

The AQF and Training in Mines, Quarries and Drilling

Presenter: Genevieve Hey

Author: Genevieve Hey

Organisation: Oaky Creek Coal (Surface Operations)

1 Introduction

The intent of this paper is to provide Health, Safety and Training professionals, who are responsible for developing, implementing and managing a Training Scheme, an overview of the Australian Qualifications Framework (AQF) and how the framework applies to the different safety and health legislations' for mining, quarrying and drilling.

The paper aims to offer practical guidance, and tools, to develop a Training Scheme which incorporates the requirements of the AQF, industry relevant Health and Safety policies, site specific procedures and organisational requirements in a cost effective and value-add way.

The benefits for adopting this approach leads to an integrated well-designed training scheme that is role specific, ensures employees' are competent in their role, and provides leverage to increase culture and performance of the organisation by:

- Articulating career and development pathways for individuals and roles
- Identifying successors to enable succession planning
- Reducing time to fill roles by understanding a person's succession readiness
- Building a talent pipeline and facilitating promotion
- Supporting individuals to develop their own skills and competencies
- Obtaining government funding by adopting the AQF and allowing individuals to obtain formal qualifications while at work.

2 Background on the AQF

The AQF is a national policy for regulating qualifications in the Australian Education and Training System. It incorporates the quality assured qualifications from each education and training sector into a single comprehensive national qualifications framework.

This policy provides a foundation for one of the AQF's most strategic objectives which is to develop qualifications that are made up of interlinking units of competency that provide a range of learning pathways within the various training packages.

Competency-based training (CBT) is a way of approaching vocational training that places primary emphasis on what a person can actually do as a result of training. It is concerned with training to nationally recognised industry standards rather than an individual's achievement relative to that of others.

The primary aim of competency-based training is to improve the standard of workplace performance. Competency is expressed in statements of standards. When the standards required of a competent worker have been defined, a trainee's achievements can be judged against those standards, irrespective of the time spent in training and without comparisons to the achievement of others. In competency-based training the outcomes are predictable and directly related to tasks performed within the workplace.

Industry needs are the starting point for competency standards development. Ultimately the nationally recognised qualification awarded at the end of the training process certifies an individual as 'competent' according to identified standards and needs of industry.

3 Applying the AQF to Legislation

Safety and Health legislation, that applies to mining, quarrying and drilling, generally require training to be conducted in a manner that is consistent with the structure provided by the AQF as per **Table 3.1**.

Coal Mining	
Section 82(e) of the Coal Mining Safety and Health Regulation 2001 describes the need for a coal mine's Training Scheme to <i>establish a training program to meet the training needs using the endorsed components of the coal industry training package that are relevant for training and assessment of the mine's coal mine workers.</i>	Endorsed refers to the units of competency that make up the RII Training Package. Coal industry training package is referring to the Resource and Infrastructure Industry (RII) Training Package developed by SkillsDMC who is the National Industry Skills Council for the Resources and Infrastructure industries.
Metalliferous Mining and Quarrying (Extractive)	
Section 93 of the Mining and Quarrying Safety and Health Regulation 2001 requires the site senior executive to ensure that each worker is trained and periodically assessed, to ensure the worker has adequate knowledge and understanding of processes, material and plant to be used for the worker's duties.	Although the RII Training Package and its associated units of competency are not directly referred to; quarrying is one of the five industry sectors covered by the RII Training Package; therefore it is good practice to use the framework it provides.
Petroleum and Gas – Drilling and Well Services	
Section 674 of the Petroleum and Gas (Production and Safety) Act 2004 requires the operator of operating plant to have a Safety Management Plan (SMP). Section 675(g) and (h) refer to the requirement to conduct a training needs analysis for all workers; and the establishment of a training and supervision program as part of the SMP. The Petroleum and Gas Inspectorate has released a Competency Standard for Petroleum and Gas Well Drilling and Well Servicing (2014).	The Competency standard applies to all operators of drilling operating plant that drills prescribed wells as defined in the Act (Queensland Government 2004, Schedule 12); and in accordance with section 54AA of the Petroleum and Gas (Production and Safety) Regulation 2004, the operator of operating plant must ensure that each person on the drilling or well servicing operating plant meets the requirements of the person's position under the Competency Standard for Petroleum and Gas Well Drilling and Well Servicing (2014).
Coal mining-coal seam gas operating plant	
Section 671, ss. 2 of the Petroleum and Gas (Production and Safety) Act 2004 states that the operator of coal mining-coal seam gas operating plant is the site senior executive appointed under the Coal Mining Safety and Health Act as per section 673, ss. 2 of the Petroleum and Gas (Production and Safety) Act 2004.	For site senior executives of a coal mine that has overlapping petroleum tenures, the Petroleum and Gas (Production and Safety) Act and Regulation applies to your operation. Therefore, workers conducting drilling or performing well services work on your site must comply with the competency standard for Petroleum and Gas Well Drilling and Well Servicing (2014).

