



Australian Government

Department of Education, Employment and Workplace Relations

MNCO1046A Apply and monitor systems and methods of mining

Release: 1

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Modification History

Unit Descriptor

This unit covers the application, monitoring and reporting on the status and maintenance of a mine site mining system.

Units Replaced

This unit replaces the following units:

MNC.O46.A Monitor systems and methods of mining.

Application of the Unit

Licensing/Regulatory Information

Pre-Requisites

Employability Skills Information

The required outcomes described in this Unit of Competency contain applicable facets of employability skills. The Employability Skills Qualification Summary for the qualification in which this Unit of Competency is packaged will assist in identifying employability skill requirements.

Elements and Performance Criteria Pre-Content

Elements and Performance Criteria

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Element	Performance Criteria
1 Plan and prepare for monitoring the application of the mining system.	1.1 Access, identify and interpret the legislative and site requirements related to the mining system. 1.2 Access and interpret site risk management, OH&S, environment, other appropriate systems and standard operating procedures . 1.3 Identify and assess the risks associated with unstable mining structures .

- 2 Monitor and report mine development operation.
 - 2.1 Monitor the application and communication of the approved **mining system** in accordance with the site requirements and procedures.
 - 2.2 Identify and assess mining constraints impacting on the maintenance of stable **mining structure** in accordance with the site requirements and procedures.
 - 2.3 Monitor, assess, rectify and report the method of mining in accordance with site procedures.
 - 2.4 Assess and report strata spoil and dump failures and implement appropriate control measures.
 - 2.5 Identify and monitor the application of the mining sequences in accordance with the site requirements and procedures.
 - 2.6 Identify, assess and record failure mechanisms , including virgin and induced **stress** control methods and implement appropriate control measures.
 - 2.7 Identify and apply emergency response and evacuation plans and procedures and report in accordance with site requirements.
 - 2.8 Monitor and report **standard operating procedures** in accordance with site requirements.
 - 2.9 Contribute to systems **audit** and review requirements in accordance with the site requirements and procedures.
- 3 Monitor waste management procedures.
 - 3.1 Identify and assess surface and groundwater information.
 - 3.2 Monitor the implementation of the drainage system in accordance with mine site requirements.
 - 3.3 Monitor and report the measures taken to mitigate the impact of water and drainage issues.
- 4 Monitor stockpile formation and reclaiming systems.
 - 4.1 Identify stockpile requirements.
 - 4.2 Monitor and report stockpile configuration according to mine site requirements.

- 4.3 Identify and assess the stockpile operation to meet mine site requirements and implement appropriate control measures.
- 5 Identify and communicate hazards related to engineering maintenance procedures.
 - 5.1 Identify and control **hazards** relating to the inspection, repair and engineering maintenance activities in accordance with site requirements and procedures.
 - 5.2 Monitor, report and review engineering maintenance activities in accordance with site requirements.

Required Skills and Knowledge

Evidence Guide

Critical Aspects of Evidence

The evidence required to demonstrate this competency must be relevant to mine site operations. In addition to satisfying the requirements of all elements, performance criteria, required knowledge and skills, evidence must include demonstration of:

knowledge of procedures, requirements and instructions to apply and monitor systems and methods of mining appropriate to a mine site on a mine site

implementation of appropriate procedures and techniques for the efficient and effective application and monitoring of systems and methods of mining appropriate a mine site on a mine site, while complying with site risk control, health, safety, environmental, quality and communication requirements. This will include:

monitoring and apply personal and operational safety procedures

interpreting and communicating information on the stability of mining structures

identifying and effectively managing risks and hazards associated with mining structures, dumps and stock piles

evaluating mine site and failure mode historical information relating to the maintenance of stable mining structures

identifying and assessing geological features

identifying, monitoring and assessing strata gas characteristics, lithological features, stress regimes coal seam stockpile and waste dump, spontaneous combustion and other methods of heating

identifying, monitoring and assessing mining system types and methods

identifying, assessing and reporting mining constraints/equipment requirements.

Required Knowledge

Specific knowledge is required to achieve the performance criteria in this unit to the standards of performance required in the workplace, to transfer the skills to other contexts and to deal with unplanned events. Assessment requires evidence of the ability to identify and explain the purpose of:

legislative and statutory requirements for mining structures , including mine plans, mining methods and safety management plans

the systems of mining

interpret visual signs of stress , including mining induced stress, adverse joining, fault orientation, spoil characteristics

sedimentology , including subsidence, water bearing strata, permeability of seam and strata, hydrology, physical property testing, over and underlying strata

mining systems of work

stable structure control and maintenance of excavation

geology, hydrogeological, strata and strata gas characteristics

coal seam characteristics which may include rank, petrology, moisture, cleat, coal hardness, seam gas, friability, pyrites, depositional factors such as seam formation, seam thickness, multiple and rider seams, fault folding, seam dip and depth of cover

basic mechanical, electrical and pressurised fluid safety

mining engineering principles

audit inspection, communication and reporting methodologies

job safety analysis

mine site historical information
people management.

