(UB1)

NSW Coal Competence Board

EXAMINATION FOR CERTIFICATE OF COMPETENCE AS

UNDER MANAGER

(Coal Mine Health & Safety Act 2002)

NORTHERN REGION
SOUTHERN REGION

Friday 14 March 2014

9.00 am to 10.00 am

MINING LEGISLATION

INSTRUCTION TO CANDIDATES

All five (5) questions are to be attempted.

All questions are of equal value - **20 marks each**

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10 minutes reading time is allowed prior to the start of the examination.

Question 1 (20 marks)

Clause 13 *Coal Mine Health & Safety Regulation 2006* refers to 'Additional Components of Health & Safety Management System'. Detail these requirements in relation to an Underground Mine.

PTO

/20

Question 2 (20 marks)

Clause 44 *Coal Mine Health & Safety Regulation 2006* prescribes the Contents of a Management Structure for an Underground Coal Mine. What are they?

PTO

	/20

Question 3 (20 marks)

Clause 49 of the *Coal Mine Health and Safety Regulation 2006*t specifies nominated High Risk Activities. Name all of these activities.

PTO

	/20

Question 4 (20 marks)

Clause 4 of the *Coal Mine Health and Safety Regulation 2006* - "Obligation to Control Risk" has a number of requirements. Specify these items.

PTO

	/20

Question 5 (20 marks)

If an employee has an issue at the work place, what do Section 80, 81 & 82 of the *Work Health and Safety Act 2011* prescribe? (20 Marks)

PTO

	/20

END OF QUESTIONS

END OF PAPER

(UB2)

NSW Coal Competence Board

EXAMINATION FOR CERTIFICATE OF COMPETENCE AS

UNDER MANAGER

(Coal Mine Health and Safety Act 2002)

NORTHERN REGION
SOUTHERN REGION

Friday 14 March 2014

10.30 am to 12.30 pm

MINE VENTILATION

INSTRUCTION TO CANDIDATES

All questions are to be attempted.

Question 1 and 2 are of equal value - **100 marks each**.

10 minutes reading time is allowed prior to the start of the examination.

Please write your candidate number on your plan

Question 1 (Worth a total of 100 marks)

Kato Colliery workings are shown on the attached A0 size plan.

The colliery works the “Jacob East” seam, which has a low to medium propensity to spontaneous combustion, is 2.8 metres thick and is overlaid by 6 metres of shale and mudstone. The working section is the full seam thickness of the “Jacob East” seam. The immediate strata below the “Jacob East” seam, is a 2.5 metre thick reasonably competent bed of shale. There are a number of thin coal seams in the overlying strata.

The Kato Colliery workings are accessed via two short portal drivages at the base of a highwall in a discontinued open cut coal mine, plus one short drift. There is also one 70 metres long, 5.5 metre diameter upcast ventilation shaft which is concrete lined.

The “Jacob East” seam is moderately gassy with a moderate permeability. Total in situ-seam gas content is typically 6 m^3/t, with a CO_2:CH_4 ratio of 20:80. Approximately 60% of the insitu gas in the cut coal is liberated during the production process.

Typical roof support is 6 x 2.1 metre bolts and a 1 metre x 4.8 metre mesh module per metre. Ribs are friable and prone to failure in the upper third of the rib, requiring support with mesh and 2 x 1.2 metre point anchor bolts every metre.

The mine produces Coking coal from three Continuous Miners in development units seven days per week and a longwall panel (LW08) five days per week. The mine produces approximately 3.2 million tonnes per year. Two CM’s are advancing the Tail Gate headings, whilst a single CM is being used to develop a Main gate road for the new longwall panel LW9.

