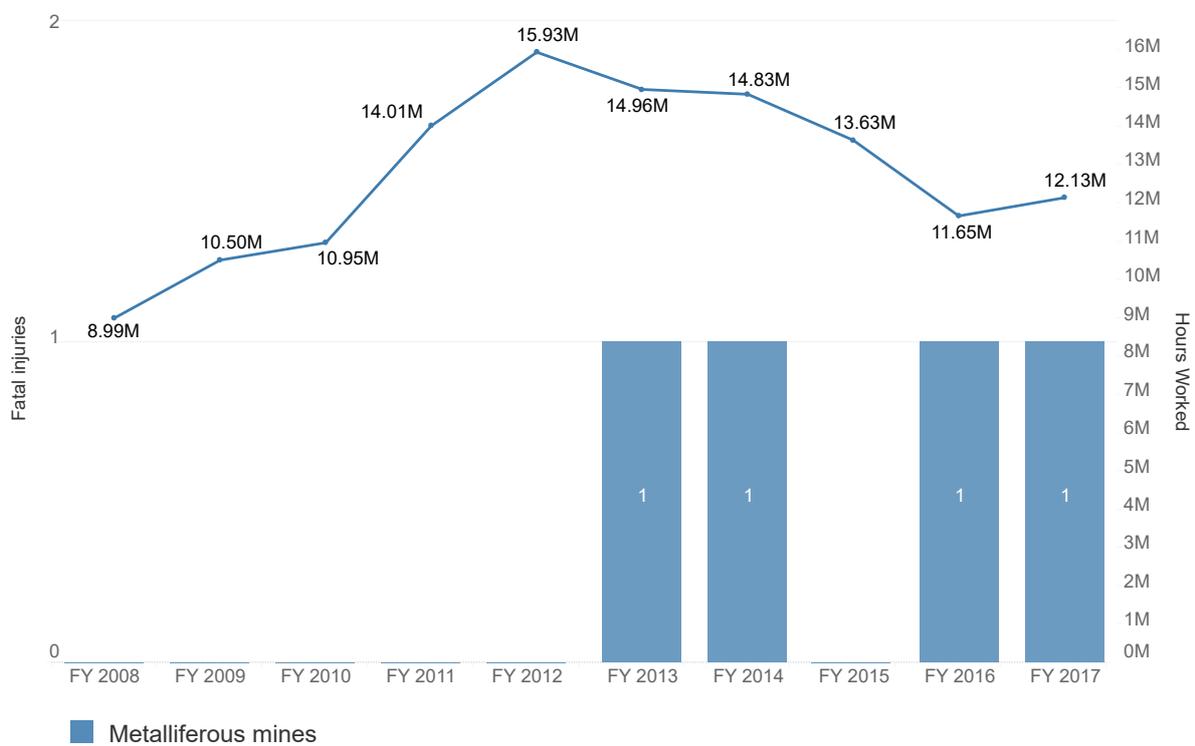
Fatal injuries

Fatal injuries and hours worked

In 2016-17, one fatal injury occurred in an underground metalliferous operation. In the ten years since 2007-08 there have been a total of four fatal injuries. All took place in underground operations.

Figure 2 above presenting fatal injuries in NSW mines from 1900 to 2016-17, shows the sustained decrease in fatal injuries occurring in metalliferous mining operations from 1989-90. The year 1999-2000 was a notable exception.

FIGURE 36. METALLIFEROUS FATAL INJURIES AND HOURS WORKED 2007-08 TO 2016-17

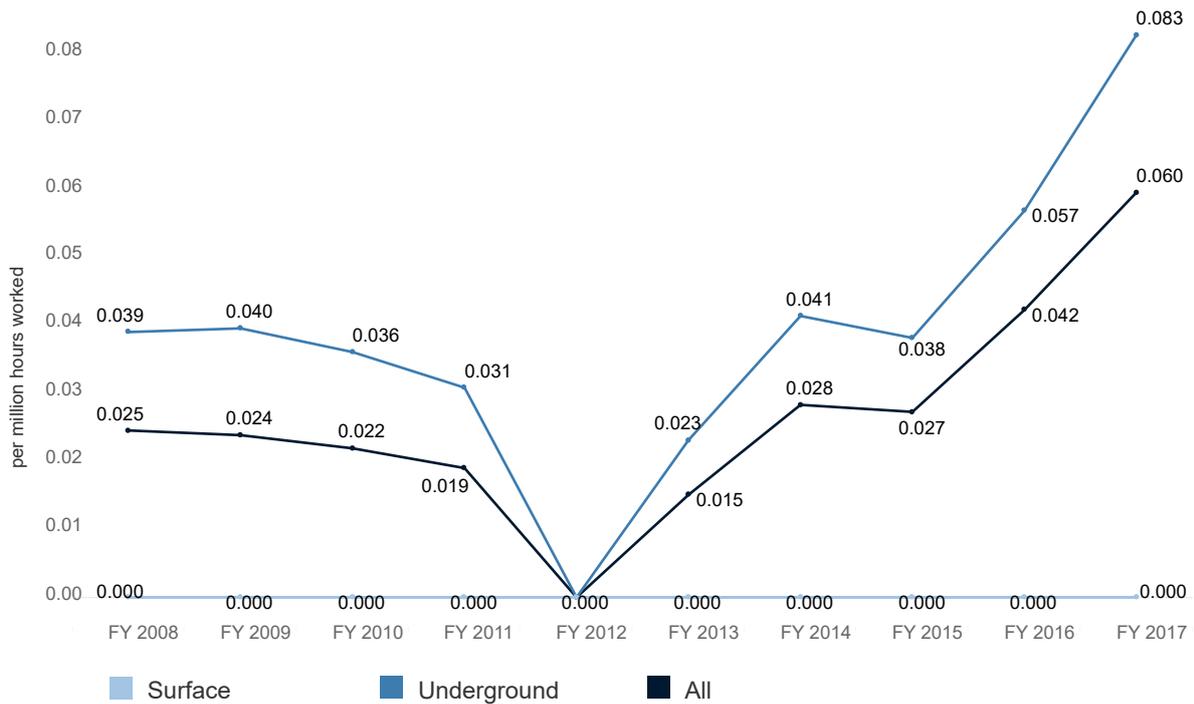


Fatal injury frequency rates

For the metalliferous mining sector, the rolling five year average fatal injury frequency rate (FIFR) to 2016-17 was up by 43% compared to the previous year (from 0.042 in 2015-16 to 0.060 in 2017-18).

From 2011-12 onwards, a steady increase in the FIFR has been observed for underground metalliferous mining operations.

FIGURE 37. METALLIFEROUS FIVE YEAR AVERAGE FIFR 2007-08 TO 2016-17



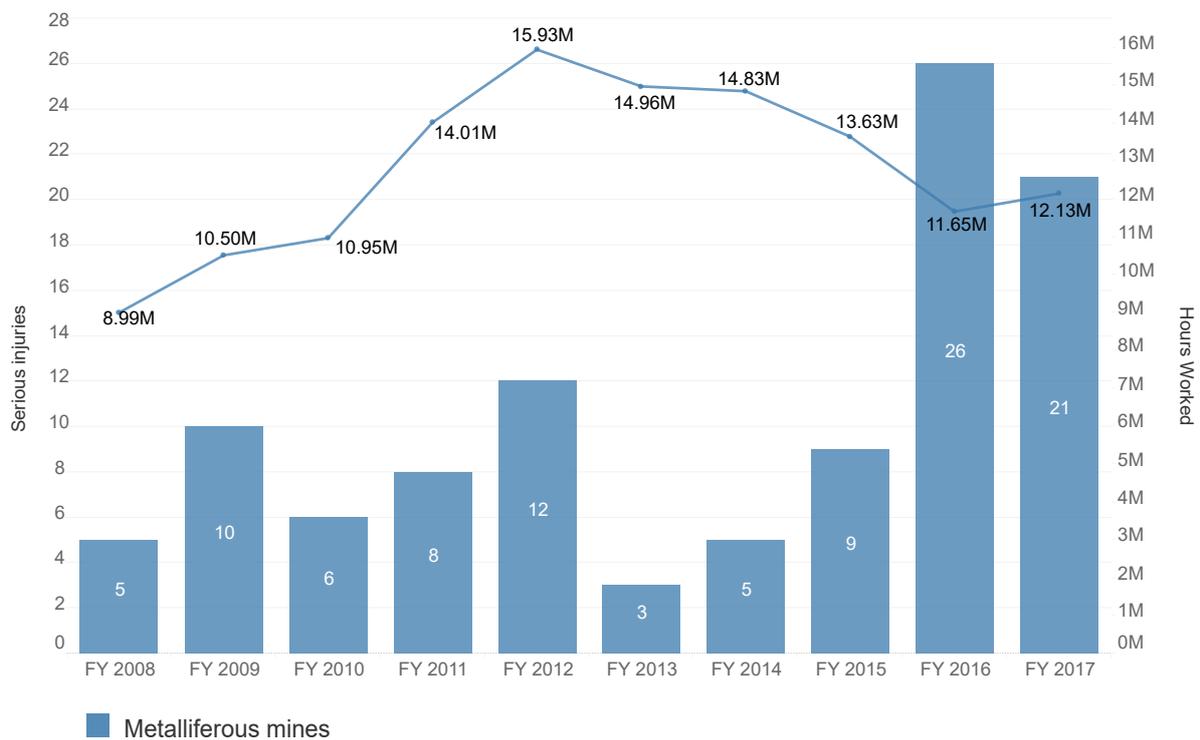
From 2011-12 onwards, a steady increase in the FIFR has been observed for underground metalliferous mining operations.

Serious injuries

Serious injuries and hours worked

In 2016-17 there were 21 serious injuries reported in the metalliferous sector this was down five from the previous year. In the two years since the Work Health and Safety (Mining and Petroleum Sites) Regulation 2014 commenced, the number of serious injuries reported to the regulator has increased. The broadened definition of serious injury has contributed to this increase.

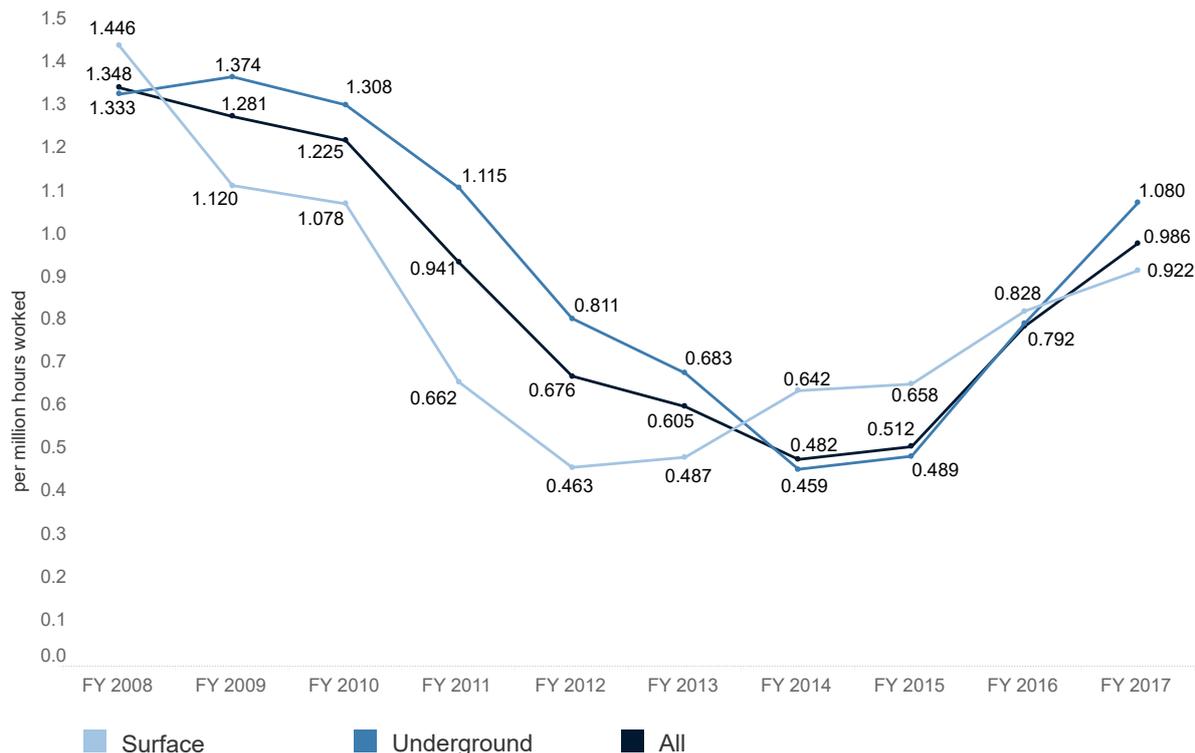
FIGURE 38. METALLIFEROUS SERIOUS INJURIES AND HOURS WORKED 2007-08 TO 2016-17



Serious injury frequency rates

For the metalliferous sector, the rolling five year average serious injury frequency rate (SIFR) was up approximately 25% from 0.792 in 2015-16 to 0.986 in 2016-17. By operation type, the underground and surface SIFRs increased by almost 36% and just over 10% respectively. The expanded definition of serious injury in 2015 has contributed to this observed increase.