Table 3-1 – Overview of Legislation

SkillsDMC is the National Industry Skills Council for the mining, civil infrastructure, quarrying and drilling industry sectors. The role of SkillsDMC is to consult with industry stakeholders to decide on qualifications and identify each sector's ever changing skill requirements which in turn facilitates the continuous improvement of the qualifications, units of competency and skill sets contained within the RII Training Package.

The AQF provides **minimum** standards of qualification for each level of mining, quarrying and drilling organisations through the application of the Resource and Infrastructure Industry Training Package; and each level of the AQF is commensurate with the level of supervision required and the level of responsibility associated with the position.

Table 3.2 provides an overview of some of the different AQF levels and how they generally align to an organisation.

AQF Level	Description
Level 1: Certificate I	Entry level qualification which provides a pathway into Certificate II and III qualifications. Generally gained at high school. Workers at this level must be fully supervised in all areas.
Level 2: Certificate II	Generally reflects an entry level operational worker performing work under supervision .
Level 3: Certificate III	Generally reflects operational workers working as trades persons and production operators under limited supervision .
Level 4: Certificate IV	Supervisors or advanced operators/trades persons who have responsibility for the quality and quantity of work performed within their area of responsibility.
Level 5: Diploma	Departmental or line managers or superintendents who can demonstrate the application of a broad range of technical, managerial, coordination and planning on the job.
Level 6: Advanced Diploma	Minimum requirement for mine managers who are required to initiate solutions to technical problems, plan strategically and be responsible for the overall business.
Level 7: Bachelor Degree	Provides the knowledge and skills to demonstrate autonomy, well developed judgement and responsibility in contexts that require self-directed work within broad parameters and the ability to provide specialist advice and is often the desired level qualification for professional roles.

Table 3-2 – Overview of the AQF levels and how they generally align to an organisation

It should be noted that there are some subtle differences between the requirements for surface and underground operational coal mine workers; and between the requirements for supervisors in accordance with the Coal Mining Safety and Health Advisory Committee and the level of qualification recommended for supervisors by the AQF.

For example, most surface operational competencies AQF level 3 units of competency and the majority of underground operational competencies are AQF level 2. In addition, **Appendix A** demonstrates that the AQF recommends a level 4 qualification for supervisors; however the units of competency required by the Coal Mining Safety and Health Advisory Committee for supervisors are AQF level 3 eg. RIICOM301 Communicate information.

The indicative AQF level associated with specific units of competency is identified by the unit code. **Table 3.3** provides an example for **RIIMPO305D Conduct stockpile dozer operations** which is an AQF level 3 unit of competency:

Unit Code Parts	Identifies	Example and Description of Unit Code Parts	
1 st 3 alpha characters	Training Package	RII	Resource and Infrastructure Industry Training Package
2 nd 3 alpha characters	Competency Field	MPO	Mobile Plant Operations
1 st numeric character	AQF Level	3	AQF Level III unit of competency
Next 2 numeric characters	Order of Unit	05	the 5th unit in the MPO competency field
Alpha suffix	Version	D	The version of the unit

Table 3-3 - Meaning of each part of a unit of competencies code

4 How to develop a Training Scheme

A Training Scheme must reflect the competency requirements of each level of the organisational chart and the varying levels of responsibility and authority associated with each role. It must provide for every stage of employment from recruitment ie. competency requirements should be documented in position descriptions; to induction and ideally it should provide a pathway for workers to progress from operator, to supervisor, all the way up to site senior executive.

