

**Council for Geoscience** 

## ANNUAL REPORT 2015 COUNCIL FOR GEOSCIENCE



## ANNUAL REPORT 2015 COUNCIL FOR GEOSCIENCE



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## **GENERAL INFORMATION**

### **1. GENERAL INFORMATION OF THE COUNCIL FOR GEOSCIENCE**

REGISTERED NAME:	Council for Geoscience
PHYSICAL ADDRESS:	280 Pretoria Street Silverton, Pretoria South Africa
POSTAL ADDRESS:	Private Bag X112 Pretoria, South Africa 0001
TELEPHONE NUMBER:	+27 (0)12 841 1911
FAX NUMBER:	+27 (0)12 841 1203
E-MAIL ADDRESS:	info@geoscience.org.za
WEBSITE ADDRESS:	www.geoscience.org.za
EXTERNAL AUDITORS:	Auditor-General of South Africa
BANKERS:	Nedbank and ABSA in Silverton, Pretoria
BOARD ADMINISTRATOR:	Nomkhosi Cele

Council for Geoscience

## 2. LIST OF ABBREVIATIONS/ACRONYMS

AMGI	African Minerals Geoscience Initiative
АМІ	Advanced Metals Initiative
BBBEE	Broad Based Black Economic Empowerment
BCC	Business Continuity Committee
BGSI	British Geological Survey International
BSC	Balanced Scorecard
СВМ	Coalbed Methane
CCS	Carbon Capture and Storage
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CGS	Council for Geoscience
C00	Chief Operations Officer
CSIR	Council for Scientific and Industrial Research
D&O	Derelict and Ownerless
DFID	Department for International Development (United Kingdom)
DIRCO	Department of International Relations and Cooperation
DMR	Department of Mineral Resources
DST	Department of Science and Technology
EOI	Expression of Interest
EXCO	Executive Management Committee
GRAP	Generally Recognised Accounting Practice
GSD	Geological Survey Department
GSN	Geological Survey of Namibia
HR	Human Resources
HRIS	Human Resources Information System

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HSE	Health, Safety and Environment
ICPMS	Inductively Coupled Plasma Mass Spectrometry
IDA	International Development Association
IGC	International Geological Congress
ISA	International Seabed Authority
ISO	International Organisation for Standardisation
JSE	Johannesburg Stock Exchange
козн	Klerksdorp-Orkney-Stilfontein-Hartebeesfontein
LIMS	Laboratory Information Management System
MQA	Mining and Qualification Authority
MTEF	Medium-Term Expenditure Framework
NDP	National Development Plan
NGG	Nuclear Geo-Hazards Group
NRF	National Research Foundation
OAGS	Organisation of African Geological Surveys
ORMC	Operational Risk Management Committee
PASA	Petroleum Agency SA
PDAC	Prospectors and Developers Association of Canada
PFMA	Public Finance Management Act
PHTE	Potential Harmful Trace Element
QDS	Quarter Degree Sheets
SACCCS	South African Centre for Carbon Capture and Storage
SAfECCS	South Africa–Europe Cooperation on Carbon Capture and Storage
SANEDI	South African National Energy Development Institute
SANS	South African National Standards
SCM	Supply Chain Management

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### **3. STRATEGIC OVERVIEW**

#### 3.1 Mission

Provide geoscience solutions in South Africa and beyond

#### 3.2 Vision

A prosperous society enabled by geoscience solutions

#### 3.3 Brand Promise

Applied Geoscience Solutions

#### 3.4 Values

Innovation	Working together as teams across functions to solve problems, develop novel ideas that create new value for our stakeholders, and improve the organisational performance of the CGS
Diversity	Striving for a diverse workplace by incorporating the contributions of people from a wide variety of backgrounds, promoting an inclusive culture and demonstrating respect for the individual
Excellence	Excellence and continuous improvement in everything we do
Accountability	Consistently setting challenging yet realistic targets, taking ownership of personal actions and work commitments, and holding ourselves personally accountable for achieving results
Learning	Ensuring professional and personal development of our staff in a learning organisation
Service	Consistently providing prompt and courteous service to both our external and internal stakeholders

Council for Geoscience

#### 3.5 Strategic Outcome Oriented Goals

The following ideal outcomes were formalised by the Board of the Council for Geoscience:

- The Council for Geoscience is a financially viable and structurally robust organisation catering for all stakeholders and utilising multiple revenue streams.
- The Council for Geoscience is responsive to the developmental needs of the country and is recognised among global leaders in the geological field because of its commitment to excellence.
- Employees view the Council for Geoscience as an organisation offering attractive career opportunities.

#### Strategic outcomes of the Council for Geoscience

The Council for Geoscience is confident that it has identified all the key challenges for the organisation and that the strategic objectives, measures and actions that have been put in place will lead to the achievement of its mission and vision.

The Council for Geoscience has listed the following outcomes:

#### Market (stakeholder/customer) perspective

- Increased customer/client/stakeholder satisfaction
- New products/services/technologies.

#### Economic/financial growth perspective

- Increased revenue
- Increased funding for statutory work
- Improved budget management.

#### Effective systems (organisational) perspective

• Improved planning and institutional reporting

- Improved business risk management and security
- Improved compliance and corporate governance
- Improved information and knowledge management
- Improved contract and project management
- Improved business processes efficiency.

#### World-class people perspective

- Increased access to critical/scarce skills (technical as well as managerial)
- Increased retention of critical/scarce skills
- A conducive work environment (positive culture, diversity, leadership)
- An improved employee performance culture
- A transformed Council for Geoscience.

## 4. LEGISLATIVE AND OTHER MANDATES

#### Constitutional mandate

The constitutional mandate of the Council for Geoscience is found in sections 24 and 26 of the National Constitution of the Republic of South Africa.

#### Legislative mandate

The principal fixed mandate and the one under which the Council for Geoscience was established is the Geoscience Act (Act No. 100 of 1993) and the Geoscience Amendment Act (Act No. 16 of 2010). The organisation is listed as a schedule 3A Public Entity in terms of the Public Finance Management Act (Act No. 1 of 1999). The objectives underlying the establishment of the Council for Geoscience are to develop and publish world-class geoscience knowledge products and to render geoscience related services to the South African public and industry.

The Geoscience Amendment Act (Act No. 16 of 2010) that was signed into law by the President of South Africa in December 2010 came into operation on 1 July 2012, with the exception of sections 4(c), (eA) and (f), section 5(b) and section (8). The sections that are still exempted deal with the custody of geoscientific information, the review and evaluation of geotechnical reports, the maintenance of certain national geoscientific facilities and the appointment of a Geotechnical Appeal Committee.

## 5. ORGANISATIONAL STRUCTURE

5.1 Board of Directors of the Council for Geoscience



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- 1. Prof. P E Ngoepe Chairperson of the Board University of Limpopo
- 2. Mr M W Kota (resigned April 2015) Chief Executive Officer Council for Geoscience
- 3. Mr B A Gerryts Department of Science and Technology
- 4. Prof. M A Hermanus Council for Scientific and Industrial Research
- 5. Mr M Mabuza Department of Mineral Resources
- 6. Dr H Mathe Tranter Resources (Pty) Limited
- 7. Dr M Mayekiso Department of Environmental Affairs
- 8. Dr J E McGill Council for Scientific and Industrial Research
- 9. Ms K R Mthimunye Bluewaves Consulting Services
- **10. Mr M Riba** Department of Rural Development and Land Reform
- 11. Mr S M Sikhosana Acting Chief Executive Officer Council for Geoscience
- **12. Mr M P Nepfumbada** (resigned January 2015) Department of Water Affairs
- **13. Ms S Ngxongo** (resigned January 2015) Department of Human Settlements

#### Alternate Members



Ms D Fischer (Alternate to Dr M Mayekiso) Department of Environmental Affairs



**Ms R Mdubeki** (Alternate to Mr M Riba) Department of Rural Development and Land Reform



Ms D Mochotlhi (Alternate to Mr M P Nepfumbada) Department of Water Affairs



Ms S Mohale (Alternate to Mr M Mabuza) Department of Mineral Resources



Mr D Sibiya (Alternate to Dr J E McGill) *Tronox* 

#### 5.2 Executive Team



**Mxolisi Kota** 

## OFFICE OF THE COO



Gerhard Graham (resigned March 2015)

#### **DIVISION - OFFICE OF THE CEO**

- Department ADMINISTRATION
- Department COMMUNICATION AND PR
- Department COMPANY SECRETARY
- Department INTERNAL AUDIT
- Department QUALITY ASSURANCE
- Department SECURITY SERVICES
- Department STRATEGIC MANAGEMENT OFFICE

#### **DIVISION - OFFICE OF THE COO**

- ► ENGINEERING GEOSCIENCE AND GEOHAZARDS THRUST
- -> ENVIRONMENTAL AND WATER THRUST
- GEOSCIENCES MAPPING THRUST
- MINERAL AND ENERGY RESOURCES THRUST
- GO TO MARKET
  - → ECONOMIC GEOLOGY COMPETENCY
  - ENGINEERING GEOLOGY COMPETENCY
  - → GEOPHYSICS COMPETENCY
  - → MAPPING GEOLOGY COMPETENCY
  - → REMOTE SENSING COMPETENCY
  - → SUSTAINABLE RESOURCES AND ENVIRONMENT COMPETENCY
  - -> Department ADMINISTRATION
  - Department SCIENTIFIC RESEARCH AND PROGRAMME MANAGEMENT



Leonard Matsepe

Fhatuwani Ramagwede

#### **DIVISION - OFFICE OF THE CFO**

- Department ADMINISTRATION
- Department CONTRACT MANAGEMENT
- Department FINANCE SERVICES
- Department SUPPLY CHAIN SERVICES

#### **DIVISION - SHARED SERVICES**

- Department ADMINISTRATION
- Department ASSETS AND FACILITIES SERVICES
- Department BUSINESS PARTNERS
- Department HR SERVICES
- Department ICT SERVICES
- Department KNOWLEDGE AND INFORMATION SERVICES
  - -> Sub-Department DATA MANAGEMENT SERVICES
  - -> Sub-Department INFORMATION SERVICES
  - -> Sub-Department DOCUMENTATION SERVICES

Department - LABORATORIES SERVICES

6. FOREWORD BY THE CHAIRPERSON OF THE BOARD AND THE ACTING CHIEF EXECUTIVE OFFICER

> The geosciences and earth scientists are vital role players in the endeavours of governments worldwide to contain the escalation of climate change, to preserve and protect existing natural resources, while locating additional deposits, to provide adequate energy and food security and to predict and contain the incidence of natural disasters.



Prof. P E Ngoepe Chairperson of the Board



Mr S M Sikhosana Acting Chief Executive Officer The Council for Geoscience faced immense challenges in the period under review. These challenges included the implementation of the repositioning strategy, the inability of the organisation to secure major commercial contracts and a delay in the implementation of MTEF projects. In addition to these challenges, change management was not introduced at the beginning of the repositioning process, resulting in a decline in staff morale. As a result, the revenue of the organisation declined and a loss was reported.

These challenges are being addressed and an interim project based structure has been introduced to expedite the delivery of the mandatory Annual Technical Programme, MTEF projects as well as commercial projects.

The organisation has secured funding for two major projects through the Economic Competitiveness Support package. These projects are the Stimulation of Investment in the Minerals and Energy Sector, valued at R145 million and an Infrastructure Recapitalisation project, amounting to R55 million. Work on these projects is on schedule and it is expected that funding will continue until the 2018/19 financial year. The Stimulation of Investment in the Minerals and Energy Sector project is aimed at supporting the strategic goal of the Department of Mineral Resources which entails unlocking the mineral wealth of the country to stimulate investment in the mineral mining and petroleum sectors in view of addressing the challenges of job creation and economic growth.

The Council for Geoscience saw the resignation of the Chief Executive Officer, the Chief Operations Officer and the Strategic Manager in the year under review. Despite the departure of these key players, it is felt that the Council for Geoscience is in safe hands at present and that the future leadership and staff will be more than capable of launching the organisation to even greater heights. Mr Simon Sikhosana has been appointed as the Acting Chief Executive Officer until a new CEO has been recruited to take the organisation forward. This organisation, as well as its predecessors over the course of more than a century, has always displayed the ability to rally under the toughest circumstances, has continually reinvented itself to suit evolving environments and has continued to prosper and grow to become the geoscience institution of choice that it is today.

The Council for Geoscience, as the mandated geoscience research body of South Africa, has to maintain and further expand its fundamental role, which entails the acquisition, interpretation and release of appropriate data sets in order to provide the detailed information required to attract investment into key exploration and development sectors. The future of the mining industry, which remains an important aspect of the local economy, is dependent on investment into the minerals sector and into mineral exploration. Moreover, the Council for Geoscience has to accelerate its programme of producing adequate data sets at appropriate scales in the effort to maintain its relevance to the developmental needs of South Africa and to help augment the ability of the country to attract the investment needed to manage its resources strategically. This endeavour will remain the main goal of the Council for Geoscience.

The financial position of the Council for Geoscience is positive with total assets to the amount of R495.6m. Current assets are to the amount of R273.0m and current liabilities to the amount of R151.9m. The organisation will be able to meet its current financial obligations.

Notwithstanding the above statistics, during the year under review, the Council for Geoscience reported a loss in revenue of R14.7 million, which is ascribed to challenges in regard to the implementation of ring-fenced MTEF projects and the contracting revenue streams. In addition, there was a delay in the conclusion of a work plan agreement, particularly in respect of the Water Ingress project. Both the Eskom Nuclear Plant Siting project and the Mine Health and Safety Seismic Stations project did not resume as had been anticipated.

The Five Year Institutional Review was undertaken and a report was compiled and submitted to the Minister of Science and Technology. The aim of the review was to highlight the successes of the Council for Geoscience and to address areas that need improvement. The business strategy, supporting the new organisational structure, was redeveloped and adopted into the balanced scorecard system for measuring performance and compliance to the set objectives. Over the next few years, this strategic plan will be rolled out and refined and the Annual Technical Programme will be aligned to the new structure. The aim is to consolidate all the current small projects into the broader activities of the organisation, such as the active African Minerals Geoscience Initiative (AMGI) and the envisioned new map for Africa. The organisation aims to utilise grants effectively, secure adequate commercial income and to optimise its cost base. Additionally, it has to strengthen its partnerships with all its stakeholders and clients to accomplish its growing mandate. In the light of these substantial organisational changes, it is understandable that the annual technical audit process for 2014/15 would differ from those of previous years.

The audit of the organisation culminated in a result of 76% for the performance index on the Annual Technical Programme. Although this percentage is a decrease from the previous year, it is still a good result and is indicative of the Council for Geoscience reaching its set targets. This reduced performance result was to be expected in light of the changes occurring within the organisation, especially in view of the procedures used to measure the Annual Technical Programme and the challenges posed by ageing and faulty infrastructure. We can thus be confident that we will see an improved result in the next ATP audit because the changes will no longer be new and the recapitalisation of CGS equipment will address the challenges of inadequate infrastructure.

The geosciences and earth scientists are vital role players in the endeavours of governments worldwide to contain the escalation of climate change, to preserve and protect existing natural resources, while locating additional deposits, to provide adequate energy and food security and to predict and contain the incidence of natural disasters. These challenges apply even more to the emerging economies, of which South Africa, as a member of the BRICS (Brazil, Russia, India, China and South Africa) group of nations, is a typical example. The Council for Geoscience is ideally positioned in terms of its mandate and with regard to its scientific competencies to assist the government in this regard. Currently, the organisation is involved in the following endeavours in support of government initiatives:

- the research into and evaluation of the economic potential of strategic minerals, including rare-earth elements, lithium, indium and others
- research into predictive mineral and gold potential mapping (target generation)
- the management of state contingent liabilities with respect to the rehabilitation of derelict and ownerless mines
- water ingress into the underground voids in the Witwatersrand mining region
- the geological storage of CO<sub>2</sub>
- the environmental impacts of South African mines
- energy, specifically the siting of nuclear power stations
- mine health and safety, with regard to seismicity, specifically involving the South African National Seismograph Network
- geohazards, by providing geotechnical investigations and advice
- regulations for shale gas and hydraulic fracturing (fracking).

In addition to its statutory and commercial projects, the Council for Geoscience endeavours to increase the grant it receives from government through the MTEF process. Financed by the National Treasury, the organisation is currently engaged in several ring-fenced projects: A Holistic Approach to the Management of Environmental Impacts of South African Mines, Exploration and Mining Investment Promotion in the Mineral and Energy Sectors, Mine Rehabilitation (Derelict and Ownerless Mines), the Strategic Water Management project, the Microzonation project, and, from 1 April 2015, the Baseline Monitoring of the Karoo project.

