

Make your Safety Management System Work

Having a safe system of work and making it work are two different things.

Many sites have engaged external expertise to help develop site-specific safety systems and plans. Most, but not all, view the implementation of safety management plans as more difficult than developing the original documentation.

New resources and workshops have been developed in a IQA / DPI joint project.

At a meeting in the middle of 2004, members of The Institute's Education Committee and the NSW Mine Safety Operations Group (then from the NSW Department of Mineral Resources now part of the NSW Department of Primary Industries, DPI) agreed that a joint project should be developed specifically for small-scale extractive industries operators to continuously improve its safety and health culture and working environments.

A 'Small Mines Campaign' in NSW had already shown substantial benefits in both an Opal Mine Safety Awareness campaign and in one for Extractive Industries. Both were designed as staged projects. The opal project initially targeted 'new chums' and, after several years, was extended at a different level to experienced opal miners. There had been at least one fatal injury every year on the opal fields prior to the introduction of the safety awareness campaign. Over 6,000 people have attended the course. For more than ten years now there has not been a death on the opal fields.

The extractive industries campaign commenced with workshops to introduce systematic management of risk, and has been extended in a joint project to help sites review their safe systems of work. While this extractive industries campaign is younger, it is showing signs of having a similar beneficial impact.

There are two types of workshop for small-scale extractive industries. The first type of workshop, Introduction to Safety Management, assists small-scale operators to meet their legal obligations for a Safety Management System/Plan. The workshop introduces operators to a Small Mines Safety Management Kit that was originally developed by the DPI and has now been made State-neutral. The kit is a two-part guide providing information about programs that may make up a safety management plan, and 'do-it-yourself' templates to form the plan.

The second type of workshop, Refining Your Safety Management System/Plan, allows operators to gain additional insight into critical components of the implementation of a Safety Management Plan. It helps meet today's increased levels of due diligence and duty of care in making mine/quarry sites safe and systematically managing risk and helps make Safety Management Plans work.

The IQA's role in the campaign is vital. Critical to the success of the opal campaign was the commitment of the Miners' Associations on the opal fields. A significant component in extending the NSW DPI's initiative was to work proactively with the management and employees in the metalliferous and extractive industries sectors, to provide guidance in the development of Safety Management Systems/Plans, and, ultimately, to help them achieve safe production. The IQA has given its commitment to supporting the small-scale sector.



A group from industry and a local mines inspector reflecting on their safety systems and sharing experiences at a workshop to 'Refine Your Safety Management Plan'

Practical safety management systems that have risk management as a core component, provide the foundations for minimising harm and thereby indirectly enhancing the industry's performance and reputation. Many sites have expressed the view that they are much better off for having implemented a safety system. Observations by NSW DPI officers support the data that a systematic approach to health and safety has also shown a clear business improvement in those sites that have embraced systematic risk management.

Just as a coarse screen eliminates large stones, a safety system by its very existence screens out large risks; the better it was constructed the more effective it will be in screening out large risks. Successive parts of the system, such as documented accountabilities, through to maintenance and contractor management programs, each provide successively finer screens. Risk assessments, Job Safety Analyses (JSAs), Safe Work Method Statements (SWMS) and specific task Procedures are common features of today's quarrying. Supervision, competencies and personal accountability provide additional screens.

The following diagram illustrates (without showing all screens) the part that formalised approaches play in minimising risks.