FIGURE 39. METALLIFEROUS FIVE YEAR AVERAGE SIFR 2007-08 TO 2016-17



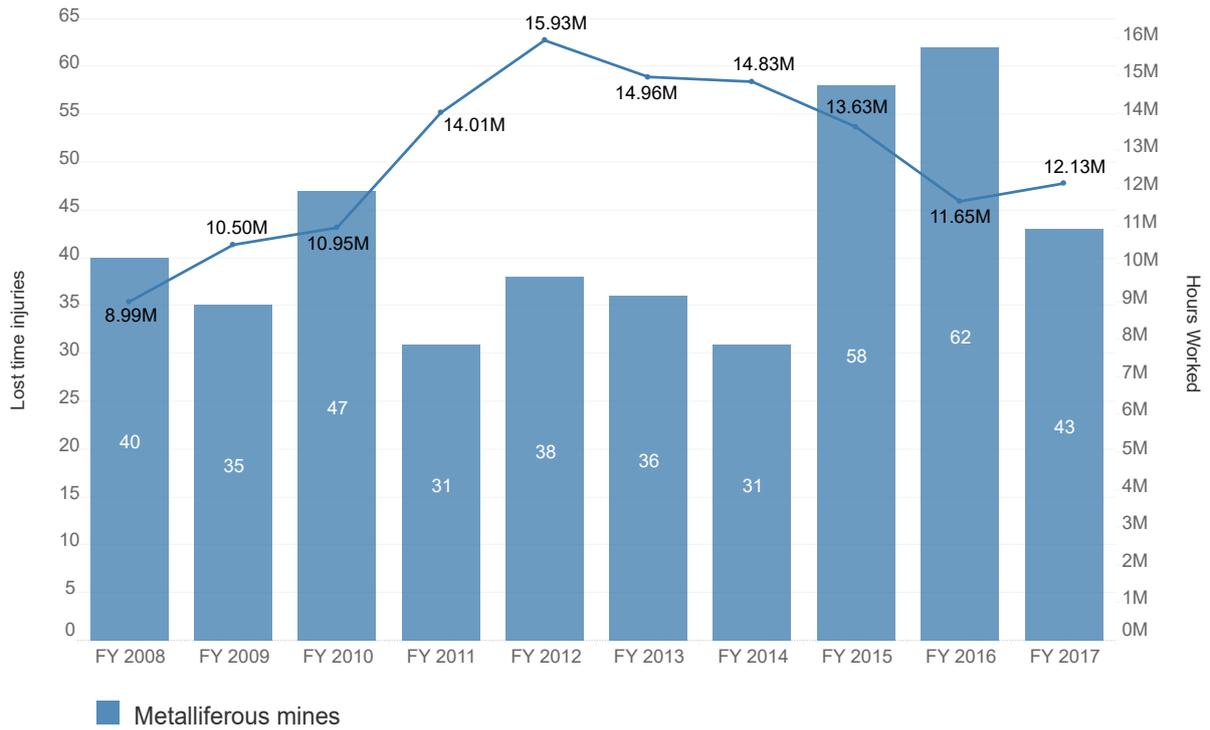
For the metalliferous sector, the rolling five year average serious injury frequency rate was up approximately 25% from 0.792 in 2015-16 to 0.986 in 2016-17.

Lost time injuries

Lost time injuries and hours worked

In 2016-17, the number of lost time injuries reported to the regulator was 43, down 19 compared to the previous year.

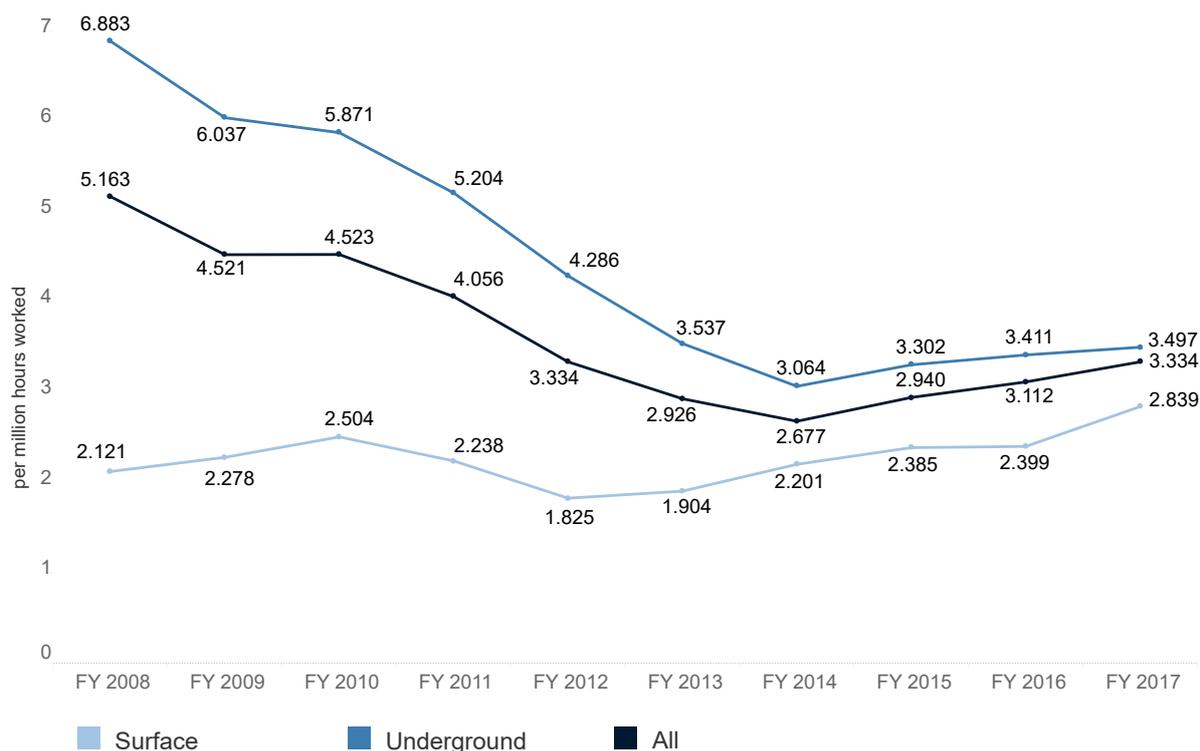
FIGURE 40. METALLIFEROUS LOST TIME INJURIES AND HOURS WORKED 2007-08 TO 2016-17



Lost time injury frequency rates

The rolling five year average lost time injury frequency rate (LTIFR) to 2016-17, compared to 2015-16, increased by almost 7%. In the ten years since 2007-08 the metalliferous LTIFR has decreased by approximately third. However, over the ten year reporting period, a steady increase in the LTIFR for surface metalliferous operations was observed.

FIGURE 41. METALLIFEROUS FIVE YEAR AVERAGE LTIFR 2007-08 TO 2016-17



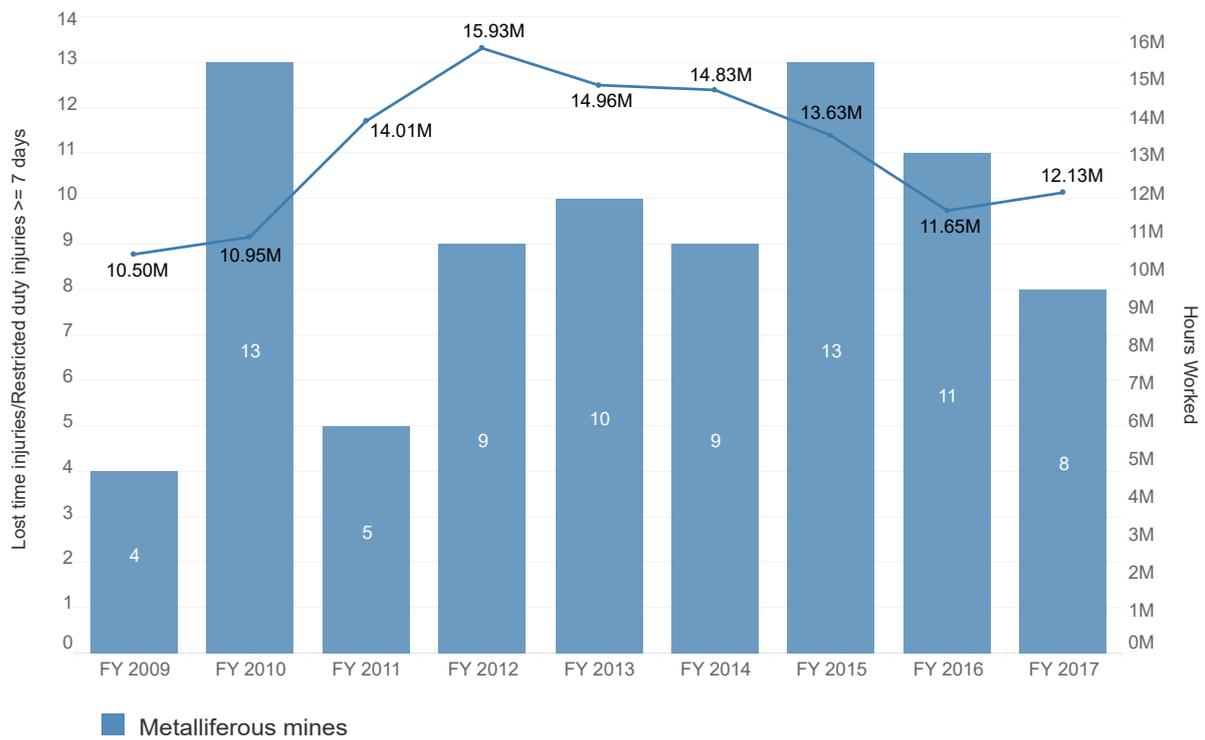
The rolling five year average lost time injury frequency rate to 2016-17, compared to 2015-16, increased by almost 7%.

Injury outcomes of seven days or more

Injury outcomes of seven days or more and hours worked

In 2016-17, there were eight metalliferous injury outcomes (lost time and restricted duties injuries) of seven days or more (LTI/RDI \geq 7 days). This is down to three compared to the previous year. In the ten years since 2007-08, the number of severe injuries of this type has doubled, from four in 2008-09 to eight in 2016-17.

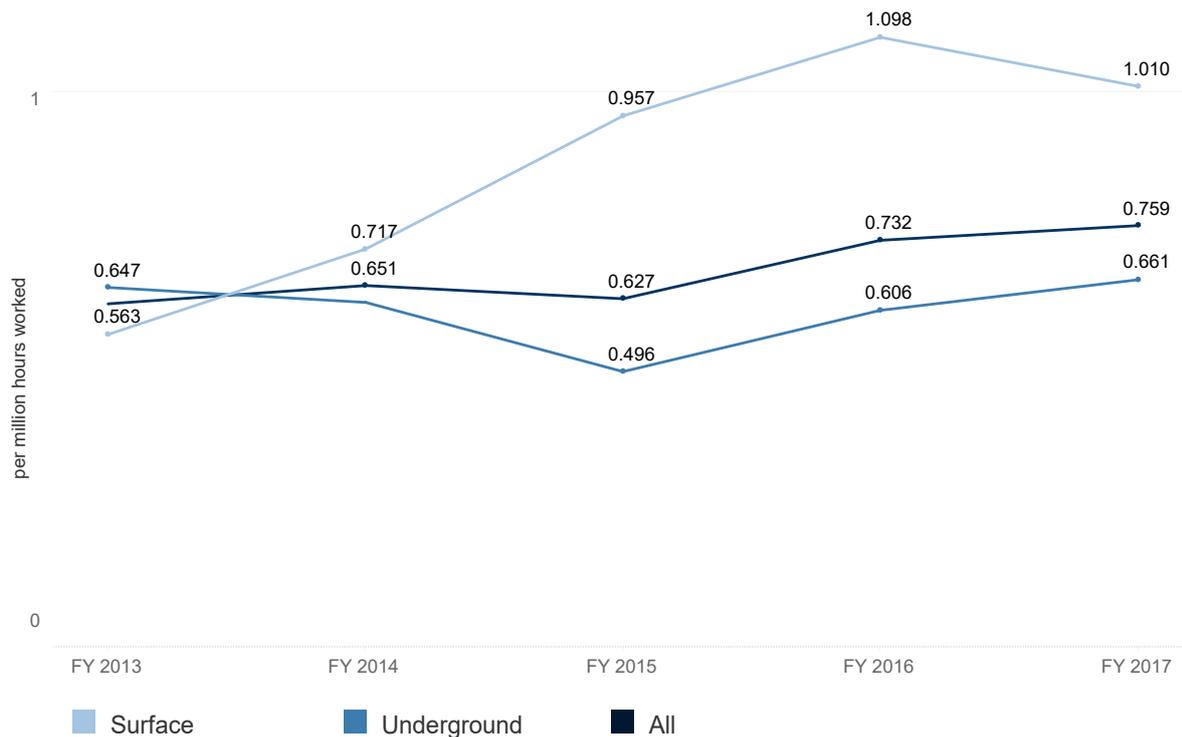
FIGURE 42. METALLIFEROUS LTI / RDI \geq 7 DAYS AND HOURS WORKED 2008-09 TO 2016-17



Injury outcomes of seven days or more frequency rates

For the metalliferous sector, the rolling five year average injury outcome (lost time and restricted duties injuries) of one week or more (LTI / RDI \geq 7days) frequency rate to 2016-17 was 0.759, up 4% on the previous year. Since 2012-13, an increasing trend for LTI / RDI \geq 7days frequency rates was observed for surface metalliferous. LTI/RDI \geq 7daysFR was unable to be calculated for the ten year reporting period as some of this data was included in metalliferous quarterly reporting requirements from 2008.