Required Skills

Specific skills are required to achieve the performance criteria in this unit. Assessment needs to obtain evidence of the ability to:

access, interpret and apply technical information
plan operations

access and analyse archival and historical strata management information related to the mine and failure mode of mine structures

interpret and monitor the application of design criteria for strata management

communicate effectively in the work place

apply operational procedures relating to strata management

conduct and report on audits and inspections

identify and evaluate geological and geotechnical information.

Assessment and Interdependence of Units

This unit may be assessed with other relevant units forming a cohesive work function, according to specific mine site requirements.

Pre-requisite Units

There are no prerequisite units for this unit.

Resource Implications

Assessment of this competency requires typical resources normally used in a mine-site work environment. Selection and use of resources for particular mine sites may differ due to mine site conditions, equipment availability, equipment/plant types and different contexts.

Consistency in Performance

To ensure consistency of performance, this unit may be assessed over a period of time and a range of work and site conditions. Local site factors will influence the breadth of evidence require to demonstrate the competency.

Context for Assessment

This unit should be assessed in the work environment where possible. Some assessment events may be conducted under simulated conditions where issues of safety and/or environmental damage are limiting factors.

All assessments must be valid, reliable, fair and flexible, and sufficient evidence should be accumulated to demonstrate the required competence.

The assessment environment should not disadvantage the participant. For example, language, literacy and numeracy demands of assessment should not be greater than those required on the job.

Methods of Assessment

Appropriate methods of assessment for this unit will usually include:

simulation/scenario analysis

oral and/or written questioning on required knowledge and skills

testimony from supervisors, colleagues, clients and/or other appropriate persons

inspection of the final product or outcome

a portfolio of documentary evidence

simulation and/or scenario analysis.

Where performance is not directly observed and/or is required to be demonstrated over a period of time and/or in a number of locations, any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons.

Questioning should be undertaken in such a manner as is appropriate to the language and literacy levels of the candidate and to the requirements of the unit of competency.

Range Statement

RANGE STATEMENT

The following range of variables is subject to site-specific operations, but is not limited to the following details. Site procedures, regulations and occupational health and safety and other relevant legislation apply to all elements and performance.

Interpret is defined as the understanding needed by the person within their job role.

Standard operating procedures (SOP's) are also known as safe working procedures, safe operating procedures and standard working procedures.

Risk is defined as: **the chance of something happening that will have an impact upon objectives. It is measured in terms of consequences and likelihood** (definition from AS/NZS 4360:1999 **Risk Management**).

Mining structures may include:

- excavations
- high walls
- low walls
- benches
- dumps
- haul roads.

Mining systems and methods may include but are not limited to:

- highwall mining
- pre strip
- inter burden removal
- spoil pits
- stockpiles, dumps and safety berms
- development of coal pits, roads and ramps
- the use of various mining equipment , including draglines, truck and shovel, excavators, bucketwheel, scraper, high wall miners, augers and drills
- mining areas which contain heating
- coal face protection from blasting
- reclamation from spoil dumps
- dragline benching

And may include the sequences involved in the development of the mining process as specified in the mine design.

Stress includes, but is not limited to:

- horizontal and vertical tectonic induced stress
- mining induced stress.

Audit is defined as: **a systematic examination against defined criteria to determine whether activities and related results conform to planned arrangement, and whether these arrangements are implemented effectively and are suitable to achieve the organisation policy and objectives** (AS/NZS 4804: 2001).

Hazard is defined as: **a source of potential harm or a situation with a potential to cause loss** (definition from AS/NZS 4360:1999 **Risk Management**).

Geological and hydrogeological information may be related, but not limited to:

- subsidence
- floor technical data
- gas content
- over and underlying strata

water bearing strata
permeability of seam and strata, physical properties
faults, intrusions and deformities.

Mine site historical information may include, but is not limited to:

existence of previous workings within the work seam or other seam
sedimentology aspects of the mine site relating to subsidence
gas content
floor technical data
over and underlying strata
water bearing strata
permeability of seam and strata
hydrology
physical property testing results
joint patterns, faulting.

Mine design may include in whole or in part requirements relating to:

mine plant
mining induced stress
sequencing
modelling
coal seam grades (dips)
geology
fault management
multi seams
fault drivage
spontaneous combustion
floor technical data
over and underlying strata
subsidence
legislative and statutory requirements.

Stable structure controls may include:

roads
strength of coal and underlying/overlying strata
stress regimes
strata characteristics
water ingress
systems of mining
direction of mining.

Mine site plans, policies and procedures may include:

mine site and environment policy
environmental impact assessment
community consultation and involvement
objectives and targets
documentation and records
operational and emergency procedures
responsibility and reporting structure
environmental impact, regulatory and legal compliance
emission and performance monitoring and measurement
land reclamation practices.

Legislation, codes, regulations and standards may include:

Australian Standards

environmental agencies regulations

environmental protection acts

isolation procedures

manufacturer specifications and recommendations

Coal Mining Acts and regulations

occupational health and safety legislation

other applicable legislation , including explosives, gas, electricity, radiation

mine legislation.

Unit Sector(s)