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1. 署名した協議議事録 (M/M)

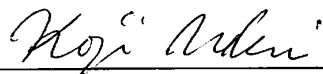
**MINUTES OF MEETING
FOR
THE PROJECT FORMULATION STUDY
ON
GEOLOGICAL MAPPING AND MINERAL INFORMATION SERVICE
PROJECT
FOR PROMOTION OF MINING INDUSTRY
IN THE REPUBLIC OF ZAMBIA**

June 14th, 2006
Lusaka, the Republic of Zambia

The Project Formulation Study Team on Geological Mapping and Mineral Information Service Project for Promotion of Mining Industry in the Republic of Zambia (hereinafter referred to as “the Japanese Team”) organized by the Japan International Cooperation Agency (hereinafter referred to as the “JICA”) and headed by Mr. Koji NAKUI, visited the Republic of Zambia (hereinafter referred to as “Zambia”) from June 3rd to June 18th, 2006.

During its stay in Zambia, the Japanese Team had a series of discussions and exchanged views on Geological Mapping and Mineral Information Service Project for Promotion of Mining Industry (hereinafter referred to as “the Study”) with the officials of the Geological Survey Department, Ministry of Mines and Minerals Development and other relevant agencies of the Government of Zambia (hereinafter referred to as “the Zambian Team”).

Discussions were conducted in a friendly and cordial atmosphere and both the Teams agreed to record the following points as summarized conclusions of the discussions.



Mr. Koji NAKUI
Leader
Project Formulation Team
Japan International Cooperation Agency



Mr. Leonard Nkhata
Permanent Secretary
Ministry of Mines and Minerals
Development

1. Confirmation of Current Situation and Facts

The Japanese Team confirmed the following facts

(1) Current Situation of Mining Sector in Zambia

Zambia has been known to have a high potential for mineral resources including copper, cobalt, gold, coal, gypsum and gemstones. The mining industry in Zambia is an important source of employment and foreign currency and thus contributes to poverty reduction of the country. Therefore the Government of Zambia desires to promote the mining sector by attracting mineral investments. At present, the number of foreign and domestic private companies which are doing exploration and exploitation in Zambia is increasing as metal prices in the world have increased.

In this environment, the Government of Zambia wishes to cooperate with the Government of Japan to conduct a study on "Geological survey and demarcation of mine plot" in order to promote the mining sector in Zambia.

(2) Reasons for the Promotion of the Mining Sector

Although Geological Survey Department (hereinafter referred to as "GSD") has been collecting various kinds of geological data and mineral resources information, GSD has not been systematically compiling these kinds of data since the year of 2000. 1:100,000 geological maps including mineral resources assessments have covered 55% of the whole country with the remaining 45% unmapped. Therefore GSD has difficulty in evaluating the potential of mineral resources in this country accurately and publishing these kinds of data and information. GSD realizes that the management of relevant information and geological mapping are very important and publishing the information is one of the most effective means to attract private investments.

(3) Feasibility of the Study

GSD has responsibilities related to geological mapping and mineral investigation, management of mineral resources information and mining activities information. GSD is expected to enhance its capability in order to respond to increasing mining activities.

The Japanese Team and the Zambian Team agreed that geological mapping and compiling relevant information have the highest priority and the Study should focus on them.

2. Outline of the Study (see ANNEX - 1)

The Japanese Team and the Zambian Team discussed and drafted an outline of the Study. Both the Teams shared ideas on the tentative Scope of Work of the Study and agreed with following points

(1) Title of the Study

Geological Mapping and Mineral Information Service Project for Promotion of Mining Industry in the Republic of Zambia

(2) Objective of the Study

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The main objective of the Study is to develop the capability to conduct geological and mineral occurrence mapping and to compile data and information related to mineral resources in order to promote the mining industry in Zambia. Major objectives of the Study are as follows;

- ✓ To revise the 1: 1,000,000 geological map and 1:2,000,000 mineral occurrence map of the whole country to a combined map of 1:1,000,000 scale.
- ✓ To make processed and interpreted satellite image of the northeast area.
- ✓ To make 1: 100,000 geological map sheets.
- ✓ To revise the GIS-based mineral information system.
- ✓ To develop GSD personnel's capacities necessary for above mentioned activities.

(3) Area to be covered by the Study

The Study covers the whole area of Zambia.

(4) Tentative Scope of Work

- 1) To review and analyze the available data, information and documents related to mineral resources for the compilation of geological map and up-gradation of GIS-based database
- 2) Revision of geological and mineral occurrence maps
Compilation of geological and mineral resources data, based on the available data and principle mineral deposits study
 - ✧ Mining, prospecting and exploration reports by private and public mining sectors
 - ✧ Study of principle mineral deposits to understand deposit geneses and metallogenic interpretation
- 3)-i 1:100,000 geological sheet mapping based on the result of geological survey and mineral potential survey.
Geological mapping will be conducted in the following topographic map areas namely 1030NE, 1030SE, 1130NE and 1130SE around Mpika district.
Stratigraphic, petrographic, mineralogical petrologic and geochronologic studies will be included.
- 3)-ii Satellite image interpretation
- 4) Revision of a GIS-based mineral information system
 - Mineral occurrence information after the year of 2000
 - Mining activity reports after the year of 2000
- 5) Data dissemination to the public for mineral investment promotion
 - Publishing geological and mineral occurrence maps
 - Organizing investment promotion seminars/workshops at international mining conferences. Seminar/Workshop topics will be discussed between JICA Study Team and the Zambian Team.



(5) Output of the Study

- Revised 1:1,000,000 geological and mineral occurrence map of the Republic of Zambia with explanatory text.
- Processed and interpreted satellite image of the northeast area to assist further geological mapping by GSD.
- 1:100,000 geological maps of the surveyed areas with explanatory text.
- Revised GIS-based mineral information system on the mineral resources map.
- The capacity of GSD personnel on conducting of geological and mineral mapping and compiling mineral data will be strengthened.

(6) The Study term

The Study term will be for approximately 26 months.

(7) Counterpart Organization

GSD is the lead implementing agency for the Study. GSD will organize the Steering Committee and appoint the appropriate personnel for the Study by the commencement of the Study. The organization chart is attached as ANNEX - 2.

(8) Tentative TOR of Member of the Japanese Study Team

- ✓ Leader / Compile relevant information, Geological mapping
- ✓ Geologist A / Geological mapping, satellite image interpretation
- ✓ Geologist B / Mineral assessment, Geological Mapping
- ✓ GIS specialist

(9) Tentative personnel assigned from GSD

- ✓ Library staff and mineral information staff (2)
- ✓ Mapping geologist and assistant geologist (4)
- ✓ GIS staff (3)

3. Treatment of equipment in the Study

The Japanese Team explained that any equipment cannot be purchased in the Study. The Zambian Team recognized this.

4. Expected Procedures and Steps for Implementation of the Study

The Japanese Team explained that final decision on the Study implementation would be subject to relevant reviews by JICA and consultation with concerned officials in the Government of Japan (hereinafter referred to as "GOJ"). After the favorable decision made by GOJ, JICA Zambia Office and the Zambian Team shall sign the Scope of Work.

5. Steering Committee

GSD will set up a steering committee under the chairpersonship of GSD for ensuring the smooth implementation and coordination of the Study. The committee



members will be composed of, but not limited to, representatives of related organizations, such as:

- GSD
- Mining Development Department
- Ministry of Mines and Minerals Development

Responsibilities of the steering committee members are as follows:

- a. GSD, as the leading counterpart, will engage in overall coordination for the Study.
- b. Other members, as the collaborating counterparts, will offer necessary advice and support for the smooth and effective implementation of the Study.

ANNEX LIST

ANNEX – 1 **Outline of the Study**

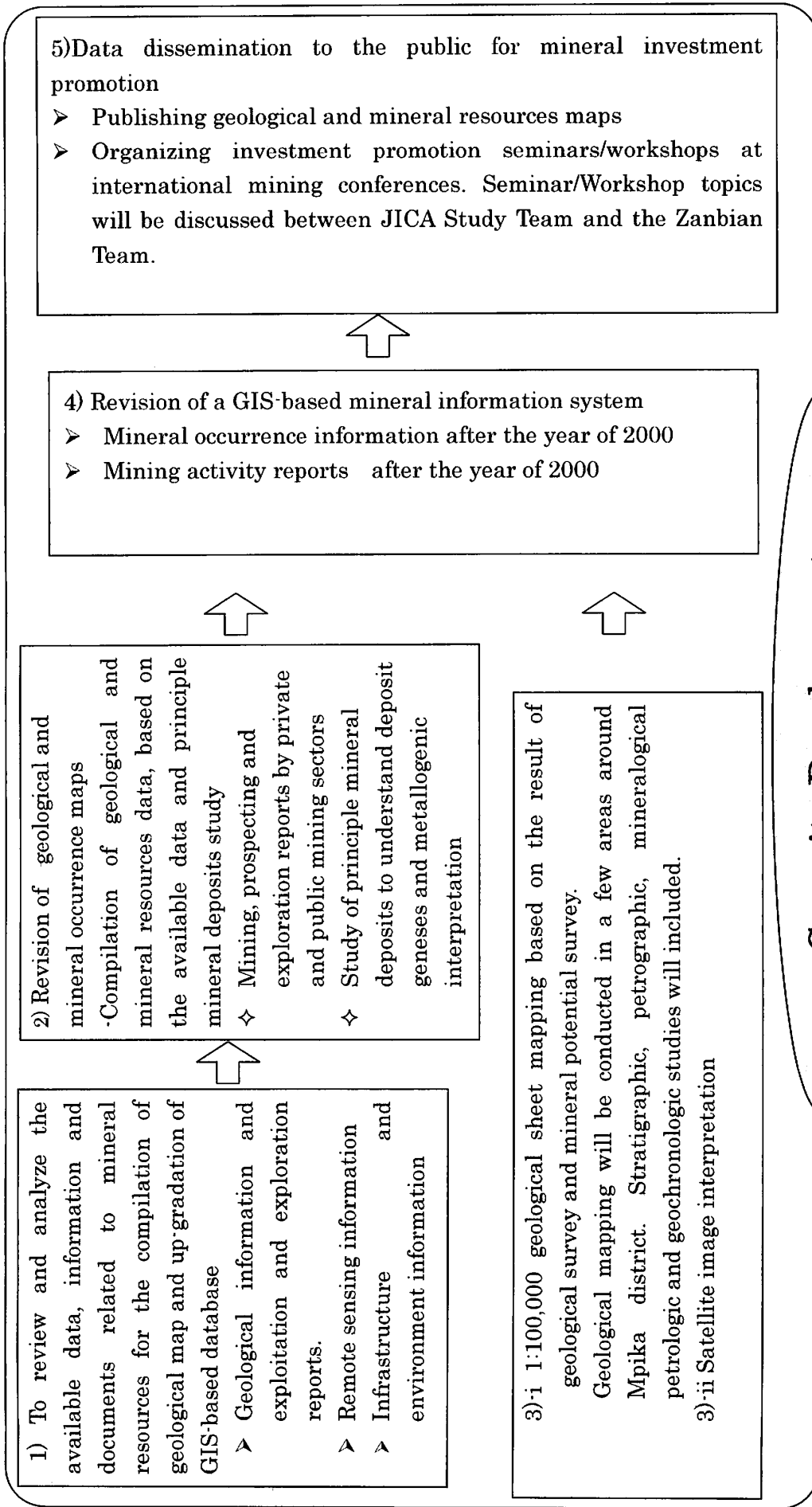
ANNEX – 2 **Organization Chart of Geological Survey Department**

ANNEX – 3 **Organization Chart of Ministry of Mines and Minerals Development**

ANNEX – 4 **Draft Scope of Work**

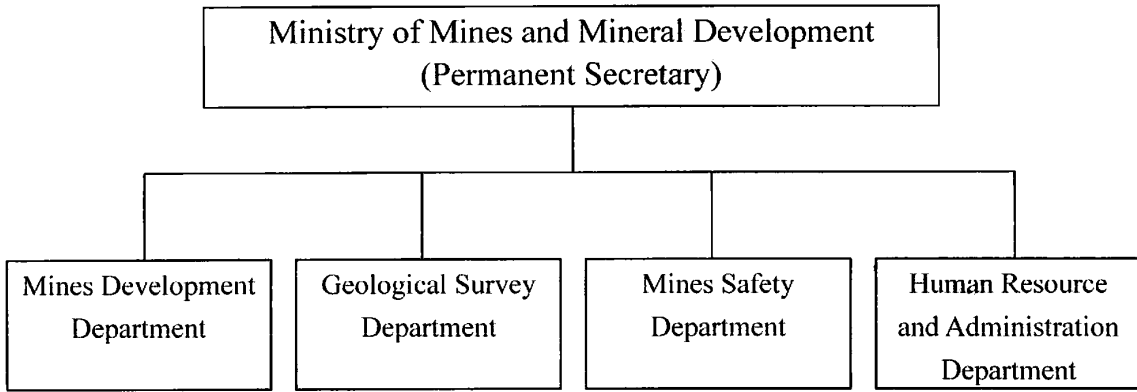


Outline of the Study



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Organization Chart of Ministry of Mines and Mineral Development



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DRAFT SCOPE OF WORK

FOR

GEOLOGICAL MAPPING AND MINERAL INFORMATION SERVICE

PROJECT FOR PROMOTION OF MINING INDUSTRY

IN THE REPUBLIC OF ZAMBIA

Lusaka, Zambia
XX XX, 2006

Mr. Eiji INUI
Resident Representative
Japan International Cooperation Agency
Zambia Office

Mr. Leonard Nkhata
Permanent Secretary
Ministry of Mines and Minerals Development

Permanent Secretary (Budget and Economic
Affairs)
Ministry of Finance and National Planning



1. Introduction

In response to the request of the Government of the Republic of Zambia, the Government of Japan decided to conduct the Study in accordance with the relevant laws and regulations in force in Japan

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as “JICA”), the official agency responsible for the technical cooperation program of the Government of Japan, will undertake the Study in close cooperation with the authorities concerned in the Republic of Zambia (hereinafter referred to as “Zambia”).