The training pathway should commence from induction. Site specific induction programs, depending on industry sector, can be mapped to accredited qualifications from the RII Training Package such as:

- Certificate II in Surface Extraction ie. coal or metalliferous mining and quarries
- Certificate II in Resource Processing ie. coal or metalliferous mining
- Certificate II in Drilling Operations.

It is a goal of the Federal Government, through the implementation of the AQF, for people to obtain formal qualifications at work; as a result, there is government funding available to subsidise this process. Accreditation for the programs can be achieved by forming a partnership with a Registered Training Organisation (RTO).

The benefits of mapping your site induction process to accredited qualifications are:

- The mandatory competency required by all coal mine workers in QLD is included
- Each area of competency that makes up the Standard 11 Induction is covered
- A robust framework for an effective induction program is provided.

In addition, the Training Scheme must provide the competency requirements of each position listed in the site's management structure, including the site senior executive / superintendents.

Superintendents in the structure will oversee supervisors who will in turn have members of the general workforce reporting to them. Each person therefore requires certain competencies to enable them to manage their work according to their level of responsibility.

Table 4.1 illustrates the correlation between the competency's key area of focus and the level of responsibility associated with each role in a site's organisational structure.

Position	AQF Level	Competencies Key Focus	Level of Responsibility
Mine Manager, Executive Safety Manager	Level 6 Adv. Dip	Establish and maintain	Ultimate responsibility for establishing how the work is planned/carried out
Superintendent, Line Manager	Level 5 Diploma	Implement	Communicate the plan with action taken on variances or deviations
Supervisor	Level 4 Cert IV	Apply and monitor	Transfer the plan into action (apply) and prevent deviation of the plan (monitor)
Operator	Levels 2 & 3 Cert II & III	Conduct	Conduct the work and consistently deliver results against the plan

Table 4-1 –The correlation between the competencies key focus and the level of responsibility for each role

Table 4.2 provides an example of how this process can be applied to selecting the competencies required by those at each level of a mine's organisational structure to manage a particular task. Managing and working on stockpiles is used in this example.

Position	AQF Level	Competency
Mine Manager	Level 6	RIISRM601 Establish and maintain the stockpile management system
Superintendent, Line Mgr	Level 5	RIISRM501 Implement the stockpile management plan
Supervisor	Level 4	RIISRM401 Apply and monitor the site stockpile management plan
Operator	Level 3	RIIMPO305 Conduct stockpile dozer operations

Table 4-2 –Competencies required by each position in the mine's structure to manage stockpile operations

5 Developing a Training Scheme for a Coal Mine

Generally speaking, workers at Queensland coal mines fall into one of the following two groups (*and there is nothing wrong with this*):

- They have worked their way up the ranks at the mine for a period of time and hold relevant units of competency; but no formal qualifications; or
- They have been employed by the mine as supervisors or senior position holders and hold relevant formal qualifications; but not all of the required units of competency

Alignment of the site's positions and Training Needs Analysis (TNA) to the AQF provides an avenue for all employees to gain formal qualifications and the required units of competency. A typical example of how to align each level of the mine's structure to the appropriate level of the AQF is shown in **Appendix A**.

The first step in developing a Training Scheme for a coal mine is to identify the operational departments within the mine and the units of competency associated with the work overseen and undertaken by each department which forms the framework for the TNA.

For example, **Table 5.1** describes departmental areas of responsibility for the surface coal mine shown in **Appendix A**:

Department	Area of responsibility
EPC & MDL Projects	Exploration drilling on leases not currently used for active mining activities. Includes the management of a small contractor workforce.
Surface Drilling	Exploration drilling in active mining areas and production drilling for the de-gasification of underground mining areas. Includes the management of a large contractor workforce.
Surface Department	Maintenance of roads, water and gas infrastructure. Rehabilitation of old pits. Overseeing reject haulage and construction projects such as tailings dams. Large contractor workforce.
Health, Safety & Training	Development, implementation and continuous improvement of the site's SHMS, Training, Emergency Preparedness and Risk Management processes.
Coal Quality & Logistics	Monitoring coal quality and stocks to meet corporate and customer requirements.
CHPP / Production	Management of the CHPP, stockpiles and associated processes.
Maintenance & Engineering	Management of the site's Maintenance Schedule, shutdowns and structural integrity processes. Includes the management of contractors for shutdowns and projects.