The Council for Geoscience was instrumental in winning the bid for South Africa to host the 35th International Geological Congress (35th IGC), an important international event on the geosciences calendar. The neighbouring countries of South Africa and other countries on the subcontinent are collaborating in this venture, the second to be held in South Africa since 1929 when the congress took place in Pretoria. An organising body was put in place and the preparations for the event, scheduled for 27 August to 4 September 2016 at the International Conference Centre in Cape Town, are continuing apace. An exciting formal programme is being planned and field trips to some superlative African geological attractions will be undertaken before and after the congress itself. It is envisaged that a significant number of African geoscience students and practitioners will be sponsored to attend the congress. The 35th IGC is set to promote geological research and mining investment in this region, thereby making a noticeable contribution in boosting the economic development of the subcontinent.

Africa is emerging as an economic role player of growing importance in the world. However, geoscience information and expertise are needed to fully develop the latent wealth of this continent. The Council for Geoscience has continued its significant contribution in this regard and is currently involved in a number of enterprises in Africa, and further afield. Moreover, the organisation is constantly working towards increasing its presence as a geoscience research institution of note on the international stage. To this end, the Council for Geoscience needs adequate investment into and maintenance of the resources at its disposal, which are its technical and research capabilities and, most important, its human resources. The full implementation of the expanded mandate of the organisation in terms of the Geoscience Amendment Act (Act No. 16 of 2010) will place significant strain on the available resources. Therefore, developing adequate financial strategies to support and expand the organisation remains a key objective, currently and for the near future.

At the close of another eventful and challenging, but, ultimately successful, year for the Council for Geoscience, we would like to acknowledge our stakeholders and clients for their contribution to the continued success of our organisation. We wish to thank the Board, the Minister, the Director-General and the staff of the Department of Mineral Resources as well as the Department of Science and Technology for their input and continued support of the Council for Geoscience.

We also wish to thank the loyal and committed management and staff of the Council for Geoscience for their hard work and dedication throughout this past year.

**Prof. P E Ngoepe** Chairperson: Board of the Council for Geoscience

Allelisame

Mr S M Sikhosana Acting Chief Executive Officer Council for Geoscience

Council for Geoscience



## **PERFORMANCE INFORMATION**

### **1. STATEMENT OF RESPONSIBILITY FOR PERFORMANCE INFORMATION**

#### Statement of Responsibility for Performance Information for the Year ended 31 March 2015

The Chief Executive Officer is responsible for the preparation of the Council for Geoscience's performance information and for the judgements made in this information.

It is the responsibility of the Chief Executive Officer to establish and implement a system of internal controls designed to provide reasonable assurance as to the integrity and reliability of performance information.

In my opinion, the performance information fairly reflects the actual achievements against planned objectives, indicators and targets as per the strategic and annual performance plan of the Council for Geoscience for the financial year ended 31 March 2015.

The performance information of the Council for Geoscience for the year ended 31 March 2015 has been examined by the external auditors and their report is presented on page 121 to page 124. The performance information was also approved by the Board of the Council for Geoscience.

Heliosang

Mr S M Sikhosana Acting Chief Executive Officer Council for Geoscience 28 July 2015

Prof. P E Ngoepe Chairperson Board of the Council for Geoscience 28 July 2015

## 2. AUDITOR'S REPORT: PREDETERMINED OBJECTIVES

The Auditor-General performed the necessary audit procedures on the performance information to provide reasonable assurance in the form of an audit conclusion. The audit conclusion on the performance against predetermined objectives is included in the Report to Management, with material findings being reported under the Predetermined Objectives heading in the Report on Other Legal and Regulatory Requirements section of the Auditor-General's report.

The Report of the Auditor-General, published as Part E: Financial Information, is contained on page 121 to page 124.

## 3. OVERVIEW OF THE PERFORMANCE OF THE COUNCIL FOR GEOSCIENCE

#### **3.1 Service Delivery Environment**

The Council for Geoscience is mandated to gather, compile, interpret and disseminate geoscience knowledge for South Africa, as provided for by the Geoscience Act (Act No. 100 of 1993) and its Amendment Act (Act No. 16 of 2010). With this mandate, the Council for Geoscience follows a business model which allows for both statutory activities and activities with financial gain. The ratio of commercial to statutory revenue has varied between 30 and 50 per cent over the years and the Council for Geoscience has become increasingly reliant on the commercial income to fund the statutory activities. However, this arrangement has proven to be unsustainable, especially as some of the statutory activities were suspended since 2009 owing to the global economic downturn. Thus, it is envisaged that, in order for the Council for Geoscience to fund national projects in the future, a dedicated investment from the

government is required, such as ring-fenced funding for projects.

The statutory technical programme addresses many of the developmental needs of South Africa, as captured in the government's NDP 2030, the Stakeholders' Declaration on Strategy for the Sustainable Growth and Meaningful Transformation of South Africa's Mining Industry of the Department of Mineral Resources, the Grand Challenges of the Department of Science and Technology, and the government's National System of Innovation.

The Council for Geoscience delivered on these developmental needs by releasing scientific publications and articles in the popular press in the following fields:

- **Geoscience mapping:** the Council for Geoscience systematically gathered and documented geoscience information into in-house maintained databases which are, in turn, used by the other fields for their deliverables.
- **Minerals and energy development:** the Council for Geoscience performed research and systematically gathered information on mineral and energy resources in the country in order to stimulate investment in the mining sector and to contribute towards the energy security of South Africa.

#### • Environment and water:

the Council for Geoscience advised on the identification, prevention and mitigation of the effects of geohazards on people and the environment, as well as assisted in the delivery of water to communities, industry and to agriculture.

 Engineering geoscience and physical geohazards:

the Council for Geoscience provided advice in order to reduce the risk to lives and property from the effects of geohazards. The Council for Geoscience delivered on projects with a financial benefit within the same fields as mentioned above, but from the following sources:

- Agency projects: these projects were solicited from other government departments and public entities.
- International projects: these projects were solicited through international tenders.
- **Private sector:** these projects were solicited mainly from local South African companies.
- Multinational research funding: these projects were solicited through joint tenders with other international research institutes.

The Council for Geoscience successfully managed a number of national facilities on behalf of the country, which include:

- the national seismograph network and infrasound observatory, which monitor the earthquakes and other sonic disturbances within the country
- the national borehole core repository, which provides a comprehensive national collection of valuable geoscientific material
- the national geoscientific databases, of which the Council for Geoscience is the custodian
- the national geoscience museum, which provides information to the public
- the national geoscience library and bookshop, which provide both international

and local geoscientific publications and maps to the public

• the national geoscience analytical facility, which is available for the analysis of geoscientific material.

#### 3.2 Organisational Environment

The Board and Executive Management of the Council for Geoscience approved changes to the business model and functions of the organisation in late 2013. A five year implementation programme will strategically reposition the organisation in the context of a changing political, economic, social, environmental, legislative and technological landscape. The ultimate objective of implementing the repositioning strategy, which started in April 2014, is to achieve a sustainable organisation and to optimise the capabilities of the organisation to make a meaningful contribution to the developmental needs of South Africa.

The first year has progressed well with the migration of all staff to support a new target operating model. Further consolidation of operating processes will continue over the next financial year. Decreasing income revenues pose a threat to the ongoing transformation agenda.

In addition to the repositioning process, an ageing infrastructure was identified as a challenge to service delivery and, thus, the Council for Geoscience has embarked on a recapitalisation programme in order to effect the necessary changes.

#### 3.3 Key Policy Developments and Legislative Changes

No key policy developments have occurred since the Geoscience Amendment Act (Act No. 16 of 2010), which was signed into law by the President in December 2010, took effect on 1 July 2012. The Amendment Act includes a more comprehensive description of the services rendered by the Council for Geoscience, expands the mandate of the organisation and reflects the interaction with the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002), the amendment of which is still pending.

#### 4. PERFORMANCE INFORMATION

#### 4.1 Performance Management Criteria and Performance Targets of the Council for Geoscience

In accordance with the strategy developed by Management, the organisation has adopted a Balanced Scorecard (BSC) approach to its performance measurement.

The balanced scorecard system, which measures the performance of the organisation at corporate, business unit and individual level, was approved by the Board of the Council for Geoscience. The corporate balanced scorecard incorporates the current performance measures into the following evaluation perspectives:

- Stakeholder and customer satisfaction; to drive stakeholder and customer satisfaction by the development of world-class products and services
- Economic growth; to achieve sustainable revenue and profit growth
- Organisational systems; to develop and maintain effective and streamlined processes, using appropriate tools and methodologies
- Scientific excellence and human capital development; to develop a world-class geoscience organisation where our people can grow and perform.

Ten strategic objectives were identified in agreement with the balanced scorecard framework, and, as such, cover the customer, internal business process, financial and learning and growth perspectives. The objectives are aligned with the targeted strategic outcomes of the organisation and include:

- A. Market (Stakeholder/Customer) Perspective Objectives
- To address stakeholder needs
- To effectively promote the Council for Geoscience and disseminate strategic information to the public.
- B. Economic and Financial Growth Perspective Objectives
- To generate revenue
- To manage overhead efficiency.
- C. Effective Systems Perspective Objectives
- To develop and implement effective policies and procedures
- To drive preferential procurement.
- D. World-Class People Perspective Objectives
- To attract and retain a skilled workforce
- To enhance present levels of excellence
- To build a positive organisational culture
- To reflect and embrace the diversity of South Africa.

#### 4.2 Corporate Performance Targets of the Council for Geoscience

In order to evaluate the corporate performance of the Council for Geoscience (CGS), the organisation has developed a range of performance indicators which cover the entire spectrum of activities within the organisation. The range of performance indicators, together with the performance targets for the period 2014/15, is summarised in the accompanying table on page 25 to page 29.

#### 4.3 Corporate Scorecard for 2014/15

Market (Stakeholder/ Customer) Perspective	TO DRIVE STAKEHOLDER AND CUSTOMER SATISFACTION BY THE DEVELOPMENT OF WORLD-CLASS PRODUCTS AND SERVICES					
Strategic Objective:	To Address Stakeholder Needs					
Performance Indicator	Actual Achievement 2013/2014	Planned Target 2014/2015	Actual Achievement 2014/2015	Deviation from Planned Target to Actual Achievement for 2014/2015	Comment on deviations	
Number of Geoscience Maps and Publications Published In- house	19	18	25	+7	This is a pleasing result which has been achieved through the CGS's commitment to its main mandate and its importance to the nation.	
Customer Satisfaction Level	90.6%	85%	86.36%	+1.36%	The customer satisfaction survey is done annually in March. This year's survey is a good indication that the CGS is meeting its expected targets on deliverables and quality. The slight decline in customer satisfaction this year is attributed to a lack of focus on stakeholder management owing to commitments to produce revenues, but the target was achieved.	
Number of Rural Development Project Reports Completed	29	14	55	+41	The over-achievement in this result is evidence of the growing acknowledgement of the importance of the CGS's work to the public and their safety and sustainability. Strategic planning focusses on the rural development aspects of all scientific projects and was responsible for the steep increase and over-achievement on this measure. The target for the next financial year will be set at a realistic level to ensure continued focus.	
Number of Regional and African Development Project Reports Completed	16	27	17	-10	The decline in World Bank projects in Africa is a major contributing factor to this lower than anticipated result. The CGS is currently working in a number of African countries and strives to leverage further engagements through these projects. The target was achieved.	
Number of Environment Project Reports Completed	23	8	7	-1	The CGS remains committed to addressing the environmental problems created by mining legacies and other challenges. Water projects (acid mine drainage) and other environmental issues are addressed by all scientific thrusts.	

Market (Stakeholder/ Customer) Perspective

TO DRIVE STAKEHOLDER AND CUSTOMER SATISFACTION BY THE DEVELOPMENT OF WORLD-CLASS PRODUCTS AND SERVICES

#### To Address Stakeholder Needs

Strategic Objective:	To Address Stakeholder Needs				
Performance Indicator	Actual Achievement 2013/2014	Planned Target 2014/2015	Actual Achievement 2014/2015	Deviation from Planned Target to Actual Achievement for 2014/2015	Comment on deviations
Number of Innovation Reports Completed	New Measure	2	7	5	A new measure that was only introduced this year. Although the target was met, this is an area that the CGS plans to grow and it thus created a distinct focus area to initiate new innovative research and applied projects.
Annual Technical Programme Performance Index	96.83%	85%	76%	-9%	Owing to the repositioning strategy and the new improved assessment processes, this result was expected. The CGS, however, plans to address this decline by initiating more focussed programmes of work with integrated deliverables rather than disparate projects. It is considered that this will bring the assessment score to levels closer to the target and over- achievement of previous years.

Strategic Objective:	To Effectively Promote the Council for Geoscience and Disseminate Strategic Information to the Public				
Articles published in the Popular Press	3	2	9	+7	The CGS aims to improve its public image. The result for this measure is pleasing as it helps to establish the CGS as a leader in geoscience.
Articles published in Industry Publications	1	4	3	-1	The target for industry publications suffered as the CGS did not manage to secure enough funding to publish some planned articles.

TO ACHIEVE SUSTAINABLE REVENUE AND PROFIT GROWTH									
To Generate Revenue									
R316.9m	R378.8m	R310.0m	-R68.8m	Total revenue depends on both MTEF additional funding and contracting revenue. There were delays in the implementation of the MTEF projects and fewer contracting projects were secured.					
R40.5m	R87.9m	R37.0m	-R50.9m	The Eskom Nuclear Plant Siting project and the Mine Health and Safety Seismic Stations project did not resume as anticipated. No large international projects were secured.					
	TO ACHIEVE SL To Generate Re R316.9m R40.5m	TO ACHIEVE SUSTAINABLE R   To Generate Revenue   R316.9m   R378.8m   R40.5m   R87.9m	TO ACHIEVE SUSTAINABLE REVENUE AND PRO     To Generate Revenue     R316.9m   R378.8m   R310.0m     R40.5m   R87.9m   R37.0m	TO ACHIEVE SUSTAINABLE REVENUE AND PROFIT GROWTHTo Generate RevenueR316.9mR378.8mR310.0m-R68.8mR316.9mR378.8mR310.0m-R68.8mR40.5mR87.9mR37.0m-R50.9m					
Economic/ Financial Growth Perspective	TO ACHIEVE SUSTAINABLE REVENUE AND PROFIT GROWTH								
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Strategic Objective:	To Generate Re	venue							
Performance Indicator	Actual Achievement 2013/2014	Planned Target 2014/2015	Actual Achievement 2014/2015	Deviation from Planned Target to Actual Achievement for 2014/2015	Comment on deviations				
Ratio of External Revenue to Total Revenue	21.01%	24%	19.29%	-4.71%	This is the effect of a decreased income from contracting work.				
Number of Large Tenders and Proposals Submitted (>R1m)	24	24	17	-7	There were fewer opportunities available for the CGS to submit tender proposals.				
Tender Success Rate	20.83%	10%	22%	+12%	Out of the 17 tenders submitted, 22% were successful, although their value is not large enough to affect the contracting revenue targets significantly.				

Strategic Objective:	To Manage Overhead Efficiency						
Ratio of Overheads to Total Cost	53.31%	60%	56.45%	-3.55%	Target achieved.		
Ratio of Personnel Cost to Total Cost	51.27%	59%	54.47%	-4.53%	Target achieved.		

Effective Systems (Organisational) Perspective	TO DEVELOP AND MAINTAIN EFFECTIVE AND STREAMLINED PROCESSES, USING APPROPRIATE TOOLS AND METHODOLOGIES							
Strategic Objective:	To Develop and Implement Effective Policies and Procedures							
Number of Audit Qualifications	0	0	0	0	An unqualified audit report was obtained.			
Number of Policies Written and/or Reviewed	New Measure	5	11	+6	A new measure aimed at ensuring compliance and remaining up to date with any changes in the laws of the country. The impetus in Human Resources and Finance can be commended. Other departments are planning continuous improvement by thorough reviews of policies.			

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Strategic Objective:	To Drive Preferential Procurement							
Performance Indicator	Actual Achievement 2013/2014	Planned Target 2014/2015	Actual Achievement 2014/2015	Deviation from Planned Target to Actual Achievement for 2014/2015	Comment on deviations			
Preferential Procurement as a Percentage of Total Procurement	18.03%	40%	51%	+11%	Renewed processes and focus on BBBEE throughout the CGS have resulted in an inspection of the supplier base. This measure has had a positive effect on the score.			