2. Objectives of the Study

The main objective of the Study is to develop the capability to conduct geological and mineral occurrence mapping and to compile data and information related to mineral resources in order to promote the mining industry in Zambia. Major objectives of the Study are as follows:

- ✓ To revise the 1: 1,000,000 geological map and 1:2,000,000 mineral occurrence map of the whole country to a combined map of 1:1,000,000 scale
- ✓ To make processed and interpreted satellite image of the northeast area
- ✓ To make 1: 100,000 geological map sheets in the target areas
- ✓ To revise the GIS-based mineral information system
- ✓ To develop Geological Survey Department (hereinafter referred to as “GSD”). personnel’s capacities necessary for above mentioned activities

3. Study Area

The Study covers the whole area of Zambia.

4. Scope of the Study

The study will be carried out in the following five (5) components.

- 1) To review and analyze the available data, information and documents related to mineral resources for the compilation of geological map and up-gradation of GIS-based database
- 2) Revision of geological and mineral occurrence maps
 - Compilation of geological and mineral resources data, based on the available data and principle mineral deposits study
 - Mining, prospecting and exploration reports by private and public mining sectors
 - Study of principle mineral deposits to understand deposit geneses and metallogenic interpretation



3)-i 1:100,000 geological sheet mapping based on the result of geological survey and mineral potential survey.

Geological mapping will be conducted in a few areas around Mpika district. Stratigraphic, petrographic, mineralogical petrologic and geochronologic studies will included.

3)-ii Satellite image interpretation

4) Revision of a GIS-based mineral information system

- Mineral occurrence information after the year of 2000
- Mining activity reports after the year of 2000

5) Data dissemination to the public for mineral investment promotion

5. Study Schedule

The Study will be conducted in accordance with Tentative Work Schedule shown in Appendix I.

6. Steering Committee

GSD will set up a steering committee under the chairpersonship of GSD for ensuring the smooth implementation and coordination of the Study. The committee members will be composed of, but not limited to, representatives of related organizations, such as:

- GSD
- Mining Development Department
- Ministry of Mines and Minerals Development

Responsibilities of the steering committee members are as follows:

- a. GSD, as the leading counterpart, will engage in overall coordination for the Study.
- b. Other members, as the collaborating counterparts, will offer necessary advice and support for the smooth and effective implementation of the Study.

7. Report

JICA shall prepare and submit the following quantity of reports with electronic version to GSD.

- | | |
|---|-----------|
| 1) Inception report (Ic/R) in English | 20 copies |
| 2) Interim report (It/R) in English | 20 copies |
| 3) Draft final report (Df/R) in English | 20 copies |

GSD will provide JICA with the comments on the Draft Final Report within one month after its reception.

- | | |
|----------------------------------|-----------|
| 5) Final report (F/R) in English | 20 copies |
|----------------------------------|-----------|

8. Division of Technical Undertaking

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The division of technical undertakings of the Study by JICA and GSD is detailed in Appendix II attached herewith.

9. Undertakings of the Government of ZAMBIA

(1) To facilitate smooth conduct of the study, the Government of Zambia shall take necessary measures:

- a) to permit the members of JICA study team to enter, leave and sojourn in Zambia for the duration of their assignment therein, and exempt them from foreign registration requirements and consular fees.
- b) to exempt the members of JICA study team from taxes, duties, fees and other charge on equipment, machinery and other materials brought into Zambia for the implementation of the Study.
- c) to exempt the members of JICA study team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of JICA study team for their services in connection with implementation of the Study

(2) The government of Zambia shall bear claims, if any arises, against the members of JICA study team resulting from, occurring in the course of, or otherwise connected with the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of JICA study team.

(3) GSD shall act as a counterpart agency to JICA study team and also as coordinating body in relation to other governmental and non-governmental organizations concerned for the smooth implementation of the Study.

(4) GSD shall, at its expense, provide JICA study team with the following in cooperation with other organizations concerned:

- a) Security-related information on as well as measures to ensure the safety of JICA study team
- b) Information on as well as support in obtaining medical services;
- c) Available data and information related to the study;
- d) Counterpart personnel;
- e) Suitable office space with necessary equipment;
- f) Credentials or identification cards

10. Undertaking of JICA

For the implementation of the Study, JICA shall take the following measures:

(1) To dispatch, at its own expense, study team to Zambia

(2) To pursue technology transfer to the Zambian counterpart personnel in the course of the Study.

11. Others

JICA and GSD shall consult with each other in respect of any matter that may arise from or in connection with the Study.

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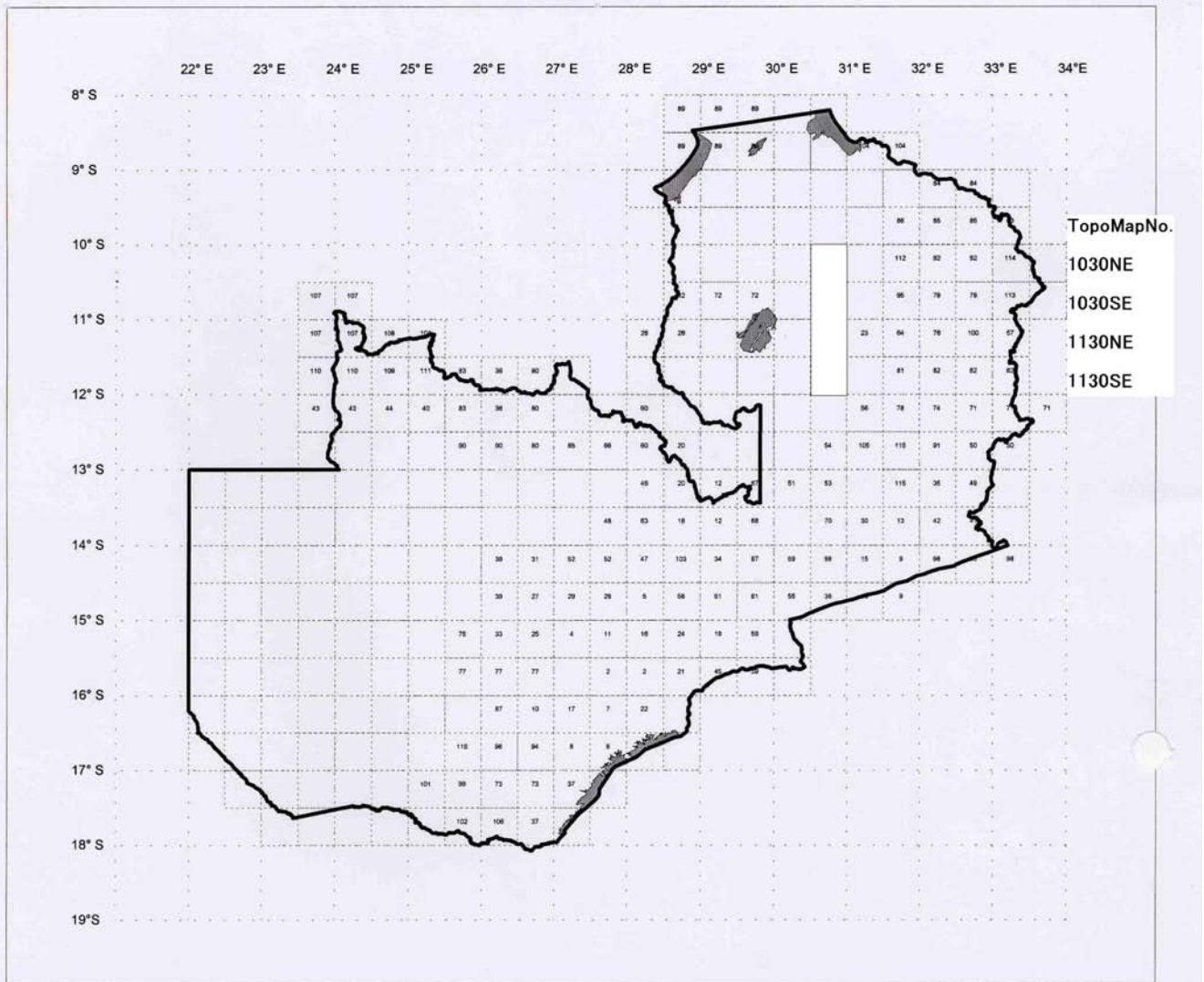
Outline of Division of Technical Undertaking

	JICA Undertaking	GSD Undertaking
1) To review and analyze the available data, information and documents related to mineral resources for the compilation of geological map and up-gradation of GIS-based database	Technical assistance for data collection and analysis	Data collection and analysis
2) Revision of geological and mineral occurrence maps	Technical assistance for revising geological and mineral occurrence maps	Revising geological and mineral occurrence maps
3)-i 1:100,000 geological sheet mapping based on the result of geological survey and mineral potential survey.	Technical assistance for mapping of geology and mineral resources	Mapping of geology mapping with mineral resources Production of geological maps
3)-ii Satellite image interpretation	Technical assistance for interpreting the satellite image	Interpreting the satellite image
4) Revision of a GIS-based mineral information system	Technical assistance for revising the GIS-based information related to mining sector	Data collection, input and revision of the database related to mining sector
5) Data dissemination to the public for mineral investment promotion	Technical assistance for seminar/workshop	Publishing geological and mineral resources maps, Organizing investment promotion seminars/workshops

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2. ザンビア地質図 Index (10万分の1地質図作成対象地域)



ザンビア 地質図Index
 ・10万分の1地質図作成対象予定地域は囲みの4地域
 (数字入りは既に地質図有り)

3. ザ国からの要請書

APPLICATION FORM FOR JAPAN'S DEVELOPMENT STUDY PROGRAM

Date of entry: month _____ year _____

Applicant: The Government of Zambia

1. Project digest

(1) Project Title: Geological Survey and Demarcation of Mine Plot

*Enter the project title in English (Spanish or French).

(2) Location (province/county name): Zambia

(city/town/village name): Lusaka

from the metropolis : about 0 hours' ride/flight

(3) Implementing Agency .

Name of the Agency: Mines Development Department

*Enter the name of the implementing agency including such details as the name of the bureau or department.

Number of Staff of the Agency: 67

(on a category

basis)

Budget allocated to the Agency : K11,244,000.00

*Attach an organizational chart, and mark the department responsible for the study.

(4) Justification of the Project

*Provide detailed information of the project regarding the items below.

-Present conditions of the sector:

The Agency does not have the necessary survey equipment and this has resulted in about 1,800 mining plots not surveyed and demarcated.

-Sectoral development policy of the national/local government:

The sectoral development policy is to establish and operationalise the Mining Cadastre and GIS System.