FIGURE 43. METALLIFEROUS LTI / RDI \geq 7 DAYS FREQUENCY RATES 2012-13 TO 2016-17



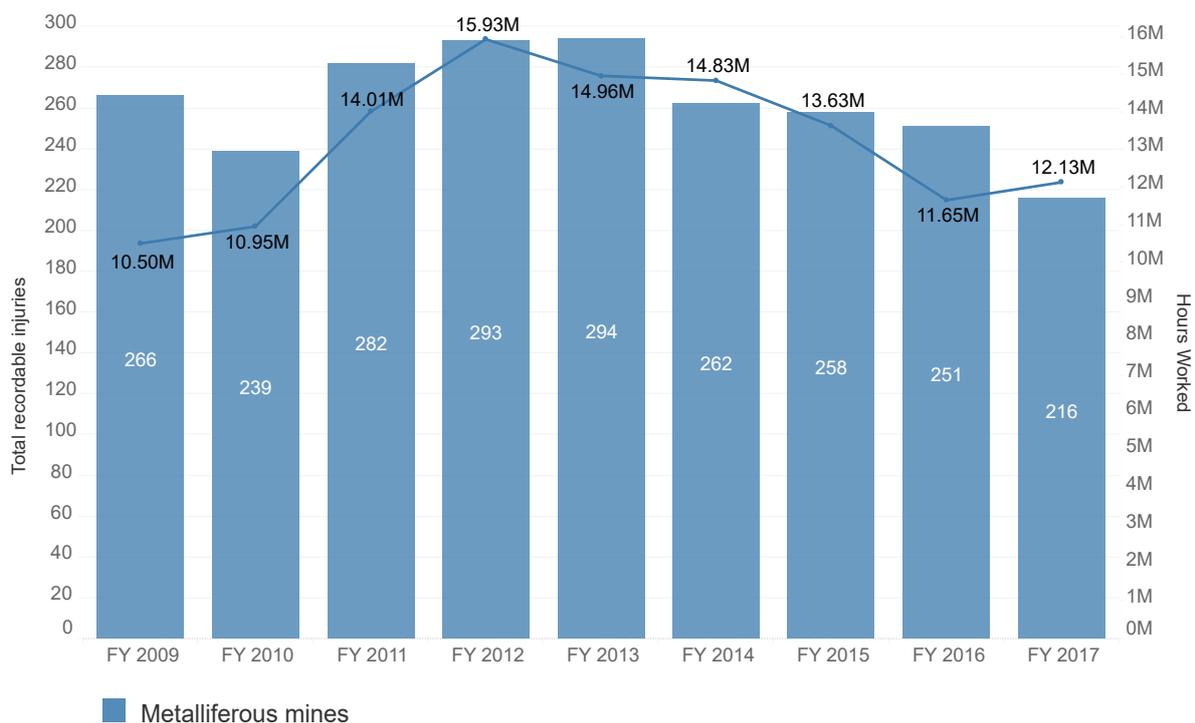
For the metalliferous sector, the rolling five year average injury outcome (lost time and restricted duties injuries) of one week or more (LTI / RDI \geq 7days) frequency rate to 2016-17 was 0.759, up 4% on the previous year.

Total recordable injuries

Total recordable injuries and hours worked

In 2016-17, the number of total recordable injuries (the total number of fatal injuries and injuries resulting in lost time, restricted duties or medical treatment) was down 14% on the previous year from 251 to 216. From 2012-13, a year on year decrease in the number of total recordable injuries was observed for the metalliferous sector.

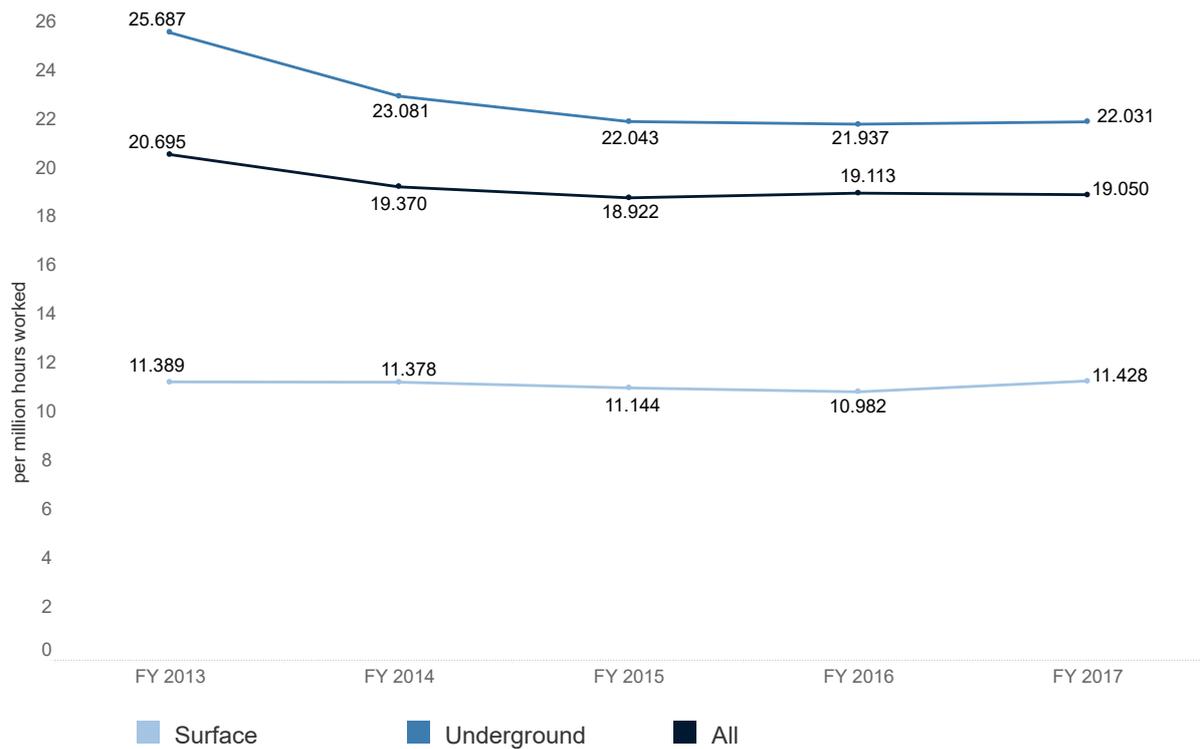
FIGURE 44. METALLIFEROUS TOTAL RECORDABLE INJURY AND HOURS WORKED 2008-09 TO 2016-17



Total recordable injuries frequency rates

Since 2012-13, there has been no substantial change in the five year rolling average total recordable injury frequency rate (TRIFR) for the metalliferous sector. A rolling five year average TRIFR was unable to be calculated for the ten year reporting period as this information was included in metalliferous quarterly reporting requirements from 2008.

FIGURE 45. METALLIFEROUS FIVE YEAR AVERAGE TRIFR 2012-13 TO 2016-17

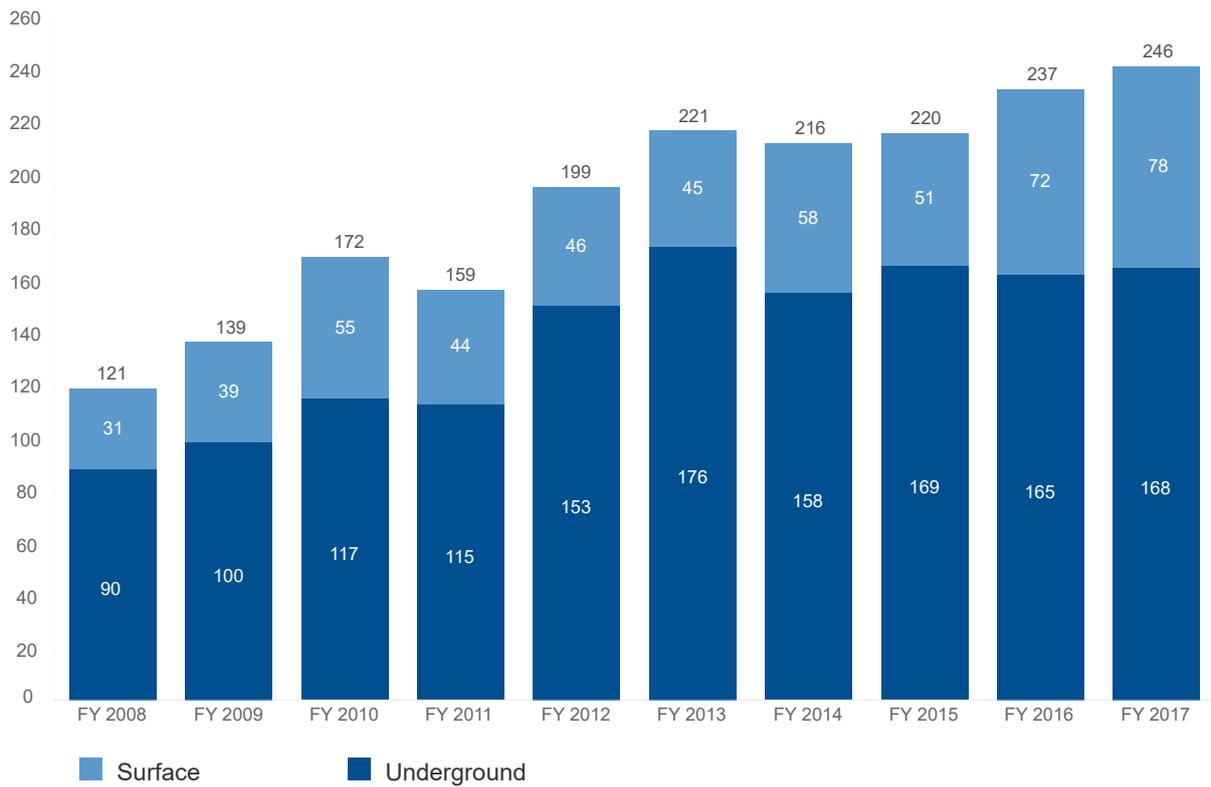


Since 2012-13, there has been no substantial change in the five year rolling average total recordable injury frequency rate (TRIFR) for the metalliferous sector.

Notified safety incidents

In 2016-17, notified safety incidents in the metalliferous sector was up nine compared to 2015-16, from 237 to 246. In the ten years since 2008-09 a steady increase in the number of notified safety incidents was observed. Improved industry reporting practices has contributed to this increase.

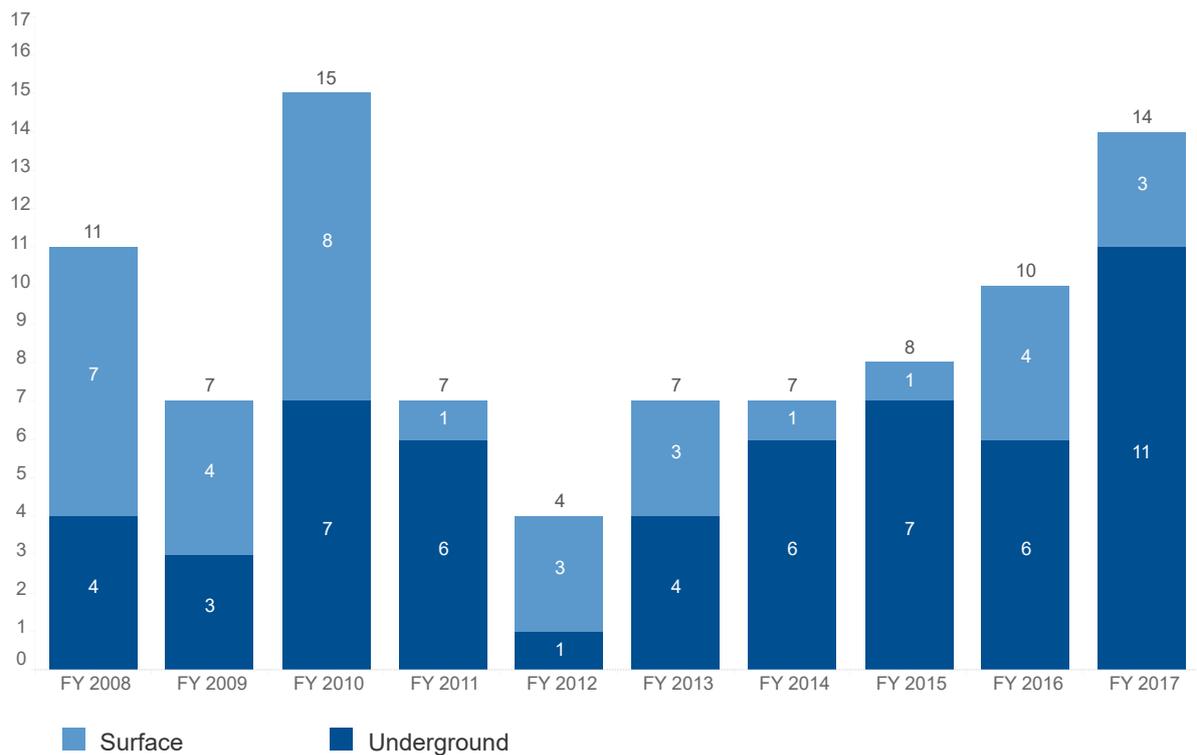
**FIGURE 46. METALLIFEROUS NOTIFIABLE INCIDENTS BY OPERATION TYPE
 2007-08 TO 2016-17**



Complaints

In 2016-17, there were 14 complaints made to the regulator about safety in the metalliferous sector complaints, up four compared to the previous year. Improvements in the regulator’s complaints notification processes has contributed to this observed increase.