World-Class People Perspective	TO DEVELOP A WORLD-CLASS GEOSCIENCE ORGANISATION WHERE OUR PEOPLE CAN GROW AND PERFORM								
Strategic Objective:	To Attract and F	Retain a Skilled	Workforce						
Staff Turnover	-2.88%	0%	1.97%	-1.97%	The negative deviation is due to a higher number of voluntary separations than was anticipated. The salary budget of the organisation is under pressure. The CGS cannot fill all the vacancies in the organisation.				
Number of Staff Sponsored for MSc and PhD Degrees	42	35	35	0	The CGS is committed to supporting young scientists in gaining advanced qualifications and thus the target was achieved as planned.				
Proportion of Scientists to Total Staff*	35.53%	50%	37.25%	-12.75%	The scarcity of scientific skills in the open market and the difficulties in obtaining and retaining skilled and qualified scientists explain this deviation.				
Proportion of Scientific Staff with MSc and PhD Degrees	47.22%	60%	45.95%	-14.05%	The negative deviation is due to the scarcity of skills associated with MSc and PhD qualifications hence the budget increase in sponsorship for MSc and PhD degrees. In addition, there are difficulties in retaining trained staff owing to the national scarcity of skills.				

\* Scientists are preparing themselves to be rated by the NRF

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Strategic Objective:	To Enhance Present Levels of Excellence						
Performance Indicator	Actual Achievement 2013/2014	Planned Target 2014/2015	Actual Achievement 2014/2015	Deviation from Planned Target to Actual Achievement for 2014/2015	Comment on deviations		
Number of Papers and Articles Published	145	70	140	+70	This is a positive result reflecting the skills development of CGS staff as well as the recognition of their skills on the international stage.		
Number of Projects with External Collaborators	50	55	46	-9	The CGS views collaboration with external partners as a very important strategy to build experience and improve skills.		
Number of Strategic Science Partnerships	29	22	17	-5	This measure is focussed on strengthening geoscience research in the organisation by engaging in joint research with universities and other research organisations.		

Strategic Objective:	To Build a Positive Organisational Culture						
Percentage Satisfied Staff Members	72.5%	65%	60.6%	-4.4	The CGS has been through a staff migration during the financial year in support of a new target operating model. This lower than targeted result is expected when high impact change is experienced.		

Strategic Objective:	To Reflect and Embrace the Diversity of South Africa							
Percentage Overall Employment Equity Targets in the Organisation (White-Black)	31:69	32:68	30:70	+2.9% Black	The CGS is satisfied with the progress made in respect of this measure.			
Percentage Overall Employment Equity Targets in the Organisation (Male-Female)	56:44	54:46	56:44	-4.3% Female	Finding female scientists remains a challenge, but the CGS is attending to this challenge through recruitment processes.			

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### 5. SUMMARY OF FINANCIAL INFORMATION

### 5.1 Revenue Collection

2014/2015					2013/2014	
Sources of Revenue	Estimate	Actual Amount Collected	(Over)/Under Collection	Estimate	Actual Amount Collected	(Over)/Under Collection
	R'000	R'000	R'000	R'000	R'000	R'000
Government Grant	287 839	250 237	38 076	271 232	250 345	20 887
Commercial	87 412	36 803	50 649	79 680	40 210	39 470
Publications	432	226	206	180	244	(64)
Total	375 683	287 266	88 931	351 092	290 799	60 293

### 5.2 Programme Expenditure

2014/2015				2013/2014		
Programme	Budget	Actual Expenditure	(Over)/Under Expenditure	Budget	Actual Expenditure	(Over)/Under Expenditure
	R'000	R'000	R'000	R'000	R'000	R'000
Annual Technical Programme	156 036	114 376	41 660	128 741	114 760	13 981
Commercial	47 527	20 875	26 629	45 211	25 203	20 008
Total	203 563	135 251	68 289	173 952	139 963	33 989

### 5.3 Capital Investment, Maintenance and Asset Management Plan

#### 2014/2015 2013/2014 Infrastructure projects (Over)/Under Expenditure (Over)/Under Expenditure Budget Actual Budget Actual Expenditure Expenditure R'000 R'000 R'000 R'000 R'000 R'000 20 997 20 562 18 605 18 605 0 Total 0

### Total payments for infrastructure projects

### Total payments for business units

2014/2015					2013/2014	
Subprogramme	Budget	Actual Expenditure	(Over)/Under Expenditure	Budget	Actual Expenditure	(Over)/Under Expenditure
	R'000	R'000	R'000	R'000	R'000	R'000
Total	382 434	324 690	57 744	326 522	312 826	13 696

### 6. HIGHLIGHTS OF ACTIVITIES

**6.1 National Projects** 

### **GEOSCIENCE MAPPING THRUST**

Geoscience mapping is a core function of the Council for Geoscience and forms the basis from which products and services that are of value to the stakeholders and clients are derived. It embodies the primary expertise of the Council for Geoscience and consists of several types of mapping, such as geological, geotechnical, geochemical, geophysical, metallogenic, seismological and marine geoscience mapping. The main aim of the Geosciences Mapping thrust is to provide world-class (leading) geoscience solutions to stakeholders and customers to enhance the prosperity and sustainability of the resources of the country and the safety of its citizens.

Systematic geoscience reconnaissance mapping of the country on appropriate scales for national development has been conducted on land and in offshore areas within the territorial boundaries of South Africa. The information gathered feeds into the solutions provided by the Mineral and **Energy Resources thrust in the identification** of potential and/or economic mineral deposits and energy resources, including geothermal energy and other natural energy resources such as coal, petroleum, natural gas and shale gas. Similarly, it will feed into the solutions provided by the Environmental and Water thrust in the mitigation or avoidance of environmental geohazards, and with water resource assessments and protection. This includes the provision of adequate quantities of water to communities, industry and agriculture, and monitoring the use of water. Assistance to the Engineering Geoscience and Geohazards thrust pertains to safe and sustainable human settlement and infrastructure development. All these support the Economy and Employment, Economic Infrastructure, **Environmental Sustainability and Resilience** and Inclusive Rural Economy focus areas of the NDP 2030.

### *New 1:1 000 000-scale geology map of South Africa*

A new release of the 1:1 000 000-scale geology map of South Africa is planned to coincide with the 35th International Geological Congress (35th IGC) in 2016. This geological map was first released in 1925 and updated in 1955, 1970, 1984 and 1998. The main plan is to review the 1:250 000-scale map sheet data for compliance with the latest lithostratigraphic advances and seamless map sheet boundaries.

Line work corrections to make the 1:250 000-scale data set seamless, with updated attribute tables containing the latest nomenclature, age data and proposals for 1:1 million-scale presentation, have been received from the various task teams and a seamless 1:250 000-scale map from the data is being compiled which will be used to manually compile two chronars. The chronars will comprise one for the western 1:1 million map sheets and the other will be a combination of the northeastern and southeastern maps. The 1:1 million polygons and lines will then be compiled manually onto these chronars, starting with the western chronar. Compilation of both chronars has to be completed in mid-2015 in order to stay on track with the schedule for production and the review of the first compilation of the complete map and legend by the end of 2015.

### Marine geological mapping

The Council for Geoscience has developed two large-scale projects aimed at addressing some of the major offshore issues of the South African coast, namely sediment dynamics as a means to understanding the availability of sediment as a mineable commodity for aggregates and building sand and the examination of possible mineral resources on the South African continental shelf.

Geophysical data sets for two areas of interest were surveyed during the year, namely the Atlantic Seaboard (between Hout Bay and Mouille Point) and the tombola between Robben Island and Big Bay.

Multibeam bathymetric data were acquired for both localities and additional sediment sampling of the Atlantic Seaboard site was done. Repetitive beach profiling surveys of beaches along the Atlantic Seaboard were concluded to identify the sediment trends and dynamics of important tourist beaches. Two lines of boomer seismic data were collected from the inshore area to the first shelf break with an additional four lines still to be collected.

It is envisioned that seismic regional boomer data will be collected with a new, more technologically advanced boomer seismic system off the western margin of the Cape Peninsula and a survey on the southwestern continental shelf near Saldanha Bay is being planned for 2015.

### Northern Cape 1:50 000-scale multidisciplinary mapping

This project commenced in April 2014 and is an integrated multidisciplinary mapping project focussed on areas covered by recent MTEFfunded programmes involving geochemistry and geophysics. The geoscience mapping started in the Keimoes area. Consolidating and supplementing all available geoscience data for the six chosen map sheets into an integrated database that is real-time during the course of the project will facilitate the early release of data to end users. The secondary aim is to standardise the approach to geological mapping in the modern digital era by interrogating and interpreting all data towards gaining a more complete understanding of target areas.

The initial project database has been established, and includes captured geological maps, Landsat and aster imagery, regional geochemistry and existing mineral occurrences information. The MTEF geophysical survey has been completed and will be added to the database. Fieldwork was done from July to September and involved the sampling and characterisation of all geological units, visiting all mineral prospects and a hydrocensus. Ground geophysical surveys were undertaken across selected structural zones.

The geological and water samples collected during the fieldwork phase were submitted to the analytical laboratory of the Council for Geoscience in Pretoria. The field databases captured by individual geologists were collated and a start was made on the compilation of the maps and the write-up of a map explanation, in anticipation of the analytical data.



Digital elevation models acquired by a mobile laser scanner for Monwabisi Beach along the northern rim of False Bay

### Multibeam bathymetry of the corridor between Robben Island and Big Bay

The Council for Geoscience was approached by an adventurer on behalf of a charity foundation in the Western Cape for reliable bathymetric data between Robben Island and Big Bay, the purpose of which is for a team to walk underwater between the two localities to raise funds for the Nelson Mandela Children's Hospital. Survey operations to acquire ultrahigh resolution multibeam bathymetric data were conducted in May and June 2014. Depths within the survey block range from approximately 0.5 to 20.0 m below chart datum. The area surveyed is characterised by a prominent convex ridge (tombola) extending from Robben Island to Big Bay. Two route options have been provided for exiting the harbour, with both being approximately 230 m long, expected to take 13 minutes to complete.

The high resolution multibeam bathymetric data have proved invaluable to successfully planning the safest route between Robben Island and Big Bay. It is evident that the most challenging part of the traverse will have to be overcome at the start when exiting the Robben Island Harbour. Once over a prominent lithological outcrop, the rest of the walk is comparatively flat with exposure to the cold water and decompression schedules being the limiting factors, rather than notable bathymetric obstructions.



Multibeam image of the Long Walk corridor between Robben Island and Big Bay



The outcrop that needs to be traversed when exiting the harbour of Robben Island

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### MINERAL AND ENERGY RESOURCES THRUST

The Mineral and Energy Resources thrust of the Council for Geoscience aims to stimulate the minerals industry in order to increase exploration expenditure as a means of creating wealth for South Africa and the African continent.

This stimulation will be achieved through the provision of precompetitive geoscience information that supports and facilitates onshore and offshore energy and mineral exploration in South Africa. The information and data form the basis for long-term investment by industry and society in the mineral and energy sectors to ensure stable employment and prosperity, as well as to guide government policies on minerals development. This is achieved through integrated programmes of data gathering and assessment conducted at a national and a regional scale.

The Council for Geoscience undertakes activities of national strategic importance that support government programmes such as the NDP 2030 (Economy and Employment, Economic Infrastructure, Inclusive Rural Economy focus areas), the New Growth Path and the Integrated Resource Plan, which seek to eradicate poverty, to promote the creation of employment, energy security, diversification of the economy, including the promotion of the green economy, and to promote growth by identifying six priority sectors focussed on infrastructure and rebuilding the productive sectors of the economy, including mining.

### Establishment of a geoscience and mining research and development programme

In 2008, the Department of Science and Technology (DST), together with the Council for Scientific and Industrial Research (CSIR), the Department of Mineral Resources (DMR), the Council for Geoscience and MINTEK, commissioned and undertook an initiative to explore how to advance mining and geosciences research and development in Africa. The outcome of the Africa mining and geoscience consultative process has been utilised to develop and inform a South African research agenda for mining and geosciences. A report undertaken by the CSIR on the development of a South African research agenda for mining and geosciences in 2012 highlights several uniquely South African problems and a revival of some aspects of research.

With this background, the Council for Geoscience was commissioned by the Department of Science and Technology to lead the implementation of the South African geoscience research priorities, mainly geometallurgy and advanced geoscience data gathering. The initiative was in agreement with the requirements of the Advanced Metals Initiative (AMI), a flagship programme of the Department of Science and Technology. This programme facilitates research, development and innovation across the whole value chain in the field of advanced metals.

A business plan covering projects to be implemented from 2014 to 2020 was submitted to the Department of Science and Technology. These projects are geared to address the fundamental geological science issues of geometallurgy and advanced geoscience data gathering.

### Geometallurgy programme

### 2014/15

Characterisation of the PGE distribution in the Platreef ores of the Bushveld Complex. This follows the completion of the characterisation of ores in the Merensky Reef. The study will also include the design of optimum metallurgical flow sheets for the Merensky Reef and Platreef.

### 2015/16

Characterisation of the iron/manganese ores in the iron-manganese fields of the Northern Cape Province and the design of metallurgical flow sheets for the optimum extraction of the ores.

- An evaluation of the mineralogical-textural subdivision of the upper manganese bed in the Kalahari Manganese Field in areas where it is very thick and has the potential of being utilised.
- Upgrading of low-grade iron ore deposits to high-grade ores. A detailed description of the low-grade ores from a textural perspective will be done followed by geometallurgical characterisation and physical metallurgical tests to obtain high grade density separates.

### 2016/17

Characterisation of titaniferous magnetite ores in the Bushveld Complex as a potential source of iron and titanium in South Africa and the design of metallurgical flow sheets for the optimum extraction of the ores.

### 2017/18

Geometallurgical study of gold in refractory ore deposits in South Africa and the development of process flow sheets for the optimisation of the existing circuits.

#### 2018/19

Geometallurgical study of base metal deposits in the Namaqualand Metamorphic Province (Aggeneys–Gamsberg) and the design of metallurgical flow sheets for the optimum extraction of the ores.

### 2019/20

Geometallurgical study of the REE deposits in South Africa and the development of process flow sheets to optimise the extraction of the metals.

### Advanced geoscience data gathering programme

### 2014-2015

Use of downhole geophysical logging to

better understand and define the distribution of alkalis in the Sishen–Beeshoek iron ore deposits and the Kraaipan gold deposits, which is critical to improving the processing and recovery of these commodities.

#### 2015-2016

Assessing the applicability of TEM/CSAMT/IP/ resistivity technologies in delineating sulphide hosted ore targets in South Africa focussing on Namaqualand.

### 2016-2017

Assessing the effectiveness of TEM/CSAMT/ IP/resistivity for structurally controlled hydrothermal gold deposits focussing on Sabie–Pilgrim's Rest.

#### 2017-2018

Assessing the effectiveness of TEM/CSAMT/ IP/resistivity for structurally controlled hydrothermal gold/base metal deposits focussing on the Tugela terrain.

#### 2018-2019

The applicability of TEM/CSAMT/IP/resistivity in delineating the mapping of quartz hematite polymetallic/REE ore targets in acidic rocks focussing on the Bushveld granitic phase.

### 2019-2020

Deep probing electromagnetic/resistivity/ seismic methods in exploration basin analysis focussing on the main Karoo Basin.

## Potential coalbed methane gas resources in South African coalfields

A literature review report was produced with the objective to compile data on coalbed methane relevant to South African coalfields, to explore the potential coalbed methane sources in various parts of the coalfields and to undertake gas resource assessments. The aim of this report is to produce a methane gas resource map of the energy potential of South African coalfields for coalbed methane (CBM) exploration.

The coal resources of South Africa are currently being exploited in various parts of

the country, among others in the Mpumalanga and Limpopo Provinces. However, there are considerable coal resources that cannot be accessed using conventional mining methods such as underground and open mining methods since the coal seams are too deep. As a result, these coal resources are inaccessible and therefore coalbed methane cannot be ignored in terms of future exploitation. The successful application of unconventional mining methods could assist in mitigating the climate change challenges and power supply constraints that South Africa is currently facing.

The assessment of coalbed methane potential was conducted in the Perdekop area in the Mpumalanga Province using parameters such as the deep coal seams, coal seam porosity, coal seam thickness, coal seam type, coal seam maturation and the volatile matter of the coals. This area is known to host deep seated coal seams and it is close to an Eskom pilot plant for underground coal gasification purposes.

The results indicated that the quantity of methane gas that could be produced in the study area may be relatively low in comparison to international coal basins but, if properly managed, coalbed methane will represent a viable, economic energy resource for the country.

### Regulations for shale gas and hydraulic fracturing

The Council for Geoscience is a member of the working group tasked with assisting the Department of Mineral Resources to draft the regulatory framework for hydraulic fracturing for the production of shale gas in South Africa. The Council for Geoscience contributes in respect of determining the requirements for the conditions below the ground, setting the requirement for hydrogeological investigation, the monitoring of microseismicity and the submission of geological overview reports. The organisation is collaborating with specialists in downhole wireline logging and deep groundwater sampling to formulate a proposal on Karoo deep groundwater dynamics.