配付先	国内部 <input type="checkbox"/>	国際協力人材部 <input type="checkbox"/>
	無償部 <input type="checkbox"/>	社会開発部 <input type="checkbox"/>
	JOCV <input type="checkbox"/>	人間開発部 <input type="checkbox"/>
	地球環境部 <input type="checkbox"/>	農村開発部 <input type="checkbox"/>
	経済開発部 <input checked="" type="checkbox"/>	

コピー 927

-Problems to be solved in the sector:

The backlog of unsurveyed and undemarcated mining plots to be reduced and therefore reduce boundary disputes.

-Outline of the Project:

Surveying and demarcation of mining plots beginning with areas of high priority.

-Purpose (short-term objective) of the Project:

To survey and demarcate mining plots.

-Goal (long-term objective) of the Project:

Reduction of border disputes and therefore improved efficiency of mining operations.

-Prospective beneficiaries:

(Population for which positive change are intended directly and indirectly by implementing the project, and gender disaggregated data, if available)

This project will benefit all mining rights holders and will also avail data to would be investors

-the Project' s priority in the National Development Plan / Public Investment Program:

It ranks amongst the top three (3) of the priority areas.

(5) Desirable or Scheduled time of the commencement of the Project:

Month January year 2006

(6) Expected funding source and/or assistance (including external origin) for the Project: Government of Zambia, EU - MSDP

*Describe the concrete policies for the realization of the project, and enter the prospects for realization and funding sources.

(7) Other relevant Projects, if any.

N/A

- (8) Any relevant information of the project from gender perspective.
This project will benefit both genders.

2. Terms of Reference of the proposed Study

*Please fill in (1) and (2) below, paying particular attention to the following items.

- In the case that a study was conducted in the same field in the past, describe the grounds for requesting this study, the present status of the previous project, and the situation regarding the technology transfer.
- Whether there are existing studies regarding this requested study or not.
- Coordination with other economic and technical cooperation from Japan

(1) Necessity/Justification of the Study:

N/A

(2) Necessity/Justification of the Japanese Technical Cooperation:

This project will bring development in the small-scale mining sector.

(3) Objectives of the Study:

*Describe the objectives of the study in detail. Also, indicate who will benefit from the study in as much detail as possible, including gender disaggregated data and describe the beneficial effect in terms of quantity. Enter in a concise manner the goal expected to be achieved in the future by conducting the study.

*When the requested study is the only input scheme there is in the cooperation program, enter the same sentences given in the "Objective of the Cooperation Program" in the summary sheet. When more than one scheme is requested including this one, describe clearly the role of the requested study.

The objective of this study is to cover as much as 80% of the unsurveyed and undemarcated mining plots by the year 2011.

(4) Area to be covered by the Study:

*Enter the name of the target area for the study and attach a rough map to the documents submitted.

The attached map should be at a scale that clearly shows the project site. Mark the site in red.

The target areas are; Mapatizya (Kalomo) and Ndola Rural (Kitwe)

(5) Scope of the Study:

*Enter in a concise manner using an itemized statement.

To identify all the mining rights areas not surveyed and demarcated.

(6) Study Schedule:

*Enter the time/period of the study.

This can be done within one (1) month.

(7) Expected Major Outputs of the Study:

Maps will be produced showing the various mining rights areas under licences.

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(8) Possibility to be implemented / Expected funding resources:

Government will facilitate the implementation of the project

(9) Environmental and Social Considerations

*Please fill in the attached screening format.

(10) Request of the Study to other donor agencies, if any:

*Please pay particular attention to the following items:

- Whether you have requested the same study to other donors or not. NOT
- Whether any other donor has already started a similar study in the target area or not. NOT
- Presence/absence of cooperation results or plans by third-countries or international agencies for similar projects. N/A
- In the case that a study was conducted in the same field in the past, describe the grounds for requesting this study, the present status of the previous project, and the situation regarding the technology transfer. N/A
- Whether there are existing studies regarding this requested study or not. (Enter the time/period, content and concerned agencies of the existing studies.) N/A

(11) Other relevant information

*Enter relevant information other than that described above, if any.

3. Facilities and information for the Study

(1) Assignment of counterpart personnel of the implementing agency for the Study:

(number, academic background, etc.)

One (1), with at least Bachelor's Degree in Land Surveying. Knowledge of GIS will be an advantage.

(2) Available data, information, documents, maps, etc. related to the Study:
(Please attach the list.)

There are about 1,800 plots that have not been surveyed and demarcated. This data will be provided to the expert.

(3) Information on the security conditions in the Study Area:
The areas are very secure.

4. Global Issues (Gender, Poverty, etc.)

With such a programme in place, definitely poverty issues will be addressed as more efficient mining operations will be in place.

(1) Women as main beneficiaries or not.
Beneficiaries will be both men and women.

(2) Project components which require special considerations for women (such as gender difference, women specific role, women's participation), if any.
N/A

(3) Anticipated impacts on women caused by the Project, if any.
N/A

(4) Poverty alleviation components of the Project, if any.
More mining area will be identified and this will bring about poverty alleviation.

(5) Any constraints against the low-income people caused by the Project.
N/A

5. Undertaking of (the recipient country)

(1) To facilitate the smooth conduct of the Study; the Government of (the recipient country) shall take necessary measures:

- 1) To permit the members of the Team to enter, leave and sojourn in (the recipient country) for the duration of their assignments therein and exempt them from foreign registration requirements and consular fees;
 - 2) To exempt the members of the Team from taxes, duties and any other charges on equipment, machinery and other material brought into (the recipient country) for the implementation of the Study;
 - 3) To exempt the members of the Team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the team for their services in connection with the implementation of the Study;
 - 4) To provide necessary facilities to the Team for the remittance as well as utilization of the funds introduced into (the recipient country) from Japan in connection with the implementation of the Study;
- (2) The Government of (the recipient country) shall bear claims, if any arises, against the members of the Team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the team.
- (3) (The implementing Agency) shall act as counterpart agency to the Japanese Study Team and also as coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.
- (4) (The implementing agency) shall, at its own expense, provide the Team with the following, in cooperation with other organizations concerned:
- 1) Security-related information on as well as measures to ensure the safety of the Team;
 - 2) Information on as well as support in obtaining medical service;
 - 3) Available data and information related to the Study;
 - 4) Counterpart personnel;
 - 5) Suitable office space with necessary office equipment and furniture;
 - 6) Credentials or identification cards; and
 - 7) Vehicles with drivers.
- (5) (The implementing Agency) will, as the executing agency of the project, take responsibilities that may arise from the products of the Study.

*In the case that Detail Design Study is requested.

The Government of (the recipient country) assures that the matters referred to in this form will be ensured for the smooth conduct of the Development Study by the Japanese Study Team.

Signed: _____

Title: _____

On behalf of the Government of _____

Date: _____

No

1-4 Did the proponent have meetings with the related stakeholders before request?

Yes No

If yes, please mark the corresponding stakeholders.

Administrative body

Local residents

NGO

Others ()

Question 2

Is the project a new one or an on-going one? In the case of an on-going one, have you received strong complaints etc. from local residents?

New On-going (there are complaints) On-going (there are no complaints)

Others ()

Question 3 Name of the law or guidelines:

Is Environmental Impact Assessment (EIA) including Initial Environmental Examination (IEE) required for the project according to a law or guidelines in the host country?

Yes No

If yes, please mark the corresponding items.

Required only IEE (Implemented, on going, planning)

Required both IEE and EIA (Implemented, on going, planning)

Required only EIA (Implemented, on going, planning)

Others: ()

Question 4

In case of that EIA was taken steps, was EIA approved by relevant laws in the host country? If yes, please mark date of approval and the competent authority. *N/A*

<input type="checkbox"/> Approved: without a supplementary condition	<input type="checkbox"/> Approved: with a supplementary condition	<input type="checkbox"/> Under appraisal
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(Date of approval: Competent authority:)

Not yet started an appraisal process

Others:()

Question 5

If a certificate regarding the environment and society other than EIA is required, please indicate the title of certificate.

Already certified Required a certificate but not yet done

Title of the certificate :()

Not required

Others []

Question 6

Are following areas located inside or around the project site?

Yes No Not identified

If yes, please mark corresponding items.

National parks, protected areas designated by the government (coast line, wetlands, reserved area for ethnic or indigenous people, cultural heritage) and areas being considered for national parks or protected areas

Virgin forests, tropical forests

Ecological important habitat areas (coral reef, mangrove wetland, tidal flats)

Habitat of valuable species protected by domestic laws or international treaties

Likely salts cumulus or soil erosion areas on a massive scale

Remarkable desertification trend areas

Archaeological, historical or cultural valuable areas

Living areas of ethnic, indigenous people or nomads who have a traditional lifestyle, or special socially valuable area

Question 7

Does the project have adverse impacts on the environment and local communities?

Yes No Not identified

Reason: []

Question 8

Please mark related environmental and social impacts, and describe their outlines.

- | | |
|---|---|
| <input type="checkbox"/> Air pollution | <input type="checkbox"/> Social institutions such as social infrastructure and local decision-making institutions |
| <input type="checkbox"/> Water pollution | <input type="checkbox"/> Existing social infrastructures and services |
| <input type="checkbox"/> Soil pollution | <input type="checkbox"/> The poor, indigenous or ethnic people |
| <input type="checkbox"/> Waste | <input type="checkbox"/> Maldistribution of benefit and damage |
| <input type="checkbox"/> Noise and vibration | <input type="checkbox"/> Local conflict of interests |
| <input type="checkbox"/> Ground subsidence | <input type="checkbox"/> Gender |
| <input type="checkbox"/> Offensive odors | <input type="checkbox"/> Children's rights |
| <input type="checkbox"/> Geographical features | <input type="checkbox"/> Cultural heritage |
| <input type="checkbox"/> Bottom sediment | <input type="checkbox"/> Infectious diseases such as HIV/AIDS etc. |
| <input type="checkbox"/> Biota and ecosystem | <input type="checkbox"/> Others () |
| <input type="checkbox"/> Water usage | |
| <input type="checkbox"/> Accidents | |
| <input type="checkbox"/> Global warming | |
| <input type="checkbox"/> Involuntary resettlement | |
| <input type="checkbox"/> Local economy such as employment and livelihood etc. | |
| <input type="checkbox"/> Land use and utilization of local resources | |

Outline of related impacts:

()

Question 9

Information disclosure and meetings with stakeholders

9-1 If the environmental and social considerations are required, does the proponent agree on information disclosure and meetings with stakeholders in accordance with JICA Guidelines for Environmental and Social Considerations?

Yes No

9-2 If no, please describe reasons below.

[]

4. 質問票および回答

A) Questionnaire for the Geological Survey Department (GSD), Ministry of Mines and Minerals Development (MMMD) in Zambia

JICA Project Formulation Study Team
Economic Development Department, JICA

I. General matters

1) Organization chart for Ministry of Mines and Minerals Development in detail including staff numbers of each section (for Geological Survey Department and Mines Development Department are essentially necessary)

to be provided as digital power point file

2) Information which describes your technical abilities and capacities (for example what is major in or special study in University), and experiences of study, projects abroad or within the country

some staff have undertaken training in the use of the following mapping/GIS software: Mapinfo, ArcGIS, Ilwis

3) Self-Assessment of technical capacities for their staffs and their desirable plan to capacity building

GSD staff need training in relational database management, GIS management, remote sensing, and field mapping techniques

4) The role of the department in the country, budget information and number of the staff in the department in categorical wise, such as mapping and economic geologists with educational background

Already provided by Director's office

5) Recent aid assistance program for geology or mining by foreign country in detail and its progress (expecting details of World Bank programs)

No recent World Bank project at the Department. Last WB project was between 1998 and 2000. Most recent external assistance is from EU who between 2004 and 2005 have provided some IT equipment and helped with rehabilitation of laboratories

6) Each Department's partial responsibility (role and mandate) for management of mining concession and ambition

Administration of mining rights a responsibility of Mines Development Department

7) Problems or troubles between Government and private sector under mining development and activities in detail if any

lack of geological maps for some parts of the country prevents companies from assessing full mineral potential of those areas

8)Major outputs or achievements of your department in recent 10 years preferably with reports such as annual reports etc.

Mwinilunga area in NW Province mapped and geochemically sampled during 1998-99.

About 20 geological maps and reports compiled in the 1970s and 1980s published during the period 1996 to 1998 through assistance of European Development Fund

9)Project details conducted by your department in recent 10 years and any further plan of projects in future

mapping in NW Province between 1998 and 1999 under World Bank 2222resulting in publication of reports 107, 108, 109, 110, 111 and Memoir 5.

10)Number of rock samples which your department analyze per year using the atomic absorption analytical equipment

In the recent past not more than a hundred rock samples per year have been analysed using AAS.

