



Environmental Scan 2010

Building Capacity and Capability at Enterprises to Support
Workforce Planning & Development



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Introduction

Twelve months ago the Australian and world economies were experiencing a massive downturn in business activity, which was dubbed 'Global Financial Crisis' (GFC). Throughout 2008, the cancer of subprime mortgages and financial engineering in the USA saw the takeover of Bear Stearns, the demise of Lehmann Bros and hundreds of financial institutions across the globe.

Banks and financial institutions across the United States and Europe required public, and in some cases the International Monetary Fund, support to avoid liquidation. The impact was felt locally, with lack of confidence between banks and their reluctance or inability to extend credit facilities on a global scale.

The Australian resources and infrastructure industry, which includes the Coal mining, Metalliferous mining, Quarrying, Drilling and Civil Infrastructure sectors, relies heavily on its ability to establish lines of credit. This ensures working capital is available to carry out operations. The immediate result of the GFC on the industry was a substantial drop in value on the share market and the reduced value of resource commodities. Some prices fell by more than 50% over three months, and the share market as a whole dropped almost 40%. These movements prompted an expected slowdown in demand for a wide range of products and services and customers were unwilling to enter into new contracts.

Large, medium and small organisations were forced to immediately consider the size and profile of their respective workforces to ensure it was appropriate to the lower levels of production required. Despite reports the resources and infrastructure industry had "lost" up to 25,000 jobs during the downturn; not all sectors were affected. It was more a case of jobs moving between sectors rather than a complete loss to the resources and infrastructure industry. The Australian Bureau of Statistics (ABS) reported an increase of over 30% employment in the mining sector in Queensland alone in July 2009. This indicates the industry's experience with skill shortages prior to the downturns of the past have prompted a different response to the global financial crisis of 2008/2009.

Many organisations off-loaded contractors to retain their permanent staff, albeit on reduced time and varied rosters. Australia's two highest export earners, coal and iron ore, maintained their production levels during this time, with only the slight hiccups of bad weather and infrastructure bottlenecks causing for reduced export tonnage across the year.

At the beginning of 2009, it was difficult to be optimistic about the future amid rising unemployment, limited credit and a long list of insolvent financial institutions in Australia and overseas. Despite these business conditions, the Australian economy did well to avoid falling into an official recession.

Throughout the year, commodity prices continued to improve, particularly in coal and natural resources sectors, cementing Australia as a major global energy player. With the level of gross domestic product growth measured at just 0.2% in the September 2009 quarter and a jobless rate of 5.8%, Australia is not out of the woods yet according to the Treasurer and economic commentators. By December 2009, anecdotal and empirical data indicated employment prospects had improved significantly, with the resources and infrastructure sectors operating at levels not seen since before the GFC.

Improving business conditions in 2010 mean the resources and infrastructure sectors will need to prepare for and address workforce needs. The possible skill shortages that come with new projects earmarked across Western Australia, Queensland, South Australia and the Northern Territory. SkillsDMC estimates the resources and infrastructure industry will require an estimated 40,000 to 50,000 workers across all occupational categories and qualifications to satisfy these skills needs over the next 12 months.



Workforce Planning

Over the past 18 months SkillsDMC has carried out a series of workforce planning and development activities in support of the Federal Government's Productivity Places Program trial project.

The aggregated reports and graphs listed in the following pages indicate the expected growth in the resources and infrastructure workforces provided by the participating organisations. It is important to note that this data is in real-time and relates to expected production and business activity of the participating organisations.

This aggregated data provides SkillsDMC with an early warning system based on real-time industry intelligence. Industry feedback highlights workforce planning as the highest priority for enterprises to avoid skills shortages. As a result, SkillsDMC has developed and implemented the 'Future Workforce Manager' – an industry-derived workforce planning instrument designed to gather enterprise demographics directly related to current and future business activity.

Prior to the GFC, the estimated number of people employed in the resources and infrastructure industry was 530,000*. In the early months of the downturn the mining sector (particularly in WA) lost somewhere between 10,000 and 15,000 workers. The vast majority of these were contractors or as a result of the closure of the Ravensthorpe Nickel mining operation.

Conditions have since taken a turn for the better. By July 2009, the Australian Bureau of Statistics (ABS)* reported an increase of almost 30% personnel in the resources and infrastructure industry in Queensland.

The value of Australian gold has increased due to the world price at over \$1000 US an ounce. The Boddington gold mine in WA is now operating at full capacity and the Ravensthorpe mine is expected to recommence operations in 2010/2011 following an agreement between BHP Billiton and new owners, First Quantum Minerals Australia. Coal seam gas extraction in Queensland and NSW is also on the cusp of a major workforce increase of approximately 3,000 new workers over the next two years across the two states.

As economic conditions improve, resources and infrastructure organisations should proceed with caution as skills shortages resurface. Federal and State Government Taskforces have been established to plan for and meet these labour and skills shortages over the next five years, however a whole-of-industry approach is needed to ensure its success. The Energy Skills Queensland, Workforce Planning report forecasts an additional 10,000 employees to service the Coal Seam Gas operations over the next 5 years.

The Gorgon (WA) project is expected to peak at 10,000 jobs across a wide range of occupations. Other projects in WA, SA, QLD and NSW will bring the number of new jobs to record levels with the resources and infrastructure sectors.

While these statistics are impressive, SkillsDMC is focussing on individual enterprises to assist them with their own workforce planning and development activities. Aggregated data shown in the following pages can be compared to that projected in the national and state reports. SkillsDMC also takes the view that as individual organisations will employ and train the required levels of personnel, it is extremely important that the most up-to-date information is available to them and relates to their own business goals.

* Prime Minister, Sept 1, 2009 Establishment of National Resources Sector Employment Taskforce

* SkillsDMC Environmental Scan 2009

* ABS 1318.3 – Qld Stats, Jul 2009



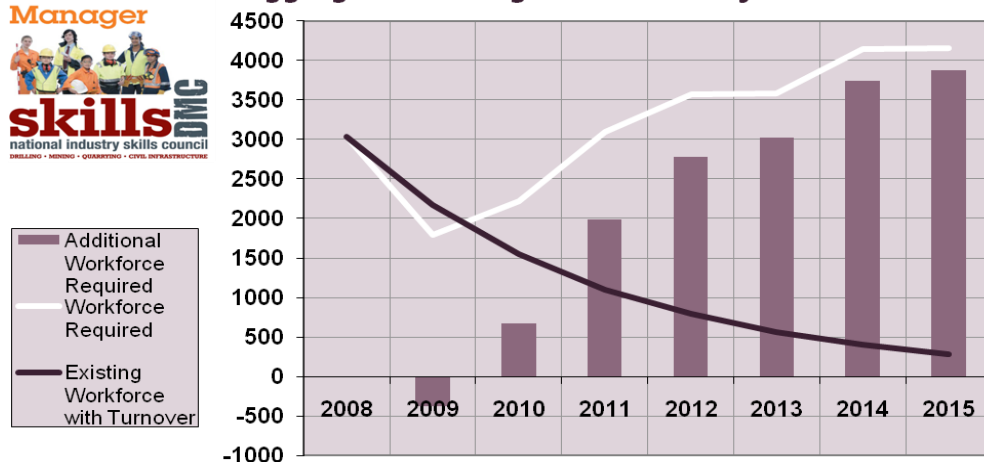
Drilling Sector Workforce Planning Analysis

Using SkillsDMC's Workforce Planning tools including the Future Workforce Manager and Skills Maximiser™, four Workforce Planning Reports were developed. This included one in Western Australia, one in the Northern Territory and two in South Australia. Following the presentation of these reports, 34 recommendations to improve recruitment, workforce development and retention have been agreed to be implemented by enterprises.

Eight organisations contributed workforce information, resulting in a national aggregated workforce of approximately 3,000 direct employees.



Aggregated Drilling Workforce Projections Summary



Workforce Profile

The majority of the drilling workforce is predominantly in operational roles including Drillers Assistants (48%), Drillers (27%) and Supervisors (7%) making up over 80% of the workforce. Approximately 77% of this group is under 45 years of age. Whilst this younger age profile is a good basis for the future of the sector, it poses potential skills issues during times of increased demand.

Gender Breakdown

The nature of the day-to-day work, remoteness of most site locations and this impact on family and social life means the sector does not generally attract females. As a result, there is a low proportion of females in the workforce at 4%. Those females who do succeed in the industry are well regarded for the quality of their work, attention to detail and maintenance of their equipment.