A research proposal on the environmental risks of hydraulic fracturing, especially the interaction between deep and shallow groundwater, has been submitted to MTEF. The Council for Geoscience is collaborating in the Karoo Research Drilling Project, led by the University of Pretoria, for which three deep boreholes will be drilled.

### Shale gas potential of the resources in the Whitehill and Collingham Formations of the Ecca Group

South Africa's energy needs are being met by the exploitation of coal. However, owing to declining coal reserves, there has been a renewed interest in alternatives including energy derived from shale gas. In addition, coal dependency for generating electricity and for conversion to liquid fuels makes South Africa one of the most  $CO_2$ -intensive countries in the world. With the emergence of shale gas as an economically viable source of energy, there is a renewed interest in the shale gas potential of the Karoo sediments, particularly the Whitehill and Collingham Formations of the Ecca Group.

A literature study was undertaken by the Council for Geoscience to compare shale gas deposits with Karoo deposits. Available information including the geology and geophysics and borehole logs was integrated into a database.

The porosity, permeability and gas contents at required depths are unknown and it is proposed that drilling of five boreholes up to 1 200 m deep in the Beaufort West area should be conducted to thoroughly understand the stratigraphy and various shale properties that contribute to the presence of hydrocarbon gas. It is recommended that a "sweet spot" north of the current study area be targeted specifically for gas exploration itself. A borehole of 3 000 m should be drilled in this area and the borehole should be thoroughly investigated in collaboration with PASA, the Department of Water Affairs, the Department of the Environment, the Department of Science and Technology and SANEDI.

### *Offshore mineral resources of the Western Cape Province*

The offshore environment of South Africa hosts a variety of georesources, including authigenic phosphates. With the vast improvements in data resolution achieved with geophysical systems in recent times and progress in methodologies applied in the interpretation of predominantly seismic data, a new opportunity to readdress South Africa's offshore georesources has been presented through the study of two areas that show potential based on past reconnaissance studies and onland indicators, the regions surrounding Saldanha Bay (West Coast) and Mossel Bay (South Coast). The target market for this project consists of stakeholders with an interest in offshore mineral reserves and global change, particularly in South Africa.

In the first phase of fieldwork for this investigation, the marine geoscience staff of the Council for Geoscience collected nine pinger seismic profiles between Knysna and Stilbaai using a vessel certified to work on the Agulhas Bank. The data were processed and integrated into the existing database. In the second phase of fieldwork, a boomer subbottom profiler was used to collect seismic profiles offshore of Saldanha Bay on the western margin.

Two commodities, phosphate and building sand, were considered for further investigations. Calculations of the phosphate resources suggested that the South African offshore area contains approximately 3 500 million tonnes of phosphate. This number could potentially be considered relatively conservative. A deposit of marine sediments blankets the Western Cape seafloor. This deposit reaches up to 20 m on the South Coast inner continental shelf and up to 10 m on the West Coast continental shelf. These sands could be considered for a future reserve of building sand.



Council for Geoscience



Diamond drilling near Jansenville in the Eastern Cape Province



Track charts for the two seismic surveys undertaken in the offshore area of South Africa





### **ENVIRONMENTAL AND WATER THRUST**

The South African mining industry is relatively mature and the focus is shifting from exploitation to rehabilitation and the need to address the mining pollution legacy produced by past mining activities. Furthermore, the social and economic wellbeing of communities is related directly to the health of the environment in which they live, produce their food and work.

In addition, adequate access to sustainable, potable water sources is critical to the health of communities and for rural development and focus will be on delivering projects that address this need.

Thus, business growth in the Environmental and Water thrust will focus on soil, water and surface pollution and the preservation of sensitive environments. The basic geoscience knowledge infrastructure and an understanding of geological processes underlie the management of all the abovementioned environmental hazards. The development of expertise to contribute meaningfully to the management of these processes should unlock significant business opportunities.

With regard to water resource assessment and protection, field investigations within the thrust will focus on the physical and chemical processes associated with subsurface water bearing environments, as well as the socio-economic and institutional aspects that affect the management of these resources.

The Environmental and Water thrust will contribute towards the NDP 2030 focus areas of Environmental Sustainability and Resilience and Inclusive Rural Economy.

### Street dust and health risk assessments of the Krugersdorp and Delmas areas

This three year project, from 2014 to 2016, is undertaken by the Council for Geoscience as part of a capacity building initiative in air quality monitoring and the prevention of pollution.

The main aim of the study is to assess the air pollution impact that is caused by street dust and to highlight the associated potential health effects. The objective of the study is to determine the chemistry and mineral contents of street dust and the particle sizes of dust in the Krugersdorp and Delmas areas. The chemistry analysis will assist in determining the metals to be found in street dust. The mineral analysis will assist in determining the relationship between the geology and mining activities of the areas which contribute to the production of minerals in the street dust. A particle size analysis will highlight potential health effects due to street dust.

The mineral results show that the most dominant minerals found in street dust are quartz and plagioclase in the Krugersdorp area and quartz and kaolinite in the Delmas area. Quartz is found to be the dominating mineral in both areas. The results of the chemistry analysis show that vanadium, manganese, copper, barium and lead are the highly concentrated metals in both areas. The two areas were chosen because they are highly agricultural and industrial and therefore prone to pollution.

### Witwatersrand Strategic Water Management project

Extensive research has been conducted by the Council for Geoscience regarding the ingress of water into the mines of the Witwatersrand. Areas of water ingress into the underground workings and implementable measures to reduce ingress have been identified. The Grootvlei and Florida canals have been constructed, with canals in the Central Basin at Durban Deep, New Canada and ERPM having reached the design and permitting stage and authorisation from the Department of Environmental Affairs still outstanding. An additional canal site has been identified in Amalgam.

### Geochemical analysis of potential harmful trace elements (PHTEs) in the groundwater of Greater Giyani, Limpopo Province

Rural communities in developing countries mostly rely on borehole water as their only source of water. Groundwater is not always pure and clean and may contain certain amounts of trace elements that can become deleterious to human health.

The objectives of this investigation were to assess the concentration levels of potential harmful trace elements (PHTEs) and their spatial distribution patterns in borehole water in the greater Giyani area of Limpopo, and the potential associated human health risks.

The method of research comprised two phases. In the first phase, the occurrence and distribution patterns of PHTEs in boreholes in the Giyani area were assessed. A total of 29 water samples were collected from 15 community boreholes and 14 primary school boreholes during the dry season of July/ August 2012, and for comparison another 27 samples from 15 community boreholes and 12 school boreholes from the same localities were collected during the wet season of March 2013. The samples were analysed for the trace elements arsenic (As), cadmium (Cd), chromium (Cr), selenium (Se) and lead (Pb) using the Inductively Coupled Plasma Mass Spectrometry (ICPMS) technique. In order to assess the groundwater quality, the PHTE concentrations were compared with the South African National Standards of drinking water, SANS 241-1:2011.

In the second phase, the geographic variations between PHTEs and associated human health effects were evaluated. This involved the acquisition of data on a total of 100 cancer cases and 66 mortalities due to cancer during the period 2011 to 2014 from a local hospital.

Cadmium displayed a low concentration in all sampled boreholes whereas lead was found

to be present at limits of detection in 96.6% of the sampled boreholes. Concentrations of As, Cr and Se, however, exceeded the South African National Standard (SANS) permissible limits for drinking water in more than one borehole. Nearly 13% of boreholes in the area had an arsenic concentration of more than two times the SANS permissible limit for drinking water with two samples containing five times more arsenic than the SANS acceptable limit. Boreholes with such high arsenic levels are hosted by the rocks of the Giyani Greenstone Belt associated with gold mineralisation. Although a few cancer incidences and mortalities due to cancer were observed in arsenic hot spots, this investigation does not reveal a clear correlation between health effects and the high arsenic levels in the borehole water of the greater Giyani area, possibly as a result of the small number of cases captured in the database.

### Management of Derelict and Ownerless (D&O) mines in South Africa

The project team of the Council for Geoscience visited and ranked about 2 778 sites during the year under review. Since 2012, approximately 5 088 (85%) of the total D&O mines in South Africa have been visited and ranked and the remaining 912 sites will be visited in 2015.

Field investigations show that there are more operational/owned mines in Mpumalanga (185) than in any other province. This can be attributed to extensive coal mining in the Mpumalanga Province and the high demand of electricity in South Africa.

Furthermore, it is evident that 48% (2 465) of the visited sites do not appear to require rehabilitation, which will reduce state liability. In addition, 16% (806) of the visited mines were found to be operational/owned. However, there were 788 sites that require rehabilitation. From the 788 sites that require rehabilitation, 211 were classified as a high priority owing to their large, negative environmental and health impacts such as water contamination, asbestosis and safety concerns as a result of mine openings close to communities. Furthermore, 189 sites are of a moderate priority and 388 are of a low priority.

It is also significant to note that there are 1 029 visited but without access sites. Most of these sites are located in nature reserves and/or private game farms/land. A total of 294 no access sites in game reserves/farms were checked for mining and prospecting licences. It was found that 149 sites had prospecting licences, 14 had mining licences and 84 had no prospecting/mining licences, while no farms were found for 47 sites.

### *Climate change impact on two river systems in the W55 catchment in the Mpumalanga Province*

Semi-arid and arid areas are particularly vulnerable to the impacts of climate change on water supply. Most of the people living in the W55 and W56 quaternary catchments in the Mpumalanga Province use groundwater directly from springs as their sole water supply.

The W55 and W56 catchment areas are used mainly for forestry and farming. Two river systems in the area, the Usushwana and Mbuluzi Rivers, have been reduced in size over the years. The objective of this study is to show the potential effect of climate change on water resource availability in the catchment areas.

A hydrochemical study in the W55 and W56 catchments to determine the physicochemical characteristics, controls on water chemistry and groundwater/surface water interaction has been carried out by analysing 63 water samples. The water was classified as low mineralised and freshwater and suitable for drinking as per SANS standards. The major controls on water chemistry are reverse ion exchange and simple mixing/dissolution processes. Both the groundwater and surface water shows an evolution from freshwater to saline water with one sample plot depicting pollution by sulphate. The groundwater and surface water does not show any distinct chemical differences which may mean that there is groundwater/surface water interaction.



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Distribution of visited versus not visited D&O mines in South Africa



Rehabilitation prioritisation of all visited D&O mines in South Africa



Rehabilitation prioritisation of visited D&O mines per province



The W55 and W56 catchments in the Mpumalanga Province



Geology of the W55 catchment area

### ENGINEERING GEOSCIENCE AND GEOHAZARDS THRUST

Engineering Geoscience and Geohazards denotes a specialised capability which provides services and consulting in this area through a huge information base and considerable expertise in the area of geohazards and disaster management.

An adequate assessment of the geological environment is a prerequisite to formulating effective recommendations regarding the suitability of a site for sustainable human settlement and infrastructure development. Any structure or infrastructure interfacing with the geological environment can be constructed economically, perform safely, and can have a non-detrimental impact on other works and human lives only if all geological elements are accurately identified and their properties adequately measured and evaluated.

This requires, inter alia, the capability to identify and describe rock and soil types, rock mass and soil formation characteristics and groundwater conditions, and the recognition and description of the potential for phenomena such as sinkholes, flooding, erosion, slope failures, ground heave and subsidence and collapse. In addition, insufficient geotechnical investigations, faulty interpretation of results or failure to portray results in a clearly understandable manner may contribute to inappropriate designs, delays in construction schedules, costly construction modifications, use of substandard borrow material, environmental damage to the site, postconstruction remedial work and even failure of a structure and subsequent litigation.

The role of the Engineering Geoscience and Geohazards thrust is to monitor, assess and conduct targeted research on a wide range of natural hazards in order that policy makers and the public understand the need to enhance preparedness, response and resilience. The thrust plays an important role in developing models, methods, information and tools to analyse hazard risks and impacts related to infrastructure development, thus contributing towards the Economic Infrastructure, Environmental Sustainability and Resilience and Inclusive Rural Community focus areas of the NDP 2030.

The Geoscience Amendment Act (Act No. 16 of 2010) mandates the Council for Geoscience to, among others, be the custodian and curator of all geotechnical information in the country, as well as being a national mandatory authority in respect of geohazards related to infrastructure development. In other words, the Act empowers the Council for Geoscience to be the custodian of all geotechnical data with the purpose of advising and assisting government, state institutions, parastatals, private organisations and the general public by providing a complete geotechnical risk profile of the country. The mandate aims to ensure safe development on hazardous ground by taking all necessary and appropriate steps to ensure that adequate and sufficient geotechnical investigations are performed prior to any housing and/or infrastructure development.

#### Microzonation of Johannesburg

Over the next three years, the Council for Geoscience will be developing a microzonation model for Johannesburg, including those areas underlain by abandoned and flooding mines, which can assist in the mitigation of possible earthquake damages. Microzonation is a process where seismic hazards are identified at different locations within an area and is essential to identifying potential seismic hotspots, which could affect critical structures such as subways, bridges, elevated highways, sky trains and dam sites (including tailings dams from the mines). Many large cities around the world, including those in regions of low to moderate natural seismicity, such as South Africa, have put much effort into developing microzonation models for a better understanding of the earthquake hazard within major cities.

Microzonation requires a multidisciplinary contribution as well as a comprehensive understanding of the effects of ground motions/ vibrations generated by earthquakes. It involves experts in the fields of geology, engineering geoscience and seismology, because local site conditions could be very different owing to variations in the thickness and properties of the soil layers. This could have significant effects on the characteristics of earthquake ground motions on the ground surface, to which buildings are subjected.

The Council for Geoscience is currently monitoring the seismicity within the Johannesburg region with a local network of 12 seismograph stations located in the Witwatersrand Basin, as well as with the 28 seismograph stations within the South African National Seismograph Network, both of which are operated and maintained by the organisation. The Council for Geoscience has noticed the continued occurrence of seismicity in the Johannesburg area since the pumping of water from the mines ceased in 2008. These events have also been noticed and commented upon by the public and the media. The Council for Geoscience believes that these earthquakes are a cause for concern as they pose a risk to the Johannesburg community.

However, the authorities involved, whether they be for disaster management, building codes

and standards, monitoring of tailings dams or housing, are not sure what they should plan for in order to mitigate the consequences of seismicity within Johannesburg.

Much effort was made to obtain the cooperation of stakeholders, such as the City of Johannesburg, the Gautrain Project Team and the National Disaster Management Centre. There was very positive feedback during the meetings that were held and a general willingness to collaborate was expressed. The engineering geology, geophysics and geology aspects of the project were initiated.

### Development of remote sensing techniques to predict geohazards

A three year grant was awarded by the Department of Science and Technology to the Council for Geoscience for a project focussed on developing remote sensing techniques to better understand and predict the occurrence and impact of a wide range of geohazards. The focus of the project was on developing remote sensing techniques to address the geological hazards identified in the first phase of the project, with an emphasis on the identification of precursors to events. Geohazards investigated include coastal and beach geohazards, terrestrial erosion, deformation related to mining activities and water abstraction, geochemical hazards, landslides, problem soils, seismic induced hazards, sinkholes and tsunami and groundwater related hazards.

The main aim of the project was to integrate and coordinate geographic information technology with special emphasis on the application of remote sensing activities and spatial data to first identify areas at risk of potential disasters and second to develop a framework for the practical assessment of the hazard, associated vulnerability and risk. The project successfully produced a database and atlas of the known geohazards in South Africa, the framework for their assessment using remote sensing and spatial analysis techniques, and a website containing the information pertinent to the project. A series of information sessions were conducted to showcase the project deliverables, including a workshop in Durban and in Pretoria and a display at the Space Science Week in Mthatha,

with the final workshop in November 2014 involving potential end users of the information in government departments, private companies and research students.

#### Dynamic 3D modelling in the KOSH area

The country's focus was shifted to the Klerksdorp–Orkney–Stilfontein–Hartebeesfontein (KOSH) area on 5 August 2014 when a magnitude 5.5 earthquake event struck in Orkney. A 28 station strong ground motion network installed and operated by the Council for Geoscience recorded the event perfectly. The significance of the event called for the construction of a simplified model of the KOSH region.

The objective was to identify whether or not the removal of material in the mines may cause additional shear stress at depth along a plane of weakness. A successful numerical analysis involves constructing a simplified representation of the physical mechanisms that control the behaviour of a particular system. Shear stress and shear displacement were monitored at three depths. The removal of blocks directly above or nearest to the fault plane resulted in a stagnation of the shear displacement and a consequent build-up of shear stress. This was most notable at a depth of 5.5 km. The magnitudes of the changes in shear displacement and shear stress were very small, roughly 4 mm and 0.042 MPa.

