

## OPEN CUT MANAGER CERTIFICATE OF COMPETENCE | JULY 2015

# Written examination

### OCM1 - Mining Legislation

Examination date: 16 July 2015

Examination time: 09:30am – 10:30am

Examination venue: Hunter Mines Recue Station, Singleton

Instructions to candidates: All five (5) questions are to be attempted. All questions are of equal value – 20 marks each. Refer to the relevant legislative provisions when answering all questions. 10 minutes reading time is allowed prior to the start of the examination.

#### Question 1 (20 marks)

Which of the following incidents are notifiable and explain your reason for your answer?

- A rear dump truck loses control down a ramp for a short time but does not hit the windrow or travel on the opposite side of the road (5 Marks)
- A fume event occurs as a result of shotfiring (5 Marks)
- An old water tank which is no longer used falls over (5 Marks)
- A parked up light vehicle rolls 5 metres forward near crib room (5 Marks)

#### Question 2 (20 marks)

A new mine is started adjoining an existing mine, what is required of the existing mine if the new mine requests this information? (20 Marks)

#### Question 3 (20 marks)

The mine plans to decommission an emplacement area, what is required under legislation? (20 Marks)

#### Question 4 (20 marks)

- You have been given the task of preparing the mine emergency plan, who must you consult with? (10 Marks)
- What is to be included in the mine emergency plan? (10 marks)

#### Question 5 (20 marks)

You receive a provisional infringement notice (PIN) from a site Health and Safety Representative (HSR) relating to a safety matter that was subject to a previous PIN that was issued and deemed resolved by the Regulator one month ago.

This comes as a surprise as the HSR had not raised this with you or anyone else before issuing the PIN. This is not the first time this HSR has done this. The last time he was subjected to disciplinary action.

An investigation into this current matter has concluded that the HSR has issued the latest PIN in retaliation for the previous disciplinary action he received.

- a) How can the notice be cancelled? (5 marks)
- b) Considering the repeated nature and seriousness of this matter, what key action do you have available to you and what are the possible outcomes of that action? (5 marks)
- c) The other HSR's on site have expressed their disapproval with the repeated conduct of this particular HSR. What action can they take against the HSR in question and how do they go about it? (5 marks)
- d) The HSR tells you that regardless of any action that may be taken he has the right to remain a HSR until the next election date. How do you respond and what do you base this response upon? (5 marks)

END OF PAPER

## OCE2 – Practical Open Cut Operations

Examination date: 16 July 2015

Examination time: 11:30am – 1:30pm

Examination venue: Hunter Mines Recue Station, Singleton

Instructions to candidates: Only five (5) of the eight (8) questions are to be attempted. Questions 5 & 7 are compulsory. All questions are of equal value however, parts of a question may vary. Drawing tools may be used for sketches. Non-programmable calculators may be used. 10 minutes reading time is allowed prior to the start of the examination.

### Question 1 (50 marks)

#### Change Management

You are the Mining Engineering Manager at an open cut mine that uses equipment including five large hydraulic backhoe excavators, a fleet of CAT 793 mechanical drive trucks and associated ancillary equipment. Your General Manager intends to replace one of the aging 996 backhoe excavators with a relatively new 996 hydraulic shovel (15,000 hrs.) fitted with a left hand cab which has become available from another operation within the company.

You have been asked to manage the project from mobilisation through to operation within your existing mine.

- a) Describe in detail the process you would use to manage this significant change. (15 marks)
- b) Detail all the activities, hazards and associated controls required to manage this change to an acceptable level of risk to ensure safety, E&C, efficiency and cost considerations are met. (35 marks)
- c) What steps would you take to ensure the ongoing safe and effective operation of the new equipment? (10 marks)

### Question 2 (50 marks)

#### Tailings Dam Rehabilitation

You are the Mining Engineering Manager of a large excavator and truck open cut operation producing 15mtpa of ROM coal which is processed in a state of the art CHPP.

Within the Colliery Holding exists an abandoned dragline void dating back to the late 1970's. This void is approximately 500m in length, 100m wide and 45m deep. It is bounded to the west and north by dragline spoil, which has been rehabilitated using truck placed overburden and to the east and south by the final high wall of the dragline pit that is reposed at 75 degrees. This void has previously been used to store tailings waste from the CHPP but has been dormant for the past five years after having reached its full capacity.

As part of the requirements of the operations' MOP, you are required to cap and rehabilitate the tailings storage area to achieve the designed final landform. As the mine does not possess the specific type of equipment required or sufficient additional labour resources to undertake the task, it has been decided to engage a contractor to perform the work.

Detail the process you would employ to complete this complex task with particular reference to the following:

- a) Planning, assessment and design. Include assumptions and diagrams where appropriate. (25 marks)
- b) Departmental approval (5 marks)
- c) Contractor Management (15 marks)
- d) Specific equipment required to complete the task (5 marks)
- e) Environmental hazards and controls (10 marks)

### Question 3 (50 marks)

#### Explosives & Shot firing

You are the Mining Engineering Manager for a large open cut mine with complex geology. You have been advised there has been a misfire during the initiation of a large overburden blast.