Turnover, Retention and Recruitment

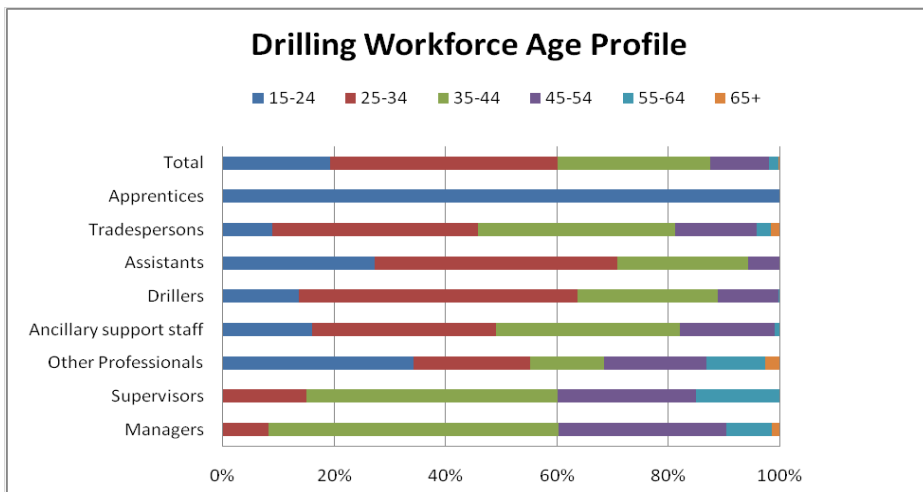
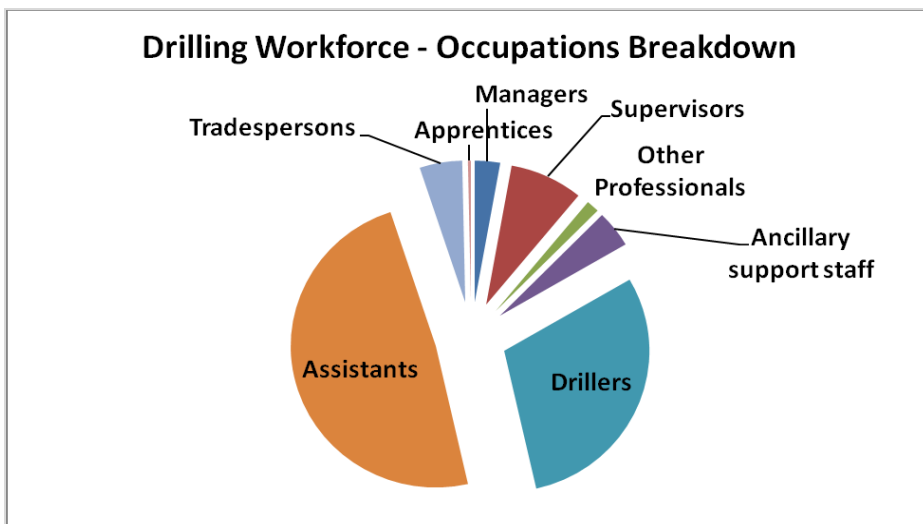
Turnover across drilling companies ranged from 5% to 70% with the overall workforce turnover estimated at 29%. Approximately 2,700 new recruits will be required by 2012/13, to meet activity levels projected for the drilling sector. This will place significant pressure on human resources departments to source, replace and retrain the workforce required to meet these production demands.

The training and development of these new employees will also need to meet the company's obligations to safety, regulation, client requirements, budget constraints and productivity levels.



The challenges for organisations to improve reduce turnover and take the pressure off recruitment and training departments include:

- Ensuring employees understand the career pathway available to them within the drilling sector.
- Ensure employees engaged in a demanding workplace.
- Encouraging employees to engage in training and development to fully realise the benefits.





Training and Development

Organisations that adopt a sustainable approach to skills development will ensure maximum productivity and improve recruitment and retention levels.

Organisations recognise long-term skills development strategies and quality training will achieve measurable outcomes in safety, productivity, cost effectiveness and reliability. Training programs will ensure new employees are inducted into the workforce appropriately and trained to the level competency required by the organisation throughout their employment.

The nature of drilling requires many years of on-the-job training to respond to geological conditions and become experienced as technical advisors.

For this reason, drillers are assessed to a Certificate III level, including three years of industry experience to achieve trade level competence. The data indicates that over 80% of employees in the industry are not yet qualified to this level due to the rate of turnover and growth in business activity over the previous years.

High levels of turnover have impacted an enterprise's ability to effectively train and develop employees. It is not always suitable to enrol employees into training with RTO's until they have completed the company's internal induction program. This allows them to gain the on-the-job experience and demonstrate a commitment to a longer term of employment.

Drilling Environment

The environment in which a drilling operator works can (and does) vary from a main street in a city to an off-shore oil drilling platform to the outback of Australia.

In a recent article ('Australian' 9–10 January 2010) it is noted "A career in the drilling industry is not for the faint of heart. Drillers face arduous work and harsh conditions, but the rewards are good."

The projected increase in business activity in the resources and infrastructure sectors is expected to put substantial pressure on the capacity of the drilling sector over the next five years.

Gas sequestration, coal seam gas development, mine and infrastructure development, water conservation will all need to be serviced by our drilling sector.

Drillers tend to work in teams and the range of competencies can vary greatly due to the nature of the work and the environment in which the work is taking place.

While there are a small number of large organisations operating in Australia, there are quite a substantial number of small (3–4 people) operators in the sector. It is also very heavily contractor orientated.

Because of its contractual nature the industry is very competitive.



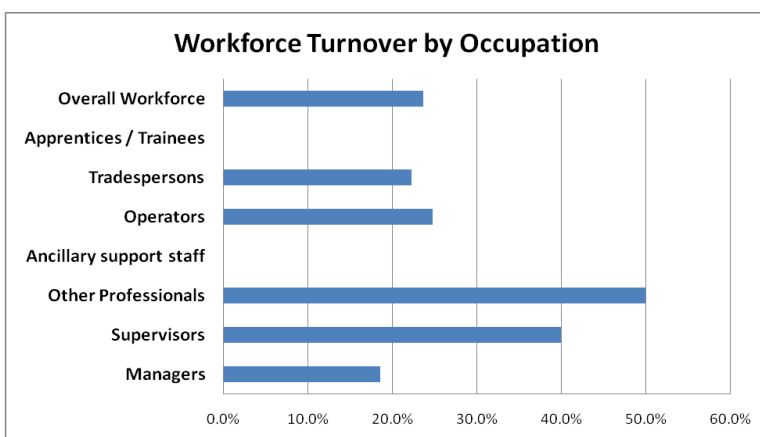
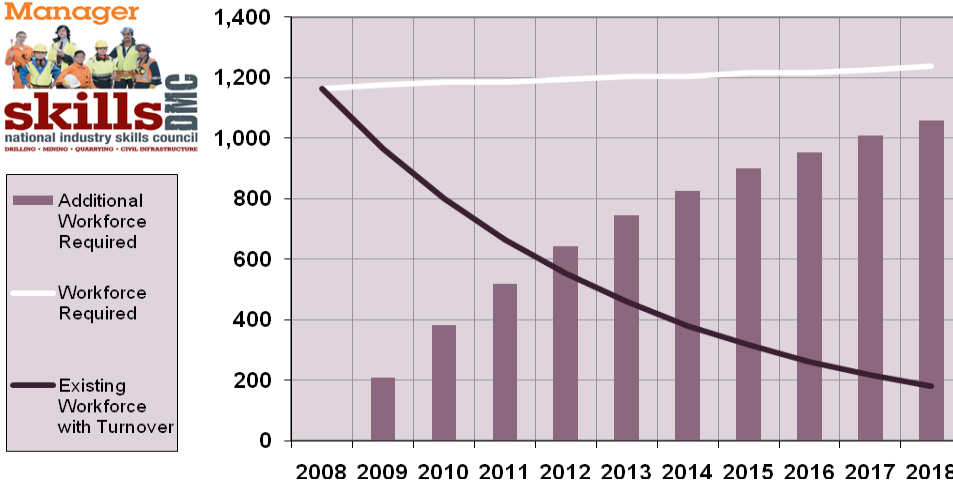
Quarry Sector Workforce Planning Analysis

Using SkillsDMC's Workforce Planning tools, two Workforce Planning Reports were completed including one in NSW and one in South Australia. Following the presentation of these reports, 15 recommendations to improve recruitment, workforce development and retention have been agreed to be implemented by enterprises.

Data was collated from 31 national quarry organisations; including an estimated 116 quarry sites and 1,164 employees. The majority of quarry operations are small with 10 employees or less at each site. Many quarries operate with two to four staff and employ contractors to provide periodic services such as drilling, blasting and maintenance.



Aggregated Quarry Workforce Projections Summary



Workforce Profile

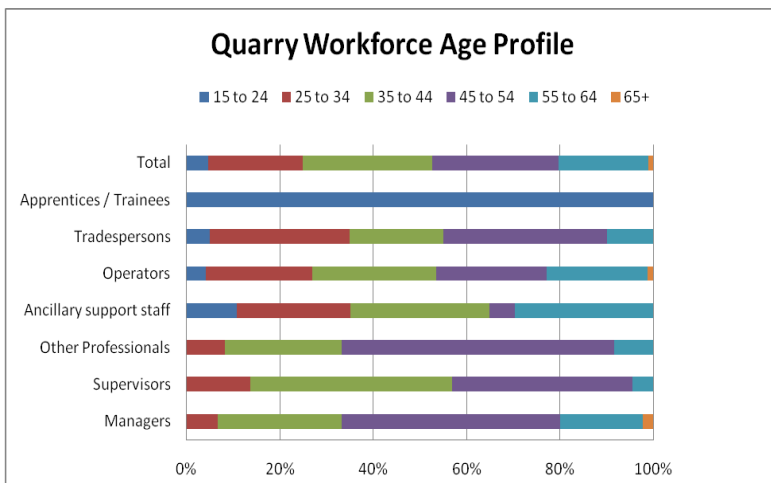
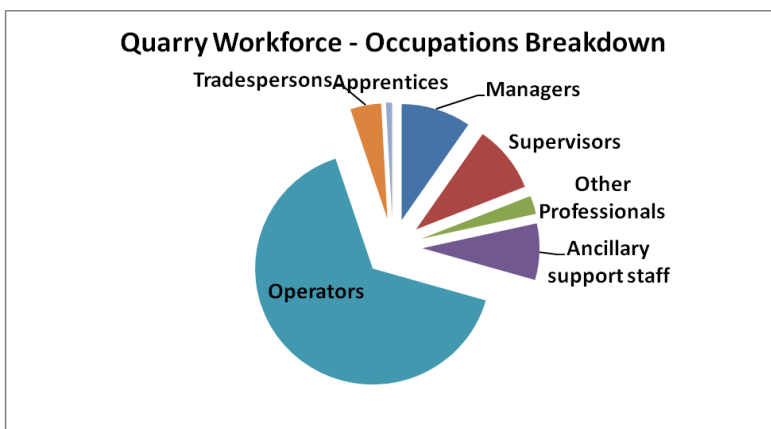
Employment in the quarry sector is dominated by operational roles such as plant/equipment operators and assistants (65%). The remaining workforce is made up of managers (10%), supervisors (9%), support staff (8%), tradespersons (4%), other professionals (3%) and trade apprentices (1%). The low number of Trade Apprentices, coupled with the 22% turnover of Trade persons, indicates the need for skills in equipment services. This may result in a further reliance on contractor arrangements.