### Seismic activity in South Africa

All natural earthquakes that were recorded in southern Africa during the year under review measured less than four on the Richter magnitude scale.

A total of 40 earthquakes within the magnitude  $1.4 \le M_L \le 2.6$  were recorded and located in Lesotho during 2014.

Swaziland experienced three earthquakes with a small magnitude ( $M_{L}$ <2.0).

The most significant mining related earthquake in South Africa measured  $M_1 \sim 5.5$  and occurred in

the Orkney gold mining area on 5 August 2014. The earthquake caused one fatality and severely damaged houses in the Orkney and outlying areas. A full investigation was done and a report compiled after the area had been visited by scientists of the organisation.

Seismic activity in the Northern Cape Province was high during the period under review and 160 earthquakes were recorded with magnitudes ranging from 0.8 to 3.2 on the local magnitude scale. The majority of the earthquakes occurred in the Augrabies area that has been seismically active since August 2006.

Nine earthquakes were located in the Western Cape Province during the period under review.

The Eastern Cape Province experienced three earthquakes with a magnitude of less than 3.0. One of the earthquakes, recorded in May 2014, was located ~90 km off the coast in the vicinity of the Agulhas–Falkland Fracture Zone.

Seismicity in the Free State was dominated by earthquakes related to gold mining activity in the region while 35 earthquakes could be identified as being of a tectonic nature.

Thirteen earthquakes in the Gauteng Province were identified as unrelated to mining activity and are thus considered as being of a tectonic origin.

Forty-two earthquakes were recorded in the North West Province. Sixteen of the earthquakes were clustered in the vicinity of Vryburg with magnitudes measuring below two on the local magnitude scale.

The Limpopo Province experienced 31 earthquakes of a tectonic origin. Nine of the earthquakes were located near a mine in the Ga-Mapela area and were possibly related to mining activity.

Forty earthquakes were recorded in the Mpumalanga Province during the year.

Thirteen earthquakes occurred in the KwaZulu-Natal Province. One earthquake measuring ~2.5 on the local magnitude scale occurred 22 km to the north of Richards Bay.



The SAGHOS Atlas was compiled to provide information on the threats of geological hazards in South Africa

"The upward trend of people affected, including the increase in the number of disasters, is expected to continue, especially with the growing threat of climate change. In order to mitigate the risks of disasters, South Africa must deploy scientific know-how to identify the kinds of disasters that are likely to occur, where they are likely to occur and why."

Dr Phil Mjwara, Director-General, Department of Science and Technology



Map of tectonic and mining related earthquakes located by the South African National Seismograph Network during the period January to December 2014. The magnitudes are measured in the local magnitude scale (M<sub>1</sub>)

### The earthquake of 5 August 2014

On 5 August 2014, an earthquake of  $M_L = 5.5$  occurred in the Orkney area in the North West Province. Using the national network as well as a cluster network of stations located in and around the Klerksdorp, Carletonville and Johannesburg areas, the Council for Geoscience timeously recorded the event. Preliminary research has shown that the event was caused by strike-slip motion along a fault.

The shaking from the 5 August 2014 earthquake was widely reported to have been felt with reports from as far as Johannesburg, Pretoria, Durban, Cape Town and even Gaborone in Botswana. Extensive damage to houses and other structures in the Khuma, Stilfontein and Orkney areas was observed. One person is reported to have died as a result of a wall that had collapsed and many people were injured.

Understanding the cause and effects of this and similar events is essential to the management of seismic risk in the country. To this end, the Council for Geoscience has embarked on investigations of the Orkney earthquake. All this information will be useful to the authorities to better prepare for similar events in the future.



An isoseismal map of the earthquake which shows bands of colours of equal intensity. The epicentre of the event is shown as a black star

### MODIFIED MERCALLI INTENSITY SCALE

MODIF	ED MERCALLI SCALE	RICHTE	R SCALE	
I.	Felt by almost no-one.	2.5	Generally not felt, but recorded	
н.	Felt by very few people.		on seismometers.	
III.	Tremor noticed by many, but they often do not realise it is an earthquake.	3.5	Felt by many people.	
IV.	Felt indoors by many. Feels like a truck has struck the building.			
V.	Felt by nearly everyone; many people awakened. Swaying trees and poles may be observed.			
VI.	Felt by all; many people run outdoors. Furniture moved; slight damage occurs.	4.5	Some local damage may	
VII.	Everyone runs outdoors. Poorly built structures considerably damaged; slight damage elsewhere.		occur.	
VIII.	Specially designed structures damaged slightly, others collapse.	6.0	A destructive earthquake.	
IX.	All buildings considerably damaged, many shift off foundations. Noticeable cracks in ground.			
Х.	Many structures destroyed. Ground is badly cracked.	7.0	A major earthquake.	
XI.	Almost all structures fall. Very wide cracks in ground.	8.0 and up	Great earthquakes.	
XII.	Total destruction. Waves seen on ground surfaces, objects are tumbled and tossed.			

The Modified Mercalli (MM) Intensity Scale is used to measure the effects of earthquakes

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#### An example of observed damage to a house in Orkney

### 6.2 International Collaboration

### The South Africa/Namibia transfrontier geology project

Both sides of the Lower Orange River are characterised by geological complexity and mineral wealth, including several mineral occurrences, particularly Cu, Pb, Zn, U, Ta, Nb, REE, Li, W and diamonds, and operating mines, and the region lends itself well to geological study. The Council for Geoscience is currently engaged in a transfrontier geology mapping initiative in the region, cofunded by the Geological Survey of Namibia (GSN) and involving collaborators from the universities of Stellenbosch, Cape Town and McGill, in Canada. The team led by the Council for Geoscience and consisting of staff members from South Africa and Namibia, has already produced eight maps on a scale of 1:50 000 and is currently compiling eight more across the high-grade rocks of the Namaqua Metamorphic Province. The mapping programme includes extensive fieldwork, map compilation and research. The research is based on field mapping and petrographic studies, major, trace and isotope geochemistry and geochronology and has been presented together with the digital maps in a report. The new maps and research data have been used to unify the cross-border stratigraphy and to determine the geological history of the area in the context of a modern-day understanding of plate tectonics.

The main application of the maps and report is to provide excellent base geological information

to economic geologists who use the information to identify areas of mineral prospectivity. Other applications of the data include searching for water in this arid region and providing base information for infrastructure development (e.g. solar power farms, pipelines, roads and bridges) of this rural area. Capacity building forms an important component of the programme and includes basic to advanced in-field and in-office training and postgraduate university degree training for the junior geologists of the Council for Geoscience and the Geological Survey of Namibia. The Council for Geoscience has recently been awarded an extension to the contract for mapping in southern Namibia, with an additional eight maps to be investigated in the forthcoming financial year.

### Tanzania mapping project

The Council for Geoscience is a joint partner in a project in Tanzania, managed by the British Geological Survey International (BGSI — now IGS Ltd) and funded by the World Bank, which includes activities such as geological and geochemical mapping, a geotechnical laboratory upgrade, remote sensing and training.

#### Geological mapping

Four CGS geologists assisted the BGSI in supervising and mapping the selected quarter degree sheets (1:100 000 scale) in Tanzania. Eighteen quarter degree sheets (QDS) were mapped and the Council for Geoscience supervised the mapping of six QDS sheets. The CGS team was also involved in the supervision of map compilations by the Tanzanian teams.

#### Geochemical survey

The geochemical survey team of the Council for Geoscience was involved in the supervision and geochemical sampling of ten QDS maps. Completion of the geochemical sampling, installation of new sieve shakers, training for sample preparation and the start of daily routine sieving of the stream sediments all took place in 2013. Training for one month of four GST geologists was done in May 2014. The Council for Geoscience analysed samples from several maps and completed the processing of the data. Very good progress was made with drawing this project to a successful conclusion during the reporting period. Visits by several consortium experts to the Geological Survey of Tanzania in Dodoma gave an almost continuous presence enabling the local teams to complete many of the deliverables. These included all four reports and maps for the regional geochemistry survey, the twelve required geophysics interpretation reports, 18 QDS geological maps and seven map sheet explanations. A contract was drawn up with an external consultant to undertake the geotechnical training component of the programme in 2015. A full meeting of senior managers from the three participating organisations took place to plot out the finalisation of the project. Both the BGSI and Council for Geoscience committed time to completing the project, which included the printing of all the maps and reports and consigning the deliverables to Dodoma.

### South Africa–Europe Cooperation on Carbon Capture and Storage (SAfECCS) and the assessment of the Zululand Basin

Both the Zululand and the Algoa Basin projects were completed and are now under review. The SAfECCS project, funded by EuropeAid, culminated in a workshop held by the international consortium of partners for all the national stakeholders and the European Commission. The Zululand Basin project ended with the submission of a final report to the South African Centre for Carbon Capture and Storage (SACCCS), covering all the contractual deliverables, i.e. a high-level work schedule and budget to carry out the next phase, which includes data acquisition.

The SACCCS-funded project, Effective CO<sub>2</sub> Storage Capacity Assessment for the Zululand Basin, will proceed with seismic profiling and drilling. These investigations aim to provide an improved understanding of the mineralogy, petrology, porosity, permeability and depositional aspects of the sandstone targets. Technical investigations specific to the aquifer assessment will include drill stem and other types of laboratory testing, collation of data and the completion of a report that will include recommendations and requirements for test injection site selection. A critical aspect of this investigation is the assessment of legal obligations regarding environmental legislation. This will be done in consultation with government and municipal authorities, conservation agencies and the broader public.

### Assessment of the $CO_2$ storage capacity of South Africa

Carbon capture and storage (CCS) is one of the fundamental approaches to mitigating global climate change by the capture and injection of  $CO_2$  into suitable geological reservoirs. The Atlas on Geological Storage of  $CO_2$  in South Africa contains a number of possible onshore and offshore repositories within South Africa that conform to the prerequisites for CCS. An expression of interest (EOI) was submitted to the World Bank to assess the CCS potential of Botswana. The Council for Geoscience is part of a multinational consortium of geoscientists, environmental lawyers and engineers awaiting the outcome of the EOI screening.

A Research and Development Agreement was signed between the Council for Geoscience and the South African Centre for Carbon Capture and Storage, represented by the South African National Energy Development Institute (SANEDI). The project entails the compilation of environmental baseline information as part of the environmental impact assessment and the public participation programme. This information is required for the proposed geophysical profiling and borehole drilling programme in support of the geological characterisation of the Zululand Basin. This project, with the Petroleum Agency South Africa, is currently in the data analysis phase.

### Scoping study for the institutional strengthening of the Geological Survey Departments of Zambia and Malawi

This project of the Department for International Development (DFID) of the United Kingdom is a scoping study in partnership with the BGSI with

the original intention to undertake an evaluation of the capacity of the Geological Survey Department (GSD) of the Zambian Government to manage geoscientific mapping and mineral resource assessments. The scope of the project was, however, expanded to include a review of the Geological Survey Department of Malawi. This project involves gathering information on the functions, operations and key challenges faced by the Geological Survey Departments of both countries and the analysis of this information to determine what professional services the Council for Geoscience could offer to strengthen the ability of these institutions to support mineral exploration and the environmental sector. As part of the preliminary data gathering, a delegation comprising staff from the Council for Geoscience and the BGSI conducted the first visit to Zambia in September 2014. The delegation attended meetings with officials, stakeholders and end users of the Geological Survey Department. A provisional progress report was compiled and submitted to the DFID in December 2014. In early 2015, a second visit was undertaken to Malawi to assess the needs of the Geological Survey Department of Malawi and the Geography and Earth Sciences Department at Chancellor College, University of Malawi. The review team also had the opportunity to meet with and obtain input from several role players in the mineral resources sector of Malawi.

# Consultancy services for national hydrogeological and water quality mapping in Malawi

The Government of Malawi, through the Ministry of Water Development and Irrigation, has received credit and a grant from the International Development Association (IDA) towards the cost of services. The intention is to apply a portion of the proceeds of this credit and grant to request certain consulting services, called the Consultancy Services for National Hydrogeological and Water Quality Mapping. This contract was awarded to the Council for Geoscience.

The overall objective of this consultancy is to map out groundwater aquifers, including yields and water quality parameters, to improve the understanding of the groundwater occurrence and quality in Malawi towards informed water resource planning, management and development. The focus will specifically be on assessing the groundwater resources, including aquifer characteristics, type and distribution and water quality parameters; improving the existing hydrogeological and water quality database; producing hydrogeological and water quality maps; building capacity in groundwater and water quality monitoring, and analysing and producing hydrogeological and water quality products.

The Council for Geoscience was contracted to provide technical services for the implementation of the project and to meet the overall objective and, by extension, the optimisation of the groundwater monitoring network, the development of analytical tools and the institutional capacity for producing



International collaboration by the Council for Geoscience in Africa in 2014/15

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and using hydrogeological and water quality maps in water resource planning, development and management.

To this end, the inception report was submitted and accepted. The baseline and geophysical survey reports were submitted in December 2014, subject to feedback from and approval by the client. The next phases of this project are drilling and training programmes, which will be completed in mid-2015.

### Kalahari–Karoo transboundary aquifer project

This project, involving Botswana, Namibia and South Africa, explores ways to produce a management system for groundwater resources relating to maintaining the water quality and securing supplies for future generations. A comprehensive understanding of the resources and their characteristics is the basis for informed decision making and planning, and must go hand in hand with appropriate legal and institutional frameworks to support an integrated and sustainable approach to water resources management.

The project consists of three components: the hydrogeology, the socio-economic and environmental aspects and the legal framework. The hydrogeology section was tasked with data collection of the physiography and climate, aquifer geometry and the hydrogeological characteristics of the aquifer. The socioeconomic and environmental section was tasked with data collection of the socioeconomic aspects, including population, groundwater abstraction and use and surface water use, while the environmental section was tasked with the data collection of the environmental aspect (groundwater quality, including sustainability, groundwater pollution and groundwater level). The legal framework was responsible for data collection of the legal/ institutional indicators and transboundary aguifer resources management at the domestic level. The data were collected and reports submitted to the client.



Visual representation of the geological map of the Mgazini area in Tanzania



Visual representation of the geophysical map for the Sekenke area, Tanzania



Geochemical orientation surveys in the Dodoma area in Tanzania



Mapping in the Handeni District in eastern Tanzania



Outcrop in the Lupila area, Tanzania



Mgazini area in the south of Tanzania



Kalahari-Karoo Transfrontier project regional meeting in Namibia



Geology of the South African part of the Kalahari-Karoo transboundary aquifer

### 7. DISSEMINATION OF INFORMATION

### 7.1 Publication Series

### Memoirs

Memoir 98: Composition and evolution of the Proterozoic Vioolsdrif Batholith (including the Orange River Group), Northern Cape Province, South Africa by H. Minnaar



Memoir 99: Parameters affecting interferometric coherence and implications for long-term operational monitoring of mining-induced surface deformation by J. Engelbrecht



### Bulletins

Bulletin 151: Evaluation for harnessing low-enthalpy geothermal energy in South Africa based on a model pilot plant in the Limpopo Mobile Belt by T. Dhansay



### Annual Reports

Annual Report of the Council for Geoscience, 2014

Annual Technical Report of the Council for Geoscience, 2014

### Other Reports

Predictive Bedrock and Mineral Prospectivity Mapping in the Giyani Greenstone Belt, South Africa by A. Billay, M. Sadeghi and E.J.M. Carranza

Coal Resources and Reserves of South Africa by L. Kirstein

South African Geological Hazards Observation System Atlas by C. Musekiwa

Popular Publications GEOclips Volume 37, June 2014, 12 pp.

GEOclips Volume 38, September 2014, 12 pp.

GEOclips Volume 39, December 2014, 12 pp.

GEOclips Volume 40, March 2015, 8 pp.

### Maps captured for database

- 3017AA & AB Riethuis
- 3017AD Hondeklipbaai
- 3017BA Soebatsfontein
- 3017BB Kamieskroon
- 3017BC Wallekraal
- 3017BD Karkams
- 3017CB Bitterriviermond
- 3017DA Soutfontein
- 3017DB Garies
- 3017DC Nariep
- 3017DD Kotzerus
- 3117BA & BB Ruitersvlei
- 3117BD Baievlei

### 7.2 Articles published in Academic Journals and Books

Α

Abiye, T. and Leshomo, J., 2014. Metal enrichment in the groundwater of the arid environment in South Africa. Journal of Environmental Earth Sciences, DOI: 10.1007/s12665-014-3356-9.

Álvaro, J.J., Benziane, F., Thomas, R.J., Walsh, G.J. and Yazidi, A., 2014. Neoproterozoic–Cambrian stratigraphic framework of the Anti-Atlas and Ouzellagh promontory (High Atlas), Morocco. Journal of African Earth Sciences, 98, pp. 19–33, DOI: 10.1016/j.jafrearsci.2014.04.026.