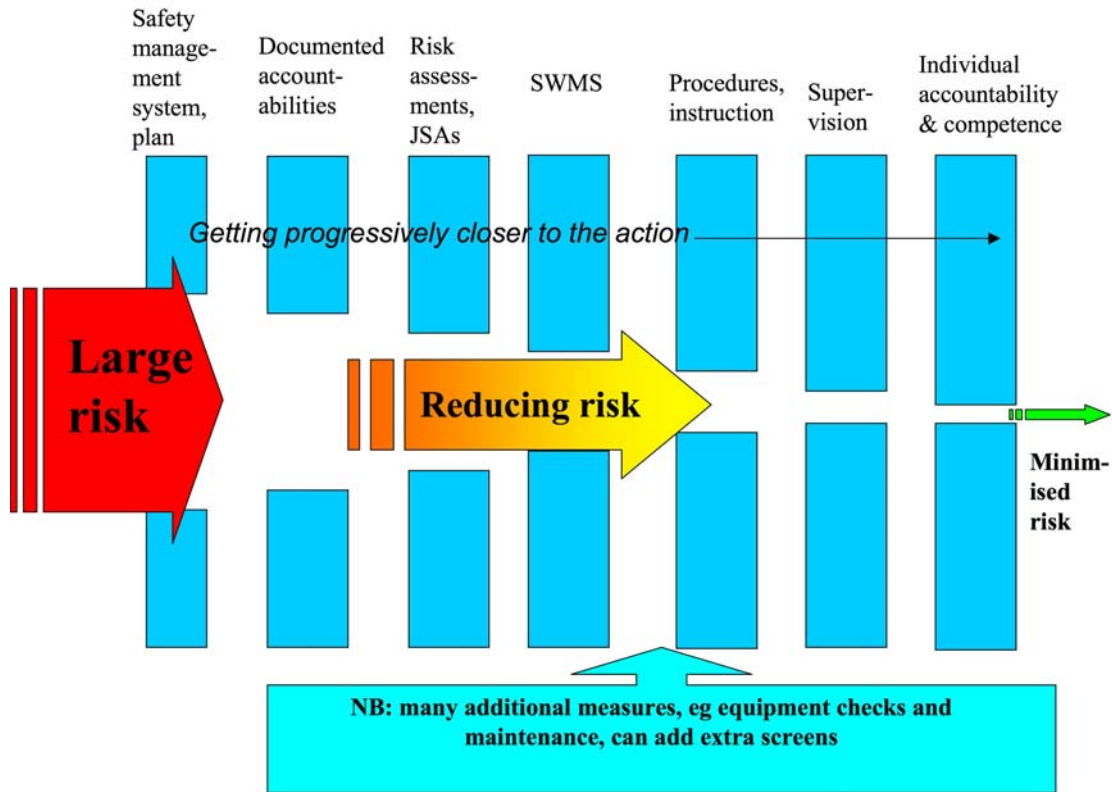


Diagram 1: a safety system and its many components help to minimise risks

Primary motivation

With targeted campaigns and the commitment of many people across the industry, the mining (including extractive) industry has made remarkable improvement since 1990. Two notable targeted campaigns have been the adoption of risk management practices, and the development of safety management systems and plans. The following chart (Chart 1) shows the most recent data available for this comparison and reflects recent improvement. There is one more recent report (published September 2006) from the Workplace Relations Ministerial Council and, while it doesn't allow the chart to be up-dated, it has dropped the mining industry from the list of the five worst industries!

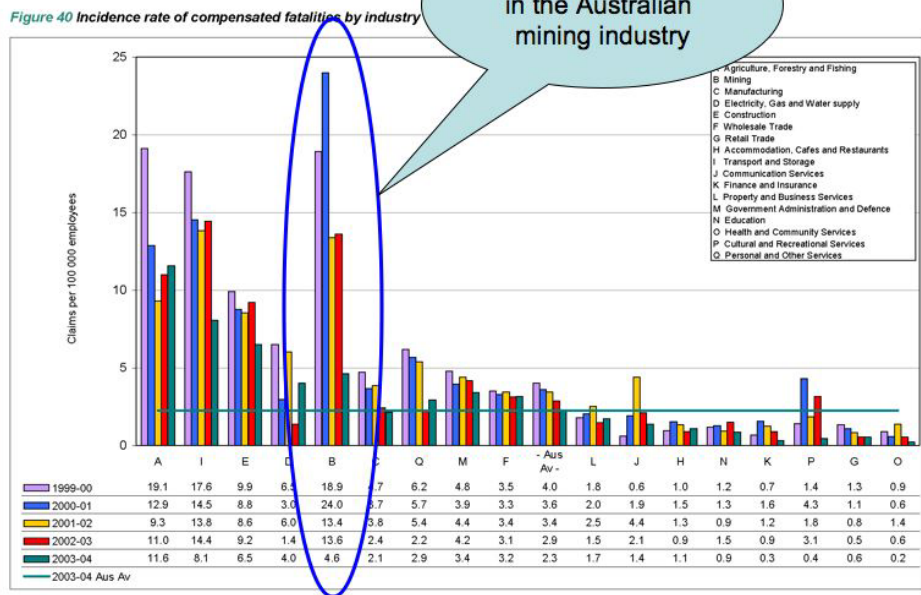


Chart 1: Comparing the incidence rate of compensated fatalities by industry between 1999 & 2004
 Source: Workplace Relations Ministerial Council’s Comparative Performance Monitoring Report 2003-04
 NB: ‘incidence rate’ in this case is the number of compensated fatalities per thousand people employed and includes death caused by disease, such as lung diseases, as well as traumatic injury, and includes self-employed people as well as employees

The industry can take pride in its achievements in approaching or going past ‘the industry average’. Such an achievement is better than an order of magnitude improvement, beyond other industries’ improvements, over the past two decades.

