UNIVERSITY OF JOHANNESBURG

**FACULTY OF SCIENCE**

**DEPARTMENT OF GEOGRAPHY, ENVIRONMENTAL MANAGEMENT & ENERGY STUDIES**

**MODULE** **ENM3B: ENVIRONMENTAL MANAGEMENT**

**CAMPUS** **APK**

**EXAM** **NOVEMBER 2016**

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| **DATE: 24 NOVEMBER 2016** | **SESSION: 08:30 – 11:30** |
| **ASSESSOR(S)** | **MRS. L.S. MODLEY** |
| **INTERNAL MODERATOR** | **DR. I.T. RAMPEDI** |
| **EXTERNAL MODERATOR** | **Mr. K.W. MAPHANGWA (UNISA)** |
| **DURATION 3 HOURS** | **MARKS 150** |

**NUMBER OF PAGES: 4 Pages**

**INSTRUCTIONS:**

1. This examination paper has **TWO** sections, please complete **SECTION A and choose ONE question from SECTION B.**
2. The assessment opportunity is **CLOSED BOOK** examination.
3. Every section must be written in a **SEPARATE ANSWER SHEET**, which should be stapled together if more answering books are used.
4. Write neatly and eligibly

## SECTION A:

## EIA PROCESSES AND SPECIALIST STUDIES

### Kamoa Project

The Kamoa Copper Project — a joint venture between Ivanhoe Mines and Zijin Mining Group Co., Ltd. — has been independently ranked as the world's largest, undeveloped, high-grade copper discovery by international mining consultant Wood Mackenzie. It is a very large, near-surface, stratiform copper deposit with adjacent prospective exploration areas within the Central African Copperbelt, approximately 25 kilometres west of the town of Kolwezi and about 270 kilometres west of the provincial capital of Lubumbashi.

In February 2016, an independent pre-feasibility study (PFS) for the first phase of development of the Kamoa Copper Project was prepared by OreWin Pty Ltd., Amec Foster Wheeler E&C Services Inc. and SRK Consulting Inc. The report reflects the initial phase of project development and describes the construction and operation of a three-million-tonne-per-annum (Mtpa) underground mine, concentrator processing facility and associated infrastructure. The first phase of mining would target high-grade copper mineralization from shallow, underground resources to yield a high-value concentrate. The planned second phase would entail a major expansion of the mine and mill, and construction of a smelter to produce blister copper.

The Project Area is at the edge of a north–north–east to south–south–west trending ridge which is incised by numerous streams and rivers. The elevation of the Project area ranges from 1,300 m to 1,540 m average metres above sea level (amsl), with current exploration activities in areas of elevation from 1,450 m to 1,540 m amsl. The local topography of the Project is affected by the drainage catchments of the Mukanga, Kamoa, and Lulua Rivers and the Kalundu, Kansoko, and Kabulo Streams. The Project lies just north of the watershed separating the Zambezi and Congo drainage basins. Mukanga, Lwampeko, Kansoko, and Kamoa are the main streams in the Project area. These are the main sources of potable water for the local communities. Wetland areas in the general Project area include dambos (water-filled depressions), marshes, and wet plateau sands. The Project is generally well vegetated with Central Zambezian Miombo woodland, characterised by broadleaf deciduous woodland and savannas interspersed with grassland, wetlands, and riparian forests. Grasslands on the Kalahari Sand plateau, together with riparian forests, are the most common vegetation type after Miombo woodland. Riparian forest dominates adjacent to watercourses. There are no known migratory routes of endangered animal species within the Project area. Information gathered from interviews with local people indicates that the only protected species in the Project area are tortoises, which occur across the whole area. The partially protected *felis serval* (serval) is also found within the area. Poaching has severely diminished the numbers of larger mammals

## Question 1

1.1)1. What does the EIA process in South Africa entail? Give a short definition of each phase of the process (you may use diagrams but you do need to explain using words what each phase entails)

(20)

1.1)2. In legal terms; when is an EIA required? Give 5 examples of legislation which provides guidelines specifically related to when an EIA is required.

(20)

1.1)3. The above excerpt gives an explanation of the project area and geographical features, as the Environmental Manager of this project which specialist studies will you recommend to participate in the baseline study? For each specialist study:

- Give a brief description of the specialist,
- Why you have chosen them,
- Important aspects of the job you believe should be included

(30)

1.1)4. Suggest an effective environmental monitoring plan for this project, taking into consideration all the characteristics of an effective management plan.

(20)

1.1)5. What would the benefits be of employing such an Environmental Management Plan for this particular project?

(10)

**TOTAL [100]**

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**SECTION B (Choose only ONE question):**

**ENVIRONMENTAL MANAGEMENT PROCESSES IN SOUTH AFRICA**

**Question 1**

1.1) Scoping and Screening in South Africa is known to be two completely different processes, resulting in two different outcomes.

Justify this statement by comparing the two processes by looking at the different aspects involved.

[20]

1.2) Give a detailed explanation of stakeholder engagement, the process and reason for it becoming increasingly popular in South Africa

[20]

1.3) An Environmental Management Plan (EMP) can be defined as "an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the projects are enhanced". EMPs are therefore important tools for ensuring that the management actions arising from Environmental Impact Assessment (EIA) processes are clearly defined and implemented through all phases of the project life-cycle.

What is the purpose of the EMP and what are the legal requirements for this phase of the EIA.

[10]

**TOTAL [50]**

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**OR**

**ENVIRONMENTAL MONITORING**

**Question 2**

**Water quality refers to the chemical, physical, biological, and radiological characteristics of water. It is a measure of the condition of water relative to the requirements of one or more biotic species and or to any human need or purpose. It is most frequently used by reference to a set of standards against which compliance can be assessed. The most common standards used to assess water quality relate to health of ecosystems, safety of human contact and drinking water.Critically discuss air quality concerns and different types and sources of pollution in South Africa.**

2.1) Give a definition of the River Health programme and discuss in detail the biological indices which can be employed when performing water quality monitoring in South Africa [25]

2.2) Which precautions would you take before sampling water, how would this different from the different sources used for water quality monitoring? [15]

2.3) What are the main elements of a water quality program in South Africa? Which are the most commonly employed programs in South Africa? [10]

**SUB-TOTAL [50]**

**TOTAL [150]**

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