### В

Bierman, P.B., Coppersmith, R., Hanson, K., Neveling, J., Portenga, E.W. and Rood, D.H., 2014. A cosmogenic view of erosion, relief generation, and the age of faulting in southern Africa. GSA Today, 24(9), pp. 4–11.

Botha, G.A., Humphries, M., Green, A. and Finch, J., 2014. Theme 4: Palaeoenvironments and geomorphological evolution. *In:*  Whitfield, A.K. (Ed.), Proceedings of the St Lucia Natural Sciences Workshop: Change, connectivity and conservation in a major wetland system. Water Research Commission Report, TT582/13, pp. 28–40.

Brandt, M.B.C., 2014. Focal depths of South African earthquakes and mine events. Journal of the Southern African Institute of Mining and Metallurgy, 114, pp. 1–8.

### С

Cawthra, H.C., Bateman, M.D., Carr, A.S., Compton, J.S. and Holmes, P.J., 2014. Understanding Late Quaternary change at the land–ocean interface: a synthesis of the evolution of the Wilderness coastline, South Africa. Quaternary Science Reviews, 99, pp. 210–223.

Chabangu, N., Beck, B., Hicks, N., Botha, G.A., Viljoen, J., Davids, S. and Cloete, M., 2014. The investigation of CO<sub>2</sub> storage potential in the Zululand Basin in South Africa. Energy Procedia (GHGT12), 63, pp. 2789–2799, DOI: 10.1016/j.egypro.2014.11.301.

Chabangu, N., Beck, B., Hicks, N., Viljoen, J., Davids, S. and Cloete, M., 2014. The investigation of CO<sub>2</sub> storage potential in the Algoa Basin in South Africa. Energy Procedia (GHGT12), 63, pp. 2800–2810, DOI: 10.1016/j. egypro.2014.11.302.

Chiliza, S.G. and Diop, S., 2014. Notes on a landslide that formed the only known true inland lake in South Africa. *In:* Sassa, K. *et al.* (Eds), Landslide Science for a Safer Geoenvironment. Springer, 3, pp. 335–340.

Chiliza, S.G. and Hingston, E.D.C., 2015. A kinematic analysis of an ancient rockslide at Lake Fundudzi, South Africa. *In:* Lollino, G. *et al.* (Eds), Engineering Geology for Society and Territory. Springer International Publishing, Switzerland, 2, pp. 783–786, DOI: 10.1007/978-3-319-09057-3\_132.

Claasen, D., 2014. Geographical controls on sediment accretion of the Cenozoic Algoa Group between Oyster Bay and St Francis, Eastern Cape coastline, South Africa. South African Journal of Geology, 117(1), pp. 109–128.

Colliston, W.P., Schoch, A.E. and Cole, J., 2015. The Grenvillian Namaqua-Natal fold belt adjacent to the Kaapvaal Craton: 1. Distribution of the Mesoproterozoic collisional terranes deduced from results of regional surveys and selected profiles in the western and southern parts of the fold belt. Journal of African Earth Sciences, 100, pp. 7–19, DOI: 10.1016/j.jafrearsci.2014.05.017.

### D

De Beer, M., Maree, J.P., Liebenberg, L. and Doucet, F.J., 2014. Conversion of calcium sulphide to calcium carbonate during the process of recovery of elemental sulphur from gypsum waste. Waste Management, 34(11), pp. 2373–2381.

De Kock, G.S. and Natukunda, J.F., 2014. The Namuwasa and Bwesigoro Groups and Kyato dolerite remnants south of Kiboga, Uganda: lithology and ages. Special Paper, Geological Survey of Finland, 56, pp. 273–293.

Doucet, F.J., Mlambo, T.K., Van der Merwe, E.M. and Altermann, W., 2014. Injection of coal fly ash slurry in deep saline formations for improved  $CO_2$ confinement — A theoretical concept. International Journal of Greenhouse Gas Control, 25, pp. 198–200.

### Е

Ekolu, S.O., Diop, S. and Azene, F., 2014. Analysis of corrosive characteristics of acid mine drainage on infrastructure materials. SAICE Civil Engineering, 22(7), p. 11–15.

Engelbrecht, J., Musekiwa, C., Kemp, J. and Inggs, M.R., 2014. Parameters affecting interferometric coherence — the case of a dynamic agricultural region. IEEE Transactions on Geoscience and Remote Sensing, 52, pp. 1572–1582.

### F

Farahani, J.V.I., Zaré, M. and Cichowicz, A., 2014. Microseismicity of the Tehran region based on the data recorded in a local monitoring network 2004–2010. IUGS Journal of International Geoscience, Episodes, 37(3), pp. 206–217.

### G

Gastaldo, R.A. and Neveling, J., 2014. Comment on: "Anatomy of a mass extinction: sedimentological and taphonomic evidence for droughtinduced die-offs at the Permo–Triassic boundary in the main Karoo Basin, South Africa" by R.M.H. Smith and J. Botha-Brink. Palaeogeography, Palaeoclimatology, Palaeoecology, 396, pp. 99–118, DOI: 10.1016/j. palaeo.2014.06.027.

### Н

Heath, G.J. and Constantinou,
S., 2014. Sinkholes and land use
regulation in South Africa. *In:* Lollino,
G. *et al.* (Eds), Engineering Geology
for Society and Territory. Springer
International Publishing, Switzerland,
5, pp. 503–506, DOI: 10.1007/978-3-319-09048-1\_97.

Hicks, N., Davids, S., Beck, B. and Green, A., 2014. Investigation of CO<sub>2</sub> storage potential of the Durban Basin in South Africa. Energy Procedia (GHGT12), 63, pp. 5200–5210, DOI: 10.1016/j.egypro.2014.11.551. Hlatywayo, D.J. and Sakala, E., 2014. Resolving optimum magnetic signatures for drill-hole targeting in exploration — A case study for Mbudzane in Gwanda, Zimbabwe. Journal of Geography and Geology, 3(1), pp. 9–29.

### Κ

Kenan, A.O., 2014. South Africa
Uranium 2014: Resources,
Production and Demand. Joint
Report by the OECD Nuclear Energy
Agency and the International Atomic
Energy Agency, OECD 2014, NEA No.
7209, pp. 380–393.

Kirsten, H.A.D., Heath, G.J., Venter, I.S. and Oosthuizen, A.C., 2014. The issue of personal safety on dolomite: A probability based evaluation with respect to two and three storey residential units. Journal of the South African Institution of Civil Engineering, 56(2), pp. 54–64.

Kirsten, H.A.D., Heath, G.J., Venter, I.S. and Oosthuizen, A.C., 2014. The issue of personal safety on dolomite: A probability based evaluation with respect to transient passage in a city centre. Journal of the South African Institution of Civil Engineering, 56(2), pp. 65–77.

Kirsten, H.A.D., Heath, G.J., Venter, I.S. and Oosthuizen, A.C., 2014. The issue of personal safety on dolomite: Update of a probability based evaluation with respect to single storey residential houses. Journal of the South African Institution of Civil Engineering, 56(2), pp. 78–87.

### L

Lin, H. and Lin, L., 2014. The development of GIS-PMWIN and its application for mine-water modelling in the Far West Rand, South Africa. Water SA, 40(2), pp. 313–322.

Lin, L., Lin, H. and Xu, Y., 2014. Characterization of fracture network and groundwater preferential flow path in the Table Mountain Group (TMG) sandstones, South Africa. Water SA, 40(2), pp. 263–272.

### Μ

Mäkitie, H., Härmä, P., Virransalo, P., De Kock, G., Lugaizi, I. and Tumwine, A., 2014. The granite batholith of Mubende, Uganda: preliminary results on its petrography, geochemistry and construction rock potential. Special Paper, Geological Survey of Finland, 56, pp. 251–272.

Manzunzu, B. and Midzi, V., 2015. The curious case of the 1919 Swaziland earthquake. Seismological Research Letters, 86(3), DOI: 10.1785/0220140228.

Maré, L.P., De Kock, M.O., Cairncross, B. and Mouri, H., 2014. Application of magnetic geothermometers in sedimentary basins: an example from the western Karoo Basin, South Africa. South African Journal of Geology, 117(1), pp. 1–14, DOI: 10.2113/gssajg.

Marean, C.W., Anderson, R., Bar-Matthews, M., Braun, K., Cawthra, H.C., Cowling, R.M., Engelbrecht, F., Esler, K.J., Fisher, E.C., Franklin, J., Hill, K., Janssen, M., Potts, A.J. and Zahn, R., 2015. A new research strategy for integrating studies of Paleoclimate, Paleoenvironment, and Paleoanthropology. Evolutionary Anthropology, 24(2), pp. 62–72.

Matshusa, K. and Makgae, M., 2014. Overview of abandoned mines in Limpopo Province, South Africa. Journal of Environmental Science and Engineering, B3, pp. 156–161.

Melosh, B.L., Rowe, C.D., Smit, L., Groenewald, C., Lambert, C.W. and Macey, P., 2014. Snap, Crackle, Pop: Dilational fault breccias record seismic slip below the brittle-plastic transition. Earth and Planetary Science Letters, 403, pp. 432–445.

Mengistu, H., Tessema, A., Abiye, T., Demlie, M. and Lin, H., 2014. Numerical modeling and environmental isotope methods in integrated minewater management: a case study from the Witwatersrand Basin, South Africa, Hydrogeology Journal, DOI: 10.1007/ s10040-014-1216-z.

Midzi, V., Zulu, B., Manzunzu, B., Mulabisana, T., Pule, T., Myendeki, S. and Gubel, W., 2014. Macroseismic survey of the M<sub>2</sub>5.5, 2014, Orkney earthquake. Journal of Seismology, ISSN 1383-4649, DOI: 10.1007/ s10950-015-9491-2.

Moabi, N.G., Grantham, G.H., Roberts R.J., Le Roux, A.P. and Matola, R., 2015. The geology and geochemistry of the Espungabera Formation of central Mozambique and its tectonic setting on the eastern margin of the Kalahari. Journal of African Earth Sciences, 101, pp. 96–112.

Muiambo, H., Focke, F., Walter, W., Atanasova, M. and Benhamida, A., 2014. Characterization of ureamodified Palabora vermiculite. Applied Clay Science, 49(9), pp. 3497–3510, DOI: 10.1016/j.clay.2014.12.019.

Muriithi, G.N., Petrik, L. and Doucet, F.J., 2014. Remediation of industrial brine using coal-combustion fly ash and CO<sub>2</sub>. Desalination, 353, pp. 30–38.

Muriithi, G.N., Petrik, L. and Doucet, F.J., 2015. Geochemical modelling of brine remediation using accelerated carbonation of fly ash. Desalination and Water Treatment, pp. 1–11, DOI: 10.1080/19443994.2014.1003607.

### 0

Oosthuizen, A.C., 2014. Hazard of karst sinkhole formation in an area south

of Pretoria, South Africa. Engineering Geology for Society and Territory, Springer International Publishing, Switzerland, 5, pp. 427–430.

### R

Rathod, G.W., 2014. Seismic microzonation of urban areas. Earth Sciences Research Journal, Special Issue, 18, p. 111.

Rathod, G.W., 2014. Earthquake catalogue processing and declustering issues. Earth Sciences Research Journal, Special Issue, 18, p. 274.

### S

Stapelberg, F., 2014. Dorper Wind Farm Project, a case study to evaluate the rock mass rating classification system for predicting foundation conditions at shallow depth. SAICE Civil Engineering, 22(9), pp. 32–38.

### Т

Thomas, A., 2015. Modelling of spatially distributed surface runoff and infiltration in the Olifants River Catchment/Water Management Area using GIS. International Journal of Advanced Remote Sensing and GIS, 4(1), pp. 828–862.

### V

Van der Merwe, E.M., Prinsloo, L.C., Mathebula, L.C., Swart, H.C., Coetsee, E. and Doucet, F.J., 2014. Surface and bulk characterization of an ultrafine South African coal fly ash with reference to polymer applications. Applied Surface Science, 317, pp. 73–83.

### 7.3 Conference Abstracts and Posters

### Α

Abgombe, M., Macey, P.H., Miller, J.A. and Lambert, C.W., 2014. Eureka Shear Zone, southern Namibia. Roy Miller Symposium, Geological Society of Namibia, Windhoek, Namibia, 18–20 August 2014.

Andreoli, M.A.G., Bumby, A., Ben-Avraham, Z., Delvaux de Fenffe, D., De Wit, M., Durrheim, R., Fagereng, A., Heidbach, A.O., Hodge, M., Logue, A., Malephane, H., Van der Merwe, N., Northcote, C., Saalmann, K., Saunders, I. and Tabola, K., 2014. Evolving stress patterns across southern Africa since the end of Gondwana: puzzling clues to the seismicity of South Africa. 10th Inkaba yeAfrica/!Khure Africa (AEON) Conference/Workshop, Matjiesfontein, 29 September–3 October 2014.

Atanasova, M., Cairncross, B. and Windisch, W., 2014. Exotic microminerals from the Bushveld Complex, South Africa. 21st General Meeting of the International Mineralogical Association (IMA), Johannesburg, 1–5 September 2014.

### В

Brandt, M.B.C. and Saunders, I., 2014. First look at an  $M_L-M_w$  earthquake magnitude relation for South Africa. 24th Institute of Mine Seismology Seminar, Stellenbosch, 5–6 May 2014.

Browning, C., 2014. The Cedarberg Formation — a review. 18th Biennial Meeting of the Palaeontological Society of Southern Africa, Johannesburg, 11–14 July 2014.

Browning, C., 2014. The Cedarberg Formation — a review. 4th International Palaeontological Congress, Mendoza, Argentina, 28 September–3 October 2014.

Bumby, A., Grantham, G.H. and Moabi, N., 2014. The structural geology of Straumsnutane area, western Dronning Maud Land, Antarctica — implications for the amalgamation of Gondwana. XXXIII SCAR Biennial Meetings and Open Science Conference, Auckland, New Zealand, 23 August–3 September 2014.

Burger, E., Grantham, G.H. and Roberts, J., 2014. Inferring tectonic setting using granite sheet orientation, in HU Sverdrupfjella, West Dronning Maud Land, Antarctica. South African National Antarctic Programme (SANAP) Symposium, Rhodes, 3–6 June 2014.

### С

Cawthra, H.C. and Compton, J.S., 2014. Quaternary evolution of the Mossel Bay continental shelf, South Africa. 15th South African Marine Science Symposium, SAMSS 2014, Stellenbosch, 15–18 July 2014.

Cawthra, H.C. and Compton, J.S., 2014. Geophysical investigations on the Mossel Bay shelf and correlation to sediment cores. RAiN Workshop II 2014, MARUM Centre for Marine Environmental Sciences, Bremen, Germany, 19–22 October 2014.

Cawthra, H.C., Compton, J.S., Fisher, E.C. and Marean, C.W., 2015. Former land surfaces and palaeoshorelines on the Mossel Bay continental shelf, South Africa. The African Quaternary: Environments, Ecology and Humans, Cape Town, 20 January–7 February 2015.

Cawthra, H.C., Compton, J.S., Hahn, A.N. and Zabel, M., 2015. Stratigraphy of incised channels on the Mossel Bay continental shelf, South Africa. The African Quaternary: Environments, Ecology and Humans, Cape Town, 20 January–7 February 2015.

Cawthra, H.C., Bateman, M.D., Carr, A.S., Compton, J.S. and Holmes, P.J., 2015. Understanding Late Quaternary change at the land–ocean interface: a synthesis of the evolution of the Wilderness coastline, South Africa. The African Quaternary: Environments, Ecology and Humans, Cape Town, 20 January–7 February 2015.

Chirenje, E. and Kenan, A., 2014. Geophysical delineation of a rare-earth element prospect in the Bushveld Granites, South Africa: Implications for Exploration. Technical Meeting on Advances in Exploration Techniques for Uranium Deposits and Other Radioactive Element Deposits, International Atomic Energy Agency, Vienna, Austria, 1–4 September 2014.

Chirenje, E. and Kenan, A., 2014. Uranium as a by-product of a hydrothermal quartz-hematite polymetallic deposit in the Bushveld Granites, South Africa. Technical Meeting on Uranium as a By-product and Co-product with an Emphasis on Base and Precious Metal and Related Deposits, International Atomic Energy Agency, Vienna, Austria, 24–26 November 2014.

Chirenje, E., Sakala, E.T. and Tshikovokovo, T., 2015. Successful mapping of hydrothermally enriched carbonate bearing faults using geophysics constrained by geochemistry and geology near Marble Hall, Limpopo, South Africa. 25th Colloquium of African Geology, Dar es Salaam, Tanzania, 14–16 August 2014.