Though the previous chart covers a recent five-year period, the Australian mining and extractive industry sectors have been charting progress in a variety of ways for the last two decades. The period prior to that shown in the chart above should be seen in a longer timeframe so that the year 2000 did not represent a peak as might be inferred from that chart. One of the indicators used in the mining and extractive industries, shows fatal accident rates¹ have decreased significantly, over a span of about 20 years.

¹ The number of fatal accidents per million hours worked, to take account of fluctuations in people employed in the industry. This data-set includes only traumatic injury.

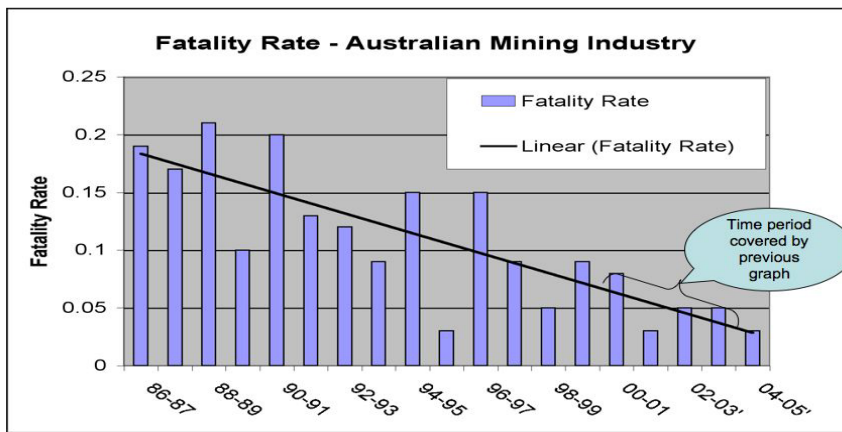
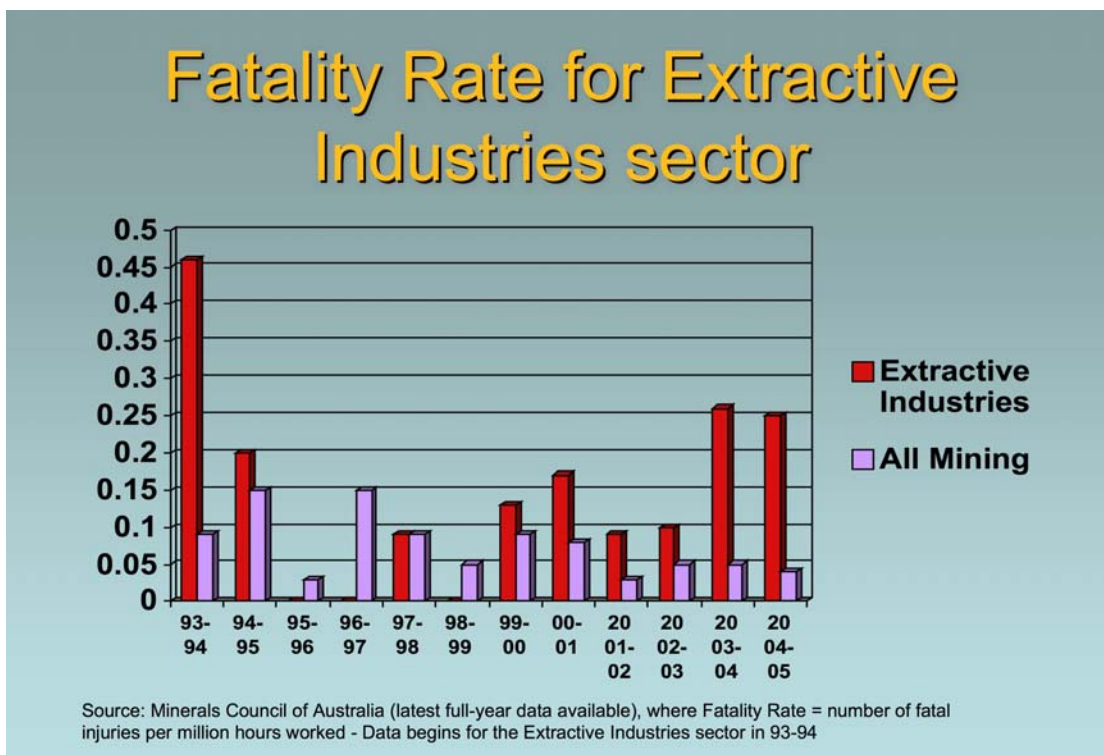


Chart 2:
Fatal Injury
Frequency Rates
1987 - 2005

Source: Minerals Council of Australia

(NB accurate hours worked not available for last two years and a conservative estimate was used so the improvement may well be greater than that shown)

Other indicators reflect a similar positive trend and can enable a better insight. However, when these are broken down into industry sub-sectors, the downward trend isn't as strong for the extractive industries sector as it is for some other sectors.