Table 5-1 –Summary of the departments and their responsibilities

The Coal Mining Safety and Health Act and Regulation define the statutory positions required by a mine site. The statutory positions will be included in the relevant operational department; and the competencies required for these statutory position holders prescribed by the Coal Mining Safety and Health Advisory Committee must be included in the TNA.

As with everything in mining; training and competency is all about managing risk. Therefore the next step in the process of developing the Training Scheme is to identify the site's principal hazards.

Once these hazards have been identified, a senior position holder in the management structure must be allocated as an "owner" of the hazard and its associated critical controls.

For example, a common principal hazard on most mine sites is associated with mobile equipment interactions. The operational department that is responsible for this principal hazard in the organisation shown in **Table 5.1** and **Appendix A** is the Surface Department which is overseen by the Surface Superintendent who is also a senior position holder in the mine's management structure. The Open Cut Examiners are also members of the Surface Department.

In order to manage their principal hazards effectively, senior position holders must hold the required competencies.

Table 5.2 provides an example of how the positions in the Surface Department can identify and align competencies associated with mobile plant and equipment to the AQF in order to manage the mobile equipment interaction principal hazard effectively.

Position	AQF Level	Competency
Surface Superintendent	Level 5	RIIMPO502D Manage the interaction of heavy & light vehicles & mining equipment
Surface Supervisor / OCE	Level 4	RIIMPO403D Monitor interaction of heavy and light vehicles and mining equipment
Surface workers	Level 3	Hold the units of competency associated with the work and the equipment they operate such as RIIMPO310 Conduct grader operations

Table 5-2 –Summary of competencies for each position

As with all the units of competency that make up the RII Training Package, **RIIMPO403** forms part of a formal qualification. In this example, this unit of competency is included in Certificate IV in Surface Coal Mining (Open Cut Examiner).

The next and final step is to identify the units of competency associated with the work. Operational workers in the Surface Department should hold units of competency that are associated with the work they perform and the equipment they operate such as **RIIMPO310 Conduct grader operations**.

This principle should be applied to all other departments in order to develop a role specific TNA for your site.

Once the department’s roles, and their associated units of competency, have been identified you will often find that the units of competency grouped together will almost (but not quite) make up a position specific formal qualification from the RII Training Package.

Table 5.3 provides an example of how the Mine Manager’s Advanced Diploma of Surface Coal Mining Management could be structured to meet the requirements of the organisational structure shown in **Appendix A**.

Table 5.3 also illustrates how each unit of competency making up the Advanced Diploma provides for the competencies recommended by the Coal Mining Safety and Health Advisory Committee and how each unit potentially aligns to the SSE’s obligations under the Act.

Core competencies	Area of Responsibility	Advisory Committee	Obligations of SSE
RIIRIS601 Establish and maintain the risk management system	Risk Management	Yes	s 42 (a) (b)
RIIENV601 Establish and maintain the environmental management system	Leadership & Planning		s 42 (f) (i)
RIIGOV601 Establish, maintain and develop a statutory compliance management system			s 42 (f) (i)
RIIQUA601 Establish and maintain a quality system			s 42 (f)
RIIWH601 Establish and maintain the occupational health and safety management system	Health, Safety & Training	Yes	s 42 (c) (d) (e) (f)
RIIERR601 Establish and maintain mine emergency preparedness and response system			s 42 (c) s 42 (f) (i)
Group A Electives (up to 4 may be selected)			
RIIWMG601 Establish and maintain water management system	Surface Department		s 42 (f) (i)
RIISRM601 Establish and maintain the stockpile management system	CHPP / Production		s 42 (f) (i)
RIISAM601 Establish and maintain plant, equipment and infrastructure maintenance system	Maintenance & Engineering		s 42 (f) (i)
RIIMEX601 Establish and maintain the site infrastructure	Surface Department		s 42 (f) (i)

Group B Electives (up to 4 may be selected)			
BSBPMG609 Direct procurement and contracting for a project	Projects		s 42 (f) (i)
BSBMGT616 Develop and implement strategic plans	Leadership & Planning		s 42 (f) (i)
BSBMGT605 Provide leadership across the organisation			s 42 (f) (i)
BSBFIM501 Manage budgets and financial plans			s 42 (f) (i)

Table 5-3 – RII60713 Advanced Diploma of Surface Coal Mining Management

You may have noticed that table 5.3 is missing a unit of competency that covers the management of drilling activities taking place across the site. **RIIODG601 Manage multiple drilling operations** can be used to address this gap. One of the Group B electives shown in Table 5.3 may be substituted with this unit of competency.