The sector's ageing workforce will pose significant recruitments issues for attracting the next generation of employees if it continues to move toward the older end of the scale as is the case with many of the smaller sites

The major challenge for the quarrying is attracting employees to the sector as a viable career path, particularly during times of increased demand. It has also become a resource to other sectors that look to employees with the same skills sets.

To increase awareness of careers in quarrying, the Certificate I in Resources and Infrastructure Operations is being used in some regional areas as an introductory qualification based on Quarrying and Civil Operations.



Gender Breakdown

Given the quarry sector's workforce is predominately male; increasing female employment may be part of the local workforce solution. The redesign of quarrying equipment and introduction of new technologies for the manipulation of heavy materials and more redesigned built into modern plant and equipment may attract female personnel at operational levels. This redesign of plant and equipment will need to be accompanied by cultural, infrastructure and work organisations changes as well. For e.g. industry current 10 hour shifts do not cater for young mums with children.



Turnover, Retention and Recruitment

The average workforce turnover was measured at 17%. Turnover ranged from a low of 0%, where the workforce is very stable to a high of 75%. The highest proportion of turnover occurs within 'Other Professionals' roles. These positions are difficult to fill, particularly during periods of high demand with some vacancies remaining open for over six months.

The Future Workforce Manager demonstrates that the turnover will result in the loss of 43% of the existing workforce in just three years, despite forecasts of low employment growth for the sector.

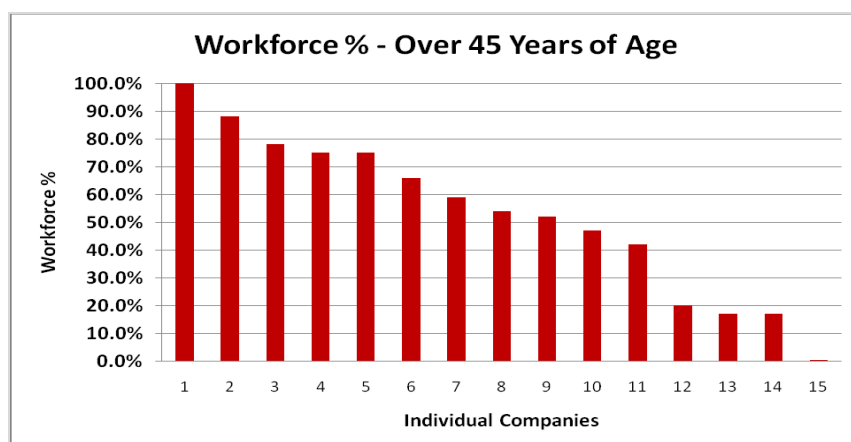
Training and Development

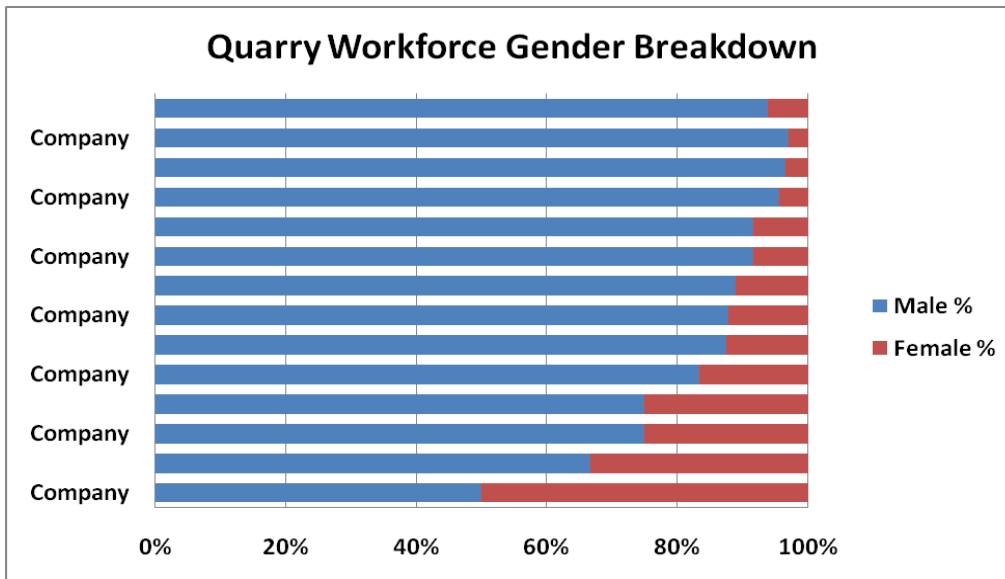
The nature of quarrying operations and workforce size requires employees to be multi-skilled across roles and job functions.

On-the-job training is necessary to meet site-specific operational competency of plants and equipment. Tickets and/or licenses usually need to be completed to meet regulatory requirements. The sector has recently introduced the use of Contracts of Training (COT), formalised competency assessments and training programs, predominantly with the larger enterprises. These organisations have also adopted the Certificate III level as a benchmark for plant and operations as data indicates over 50% of employees are yet to be assessed to this level.

Production and Demand

The sector forecasts demand to depend on the number of contracts and civil projects awarded through the Federal Government's stimulus package. Production requirements are expected to remain consistent over the coming years in quarry markets such as Civil Grade Aggregate, Gravel, Sand, Dimensional Stone and Agricultural Limestone. The quarry sector jobs were down by 20-25% in 2009-10, the quarry sector will need to recover these jobs in addition to the jobs that will be required to meet the future demands of the industry. The impact of the next 18 months of the downturn will be that the quarry sector workforce requirements will be higher than that of the other sectors within the resources and infrastructure industry.





Substantial change is occurring in the quarry sector. Environmental management in line with community expectations and engaging with the community are critical for the well being of the quarry sector.

Another area of change is the emergence of the re-use of construction materials. Newly constituted organisations, equipment and the costs of virgin materials supports the growth of these activities.

The downturn in business and government building activities brought on by the GFC has severely hit the quarry sector, civil infrastructure and general construction sectors.

Indications are positive of growth in these sectors as more projects start up and the need for all quarry products are required. As other related industry sectors gather pace, industry stakeholders are concerned that the 'better off' sectors will attract some of their experienced staff with financial inducements.

Many of those operating in the quarry sector are small (between 5 to 10 people) organisations satisfying niche (local) markets.

With a national workforce of between 30,000 and 35,000 people and an ageskew above the national average, the quarry sector will require additional personnel over the next three years.



Civil Sector Workforce Planning Analysis

Using the SkillsDMC Workforce Planning tools, three Workforce Planning Reports were completed in the civil sector in the NT. Following the presentation of these reports, 23 recommendations to improve recruitment, workforce development and retention will be implemented by enterprises.

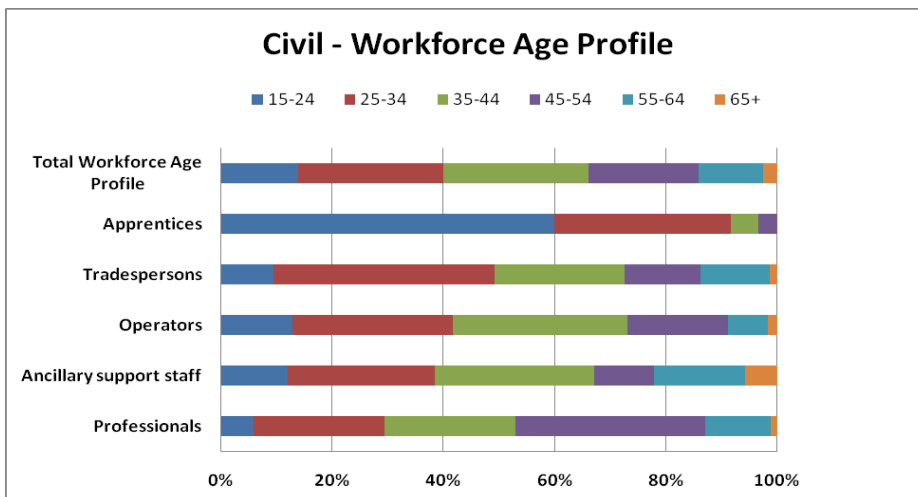
Nationally, 16 civil sector organisations contributed to the analysis of approximately 1,495 employees.

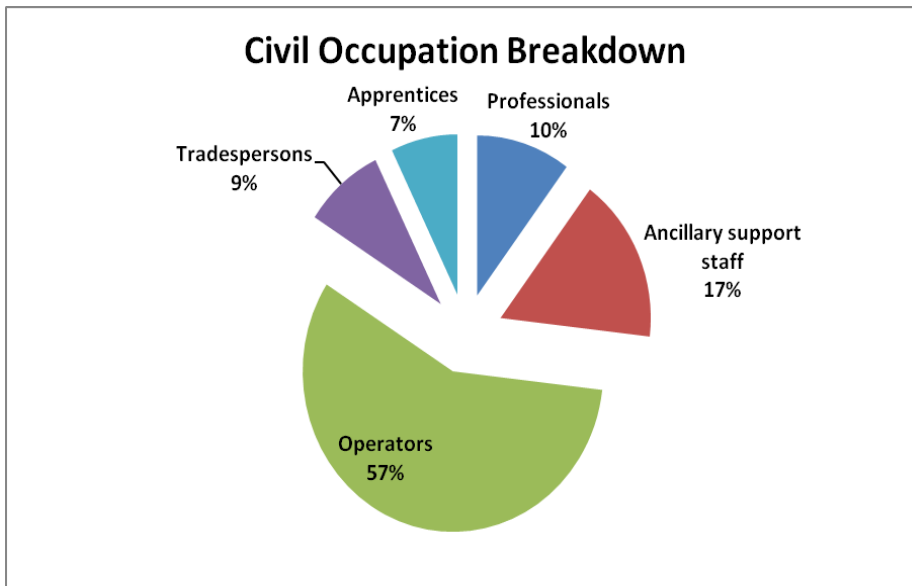
Workforce Profile

More than half (57%) of the civil sector are employed in operational roles, typically plant operators and supporting roles. The sector has a good ratio of apprentices to tradespersons, as well as an even spread across all age categories.