Chirenje, E., Sekiba, F.M., Nyabeze, P.K. and Coetzee, H., 2014. Testing the effectiveness of coal mine dump rehabilitation using electrical resistivity tomography: Results from AngloCoal's Bank 5 Colliery, Mpumalanga in South Africa. Closing Workshop on IGCP/ SIDA Project 606 on Addressing Environmental and Health Impacts of Active and Abandoned Mines in Sub-Saharan Africa, Prague, Czech Republic, 26–27 May 2014.

Cichowicz, A., 2014. Estimation of spectral parameters of mining related

events by a surface network installed in the mining region. Monitoring and Modelling Seismic Rock Mass, Stellenbosch, 5–6 May 2014.

Cichowicz, A. and Ogasawara, H., 2014. Methodology for the automatic estimation of seismic source parameters and updating corrections for path effect. 30th IUGG Conference on Mathematical Geophysics, Merida, Mexico, 2–6 June 2014.

Coetzee, H., Bosman, C. and Larkin, J., 2014. Doing more good than harm: looking for an appropriate regulatory regime for the rehabilitation of mining legacies in South Africa. Biennial Conference 2014, Water Institute of South Africa (WISA), Mbombela, 25–29 May 2014.

Coetzee, H., Tlowana, S. and Makgae, M., 2014. Flooding of the underground mine workings of the old Witwatersrand gold/uranium mining areas: acid mine drainage generation and long term options for water quality management. Uranium — Past and Future Challenges. 7th International Conference on Uranium Mining and Hydrogeology, Freiberg, Germany, 21–25 September 2014.

Cole, P., 2014. The history and design behind the Python Geophysical Modelling and Interpretation (PyGMI) package. SciPy 2014 Scientific Computing with Python, Austin, Texas, 6–12 July 2014.

Constantinou, S. and Oosthuizen, A.C., 2014. Sinkhole statistics for Gauteng. SAICE Dolomite Seminar, Pretoria, 24–25 June 2014.

Coppersmith, R., Hanson, K., Neveling, J. and Reddering, J.S.V., 2014. Unique geomorphic strain gauges to assess fault seismogenic probability in a reactivated SCR environment. GSA Annual Meeting, Vancouver BC, Canada, 19–22 October 2014.

### D

De Kock, G.S. and Armstrong, R., 2014. Timing of tectonism: SHRIMP dates on Damara Granites, Namibia. 25th Colloquium of African Geology, Dar es Salaam, Tanzania, 14–16 August 2014.

De Kock, G.S. and Armstrong, R., 2014. Shrimp dating on magmatic rocks from the Karibib–Otjimbingwe region, Namibia. Roy Miller Symposium, Geological Society of Namibia, Windhoek, Namibia, 18–20 August 2014.

De Kock, G.S., Dhansay, T. and Armstrong, R., 2014. Akanyaru–Ankole Supergroup of Rwanda: strata, structures and ages. 25th Colloquium of African Geology, Dar es Salaam, Tanzania, 14–16 August 2014.

Dhansay, T., 2014. Soutpansberg fracture analysis. 25th Colloquium of African Geology, Dar es Salaam, Tanzania, 14–16 August 2014.

Durrheim, R., Ogasawara, H., Nakatani, M., Yabe, Y., Milev, A., Cichowicz, A., Kawakata, H., Moriya, H., Naoi, M., Kgarume, T., Murakami, O. and Mngadi, S., 2014. Observational studies in South African mines to mitigate seismic risks: implications for mine safety and tectonic earthquakes. Geophysical Research Abstracts, European Geosciences Union (EGU) 2014 General Assembly, Austria, Vienna, 16, EGU2014-13713, 27 April–2 May 2014.

### Е

Ekolu, S.O., Diop, S. and Azene, F., 2014. Bottom ash and fly ash wastes as alkalinising reagents for neutralising acid mine drainage. 1st International Conference on Construction Materials and Structures (ICCMATS), Johannesburg, 24 November 2014.

Ekolu, S.O., Diop, S. and Azene, F., 2014. Potentiodynamic polarization

study of the corrosion characteristics of acid mine drainage. 1st International Conference on Construction Materials and Structures (ICCMATS), Johannesburg, 24 November 2014.

### F

Fyffe, L., Coetzee, H. and Wolkersdorfer, C., 2014. Cost effective screening of mine waters using accessible field test kits: Experience with a high school project in the Wonderfonteinspruit Catchment, South Africa. Uranium — Past and Future Challenges. 7th International Conference on Uranium Mining and Hydrogeology, Freiberg, Germany, 21–25 September 2014.

### G

Gastaldo, R.A., Neveling, J., Kamo, S.L., Geissman, J.W. and Bamford, M., 2014. Stratigraphic evidence for Early Triassic *Glossopteris* in the Karoo Basin, South Africa. GSA Annual Meeting, Vancouver, Canada, 19–22 October 2014.

Gastaldo, R.A., Bamford, M., Geissman, J., Kamo, S.L., Looy, C. and Neveling, J., 2014. Stratigraphic evidence for Early Triassic *Glossopteris* in the Karoo Basin, South Africa. European Palaeobotany and Palynology Conference (EPPC) 2014, Padua, Italy, 26–31 August 2014.

Grantham, G.H., 2014. Current research focus and future earth science research in SANAP. South African National Antarctic Programme (SANAP) Symposium, Rhodes, 3–6 June 2014.

Grantham, G.H., 2014. Tectonic control on the Ordovician sandstones and Permo-Carboniferous Dwyka glaciation of Gondwana. South African National Antarctic Programme (SANAP) Symposium, Rhodes, 3–6 June 2014.

Grantham, G.H., 2014. Tectonic control on the Ordovician sandstones

and Permo-Carboniferous Dwyka glaciation of Gondwana. XXXIII SCAR Biennial Meetings and Open Science Conference, Auckland, New Zealand, 23 August–3 September 2014.

Grantham, G.H., Macey, P.H., Roberts, M.P., Ingram, B.A., Armstrong, R.A., Eglington, B., Hokada, T. and Jackson, C., 2014. Neoproterozoic to Cambrian granitoids of northern Mozambique and Dronning Maud Land, Antarctica: timing, genesis and tectonic implications for Gondwana amalgamation. Gondwana 15, Madrid, Spain, 14–18 July 2014.

### н

Hahn, A.N., Cawthra, H.C., Compton, J.S., Herrmann, N., Kirsten, K., Meadows, M. and Zabel, M., 2015. Holocene paleoclimatic variations as recorded offshore south-western South Africa. The African Quaternary: Environments, Ecology and Humans, Cape Town, 20 January–7 February 2015.

Hanson, K., Slack, C., Coppersmith, R., Neveling, J., Glaser, L., Bierman, P., Forman, S., Goedhart, M., Johnson, C. and Black, D., 2014. Paleoseismic investigations of the Kango fault, South Africa: incorporating temporal and spatial clustering behavior into a seismic source characterization model. Seismological Society of America (SSA) Annual Meeting, Anchorage, Alaska, 30 April–2 May 2014.

Harbezettl, T., Wuendsch, M., Cawthra, H.C., Daut, G., Frenzel, P., Kasper, T., Meschner, S., Zabel, M., Kirsten, K., Meadows, M., Quick, L. and Maesbacher, R., 2015. The RAIN project and first results from lacustrine archives from Eilandvlei and Verlorenvlei. The African Quaternary: Environments, Ecology and Humans, Cape Town, 20 January–7 February 2015.

Hatton, C., 2014. Melting at the Moho during petrogenesis of platinum deposits in the Bushveld Complex, South Africa. 25th Colloquium of African Geology, Dar es Salaam, Tanzania, 14–16 August 2014.

Heath, G.J. and Constantinou, S., 2014. Sinkholes and land use regulation in South Africa. IAEG II Congress, Engineering Geology for Society and Territory, Torino, Italy, 15–19 September 2014.

Heath, L.G., Constantinou S. and Oosthuizen, A.C., 2014. The CGS dolomite databank and research. SAICE Dolomite Seminar, Pretoria, 24–25 June 2014.

### Κ

Kenan, A.O., 2014. Uranium update. 51st Meeting of the Joint OECD/ NEA-IAEA Uranium Group, Windhoek, Namibia, 6–10 October 2014.

Kenan, A.O., 2014. Reporting of uranium resources in South Africa, with respect to UNFC-2009. Workshop on Application of United Nations Framework Classification – 2009 (UNFC-2009) for Uranium Resources, Johannesburg, 10–14 November 2014.

Kenan, A.O. and Chirenje, E., 2014. Uranium in South Africa: Exploration, mining and production. International Symposium on Raw Material for the Nuclear Fuel Cycle, Exploration, Mining, Production, Supply, and Demand, Economics and Environmental Issues, Vienna, Austria, 23–27 June 2014.

Kwata, M.G., Makgae, M.E., Msezane, M., Coetzee, H. and Tlowana, S., 2014. Monitoring of dust deposition and determination of mineral composition in the dust for gold mines and coal mines. 7th Conference of the African Association of Women in Geoscience, Earth Science and Climate Change: Challenges to Development in Africa, Windhoek, Namibia, 3–9 November 2014.

### L

Lambert, C.W., Groenewald, C.A., Kisters, A.F.M., Macey, P.H., Frei, D. and Buick, I.S., 2014. The Marshall Rocks– Pofadder Shear Zone and other late-Namaqua shear zones: 45 million years of progressive deformation in western Namaqualand. Roy Miller Symposium, Geological Society of Namibia, Windhoek, Namibia, 18–20 August 2014.

Lekoadu, S., Makgae, M. and Tlowana, S., 2014. Phytoremediation on contaminated lead and AMD soils. 31st American Meeting, Society of Mining and Reclamation, Oklahoma City, Oklahoma, 14–19 June 2014.

### Μ

Macey, P.H., Lambert, C. and Shifotoka, G., 2014. The syntectonic granitoid Orange Falls Suite, implications for the timing of collision and thrust tectonics in the Namaqua Metamorphic Province of southern Namibia. Roy Miller Symposium, Geological Society of Namibia, Windhoek, Namibia, 18–20 August 2014.

Macey, P.H., Minnaar, H., Miller, J.A., Lambert, C.W., Groenewald, C.A., Diener, J., *et.al.*, 2014. Tracing tectonic terranes in southern Namibia. Roy Miller Symposium, Geological Society of Namibia, Windhoek, Namibia, 18–20 August 2014.

Makgae, M., 2014. The legacy of asbestos mining in South Africa and its rehabilitation program. 7th Conference of the African Association of Women in Geoscience, Earth Science and Climate Change: Challenges to Development in Africa, Windhoek, Namibia, 3–9 November 2014.

Manzunzu, B. and Midzi, V., 2015. The aftershock sequence of the 5 August 2014 Orkney earthquake. AfricaArray Conference, Johannesburg, 19–20 January 2015.

Maré, L.P., 2014. Petrophysical and rock magnetic evaluation of the shale gas potential of the Karoo Basin. 4th Combined Science and Technology Train and Space Geodesy Observatory Workshop, Matjiesfontein, 7–11 April 2014.

Maré, L.P., De Kock, M.O., Cairncross, B., Mouri, H., Ferré, E.C. and Jackson, M., 2014. Geothermal modeling of the Karoo Basin, South Africa, using rock magnetic methods. AGU Fall Meeting, GP11A-3564, San Francisco, USA, 15–19 December 2014.

Matshusa, K. and Makgae, M., 2014. Overview and challenges of abandoned mines in South Africa. 5th Annual EnviroMining Conference, Midrand, 18–19 March 2015.

Midzi, V., 2014. Focal mechanism compilation for updating the African stress map; Seismic Hazard Implication of the seismotectonics of southern Africa. European Geosciences Union (EGU) 2014 General Assembly, Austria, Vienna, 27 April–2 May 2014.

Midzi, V. and Manzunzu, B., 2014. Seismotectonic map of South Africa and seismic hazard implications. IASPEI-Latin American and Caribbean Seismological Commission (LACSC), Bogota, Colombia, 23–25 July 2014.

Midzi, V., Mulabisana, T.F. and Manzunzu, B., 2014. The seismotectonics and seismic hazard of southern Africa. 25th Colloquium of African Geology, Dar es Salaam, Tanzania, 14–16 August 2014.

Moabi, N., Grantham, G.H. and Roberts, J., 2014. A geochemistry of Straumsnutane lavas (Jutulstraumen Group) in western Dronning Maud Land, Anatarctica. South African National Antarctic Programme (SANAP) Symposium, Rhodes, 3–6 June 2014.

Moabi, N., Grantham, G.H., Roberts, J. and Le Roux, P., 2014. A geochemistry of the Straumsnutane lavas (Jutulstraumen Group) in western Dronning Maud Land, Antarctica and the Espungabera lavas (Mkondo Group) in central Mozambique: Evidence for comagmatic and continental emplacement. XXXIII SCAR Biennial Meetings and Open Science Conference, Auckland, New Zealand, 23 August–3 September 2014.

Mohamed, S., Doucet, F.J., Atanasova, M., Van der Merwe, E.M., Altermann, W. and Yibas, B., 2014. Mechanisms of thermal decomposition for the reaction between ammonium sulphate and metal oxides from PGE mine tailings. Analitika 2014, Parys, 7–11 September 2014.

Mulabisana, T.F., 2014. Compiling the earthquake catalogue for southern Africa. 3rd Young Earth Scientists (YES) Congress, Dar Es Salaam, Tanzania, 11–16 August 2014.

Muriithi, G.N., Petrik, L. and Doucet, F.J., 2014. CO<sub>2</sub> capture as a fly ash beneficiation process. 12th Annual Conference on Carbon Capture, Utilisation and Storage (CCUS), Pittsburgh, USA, 28 April–1 May 2014.

Musekiwa, C. and Engelbrecht, J., 2014. Comparison of weights of evidence and rule-based classification for mineral prospectivity mapping. 10th International Conference of the African Association of Remote Sensing of the Environment, Johannesburg, 27–31 October 2014.

### Ν

Nadasan, D.S., Davies, T.C., Shapi, M.M. and Chirenje, E., 2014. The distribution of some potentially harmful elements (PHEs) in the Krugersdorp Game Reserve, Gauteng, South Africa: Implications for wildlife health. Closing Workshop on IGCP/SIDA Project 606 on Addressing Environmental and Health Impacts of Active and Abandoned Mines in Sub-Saharan Africa, Prague, Czech Republic, 26–27 May 2014.

Netshitungulwana, R., Yibas, B., Novhe, O.N. and Vadapalli, V.R.K., 2014. Stream sediment geochemistry of Inkomati catchment of South Africa. Goldschmidt 2014, Sacramento, USA, 8–13 June 2014.

Netshitungulwana, R., Yibas, B., Elsenbroek, J.H. and Obed, N.N., 2014. Investigation of metal contamination in the middle great Letaba and Shingwedzi catchment by using stream sediments and soil geochemistry, Giyani, South Africa. I2SM 2014, Ferrara, Italy, 17–19 September 2014.

Neumann, F.H., Roberts, D.L., Berg, E., Carr, A.S., Cawthra, H.C., Humphries, M., MacHutchon, M., Rossouw, L. and Scott, L., 2014. A multi-proxy study of offshore Miocene fluvio-paludal sediments at the southwestern tip of Africa: implications for Neogene climate and vegetation evolution. 18th Biennial Conference of the Palaeontological Society of Southern Africa (PSSA), Johannesburg, 11–14 July 2014.

Neumann, F.H., Roberts, D.L., Berg, E., Carr, A.S., Cawthra, H.C., Humphries, M., MacHutchon, M., Rossouw, L. and Scott, L., 2014. A multi-proxy study of offshore Miocene fluvio-paludal sediments at the southwestern tip of Africa: implications for Neogene climate and vegetation evolution. Arbeitskreis für Vegetationsgeschichte — Working Group for Vegetation History 2014, Frankfurt, Germany, 28 September–1 October 2014.

Neveling, J., Gastaldo, R.A., Prevec, R., Looy, C.V. and Bamford, M., 2014. Early Triassic *Glossopteris*: an examination of stratigraphic evidence. 18th Biennial Conference of the Palaeontological Society of Southern Africa (PSSA), Johannesburg, 11–14 July 2014.

Novhe, O.N., Yibas, B., Netshitungulwana, R. and Lusunzi, R., 2014. Geochemical and mineralogical characterization of mine residue deposits in the Komati/Crocodile catchment, South Africa: An Assessment for Acid/ Alkaline Mine Drainage. IMWA 2014, Xuzhou, China, 18–22 August 2014.

Nxumalo, V., 2014. Distribution of uranium in the Springbok Flats Coalfield, South Africa. 25th Colloquium of African Geology, Dar es Salaam, Tanzania, 14–16 August 2014.