II.Management and control of data and information

1)Kind of possessing data and information, quality, quantity, caring condition and their ambition for them in the future

The Department has data and information on geology, geophysics, geochemistry from its own work as well as from prospecting and mining companies. The data and information are available as analogue as well as in digital formats.

2)Data and information include following matters

- Geological map data(details such as number of 1:100,000 geological maps published by your department in recent 10 years and future plan of that if any) *25 geological maps with accompanying reports*
- Geological literature *a lot of literature available. However many early reports of economic investigations are now out of stock*
- Library *the library acquires new publications every year, usually from other countries*
- Investigation data(geochemical, geophysical, survey notebook)
Very limited geochemical and geophysical surveys have been undertaken in the recent past by the department..

➤ Etc.

Available data and staff for Japanese team if we will make geological maps, mineral occurrence map, mining concession map and GIS Data-Base and their ambition for them in the future

All GSD staff potentially available for the project. But not all may possess the required expertise

III. GIS, Sat-image interpretation

1. General concern of GIS application

1) Please specify current issues on geologic/mining information management or awareness of the issues as concretely as possible.

Limited knowledge of and use of GIS; Limited GIS facilities at the department

2) Please describe effects, or expected effects, to metal mining sector by utilizing GIS to facilitate geologic/mining information services.

Easier integration of different types of geoscientific information

3) Please describe concrete examples of GIS application in mining sector.

Mineral potential mapping and area selection for prospecting

2. Items to be compiled and managed in GIS

Fill in the blank of Table 1. Please add rows with specified items to the table, if you have any other items to be considered.

3. Facilities of GIS management

Please describe current facilities for GIS management according to the following aspects.

1) Computer (CPU, Memory, HDD, Operating system, etc)

	<i>Quantity</i>	<i>HDD (GB)</i>	<i>RAM (MB)</i>	<i>Acquisition Year</i>	<i>Operating System</i>
<i>COMPAQ Pentium I</i>	<i>1</i>	<i>10</i>	<i>96</i>	<i>1998</i>	<i>Win NT</i>
<i>IBM Pentium IV</i>	<i>1</i>	<i>40 (hard disk full)</i>	<i>128</i>	<i>2000</i>	<i>Win 2000</i>
<i>IBM Pentium IV</i>	<i>1</i>	<i>20 (hard disk full)</i>	<i>128</i>	<i>2000</i>	<i>Win XP</i>
<i>HP Pentium IV</i>	<i>1</i>	<i>120</i>	<i>256</i>	<i>2006</i>	<i>Win XP</i>

2) Input/Output devices (Display, Printer, Scanner, Plotter, Digitizer, etc)

<i>device</i>	<i>quantity</i>	<i>Operational status</i>	<i>Acquisition Year</i>
<i>HP LJ5000 printer</i>	<i>1</i>	<i>working</i>	<i>2000</i>
<i>HP LJ4 printer</i>	<i>1</i>	<i>working</i>	<i>1994</i>
<i>HP 450c plotter</i>	<i>1</i>	<i>Not working, requires repair</i>	<i>1999</i>
<i>HP 750c plotter</i>	<i>1</i>	<i>Not working, requires repair</i>	<i>1998</i>

3) Software (GIS, Image analysis, Version, Distributor, etc)

<i>software</i>	<i>version</i>	<i># of licences</i>	<i>distributor</i>
<i>MapInfo</i>	<i>6.5</i>	<i>1</i>	<i>Spatial Technology, South Africa</i>
<i>MapInfo</i>	<i>7.0</i>	<i>1</i>	
<i>Discover*</i>	<i>5</i>	<i>1</i>	<i>ENCOM Technology, Australia</i>

The MapInfo licences are running on machines whose hard disks have filled up

The Discover software is an extension of MapInfo, giving extra functionality to Mapinfo

4) Staff (Number, Education level, Special training skill, etc)

(As given out to you in the staff list)

5) Others (Maintenance/Running cost of hardware and software, etc)

The department does not currently have maintenance contracts for the hardware. There is no annual maintenance for any of the software. Three of the four PCs used for GIS work require replacement, as do the two plotters which don't work. Actual running costs not known due non-operational state of some of the equipment like the plotters.

4. GIS application in the other field

Please describe examples of application of GIS in any other field than mining sector, for example agriculture, forestry, natural resources management, tourism etc.

Environmental monitoring and management; land use management

5. Opportunity of application of satellite images in geology

Please describe examples of satellite images application in geologic mapping, mineral exploration and/or metal mining sector.

Extraction of regional structures, alteration zones

6. Education and/or training

Please describe literacy situation and education system of GIS and Satellite image application according to the following categories.

1) In general

Not every geoscientist in the department is conversant with GIS and Remote Sensing. There are some who have been exposed to GIS and Remote Sensing

2) GIS application in geology/mining

Literacy ranges from those geoscientists with no knowledge to two who are fully conversant with some software like ArcGIS

3) Satellite image application / processing / interpretation in geology/mining

Literacy ranges from those geoscientists with no knowledge to those fully conversant with some software like 3D Analyst, Image Analysis and Spatial Analyst extensions of ArcGIS.

Table 1 List of items to be compiled and managed in GIS

Items	Medium and condition (paper, sheet, digital data, etc)	Source	Quantity / Amount with unit	Target User (internal staff, visitor, private firm, individual, foreigner, etc)	Update frequency for sustainable management	Storage location	Remarks	On-site check availability during the mission visit
Mineral inventory	Paper,digital	GSD	2700 records	All categories of users	As and when new data and information available	GSD Chamber Mines		
Tectonic map	Paper	GSD		All categories of users	As and when new data and information available			
Geologic map	Paper,digital	GSD	100	All categories of users	As and when new data and information available	GSD		
Geochemical map		GSD		All categories of users	As and when new data and information available	GSD		
Geochemical data	Paper,digital	GSD	30,000+ records	All categories of users	As and when new data and information available	GSD		
Geophysical map	Paper,digital	GSD	1 aeromag digital	All categories of users	As and when new data and information available	GSD		
Geophysical data	Paper,digital	GSD	200+ analogue maps	All categories of users	As and when new data and information available	GSD		
Mineral exploration data obtained by private companies	Paper	GSD MDD	600+ reports	Prospecting companies	As and when new data and information available	MDD, GSD Chamber Mines		
Literature, Journal	Paper	GSD	Quantity unknown	All categories of users		GSD		

Internal Report	Paper	GSD	Quantity unknown	Internal staff		GSD	
Satellite image		JICA		Internal staff			
Basic information (infrastructure)	paper	Survey Dept		All categories of users			
Mining Claim	Paper, digital	MDD		All categories of users	As and when new data and information available	MDD	
Others (please specify)							

END



REPUBLIC OF ZAMBIA

MINISTRY OF MINES AND MINERALS DEVELOPMENT

GEOLOGICAL SURVEY DEPARTMENT

ANNUAL REPORT FOR THE YEAR 2003

1.0 Organisation and Structure

The Geological Survey Department is one of the four departments under the jurisdiction of the Ministry of Mines and Minerals Development. The structure and organisation of the department is shown in figure 1.1. The department is headed by a director and has four sections: Administration, Economic Geology, Laboratories and Regional Mapping sections.

2.0 Introduction

The Department had no major government financed geological field programme because all the proposed projects which fell in the Capital projects in the draft 2003 budget were rejected by Ministry of Finance and National Planning. The only projects undertaken were technical co-operation with Czech Geological Survey. Under this co-operation two environmental study projects were undertaken.

3.0 Staff

Most of the senior positions were full in the establishment of the Department. However, some critical positions including those of documentalist, geologists, metallurgist, electronics engineer, seismologist, cleaners, drivers and watchmen were vacant. The position of documentalist is very critical in the data management of the department. He is responsible for overseeing the geological data archives, technical records and the Library. The electronics engineer is responsible for geophysical and seismic equipment. There is a shortage of drivers due to attrition over the years. The drivers form a critical support staff during fieldwork. Otherwise, the geologists have to perform dual roles of a professional and a driver. Watchmen at the remote seismic stations are critical because of the increased vandalism on the seismic equipment especially solar panels.

3.1 Recruitment

There was no recruitment in the year 2003 because the Department did not get the authority from Cabinet Office.

3.2 Retirement

Mr. Stuard Chifokolo, an Assistant Stores Officer, was retired in the nation's interest on 30th November 2003.

3.3 Resignations

The new staff recruited was slowly settling in and consequently there were no resignations during the year.

3.4 Staff Development

The department continued in its quest to enhance the skills of members of staff. Three members of staff left for further studies abroad, these are Mr. Mbula Tindisa, a Technician, who got a scholarship to do a two year course in gemology in Germany; Mr. Chisonga Benny, a Geologist/Seismologist, left for his two year MSc programme in Ore Petrology at Rands Afrikaans University (RAU) in the Republic of South Africa; and Mr. Banda Marilo, a Geologist, was awarded the VLIR scholarship to pursue an MSc in Water Resources Engineering at Leuven in Belgium while one member of staff, Mr. Ndhlovu Felix, a Learner Cartographer, got admitted at University of Zambia to pursue a BSc. in Engineering. Miss Chungu Patricia, an Assistant Stores Officer, pursued a one-year course (Jan – Dec) in Purchase and Supply at ZICAS under the sponsorship of the Zambia National Tender Board.

The department facilitated the training of four members of staff in the 8-week (20th Oct – 8th Dec) MSDP – EU sponsored short-course in Gemology at the University of Zambia. These are: Mr. Chilumbu Delax – Principal Metallurgist, Mr. Mwila Gerald – Geologist, Mr. Mwamba Kelvin C. – Geologist, and Mr. Kambikambi Patson – Senior Technician. Mr. Kunkuta E. C. a Senior Seismogram Analyst was sent for training in South Africa for a UNESCO organised, Germany Government sponsored short course (7th Sept – 15th Oct) in Seismology, Hazard Assessment and Risk Mitigation.

Other members of staff were supported to attend workshops on various issues. These include:

- The Ag. Director Mr. Liyungu K. A., Senior Geophysicist Mr. Lombe D. K., Senior Chemist Mr. Mumba L. and Administration officer Mr. Mugala K. who attended a management seminar organised by the Ministry on Annual Performance Appraisal System (APAS) from 9th –15th November in Ndola.

- Mr. Lombe D. K., Senior Geophysicist attended a workshop on 6th – 10th May in Norway and another one on 29th September – 10th October in the Netherlands
- Messrs Dokowe A. P. and Mwila G. attended a British Geological Survey sponsored workshop on Metadatabase in South Africa from 3rd to 4th December.
- Mr. Mwale M. attended a workshop on ... sponsored by JICA on 12th May.
- Mr. Chimanya K. C. attended a workshop on 8th – 10th January University of Zambia and Kansas University.
- Messrs Chimanya K. C. and Ndhlovu R. attended a workshop 25th – 26th July sponsored hydrogeology by BGR – Germany.
- Messrs Mumba L. and Mwembela C. attended a NUSESA workshop on AAS maintenance and repair (13th – 17th October at UNZA
- Mr. Mwembela Constantino – Chemist, Ms. Mwanza Beverly - Metallurgist, Ms. Mubita Barbara - Secretary, and Mr. Nkole Gibson – Data Entry Clerk attended a ZANARA workshop for peer educators on HIV/AIDS (20th – 24th October) held at Manchinchi Bay Lodge in Siavonga.

3.6 Deaths

The department lost two members of staff. Mr. J. Banda, a Watchman, died on 6th March 2003, while Mr. B. Sichone, a Field Survey Orderly, passed away on 15th August 2003.

4.0 Major Programmes, Strategies and Extent of Execution

4.1 Regional Mapping (F. M. Njamu, Ag. Chief Geologist)

There was no regional geological mapping during the year because all the Capital Funding projects for the Department under which the mapping was falling were removed from the 2003 Budget by Ministry of Finance and National Planning.

4.2 Geophysics Unit (D. K. Lombe, Senior Geophysicist)

Repair of communications link between the NDC VSAT and Vienna IDC

Renovations to the Geophysics Section by partitioning to create offices for the three station handymen and renovate the former seismogram analysis room to convert it to an office for Senior Geophysicist

Hydrogeological Mapping and Ground Water Exploration

Formulating a project proposal “Hydrogeological Mapping and Ground Water Exploration in Southern Province” with the Department of Water Affairs, University of Zambia, Geology Department.

