

Safety *2001/2002* *Performance*

in the Western Australian Mineral Industry

Accident & injury statistics



Department of
Industry and Resources

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SUMMARY



The 2001/02 year has seen a further consolidation in the overall safety performance of the Western Australian mineral industry. Statistics from the Department's AXTAT database, as of October 2002, show a continuation of the downward trend following the marginal increase in 1999/00.

Over the ten year period from 1992/93 to 2001/02 the lost time injury frequency rate (lost time injuries per million hours worked) fell from 19.9 to 4.5. This performance, although very creditable, leaves scope for further improvement through a joint effort by employers and employees in the area of risk management.

The incidence rate (lost time injuries per thousand employees) and frequency rate of reported lost time injuries in both the surface and underground mining sectors improved during the year, falling by 24 percent and 22 percent respectively in surface mining and by 7 percent and 4 percent respectively in the underground mining sector.

A rise in injury duration rate (average work days lost per injury) in both the surface and underground sectors represented a 13 percent deterioration overall.

The fall in frequency rate was greater than the rise in duration rate and resulted in an 11 percent improvement in injury index (workdays lost per million hours worked).

Total serious injuries reported fell from 263 in 2000/01 to 254 in 2001/02 while the number of minor injuries reported fell from 212 to 126 for the same period. The total decrease in injuries represents a significant improvement on last year.

The 40,969 employees in the mining industry (a rise of two percent) worked a total of 84.80 million hours.

There were three fatal accidents during the year – one in the surface nickel sector, one in the dimension stone sector and one in the underground gold sector.

The Department's view is that no fatal accident is acceptable and that a fatal incidence rate of zero in the industry is achievable.

During the year, the Department continued to implement its program of greater self-regulation by industry. In doing so, the Department still maintained a high degree of visibility and interaction with industry. This regulatory transition is underpinned by a move from compliance inspections to field audits and a new emphasis on risk management.

Throughout the year, management safety systems audits, occupational health audits and high impact function audits were conducted by the Department. These audits were complemented by inspections and site visits for other purposes. An electrical safety audit protocol was developed

for use by the Department's electrical inspectors. The program of audits, accident investigations and inspections at times resulted in items of plant and machinery being stood down, site closures, and the preparation of prosecution briefs.

The Department continued to play an important role in providing education, training support and information to industry. During the year, safety meetings, presentations to mine site employees, along with briefings to industry safety and health representatives, were conducted by the Department. The inspectorate particularly targeted communication with Safety and Health Representatives, and safety performance in small quarries in the dimension stone industry which exhibited an anomalous incidence of fatalities over the last few years. These activities were complemented by a range of publications and a much-appreciated telephone information and advisory service provided by the Department's occupational safety and health professionals.

The Mines Occupational Safety and Health Advisory Board (MOSHAB) reviewed its rolling three-year strategic plan with a view to achieving a step-change improvement in the incidence of fatalities and serious injuries in the WA mining industry. In order to accomplish this, a series of actions were determined and implemented in the three priority areas of:

- Risk management
- Communicating risk information
- Specific 'targeted initiatives'

MOSHAB participated and assisted in the development of a National risk assessment guideline on behalf of the Minerals Council of Australia as a key component of its endeavours to improve risk management. MOSHAB surveyed a large number of mining industry employees to seek their views and perceptions on risk taking behaviour in order to determine and prioritise future courses of action. In line with MOSHAB priorities, guidance material on the management of exploration safety and exposures to arsenic and inorganic mercury in the workplace were developed and a discussion document on the management of risks associated with deep underground mining has been circulated to industry.

Changes to the AXTAT system have enabled the recording of all disabling injuries as specified in the Mines Safety and Inspection Act 1994 as distinct from only recording lost time injuries. The inclusion of all disabling injuries into the database allows more scope for future analyses and will aid in the development of injury prevention strategies.



STATISTICAL SUMMARY

- There were three fatal accidents during 2001/02; one occurred underground in a gold mine and two occurred on the surface; one at a nickel mine and one at a dimension stone quarry.
- There were 380 lost time injuries during 2001/02, significantly less than for the previous year (475 injuries in 2000/01) for a total workforce of 40,969. The breakdown of the number of injuries by commodity mined is illustrated graphically in Appendix A.
- The overall lost time injury frequency rate for 2001/02 was 4.5. This shows a 20 percent improvement on the 2000/01 figure, which was 5.6.
- The overall lost time injury duration rate increased from 16.6 to 18.8 during 2001/02. The breakdown of the average workdays lost for each commodity mined is illustrated graphically in Appendix A.
- The injury index decreased by 11 percent during 2001/02 (down from 94 to 84).
- Serious injuries in the mining industry during 2001/02 totalled 254, which is 9 fewer than for 2000/01.
- During 2001/02 the overall serious injury frequency rate improved slightly from 3.1 to 3.0.
- The bauxite and alumina sector lost time injury frequency rate remained stable at 2.5 during 2001/02.
- The gold sector lost time injury frequency rate improved by 5 percent during 2001/02, decreasing from 6.1 to 5.8.
- The iron ore sector lost time injury frequency rate improved by 38 percent during 2001/02 decreasing from 3.7 to 2.3.
- The nickel sector lost time injury frequency rate improved by 40 percent during 2001/02, decreasing from 5.0 to 3.0.



Introduction

The statistics published in this report relate to accidents that occurred between 1 July 2001 and 30 June 2002 (2001/02) involving time lost from work of one day or more (lost time injuries) on mines in Western Australia. The day on which the accident occurred is not counted as a day lost. The total number of working days lost through injury in 2001/02 has three components :

- i) Initial Injuries - days lost in 2001/02 from injuries that occurred in 2001/02.
- ii) Recurrent Injuries - days lost in 2001/02 through recurrences of injuries that occurred in 2001/02 and previous years.
- iii) Carry Over Injuries - days lost in 2001/02 by persons continuously off work from injuries which occurred before 1 July 2001.

Note: Appendix K contains statistics on disabling injuries.

Scope

Injuries to all company and contractor employees who worked at 'mining operations' are included in these statistics. The definition of 'mining operation' is stated in Section 4 of the Mines Safety and Inspection Act 1994 and includes mining company treatment plants, port facilities, and railways. Exploration activities, although now included in the definition of mining operations, have not been included. In addition, the oil and gas industry injuries are not included in the statistics in this report.

Metalliferous Mines

All mines other than coal mines are classed as metalliferous mines.

Fatal Accidents

Work days lost have not been allocated to this type of accident, nor have fatalities been included in injury incidence, frequency or duration rate calculations except in the tables on page 14 which are in accordance with Australian Standard 1885.1-1990.

Collection of Information

Each month accident/injury details are reported to the Department of Mineral and Petroleum Resources by mine managers, as are the number of persons employed (including contractor employees) and the hours worked during the month.

During the twelve months, on average, 179 mines or groups of mines reported to the AXTAT system.

Journey Accidents

Injuries which occurred in journey accidents (travelling to or from work) have not been included in calculations of incidence, frequency or duration rates.

Definitions

Lost Time Injury – a work injury that results in an absence from work of at least one full day or shift any time after the day or shift on which the injury occurred.

Serious Injury – a lost time injury that results in the injured person being disabled for a period of two weeks or more.

Incidence Rate – the number of injuries per 1000 employees for a 12 month period.

Frequency Rate – the number of injuries per million hours worked.

Duration Rate – the average number of workdays lost per injury.

Injury Index – the number of workdays lost per million hours worked (frequency rate x duration rate).

Fatal Incidence Rate – the number of fatalities per 1000 employees for a 12 month period.

Fatal Frequency Rate – the number of fatalities per million hours worked.

Serious Incidence Rate – the number of serious injuries per 1000 employees for a 12 month period.

Serious Frequency Rate – the number of serious injuries per million hours worked.



ABBREVIATIONS

| | |
|-----------------|---|
| BAUX ALUM | - bauxite and alumina mines |
| BRUISE/CONT | - bruise/contusion |
| C/BY MACH | - caught by or between operating machine |
| CHANGE RMS | - change rooms |
| CONST MAT | - construction materials |
| C/BY BETWN | - caught by or between moving and/or stationary objects |
| C/W ELECTRIC | - contact with electric current |
| C/W FRGN BODY | - contact with foreign body |
| C/W OBJ/TOOL | - contact with object or tool |
| EFF CHEM | - effects of chemicals |
| EXPL DETON | - explosives detonation |
| FRACT/BREAKS | - fractures and breaks |
| FRGN BODY | - foreign body |
| LTI | - lost time injury |
| METAL AV | - metalliferous average |
| METWORKERS | - metal workers |
| MIN SANDS | - mineral sands |
| MINE ROAD | - mine access road (not haul road) |
| MOTOR COLLSN | - motor vehicle collision |
| MOTOR VEH ROLL | - motor vehicle roll over |
| M VEH/EQUIP | - motor vehicle/equipment |
| NLT | - no lost time |
| O/C PROD | - open cut production |
| OBJT | - object |
| OVER/STREN MOV | - over exertion or strenuous movements |
| OFF/ADMIN | - office and administration |
| POWER GEN | - power generation |
| R/WAY | - railway |
| R/FALL U/G | - rock fall underground |
| S/AGAINST OBJT | - struck against object |
| S/BY OBJT | - struck by object |
| S/BY VEH/MOBILE | - struck by vehicle or mobile plant |
| STREN MOV | - strenuous movements |
| T/PLANT | - treatment plant |
| U/G ACCESS | - underground access, includes: travelling and haulage ways |
| U/G DUMPG | - underground dumping |
| U/G PROD/DEV | - underground production/development |
| U/G PROD | - underground production |
| U/GROUND | - underground |
| VEH/EQP JOLT | - vehicle/equipment jolting |
| W/SHOP | - workshop |



Review of Fatal Accidents during 2001/02

Three fatal accidents occurred in the Western Australian mineral industry during the 2001/02 fiscal year; one occurred underground in a gold mine and two occurred on the surface; one at a nickel mine and one at a dimension stone quarry.

- A drill jumbo operator was electrocuted when he made contact with 'live' cables inside a drill jumbo electrical control panel in an underground substation. It remains unclear as to why the person opened and accessed the electrical panel.
- An equipment hire company representative sustained fatal injuries while attempting to manoeuvre a 'Cherry Picker' extendable work platform onto a trailer. He was operating the machine from the work basket and was thrown from the basket when the extendable work platform travelled beyond the trailer's point of balance and rolled off the end of the trailer.
- A supervisor died when he was caught in the mechanism of a machine designed to form and place reconstituted limestone blocks. It is believed that he opened a gate in the guarding surrounding the machine and entered the enclosure to inspect the machine with a view to rectifying a fault.

Fatal Incidence Rate by Mineral Mined 1997/98 – 2001/02

Figure 1 is a chart of fatal incidence by mineral mined (excluding exploration) for the last five years. The grouped information for all surface and underground mines is given at the top of the chart.

► Figure 1

Fatal Incidence by Mineral Mined 1997/98 - 2001/02

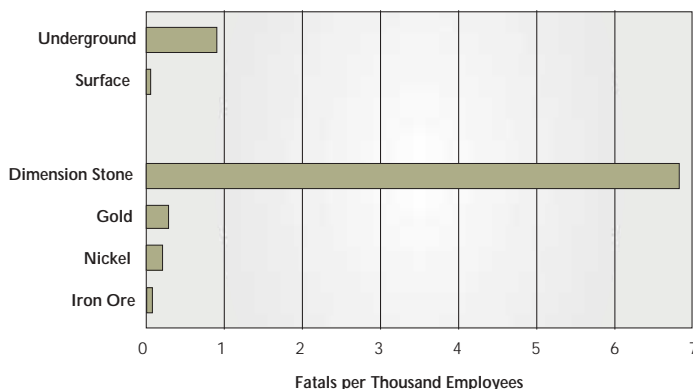


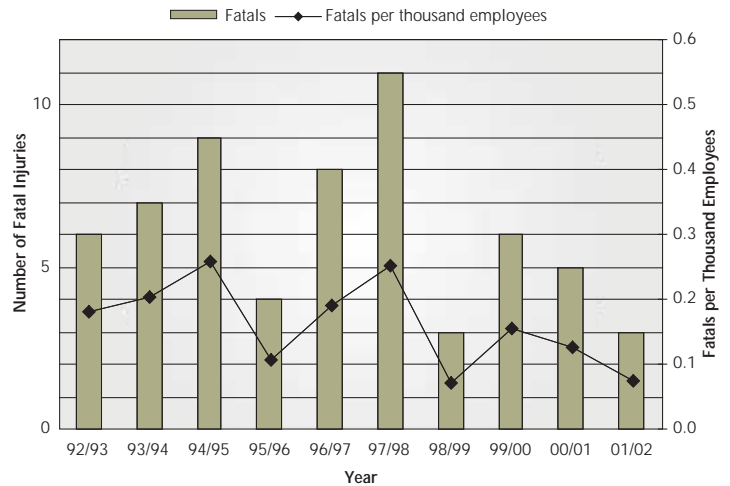
Figure 1 shows that underground mining has a much higher rate of fatal incidence than surface operations. This is reflected in the gold and nickel sectors where the majority of the State's underground mining occurs. The high incidence rate for the dimension stone sector was the result of three fatal accidents in a relatively small work-force.