Question 1 (continued)

On the accompanying plan:

a) Show the location of all the production faces, together with an estimate of their daily production levels. (15 Marks)

b) Ventilate the plan using the code of symbols specified in the relevant Australian Standards, Mine Plans – Preparation and Symbols. (30 Marks)

c) Document the air quantities you would expect to be entering each production panel measured at the commencement of the hazardous zone. Indicate why these quantities have been chosen. (15 Marks)

d) Calculate the general body methane and carbon dioxide content in the LW8 panel return whilst the LW is producing coal (clearly state assumptions you are relying upon in these calculations and why you have chosen these assumptions). (20 Marks)

e) Calculate the main ventilation fan power requirements to ventilate this mine. (clearly state assumptions you are relying upon in these calculations and why you have chosen these assumptions). (20 Marks)

END OF QUESTION 1

Question 2 (Worth a total of 100 marks)

Using data supplied in Question 1 and in relation to the mine layout as per the attached plan of Kato Colliery:

a) Identify and list the relevant hazards associated with the ventilation arrangements and those issues which must be addressed by, the ventilation management system. Your answer should include ventilation control measures and any other identified major hazard management requirements associated with the ventilation.
(70 marks)

PTO

/70

b) One of your development panel deputies reports to you that recirculation is occurring at the face, resulting in an accumulation of methane at the face of 3% concentration (30 Marks):

i) What could be causing the problem? (10 Marks)

/10

ii) How can recirculation be prevented? (10 Marks)

/10

iii) Describe how you as undermanager will deal with this issue and how an auxiliary fan can be used to clear this accumulation. (10 Marks)

/10

END OF QUESTIONS

END OF PAPER

(UB3)

NSW Coal Competence Board

EXAMINATION FOR CERTIFICATE OF COMPETENCE AS

UNDER MANAGER

(Coal Mine Health & Safety Act 2002)

NORTHERN REGION
SOUTHERN REGION

Friday 14 March 2014

1.30 pm to 4.30 pm

COAL MINING PRACTICE

INSTRUCTION TO CANDIDATES

Only five (5) of the eight (8) questions are to be attempted

All questions are of equal value - **20 marks each**

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10 minutes reading time is allowed prior to the start of the examination.

Question 1 (20 marks)

You are the Production Manager at a large LW operation. Your mine is developing into a new area that will extend the mine life by 20 years. In order to achieve this a five metre diameter ventilation shaft is to be sunk. It will be done by the 'blind boring' method and will be into virgin ground ready for holing into at a later date.

a) Explain, with the aid of sketches, how this shaft sinking method works. (10 marks)

b) What are the advantages and disadvantages of this method? (5 marks)

/5

c) What precautions would you take before holing the shaft in the underground workings? (5 marks)

/5

Question 2 (20 marks)

You are an Undermanager in Charge at a longwall mine and use continuous miners fitted with on board bolting rigs to develop the gate roads. Working height is 3.2 metres and the roof is laminated shales. The Main Gate headings are a two heading development. The face of 1 heading is 100 metres in advance of the last line of cut through and 2 heading has a 20 metre stub off the last line of cut through.

The continuous miner is working in 1 heading when the crew has to be withdrawn from the face because of sudden roof convergence that develops into a fall on the continuous miner. The roof has fallen to 3 metres and covers the miner except for the boom. The miner is unable to be removed under its own tractive effort.

Describe with the aid of sketches, if required: (20 marks)

a) Your initial reactions to the immediate incident?

	/3

b) How you would develop a plan to recover the miner and who would be involved?

/3

c) What process would you use to recover the miner, include a list of what you consider to be the risks involved and how you would control them?

/3

d) What could be the causes of the roof fall?

/3

e) What investigations you would undertake to determine the cause of the fall and who would you involve?

	/3

f) What actions you would undertake prior to recommencing mining in the area?

	/5

Question 3 (20 marks)

Please respond as directed to the following:

a) Explain the purpose of "Goaf Drainage" and how it works (4 Marks)

/4

b) Draw a typical Vertical Goaf Drainage well layout for a 2000m long / 300m wide longwall block (10 Marks)

/10

c) How are the Vertical Goaf Drainage wells completed to ensure their effectiveness in weak strata above the longwall block (6 Marks)