The workforce is predominantly male with 10% female participation and approximately 8% indigenous.

A number of regional organisations have implemented indigenous participation plans as part of their commitment to developing indigenous employment opportunities in construction projects.





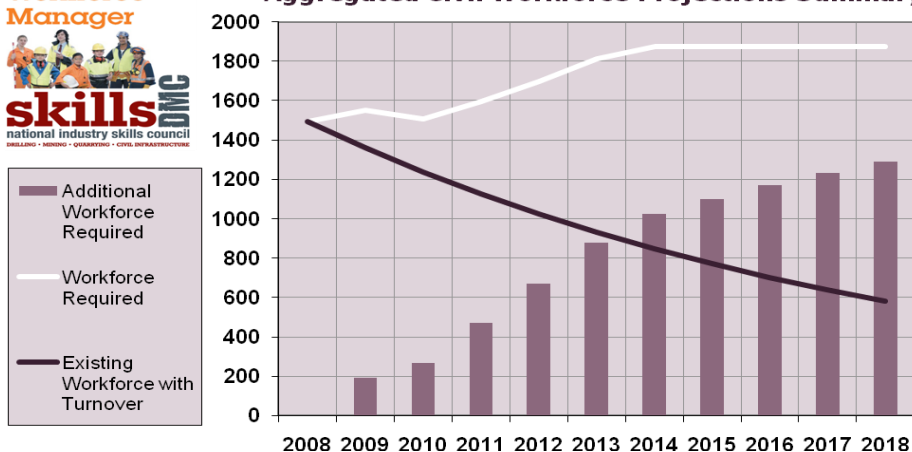
Turnover, Retention and Recruitment

The turnover for the sector was measured at 9%; lower in comparison to other sectors in the resources and infrastructure industry. However, turnover across civil sector organisations varied from a low of 5% to a high of 45%.

This turnover demonstrates the increasing demand for skilled employees over the next eight years, flow-on effects into recruitment, induction and training departments.



Aggregated Civil Workforce Projections Summary



Recruitment and Retention

The workforce analysis identifies remoteness, competitive salaries from other sectors and skills gaps in professional and technical positions, as the major recruitment and retention challenges for the sector. In some regional areas of the Northern Territory, these positions have remained vacant for several years.



Training and Development

The analysis of competency levels reveals that over 50% of operational employees have not been assessed to the desired AQF (Australian Qualifications Framework) level. These standards include:

- Plant Operators
- Supervisors
- Management
- Certificate III in Civil Construction
- Certificate IV in Civil Construction (supervision)
- Advanced Diploma of Civil Construction

Organisations are partnering with training providers in an effort to increase the level of training programs. Traineeships and include:

- Certificate I in Resources and Infrastructure Operations
- Certificate III in Civil Construction
- Certificate IV in Civil Construction Supervision
- Diploma in Civil Construction Management
- Advanced Diploma in Civil Construction Management

Joint Skills Australia, Civil Contractors Federation and SkillsDMC Pilot Project

The Deputy Prime Minister has requested Skills Australia undertake a pilot project together with the Civil Contractors Federation (CCF) and SkillsDMC, to review the skill levels of occupations within the civil construction industry. This request is a response to the Civil Contractors Federation policy paper which identifies the current Australian and New Zealand Standard Classification of Occupations (ANZSCO) as a barrier to the industry being eligible for skills programs and therefore being able to meet the current and future demands of government and private infrastructure investment.

The development of transport and utilities infrastructure in Australia is at unprecedented levels. Civil construction and maintenance projects will include roads, bridges, marine structures including dams, cable and pipelines, tunnels and site works for commercial, industrial and housing development.

Key Issues:

- The current ANZSCO Code system doesn't reflect the occupations within civil construction and where it does the skill level requirements are at too low a level.
- The ANZSCO Code system provides the framework and classification system used by the Australian Government to research and govern the National Skills Needs List, Skilled Migration criteria, funding for training available to the Long Term Unemployed, Careers Advice information to school leavers, such as the Job Guide and the newly announced Skilling Australia for the Future Initiative.
- An alternative mechanism to ANZSCO codes needs to be established that will ensure policy decisions on funding and incentives include the needs resources and infrastructure Industry.

Occupation Review Overview

SkillsDMC and the Civil Contractors Federation partnered to conduct a targeted industry workforce profiling survey to establish:

- a) Occupation titles, skill levels and qualifications applicable to the industry
- b) Priority skills needs occupations
- c) Current and forecast skills shortages
- d) Other issues relating to meeting industry labour requirements



The survey was conducted nationally and respondents included 71 enterprises with a combined workforce of 20,200 direct employees and over 7,000 contractors. These enterprises covered the full range of civil construction operations.

A Qualifications

Respondents indicated a broad range of views in the qualifications / minimum qualifications and experience required to be competent in each of the specified areas, particularly in operations and supervisory roles. The variance in the level of qualifications required can be attributed to a number of factors:

- the *availability* of industry specific qualifications within the civil sector is relatively new;
- the *acceptance and uptake* of qualifications is not yet a 'given'; and
- there has been a *focus* on meeting immediate minimum requirements within industry with a view rather than investing in developing the workforce to meet current and future needs.

Although industry has indicated a need for operators to be able to perform at the Certificate III level they often settle for less due to the issues encountered in achieving this. These issues include:

- insufficient training providers, both public and private, with the capacity to meet industry needs, particularly in specialist areas. For example industry feedback has indicated that only one training provider is available in Australia with the capacity to deliver Bituminous Surfacing qualifications to industry standards;
- The development of resources to support both current practices and emerging technologies has been left to training providers who are under resourced to meet this need.

The qualifications identified provide a clear indication of the career progression within the civil sector. This is an important indicator for understanding the skills shortages that are currently occurring and will continue into the future if the situation is not addressed.

The key roles for progression are shown to be:

- Operator
- Supervisor / Team Leader
- Foreman / Leading Hand
- Estimator / Project Manager

The qualifications required for each of these roles builds on the lower levels of the previous occupations with dual career paths through industry specific Diploma's and Advanced Diplomas or Degree qualifications at the higher levels.

The supervisory roles (Supervisor, Team Leader, Foreman, Leading Hand) relate directly to the qualifications achieved through the operator role, Certificate II or III combined with experience. These roles cannot be filled from an academic background alone which adds to the necessity to forward plan to be able to meet the future needs at this level.

The on the job time required will depend on the diversity of the role and level of proficiency required. Respondents have indicated that a plant operator may be 'qualified' after 4-6 months but in most instances 24 – 36 months has been identified as the minimum time required on the job for an operator to be competent, and therefore, of value to the business.

The 'ticket' that is the competency to operate plant, which would be required prior to commencement of employment, is not considered an appropriate level of experience on its own and is merely a



prerequisite requirements for employment in this role. This creates a dual level for the occupation as there are ticketed operators and competent operators but this is not the same thing.

B Priority Skills Needs Occupations

The civil construction industry is faced with significant skills shortfalls across all areas of activity from operations to team leaders, foremen and supervisors, estimators, and project managers. Difficulties have been encountered in sourcing suitably skilled and experienced people to the industry, and retaining them during fluctuations in activity, largely relating to the impact of the GFC particularly in smaller operations.

The industries priority skills needs in the next 3 – 5 years will continue to be in these areas with operations roles relating to bridge construction, pipe laying, plant operations and road construction and maintenance being of primary significance. Skilled workers in areas such as trenchless technology, which may not be large in number but form an essential, and growing, function in the sector will also be in high demand.

C Current and Forecast Skills Shortages

On forecast vacancies to December 2009 the main areas of recruitment were for plant operators, road constructors and pipe layers as well as foremen, supervisors and leading hands. To December 2012 there was a significant increase in demand for civil engineers, project managers, plant operators, pipe layers and road constructors as well as the management streams of foreman, supervisors and leading hands.

The table below indicates the forecast skills needs and shortfall in the priority occupation areas.

Priority Occupation	Expected Vacancies and Additional Workforce to 2012	Shortfall Based on Current Unfilled Vacancy Rate
Leaders and Supervisors (including estimators):	8,478	4,042
Bridge Constructor	1,413	1,060
Pipe Layer	2,862	716
Plant Operator	8,080	2,464
Road Constructor	7,572	2,163

Based on the projected labour force of 350,000.

A dramatic shortfall in the occupations of Civil Engineer and Project Manager was also indicated.

Given that details of forecast vacancies are provided only on the basis of current business expectations without consideration for growth as a result of infrastructure stimulus or development packages, the shortfall is a major concern for the civil construction industry. Add to this that economic



recovery and growth in the resources sector will undoubtedly draw from the civil construction skills pool adding to the skills needs.

D Other Issues

The age profiles of the industry indicated that 47% of the workforce fall into operations and supervisory roles. There are very low employment entry rates for 15 – 24 year olds with over one third of the workforce falling in the 25 – 44 year age group, which represents over 70% of the operations and supervisory workers in the industry. This drops dramatically in the 45 – 55 year age group, a period when leadership and supervisory capacity would be most readily realised.

Age Profile Summary

- 4.6% of operators and supervisors within the 15 to 24 age group
- 12.9% of operators and supervisors within the 25 to 34 age group
- 20.7% of operators and supervisors within the 35 to 44 age group
- 1.7% of operators and supervisors within the 45 to 54 age group
- 7.1% of operators and supervisors within the 55 to 64 age group

The occupation review findings are generally consistent with those of SkillsDMC's aggregated workforce planning activity for the civil sector.

In order to address the priority skills needs identified a range of interventions and recommendations will be considered.