The details of the incident are as follows:

- Eight out of twenty rows failed to fire during initiation
  - The eight rows that failed were in the middle area of the shot
  - Electronic initiation was used.
  - 50% of the shot design was through seam blasting
  - All blast holes were wet
  - The blast was fired at 4pm before an upcoming holiday long weekend.
- a) Detail the actions you take to respond to this incident after receiving the phone call. (15 marks)
  - b) What are the hazards and related issues associated with this incident? (15 marks)
  - c) Detail how you would manage this misfire scenario. (30 marks)

### Question 4 (50 marks)

#### Hot Ground Management

You are the Mining Engineering Manager of an open cut mine where an economic reserve has been located under an old dump that was rehabilitated 10 years ago which is now planned to be recovered. The original dump material came from an adjacent pit from within a neighbouring mining lease. The strip ratio is less than 6:1 and plans have been made with consent given to mine the coal beneath the spoil.

Previous records and subsequent exploratory drilling indicates evidence of significant heating within the dump. The dump is 40m at the highest point with a total volume of approximately 4 million cubic meters of material above natural surface.

Your mine uses an electric rope shovel, hydraulic shovel and a hydraulic excavator, along with a suite of ancillary equipment including 2 x graders, 1 x drill, 3 x dozers, 1 x front end loader and 1 x water cart.

- a) List all the hazards associated with mining this hot material and control measures for each. (30 marks)
- b) Describe how you would safely mine the hot dump material and what resources you would use. (15 marks)

- c) What would you do to maintain legislative compliance for such a project? (15 marks)

### Question 5 (50 marks)

#### Tyre & Rim Management (Compulsory)

Due to cost cutting measures your Operations Manager has asked you investigate the use of recently available bias ply tyres with currently used radial tyres for the electric rear haul dump trucks at your mine.

- Using a typical risk assessment format, document the activities, hazards existing and additional controls required to manage the risk of the introduction of the bias ply tyres to the fleet. (20 marks)
- Detail the process of implementation you would use for this change. (20 marks)
- List the documentation contained in your Safety Management System which relate to the implementation and ongoing management of heavy earthmoving tyres at your mine. (20 marks)

### Question 6 (50 marks)

#### Safety Management & Compliance

You are the newly appointed Mining Engineering Manager at a medium sized open cut coal mine. The site has been in operation for some time, but has a poor record in terms of safety performance.

- What key legislative requirements would you need to check as the new mining engineering manager to ensure that the mine was legally compliant? (20 marks)
- How would you go about ensuring that the mine site was operating in accordance with its legal obligations? (15 marks)
- You have identified that there is no transport management plan contained within the Health and Safety Management System and that there has been a spate of traffic related incidents on site. Detail the process you would use and the actions you would take to rectify this problem. (25 marks)

### Question 7 (50 marks)

#### Mining Productivity (Compulsory)

During a recent restructure at your open cut mine you were appointed as the Mining Engineering Manager. The mine has a fleet of Excavators, 190T and 240T trucks for coal and waste. The 190T trucks have combo bodies and are predominantly used on coal.

It has been suggested replacing the 2 x 250T (17m<sup>3</sup> bucket) hydraulic backhoe diggers with a 360T (23m<sup>3</sup> bucket) machine. The current and the proposed machine would have 60% utilisation (calendar), 90% availability (calendar) working on a 7 day roster (12hr day shifts/10.5hr night shifts). The excavator load cycle time is 30 seconds assuming 92BCM rated trucks.

- List the advantages of this proposal. (10 marks)
- List the disadvantages of this proposal. (10 marks)
- Calculate the available dig time for 1 week's production. (10 marks)
- Calculate theoretical waste dig rate for the 2 x 250Ts compared to the 360T class machine. List clearly any assumptions. (10 marks)
- For a 30 minute waste haul using the 360T dig rate from above, calculate the number of 240T trucks required. (20 marks)

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## Question 8 (50 marks)

### Environmental Management

You are the Mining Engineering Manager of a large open cut coal mine in the Hunter Valley which operates a fleet of large hydraulic excavators and mechanical drive trucks. Due to recent EPL change, your General Manager has asked you to assist in the development of a Pollution Incident Response Management Plan (PIRMP) for the site.

- a) Detail the contents of the site PIRMP. (20 marks)
- b) Describe when a site's PIRMP is to be enacted. (10 marks)
- c) Detail who should be notified in the event of an incident that requires the PIRMP to be enacted. (10 marks)
- d) How often would you test the PIRMP and how would you do this? (10 marks)
- e) List at least three examples of potential incidents relative to your site that could require the PIRMP to be enacted. (10 marks)

END OF PAPER

END OF EXAMINATION

### More information

Business Processes and Authorisations Unit – 02 4931 6625

### Acknowledgments

Open cut examination panel

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