Fatal Incidence Rate 1992/93 - 2001/02

The fatal incidence rate for 2001/02, as indicated in Figure 2, was 0.07 (0.13 in 2000/01) and is still a concern to the Department. While the overall trend continues to decline, there is a year-by-year scatter of incidence rate which is typical for fatalities because of the low number of occurrences.

► Figure 2

Fatal Incidence Rate 1992/93 - 2001/02



The Department maintains the view that no fatal accident is acceptable and a fatal incidence rate of zero is achievable and sustainable.



Fatal Accidents by Type 1997/98 - 2001/02

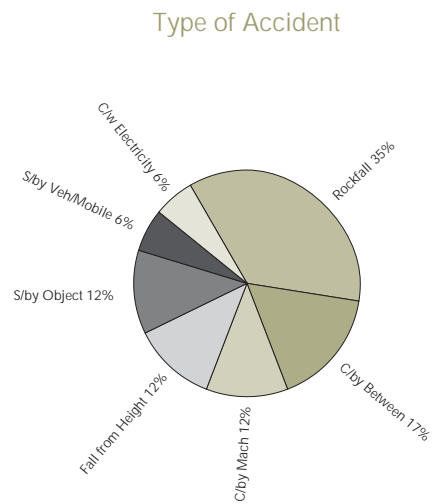
Figures 3 and 4 show the type of accidents (excluding exploration) for the 28 fatalities that occurred in the mining industry over the last five years. Of these fatalities, 17 occurred underground and 11 were in surface operations.

The most common type of underground fatal accident was rockfall which resulted in 6 fatalities (35 percent). Emphasis should continue to be placed on all aspects of ground control in underground mines, including training, excavation design and support, lighting, mechanisation of scaling operations and overhead protection for operators.

The most common type of surface fatal accident was vehicle rollover which resulted in 4 fatalities (37 percent).

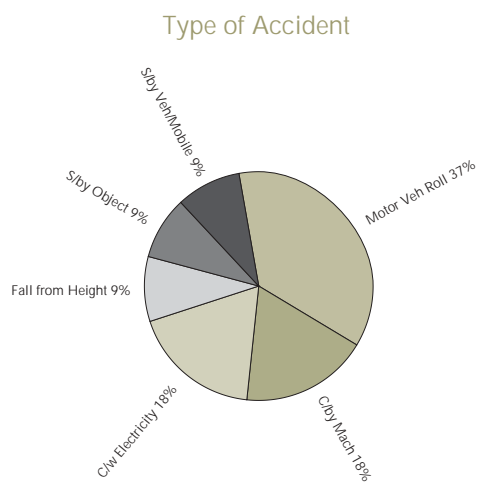
► **Figure 3**

Underground Fatalities 1997/98 - 2001/02



► **Figure 4**

Surface Fatalities 1997/98 - 2001/02





Review of Serious Injuries during 2001/02

There were 254 serious injuries in the mineral industry during the 2001/02 fiscal year (263 in 2000/01). Of these injuries, 249 occurred in metalliferous mines and 5 were in coal mines. Descriptions of some selected serious incidents that occurred during the year follow:

- ▶ A driller's assistant received multiple injuries, including broken ribs and a punctured lung, when the work platform attached to the mast of an exploration drill rig swung down and struck him. He was underneath the platform removing a set of steps while the mast was being lowered.
- ▶ A tanker driver, unloading sodium hydroxide, received caustic burns when he unclipped a filler hose which was still pressurised.
- ▶ A fitter, climbing down a ladder on a scaffold, lost his footing and fell approximately 1.2 metres onto a gridmesh walkway breaking his arm.
- ▶ A fitter, tightening bolts in an awkward position, strained muscles in the back of his neck.
- ▶ A driller received fractures and lacerations to his hand, which was caught between the drill head and rod rack, when the drill head accidentally activated while he was removing a split pin from a chain link.
- ▶ A driller's offsider received fractured ribs when the tongs he was using to break out rods spun around and hit him in the chest.
- ▶ A member of the grout crew received a fractured leg in a rockfall while standing near a drill jumbo which was being used to install rockbolts and mesh.
- ▶ A service person dislocated his shoulder when he slipped off the bonnet of a service truck and fell to the ground. He had been on the bonnet cleaning the windscreen because the windscreen washer was faulty.
- ▶ A truck driver, waiting for his haultruck to be loaded by an excavator, received a strained neck when his truck was struck by the excavator bucket.
- ▶ A treatment plant operator sprained his knee when he slipped on wet clay while walking down a ramp to assist with the relocation of a pontoon.
- ▶ A diesel fitter received a fractured skull while he and two other employees were attempting to place the left rear final drive onto a front end loader with an overhead crane. His head was caught between the final drive and the loader frame when the final drive was being put into position.
- ▶ A roofbolter received multiple injuries, after he walked into an area of unsecured cable bolts. He was struck on the shoulder, neck and back by a falling cable bolt.
- ▶ A scaffolder, working on a platform in a calciner holding vessel, received multiple injuries including a fractured wrist when he lost his balance and fell through a hole in the floor.
- ▶ An underground supervisor, loading rockbolts and mesh onto the back of a light vehicle parked in a stope, received a fractured pelvis when the vehicle rolled backwards pinning him against the wall.
- ▶ A mobile equipment operator, standing on the ground approximately 7 metres ahead of a scraper, was attempting to spot it closer to a wash down unit when he received head injuries after being struck by a falling tree. The off side cutting edge of the scraper bowl caught on the tree and as the scraper moved forward the tree fell in the direction of worker. The scraper and wash down unit were in a confined bush track area.
- ▶ A supervisor, on the back of a water truck, strained his lower back while lifting an air cleaner assembly and passing it down to another employee.
- ▶ A labourer, attempting to turn a blockmaking machine around, received a crushed foot when it was run over by the machine after he put it in reverse. He was standing outside of the cab reaching for the control lever.
- ▶ An underground LHD operator received a jarred back when he drove the LHD over pot holes and rocks.
- ▶ A treatment plant operator received a degloving injury to his thumb while attempting to remove a down hole drill bit which was jammed along the stringers of a conveyor. The jammed bit was near an electromagnet and when the bit was dislodged it was attracted by the magnet resulting in his thumb being caught between the bit and the magnet.
- ▶ A hoist operator fractured his knee cap underground when a stage in the manway collapsed and he fell 3 metres to the stage below.
- ▶ A bulldozer operator fractured his leg while getting down from a bulldozer. The operator slipped on the wet grouser plates of the bulldozer track and his leg went between the trunnion arm and the track frame.
- ▶ A serviceman had a sliver of metal penetrate his left eye while changing teeth on the bucket of a front end loader. He was using a sledge hammer to line up one of the teeth with the retainer pin hole and was not wearing appropriate personal protective equipment.
- ▶ A fitter slipped and strained his knee while climbing down from a large pump. No step was available.
- ▶ An electrician sustained general bruising and two fractured ribs when he fell approximately 4 metres from a ladder in a workshop.
- ▶ A driller's offsider had two fingers amputated while waiting for a sample to collect on a drill rig. He had opened an air activated valve to drop the sample when the tips of his fingers were caught between the valve blade and a bracket.



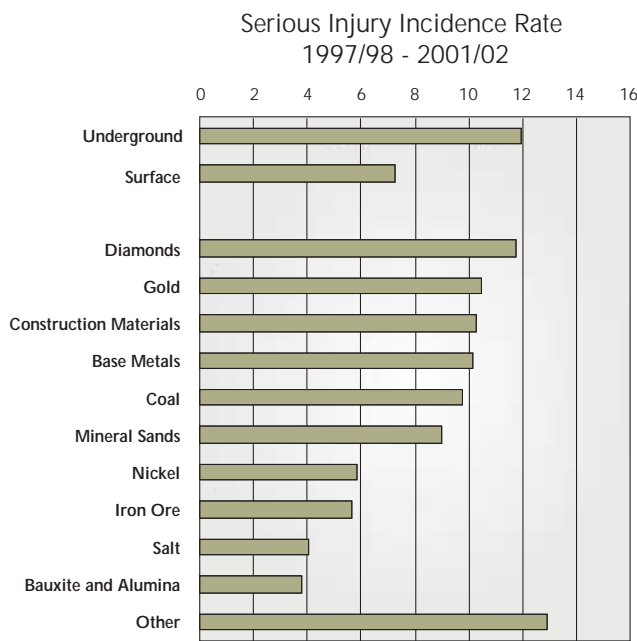
Serious Injury Incidence Rate by Mineral Mined 1997/98 – 2001/02

Figure 5 is a chart of incidence rates for serious injuries for the past five years. The top of the chart shows the serious injury incidence rates for surface and underground operations while the lower part of the chart shows serious injury incidence rates by mineral mined.

The chart shows that underground mining had a 64 percent greater serious injury incidence rate (12.0) than surface mining (7.3).

Of the major mining sectors diamonds had the highest five year average serious incidence rate (11.8) while bauxite and alumina had the lowest (3.8). The mining sector referred to as 'other', with a five year average serious incidence rate of 12.9, contained 4 percent of the total number of employees spread over 16 commodity groups. Most of the minesites in this sector had less than 50 employees.

► **Figure 5**



Serious Injury Frequency Rate 1997/98 – 2001/02

Figure 6 shows that, for underground metalliferous operations, the serious injury frequency rate increased in 2001/02 while for surface metalliferous operations and the coal sector the rate fell resulting in a slight improvement overall.

| | 97/98 | 98/99 | 99/00 | 00/01 | 01/02 |
|-----------------------|-------|-------|-------|-------|-------|
| Metalliferous U/G | 4.7 | 4.3 | 3.9 | 3.9 | 4.3 |
| Metalliferous Surface | 3.0 | 2.6 | 2.6 | 3.0 | 2.8 |
| Coal | 5.3 | 7.9 | 2.3 | 5.6 | 4.3 |
| Total | 3.2 | 2.9 | 2.8 | 3.1 | 3.0 |

Serious Injury Percentage Breakdown for 2001/02

Appendices B and C provide a percentage breakdown of the number of serious injuries by part of body, nature of injury, location of accident, and type of accident for underground and surface operations, respectively.

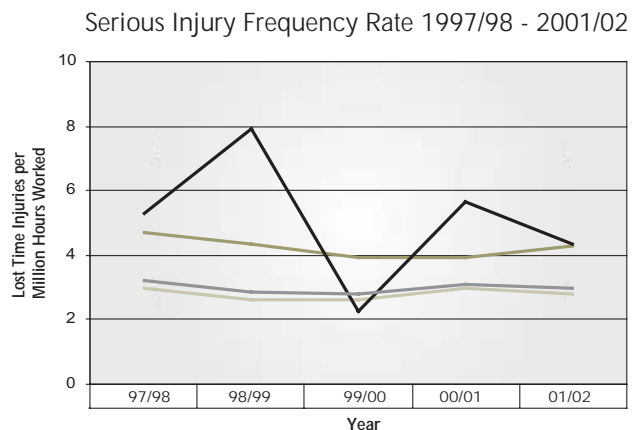
Underground

- Injuries to backs, legs and hands accounted for 32 percent, 21 percent, and 13 percent of serious injuries respectively. Of serious leg injuries, 75 percent were to knees and ankles.
- Consistent with the high proportion of back, knee and ankle injuries, strain represented the highest proportion by nature (28 percent), followed by fracture at 26 percent then sprain at 10 percent.
- The majority of serious injuries underground were in production and development areas (69 percent), and in access and haulage ways (18 percent).
- The most common accident types associated with serious injuries underground were over exertion and strenuous movements (32 percent), followed by struck by object (15 percent) and rockfall, caught by or between moving objects and fall from height (10 percent each).

Surface

- Injuries to backs and legs accounted for 22 percent of serious injuries each, followed by injuries to hands at 20 percent. Of serious leg injuries, 66 percent were to knees and ankles.
- Consistent with the high proportion of back, knee and ankle injuries, strain represented the highest proportion by nature (33 percent). Fracture was the next highest (16 percent) and crushing accounted for 10 percent.
- The majority of serious injuries on the surface occurred in treatment plants (42 percent), open pits (22 percent) and workshops (15 percent).
- The most common accident types associated with serious injuries in surface operations were over exertion and strenuous movements (27 percent), struck by object (14 percent) and slip/trip (11 percent).

► **Figure 6**





Review of Lost Time Injuries during 2001/02

In 2001/02, 17,254 days were lost through occupational injuries on mines in Western Australia. This figure is made up of the number of days lost from injuries occurring in 2001/02 (7,145), the number of days lost from recurrences of injuries which occurred before 2001/02 and in 2001/02 (1,478) and from lost time injuries and which carried over into 2001/02 from accidents which occurred prior to July 2001 (8,631). A breakdown of work days lost in coal and metalliferous mining is given in Table 1.

During the 2001/02 fiscal year there were 380 lost time injuries in the State's mining industry, 360 in metalliferous

mines and 20 in coal mines. A breakdown of this data together with performance indicators is given in Tables 2 and 3.

In addition to the initial injuries there were 37 recurrences of previous injuries resulting in 1,478 work days lost during 2001/02. A breakdown of recurrent injuries by year of initial injury is given in Table 4.

Eighty four persons who were still off work from injuries received before July 2001 lost 8,631 work days in 2001/02. A breakdown of these carry over injuries is given in Table 5.