SkillsDMC will be continuing to work with the Civil Contractors Federation and Skills Australia on this critical project.



Mining Sector Workforce Planning Analysis

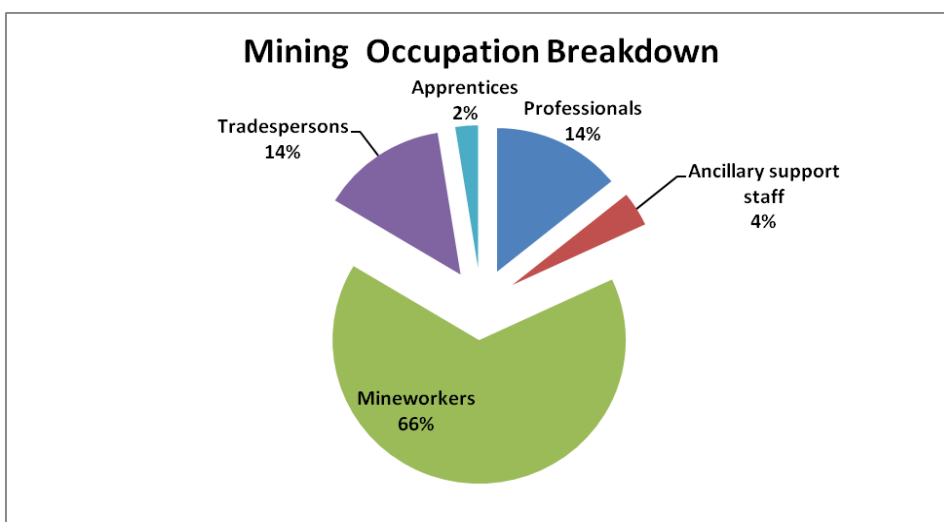
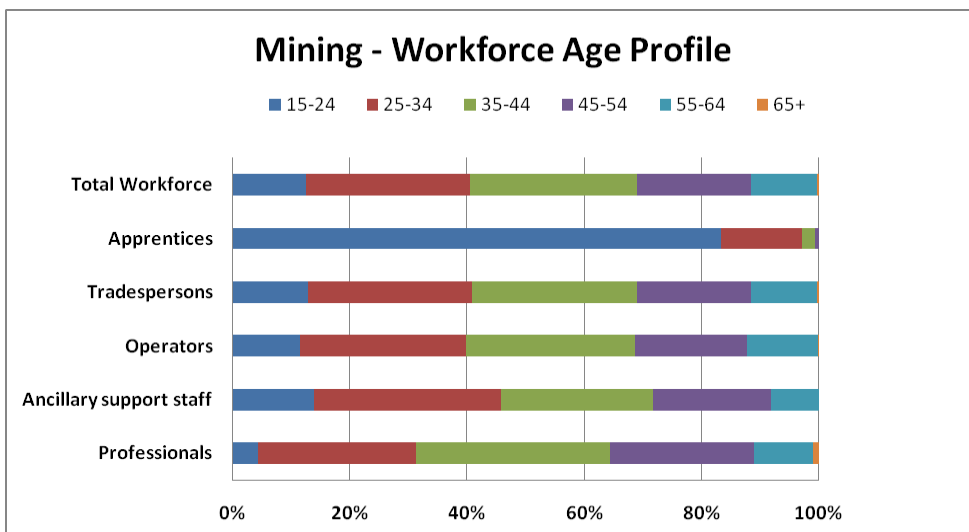
Using SkillsDMC's Workforce Planning tools including the Future Workforce Manager and Skills Maximiser™, four Workforce Planning Reports were developed. This included two in the Northern Territory, one in Tasmania and one in Western Australia. Following the presentation of these reports, 33 recommendations to improve recruitment, workforce development and retention have been agreed to be implemented by enterprises.

Nationally, 49 organisations contributed to the analysis of 21,746 employees.

Workforce Profile

The majority of the mining workforce is employed in mineworker positions (66%), followed by tradespersons (14%) and Professionals (14%). There is a reasonable balance of younger and older workforce participants, however the low level of trade apprentices indicates future skills gaps for maintenance and service positions.

The workforce is predominantly male with 15% female participation and less than 10% indigenous.





Turnover, Retention and Recruitment

The turnover rate for the mining sector was measured at 13.3%. This is an indicative representation based on the workforce information provided and the limited production forecast requirements available.

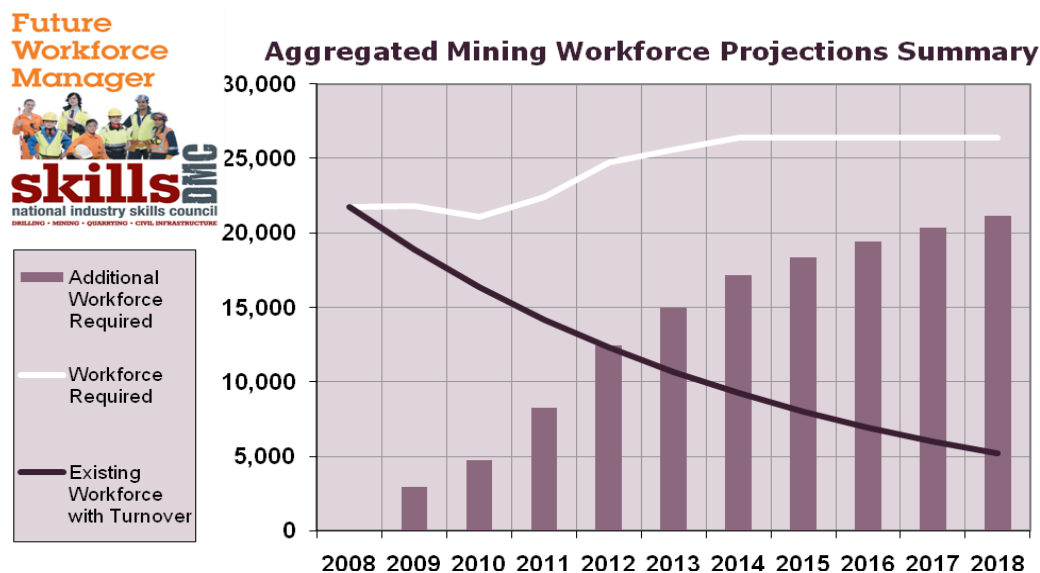
The rapid growth of the mining industry throughout 2008 placed great pressure on the sector's ability to source, train and retain employees. Turnover of employees increased during this period and led to difficulties such as:

- Sourcing sufficient numbers of skilled recruits
- Increasing cost to train new/inexperienced workers
- Impact of skills gaps on safety, productivity, quality and budget constraints

The downturn of 2009 has provided the industry with an opportunity to address labour and skills gaps and improve recruitment efforts.

The mining sector operates 365 days a year, 24 hours a day, 7 days a week, with partial closures for planned repairs and maintenance during the Christmas and New Year holiday period. Employees are usually required to work rotating 12 hour shifts.

These operational circumstances, coupled with the remoteness of mine sites in extreme conditions contribute to the challenge of attracting and retaining skilled employees.



Training and Development

The limited capacity and capability for Registered Training Organisations to deliver programs in the regions such as the Northern Territory and Tasmania. The lack of competition between providers has stifled best practice and affected the ability for organisations to participate in training initiatives such as the Federal Government's Productivity Places Program.

Approximately 15% of the mining employees have a level of education equivalent to or below Year 10, no formal qualifications and some may require assistance with language, literacy and numeracy skills.



As a result, organisations spend an average of \$20,000 per month on training, with approximately 20% of the workforce provided with accredited training at Certificate III, IV and Diploma levels.

Organisations recognise skills development and training initiatives are key to maximising performance and productivity during periods of slowdown as well as during periods of growth.

Organisations that have implemented training initiatives have reported significant productivity gains and minimised downtime.

Skills development is reported as one factor contributing to reduced levels of turnover from over 20% in 2002 to below 5% in 2008. Employees are provided with greater opportunity to expand their level of responsibility; increase remuneration accordingly and fast-track career advancement. As a result, workforce development is beneficial to employees, the organisation, the sector, resources and infrastructure industry and economy as a whole.

Coal and Metalliferous Mining

The Coal and Metalliferous mining sectors of the Australian resources industry for many years operated separately.

Over the past fifteen years or so that two sectors have become closer due to the rationalisation of the major organisations operating in the sectors.

Mergers, joint ventures, takeovers and contractualisation have consolidated individual operations into transnational organisations with an emphasis on production.

The resources sectors are by far the biggest earner (through exports) in the Australian economy with less than 2% of the national workforce.

Coal and iron (depending on the prevailing world commodity prices) are numbers one and two when it comes to winning export dollars.

The mining industry (particularly coal) is highly regulated and requires a number of statutory officials present at the site to oversee operations (safety matters).

The industry also employs very specialised personnel operating expensive pieces of equipment, some pieces rivalling the cost of a medium sized passenger jet aircraft.

Over the years the mining sector has trained its own staff to operate at the mine site at its own cost. Since Australia has adopted the competency based system, the industry has been involved in the development of the national competency recognition system.

The intelligence gathered from industry stakeholders indicates support for the competency based system, however, the attainment of qualifications is seen as the responsibility of the individual and/or government. The attainment of competencies (skill sets) relative to industry needs is seen as most important to the enterprises.

The mining industry is well known for its investment in training and is still No. 1 when it comes to the amount invested in each employee. The combined Coal and Metalliferous sectors employ approximately 40,000 and 200,000 respectively.

All indicators point to increased production and new operations starting up over the next three years, which means an increase of between 5% and 10% in the workforce per annum over the same period.



National Competency Recognition System (Training Package)

The Resources and Infrastructure Industry sectors have been involved with the competency based system for a number of years now. There is a greater understanding among industry stakeholders on the critical role of competency based system on workforce planning and development. With the passage of time, better quality and quantity of advice the impact of the three endorsed components (units of competency, qualification structure and assessment guidelines) continues to grow in the resources and infrastructure industry sectors.