Extracted and printed magnetic maps for Chipata, Lumezi (Lundazi), and Sasare (Petauke) Areas for a geology student at the University of Zambia, Geology Department. The student was doing research on “Lithological and Magnetic Association of Gold Occurrences in Eastern Zambia”.

Compiled the following project proposals to be funded under the Mining Sector Diversification Programme:

- ***Evaluation of the potential authentication of emerald mineralisation in Northwestern Province.***
- ***Establishment of geophysics and geochemistry database.***

Our foreign co-operating partners made visits to Lusaka for the following purposes:

- Expert from CTBTO came in April to fix the indoor equipment at N-192, Geophysics Section, GSD and conduct some testing of the seismic equipment at Kapopo.
- Expert from USGS-ASL and CTBTO came in May to fix the equipment at Kapopo seismic station.
- A meeting was held between Geophysics Section and USGS-ASL & CTBTO experts on 22nd May 2003 to discuss pertinent issues related to smooth operations of the Lusaka seismic station and the National Data Centre and the establishment of linkages for seismic data and information transmission and exchange between the three institutions and between the Lusaka seismic station and the NDC at GSD.

There was high frequency seismic noise associated with the seismic waveform records at Lusaka seismic station.

Compiling of individual mine reports for the mines visited during the 2001 Czech-GSD research in Kafubu emerald area in the Copperbelt

13 – 28 June the Geophysics Section was involved, through the Senior Geophysicist, in the Environmental Research of the Kafubu Emerald Area in Ndola Rural in collaboration with the Czech Geological Survey geologists. During the same period some of the individual reports for the visited mines during the Lithological, Petrological and Geochemical Research of Beryl Mineralization in the Kafubu Emerald Area, Zambia, conducted in 2001 were distributed.

4.3 Geochemistry Unit (B. Ng’uni)

4.3.1 Processing of Geochemical Data for the Compilation of Geochemical Atlas of Zambia

Processing of geochemical data to produce maps covering four (4) Quarter Degree Sheets was the main objective for the Geochemistry Unit. The Regional Mapping (RM) and Metalogenic Province (MP) samples had been analysed for seven (7) elements. The computer processing of the Geochemical data was done in the first 8 months of the year with the assistance of a former Senior Geochemist (A.P. Dokowe) now transferred to head the Industrial and Base Metals Unit of the Economic Section. The data is currently only in Geosoft software digital form on the geochemistry computer and on a backup disk. RM processed and re-processed geochemical data is available for the following areas: -

<i>GSD Geochemistry prefix</i>	<i>Area</i>	<i>Quarter Degree Sheet</i>	<i>GSD Geochemistry prefix</i>	<i>Area</i>	<i>Quarter Degree Sheet</i>
04HB	Namwala	1525B	05EB/05DD	Solwezi / Tenke	1226B /1126D
05EB	Solwezi	1226B	05ED	Solwezi	1226D
08GB	Mulungushi	1429B	08GC	Mulungushi	1429C

08GD	Mulugushi	1429D	09GA	Petauke	1430A
10EB	Mwanya	1231B	11BA	Tunduma	0932A
11DA	Shiwangandu	1132A	11DC	Shiwangandu	1132C
11ED	Mwanya	1232D	12EC	Lundazi	1233C
11EB	Lundazi	1232B			

MP processed data is also available as combined data for all the sampled areas.

The computer manipulation/processing of geochemical data is an on going exercise that depends on the requirements of the end users. The maps vary when some parameters are changed for the same element(s) (e.g gridding, concentration ratios, search radius or contour intervals)

4.3.2 GSD and ‘Old Minex’ Sample Store Inventory

The current state of samples in the geochemistry sample store at the GSD geochemical sample store is not in a desired condition. There is some order but in many places there is a possibility of contamination of one sample by another. To correct such a situation, inventory of samples was initiated. There is need to improve the documentation of samples available in the store. Most of the samples have been sieved to –80mesh and only analysed for seven (7) elements namely Cu, Co, Pb, Zn, Mn, Fe and Ni except the samples covering Mwinilunga area that were analysed for forty-three elements. Absence of analytical data for the other elements justifies the importance of the inventory exercise should there be a need for reanalysis. The other samples are at the former Minex office sample store. At the old Minex sample store there is some relatively good order. The problem with the samples at the old Minex sample store is that analytical results are still on hard copies in various reports.

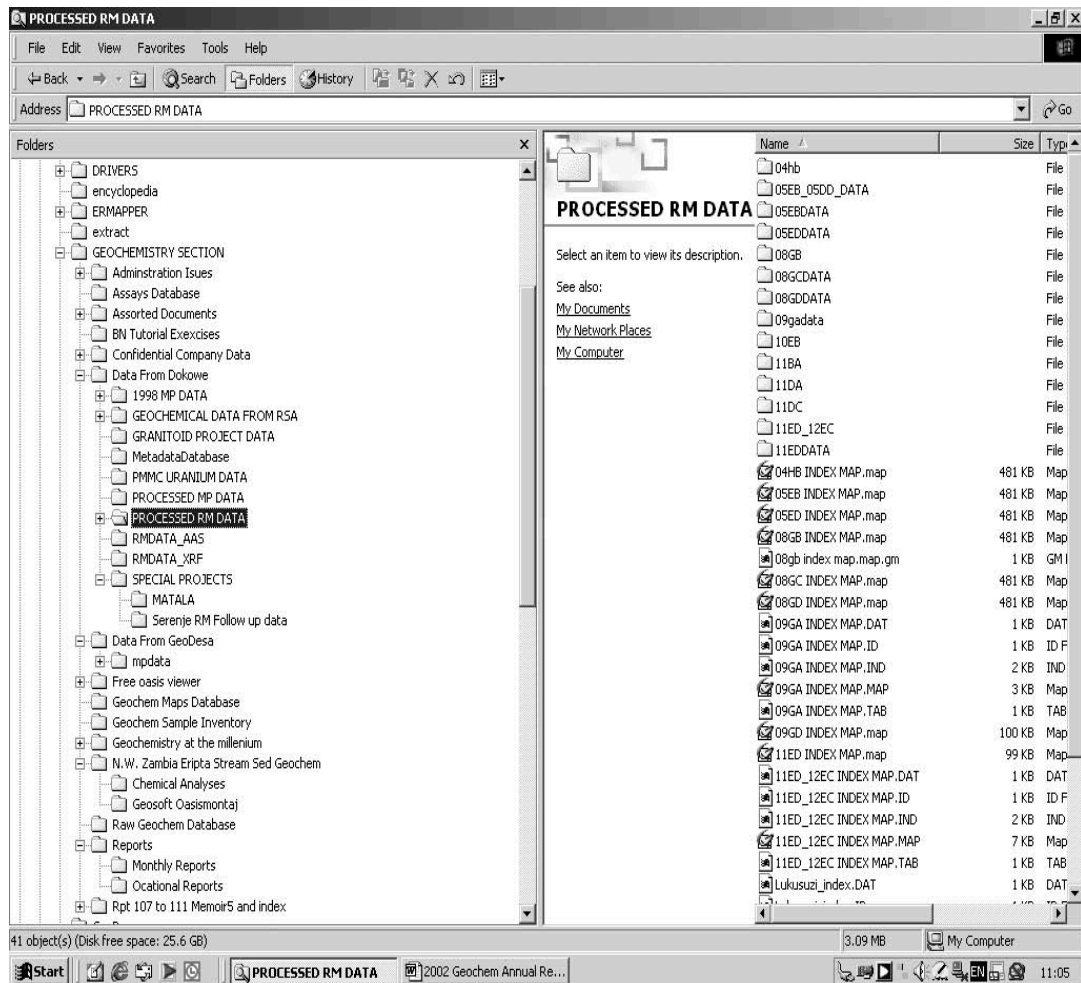
Inventory of samples at the GSD geochemistry sample store is in progress. A total of 5800 samples were counted up to the end of the year 2002. 2362 samples of the above counted samples have been entered into a new sample inventory database with the

following parameters for each sample: - Area code, Project code, Sample number, Sample type, Store location ID, Sieved size fraction and General comments. This information will later be merged with existing assay data and it will be of help to know which samples have been analysed and if need be, to know the available samples which can be reanalysed for other elements.

Inventory of the old Minex sample store has not yet commenced but is expected to commence during the year 2003.

4.3.3 Reorganisation of Geochemical Database

The geochemistry database was transferred to a Pentium 4 IBM computer assigned to the Geochemistry Unit. Two backup disks have been created for the analytical data and inventory data for safe keeping in case a computer breaks down. The geochemistry data on the computer is stored as follows:-



4.3.4 Interpretation of Be and Cr Anomalies in NW Zambia In relation to Emerald Mineralisation

Processing and interpretation of the geochemical stream sediments analytical results from the ERIPTA Project for beryllium (Br) and chromium (Cr) show two distinct anomalous areas in the NW Province. The areas could on a regional scale be considered prospective for emerald mineralisation but this has to be followed by detailed geological, geophysical and geochemical orientation surveys. The two area include: -

- The Lumwana West area on the NE part of the Kabompo Done mainly covered by Basement Complex rocks and bound by UTM 280000mE to 330000mE and 8670000mN to 8710000mN.
- The Mwinilunga area covered by Lower Kundelungu rocks and bound by UTM 200000mE to 240000mE and 8670000mN to 8720000mN.

The above anomalous Cr and Be areas from stream sediment considered in this case generally represent those areas above 70 ppm Cr and above 3ppm for Be. It is also evident that there is no correlation between the two elements. However even the Ndola Rural area with proven emerald mineralisation does not show correlation of Cr and Be. (Seifert, A.V., Vra'na, S., Zacek, V., 2002)

Below are summary statistics for the two elements in the NW Province: -

	Cr_2ppm Det. Limit	Be_1ppm Det. Limit
Minimum	1	0.1
Maximum	1191	11
Mean	48.62	0.57
Geo. Mean	23.96	0.21
Median	25.11	0.10
Mode	11.02	0.10
Std Dev.	59.51	0.95
Std Err.	1.05	0.13
Skewness	4.17	2.93
Kurtosis	51.33	14.5

4.5 Economic Geology

The Economic Section undertook three projects last year. Two of these were environmental projects under the co-operation with the Czech Geological Survey. These are Impact assessment of mining of beryl mineralisation on the environment in the Kafubu area; Problems and Solutions, Zambia and the Impact assessment of Mining and Processing of copper and cobalt ores on the environment of the Copperbelt. The third project was the Chinese Embassy geological engineering site investigation.

4.5.1 Impact assessment of mining of beryl on the environment in the Kafubu area

The fieldwork was undertaken in the Kafubu area where the beryl mining is done. The study indicated there is extensive damage to environment, fauna and flora because of the large excavations that are done during. The detailed information is contained in the publication on the same.

4.5.2 Impact assessment mining and processing of copper and cobalt ores on the environment of the Zambian Copperbelt

The Zambia Geological Survey Department, The Geology Department, School of Mines in collaboration with the Czech Geological Survey did soil, stream sediment, agricultural products and water sampling on the Copperbelt. The project aims to assess the overall environmental impact of copper cobalt mining and metallurgical processing on the environment. The project will assess the effects acidic emissions to the environment, environmental scarring, possibility of water pollution, contamination to agricultural produce. The project is still ongoing and will end in 2006. The results of the project will come after 2006.

4.5.3 Geological engineering site investigations at the Chinese Embassy Plot

The geological engineering site investigations were done at the plot of the Chinese Embassy in Lusaka. This was done in order to ascertain the suitability of the plot to build on. A comprehensive study of the plot was done covering geological mapping, pitting and logging, geophysical studies and soil rock engineering properties.

4.6 Laboratories

4.7 Mineral Dressing Laboratory (J. M. Zulu, Ag Senior Metallurgist)

4.7.1 Diatomaceous Earth Treatment

At the request of Mr. C. Wamulwange, a preliminary evaluation was carried out to separate siliceous material from clay (Diatomaceous Earth) to achieve a product specification of less than 3% silica. The testwork programme included natural flotation (without addition of reagents), sedimentation and cycloning. While flotation results were poor, preliminary results for sedimentation and cycloning were encouraging. The work was however, not concluded due to persistent interference and unilateral change of the testwork programme by the client.

4.7.2 Tumbling Drum for Surface Cleaning of Quartz

The Section was initially requested to test whether it was possible to clean and polish quartz stone /rock surfaces using available laboratory facilities. After preliminary tests it was confirmed that the work could be done although constraints, which included low capacity and inappropriate materials of construction for the available units, were recognised. A portable tumbling unit was therefore designed to meet the desired processing rate of 2.4 tonnes per day.