Source: Minerals Council of Australia (latest full-year data available), where Fatality Rate = number of fatal injuries per million hours worked - Data begins for the Extractive Industries sector in 93-94

Chart 3: Fatal injury frequency rates 1993 - 2005
Source: Minerals Council of Australia

There is no doubt that when the latest data is available, the trend towards zero harm will have continued improving through to the present time. While the mining and quarrying industry is approaching or surpassing 'the average industry's' safety performance, there would be few that might be tempted to say "enough has been done". Tomorrow's continued production depends on today's performance and reputation.

Small-Scale extractive industry operations

Operations range from those utilising sophisticated mobile equipment and fixed plant, to 'father and son' businesses that excavate and stockpile sand on a part-time basis. A small number of people on a site can produce substantial tonnes of product.



This "small mine" produces stone products for the building industry and is typical of those who have participated in the Small Mines Campaign education program.

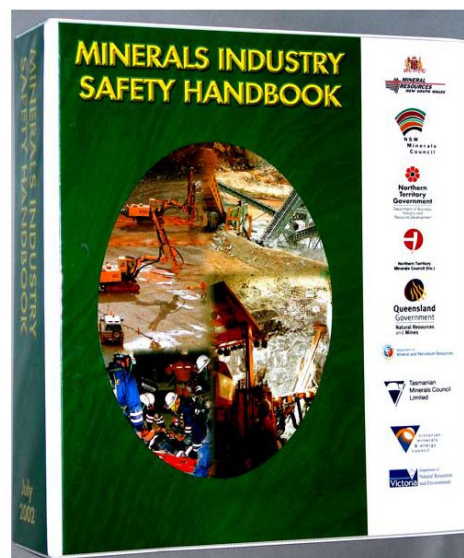
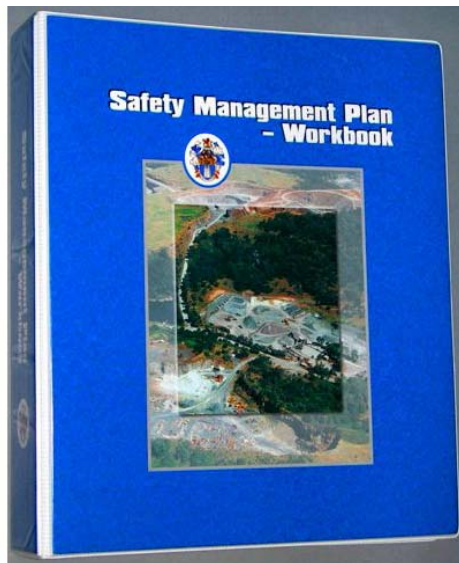
To many small-scale operators, the likelihood of a serious incident seems remote and the consequence is almost always far more profound than most would have anticipated. The profile of incidents in small-scale operations is significantly different to larger mines and quarries. In smaller operations there is a higher risk associated with conveyors, or crushing and screening plant, than is the case in much larger operations. A campaign for small-scale operations shares information about the likelihood and consequence of incidents, and ways to manage risks that are tailored to their needs.

Resources

The Institute had earlier recognised the need to develop a systematic approach to the management of risk. The IQA's state-of-the-art Safety Management Plan Workbook, first published in 2000, supported the development of safety (and health) systems. This resource is widely known as 'the blue book', and was developed jointly by the IQA with the NSW DPI, so it is available from them – see ..

<http://www.dpi.nsw.gov.au/minerals/safety/publications/workbooks>

The blue book is supported by a technical (as opposed to a *process*) reference guideline called the National Minerals Industry Safety Handbook (widely known as ‘the green book’, which was previously titled ‘Guidelines for Safe Mining’).