FIGURE 47. METALLIFEROUS COMPLAINTS RECEIVED BY OPERATION TYPE 2007-08 TO 2016-17



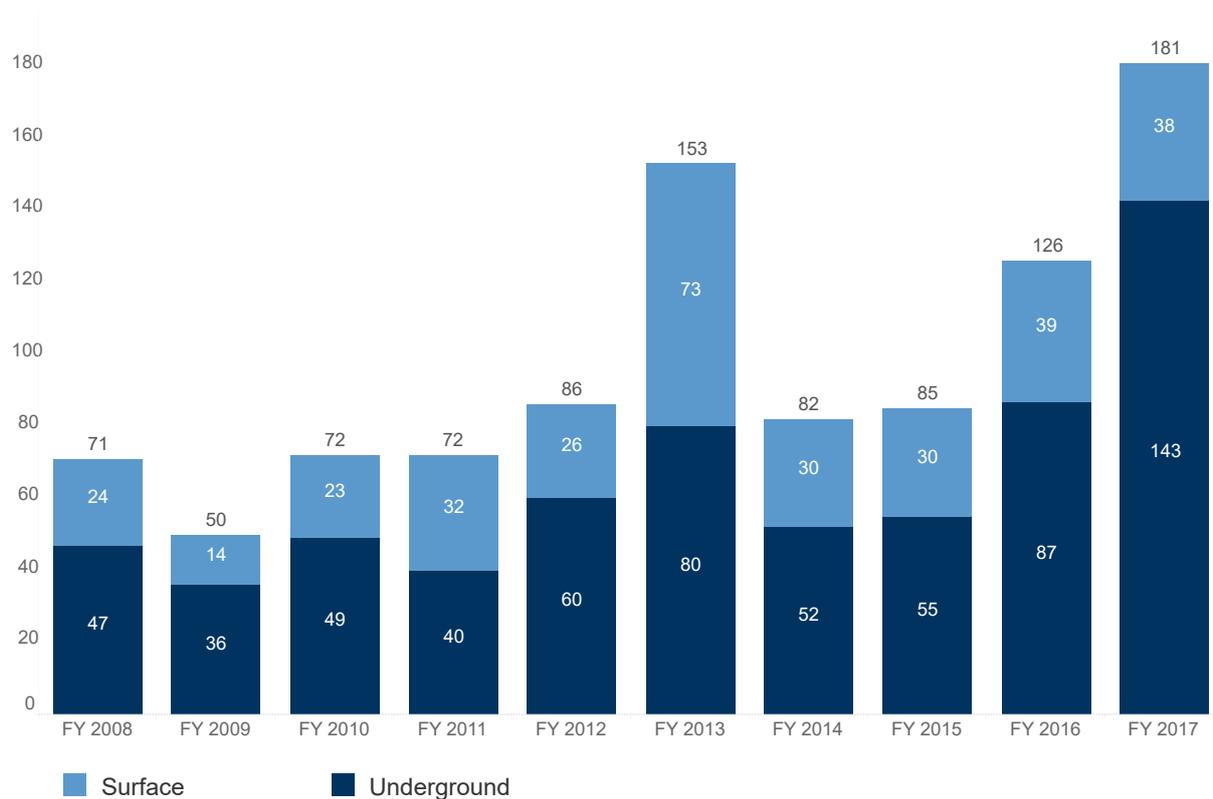
In 2016-17, there were 14 complaints made to the regulator about safety in the metalliferous sector complaints, up four compared to the previous year.

Safety notices

Safety notices by operation type

In 2016-17, the number of safety notices (notices of concern, improvement, prohibition, investigation and explosives enforcement notices) issued by the regulator in the metalliferous sector was up 55 compared to the previous year, from 126 to 181. There has been an upward trend in notices in the ten years since 2007-08. In 2016-17 the number of safety notices has tripled from 71 to 181.

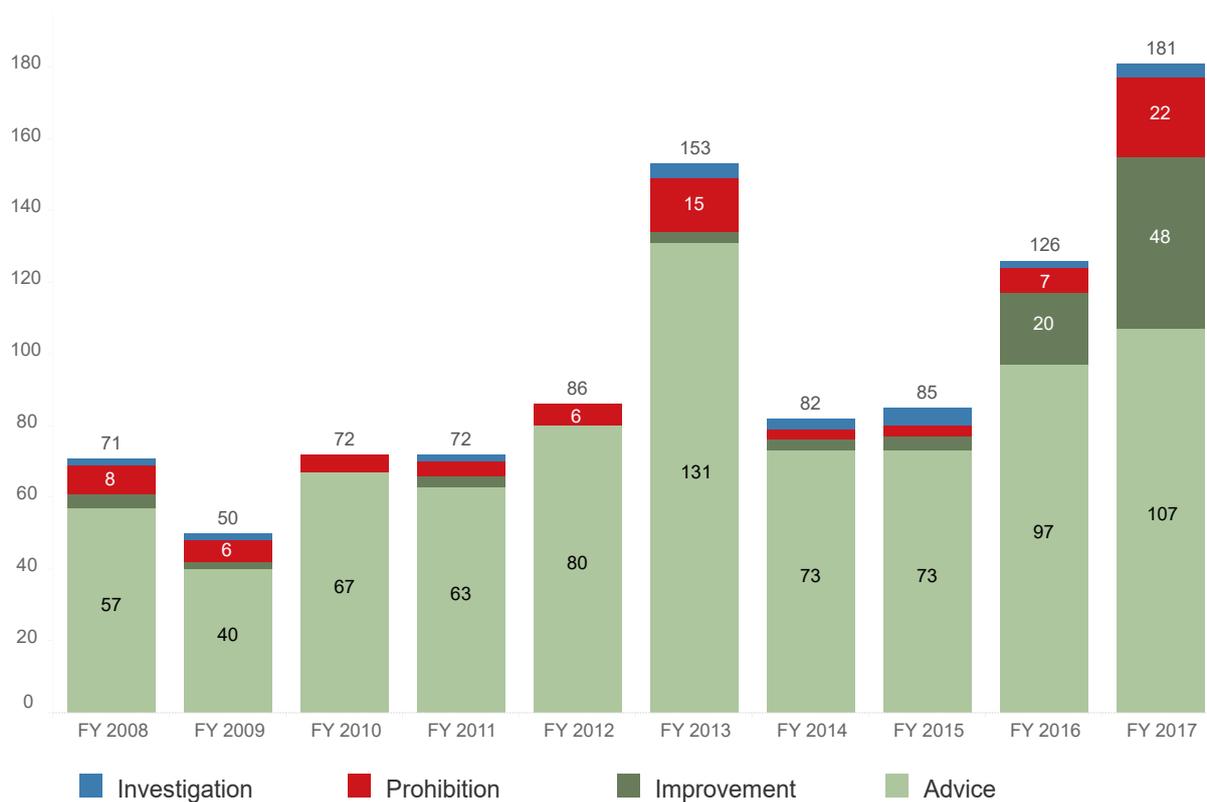
FIGURE 48. METALLIFEROUS NOTICES BY OPERATION TYPE 2007-08 TO 2016-17



Safety notices by notice type

In 2016-17 the number of prohibition notices issued by the regulator was up 15 compared to the previous year, from seven to 22. There has been an upward trend in the number of notices issued over the ten years since 2007-08 so that they are currently 60% higher than ten years ago.

FIGURE 49. METALLIFEROUS NOTICES BY NOTICE TYPE 2007-08 TO 2016-17



In 2016-17 the number of prohibition notices issued by the regulator was up 15 compared to the previous year, from seven to 22.

Extractives sector

Extractives sector statistics and performance measures for 2016-17



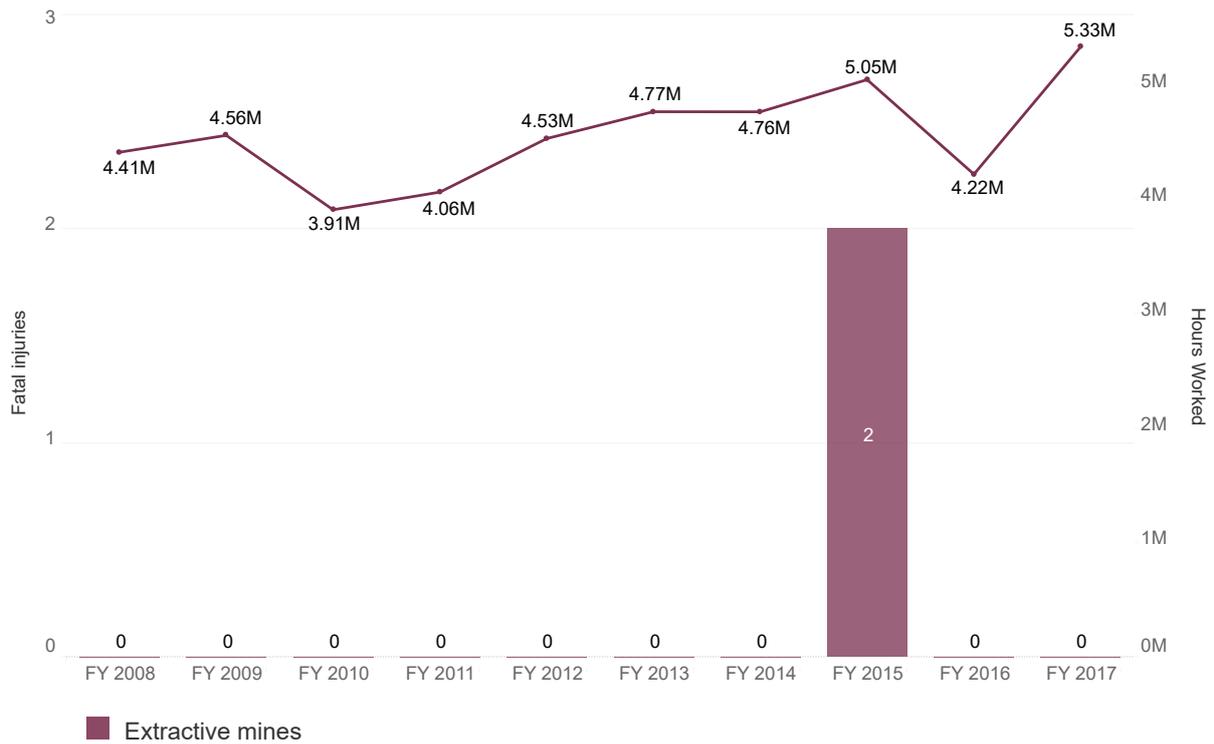
- Zero fatal injuries
- Fatal injury frequency rate (per million hours worked) down 3.49% from 0.086 in 2015-16 to 0.083 in 2016-17
- 12 serious injuries
- Serious injury frequency rate (per million hours worked) up 16.85% from 1.490 in 2015-16 to 1.741 in 2016-17
- 46 lost time injuries
- Lost time injury rate (per million hours worked) down 6.78% from 10.777 in 2015-16 to 10.040 in 2016-17
- 4 injury outcomes (lost time or restricted duty injuries) of seven days or more
- Injury outcome rate (lost time and restricted duty) with outcomes of seven days or more (per million hours worked) down 23 % from 2.44 in 2015-16 to 1.865 in 2016-17
- 112 total recordable injuries
- Total recordable injury rate (per million hours worked) In 2016-17, down 12% from 31.724 in 2015-16 to 27.974 in 2016-17.
- 135 safety incidents notified to the regulator.
- 17 complaints received in relation to the regulator – all 17 complaints lodged by extractives operations
- 429 safety notices issued – all 429 issued on surface operations, 25 were prohibition notices

Fatal injuries

Fatal injuries and hours worked

There were no fatal injuries in the extractives sector in 2016-17 financial year. Over the ten year reporting period there were two fatal injuries in the extractives sector. Both occurred in 2014-15.