4.7.3 Rehabilitation/ Upgrading of Metallurgical Laboratory

Due to lack of funds, no progress was made on this project. In an effort to source alternative funding, a bid was submitted to the Performance Improvement Fund in 2002 but no feedback was received. However, a Project Proposal was submitted to the Mining Sector Diversification Programme (MSDP) for consideration.

4.7.4 GSD/ECZ Environmental Inspection of Dunrobin Gold Mine

A report on the first sampling campaign to assess the environmental impact of cyanide around the closed Dunrobin Mine was issued in 2002. However, due to constraints encountered with chemical analysis after the first campaign, another sampling exercise was recommended but no further communication was received from the Environmental Council of Zambia.

4.7.5 Scrap Metal Inspections

Scrap metal inspections were carried out as per agreed schedules with clients throughout the year.

4.8 Chemical Laboratory (L. Mumba, Senior Chemist and C. Mwembela, Chemist)

4.9 Mineralogical and Petrological Laboratories (F. Chibesakunda, Geologist)

The Mineralogy/Petrology laboratory provides an insight into the geology through mineral, rock and core data acquisition and processing to the department and the public. It is a support unit for the Department as it forms the focus of the mineral, rock and core analysis to complete and complement the field geological work. It consists of the Mineralogy /Petrology laboratory, rock and core stores, and the geological museum.

The laboratory is involved in the rock cutting to prepare mineral thin sections for further studies. The laboratory has the cutting and lapping equipment, which have been operating below the capacity for sometime now. This is due to finished blades and accessories. The section was capable of handling internal and external assignments for thin and polished mineral sections. However, this is not the case and worse is the fact that the ornamental slab orders for our clients cannot be met.

4.9.1 Museum

This is another important part of the unit that provides general geological processes that occurred in Zambia and hosts local and some international rock and mineral specimens. It is open to the public, especially students and investors. It has been undergoing rehabilitation for a year now and restocking with minerals. The upgrading process is slow due to inadequate funds.

4.9.2 Core and Rock stores

The core and rock stores are well stocked with rocks and cores collected over time in the country. This part of the unit is vital and will need upgrading and restocking as well to suit the required standards. The core shed is housed in the metallurgical unit and hence the interference during peak hours. The rock store is almost full and will need extension for anticipated field work next year.

The section remains an important pillar of the department for it makes the research work complete and as such it should be given the attention it deserves.

4.10 Information Unit/Technical Records (R. Simonda, Library Assistant)

The position of documentalist was still vacant during the year because the Department did not get the authority to employ from Cabinet Office. This scenario meant that the Technical Records Office continued to be understaffed. Consequently, the data management of the Department was affected. The record services provided to the members of the public, exploration and mining companies was not to the desired quality because of the aforementioned.

Despite the staff shortfall, the unit continued to provide information to members of the public, mining and exploration companies and the government departments and ministries.

Termites affected the library and the Department was in the process of identifying a service provider to eradicate the termites.

5.0 Major Constraints

The major constraints continued to be poor funding and old unserviceable equipment. Geological mapping and other economic mineral appraisal programmes included in the draft 2003 budget were not approved by the Ministry of Finance and National Planning. There were vacant positions to in the Department. The positions are critical to the smooth running of the Department. These include geologists, senior metallurgist, documentalist, chemist, registry clerk, drivers and some watchmen.

6.0 Proposed Solutions

The Department put up a number of project proposals to the European Union under the Mining Sector Diversification Programme (MSDP) and Czech Geological Survey and the Zambia Geological Survey co-operation. The Department also lobbied Ministry of Finance and National Planning to consider the importance of the Geological Survey Department programmes to the economic growth and asked for improved funding in order for it to execute its statutory functions.

The Department sought for permission through the Ministry of Mines and Minerals to recruit the critical staff.

References

(Seifert, A.V., Vra'na, S., Zacek, V. 2002. Lithological, geochemical and petrological research of beryl mineralization in the Kafubu Area, Zambia).

Appendices

6. ザンビア地質調査局スタッフリスト

GEOLOGICAL SURVEY DEPARTMENT

STAFF LIST AS AT 31ST MARCH, 2003

NAME	STAFF #	D.O.B	SEX	NRC. #	POST	DATE OF FT. APPT	DATE OF P. APPT.	SALARY SCALE	MAN #	CONDITION OF SERVICE	QUALIFICATIONS
K A LIYUNGU	AE:92916	1959/11/15	M	172168/84/1	A DIRECTOR	1984/8/13	2000/2/12	PMS/02	112213	LOCAL	B.Min. Sc & Msc. Geology
B S KUMWENDA	S:110572	1950/3/16	M	134964/51/1	C GEOLOGIST	1977/8/22	2000/2/12	PMS/03	83640	LOCAL	B.Min. Sc & Msc. Geology
D T CHILUMBU		1958/12/23	M	318607/11/1	C METALLURGIST	2002/5/27	2002/2/27	PMS/04	174765	LOCAL	B.Min & Msc. Metallurgy
K MWEEEMBA	S:147646			331967/11/1	SNR METALLURGIST		2002/4/8	PMS/06	124724	LOCAL	B.Min
D K LOMBE	S:121724	1958/6/5	M	129643/41/1	SNR GEOPHYSICIST	1983/8/8	1993/6/18	PMS/06	110069	LOCAL	B.Min & Msc. Geophysics
A DOKOWE	AE:141889	1961/3/12	M	228398/74/1	SNR GEOLOGIST	1986/9/1	2000/2/12	PMS/06	116995	LOCAL	B.Min. Sc, Pgr. Dip. Min. Exploration
FRED M NJAMU	AE:105753	1963/6/19	M	198239/66/1	SNR GEOLOGIST	1991/11/1	2000/2/20	PMS/06	152188	LOCAL	B.Min. Sc & Msc. Geology
E MULENGA	AE:104621	1966/12/22	M	136603/63/1	SNR GEOLOGIST	1991/9/17	2000/2/20	PMS/06	146985	LOCAL	B.Min. Sc & Msc. Geology
R N NDHLOVU	AE:99794	1963/5/16	M	388802/11/1	SNR GEOLOGIST	1988/11/14	2000/8/23	PMS/06	120961	LOCAL	B.Min, Pgr. Dip. Hydro-Geology
K C NJOBVU	AE:77003	1953/10/10	M	182683/61/1	SNR GEOLOGIST	1994/6/20	2000/8/12	PMS/06	152511	LOCAL	B.Min. Sc & Msc. Geology
E MBUMBA	AE:126341	1954/12/15	M	151369/21/1	SNR GEOLOGIST	2002/6/3	2002/6/3	PMS/06	174720	LOCAL	B.Min. Sc & Msc. Geology
B NGUNI		1967/7/8	M	218776/66/1	SNR GEOCHEMIST	2002/7/15	2002/7/15	PMS/06	175051	LOCAL	B.Min. Sc, Cert. Image Proc. & Interpr
L MUMBA	S:132916	00/00/56	M	128726/65/1	SNR CHEMIST	2000/2/12	2000/2/12	PMS/06	118924	LOCAL	B.Min. Sc, Pgr. Dip. Analytical Tech.
M N MUMBA	S:151231	1967/8/20	F	153997/11/1	ADMIN OFFICER	2000/4/17	2000/4/17	GMS/06	116739	LOCAL	Dip. Personnel Mgt. Cert. In HRMD. Cert TS
B CHISONGA	AE:126579	1978/3/7	M	113421/77/1	SEISMOLOGIST	2002/5/10	2002/5/10	GPS/02		LOCAL	B. Min, Sc
F CHIBESAKUNDA	AE:112346	1978/2/5	M	172406/45/1	PETROLOGIST	2002/5/14	2002/5/14	GPS/02	174584	LOCAL	B. Min, Sc
B MWANZA	CRA:9596	1978/9/9	F	317633/67/1	METALLURGIST	1999/6/1	2000/2/12	GPS/02	170935	LOCAL	B. Min, Sc
J M ZULU		1958/4/6	M	299459/52/1	METALLURGIST	2002/4/15	2002/4/15	GPS/02	174533	LOCAL	B. Min, Sc
C SICHULA			M		METALLURGIST				174651	LOCAL	B. Min, Sc
M S MUBU		1956/10/25	M	302929/11/1	GEOPHYSICIST	1991/6/10	1991/6/10	GPS/02	145227	LOCAL	B. Min, Sc
E M SIWALE		1974/11/30	M	622736/11/1	GEOPHYSICIST	2002/10/28	2002/10/28	GPS/02		LOCAL	B. Min, Sc
H CHIKAMBWE	S:146824	1960/9/24	M	132657/15/1	GEOLOGIST	1994/4/3	2000/8/23	GPS/02	152219	LOCAL	B. Min, Sc
B MWIBEYA	AE:117797	1966/10/5	M	263303/74/1	GEOLOGIST	2000/8/23	2000/8/23	GPS/02	158625	LOCAL	B. Min, Sc
J BANDA	AE:1199512	1970/10/28	M	526960/11/1	GEOLOGIST	2000/8/23	2000/8/23	GPS/02	170757	LOCAL	B. Min, Sc
F NZABARA	CRA	00/00/53	M	567293/99/3	GEOLOGIST	2000/8/23	2000/8/23	GPS/02	170935	CONTRACT	B. Min, Sc
M BANDA	AE:126588	1973/2/25	M	274907/53/1	GEOLOGIST	2002/5/10	2002/5/10	GPS/02	174671	LOCAL	B. Min, Sc

NAME	STAFF #	D.O.B	SEX	NRC. #	POST	DATE OF FT. APPT	DATE OF P. APPT.	SALARY SCALE	MAN #	CONDITION OF SERVICE	QUALIFICATIONS
K C MWAMBA		1976/8/27	M	206697/42/1	GEOLOGIST	2002/5/13	2002/5/13	GPS/02	158685	LOCAL	B. Min, Sc
G MWILA	AE:126340	1975/2/3	M	295744/46/1	GEOLOGIST	2002/5/13	2002/5/13	GPS/02	170757	LOCAL	B. Min, Sc
K C CHIMANYA	AE:126351	1974/9/12	M	197293/31/1	GEOLOGIST	2002/5/14	2002/5/14	GPS/02	170935	LOCAL	B. Min, Sc
M MWALE	AE:113838	01/01/68	M	486536/11/1	GEOCHEMIST	1996/3/19	2000/3/6	GPS/02	174671	LOCAL	B. Min, Sc
VACANT (10)											
VACANT(1)											
VACANT (1)											
C MWEMBELA	AE:127974	1972/9/18	M	183959/31/1	CHEMIST	2002/4/15	2002/4/15	GPS/02	174537	LOCAL	B.Sc
K MOONO	S:153188	1970/4/2	M	148432/73/1	SNR ST. OFFICER	1992/9/11	2000/4/10	GAS/04	153188	LOCAL	CIPS I,II,III,IV
K MUGALA	AE:121375	1974/1/24	M	202918/76/1	EXEC. OFFICER	1995/3/1	2000/2/8	GAS/04	164330	LOCAL	CERT. Mgt & Admin, Dip
C W MWANAKAABA	S:146162	1974/7/22	M	620536/11/1	REG. OFFICER	1993/9/22		GAS/04	159879	LOCAL	Int Egn. Relations Systems Analysis
G GNKOLE	S:84962	1961/2/20	M	127392/46/1	DATA E. CLERK	1981/7/1	2000/3/1	GAS/05	104787	LOCAL	Cert. Computer Network, Dip. Electronics
M LOMBANYA	AE:124377	1974/3/19	F	583683/11/1	DATA E. CLERK	1997/7/21	2002/3/13	GAS/05	173471	LOCAL	Cert. Data Processing and Programming
L CHONGO	AE:126802	1972/9/13	M	540107/11/1	LAPIDARY	2002/5/2	2002/5/2	GAS/07	174535	LOCAL	Craft Cert. Fitting
J SIKALUMBI		1972/4/11	M	544786/11/1	LAPIDARY	2002/5/8	2002/5/8	GAS/07	174670	LOCAL	Craft Cert. Electrical
P K CHUUNGU	AE:126343	1978/6/5	F	273981/16/1	ASST. STORES OFF.	2002/5/3	2002/5/3	GAS/06	174558	LOCAL	CIPS I
S CHIFOKOLO	AE:103105	1962/10/10	M	152530/17/1	ASST. STORES OFF.	1990/7/9	1990/7/9	GAS/07	124833	LOCAL	Form V
F SALIMU	AE:76285	1949/6/6	M	101464/11/1	F. S. ORDERLY	1973/2/12	1973/2/12	GAS/08	98394	LOCAL	Grade VII
R M SIMONDA	AE:103107	1961/4/7	M	148222/81/1	F. S. ORDERLY	1990/1/12	2002/4/19	GAS/08	124593	LOCAL	Cert. In Lib Studies
H TUMBE	AE:126798	1977/2/25	M	209737/42/1	F. S. ORDERLY	2002/4/25	2002/4/25	GSS/15	174525	LOCAL	Grade VII
J M BWALYA	S:84845	1955/1/25	F	135292/45/1	CARTOGRAPHER	1974/8/3	1989/8/1	TS/04	72165	LOCAL	Cert. In cartography
K L MUHAMUBI	S:91538	1956/12/26	F	315281/11/1	CARTOGRAPHER	1977/9/1	1994/9/1	TS/04	83720	LOCAL	Cert. In cartography
C E CHIBANDA		1970/5/16	F	512566/11/1	CARTOGRAPHER	1990/2/12	2000/2/12	TS/04	125120	LOCAL	Dip. In cartography
M JAMBA	AE:126797	1972/5/9	M	215678/64/1	CARTOGRAPHER	2002/4/11	2002/4/11	GSS/11	174527	LOCAL	Cert. In Draughting
B I KASONDWA	AE:96571	1964/6/27	M	422801/11/1	S. ANALYST	1987/12/1		TS/06	119027	LOCAL	Cert In Seismology
VACANT (3)					S. ANALYST			TS/06		LOCAL	
U N TEMBO		1967/6/2	M	203297/64/1	LIBRARY OFFICER	2002/7/19	2002/7/19	TS/06	174592	LOCAL	Cert+. In Lib. Studies
VACANT(1)					LIBRARY OFFICER			TS/06		LOCAL	
										LOCAL	
C MFUNE		1969/6/3	M	225059/66/1	A. CARTOGRAPHER	2002/4/22	2002/4/22	TS/05	174528	LOCAL	Cert. In Draughting
J BWALI	AE:126408	1981/4/2	M	771439/11/1	A. CARTOGRAPHER	2002/4/29	2002/4/29	TS/05	174659	LOCAL	Grade VII
P HAMWEEMBA (2)		1980/2/6	F	734352/11/1	A. CARTOGRAPHER	2002/5/7	2002/5/7	TS/05	174677	LOCAL	CABS