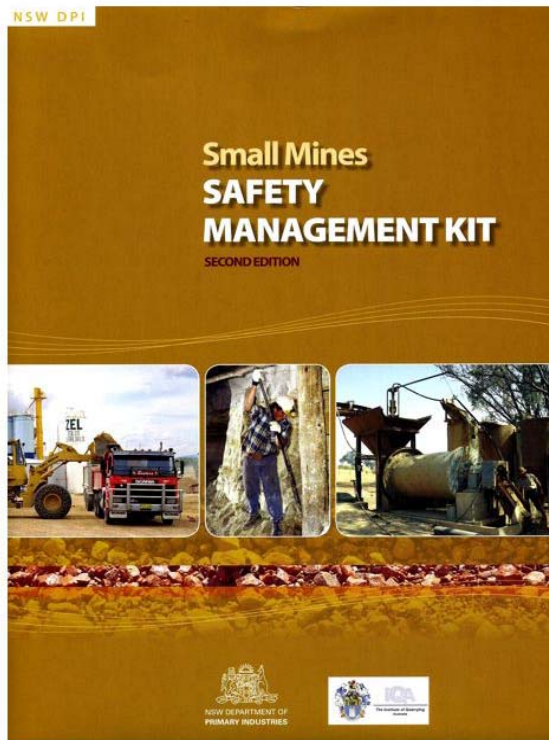


The 'blue' and the 'green' books: both publications are available for purchase from any NSW Department of Primary Industries office. The green book is also able to be downloaded freely from the NSW and other States' websites.

All States/Territories have, in various ways, encouraged the systematic management of hazards and risks. Such encouragement includes making it a legal obligation to have safe systems of work and risk management.

For many small-scale operators the blue book was daunting, so a simpler version was produced and tested by over 400 industry participants across NSW; this has been called ‘the brown book’. The brown book is officially known as the Small Mines Safety Management Kit and is available from the NSW DPI.

Workshops for the brown book, titled ‘Introduction to Safety Management System/Plan’, are being extended from NSW into other States, with Victoria being the first, and Queensland next, in the industry’s common desire for national consistency. These workshops help sites get started in developing safety management systems and plans.



The 'brown' book – now a national resource

A further step was taken during 2006. New, and nationally consistent resources have been developed as part of an on-going campaign. The IQA made the second edition of the brown book State-neutral and, in another joint project with the DPI, supplemented it with a separate risk management guide called the 'Risk Management Pocket Guide'.

The pocket guide is aimed at people who work in the mining and extractive industries. It is not designed primarily for risk managers, though it provides a useful tool for them. The kit includes an explanation of practical risk management and a disc that includes a slide presentation as well as forms/templates. Included is a pocket book that contains a pad for making notes and hazard report forms, as well as hazard prompt cards. Each part can be purchased separately, or as one full kit. They are available from the NSW DPI.

Participants at the workshops for refining safety management systems/plans receive a copy of the pocket guide as part of their registration, as well as a copy of workshop notes, a 'Workplace Inspection Checklist' and templates for contractor safety management.



The 'Risk Management Pocket Guide' and its various components

Campaign Structure and Content

The specific objectives of the Small Mines & Quarries Campaign include:

- Identifying small-scale operations that might benefit from external support in introducing, then refining, safety systems, plans and risk management;
- Explaining the need for dedicated effort in improving safety and health across the industry;
- Producing a resource to help organise, plan and implement a more deliberate program for improving safety and health;
- Providing a structured education program that helps sites take advantage of the resource; and,
- Working with program participants to share experiences and help identify further improvements.

Workshops to help refine safety management systems/plans have been developed for those who already have a safety management system/plan and are keen to make it work more effectively. Since mid 2006 seventeen of these workshops have been convened across NSW jointly by the IQA and the NSW DPI and were attended by 350 participants from more than 200 sites. They have provided a good test of the approach and the resource material. These workshops have already been extended to Victoria where they are being conducted in regional centres as well as Melbourne.

Workshops for refining safety management systems/plans concentrate on:

- * Workplace Inspections, and Hazard Identification and Reporting – the ultimate aim is to identify hazards and check that hazards are being controlled effectively
- * Risk Management and Job Safety Analysis – to prioritise attention to the worst hazards first
- * Contractor Management – demonstrating due diligence and duty of care for all people on site

Most participants also appreciate being updated on legal obligations and legislative change. When dealing with risk management, a frequent question is “when do I do a formal risk assessment, when do I do an informal risk assessment, and when is one not needed”. Practical situations and a diagram are used to illustrate possible answers, and, similarly, practical issues with workplace inspections and contractors, are explored.