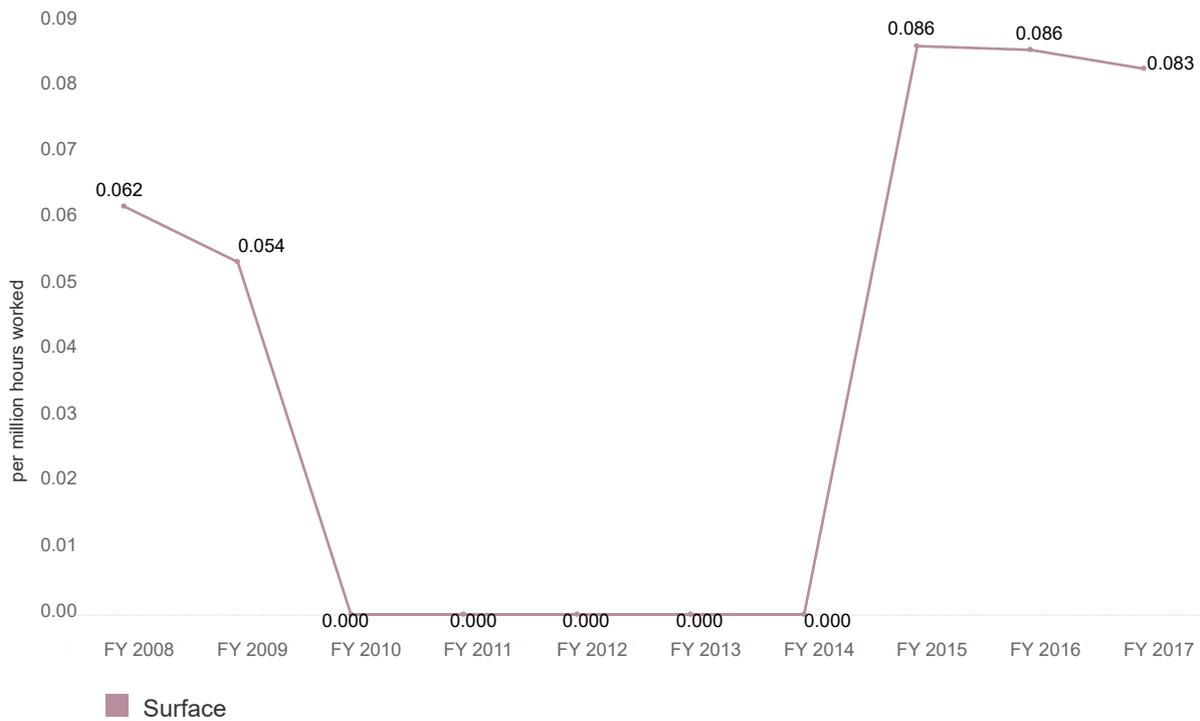
FIGURE 50. EXTRACTIVES FATAL INJURIES AND HOURS WORKED 2007-08 TO 2016-17



Fatal injury frequency rates

In the extractives mining sector, the rolling five year average fatal injury incident rate (FIFR) to 2016-17 was down by almost 3.5% compared to previous year (from 0.086 in 2015-16 to 0.083 in 2016-17).

FIGURE 51. EXTRACTIVES FIVE YEAR AVERAGE FIFR 2007-08 TO 2016-17



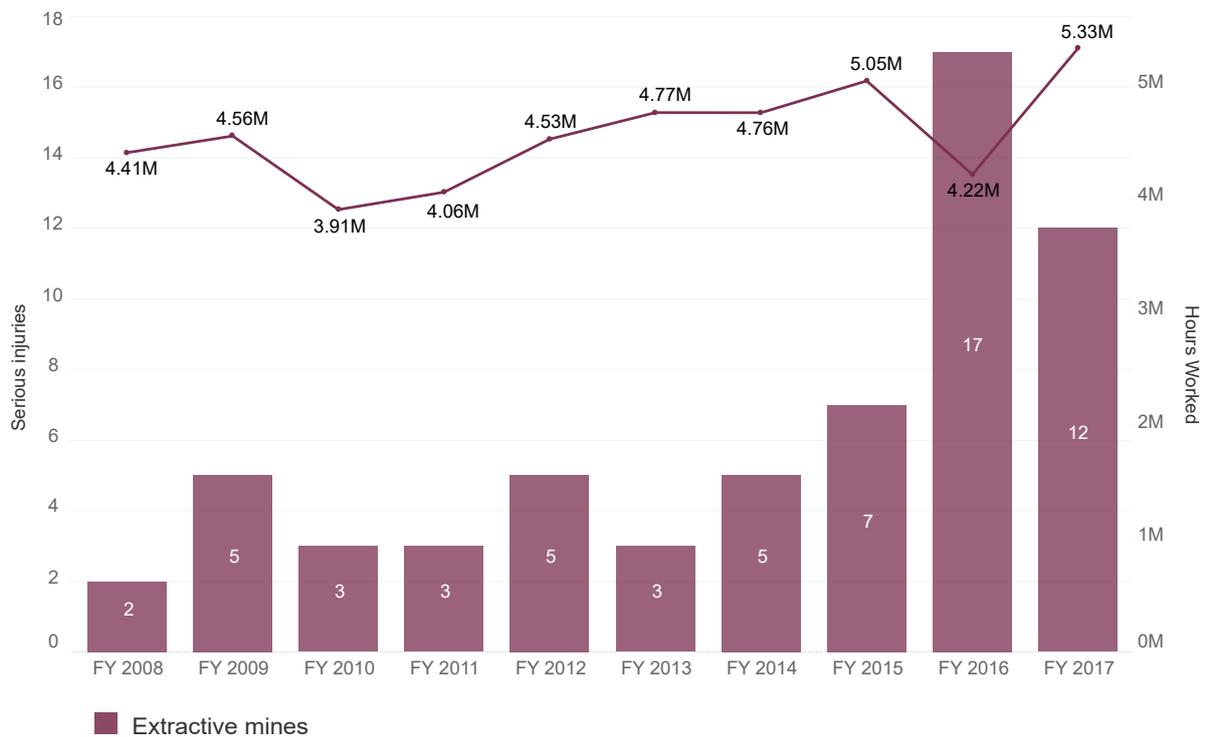
Fatal injury frequency rate (per million hours worked) down 3.49% from 0.086 in 2015-16 to 0.083 in 2016-17

Serious injuries

Serious injuries and hours worked

There were 12 serious injuries reported in the extractives sector during 2016-17 this is down 5 compared to the previous year. In the three year period since the Work Health and Safety (Mining & Petroleum Sites) Regulation 2014 commenced, the number of serious injuries reported to the regulator by the extractives sector has increased. The broadened definition of serious injuries has contributed to the observed increase.

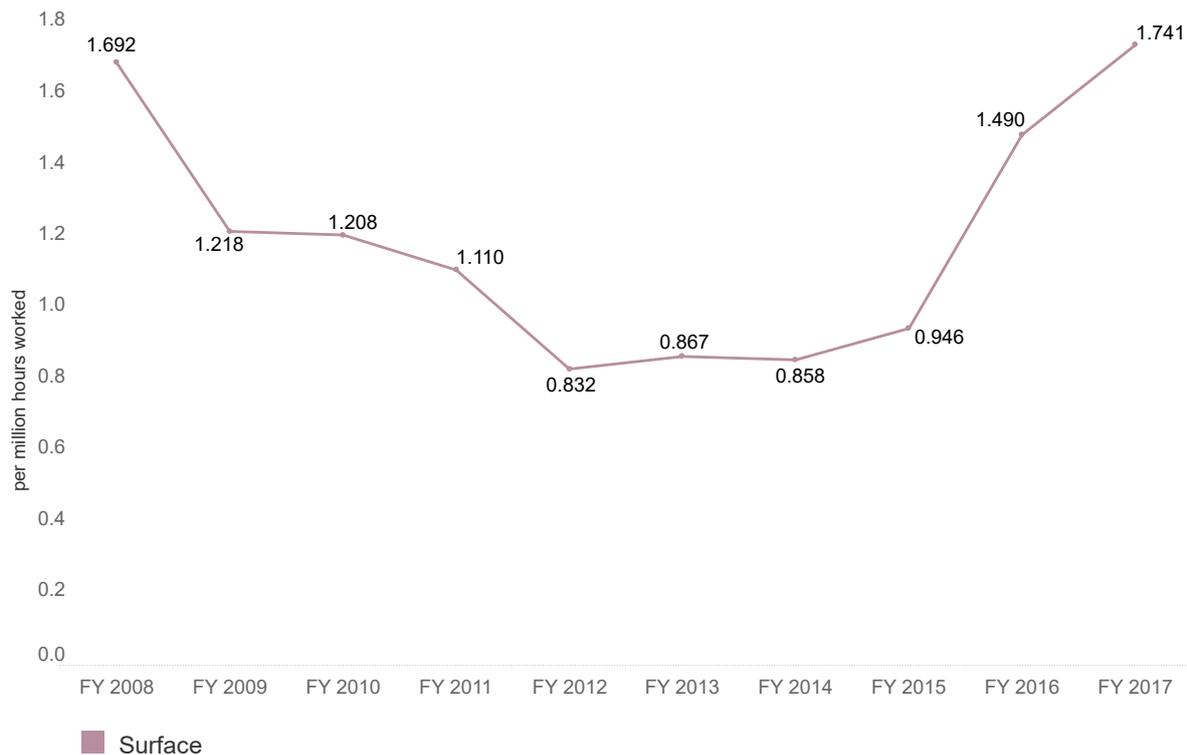
FIGURE 52. EXTRACTIVES SERIOUS INJURIES AND HOURS WORKED 2007-08 TO 2016-17



Serious injury frequency rates

For the extractives sector, the rolling five year average serious injury frequency rate (SIFR) was up 16% from 1.490 in 2015-16 to 1.741 in 2016-17. The introduction of the Work Health and Safety (Mines and Petroleum Sites) Regulation 2014 introduced an expanded definition of serious injury. This has contributed to the observed increase since 2014-15.

FIGURE 53. EXTRACTIVES FIVE YEAR AVERAGE SIFR 2007-08 TO 2016-17



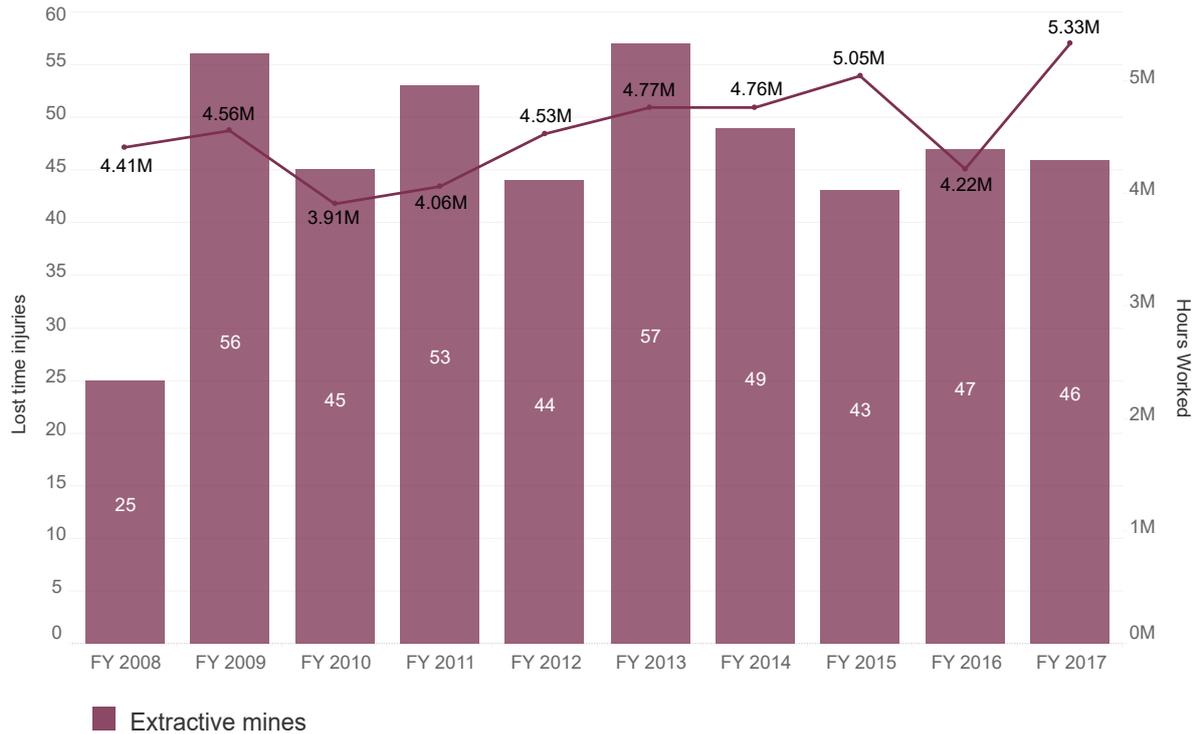
For the extractives sector, the rolling five year average serious injury frequency rate was up 16% from 1.490 in 2015-16 to 1.741 in 2016-17.

Lost time injuries

Lost time injuries and hours worked

In 2016-17, the number of lost time injuries was 46, down one from the previous year. In the ten years since 2007-08, there has been no obvious increasing trend in lost time injuries.