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VACANT (2)					A. CARTOGRAPHER			TS/05			
G MUSONDA		1979/5/3	F	657044/11/1	S. HANDYMAN	2002/4/25	2002/4/25	TS/07	174538	LOCAL	Grade VII
M M MUTAFI	AE:126357		F		S. HANDYMAN			TS/07	174680	LOCAL	Grade VII
A KATUNDU	AE:126794	1976/6/22	F	189180/7/1	S. HANDYMAN	2002/5/21	2002/5/21	TS/07	174717	LOCAL	Grade VII, CABS
VACANT (1)					S. HANDYMAN			TS/07			
A M MUTALE	AE:126344	1974/11/4	M	608975/11/1	GEO. ASST	2002/5/9	2002/5/9	TS/07	174673	LOCAL	Grade VII
P CHIPUMBU	AE:126577	1981/8/25	M	400599/64/1	GEO. ASST	2002/5/13	2002/5/13	GSS/14	174648	LOCAL	Grade VII
VACANT (1)					GEO. ASST			TS/07			
G SITALI		1977/11/27	F	712078/11/1	A. LIBRARY OFF.	2002/4/30	2002/4/30	TS/07	174678	LOCAL	Grade VII
R C MUMPANSHA		1978/4/1	F	633478/11/1	A. LIBRARY OFF.	2002/4/30	2002/4/30	TS/07	174668	LOCAL	Grade VII
B SHEZONGO	AE:126792	1967/1/7	M	446102/11/1	L. CARTOGRAPHER	2002/4/3	2002/4/3	TS/08	174525	LOCAL	Grade VII
F NDHLOVU	AE:126352	1981/4/29	M	819127/11/1	L. CARTOGRAPHER	2002/5/13	2002/5/13	TS/08	174719	LOCAL	Grade VII
W MWAJANANZALA	AE:111078	1970/12/28	M	491864/11/1	ACC. ASSISTANT	1995/3/6	1995/3/6	TS/05	164120	LOCAL	Grade VII, ATD
S SIKAZWE	AE:126579	1980/2/24	F	805262/11/1	R. CLERK	2002/4/28	2002/4/28	GAS/07	174721	LOCAL	Dip. In AAT
J NKOLONGANYA			M		R. CLERK			GAS/07		LOCAL	
B M MUBITA	AE:121659	1966/5/18	F	187106/13/1	STENOGRAPHER	1996/11/12	2000/4/12	GAS/04	167621	LOCAL	Cert. Private Secretary
M NDABA	S:146163	1949/12/8	F	256765/11/1	STENOGRAPHER		2000/5/8	GAS/04	85485	LOCAL	80/90 wpm
M NYEMBA	AE:126799	1978/8/3	F	667287/11/1	STENOGRAPHER	2002/4/25	2002/4/25	GAS/04	174532	LOCAL	Shorthand
PETER MITI	AE:126578	1977/6/26	M	462159/52/1	F. S ORDERLY	2002/4/29	2002/4/29	GSS/15	174820	LOCAL	Grade VII
SUNDAY MULENGA	AE:126801	1970/3/21	M	190469/47/1	F. S ORDERLY	2002/4/29	2002/4/29	GAS/08	174531	LOCAL	Grade VII
BINWELL SICHONE	AE:126581	00/06/61	M	126739/22/1	F. S ORDERLY	2002/5/3	2002/5/3	GAS/08	174672	LOCAL	Cert. In Sales Manship
S. MULENGA		1971/9/9	M	210921/43/1	F. S ORDERLY	2002/5/8	2002/5/8	GAS/08	174675	LOCAL	Cert. Auto. Techn.
ROBSON MUKOSHA	AE:126354	1978/8/15	M	729974/11/1	F. S ORDERLY	2002/5/9	2002/5/9	GAS/08	174738	LOCAL	Grade VII
EVANS CHIBANGA			M		F. S ORDERLY			GAS/08	174739	LOCAL	Grade VII
F M MWALLA	S:76019	1954/4/29	M	174101/82/1	C CARTOGRAPHER	1974/7/7	2000/3/3	TS/01	72889	LOCAL	Dip. In Cartography
VACANT (1)					S. GEMMOLOGIST						
E G NKHATA	S:007974	1950/11/1	M	213251/74/1	S. TECHNICIAN	1988/11/11	2000/2/12	TS/03	119167	LOCAL	Adv. Cert. In Met.

NAME	STAFF #	D.O.B	SEX	NRC. #	POST	DATE OF FT. APPT	DATE OF P. APPT.	SALARY SCALE	MAN #	CONDITION OF SERVICE	QUALIFICATIONS
I KALUNDULA	AE:96872	1964/1/1	M	436989/1/1	S TECHNICIAN	1987/12/1	2000/2/12	TS/03	119017	LOCAL	Cert. In Electricity
VACANT (1)					SNR. LIB. OFF.			TS/03			
VACANT (1)					SNR. CART.						
P CHIBULU	AE:104269	1966/8/25	M	444427/1/1	GEMMOLOGIST	1991/7/1	2000/2/12	TS/03	146387	LOCAL	Adv. Cert. In Met., Dip. In Gemmology
M M MUMBA		1970/12/28	M	142981/63/1	TECHNICIAN	1996/7/12	1996/2/12	TS/05	158593	LOCAL	Dip. In Metallurgy
P S KAMBIKAMBI	AE:127993	1970/12/8	M	212599/64/1	TECHNICIAN	1995/6/25	2000/2/12	TS/05	166735	LOCAL	Dip in Sci. Lab
T MBULA		1975/3/25	M	255952/66/1	TECHNICIAN	1999/8/18	2000/2/12	TS/05	171110	LOCAL	Dip. In Metallurgy
E KUNKUTA	AE:111345	1973/10/26	M	199545/42/1	SNR. LAB. ASST.	1995/1/30	2000/8/23	TS/05	164297	LOCAL	Pgr. Dip in Seismology
A N MULOWEZI	AE:97867	1962/1/8	M	163578/1/1	SNR. SEIS. ANALYST	1987/12/16	2000/8/23	TS/05	119029	LOCAL	Cert. In Seismology
J S MUBIANA	AE:113817	1973/4/6	M	250229/16/1	LAB. ASSIST.	1996/3/14	1996/3/14	TS/07	169499	LOCAL	Grade VII
C NGWENYA	AE:131059	1963/9/29	M	184583/64/1	LAB. ASSIST.	2002/4/18	2002/4/18	GSS/13	174529	LOCAL	Adv. Cert. Metallurgy
C CHILESHE	AE:126793	1960/12/4	M	210117/61/1	LAB. ASSIST.	2002/4/29	2002/4/29	GSS/13	174530	LOCAL	Dip. In Metallurgy
H PANDE		1974/5/13	M	292280/61/1	LAB. ASSIST.	2002/5/7	2002/5/7	TS/06	174650	LOCAL	Adv. Cert. Sci. Lab
R BWALYA		1974/8/2	M	250450/66/1	LAB. ASSIST.	2002/5/9	2002/5/9	TS/06	174652	LOCAL	Dip. Chemical Egn
JEAN PHIRI	AE:126348	1977/8/26	F	336871/67/1	TYPIST	2002/5/13	2002/5/13	GAS/06	174649	LOCAL	Cert. Clerk Typing
MONDE KONOSO		1996/7/21	F	695952/11/1	TYPIST	2002/5/2	2002/5/2	GAS/06	174669	LOCAL	Secretarial Studies
I T MUNDIA	AE:126796	1967/4/14	F	223330/82/1	TYPIST	2002/5/6	2002/5/6	GAS/06	174895	LOCAL	Adv. Typwriting
I SAKALA	S:86719	1954/2/15	M	187183/53/1	OFF. ORDERLY	1977/9/6		SP Grade	132272	LOCAL	Grade VII
S Y SAKALA		1955/1/1	M	295208/52/1	OFF. ORDERLY	1982/5/22		SP Grade	132322	LOCAL	Form III
K J SIWALE		1960/3/20	M	176484/64/1	OFF. ORDERLY	1981/7/16		SP Grade	132312	LOCAL	Form III
A MUKABACHINDU		00/00/59	M	122582/72/1	OFF. ORDERLY	1981/5/18	1990/5/1	CDE 01	132295	LOCAL	Grade VII
A TONGA		1957/4/18	F	249773/52/1	OFF. ORDERLY	1981/5/7	1990/5/1	CDE 01	132276	LOCAL	Grade VII
P KHONDOWE		1955/4/25	F	291583/1/1	OFF. ORDERLY	1981/5/19	1988/5/1	CDE 01	132315	LOCAL	Grade VII
VACANT (3)					OFF. ORDERLY			CDE 02		LOCAL	
L MAKENDU		1956/9/10	F	124006/63/1	OFF. ORDERLY	1983/6/22		CDE 03	132293	LOCAL	Grade VII
B MASHINDE		1970/2/10	M	404267/67/1	GEN. WORKER	2000/9/6	2000/9/6	GEN	172587	LOCAL	Grade VII
M LISUNDA		00/00/54		164402/83/1	PLUMBER	1996/9/19	1996/9/19	TTW03	168574	LOCAL	Grade IX