Table 1. Time Lost Through Injury during 2001/02

| | Days Lost | | | |
|----------------------|------------------|--------------------|---------------------|---------------|
| | Initial Injuries | Recurrent Injuries | Carry Over Injuries | TOTAL |
| Metalliferous Mining | 7,028 | 1,396 | 8,318 | 16,742 |
| Coal Mining | 117 | 82 | 313 | 512 |
| TOTAL MINING | 7,145 | 1,478 | 8,631 | 17,254 |

Table 2. Initial Lost Time Injuries during 2001/02

| Mines | No. of Employees | No. of LTIs | Incidence | Frequency | Duration | Injury Index | Days Lost |
|------------------------|------------------|-------------|------------|------------|-------------|--------------|--------------|
| Metalliferous Surface | 36,706 | 302 | 8.2 | 4.0 | 19.4 | 79 | 5,868 |
| Metalliferous U/Ground | 3,601 | 58 | 16.1 | 6.4 | 20.0 | 128 | 1,160 |
| Metalliferous Total | 40,307 | 360 | 8.9 | 4.3 | 19.5 | 84 | 7,028 |
| Coal Total | 662 | 20 | 30.2 | 17.4 | 5.9 | 102 | 117 |
| TOTAL MINING | 40,969 | 380 | 9.3 | 4.5 | 18.8 | 84 | 7,145 |



Table 3. Injuries by Mineral Mined during 2001/02

| Mineral Mined | No. of Employees | No. of LTIs | Incidence | Frequency | Duration | Injury Index | Days Lost |
|------------------------|------------------|-------------|------------|------------|-------------|--------------|--------------|
| Gold | 12,454 | 155 | 12.4 | 5.8 | 18.1 | 106 | 2,811 |
| Iron Ore | 8,926 | 40 | 4.5 | 2.3 | 25.4 | 58 | 1,014 |
| Bauxite and Alumina | 6,439 | 31 | 4.8 | 2.5 | 22.4 | 56 | 693 |
| Nickel | 4,873 | 33 | 6.8 | 3.0 | 21.8 | 65 | 718 |
| Mineral Sands | 2,244 | 21 | 9.4 | 4.5 | 22.7 | 101 | 477 |
| Base Metals | 1,278 | 16 | 12.5 | 5.3 | 12.1 | 64 | 193 |
| Diamonds | 1,060 | 13 | 12.3 | 5.5 | 18.4 | 102 | 239 |
| Salt | 690 | 2 | 2.9 | 1.7 | 46.0 | 79 | 92 |
| Coal | 662 | 20 | 30.2 | 17.4 | 5.9 | 102 | 117 |
| Construction Materials | 459 | 11 | 24.0 | 13.3 | 14.1 | 187 | 155 |
| Other | 1,884 | 38 | 20.2 | 9.0 | 16.7 | 150 | 636 |
| TOTAL MINING | 40,969 | 380 | 9.3 | 4.5 | 18.8 | 84 | 7,145 |

NOTE: Duration in Tables 2 and 3 does not take into consideration time lost after 30 June 2002 by persons still off work at the end of the fiscal year, time lost from recurrent injuries or time lost by persons with carry over injuries from before July 2001.

Table 4. Recurrent Injuries during 2001/02

| Year | Metalliferous Mining | | Coal Mining | |
|--------------|----------------------|---------------------|--------------------|---------------------|
| | Number of Injuries | Number of Days Lost | Number of Injuries | Number of Days Lost |
| 2002 | 4 | 108 | - | - |
| 2001 | 22 | 923 | 1 | 82 |
| 2000 | 5 | 86 | - | - |
| 1999 | 3 | 112 | - | - |
| 1997 | 1 | 140 | - | - |
| 1996 | 1 | 27 | - | - |
| TOTAL | 36 | 1,396 | 1 | 82 |

NOTE: Apart from the information shown in Tables 1, 4 and 5 analysis of recurrent and carry over injuries has not been presented in this publication.

Table 5. Carry Over Injuries during 2001/02

| Year | Metalliferous Mining | | Coal Mining | |
|--------------|----------------------|---------------------|--------------------|---------------------|
| | Number of Injuries | Number of Days Lost | Number of Injuries | Number of Days Lost |
| 2001 | 48 | 3,541 | 3 | 97 |
| 2000 | 19 | 2,764 | 2 | 216 |
| 1999 | 4 | 536 | - | - |
| 1998 | 6 | 995 | - | - |
| 1997 | 1 | 240 | - | - |
| 1996 | 1 | 242 | - | - |
| TOTAL | 79 | 8,318 | 5 | 313 |



Review of Lost Time Injuries during 2001/02 in Accordance with Australian Standard AS 1885.1 - 1990

In June 1990 Standards Australia and Worksafe Australia released a joint Standard for recording workplace injuries and diseases. This standard, AS 1885.1 - 1990 "Workplace Injury and Disease Recording Standard", is designed to be used by individual workplaces. There are two major differences between AXTAT and this Standard. The Standard treats fatalities as lost time injuries with a penalty

of 220 workdays lost for each, whereas AXTAT keeps them separate with no penalty. Also, AXTAT calculates incidence per thousand employees, in contrast to the Standard's definition of injuries per hundred employees.

Tables 6 and 7 provide statistical information in accordance with this standard.

Table 6. Initial Lost Time Injuries During 2001/02 (AS1885.1-1990)

| Mines | No. of Employees | No. of LTIs | Injuries per Hundred | Frequency | Duration | Days Lost |
|------------------------|------------------|-------------|----------------------|------------|-------------|--------------|
| Metalliferous Surface | 36,706 | 304 | 0.8 | 4.1 | 20.8 | 6,308 |
| Metalliferous U/Ground | 3,601 | 59 | 1.6 | 6.5 | 23.4 | 1,380 |
| Metalliferous Total | 40,307 | 363 | 0.9 | 4.3 | 21.2 | 7,688 |
| Coal Total | 662 | 20 | 3.0 | 17.4 | 5.9 | 117 |
| TOTAL MINING | 40,969 | 383 | 0.9 | 4.5 | 20.4 | 7,805 |

NOTE : Duration in Tables 6 and 7 does not take into consideration time lost after 30 June 2002 by persons still off work at the end of the fiscal year, time lost from recurrent injuries or time lost by persons with carry over injuries from before July 2001.

Table 7. Injuries by Minerals Mined during 2001/02 (AS1885.1-1990)

| Minerals Mined | No. of Employees | No. of LTIs | Injuries per Hundred | Frequency | Duration | Days Lost |
|------------------------|------------------|-------------|----------------------|------------|-------------|--------------|
| Gold | 12,454 | 156 | 1.3 | 5.9 | 19.4 | 3,031 |
| Iron Ore | 8,926 | 40 | 0.4 | 2.3 | 25.4 | 1,014 |
| Bauxite and Alumina | 6,439 | 31 | 0.5 | 2.5 | 22.4 | 693 |
| Nickel | 4,873 | 34 | 0.7 | 3.1 | 27.6 | 938 |
| Mineral Sands | 2,244 | 21 | 0.9 | 4.5 | 22.7 | 477 |
| Base Metals | 1,278 | 16 | 1.3 | 5.3 | 12.1 | 193 |
| Diamonds | 1,060 | 13 | 1.2 | 5.5 | 18.4 | 239 |
| Salt | 690 | 2 | 0.3 | 1.7 | 46.0 | 92 |
| Coal | 662 | 20 | 3.0 | 17.4 | 5.9 | 117 |
| Construction Materials | 459 | 11 | 2.4 | 13.3 | 14.1 | 155 |
| Other | 1,884 | 39 | 2.1 | 9.2 | 21.9 | 856 |
| TOTAL MINING | 40,969 | 383 | 0.9 | 4.5 | 20.4 | 7,805 |

WORKERS' COMPENSATION

PREMIUM RATES FOR THE WESTERN AUSTRALIAN MINERAL INDUSTRY

The Workers' Compensation premium rates determined by the Premium Rates Committee, are published in a dedicated Western Australian Government Gazette and are effective from 30 June.

Figure 7 indicates workers' compensation cost trends for selected mineral groups for the 10 year period since 1993/94.

Most mineral groups have shown reductions in compensation costs since 1993/94. Over the 10 year period coal mining compensation costs reduced by 35 percent, underground gold operations by 24 percent, open pit gold operations by 22 percent, and iron ore operations by 60 percent.

The overall average premium rate for the Western Australian mining industry for 2002/03 is currently 2.55 percent of payroll, a 7 percent reduction on 2001/02 (2.74 percent of payroll).

Figure 8 shows the current recommended premium rates for the 2002/03 fiscal year for a variety of mineral groups and other industries.

Premium rates for mining industry groups compare favourably with other industry groups such as clay brick manufacturing and structural steel fabrication which have current premium rates of 6.43 and 7.54 percent of payroll, respectively.

The recent trend of the traditionally higher risk mining sectors having lower premium rates than many manufacturing sectors has continued.

Although premium rates in isolation are not necessarily reliable indicators of risk, they do represent a cost to industry and, in part, reflect past accident rates.

Figure 7

Mines Workers Compensation Cost Trends

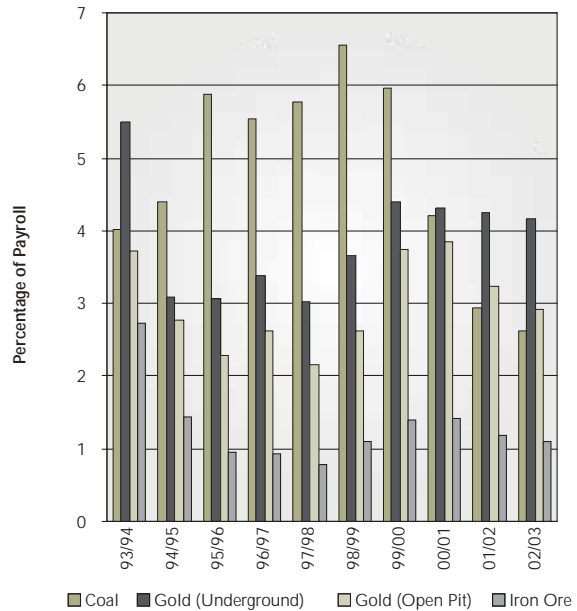
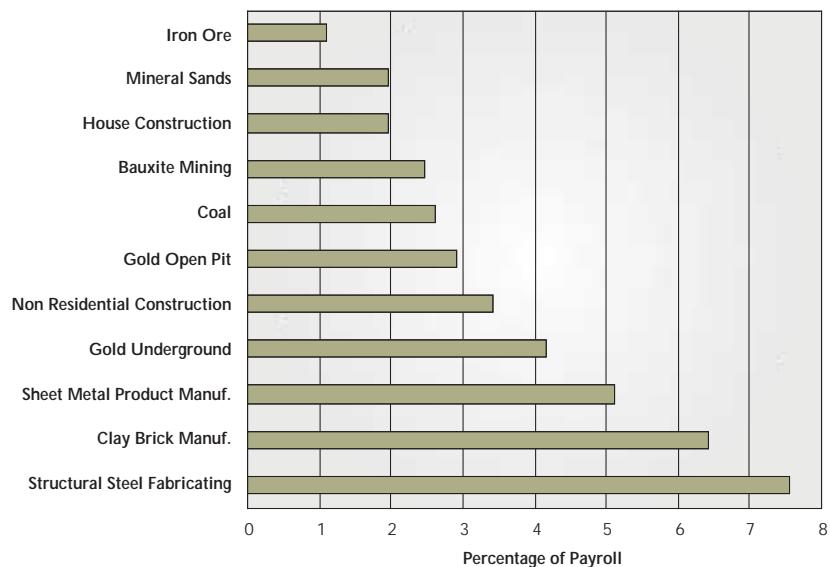


Figure 8

Recommended Premium Rates 2002/03





METALLIFEROUS PERFORMANCE INDICATORS

The performance indicators for the metalliferous mining sector show mixed results during 2001/02. Figures 9 to 12 depict the performance indicators; incidence, frequency, duration and injury index (see explanatory notes for definitions) for the last five years.

Some interesting trends noted in the performance indicators for metalliferous mines during 2001/02 include the following:

- The overall incidence rate improved by 21 percent, falling from 11.2 to 8.9. The surface sector improved by 23 percent (from 10.6 to 8.2) while the underground sector rate improved by 7 percent (from 17.4 to 16.1).
- The overall frequency rate improved by 19 percent, falling from 5.3 to 4.3. The surface sector improved by 22 percent (from 5.1 to 4.0) while the underground sector rate improved by 4 percent (from 6.7 to 6.4).
- A rise in duration rate for both underground and surface operations was evident. The overall injury duration rate is currently 19.5, 12 percent higher than in 2000/01.
- The fall in frequency rate more than compensated for the rise in duration rate in surface operations and resulted in an improvement in the overall injury index, a fall of 9 percent (down from 92 to 84).

Metalliferous Injury Percentage Breakdown for 2001/02

Appendices D and E provide a percentage breakdown of the number of injuries for part of body, nature of injury, location of accident, and type of accident for underground and surface operations, respectively.

Injuries by Part of Body

- Back injuries accounted for the largest proportion of injuries for both underground and surface at 27 percent and 23 percent respectively.
- Leg injuries accounted for the second largest proportion of injuries underground (19 percent), followed by hands at 12 percent. Of the leg injuries, 73 percent were to knees and ankles.
- Leg injuries also accounted for the second largest proportion for surface operations (21 percent), followed by hand injuries at 17 percent. Of the leg injuries, 63 percent were to knees and ankles.