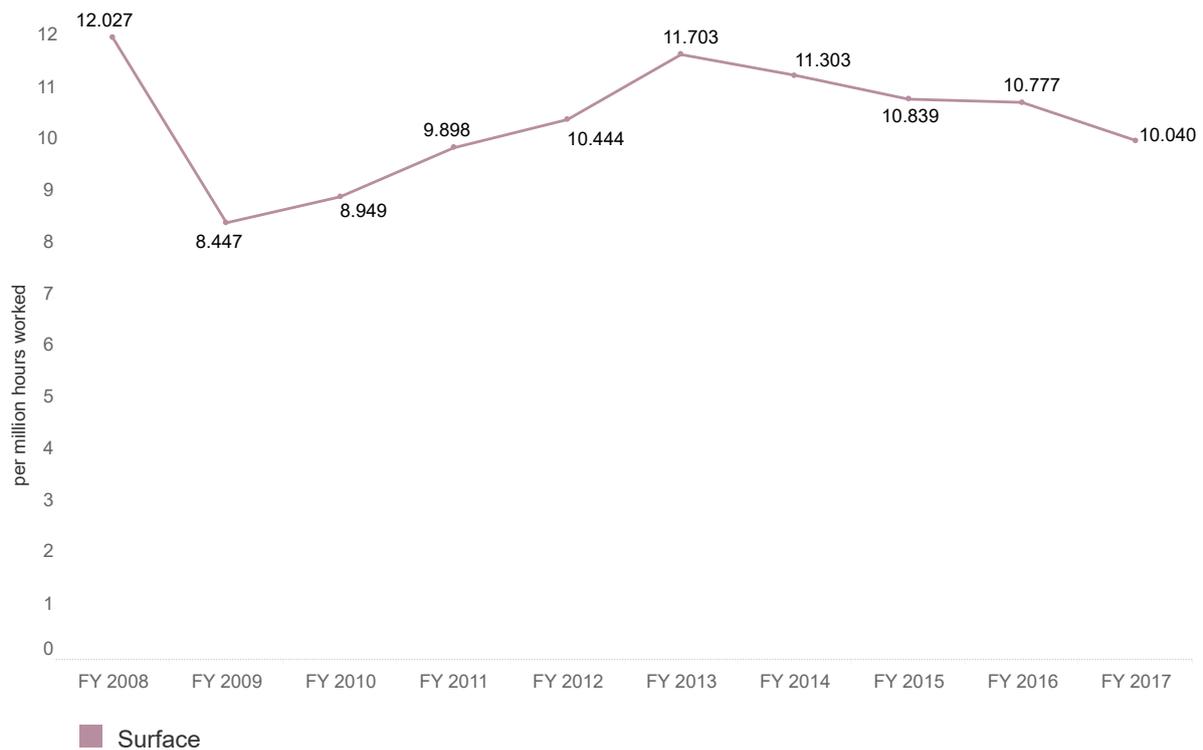
FIGURE 54. EXTRACTIVES LOST TIME INJURIES AND HOURS WORKED 2007-08 TO 2016-17



Lost time injury frequency rates

In 2016-17, rolling five year average lost time injury frequency rate (LTIFR) was down 7% on the previous year from 10.777 to 10.040. Over the ten year reporting period, there has been no obvious increasing or decreasing trend in the rate of lost time injuries in the extractives sector.

FIGURE 55. EXTRACTIVES FIVE YEAR AVERAGE LOST TIME INJURY FREQUENCY RATE (LTIFR) 2007-08 TO 2016-17



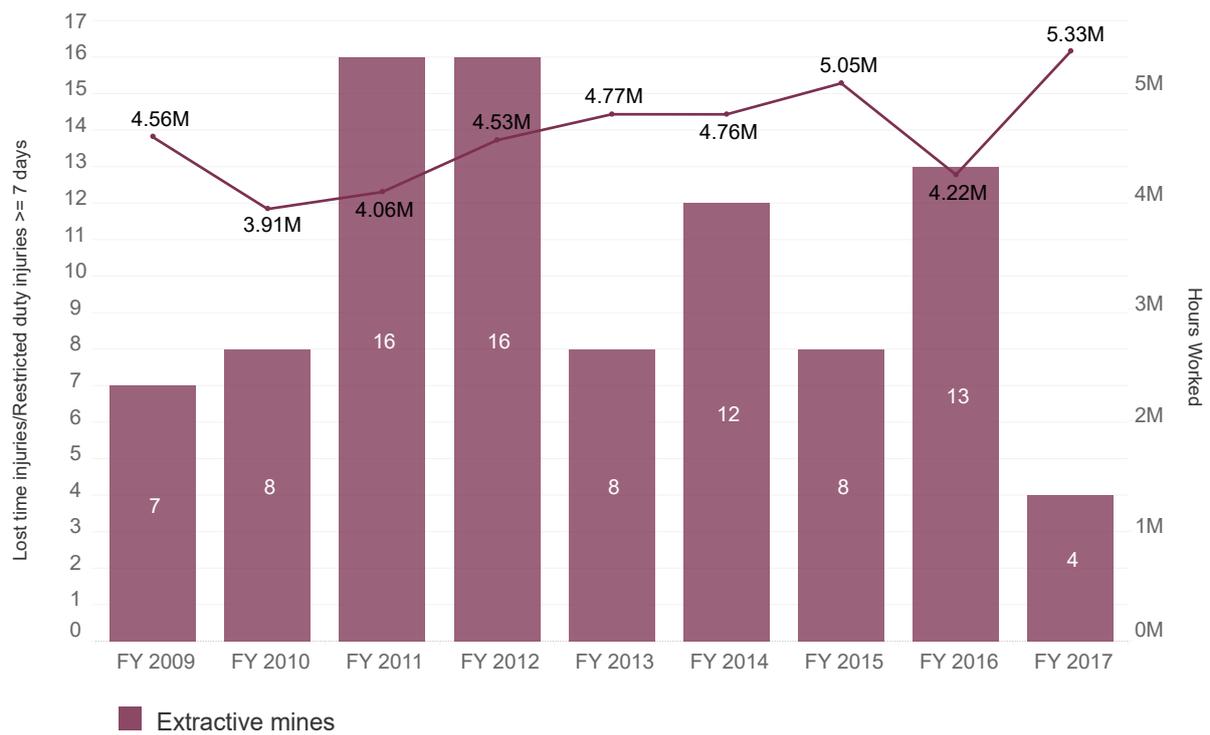
In 2016-17, rolling five year average lost time injury frequency rate was down 7% on the previous year from 10.777 to 10.040.

Injury outcomes of seven days or more

Injury outcomes of seven days or more and hours worked

In 2016-17, there were four metalliferous injury outcomes (lost time injuries and restricted duties injuries) seven days or more (LTI / RDI \geq 7 days), down nine on the previous year. Overall, there has been no obvious increasing or decreasing trend for LTI / RDI \geq 7 days in the nine years since 2008-09.

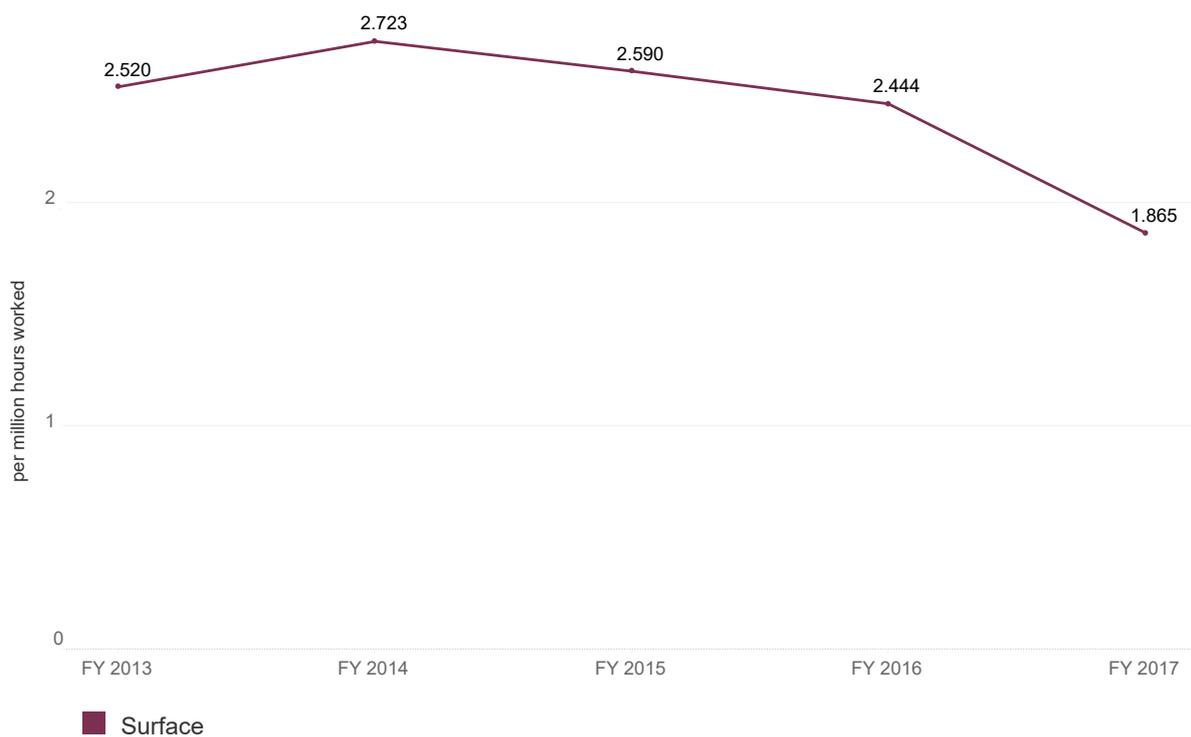
FIGURE 56. EXTRACTIVES LTI / RDI \geq 7 DAYS AND HOURS WORKED 2008-09 TO 2016-17



Injury outcomes of seven days or more frequency rates

For the extractives sector, the rolling five year average injury outcome (lost time and restricted duties of one week or more) (LTI / RDI \geq 7days) frequency rate to 2016-17 was 1.865, down 23% on the previous year. Since 2013-14, a downward trend for LTI / RDI \geq 7days frequency rates was observed for extractives and in 2016-17, the frequency rate was about 30% less than the rate in 2013-14.

FIGURE 57. EXTRACTIVES FIVE YEAR AVERAGE LTI / RDI \geq 7 DAYS FREQUENCY RATES 2012-13 TO 2016-17



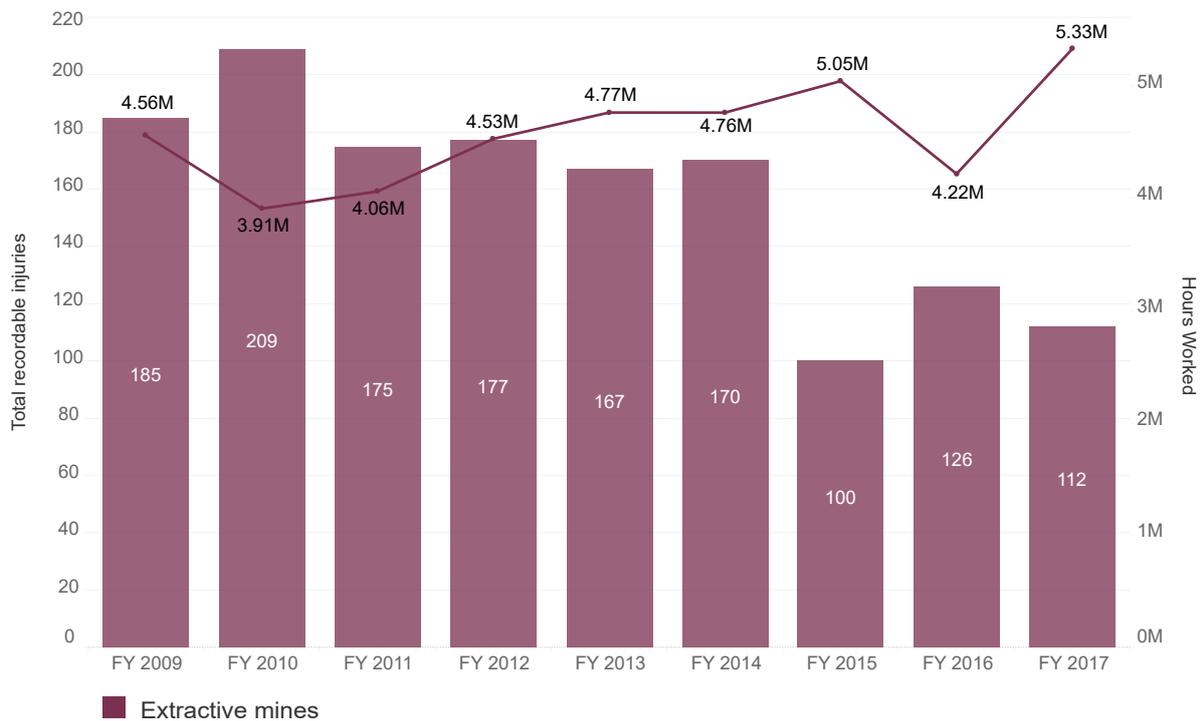
Since 2013-14, a downward trend for LTI / RDI \geq 7days frequency rates was observed for extractives and in 2016-17, the frequency rate was about 30% less than the rate in 2013-14.

Total recordable injuries

Total recordable injuries and hours worked

In 2016-17, compared to 2015-16, total recordable injuries decreased by approximately 11%, from 126 down to 112. In the ten year period since 2008-09, total recordable injuries (the total number of fatal injuries and injuries resulting in lost time, restricted duties or medical treatment) has decreased by almost 40%.