Table 5.4 provides an example of how a Certificate III in Resource Processing could be structured for coal mine workers employed in the CHPP / Production department. The ability to choose from a range of electives creates tailored pathways toward the same qualification.

Core competencies	Included in STD 11	Operational Competency
RIIENV302 Apply environmentally sustainable work practices		Yes
RIICOM201 Communicate in the workplace	Yes	
RIIWS201 Work safely and follow WHS policies and procedures	Yes	
RIIRIS301 Apply risk management processes		Yes
Group A Elective (1 must be chosen)		
RIIGOV201 Comply with site work processes/procedures	Yes	
Group B Elective (6 must be chosen)		
RIIERR302 Respond to local emergencies & incidents	Yes	
RIIMCP301 Monitor coal preparation plant operations		Yes
RIIMPO305 Conduct coal stockpile dozer operations		Yes
RIIPRO301 Conduct crushing and screening plant operations		Yes
RIIPRO302 Perform processing control room operations		Yes
RIIHAN311 Conduct operations with integrated tool carrier		Yes
RIISRM302 Conduct stockpile reclaiming operations		Yes
RIIWS301 Conduct safety and health investigations		Yes
RIICOM201 Communicate in the workplace		Yes
MSAPMPER300 Issue work permits		Yes
Group C and D (2 may be chosen from either group)		
RIIMPO208 Operate support equipment		Yes
RIIWS202 Enter and work in confined spaces		Yes
RIIWS204 Work safely at heights		Yes
RIIMCP202 Conduct rail dispatch operations		Yes
2 may be chosen from any Cert II, III or IV		
RIIVEH201 Operate light vehicle		Yes
RIIERR205 Apply initial response first aid	Yes	

Table 5-4 – RII30413 Certificate III in Resource Processing

There are a number of additional competencies required by coal mine workers employed in the CHPP / Production department that are not included in **Table 5.4**; however the Certificate III in Resource Processing example provides a good foundation from which to develop a TNA for a coal mine worker in this area.

6 Developing a Training Scheme for a Metalliferous Mine or Quarry (Extractive)

The RII Resources and Infrastructure Industry Training Package Implementation Guide (2015) provide pathways to the Advanced Diploma of Metalliferous Mining for surface and underground metalliferous sites; and the Advanced Diploma of Extractive Industries Management for Quarrying.

The same principles used to align the organisational charts and competency requirements to the AQF and develop role specific qualifications used in the coal mining section of this paper should be used for metalliferous mines and quarries.

Once again, the management structure should be developed to implement the safety and health management system and to manage risk; with formal qualifications for each role developed based on the units of competency required to give people the skills they require to manage those risks appropriately in the performance of their day-to-day work.

7 Developing a Training Scheme for Drilling and Well Services

The Queensland Petroleum and Gas Inspectorate's Competency Standard for Petroleum and Gas Well Drilling and Well Servicing (2014) defines the competency standards required for people performing work in drilling and well services; and provides comprehensive definitions for *direct supervision* and a *competent person*.

Section 54AA of the Petroleum and Gas (Production and Safety) Regulation 2004 requires that the operator of operating plant must ensure competency requirements are met; however it does not define what it means to "act under the supervision of a competent person".

For the purpose of applying the Competency Standard, the following points are provided for clarification:

- The person supervising must be on site and capable of face-to-face communication on each and every shift
- The person is competent if he or she is undergoing training as permitted by section 54AA (3)(a) or (4)(a) of the Regulation
- The person has acquired through training, qualification or experience, the knowledge and skills required to carry out the task

For the overarching requirements of section 675 of the Petroleum and Gas (Production and Safety) Act to be achieved, each person must have the necessary competencies to undertake their allocated work. The Competency Standard provides the following Tables which describe the minimum qualifications required for each area it applies to:

- Table A – Mandatory minimum qualifications to undertake drilling for petroleum
- Table B – Mandatory minimum qualifications to undertake well servicing on petroleum wells
- Table C – Recommended minimum qualifications to undertake drilling for minerals and coal (where there is a risk of encountering petroleum)

It is important to note that section 299 of the Petroleum and Gas (Production and Safety) Act 2004 defines coal seam gas (CSG) as petroleum, and in circumstances where a drill rig is used to drill for CSG, the qualifications listed in Table A of the Competency Standard for Petroleum and Gas Well Drilling and Well Servicing (2014) must be held. In addition to this, the Competency Standard also recommends that well control qualifications are held by the Driller on rigs used in these circumstances.