Injuries by Nature

- Strains accounted for the majority of injuries for both underground and surface operations at 26 percent and 30 percent respectively.
- For underground operations the second highest ranking nature of injury was fracture (19 percent), followed by sprain at 10 percent.
- The second highest ranking nature of injury for surface operations was also fracture (13 percent), followed by bruise/contusion at 9 percent.

Injuries by Location

- For underground operations most injuries occurred in production and development areas (69 percent), followed by access and haulage ways at 17 percent.
- The majority of injuries for surface operations occurred in treatment plants (43 percent), followed by open pits at 22 percent.

Injuries by Type

- Over exertion and strenuous movements was the major accident type for underground injuries (28 percent), followed by struck by object at 14 percent and rockfall at 12 percent (up from 8 percent in 2000/01).
- For injuries in surface operations the most common accident type was also over exertion and strenuous movements (25 percent), followed by struck by object at 13 percent and slip/trip at 9 percent.

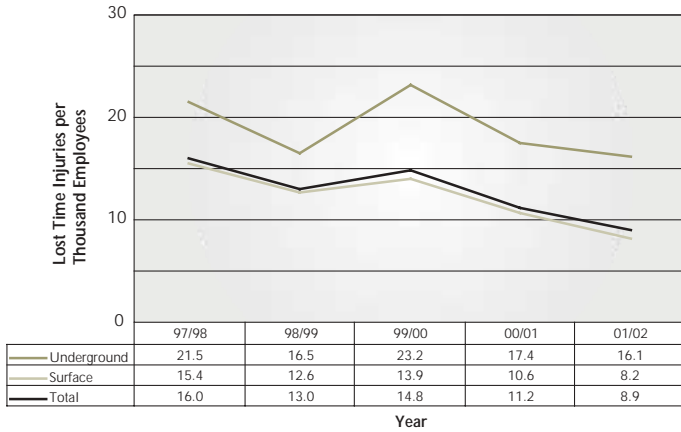
INJURIES BY COMMODITY



Metalliferous Performance Indicators 1997/98 – 2001/02

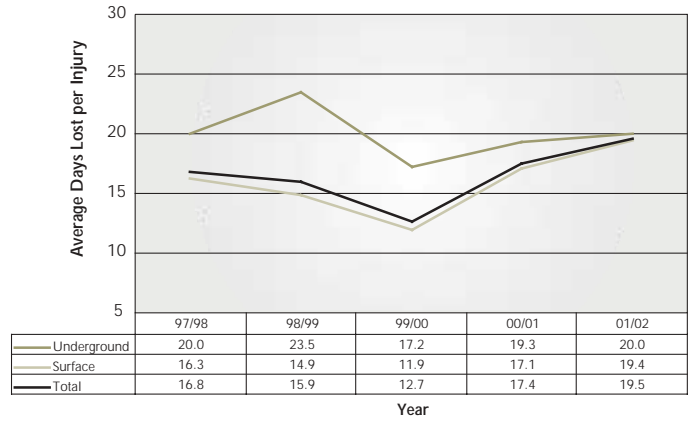
► Figure 9

Incidence Rate



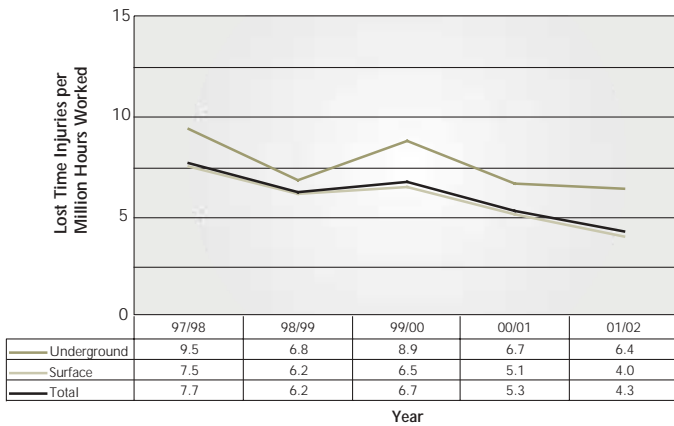
► Figure 11

Duration Rate



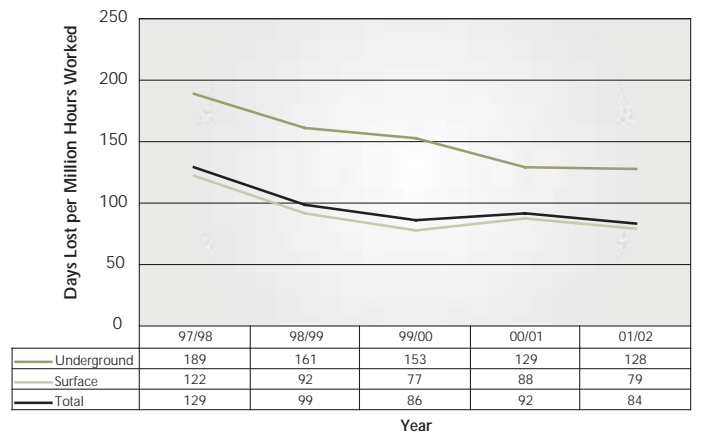
► Figure 10

Frequency Rate



► Figure 12

Injury Index





GOLD PERFORMANCE INDICATORS

The performance indicators for the gold sector showed mixed results for 2001/02. Figures 13 to 16 depict the performance indicators; incidence, frequency, duration and injury index.

Some interesting trends noted in the gold sector performance indicators during 2001/02 include the following:

- The overall incidence rate improved by 13 percent, dropping from 14.2 to 12.4. The surface sector improved by 17 percent (from 13.8 to 11.5) while the underground sector rate deteriorated slightly by 1 percent (from 15.8 to 16.0).
- A similar trend was noted in the frequency rate for both underground and surface sectors. The overall frequency rate improved by 5 percent (from 6.1 to 5.8). The rate for the surface sector improved by 8 percent (from 6.2 to 5.7) while the rate for the underground sector deteriorated by 9 percent (from 5.7 to 6.2).
- The overall duration rate is currently 18.1 representing a 12 percent fall for 2001/02. Duration rate for the surface sector improved by 19 percent while the underground duration rate deteriorated by 4 percent.
- The fall in duration rate and the improvement in frequency rate resulted in a 15 percent overall improvement in the injury index (down from 124 to 106). In the surface sector the the injury index improved by 24 percent (from 119 to 90) while the underground sector injury index deteriorated by 12 percent (from 139 to 155).

Gold Injury Percentage Breakdown for 2001/02

Appendices F and G provide a percentage breakdown of the number of injuries for part of body, nature of injury, location of accident, and type of accident for the underground and surface sectors, respectively.

Injuries by Part of Body

- Back injuries accounted for the largest proportion of injuries for both underground and surface operations at 35 percent and 24 percent respectively.
- In the underground sector leg injuries accounted for the next largest at 17 percent (over half of which were knee and ankle injuries) followed by arm injuries at 12 percent.
- For the surface sector hand and leg injuries accounted for the next largest at 18 percent each, followed by arm injuries at 11 percent. Of the leg injuries, over half were to knees and ankles.

Injuries by Nature

- Strains accounted for the majority of injuries in both underground and surface operations at 24 percent and 33 percent respectively.
- For the underground sector the second highest ranking nature of injury was fracture (17 percent), followed by sprain and jarring, each at 10 percent.
- For the surface sector the second highest ranking nature of injury was fracture (10 percent), followed by sprain at 9 percent.

Injuries by Location

- For underground operations most injuries occurred in production and development areas (71 percent), followed by access and haulage ways at 17 percent.
- The majority of injuries occurred in treatment plants for the surface sector (35 percent), followed by open pits at 32 percent.

Injuries by Type

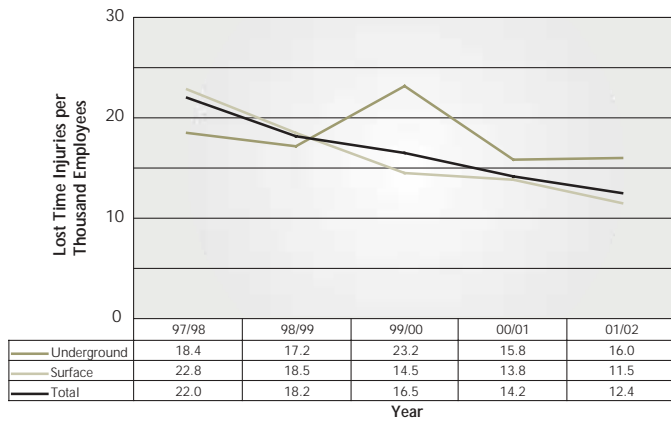
- Over exertion and strenuous movements was the major accident type for underground injuries (27 percent), followed by struck by object at 15 percent and rockfall at 12 percent.
- The most common accident types for surface operations were over exertion and strenuous movements (29 percent), followed by struck by object at 11 percent and caught by or between moving objects at 8 percent.



Gold Performance Indicators 1997/98 – 2001/02

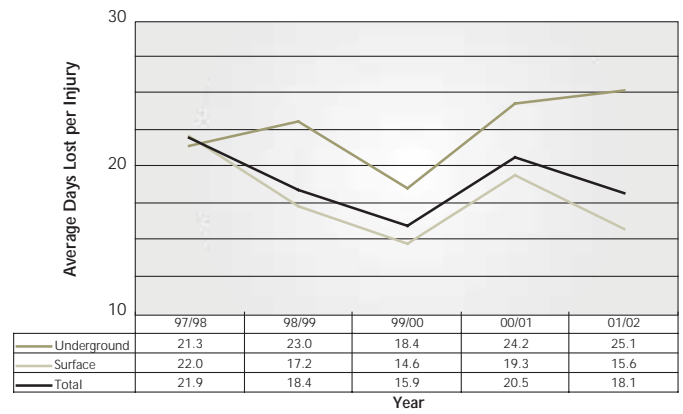
► Figure 13

Incidence Rate



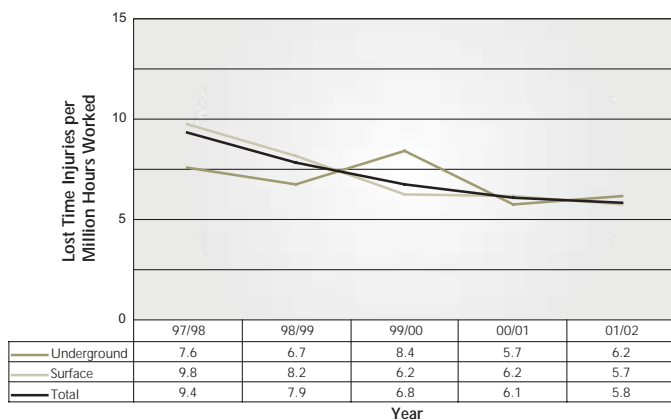
► Figure 15

Duration Rate



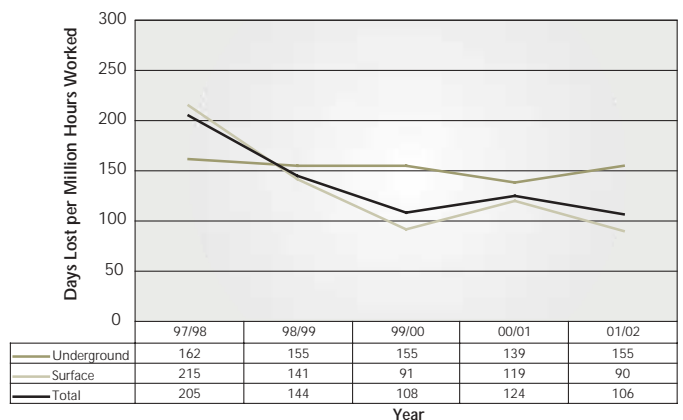
► Figure 14

Frequency Rate



► Figure 16

Injury Index





IRON ORE PERFORMANCE INDICATORS

The performance indicators for the iron ore sector showed mixed results for 2001/02. Figures 17 to 20 depict the performance indicators; incidence, frequency, duration and injury index.

Some interesting trends noted in the iron ore sector performance indicators during 2001/02 include the following:

- The incidence rate of 4.5 represents a 39 percent improvement on 2000/01.
- The frequency rate improved by 38 percent, currently at 2.3.
- There was a substantial increase in duration rate to 25.4 (107 percent). Two injuries, each with over 200 days lost, had a significant contribution to this increase.
- The rise in duration rate was greater than the fall in frequency rate and resulted in an overall deterioration in injury index (up 26 percent from 46 to 58).

Iron Ore Injury Percentage Breakdown for 2001/02

Appendix H provides a percentage breakdown of the number of injuries for part of body, nature of injury, location of accident, and type of accident.

Injuries by Part of Body

- Leg injuries accounted for the largest proportion of injuries representing 37 percent. Of the leg injuries, 73 percent were to knees and ankles
- Hand injuries accounted for the next largest proportion of injuries at 17 percent, followed by back injuries at 12 percent.

Injuries by Nature

- Fracture was the most common nature of injury at 24 percent.
- Strain was the next highest proportion (23 percent), followed by crushing and sprain both at 10 percent.