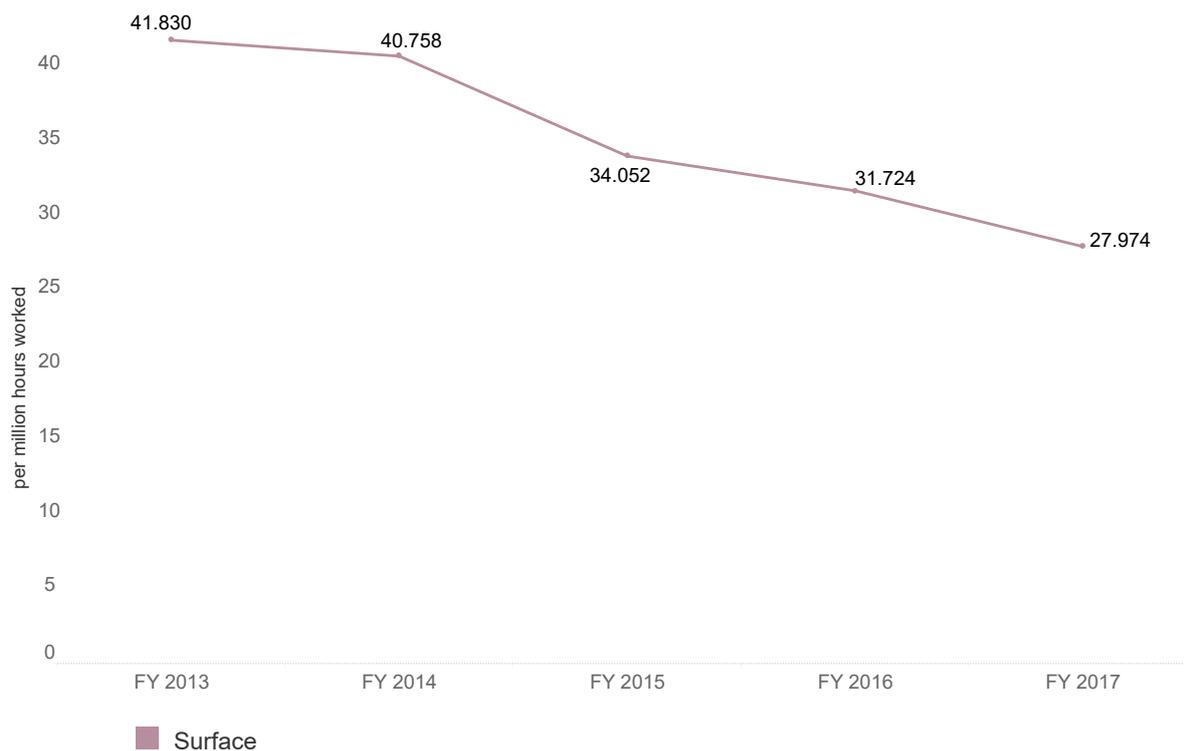
FIGURE 58. EXTRACTIVES TOTAL RECORDABLE INJURY AND HOURS WORKED 2008-09 TO 2016-17



Total recordable injury frequency rates

In 2016-17, the five year rolling average total recordable injury frequency rate (TRIFR) for the extractives sector was down approximately 12% compared to the previous year, from 31.724 to 27.974. From 2012-13, a steady decrease in the TRI frequency rates has also been observed. A rolling five year average TRIFR was unable to be calculated for the ten year reporting period as this information was included in extractives quarterly reporting requirements from 2009.

FIGURE 59. EXTRACTIVES FIVE YEAR AVERAGE TRIFR 2012-13 TO 2016-17

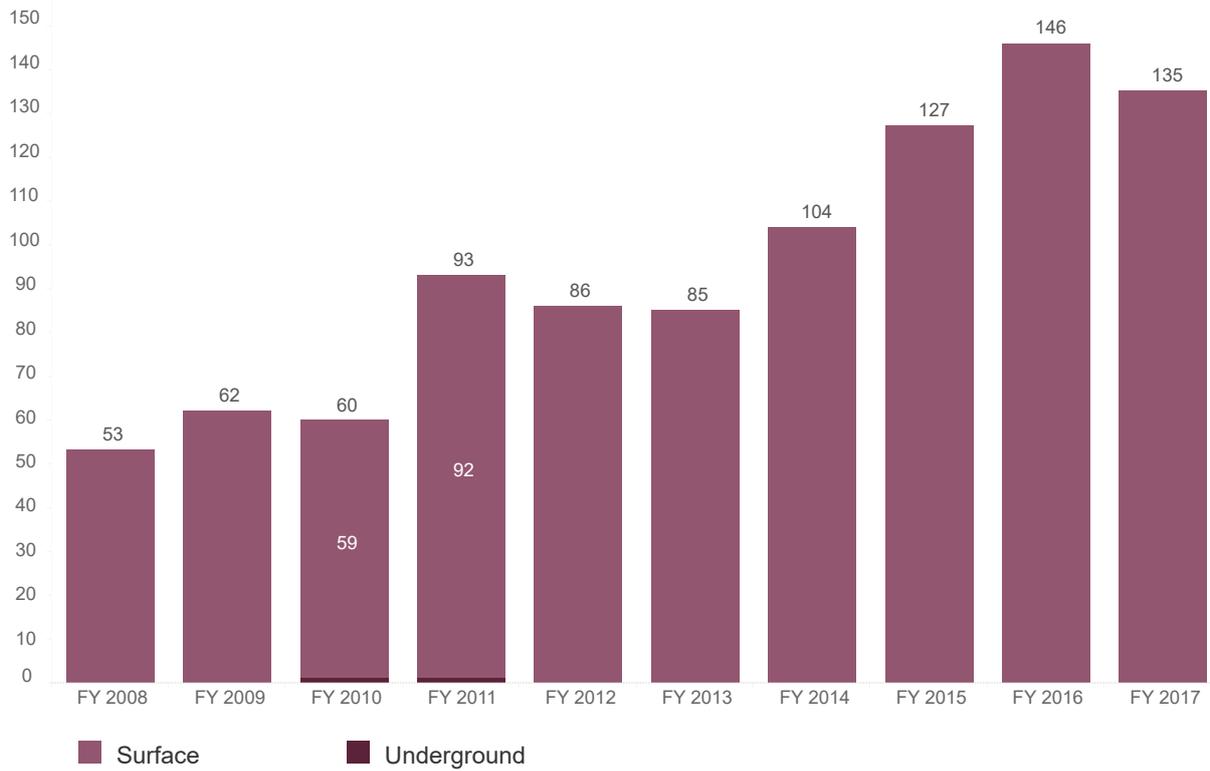


In 2016-17, the five year rolling average total recordable injury frequency rate for the extractives sector was down approximately 12% compared to the previous year, from 31.724 to 27.974.

Notified safety incidents

In 2016-17 compared to 2015-16, notified safety incidents for the extractives sector decreased by almost 8 from 146 to 135. There has been a steady upward trend in notified safety incidents over the ten years since 2007-08 so that they are currently three times higher than ten years ago.

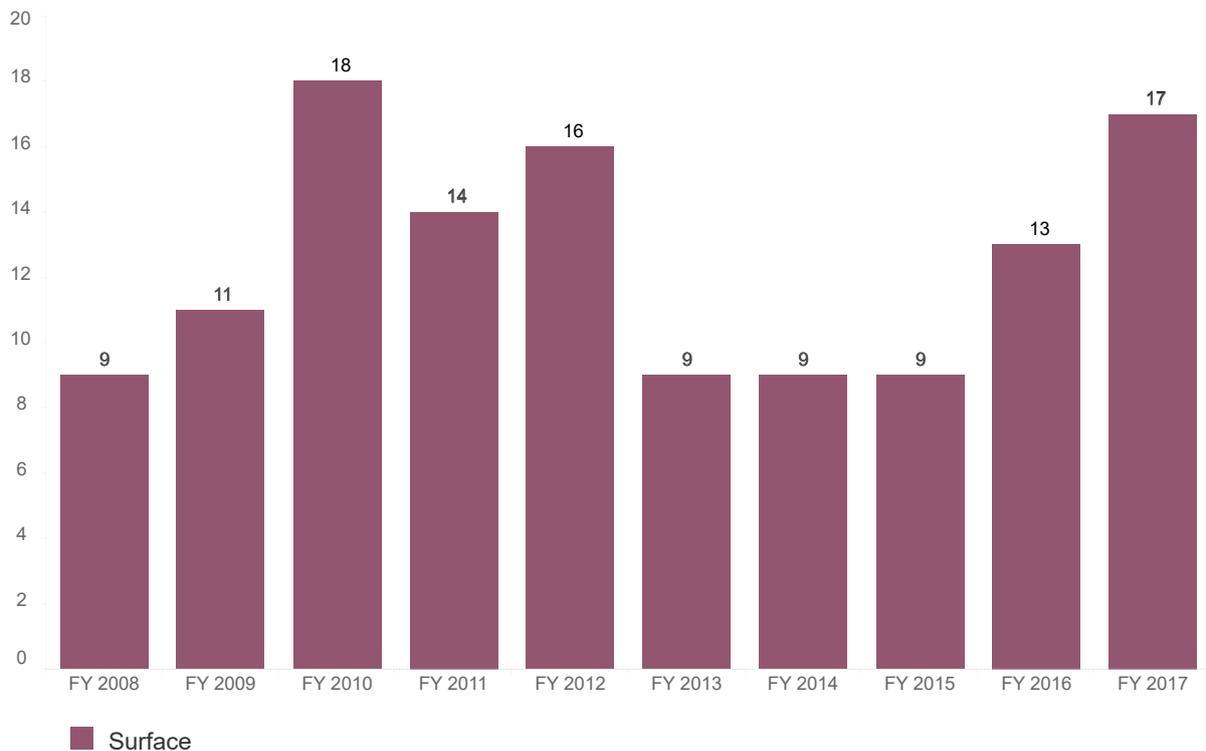
FIGURE 60. EXTRACTIVES NOTIFIABLE INCIDENTS BY OPERATION TYPE 2007-08 TO 2016-17



Complaints

In 2016-17, there were 17 complaints made to the regulator about safety in extractives mines, up four on the previous year. There has been no obvious upwards or downwards trend in the number of complaints about extractives mines in the ten years since 2007-08.

FIGURE 61. EXTRACTIVES COMPLAINTS RECEIVED BY OPERATION TYPE 2007-08 TO 2016-17



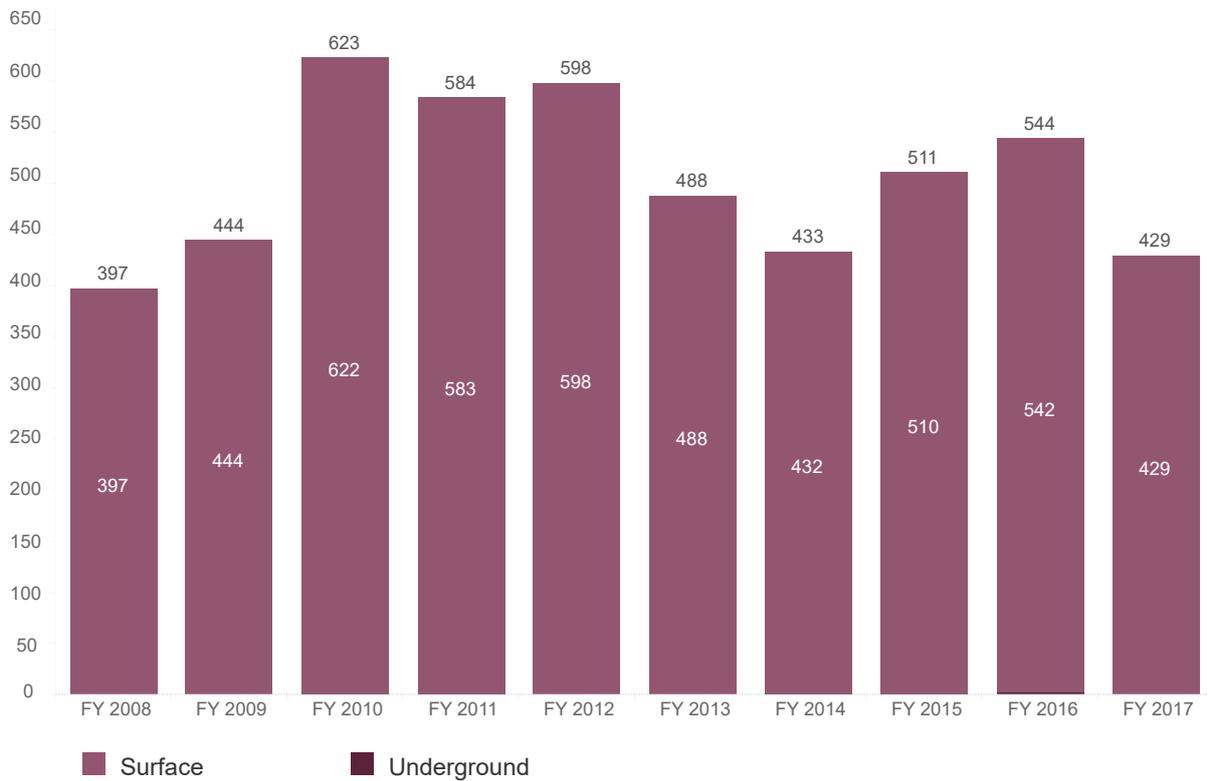
In 2016-17, there were 17 complaints made to the regulator about safety in extractives mines, up four on the previous year.

Safety notices

Safety notices by operation type

In 2016-17, the regulator issued fewer safety notices (notices of concern, improvement, prohibition, investigation and explosives enforcement notices) in the extractives sector, down 115 on the previous year, from 544 to 429. All notices were issued in surface operations. There has been no obvious upwards or downwards trend in the number of safety notices issued in the ten years since 2007-08.