The Resources and Infrastructure Industry sectors measure the impact of the endorsed components in a number of ways, the attainment recognised credential by a candidate is only one. Improvements in production rates, reduction in incidents and staff morale, including attraction and retention of staff are other measures used by the industry.

The resources and infrastructure sectors do not generally use the publicly funded programs, some of this relates to the inflexibility of the training system – the industry mainly operates out of remote and regional areas, and a large part of the resources industry is focussed on skill sets as opposed to full qualifications - this has resulted in the need to fund their own development programs.

However, the impact of Training Packages on these sectors can also be measured through the following:

- After almost three years of stakeholder consultation and agreement, all five sectors agreed to rationalise five Training Packages into one, substantially reducing the number of units of competency and qualifications. The new Training Package was endorsed in July 2009. (See cartoon on page 19 – with kind permission of Greg Smith, Editorial Cartoonist (Perth's Sunday Times, Perth's Community Newspaper Group, *The Mining Chronicle*).
- The endorsed units of competency are an integral component of the SkillsDMC Systematic Approach to plan and implement national recognised workforce development.
- The SkillsDMC unique and innovative use of the endorsed components on an IT platform (Skills Maximiser™) provides enterprises with a training needs analysis tool directly related to their own competency profile, skills and business needs.
- Combining the data harvested from Skills Maximiser™ and Future Workforce Manager can provide an early warning system to enterprises, regional groups, State and Federal governments to plan for the future.

SkillsDMC will analyse the enterprise competency profiles to determine (prioritise) those suites of competencies for resource development.

The diagram included on page 22 notes the relationship between all components of the SkillsDMC Systems Approach including the Training Package.



*Greg Smith, Editorial Cartoonist
(Perth's Sunday Times, Perth's Community Newspaper Group,
The Mining Chronicle)*

Challenges

Industry intelligence, economic forecasts, improving business confidence, share market performance and increasing commodity prices all indicate growth for the Australian economy and the resources and infrastructure industry in over the next 3 to 5 years.

Whilst many organisations have adopted strategies to retain their highly skilled workforce, sectors may experience labour and skill shortages as early as this year as demand for commodities increases globally. China's expected growth and demand from other countries for Australian resources will also contribute to the increased level of production and expanded skills needs.

Western Australia is set to lead growth and expansion, with a number of LNG projects earmarked to produce and export to China, India, Japan and other countries with construction activities having already commenced in 2009.

The mining sectors (both Coal and Metalliferous) have returned to production levels achieved prior to the GFC. Many major operators are hiring or are in the process of recruiting operational staff at all levels including operators, tradespeople and professionals.

The drilling sector is also expected to expand in 2010. The exploratory nature of CO² sequestration, geothermal energy development, coal seam gas extraction and increased activities in development and production in Queensland and New South Wales.

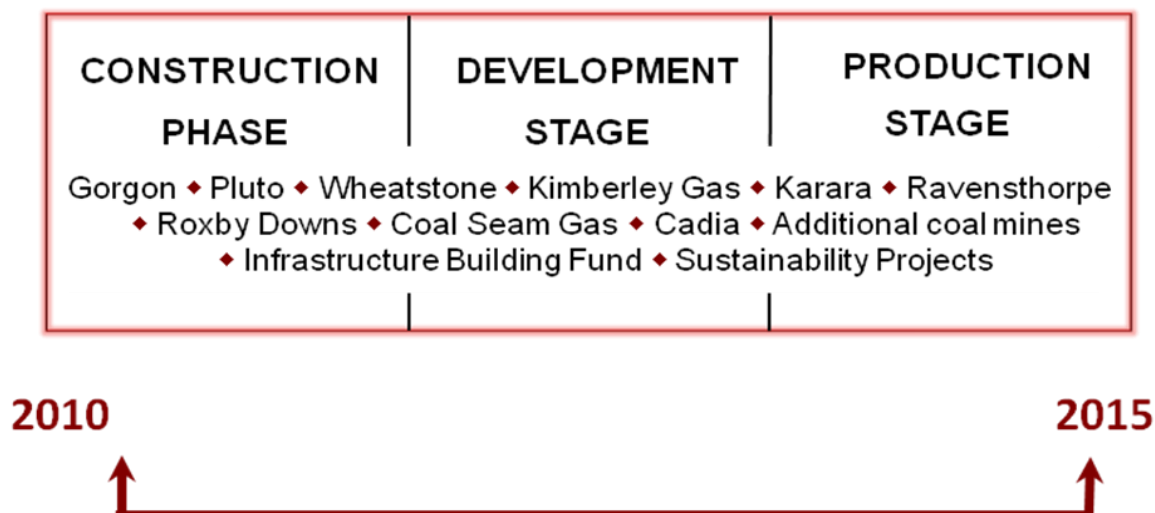
Quarrying is an integral part of the resources and infrastructure industry and is expected to require skilled personnel as the inevitable movement of labour occurs across all five sectors.

Exploration has been identified as one area that will not directly benefit from the economic upswing. Unemployment in the geosciences field (such as geologists and geophysicists) has been reported at nearly 20%. This is well above the unemployment national average of 5.8%. The increase in contracting is only a short-term solution to skills gaps that can take up to six or seven years to achieve the required competency and performance levels.

All five industry sectors, Coal and Metalliferous mining, Civil Infrastructure, Drilling and Quarrying, share strong business relationships and require personnel who possess similar qualifications and on-the-job experience.



The diagram below indicates a small proportion of the projects and activities planned to take place over the next five years. These three distinct stages will require a substantial increase in the workforce with the appropriate skills profile to satisfy industry existing and future business needs.



Demand

Prior to the GFC, SkillsDMC estimated 530,000 were employed in the resources and infrastructure industry. While job losses were experienced in 2009 (particularly in WA), these did not significantly impact the industry's national production performance.

Due to high level of contracting within this period, solid demographics were difficult to obtain. The real-time data sourced by SkillsDMC (through the application of Future Workforce Manager) indicates substantial increases across all five sectors. (See pages 5 —15)

SkillsDMC forecasts the industry will require approximately 50,000 new recruits per year to maintain existing workforce levels. The labour and skills needs of the industry will put some strain on other sectors across Australia.

Supply

The Minerals Council of Australia's 1998 *'Back from the Brink'* paper refers to the lack of a true partnership between industry, government and academia "will pose severe long term problems to the Australian minerals industry, which already faces a chronic shortage of minerals specialist graduates, especially mining engineers and metallurgical engineers. In the past shortfalls have been met largely by the leading Schools of Mines in UK, USA and NZ. However, these schools have dramatically weakened in recent years and may have closed". South Africa can now also be included in this list of countries.

Australia can no longer expect other nations to invest in the training of its population to satisfy Australian skills needs, including tradespeople. This raises the question of who is responsible for the supply of qualified and competent workers in Australia.

Industry no longer operates in an era when there was less outsourcing and organisations contributed to national skills pool. In fact, all five sectors are now accessing the same skills pool; requiring a workforce planning and development structure to replenish the skills pool on an ongoing basis.



While some organisations are adopting workforce planning and development strategies, these need to include a level of training appropriate to the site's specific skills needs. As outsourcing/contractors become increasingly common, the responsibility of replace or retrain retiring personnel is unclear. Simultaneously the number of apprentices employed by the industry has fallen, and therefore, the availability of skilled tradespeople for the future is under imminent threat.

The 'partnership' between industry, federal and state governments must be put into place to allow the partners to establish a skills supply structure, responsive to industry needs. Governments need to adopt an incentive system based on industry requirements. These need to support employment levels and result in an industry-recognised qualification. The Dutch system* uses a range of such incentives and could be referred to as an example of best practice.

Adopting workforce planning and development principles and appropriate funding arrangements will ensure the right skills are available in accordance with demand, timings and costs.

Future Directions

SkillsDMC continues to provide support at the enterprise level to raise the capability and capacity for organisations to manage their own skills needs. Organisations equipped with adequate workforce planning and skills development strategies will maximise productivity and performance.

Workforce planning and development strategies should be designed to efficiently and effectively improve overall workforce competencies and productivity levels.

With industry consultation and government funding support, SkillsDMC has invested substantial resources to develop and implement an industry-driven workforce planning and development system. This system is capable of dovetailing into the publicly funded VET structure and/or the enterprise funded development system.

A practical example of this step-by-step systems approach is documented in the SkillsDMC model to implement the Federal Government's Productivity Places Program.

To ensure the quality, consistency and relevance of the systems approach, SkillsDMC has invested in:

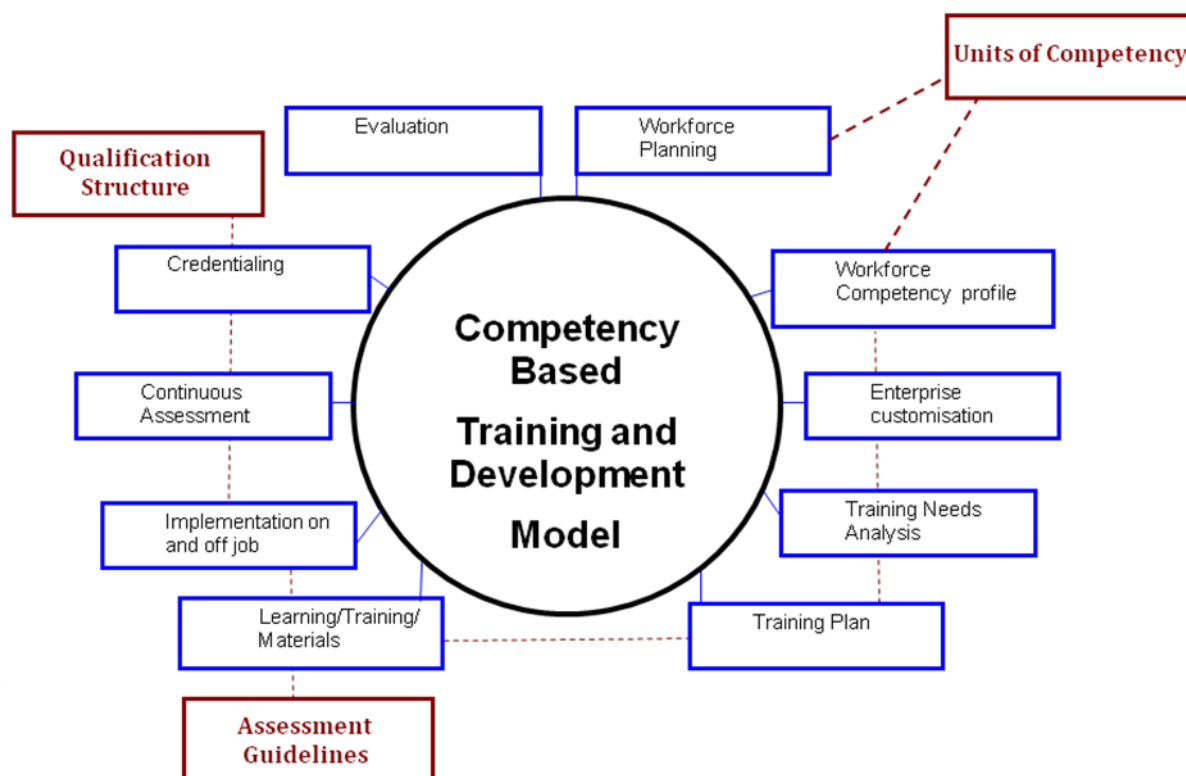
- A national network of Industry Skills Advisors to implement this system.
- Professional development program for SkillsDMC's Industry Skills Advisors.
- IT based workforce planning instruments such as the 'Future Workforce Manager'.
- IT based training needs analysis instruments such as the Skills Maximiser™.
- The industry's first rationalised Training Package, RII09.
- Support materials for training providers.
- Insistence of compulsory on-the-job training.

The PPP model also adopted the principle of providing funds to organisations and ensuring the enterprise became the purchaser and assessor of the services provided.

* *A comparative assessment of International policy approaches to Skills. University of Leicester.*



The diagram below outlines the step-by-step approach of the SkillsDMC competency-based system approach.



The competency-based systems approach was adopted, with measurable success, for the implementation of the Productivity Places Program trial. The trial was conducted with eight organisations across all states and the Northern Territory and the five SkillsDMC industry sectors.

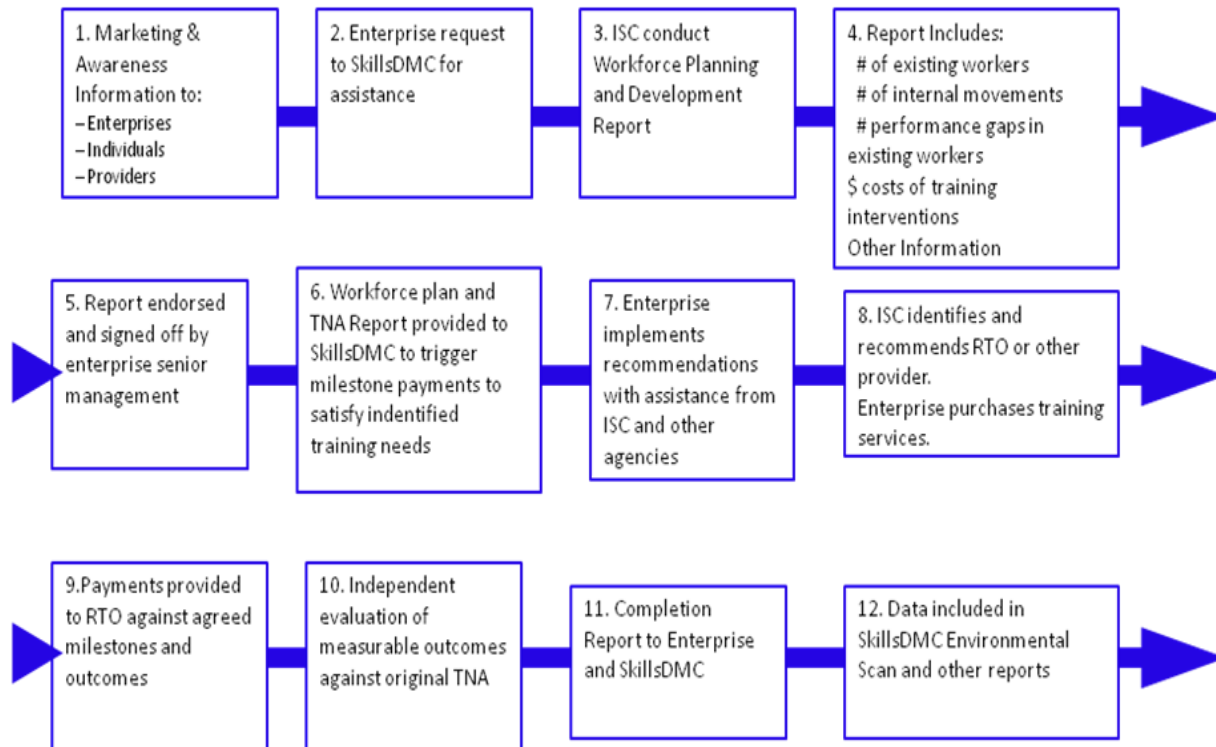
There are four main features contained in the SkillsDMC model.

1. Each participating organisation must complete a workforce planning and development report and provide the data to SkillsDMC.
2. Organisations are provided with the Productivity Places Program funds and become the purchasers of RTO services.
3. Organisations sign a letter of agreement to carry out the training plan contained in the workforce planning and development report.
4. The Report is a live document to be revised annually. It becomes an early warning system for the organisation, with information from organisations fed into the Skills Australia pool of data.

The success can also be measured through the application from enterprises to conduct programs (including PPP) at their operations.



The model is listed in the diagram below.



SkillsDMC was contracted to allocate 150 places in the program. With assistance from the participating organisations, SkillsDMC secured over 190 places.

The model has been accepted by industry and SkillsDMC collate substantial industry intelligence in the process.

The partnership to install the PPP between industry, government and the VET system has been regarded as a success by those participating in the trial.

With the recent announcement by the Deputy Prime Minister to allocate a further \$25M to support existing workers to participate in the Productivity Places Program, SkillsDMC is well placed to facilitate a government and industry partnership through the above mentioned model.



SkillsDMC Capacity and Capability

Through its national network of Industry Skills Advisors, SkillsDMC promotes and assists enterprises and individuals to experience the full value of the Australian national competency recognition system.

The SkillsDMC approach is to raise the capacity and capability of enterprises to manage skills needs specific to their organisation. Workforce planning, development and implementation tools identify these skills needs, with support from SkillsDMC's Industry Skills Advisors.

To ensure the quality and consistency of the system is maintained nationally, all SkillsDMC Industry Skills Advisors have undertaken professional development for:

- Implementation of the SkillsDMC systems approach
- Workforce Planning using 'Future Workforce Manager'
- Training needs analysis using 'Skills MaximiserTM'
- National Competency Recognition System (Development principles)
- Instructor training (Criterion referenced instruction)
- Instructional design/program development
- Auditing/evaluation training provision
- Brokering recognised training
- Mentoring/coaching of enterprises

The DEEWR/SkillsDMC Funding Agreement provides for engaging in workforce and development activities. It assists in the allocation of training places under the Productivity Places Program initiative and the provision of industry advice to Skills Australia and enterprises.

SkillsDMC, its network of Industry Skills Advisors and planning and development instruments are well placed to play their part in workforce development. Ensuring the partnerships between SkillsDMC, governments, enterprises and individuals will successfully maintain and grow the future workforce for the resources and infrastructure industry.



Summary

Anecdotal and empirical data harvested over the past year point to probable labour and skill shortages for our sectors over the next 2 to 5 years. Government agencies (federal and state), industry associations and economic forecasting report on new and expanding projects, global demand for commodities and the infusion of \$100 billion into infrastructure.

SkillsDMC has completed or is in the progress of completing workforce planning reports for more than 80 enterprises across all five sectors. The purpose of this strategy is to drive the information down to the organisation who will employ and train the requisite number of new and existing staff.

While industry stakeholders are more than aware of the value of a credentialed workforce, they generally consider the attainment of qualifications is the responsibility of the individual and/or government. Units of competency are now the currency of employment and in some cases regulatory requirement. Industry stakeholders are more interested in the achievement of a suite of competencies directly related to enterprise performance and business needs.

There is no doubt that the next 3 to 5 years will provide a period of employment growth across all five sectors of the resources and infrastructure industry. State and Territory Workforce Plans, investment by trans national organisations, Infrastructure Fund, world economic recovery and Australia's reputation as a secure and reliable source of commodities support this view.

It is expected that the global economy will not lose pace over the next year or so and maintain steady (if not substantial) growth in the same period. The continued march of China, India and other emerging economies is vital to the overall global economy and particularly, Australia.

Many traditional (European and USA) economies are heavily in debt and will influence governments and individual householders for some time to come, but will not affect Australia.

The occupations listed in Appendix C pretty well represent all areas of work across all sectors and in most jurisdictions of the nation.

Needless to say the highest number, greatest demand for workers will be in the qualification bands of AQF II and III and industry plays a strong and important role to train at this level.

Industry advice is that it is more than capable of training its own people in these areas.

Stakeholders are more concerned about the jobs requiring substantial on and off the job training to attain the level of competence to operate effectively, efficiently and safely.

The list includes:

- Professional Personnel (Managers, Engineers, Statutory Positions)
- Para Professionals (Technicians, Project Managers, Laboratory Technicians, etc.)
- Tradespeople (Tradespeople with specific industry experience)

The resources and infrastructure sectors (over the years) have played a major role in developing their own workforce. SkillsDMC has adopted a strategy in which the job may develop into a qualification and not the traditional position of a qualification into a job.