Each of the refining workshops runs for a day, and to date they have been jointly facilitated by Graham Terrey, on behalf of the IQA, and one or more local mines inspectors. Each is attended by up to 20 participating sites so that individual attention can be given - having that number of participants also increases the range of experiences across the group. Participants are asked to bring their safety management plan along to the workshop and contribute for the benefit of the other participants – “what does your safety management plan *actually* say about workplace inspections?” (for example). In this way participants have the opportunity, away from daily pressures, to reflect on the implementation of their plan, and to see how others are addressing similar challenges. Interaction between participants ensures practical responses or suggestions.

Many sites have engaged external expertise to help develop site-specific safety systems and plans. Most, but not all, view the implementation of safety improvement plans as more difficult than developing the original documentation. Most participants at these new workshops also see a value in making on-going improvements for themselves, and some of these on-going improvements entail a reduction, rather than an increase, in the volume of documentation. This reduction becomes possible as risk management practices mature and with experience in implementing the system/plan. During the workshop, participants have the opportunity to explore these ideas with others as well as get some feedback from Regulators.

Maturing Role of Department Officers in Workshops

Sites need to be active in identifying hazards for themselves, and to develop a systematic way of dealing with the obvious, as well as surprises. Many small-scale operators value the fresh set of eyes that an inspector brings to their site. Regulators do not have unlimited resources, so it is efficient for them to invite people to attend these workshops and, in this way, reach many sites in one go. They can then give more attention to those who have not developed safety systems and plans, or to those most at risk.

DPI officers have the benefit of seeing many ways of addressing risks and are well placed to share their experience. Unfortunately they often see the devastating impacts of a serious incident, so they are keen to pass on the lessons to others.

The leadership and support of DPI officers is necessary for the workshops. For many departmental officers, co-facilitating requires an additional style to their normal role; facilitating on-going improvements in site safety cultures means influencing by querying, rather than being direct and it requires them to be part of the solution. It also requires a genuine desire to work proactively with mine/quarry owners, managers and support staff. Networking, which may begin at such workshops, is also encouraged to supplement the resources available to sites.

Response from Industry

Feedback from all participants is vital for both the IQA and the DPI. All participants fill in a one-page feedback sheet at the end of the workshop and the feedback so far has been very positive, with some excellent suggestions for additional support.

Many sites have taken advantage of the discounted registration fee for second and subsequent participants from the same site. In many of these instances the additional participant was not employed at the time of developing the safety management plan, so they find the workshop a good way of discussing improvements with other participants from the same site or other participants in similar situations. Additional participants also provide an invaluable support once back on site – helping with communication and the commitment to achieve maximum improvement.

Many local council officers have participated in workshops. They are often keenest to integrate separate safety management systems, and they use their involvement in the workshops to explore that possibility.

The IQA's primary goal is to advance the science (knowledge and application) of quarrying. A key strategy is education of those in the industry and these new workshops fit into that strategy. They also provide the underpinning knowledge and skills for some elements of training package competencies.

Workshops present an opportunity for the Institute to encourage new membership; over 50 information packages that describe the IQA were requested by participants at workshops during 2006.

Future Action

Suggestions for additional support or material gathered along the way will be forwarded to other committees of the IQA. In particular their Technical Committee will receive suggestions for other initiatives or improving existing technical resources.

The IQA's Education Committee will consider how best to support other identified needs of the industry. The Departments involved will do likewise.

A reduction in injuries and fatal accidents is expected. A significant reduction will be of huge benefit to individuals and their families and communities as well for the sustainability of the industry.

Acknowledgments

- The authors² wish to thank The Institute of Quarrying Australia and the NSW Department of Primary Industries, Mine Safety Operations Branch for the opportunity to be involved in this campaign and to publish this paper.
- The significant contribution that the many Departmental officers are making to the small-scale operators in the mining and extractive industries sector in their understanding and implementation of outcomes-focussed legislation is also gratefully acknowledged. In particular, special thanks go to Angus McDouall and Ron Dillon for their enthusiasm and commitment in developing the new resources. The support of the many local inspectors in facilitating the workshops has also been exemplary.
- The positive response by the many participants at workshops held to date has been the motivation for preparing this paper.

References

- Moss.J. *Why Are Mine Safety Management Plans Important to Mining Operators ?* AusIMM Underground Operators' Conference July 2002

² Graham Terrey, Director Mine Resilience (Australia) Pty Ltd, & project leader for the Institute, and John Moss, Senior Inspector of Mines, Mine Safety Operations, & project co-ordinator for NSW DPI