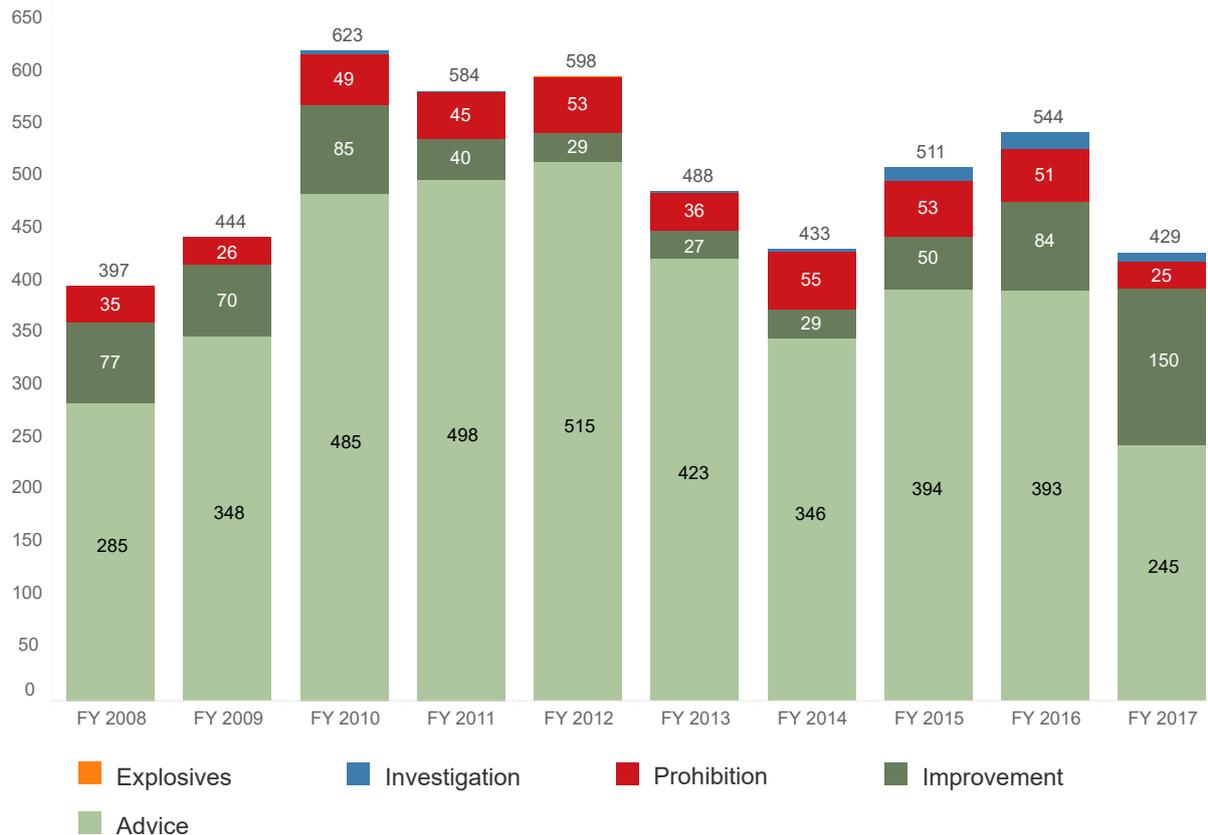
FIGURE 62. EXTRACTIVES SAFETY NOTICES BY OPERATION TYPE 2007-08 TO 2016-17



Safety notices by notice type

In 2016-17, the number of improvement notices issued almost doubled compared to the previous year from 84 in 2015-16 to 150 in 2016-17. The regulator’s renewed focus on incident prevention has contributed to this result where it sought to clearly identify matters that necessitate the issue of an improvement notices as compared with a written notice of concern.

FIGURE 63. EXTRACTIVES SAFETY NOTICES BY NOTICE TYPE 2007-08 TO 2016-17



In 2016-17, the number of improvement notices issued almost doubled compared to the previous year from 84 in 2015-16 to 150 in 2016-17.

Opal sector

In 2016-17, there were 3,487 open opal mines, 98% of which were underground operations.

Fatal injuries, serious injuries and notified incidents

In 2016-17 there was one notified incident which resulted in a fatal injury. In the ten years since 2007-08 that has been two fatal injuries and three serious injuries reported in the opal sector.

The opal mining sector is not required to submit quarterly reports detailing hours worked or lost time injuries and therefore frequency rates for these measures have not been calculated.

**TABLE 2. OPAL FATAL INJURIES, SERIOUS INJURIES AND NOTIFIED INCIDENTS
2007-08 TO 2016-17**

MEASURE	OPERATION TYPE	2007 2008	2008 2009	2009 2010	2010 2011	2011 2012	2012 2013	2013 2014	2014 2015	2015 2016	2016 2017	TOTAL
Fatal injuries	Surface	0	0	0	0	0	0	0	0	0	0	0
	Underground	0	0	0	0	0	1	0	0	0	1	2
Serious injuries	Surface	1	0	0	0	0	0	0	0	1	0	1
	Underground	0	0	0	0	0	0	0	1	2	0	2
Notified incidents	Surface	2	1	1	1	0	0	2	0	2	0	9
	Underground	0	0	1	0	0	1	2	1	2	1	8

Complaints and safety notices

Complaints are received from mine workers, members of the public, trade union representatives or are submitted anonymously. In 2016-17 there were no complaints made to the regulator about safety in the opal sector.

In 2016-17, the regulator issued 159 safety notices in the opal sector. There were 143 notices of concern, and five prohibition notices. By proportion, 97% of notices were issued to underground mines and almost 90% were notices of concern.

In the ten years since 2007-08 that has been two fatal injuries and three serious injuries reported in the opal sector.

Petroleum sector

In the 2016-17, there were 405 active petroleum mines. All of which were surface operations.

Fatal injuries, serious injuries and notified incidents

In 2016-17 there were no fatal injuries, serious injuries or notified incidents in the petroleum sector. In the ten years since 2007-08, there has been one fatal injury and six serious injuries.

The petroleum mining sector is not required to submit quarterly reports detailing hours worked or lost time injuries and therefore frequency rates for these measures have not been calculated.

TABLE 3. PETROLEUM FATAL INJURIES, SERIOUS INJURIES AND NOTIFIED INCIDENTS 2007-08 TO 2016-17

MEASURE	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Fatal injuries	0	0	1	0	0	0	0	0	0	0
Serious injuries	0	1	4	1	0	0	0	0	0	0
Notified incidents	0	5	14	8	2	1	3	4	3	0

Complaints and safety notices

Complaints are received from mine workers, members of the public, trade union representatives or are submitted anonymously. In 2016-17 there were no complaints made to the regulator about safety in the opal sector.

TABLE 4. PETROLEUM COMPLAINTS AND SAFETY NOTICES 2007-08 TO 2016-17

ACTIVITY	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Complaints received	0	0	0	0	0	1	0	0	1	0
Safety notices	0	0	9	2	0	0	0	0	1	0

In the 2016-17, there were 405 active petroleum mines. All of which were surface operations.

Appendices

Appendix 1. Definitions

Injury classification

TERM	DEFINITION
Fatal injury (FI)	An injury that results in death.
Lost time injury (LTI)	An injury that results in a minimum of one full shift's absence (AS1885.1 – 1990).
Restricted duty injury (RDI)	An injury resulting in the injured person returning to alternative or restricted duties.
Medical treatment injury (MTI)	An injury requiring medical treatment.
Total recordable injuries (TRI)	The total number of fatal injuries, lost time injuries, restricted duty injuries and medical treatment injuries.
Serious injury (SI)	<p>An injury where the nature of injury is defined by the relevant legislation. In addition, with the commencement of the Work Health and Safety (Mines and Petroleum Sites) Regulation 2014, the definition of a serious injury was expanded and also includes any injury that results in immediate treatment as an in-patient in a hospital, irrespective of the nature of injury.</p> <p>Note:</p> <ol style="list-style-type: none"> Under the Petroleum (Onshore) Schedule 1992, 301(1), a serious injury in the Petroleum sector was defined as the need for immediate attention by a medical practitioner. This is a lower threshold than for the mining industry. In general, a serious injury under this definition is not directly comparable to definitions in other mining jurisdictions or SafeWork Australia.
Injury with outcome LTI/RDI ≥ 7 days	A lost time injury resulting in an absence of 7 days or more, or a restricted duty injury resulting in alternative or restricted duties of 7 days or more.

APPENDICES

Frequency rates

TERM	DEFINITION
Fatal injury frequency rate (FIFR)	The number of fatal injuries per million hours worked.
Lost time injury frequency rate (LITFR)	The number of lost time injuries per million hours worked.
Serious injury frequency rate (SIFR)	The number of serious injuries per million hours worked.
Total recordable injury frequency rate (TRIFR)	The total number of fatal, lost time, medical treatment and restricted duties injuries per million hours worked.
Injury outcome 7 days or more (LTI/RDI \geq 7daysFR)	The number of injuries (lost time and restricted duties) with an outcome of seven days or more per million hours worked.

Terminology

TERM	DEFINITION
Complaints	The regulator records all mine work health and safety complaints or requests for service it receives. Complaints may be received from mine workers, members of the public, trade union representatives. Complaints may be submitted anonymously.
Notifiable safety incident	An incident where the cause of the incident, nature of the injury and/or injury outcome requires notification to the regulator according to the relevant legislation. Note that multiple gas trips that were reported to the Regulator in a single incident notification have been included as individual incident notifications in this report.
Quarterly workplace health and safety report	Quarterly workplace health and safety reports are required to be submitted by the mine operator to the regulator, according to the relevant legislation, and contain information on injuries and illness occurring in the quarter, as well as other information such as the total number of hours worked at the mine. This information is used for preparing key statistical data for mining sectors including frequency rates.

Enforcement and advice notices

ENFORCEMENT AND ADVICE NOTICE CATEGORY	DEFINITION	LEGISLATION AND ENFORCEMENT AND ADVICE NOTICE TYPE		
Advice notice or notice of concern	Notice raising concerns regarding health, safety or welfare to the attention of operators.	<i>Coal Mine Health Safety Act 2002</i>	s 150	Bringing of concerns regarding health, safety or welfare to the attention of operators
		<i>Mine Health Safety Act 2004</i>	s 131	Bringing of concerns regarding health, safety or welfare to the attention of operators
		<i>Mines Inspection Act 1901</i>	s 36B	Inspector or mine safety officer to inform mine management of certain matters
		<i>Work Health and Safety (Mines and Petroleum Sites) Act 2013</i>	s 23	Notice of concern

APPENDICES

ENFORCEMENT AND ADVICE NOTICE CATEGORY	DEFINITION	LEGISLATION AND ENFORCEMENT AND ADVICE NOTICE TYPE		
Improvement notice	Notice directing remedy or prevention of a contravention or potential contravention.	<i>Occupational Health and Safety Act 2000</i>	s 91	Issue of improvement notices
		<i>Work Health and Safety Amendment Act 2011</i>	s 191	Issue of improvement notices
Prohibition notice	Notice prohibiting carrying on of an activity or carrying on of an activity in a way that involves or will involve serious risk to health and safety. In an underground mine this may require removal of workers from underground areas.	<i>Work Health and Safety Act 2011</i>	s 195	Power to issue prohibition notices
		<i>Occupational Health and Safety Act 2000</i>	s 93	Issue of prohibition notices
		<i>Mines Inspection Act 1901</i>	s 37	Notice to be given of cause of danger
			s 37A	Order to withdraw persons from mine
		Mine Health Safety Regulation 2007	cl 158	Chief Inspector may impose prohibitions or restrictions or direct evacuation or closure of mine
		Coal Mine Health Safety Regulation 2006	cl 51	Chief Inspector may impose prohibitions or restrictions or direct evacuation or closure of coal operation
Investigation notice	Notice requiring stoppage of plant, non-disturbance of premises or for an inspector obtain information/ documents/ evidence.	<i>Occupational Health and Safety Act 2000</i>	s 62	Power of Inspectors to obtain information, documents and evidence
			s 89	Investigation notice to stop plant or prevent disturbance of premises to allow investigation
		<i>Work Health and Safety Act 2011</i>	s 155	Powers of regulator to obtain information
			s 171	Power to require production of documents and answers to questions
				Issue of a non-disturbance notice
Explosive notice	Notice regarding certain powers of inspectors in relation to explosives.	Explosives Regulations 2005	cl 99	Certain powers of inspectors and police officers

APPENDICES

Appendix 2. Mine definitions

This appendix is included to help readers understand the different types of mines and how they are classified into mining sectors. In this report:

- exploration is included in surface operations
- both surface and underground activity occurring at an underground operation is considered as underground activity.

Active mines

Active mines include mines that are open, mines that operate intermittently, mines that are under care and maintenance, open tourist mines, planned mines and small-scale titles that are current or pending.

Mine Types

MINING SECTOR	MINE TYPE
Coal mines	<ul style="list-style-type: none"> • Coal • Declared plant - CPP
Metalliferous mines	<ul style="list-style-type: none"> • Metals • Mineral sands
Extractive mines	<ul style="list-style-type: none"> • Construction materials • Industrial minerals
Other Non-coal mines	<ul style="list-style-type: none"> • Gemstones or precious stones (excluding Operation type of Opal Mining (All Types)) • Readymix or bitumen • Ancillary to mining • Waste mining • Treatment plant • To be determined
Petroleum and Geothermal sites	<ul style="list-style-type: none"> • Petroleum • Geothermal
Opal mines	<ul style="list-style-type: none"> • Small Scale Titles • Opal claim • Gemstones or precious stones with Operation type of Opal Mining (All Types)

APPENDICES**Mine operation types**

MINING SECTOR OPERATION TYPE	MINE OPERATION TYPE
Underground	<ul style="list-style-type: none">• Underground
Surface	<ul style="list-style-type: none">• Open Cut• Processing• Borrow Pit• Dredging• Exploration• Exploration Wells• Opal Mining (All Types)• Production Wells• To be determined