Injuries by Location

- The majority of injuries occurred in treatment plants which accounted for 39 percent.
- The next largest proportion occurred in workshops (28 percent), followed by open pits at 15 percent.

Injuries by Type

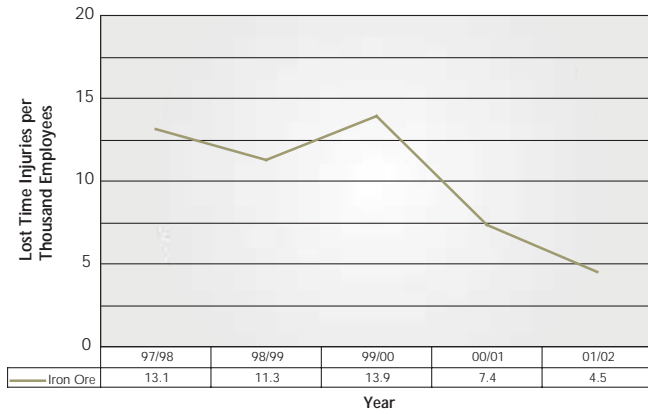
- Struck by object was the major type of accident resulting in injury (22 percent).
- Over exertion and strenuous movements was the next highest type (18 percent), followed by stepping at 15 percent.

INJURIES BY COMMODITY ►► IRON ORE

Iron Ore Performance Indicators 1997/98 – 2001/02

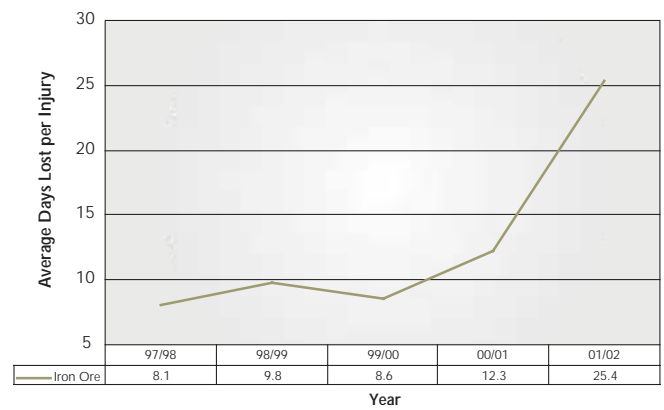
► Figure 17

Incidence Rate



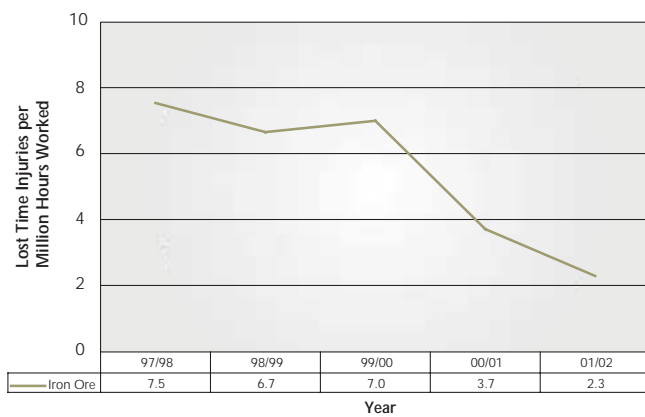
► Figure 19

Duration Rate



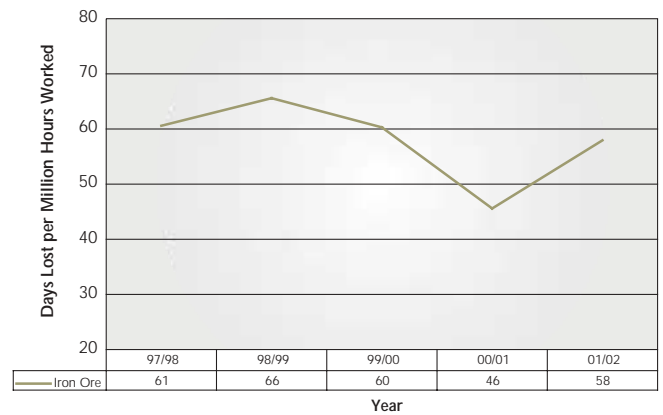
► Figure 18

Frequency Rate



► Figure 20

Injury Index





BAUXITE AND ALUMINA PERFORMANCE INDICATORS

There were mixed results in the performance indicators for the bauxite and alumina sector during 2001/02. Figures 21 to 24 depict the performance indicators; incidence, frequency, duration and injury index.

Some interesting trends noted in the bauxite and alumina sector performance indicators during 2001/02 include the following:

- The incidence rate deteriorated slightly from 4.7 to 4.8 (2 percent).
- The frequency rate remained stable at 2.5.
- There was a significant rise in duration rate from 17.4 to 22.4, a 29 percent deterioration. Two injuries, each with over 100 days lost, had a significant contribution to this increase.
- The large rise in duration rate resulted in a rise of 30 percent to the injury index, up to 56. However, it still remained the lowest of all the major commodity groups.

Bauxite and Alumina Injury Percentage Breakdown for 2001/02

Appendix I provides a percentage breakdown of the number of injuries for part of body, nature of injury, location of accident, and type of accident.

Injuries by Part of Body

- Back injuries accounted for the largest proportion of injuries representing 22 percent.
- Leg and arm injuries accounted for the next largest proportion of injuries both at 19 percent followed by hand, neck, and foot and toe injuries each at 10 percent.

Injuries by Nature

- Fractures accounted for the majority of injuries at 23 percent.
- Strain was the next highest proportion at 19 percent, followed by bruise/contusion and sprain both at 16 percent.

Injuries by Location

- The majority of injuries occurred in treatment plants (64 percent), followed by surface general at 16 percent and workshops at 10 percent.

Injuries by Type

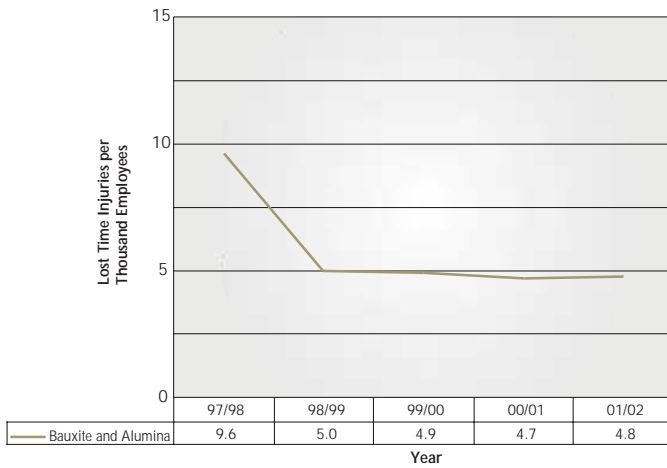
- Over exertion and strenuous movements was once again the most common type of accident resulting in injury (19 percent).
- Struck by object and struck against object were the next highest proportion at 16 percent followed by slip/trip at 13 percent.

INJURIES BY COMMODITY ►► BAUXITE & ALUMINA

Bauxite and Alumina Performance Indicators 1997/98 – 2001/02

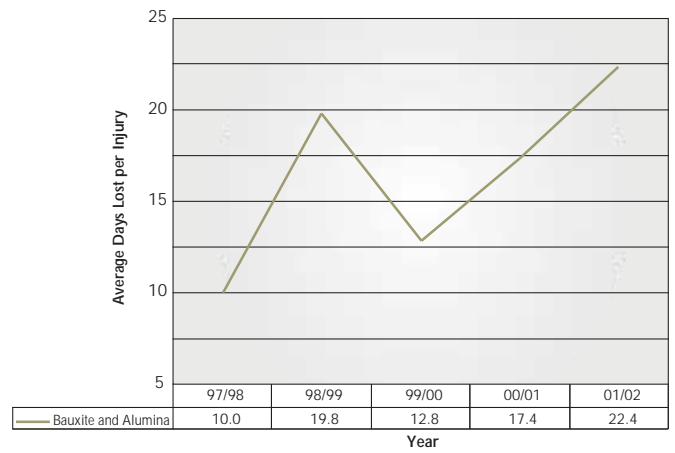
► Figure 21

Incidence Rate



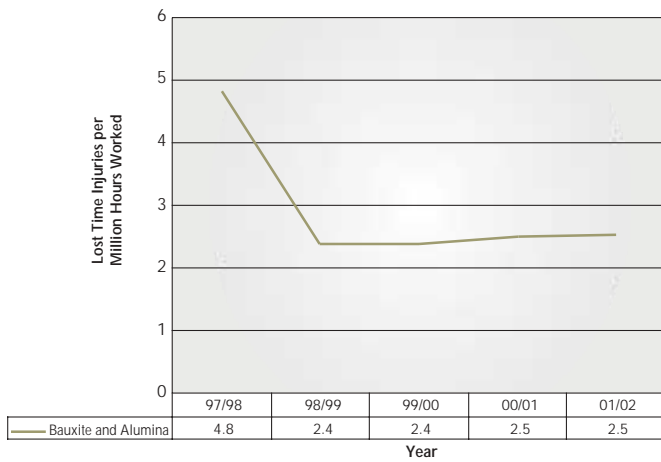
► Figure 23

Duration Rate



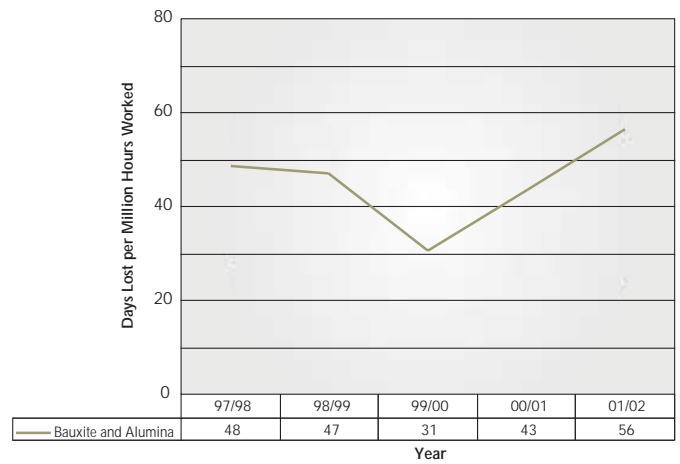
► Figure 22

Frequency Rate



► Figure 24

Injury Index





NICKEL PERFORMANCE INDICATORS

There were mixed results in the performance indicators for the nickel sector during 2001/02. Figures 25 to 28 depict the performance indicators; incidence, frequency, duration and injury index.

Some interesting trends noted in the nickel sector performance indicators during 2001/02 include the following:

- The incidence rate fell from 10.9 to 6.8 (38 percent).
- The frequency rate fell by 40 percent to 3.0 during 2001/02.
- The duration rate exhibited an increase from 18.6 to 21.8 which is 17 percent higher than 2000/01.
- The fall in frequency rate was greater than the rise in duration rate and resulted in a substantial fall in injury index (from 93 to 65), a 30 percent improvement.

Nickel Injury Percentage Breakdown for 2001/02

Appendix J provides a percentage breakdown of the number of injuries for part of body, nature of injury, location of accident, and type of accident.

Injuries by Part of Body

- Back and leg injuries accounted for the largest proportion of nickel mining injuries both at 18 percent.
- Hand and head injuries accounted for the next largest proportion both at 12 percent, followed by injuries to trunks and multiple parts of the body both at 9 percent.

Injuries by Nature

- Strains accounted for the majority of injuries at 28 percent.
- Fracture was the next highest proportion (15 percent), followed by laceration at 12 percent.

Injuries by Location

- The majority of injuries occurred in treatment plants accounting for 43 percent.
- The next largest proportion occurred underground at 24 percent followed by open pits at 9 percent.

Injuries by Type

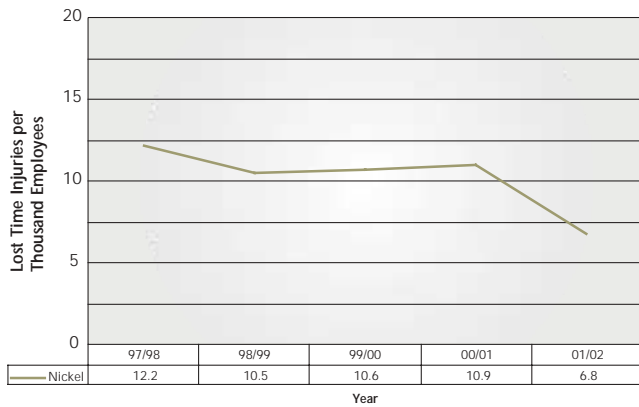
- Over exertion and strenuous movements continued to be the major type of accident resulting in injury (21 percent).
- Struck by object featured as the second most frequent type of accident (15 percent), followed by slip/trip at 9 percent.