Government funding for VET should reflect the industry investment in training and support on-the-job training as a matter of some urgency. Following on from our experience with the PPP trial project, SkillsDMC support the principle of direct government incentive to enterprises and enterprises purchasing recognised training.



Appendix A

Report of Previous Continuous Improvement

The RII09 Resources and Infrastructure Industry Training Package – the new rationalised Training Package was endorsed by the National Quality Council (NQC) on 7 July 2009. It was rolled out nationally to industry and VET stakeholders over the following 5 months. There were over 30 workshops held in the major metropolitan and regional centres, with approximately 2000 attendees.

BRIEF SUMMARY OF CHANGE	INDUSTRY IMPERATIVES/ RATIONALE FOR CHANGE	DATE SUBMITTED TO NQC SECRETARIAT	DATE ENDORSED BY NQC/ or ISC UPGRADE	DATE MADE PUBLIC THROUGH NTIS
<ul style="list-style-type: none"> • Rationalised and consolidated 6 Training Packages covering SkillsDMC sectors:- Coal, Extractive, Metalliferous, Drilling and Civil Construction into one <i>RII09 Resources and Infrastructure Industry Training Package</i> • It is a consolidation of: <ul style="list-style-type: none"> – Civil Construction Training Packages (BCC03 & RII06) – Coal Mining Training Package (MNC04) – Extractive Industries Training Package (MNQ03) – Drilling Training Package (DRT03) – Metalliferous Mining Training Package (MNM05) Key changes <ul style="list-style-type: none"> • Units of Competency <ul style="list-style-type: none"> – 741 RII units and 173 imported units (reduced from 1300 units) – New unit coding – New unit format – New units/Consolidated Units and ‘unchanged’ units • Qualifications <ul style="list-style-type: none"> – 60 qualifications (reduced from a total of 106 qualifications) – New coding – New Certificate II Resources and Infrastructure Work Preparation - qualification for new entrants to industry • Skill Sets <ul style="list-style-type: none"> – 7 Skill Sets (increased from a total of 3 Skill Sets) 	<ul style="list-style-type: none"> • Create pathways between industry sectors and recognised portability of skills • Create a pool of skills that are of value and portable across the SkillsDMC sectors • Greater consistency of product and quality across SkillsDMC qualifications • Greater efficiencies in the development and delivery strategies for employers and providers • More effective targeting of the funds available to SkillsDMC 	29 May 2009	7 July 2009.	2 Sept 2009



Appendix A (continued)

SkillsDMC RII09 Resources and Infrastructure Industry Training Package Continuous Improvement

SkillsDMC will review and update the new RII09 Resources and Infrastructure Industry Training Package in line with continuous improvement. SkillsDMC has established an online issues register that can be accessed from the SkillsDMC website.

SkillsDMC had a Training Package continuous procedure in place to:

- Developing and/or improving units of competency
- Developing and/or improving qualifications or Skills Sets

Procedure	Action
SkillsDMC receive notice of a requirement for change	<ul style="list-style-type: none"> • Initiator logs the issue on the SkillsDMC online issues register
Brief Given	<ul style="list-style-type: none"> • Presentation to, and approval given by, the sector Training Package Working Party in the form of a Brief.
Form Subject Matter Expert Group	<ul style="list-style-type: none"> • Subject matter expert group formed with representation from a number of enterprises.
Conduct a Functional Analysis of the job	<ul style="list-style-type: none"> • Do a Functional Analysis i.e. what the person does on the job in that occupation. Identify competencies and underpinning knowledge required to perform the task.
Confirm development requirements	<ul style="list-style-type: none"> • Map the outcomes of the functional analysis to existing competencies within RII09 and allied Training Packages, identify any gaps and determine if new units of competency have to be developed.
Establish timeframe for developmental outcome	<ul style="list-style-type: none"> • Advise all State Training Authorities in all States/Territories that SkillsDMC is undertaking this work and the anticipated timeframe (STAs have to sign off before it is submitted for endorsement).
Drafting	<ul style="list-style-type: none"> • Draft the new Units of Competency/new qualification/Skill Set.
Validation	<ul style="list-style-type: none"> • Validate with industry nationally.
Sign off	<ul style="list-style-type: none"> • Get the Training Package Working Party to sign off.
NQC Endorsement	<ul style="list-style-type: none"> • Prepare for endorsement, submit for endorsement.
Implement	<ul style="list-style-type: none"> • Customisation and contextualisation at the enterprise level during implementation and post endorsement. • Advice and support to training providers through RTO Forums and the regional networks, on request.



Appendix B

Methodology and Bibliography

This Environmental Scan of the resources and infrastructure industry sectors is based on industry intelligence, empirical and anecdotal data harvested through our industry stakeholder engagement processes and procedures. These include:

- Training Package rationalisation workshops involving industry subject matter reports, STA personnel, State Regulators, VET providers and industry associations
- Workforce Planning and Development Reports for enterprises
- Regional Workshops/Meetings
- Site Visits
- Conducting a National Conference
- Speaker at Conferences
- Reports from SkillsDMC National Network of Industry Skills Advisors
- Interface with industry associations/unions
- Newspaper Reports/Business Networking
- MCA Discussion Paper (Back from the Brink)
- MCA Vision 2020 Project (Minerals Industry Infrastructure Path to Prosperity)
- Sector Strategic Planning Workshops for each Sector
- Scenario Planning Workshop facilitated by BIS Shrapnel
- Enterprise participation in Productivity Places Program
- Installation of Cert I materials in schools
- Development and implementation of resources for AQF II and III
- Four Board Meetings
- Roll-out workshops for Rationalised Training Package RII09
- Continuous Improvement Plan
- Interface with Skills Australia
- Direct visits to enterprises by SkillsDMC Skills Advisors
- Business Reports
- Industry Peak Body Reports/Papers
- Feedback following media coverage of SkillsDMC activities
- Joint Skills Australia, Civil Contractors Federation and SkillsDMC Pilot Project
- House of Cards (W.D. Cohan)



Appendix C

Occupations in Demand

Other than the exploration sector of industry all other sectors are reporting an increase in business activity requiring additional staff.

ANZSCO Code - Occupation¹	OCCUPATION - Industry Title	QUALIFICATION	JUSTIFICATION
712211 – Driller	Drillers	Certificate III in Drilling Operations	Continued demand for qualified and experienced drillers due to the variety of areas (water drilling etc) that require their skills. Following the downturn resulting from the GFC, many drillers have moved from this labour pool to other positions, leaving a shortfall in this rapidly expanding sector resulting from the gradual return to previous levels of activity.
233211 – Civil Engineer	Infrastructure Engineers	Degree of Engineering (Civil) Advanced Diploma of Civil Construction Advanced Diploma of Civil Construction Design	Increased demand in the medium term due to new infrastructure projects coming online.
721999 – Mobile Plant Operators NEC	Plant Operators	Certificate III in Civil Construction (Plant Operations)	Continued demand for high level operators to fulfil infrastructure project requirements. Mining sector also draws on the civil sector to meet its labour requirements. There is a large gap between the number of people moving out of

¹ ANZSCO codes and titles do not adequately reflect the skill level of the occupations listed. However suitable alternatives do not currently exist.



			the industry and new entrants contributing to skills shortages.
399999 – Technical and trades workers NEC	Pipe Layer	Certificate III in Pipe Laying	Increasing demand to fulfil infrastructure project requirements.
399999 – Technical and trades workers NEC	Bridge Constructor	Certificate III in Bridge Construction	Increasing demand to fulfil infrastructure project requirements particularly with major funding being directed to improving the flow of traffic in metropolitan and built-up areas for vehicular and non vehicular traffic (footpaths and bicycle lanes)
399999 – Technical and trades workers NEC	Road Construction and Maintenance	Certificate III in Road Construction and Maintenance	As above
330000 – Construction Trades Workers	Supervisors / Team Leaders / Line Manager / Foreman	Certificate IV in Civil Construction Supervision Diploma of Civil Construction Management	Recent industry consultation has indicated the need for supervisors is as great as the need for operations personnel, with the added challenge that the supervisors require extensive industry experience before progressing to higher level roles.
312114 – Construction Estimator	Estimators	Bachelor of Engineering (Civil Construction) - various other degree qualifications in Engineering or Surveying fields	This is a highly skilled occupation requiring extensive knowledge and industry experience. The increasing rigour of purchasing / contract requirements has contributed to the need for more qualified personnel to undertake this role across small medium and large enterprises.




133111 – Construction Project Manager	Project Managers	Diploma of Civil Construction Management Advanced Diploma of Civil Construction	As above
312913 Mine Deputy	Statutory officials Underground Mine Managers Mine Deputies Open-cut Examiners	Certificate IV in Metalliferous Mining Operations (Underground) Certificate IV in Underground Coal Operations Certificate IV in Surface Coal Mining	Continued demand for qualified and experienced officials continues due to the variety of areas that require their skills and the specific high level regulated skill sets.
712200 – Drillers, Miners and Shotfirers	Shotfirers	Certificate III in Surface Extraction Operations Certificate III in Underground Coal Operations Certificate III in Underground Metalliferous Mining Including: Skill Set Surface Shotfiring OR Skill Set Underground Shotfiring - Coal OR Skill Set Underground Shotfiring - Metalliferous	As above
2112-11	Geologist	Diploma in Geoscience CII - CIII Exploration in Mining	Exploration activity and ongoing mining operations require the expertise of geologists and support staff at all levels from field assistants to post graduate experts. Industry and training provider alike have reported a reduction in the number of applicant's positions vacant and training places.
712212 – Miner	Plant Operator Underground Miner (Coal) Underground Miner (Metalliferous)	Certificate III in Surface Extraction Operations Certificate III in Underground Coal Operations Certificate III in	Maintaining current levels of operations and ensuring requirements for new operations currently in the planning stages will



		Underground Metalliferous Operations	require personnel across all areas of operations with particular emphasis on the operations occupations.
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NOTES



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