Table 7.1 shows how the competency standard aligns each position in a Drilling or Well Services organisation to the AQF.

Position	AQF Level	Competencies Key Focus	Level of Responsibility
Executive Safety Manager or General Manager	Level 6 Adv. Dip	Establish and maintain	Ultimate responsibility for establishing how the work is planned/carried out
Operator of Operating Plant, Drilling Supervisor or Rig Manager	Level 5 Diploma	Implement	Communicate the plan to supervisors ensuring it is well understood with action taken on variances or deviations
Senior Driller	Level 4 Cert IV	Apply and monitor	Transfer the plan into action (apply) and prevent deviation of the plan (monitor)
Driller or Trainee Driller	Level 3 Cert III	Conduct	Conduct the work and consistently deliver results against the plan
Driller's Assistant, Floorman or Motorman	Level 2 Cert II	Conduct and assist	Works under supervision
Utility Worker, Leasehand or entry level worker	Part Level 2 Cert II	Introduce to the industry, conduct and assist	Works under constant, direct supervision

Table 7-1 – Example of how the AQF aligns to roles in the Drilling and Well Services industries

Table 7.2 provides an example of how units of competency can be selected to develop role specific qualifications for persons employed in a Drilling organisation to manage rotary mud drilling.

Position	AQF Level	Competency
Executive Safety Manager	Level 6	RIIOGD601 Manage multiple drilling operations
Operator of Op. Plant	Level 5	RIIOGD504 Manage drilling operations
Senior Driller	Level 4	RIIOGD403 Conduct drilling operations
Driller / Trainee Driller	Level 3	RIINHB311 Conduct mud rotary drilling
Driller's Assistant	Level 2	RIINHB211 Assist mud rotary drilling
Utility Worker	Partial Level 2	Enrolled in RIINHB211 Assist mud rotary drilling

Table 7-2 –Competencies required by each position in a Drilling organisation's structure to manage rotary mud drilling operations

Note that **RIIOGD601 Manage multiple drilling operations** forms part of the mine manager's training needs analysis for the surface coal mine shown in **Appendix A**.

From here the same principles discussed in the coal mining section of this paper can be applied to identify the units of competency required to develop the qualifications required by each position mentioned in the Competency Standard for Petroleum and Gas Well Drilling and Well Servicing.

It's important to note that the Drilling and Well Services industry (and any coal mines that are drilling for coal seam gas) are within the 12 month transition period for the implementation of the abovementioned Competency Standard into their Training Schemes.

8 Conclusion

The intent of this paper was to provide an understanding of why, and how, to align a site's Training Scheme to the AQF, legislation and site specific requirements. The development of a Training Scheme requires an understanding of:

- Qualification levels as defined within the AQF
- Competency standards based on industry need
- Qualification requirements for industry sectors as defined by SkillsDMC
- Legislation relevant to sites to ensure statutory requirements are met
- The organisational structure and position accountabilities within the structure
- The site's principal hazards in order to manage the risk effectively.

Sites that have overlapping operations, such as coal mining, petroleum tenures and are drilling for coal seam gas need to have Training Schemes that take more than one piece of legislation into consideration to ensure competency requirements are captured.

Training pathways should commence from induction and follow through to provide vertical, and horizontal, career pathways for different role levels and types. As role competencies are defined, they can be grouped together on the basis of identifying a formal qualification. It is the intent of the government, through the AQF, to assist individuals to obtain a formal qualification at work – government funding is available to support this concept.

The benefits of aligning to the AQF far outreach those of simple compliance. A well-designed training scheme can increase individual and organisational performance, employee engagement, provide career and qualification pathways and enable the organisation to undertake talent and succession planning to provide sustainability within the industry in which it operates.

9 Appendix A: Organisational Structure for a surface coal mine aligned to the Australian Qualifications Framework (AQF)