INJURIES BY COMMODITY ►► NICKEL

Nickel Performance Indicators 1997/98 – 2001/02

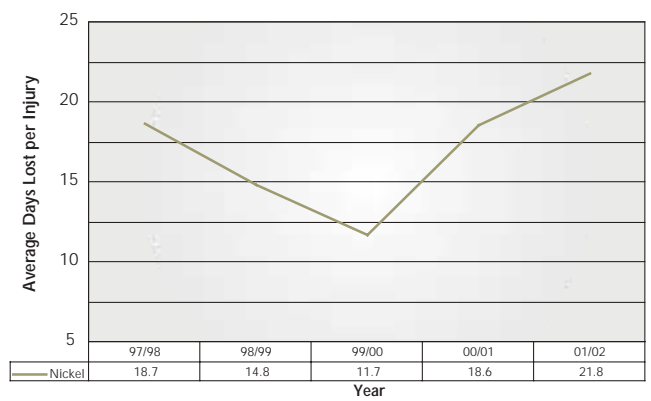
► Figure 25

Incidence Rate



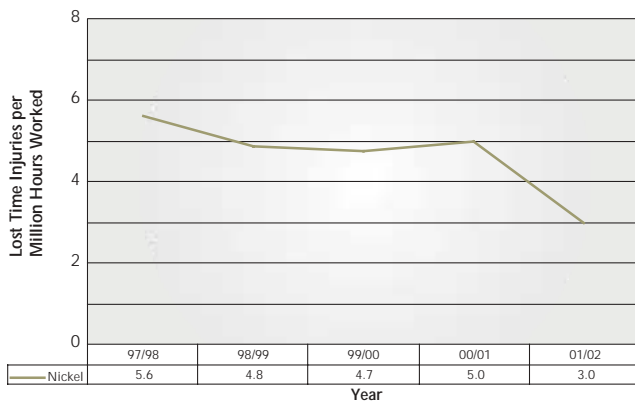
► Figure 27

Duration Rate



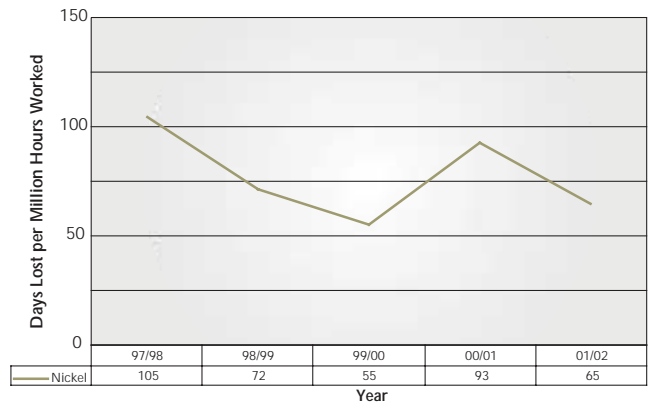
► Figure 26

Frequency Rate



► Figure 28

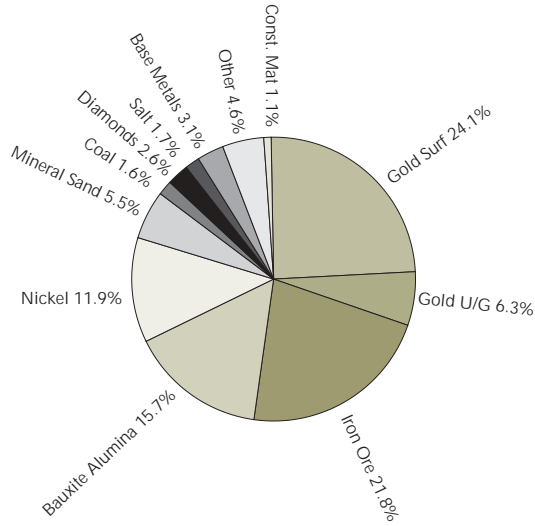
Injury Index



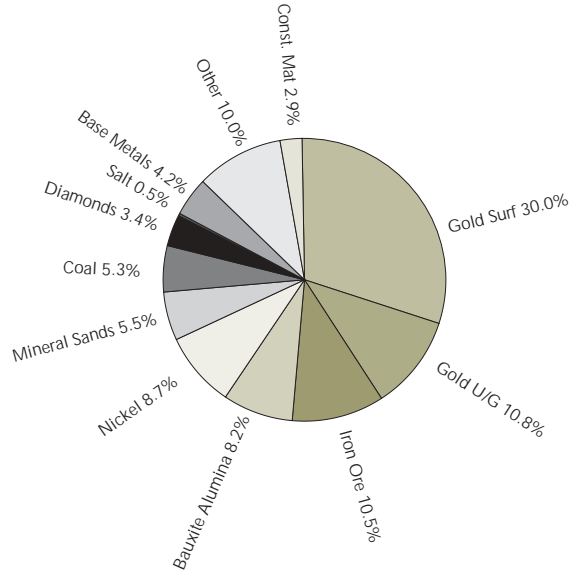


WESTERN AUSTRALIAN MINES 2001/02 FINANCIAL YEAR

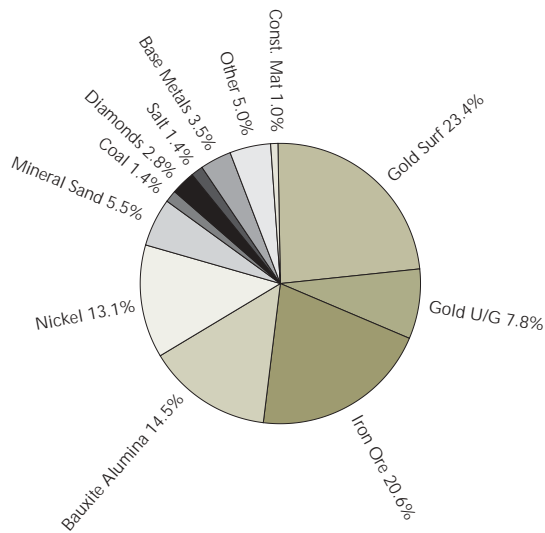
Number of Employees



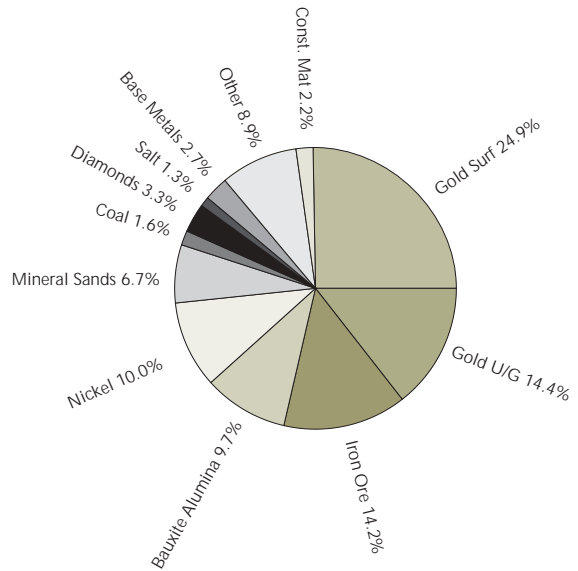
Number of Injuries



Million Hours Worked

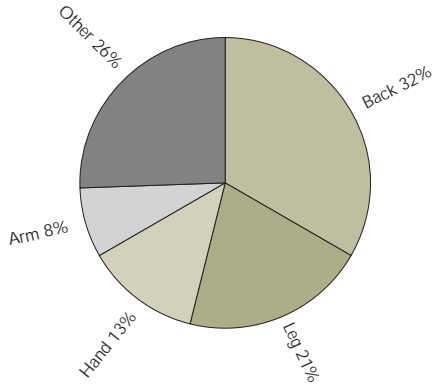


Work Days Lost

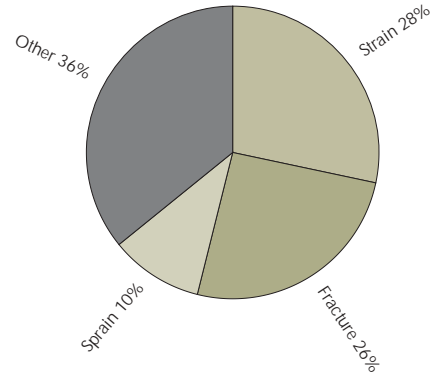


SERIOUS INJURIES UNDERGROUND 2001/02

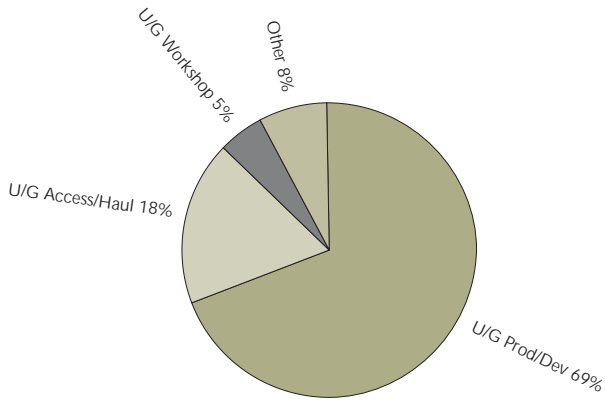
Part of Body



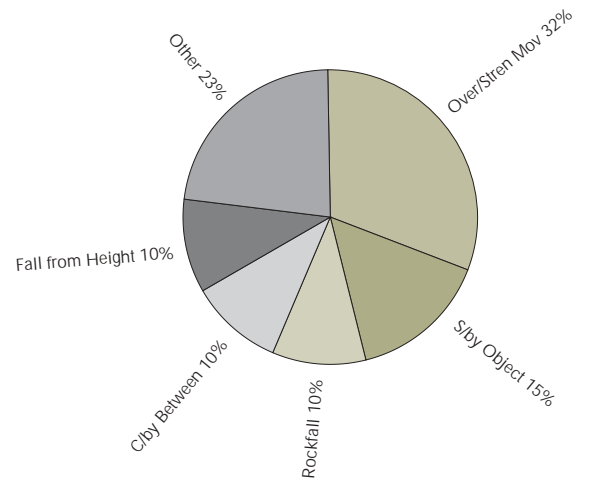
Nature of Injury



Location of Accident



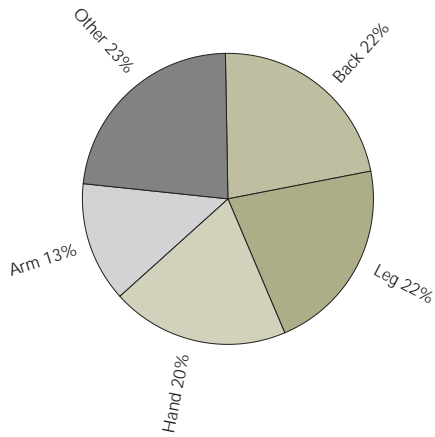
Type of Accident



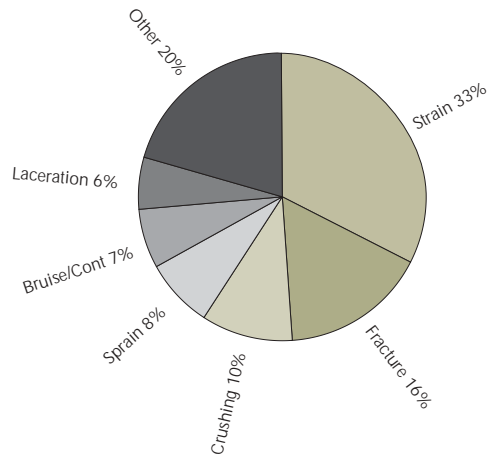


SERIOUS INJURIES SURFACE 2001/02

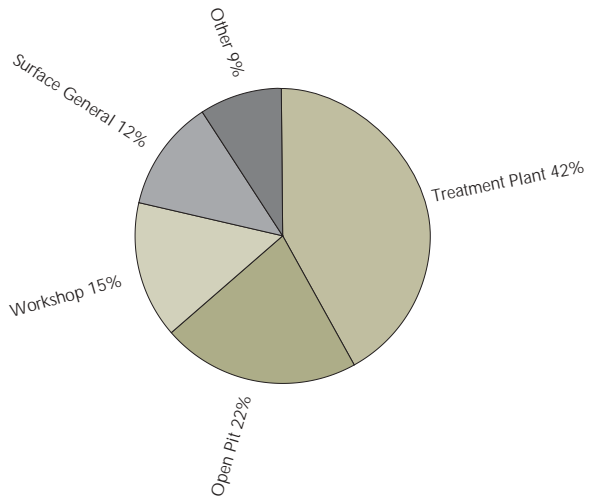
Part of Body



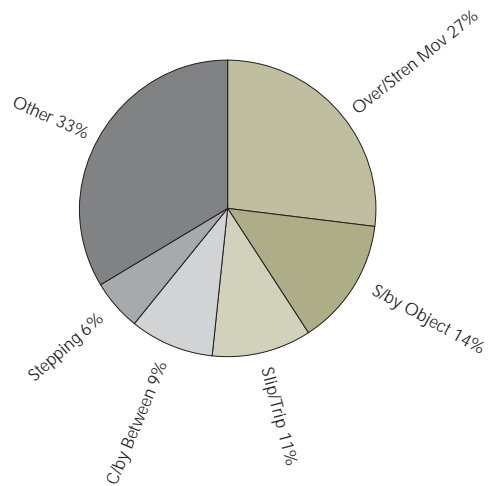
Nature of Injury



Location of Accident

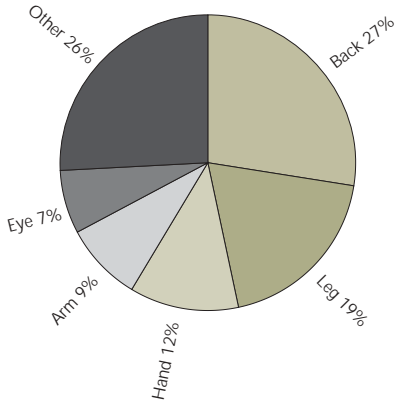


Type of Accident

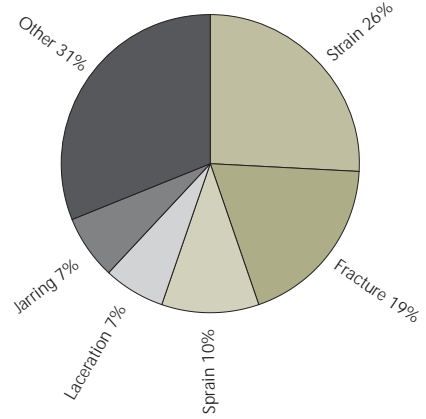


METALLIFEROUS UNDERGROUND INJURIES 2001/02

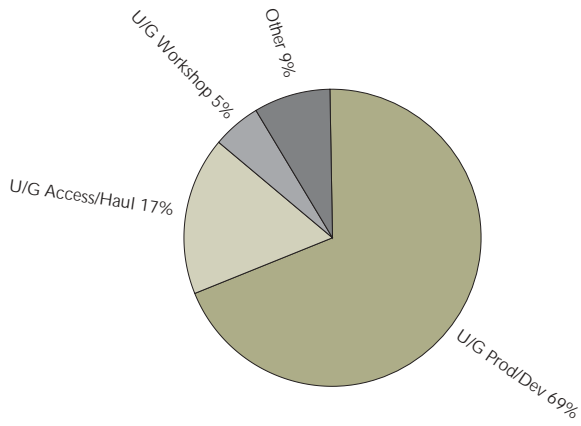
Part of Body



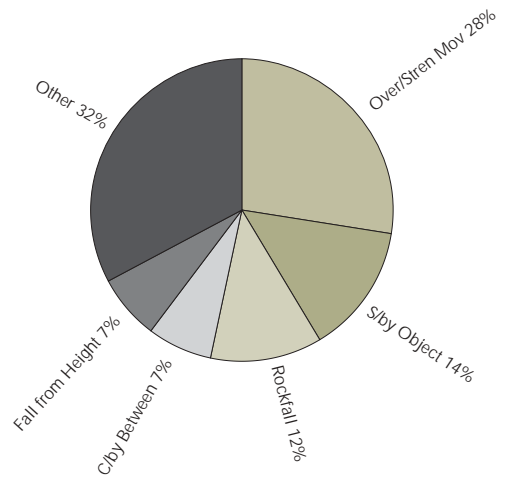
Nature of Injury



Location of Accident

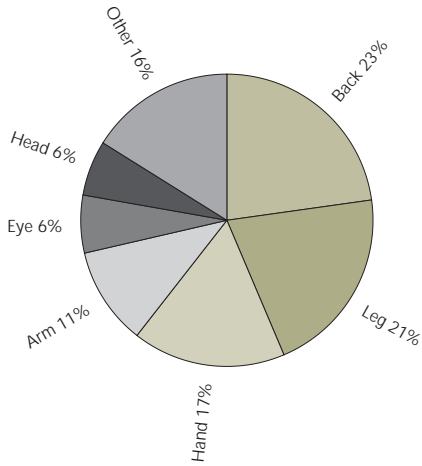


Type of Accident

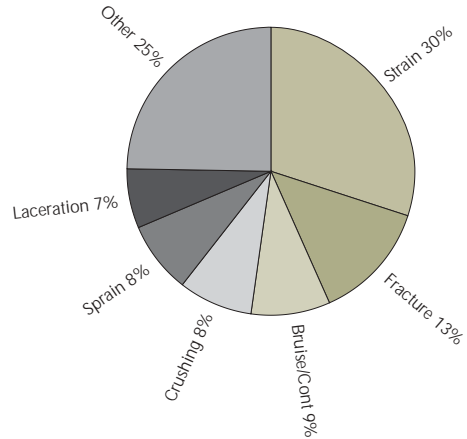


METALLIFEROUS SURFACE INJURIES 2001/02

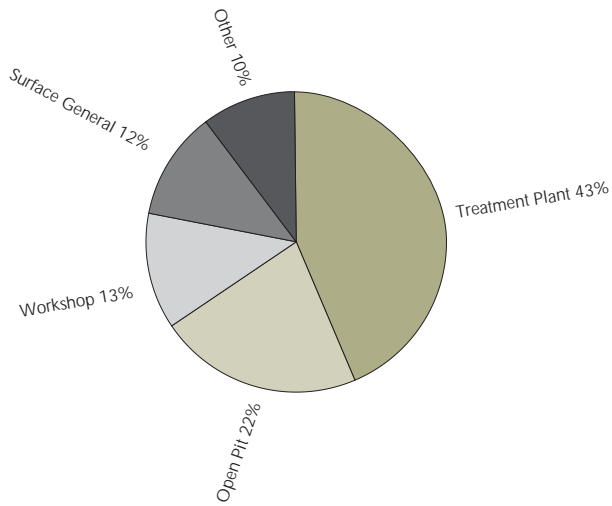
Part of Body



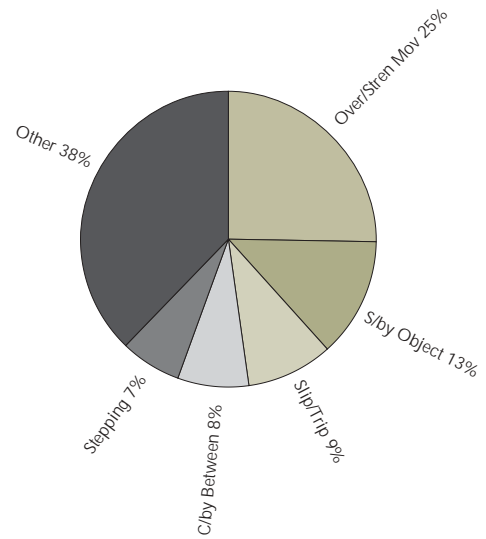
Nature of Injury



Location of Accident



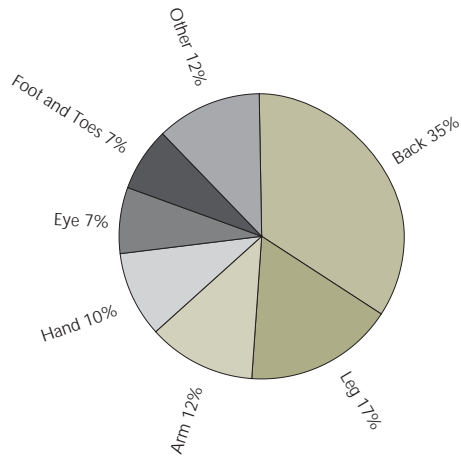
Type of Accident



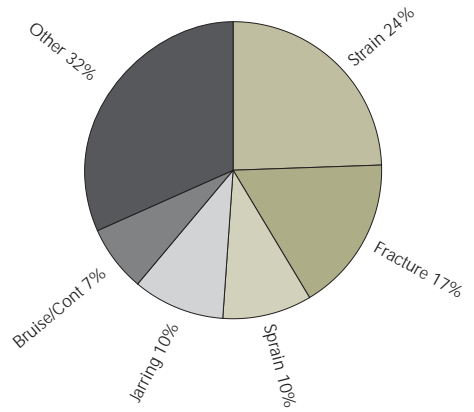


GOLD UNDERGROUND INJURIES 2001/02

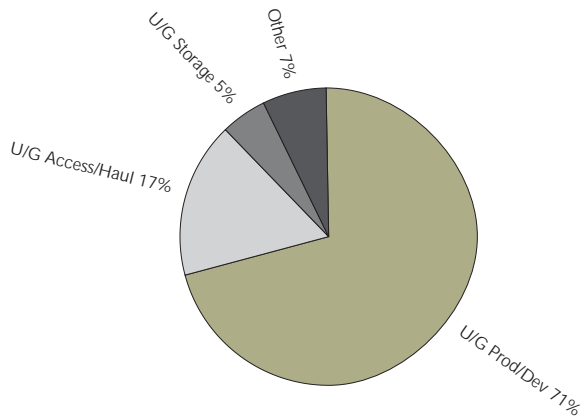
Part of Body



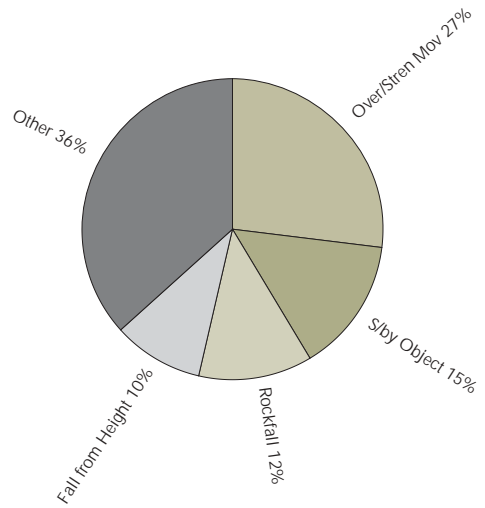
Nature of Injury



Location of Accident