NAME	STAFF #	D.O.B	SEX	NRC. #	POST	DATE OF FT. APPT	DATE OF P. APPT.	SALARY SCALE	MAN #	CONDITION OF SERVICE	QUALIFICATIONS
S DAKA		1948/8/1	M	275949/11/1	AUTO. MECH	1990/5/16	1990/5/16	TTW06	132308	LOCAL	Grade VII
J KASAMBISHA		1974/6/27	M	392283/11/1	CARPENTER	1989/3/1	1989/3/1	TTW07	132327	LOCAL	Grade VII
S NYAMBA		00/00/53	M	287265/11/1	PAINTER	1981/2/1	1981/2/1	TTW09	132397	LOCAL	Grade VII
D MWENYA		1947/6/19	M	106596/66/1	DRIVER	1976/4/19	1988/4/22	TTW05	132302	LOCAL	Grade VII
A MUSUMALI		1953/1/6	M	152743/64/1	DRIVER	1977/12/12	1977/12/12	TTW08	132277	LOCAL	Grade VII
J KANYANTA		1962/6/6	M	150495/68/1	DRIVER	1988/9/1	1988/9/1	TTW08	132900	LOCAL	Grade VII
F ZULU		1959/2/22	M	197002/53/1	DRIVER	1987/7/30	1987/7/30	TTW09	132282	LOCAL	Form III
G SIMONJE		1959/10/2	M	227184/74/1	DRIVER	1997/1/24	1997/1/24	TTW04	158583	LOCAL	Form III
C LWIMBA		1962/1/24	M	391835/11/1	DRIVER	2000/11/16	2000/11/16	TTW09	172585	LOCAL	Grade VII
K A I CHEMEBE		1953/7/7	M	198093/53/1	DRIVER	2000/11/14	2000/11/14	TTW09	172584	LOCAL	Grade VII
R I CHALWE		1976/2/2	M	662603/11/1	DRIVER	2001/1/28	2001/1/28	TTW09	172583	LOCAL	Grade IX
T PHIRI		1961/10/10	M	465879/11/1	DRIVER	1987/7/27	2002/4/30	TTW09	132271	LOCAL	Form III
S TEMBO		1959/2/22	M	259438/52/1	SNR. WATCHMAN	1987/6/15	1987/6/15	WATCH	132320	LOCAL	Form II
P MATEKENYA		1963/4/9	M	178347/75/1	WATCHMAN	1990/5/7	1990/5/7	WATCH	132310	LOCAL	Grade VII
E SEJANI		1962/4/14	M	163598/75/1	WATCHMAN	1997/5/7	1997/5/7	WATCH	169281	LOCAL	Grade VII
S NGULUBE		00/00/55	M	190981/51/1	WATCHMAN	1997/5/7	1997/5/7	WATCH	169280	LOCAL	Grade VII
M ZULU		1972/1/28	M	577135/11/1	WATCHMAN	1997/5/7	1997/5/7	WATCH	169284	LOCAL	Grade VII
L BANDA		1972/1/14	M	554905/11/1	WATCHMAN	1996/8/14	1997/5/1	WATCH	169283	LOCAL	Grade VII
C KAPOPO		1960/8/11	M	167203/17/1	WATCHMAN	1995/5/1	1997/4/1	WATCH	169285	LOCAL	Grade VII
R E K MUSOLE		1959/3/11	M	157659/75/1	WATCHMAN	1995/1/1	1997/4/1	WATCH	169498	LOCAL	Grade VII
W C CHIMWAYE		00/00/64	M	162619/75/1	WATCHMAN	1995/5/2	1995/5/2	WATCH	169502	LOCAL	Grade VII
J SIKAAAMBA		00/00/56	M	151468/75/1	WATCHMAN	1987/8/1	1990/7/1	WATCH	132378	LOCAL	Grade VII
W KOLOZA		1972/9/21	M	194225/75/1	WATCHMAN	1995/3/1	1995/3/1	WATCH	169503	LOCAL	Grade VII
VACANT (3)					WATCHMAN			WATCH			

GEOLOGICAL SURVEY DEPARTMENT

SERIAL No.	NAME	SUBSTANTIVE POSITION	ACTING POSITION (WITH A VIEW/ FOR ADMIN)	DATE APPOINTED IN ACTING POSITION		No. OF POSITIONS	
				FILLED	VACANT	FILLED	VACANT
AE:92916	KENNEDY A LIYUNGU	DIRECTOR			1	0	0
		CHIEF GEOLOGIST(ECONOMIC)			0	1	1
		CHIEF GEOLOGIST(REGIONAL)			0	1	1
	DELAX T CHILUMBU	PRINCIPAL METALLURGIST			1	0	0
		SENIOR METALLURGIST			0	1	1
S:121724	DANIEL K LOMBE	SENIOR GEOPHYSICIST			1	0	0
S:141889	ALPHAT P DOKOWE	SENIOR GEOLOGIST			5	1	1
AE:105753	FRED M. NJAMU	SENIOR GEOLOGIST					
AE:104621	EMMANUEL MULENGA	SENIOR GEOLOGIST					
AE:99794	ROBERT N NDHLOVU	SENIOR GEOLOGIST					
AE:126341	ELIAS MBUMBA	SENIOR GEOLOGIST					
AE:131051	BONIFACE NG'UNI	SENIOR GEOCHEMIST			1	0	0
S:132916	LEONARD MUMBA	SENIOR CHEMIST			1	0	0
S. 109567	ELIZABETH T DAKA	ADMINISTRATIVE OFFICER	WITH A VIEW		1	0	0
		SEISMOLOGIST			0	0	0
		PETROLOGIST			0	1	1
AE:131052	JOACHIM M ZULU	METALLURGIST			2	2	2
	COLLINS SICHULA	METALLURGIST					
	S.M MUBU	GEOPHYSICIST			1	1	1
S:146824	EZEKIAH M CHIKAMBWE	GEOLOGIST	SECONDED(AUSTRIA)CTBTO		7	11	11
AE:126340	GERALD MWILA	GEOLOGIST					
AE:126588	MALIRO BANDA	GEOLOGIST					
CRA: 9586	FAUSTIN NZABARA	GEOLOGIST					
AE: 131055	KELVIN C. MWAMBA	GEOLOGIST					
AE:126579	BENNY CHISONGA	GEOLOGIST					
AE:112346	FRANCIS CHIBESAKUNDA	GEOLOGIST					
AE:113838	MABVUTO MWALE	GEOCHEMIST			1	1	1
		ELECTRICAL ENGINEER			0	1	1
		DOCUMENTALIST			0	1	1
		CHEMIST			0	2	2
S:153188	KAPILI MOONO	PURCHASING SUPPLIES OFFICER			1	0	0
AE:121375	KONDWANI MUGALA	EXECUTIVE OFFICER			1	0	0
S:143379	CORNELIO PHIRI	ACCOUNTS ASSISTANT			1	0	0
S:84962	GIBSON NKOLE	DATA ENTRY CLERK			2	0	0
AE:124377	MIRRIAM LOMBANYA	DATA ENTRY CLERK					
AE:126343	PATRICIA K CHUNGU	ASSIST. PURCHASING OFFICER			1	0	0

SERIAL No.	NAME	SUBSTANTIVE POSITION	ACTING POSITION (WITH A VIEW/ FOR ADMIN)	DATE APPOINTED IN ACTING POSITION		No. OF POSITIONS	
				FILLED	VACANT	FILLED	VACANT
AE:126802	JONAS SIKALUMBI	LAPIDARY			2	0	
AE:103107	LAZAROUS CHONGO	LAPIDARY					
AE:126578	ROY SIMONDA	FIELD SURVEY ORDERLY			7	1	
AE:126798	PETER MITI	FIELD SURVEY ORDERLY					
AE:126801	HUSTON TUMBE	FIELD SURVEY ORDERLY					
	SUNDAY MULENGA	FIELD SURVEY ORDERLY					
	SHEPARD MULENGA	FIELD SURVEY ORDERLY					
AE:126354	ROBSON MUKOSHA	FIELD SURVEY ORDERLY					
AE: 126342	EVANS CHIBANGA	FIELD SURVEY ORDERLY					
S:76019	FREDDY M MWALLA	CHIEF CARTOGRAPHER			1	0	
		SENIOR GEMMOLOGIST			0	1	
AE:96872	ISAAC KALUNDULA	SENIOR TECHNICIAN			1	2	
		SENIOR LIBRARY OFFICER			0	1	
		SENIOR CARTOGRAPHER			1	0	
AE:104269	PATRICK CHIBULU	GEMMOLOGIST			1	0	
S:84845	JUSTINA M BWALYA	CARTOGRAPHER			4	0	
S:91538	MUHAMUBI KAMONA	CARTOGRAPHER					
S: 153571	CHEWE CHIBANDA	CARTOGRAPHER					
AE:126797	MACHILA JAMBA	CARTOGRAPHER					
AE: 116019	MARVIN MUMBA	TECHNICIAN			2	3	
AE:127993	PATSON KAMBIKAMBI	TECHNICIAN					
AE: 131058	TINDISA MBULA	SENIOR LAB. ASSISTANT			2	1	
AE:126583	HANGANI PANDE	SENIOR LAB. ASSISTANT					
AE:97867	ANNIE MULOWEZI	SNR. SEISMOGRAM ANALYST			2	0	
AE:111345	EUGENE KUNKUTA	SNR. SEISMOGRAM ANALYST					
AE:129390	CHRISTOPHER MFUNE	ASSISTANT CARTOGRAPHER			2	2	
AE:126408	JACK BWALI	ASSISTANT CARTOGRAPHER					
AE:126793	CHARLES CHILESHE	LABORATORY ASSISTANT			2	1	
AE:131059	CHARLES NGWENYA	LABORATORY ASSISTANT					
AE:96571	BOYD KASONDWA	SEISMOGRAM ANALYST			1	3	
AE: 131054	NIXON U TEMBO	LIBRARY OFFICER			1	1	
AE:126589	REBECCA M MUMPANSHA	ASSISTANT LIBRARY OFFICER			2	0	
AE:131057	GETRUDE C SITALI	ASSISTANT LIBRARY OFFICER					
AE:126357	MONICA MUTAFI	STANTION HANDYMAN			2	1	
AE: 131052	GRACE MUSONDA	STANTION HANDYMAN					
AE:126577	PETER CHIPUMBU	GEOLOGICAL ASSISTANT			2	1	
AE:126344	ANDREW MULENGA	GEOLOGICAL ASSISTANT					

SERIAL No.	NAME	SUBSTANTIVE POSITION	ACTING POSITION (WITH A VIEW/ FOR ADMIN)	DATE APPOINTED IN ACTING POSITION	No. OF POSITIONS	
					FILLED	VACANT
AE:126792	BONIFACE SHEZONGO	LEARNER CARTOGRAPHER			2	0
AE:126352	FELIX NIDHLOVU	LEARNER CARTOGRAPHER				
S:146162	CHILOMO MWANAKAABA	REGISTRY CLERK	REGISTRY OFFICER(WITH A VIEW)		1	0
AE:121659	BARBARA MUBITA	REGISTRY CLERK			0	2
AE:126799	MUTINTA NYEMBA	STENOGRAPHER			2	1
S:86719	ISAAC SAKALA	STENOGRAPHER			0	3
	STEWARD SAKALA	TYPIST			2	1
	ANDREW MUKABACHINDU	CHIEF OFFICE ORDERLY				
	ACKNESS TONGA	CHIEF OFFICE ORDERLY			1	1
	SANDRESS PHIRI	PRINCIPAL OFFICE ORDERLY			1	1
	LENDY MIYOBA	SENIOR OFFICE ORDERLY				
	PATRICIA KHONDOME	OFFICE ORDERLY				
	LOVENESS MAKENDU	OFFICE ORDERLY			3	0
	JUSTINA M SAKALA	CLEANER				
	MATTHEWS MUBANGA	CLEANER				
	STEVEN NYAMBA	GENERAL WORKER			1	1
	MWANGALA LISUNDA	PAINTER			1	0
	DANIEL MALUNGA	PLUMBER			1	0
	JOHN KASAMBISHA	MECHANIC			1	0
	RAPHAEL MAZIMBA	CARPENTER			1	0
	TSEPO MWALLA	ELECTRICIAN			1	0
	FALAWO ZULU	AUTO ELECTRICIAN			1	0
	JOSEPH KANYANTA	DRIVER			7	3
	CHARLES LWIMBA	DRIVER				
	THOMSON PHIRI	DRIVER				
	DAVID MUGWAGWA	DRIVER				
	KINGSLEY MULENGA	DRIVER				
	ROMAN SIAMONDO	DRIVER				
	SOLOMON TEMBO	WATCHMAN			12	4
	PAUL MATEKENYA	WATCHMAN				
	BENSON BANDA	WATCHMAN				
	SUZGO NGULUBE	WATCHMAN				
	MASAUSO ZULU	WATCHMAN				
	R'E'K MUSOLE	WATCHMAN				
	WISDOM CHIMWAYE	WATCHMAN				
	JOSEPH SIKAAIMBA	WATCHMAN				
	WILLARD KOLOZA	WATCHMAN				

	JOSEPH SIMUTOWE	WATCHMAN			
	LEONARD BANDA	WATCHMAN			
SERIAL	NAME	SUBSTANTIVE POSITION	ACTING POSITION (WITH A VIEW/ FOR ADMIN)	DATE APPOINTED IN ACTING POSITION	No. OF POSITIONS FILLED
No.	EDSON SEJANI	WATCHMAN			VACANT