/6

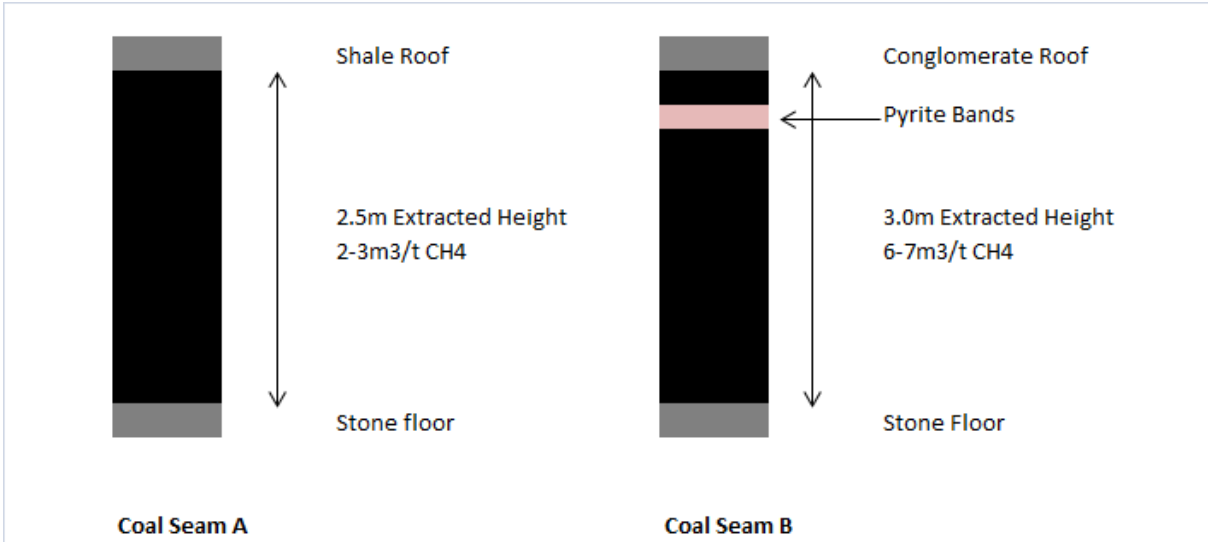
Question 4 (20 marks)

You are the Undermanager at a mine that has moved longwall operations from coal seam "A" to coal seam "B".

During the first longwall block in coal seam "B", a Frictional Ignition event occurred on the longwall shearer - the first for your mine. The Manager of Mining Engineering has requested you conduct a full investigation of this event.

Outline how you would conduct your investigation, including references to Equipment and Mining Processes. Also include, suggested controls for minimising the risk of further Friction Ignition events.

Note: Coal seam "A" was 2-3 m^3/t of CH_4 whilst coal seam "B" was 6-7 m^3/t and has several Iron pyrite bands.



	/20

Question 5 (20 marks)

A new Longwall maingate belt drivehead installation is due to commence on your shift shortly.

To ensure the Contractor's activities are in compliance with legislation and site standards, how will you **practically** ensure this will occur?

Your answer should include reference to elements of Clause 40 of the *Coal Mine Health and Safety Regulation 2006 - Contents of Contractor Management Plan*

	/20

Question 6 (20 marks)

You are the Undermanager at an underground coal mine where the main headings have hit a 2.5m dyke running at 90 degrees to the heading.

The dyke is too hard to cut with the miner and it has been decided to shot fire the dyke. The mine has not previously used explosives.

Describe your actions in getting this job done safely?

/20

Question 7 (Total 20 marks)

a) You are the Undermanager at an underground mine where pillar extraction is taking place and the manager has asked you to prepare an audit document for the pillar extraction. What would this document contain? (15 Marks)

	/15

b) Whilst carrying out your U/G inspection, the deputy in the pillar panel asks for a minor variation to the pillar extraction.
What do you do? (5 Marks)

/5

Question 8 (Total 20 marks)

You are the Undermanager at a gassy mine working over the weekend when the power to the mine is lost. This is not an uncommon event as it has occurred several times previously.

a) The mine is quickly filling with methane as the drainage plant has also lost power. What do you do? (10 Marks)

	/10

b) The mine upcast shaft is located 75 metres from a main highway and on the other side only 50 metres from the main rail line. The gas plant is located near the upcast shaft.

How do you restore ventilation to the mine once the power has been restored some 6 hours later? Include in your answer the steps would you take to limit the risk of loss of power in the future to reduce the gas problem at the mine? (10 Marks)

	/10

END OF QUESTIONS

END OF PAPER