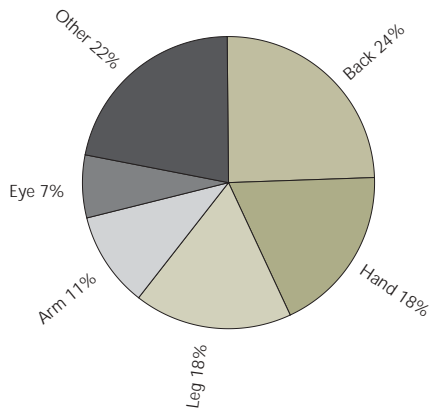
Type of Accident



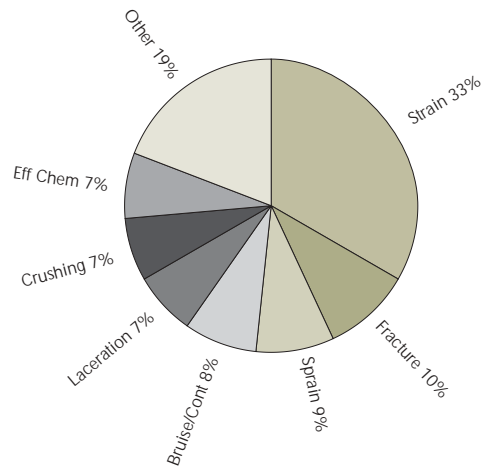


GOLD SURFACE INJURIES 2001/02

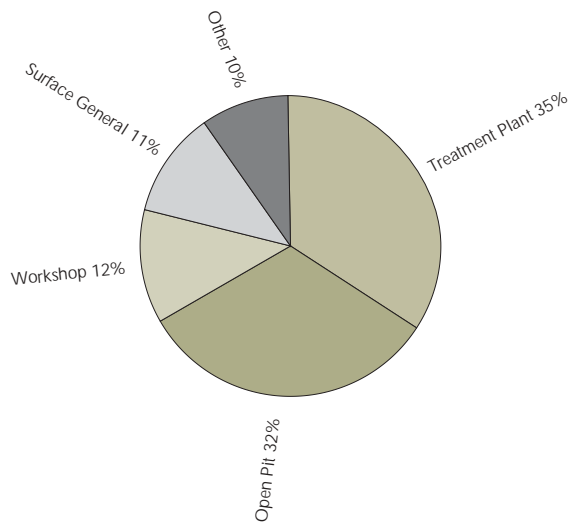
Part of Body



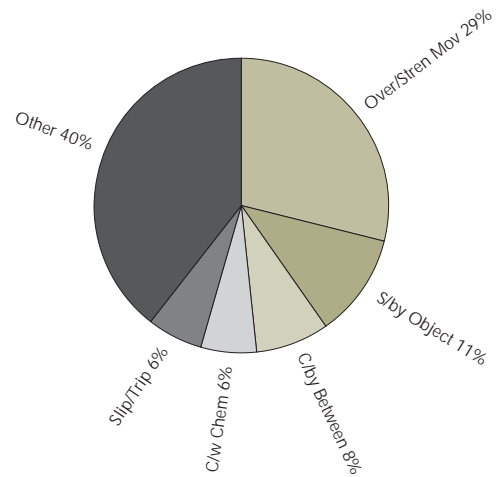
Nature of Injury



Location of Accident



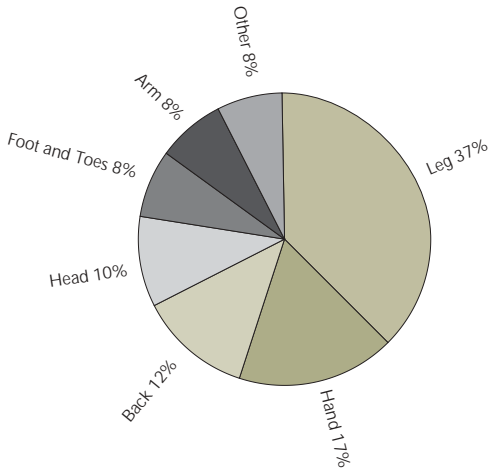
Type of Accident



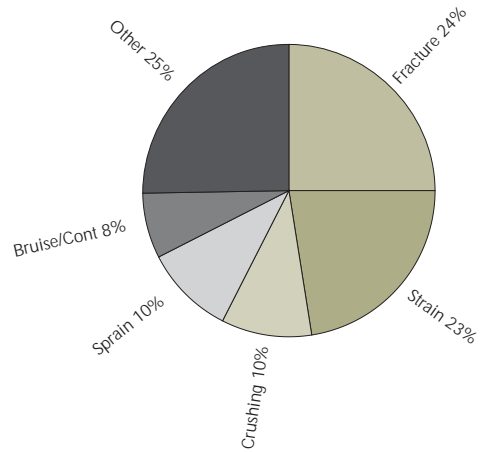


IRON ORE INJURIES 2001/02

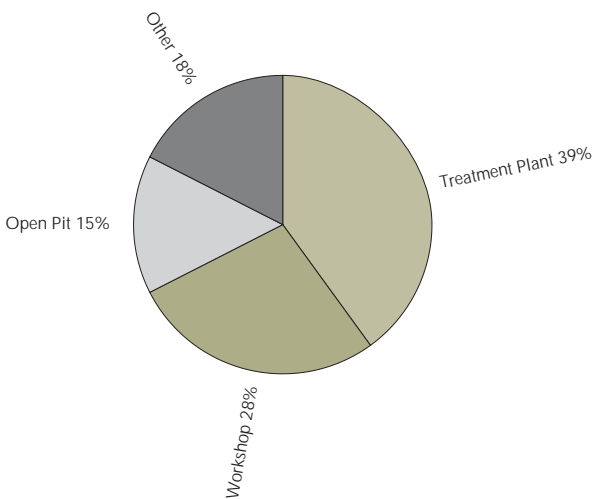
Part of Body



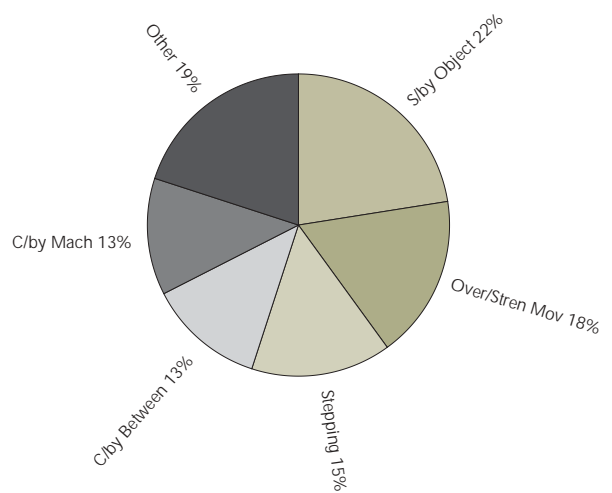
Nature of Injury



Location of Accident



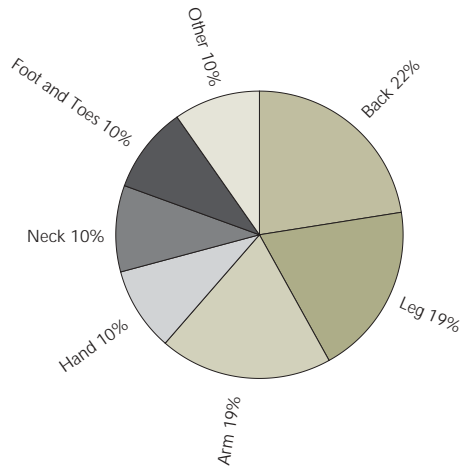
Type of Accident



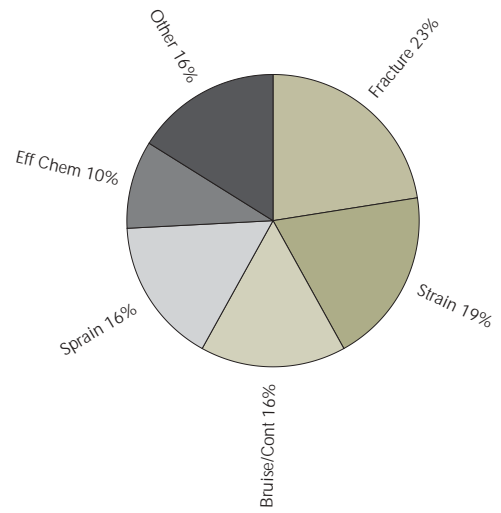


BAUXITE AND ALUMINA INJURIES 2001/02

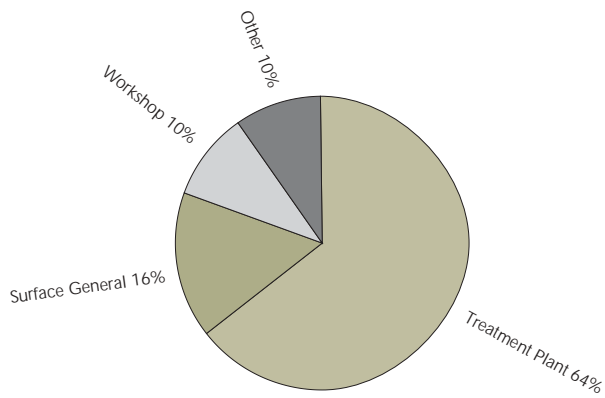
Part of Body



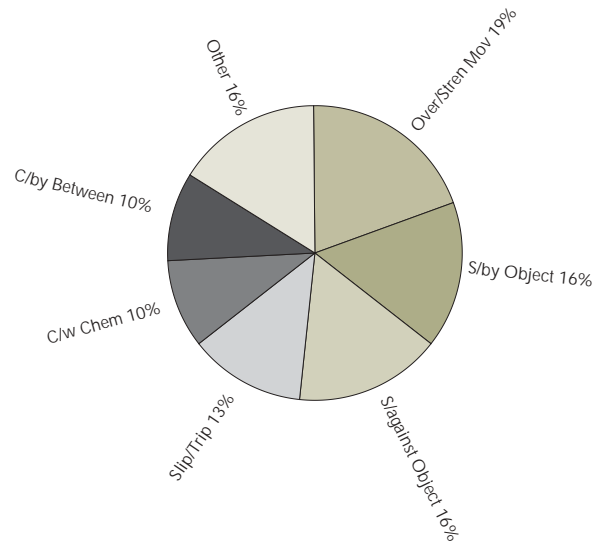
Nature of Injury



Location of Accident

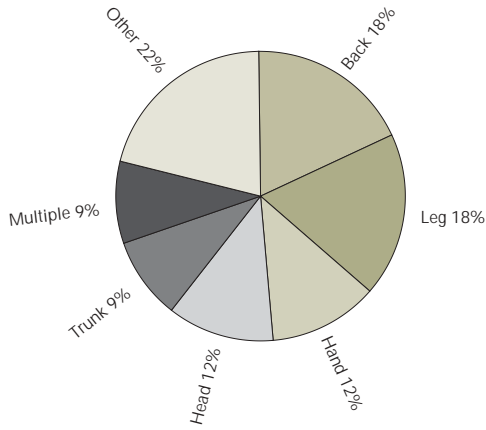


Type of Accident

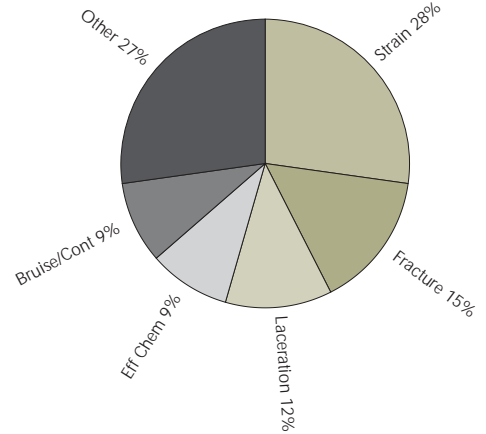


NICKEL INJURIES 2001/02

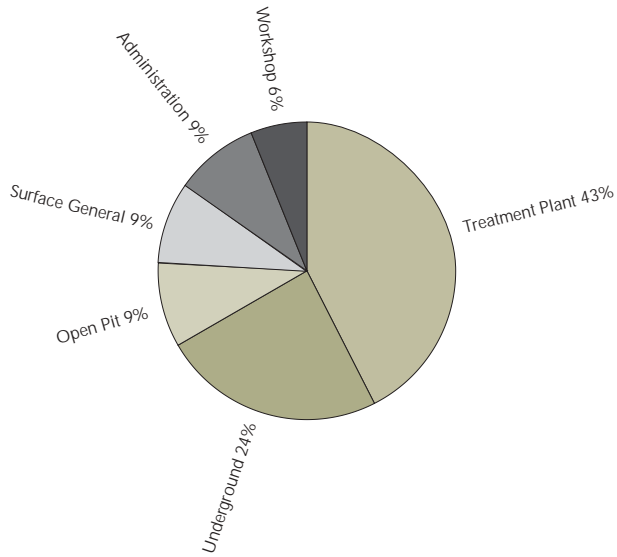
Part of Body



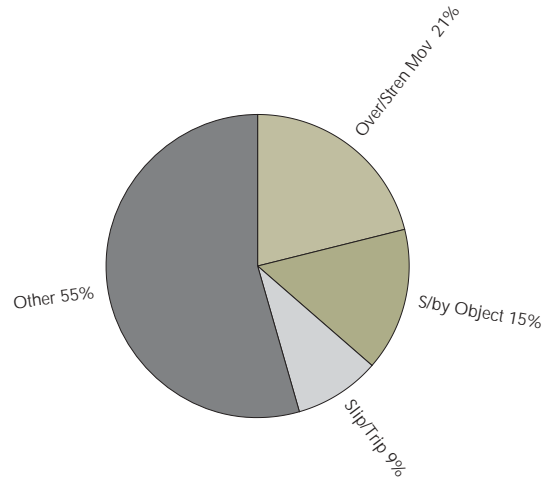
Nature of Injury



Location of Accident



Type of Accident



DISABLING INJURIES 2001/02

During the 2001/02 fiscal year, in addition to the 380 lost time injuries, there were 313 disabling injuries reported (311 in metalliferous mines and 2 in coal mines), bringing the total number of reportable injuries to 693. A breakdown of this data together with performance indicators is shown in the tables below.

One hundred and eighty seven of the disabling injuries resulted in the injured person being disabled for two weeks or more.

Disabling Injuries during 2001/02

| Mines | No. of Employees | Disabling Injuries | | | All Injuries (DIs and LTIs) | | |
|------------------------|------------------|--------------------|------------|------------|-----------------------------|-------------|------------|
| | | No. of Injuries | Incidence | Frequency | No. of Injuries | Incidence | Frequency |
| Metalliferous Surface | 36,706 | 268 | 7.3 | 3.6 | 570 | 15.5 | 7.6 |
