

Surname	Centre Number	Candidate Number
Other Names		2



GCE A level

1215/02

GEOLOGY – GL5

Thematic Unit 2

Geology of Natural Resources

P.M. TUESDAY, 11 June 2013

ONE of TWO units to be completed in 2 hours

Suitable for Modified Language Candidates

			Examiner only
Section A	1.	15	
Section B	2.	25	
	3.		
	4.		
Total		40	

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ADDITIONAL MATERIALS

In addition to this and one other examination paper, you may require a calculator.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **question 1** in Section A (15 marks) and **one** question from Section B (25 marks).

INFORMATION FOR CANDIDATES

The number of marks is given in brackets at the end of each question or part-question.

You are reminded of the necessity for good English and orderly presentation in your answers.

SECTION A

1. **Figure 1a** is a geological cross section through the Kidd Creek sulphide ore deposit in Ontario, Canada. **Figure 1b** is a table of properties of the sulphide minerals that occur in the Kidd Creek sulphide ore deposit.

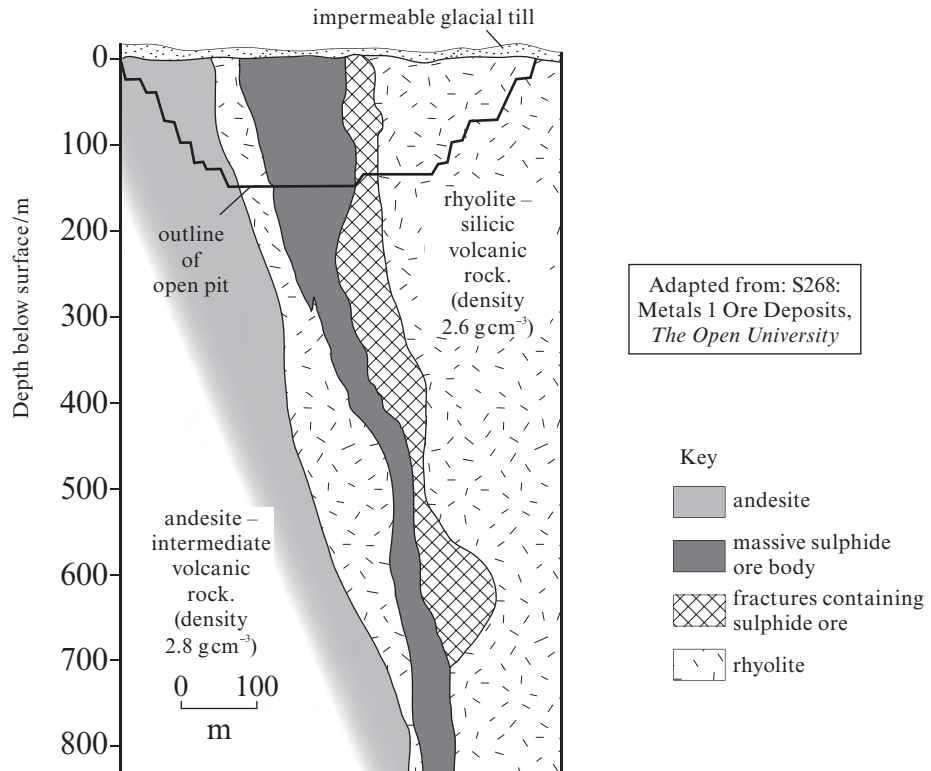


Figure 1a

Mineral	Composition	Grade mined (1966-1989)	Density / g cm ⁻³
Sphalerite	(Zn,Fe)S	7.2% (Zn)	4.2
Chalcopyrite	CuFeS ₂	2.2% (Cu)	4.2
Galena	PbS	0.28% (Pb)	7.5
Pyrite	FeS ₂	~	5.0

Figure 1b

(a) Using **Figure 1a**:

- (i) Describe the size and shape of the ore body.

[2]

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- (ii) The sulphide ore body was formed by hydrothermal processes. Describe the evidence that could be used to support this interpretation (opinion). [3]

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- (b) (i) Even though it is big, the ore body, was only discovered in 1964. Using **Figure 1a** suggest a **geological** reason why the ore body remained undiscovered for so long. [2]

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- (ii) Using **Figure 1b**, describe **one** geophysical prospecting technique that geologists could have used to discover this ore body. Evaluate the application of this technique in the discovery of this ore body. [4]

Description:

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Evaluation:

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- (c) Using **Figures 1a** and **1b**:

- (i) State **one** way in which the extraction of the minerals in this ore body would interfere with the surface or subsurface environment. [1]

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- (ii) With reference to your answer for (c)(i), explain how the adverse effects of this environmental interference could be minimised. [3]

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SECTION B

Answer one question only.

Write your answer in the remaining pages of this booklet.

2. Evaluate the statement:
“Sedimentary processes and associations can produce metalliferous ores and non-metallic minerals of economic importance.” [25]

3. (a) Describe how coal-forming processes can produce coal of different ranks.
(b) Evaluate the use of depleted oil and gas reservoirs as possible CO₂ repositories (carbon sequestration). [25]

4. Evaluate the role of geological factors in controlling the formation, migration and accumulation of oil and natural gas. [25]