| Metalliferous U/Ground | 3,601 | 43 | 11.9 | 4.7 | 101 | 28.0 | 11.1 |
| Metalliferous Total | 40,307 | 311 | 7.7 | 3.7 | 671 | 16.6 | 8.0 |
| Coal Total | 662 | 2 | 3.0 | 1.7 | 22 | 33.2 | 19.1 |
| TOTAL MINING | 40,969 | 313 | 7.6 | 3.7 | 693 | 16.9 | 8.2 |

Disabling Injuries by Mineral Mined during 2001/02

| Mineral Mined | No. of Employees | Disabling Injuries | | | All Injuries (DIs and LTIs) | | |
|------------------------|------------------|--------------------|------------|------------|-----------------------------|-------------|------------|
| | | No. of Injuries | Incidence | Frequency | No. of Injuries | Incidence | Frequency |
| Gold | 12,454 | 132 | 10.6 | 5.0 | 287 | 23.0 | 10.8 |
| Iron Ore | 8,926 | 13 | 1.5 | 0.7 | 53 | 5.9 | 3.0 |
| Bauxite and Alumina | 6,439 | 100 | 15.5 | 8.1 | 131 | 20.3 | 10.7 |
| Nickel | 4,873 | 36 | 7.4 | 3.2 | 69 | 14.2 | 6.2 |
| Mineral Sands | 2,244 | 3 | 1.3 | 0.6 | 24 | 10.7 | 5.1 |
| Base Metals | 1,278 | 14 | 11.0 | 4.7 | 30 | 23.5 | 10.0 |
| Diamonds | 1,060 | 5 | 4.7 | 2.1 | 18 | 17.0 | 7.7 |
| Salt | 690 | 0 | 0.0 | 0.0 | 2 | 2.9 | 1.7 |
| Coal | 662 | 2 | 3.0 | 1.7 | 22 | 33.2 | 19.1 |
| Construction Materials | 459 | 2 | 4.4 | 2.4 | 13 | 28.3 | 15.7 |
| Other | 1,884 | 6 | 3.2 | 1.4 | 44 | 23.4 | 10.4 |
| TOTAL MINING | 40,969 | 313 | 7.6 | 3.7 | 693 | 16.9 | 8.2 |

Disabling Injury (DI) - a work injury, not a lost time injury, that results in the injured person being unable to fully perform his or her ordinary occupation (regular job) and where either alternative or light duties are performed

This category would include:

- where the injured person is placed in a different occupation/job, whether on full or restricted work hours;
- where the injured person remains in his or her normal occupation/job, but is not able to perform the full range of work duties; and
- where the injured person remains in his or her normal occupation/job, but on restricted hours.



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