Nxumalo, V., 2014. Uranium in the Springbok Flats Basin, South Africa. Workshop on Application of United Nations Framework Classification – 2009 (UNFC-2009) for Uranium Resources, Johannesburg, 10–14 November 2014.

### 0

Ogasawara, H., Durrheim, R., Harumi, K., Hofmann, G., Piper, P., Nakatani, M., Yabe, Y., Satoh, T., Kawakata, H., Moriya, H., Milev, A., Cichowicz, A., Naoi, M., Murakami, O., Nakao, S., Okubo, M., Ishii, H., Roberts, D., Clements, T., Ward, T., Wienand, J., Lenegan, P., Watson, B., Oelofse, J., Naiker, N., Yilmaz, H., Visser, V., Birch, D., Ngobeni, D. and Mngadi, S., 2014. Observational studies of rock mass response to mining in highly stressed gold mines in South Africa. 7th International Conference on Deep and High Stress Mining, Deep Mining 2014, Sudbury, Canada, 16–18 September 2014.

Oosthuizen, A.C., 2014. Hazard of karst sinkhole formation in an area south of Pretoria, SA. IAEG II Congress, Engineering Geology for Society and Territory, Torino, Italy, 15–19 September 2014. Oosthuizen, A.C. and Constantinou, S., 2014. The CGS's experience with the implementation of SANS 1936. SAICE Dolomite Seminar, Pretoria, 24–25 June 2014.

### Ρ

Pule, T., 2014. Quantitative study of vulnerability/damage curves in South Africa. European Geosciences Union (EGU) 2014 General Assembly, Austria, Vienna, 27 April–2 May 2014.

Pule, T., 2014. Quantitative study of vulnerability/damage curves in South Africa. 2014 Understanding Risk Forum, London, United Kingdom, 30 June– 4 July 2014.

### R

Robey, K., 2014. An option into preventing iron-related water quality and supply problems in South Africa. 25th Colloquium of African Geology, Dar es Salaam, Tanzania, 14–16 August 2014.

### S

Saunders, I., 2014. The regional seismicity of KwaZulu-Natal. 4th Combined Science and Technology Train and Space Geodesy Observatory Workshop, Matjiesfontein, 7–11 April 2014.

Saunders, I. and Fourie, C.J.S., 2014. Reappraisal of single station locations reported by the SANSN. 10th Inkaba yeAfrica/!Khure Africa (AEON) Conference/ Workshop, Matjiesfontein, 29 September-3 October 2014.

Shabalala, A.N., Ekolu, S.O. and Diop, S., 2014. Permeable reative barriers for acid mine drainage treatment: a review. First International Conference on Construction Materials and Structures (ICCMATS), Johannesburg, 24 November 2014. Shapi, M.M., Davies, T.C., Nadasan, D., Siyabonga, N., Cibane, N., Mbambo, A., Ndlovu, N., Chirenje, E., Penaye, J. and Bate-Tibang, E.E., 2014. Standard addition chemical analysis of potentially harmful elements in water samples from mining sites in the Kette-Batouri area of Eastern Cameroon and the Krugersdorp area of South Africa. Closing Workshop on IGCP/SIDA Project 606 on Addressing Environmental and Health Impacts of Active and Abandoned Mines in Sub-Saharan Africa, Prague, Czech Republic, 26–27 May 2014.

Singh, R.G., Engelbrecht, J., Botha, G.A. and Kemp, J., 2014. Monitoring soil erosion features using a time series of airborne remote sensing data: a case study, Wild Coast, South Africa. 10th International Conference of the African Association of Remote Sensing of the Environment, Johannesburg, 27–31 October 2014.

Smith, H.P., Miller, J.A., Macey, P.H., Olivier, S. and Lambert, C.W., 2014. Emplacement and evolution of the Keimasmund Complex. Roy Miller Symposium, Geological Society of Namibia, Windhoek, Namibia, 18-20 August 2014.

Т

Taylor, W.L., Dreyer, T., Browning, C., De Beer, C. and Cole, D., 2014. Cape geoheritage and GEOteach: Vehicles for powerful geoscience education and community engagement. 7th Conference of the African Association of Women in Geoscience, Windhoek, Namibia, 3–9 November 2014.

Tlowana, S., Coetzee, H., Vadapalli, V., Makgae, M. and Kruger, R., 2014. Leach testing of coal fly ash to assess its applicability in the closure of abandoned underground coal mines in Mpumalanga Province, South Africa. An interdisciplinary response to mine water challenges. IMWA 2014 Conference, Xuzhou, China, 18–22 August 2014.

### 7.4 Popular Journals and Books

Oosterhuis, R., 2014. Mines and Mineral Resources of Western Africa Map. Mining Review Africa, Mines and Mineral Resources, August 2014.

Oosterhuis, R., 2014. Mines and Mineral Resources of the SADC Map. Mining Review Africa, Mines and Mineral Resources, November 2014.

Oosterhuis, R., 2014. Mines and Mineral Resources of Africa Map. Mining Review Africa, Mines and Mineral Resources, January 2015.

Marean, C.W., Cawthra, H.C., Cowling, R.M., Esler, K.J., Fisher, E.C., Milewski, A., Potts, A.J., Singels, E. and De Vynck, J., 2014. Stone Age people in a changing South African Greater Cape floristic region. *In:* Allsopp, N., Colville, J.F. and Verboom, T. (Eds), Ecology and Evolution of Fynbos: Understanding Megadiversity. Oxford University Press, Oxford, pp. 164–199.

Werz, B., Cawthra, H.C. and Compton, J.S., 2014. Recent developments in African offshore prehistoric archaeological research, with an emphasis on South Africa. *In:* Evans, A., Flatman, J. and Flemming, N. (Eds), Submerged Prehistoric Archaeology on the Continental Shelf: A Global Review. Springer, pp. 233–255.



Workshop on the application of United Nations Framework Classification – 2009 (UNFC-2009) for Uranium Resources



### GOVERNANCE

### **1. INTRODUCTION**

The Council for Geoscience is fully committed to applying the fundamental principles of good governance, transparency, integrity, accountability and responsibility. It embraces the principles of good governance as set out in the Public Finance Management Act (Act No. 1 of 1999, as amended) and the Protocol on Corporate Governance in the Public Sector.

### 2. EXECUTIVE AUTHORITY

The Council for Geoscience submitted quarterly reports in terms of National Treasury regulations (26.1) to the Executive Authority on 31 January, 30 April, 31 July and 31 October. The Annual Performance Plan and the Council for Geoscience Strategic Plan were submitted to the Department of Mineral Resources on 30 September.

The reports and plans were approved by the Minister on 10 March 2014.

### 3. THE BOARD OF THE COUNCIL

### FOR GEOSCIENCE

The Board of the Council for Geoscience approves the mission, strategies, goals, operating policies and priorities of the organisation and monitors compliance with the policies and achievements with respect to the scientific, administrative and financial objectives.

The Board is appointed by the Minister in accordance with the provisions of section 4 of the Geoscience Act (Act No. 100 of 1993). Other than the Chief Executive Officer, all the Board Members are non-executive members. The Board Members are continually and actively involved in, and bring independent counsel and judgement to bear on, all Board discussions and decisions. Board Members are fully conversant with their fiduciary duties as outlined in section 50 of the Public Finance Management Act (Act No. 1 of 1999, as amended) which, among others, requires them to declare their interests in the event of a potential conflict of interest. The Board meets on a quarterly basis, or as required during the course of a financial year. Five meetings were held during the period under review, on 29 May, 28 July, 28 August and 20 November 2014 and on 26 February 2015.

### Abridged Board Charter per PFMA and Protocol on Corporate Governance

A Board Charter was developed and established for the Board of the Council for Geoscience. The Charter defines the governance parameters within which the Board exists and sets out specific responsibilities to be discharged by the Board.

The Board is fully committed to applying the fundamental principles of good governance, transparency, integrity, accountability and responsibility in all dealings by, in respect and on behalf of, the Council for Geoscience. It accordingly embraces the principles of good governance as set out in the Public Finance Management Act (Act No. 1 of 1999, as amended) and the Protocol on Corporate Governance in the Public Sector.

The Charter confirms the following with respect to the Board:

- role in exercising leadership, judgement and providing strategic direction
- composition
- accountability
- fiduciary duties and responsibilities
- code of conduct
- appointment of committees
- governance and meeting procedures
- duty to declare conflict of interests
- responsibility for adoption of strategic plans
- monitoring of operational performance and management

- determination of policy and processes to ensure the integrity of the risk management and internal controls of the Council for Geoscience
- communications policy
- director selection, orientation and evaluation.

The Board Charter is reviewed, as and when necessary, to ensure that it remains relevant to the business objectives of the Council for Geoscience.

Name	Designation	Employer	Date appointed	Qualifications	Area of expertise	Other committees
Prof. P E Ngoepe	Chairperson	University of Limpopo	1 October 2012	PhD (Physics)	Physics	1
Mr M W Kota	CEO	Council for Geoscience	1 December 2012 Resigned in April 2015	MSc (Exploration Geology), MBA, Postgraduate Diploma (Financial Strategy)	Geology	Technical PRT Finance
Mr B A Genyts	Board Member	Department of Science and Technology	1 February 2013	MSc (Engineering Management)	Technology and Innovation Systems	Technical
Prof. M A Hermanus	Board Member	Council for Scientific and Industrial Research	1 October 2012	MSc (Engineering, Physical Metallurgy)	Mining Engineering	Technical
Mr M Mabuza	Board Member	Department of Mineral Resources	1 October 2012	BSc (Geology)	Mineral Policy and Promotion	Audit and Risk
Dr H Mathe	Board Member	Tranter Resources (Pty) Limited	1 October 2012	PhD (Geology)	Geology	PRT Technical
Dr M Mayekiso	Board Member	Department of Erwironmental Affairs	1 February 2014	PhD (Marine and Environmental Science)	Conservation of the Ocean and Coast	
Dr.J E McGill	Board Member	Council for Scientific and Industrial Research	1 October 2012	PhD (Economic Geology)	Economic Geology	Technical Finance

**Composition of the Board** 

Name	Designation	Employer	Date appointed	Qualifications	Area of expertise	Other committees
Ms K R Mthimunye	Board Member	Bluewaves Consulting Services	1 October 2012	BCompt Hons (Accounting) CA (SA)	Accounting	Audit and Risk Finance
Mr M P Nepfumbada	Board Member	Department of Water Affairs	1 October 2012 Resigned in January 2015	MSc (Soil Science)	Special Advisor to Minister of Water Affairs	Audit and Risk
Ms S Ngxongo	Board Member	Department of Human Settlements	1 October 2012 Resigned in January 2015	BCom (Business Management) MBL (Financial Management, Project Management and Corporate Strategy)	Regulatory Compliance Services	Technical
Mr M Riba	Board Member	Department of Rural Development and Land Reform	1 October 2012	BSc (Mathematics and Chemistry, Surveying)	Land Surveying	
Ms D Fischer (Alternate to Dr M Mayekiso)	Alternate Member	Department of Environmental Affairs	1 February 2014	MSc (Environmental Management)	Environmental Management	
Ms R Mdubeki (Alternate to Mr M Riba)	Alternate Member	Department of Rural Development and Land Reform	1 October 2012	BSc (Land Surveying)	Land Administration (Cadastral Surveys)	PRT
Ms D Mochotlhi (Alternate to Mr M P Nepfumbada)	Alternate Member	Department of Water Affairs	1 October 2012	MSc (Environment and Society)	Environment	Finance
Ms S Mohale (Atternate to Mr M Mabuza)	Alternate Member	Department of Mineral Resources	1 October 2012	MSc (Globalisation and Development)	Economic Development	PRT Technical
Mr D Sibiya (Alternate to Dr J E McGill)	Alternate Member	Tronox	1 October 2012	MSc (Mining Engineering)	Geology	PRT
Mr S M Sikhosana	Acting CEO	Council for Geoscience	1 May 2015	BSc Hons (Geology) MBA	Geology	Technical PRT Finance

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MEMBER	DIRECTORSHIP
Prof. P E Ngoepe	Madibeng - Life member
Mr M W Kota	IGC Co-President and Board Member of the 35th IGC Foundation NPC Board
Mr B A Gerryts	• None
Prof. M A Hermanus	<ul> <li>AVENG (Pty) Ltd — Non-Executive Board Member</li> <li>Bokamoso Trust — Chairperson of the Board of Trustees for AngloGold Ashanti Option</li> </ul>
Mr M Mabuza	• None
Dr H Mathe	<ul> <li>Zaria Mining – Director</li> <li>Howden Africa Holdings – Director</li> <li>African Emissions Trading – Director</li> <li>Tranter Kismet Investments – Director</li> <li>Tranter Pangea Diamond – Director</li> <li>Tranter Pangea Cold Investments – Director</li> <li>Tranter Holdings – Director</li> <li>Tranter Holdings – Director</li> <li>Dorper Wind Fam (FF) – Atternate Director</li> <li>Borper Wind Fam (FF) – Atternate Director</li> <li>Uwescoal Holdings – Director</li> <li>Erret Mining and Environmental Services – Director</li> <li>Upward Spiral 10 – Director</li> <li>Evesizve Mining – Director</li> <li>Tranter Resources – Director</li> <li>Tranter Resources – Director</li> <li>Tranter Resources – Director</li> </ul>

MEMBER	DIRECTORSHIP
Dr H Mathe	<ul> <li>Scinta Energy – Director</li> <li>Scinta South Africa – Director</li> <li>Scinta South Africa – Director</li> <li>Acetomanzi – Director</li> <li>Dorper Wind Development – Director</li> <li>Tranter – Inkwali Engineering – Incorporator</li> <li>Dorper Wind Farm BBEE Holdings (RF) – Trustee</li> <li>Dorper Wind Farm BEEE Holdings (RF) – Director</li> <li>Tent10 Holdings – Director</li> <li>Tant10 Holdings – Director</li> <li>Tant20 – Director</li> <li>Tant20 – Director</li> </ul>
Dr M Mayekiso	• Moisource (Pty) Ltd — 25% interest
Dr J E McGill	• None
Ms K R Mthimunye	<ul> <li>Haffield Group – Shareholder</li> <li>NERSA – Director</li> <li>Mintek – Director</li> <li>Konika Minolta SA – Director</li> <li>OCE SA – Director</li> <li>OCE SA – Director</li> <li>Ceci Nurse – Director</li> </ul>
Mr M P Nepfumbada	Member of the SAQA Audit Committee
Ms S Ngxongo	• None
Mr M Riba	• None
Ms D Fischer	• None

MEMBER	DIRECTORSHIP
Ms R Mdubeki	• None
Ms D Mochothi	· Note
Ms S Mohale	Sasol – Shareholder     Applewood Trading – Shareholder     State Diamond Trader – Non-Executive Director
Mr D Sibiya	• None
Mr S M Sikhosana	· None
Appointment of Bo	ard Committee Members
Audit and Risk Committe	
Chairperson	Mr S M Xulu
Members	Mr M Mabuza Ms K R Mthimunye Mr M P Nepfumbada (resigned in January 2015) Dr B Tema

imunye la - Chef Executive Officer and and and and and and and and						
irinunye ta - Chief Executive Officer ill mazi othi ta - Chief Executive Officer ta - Chief Executive Officer eki ele yts ermanus ta - Chief Executive Officer eki ta - Chief Executive Officer eki te - Chief Executive Officer eki te - Chief Executive Officer eki te - Chief Executive Officer eki bernanus te - Chief Executive Officer eki bernanus te - Chief Executive Officer eki bernanus						
	nimunye	ta — Chief Executive Officer sill nazi otthi	ormation Committee	ta — Chief Executive Officer beki le	80	ryts lermanus ta — Chief Executive Officer le ngo (resigned in January 2015)

# **BOARD AND COMMITTEE MEETINGS**

### **BOARD MEETINGS**

## 1 APRIL 2014-31 MARCH 2015

Meetings attended		0	Ø	Q	7	4	œ	0	Ø	Ø	5/6	9/0	4
	30 March (special)	Present	Present	Present	Present	Apology	Present	Present	Present	Present	Not a member	Not a member	Apology
2015	13 March (special)	Present	Present	Apology	Present	Apology	Present	Present	Present	Present	Not a member	Not a member	Present *
	26 February	Present	Present	Present	Present	Apology	Present	Apology	Present	Present	Not a member	Not a member	Present*
	20 November	Present	Present	Present	Present	Present	Present	Apology	Present	Apology	Present	Absent	Apology
	28 October (special)	Present	Present	Present	Apology	Apology	Present	Apology	Present	Present	Present	Apology	Apology
2014	17 September (special)	Present	Present	Apology	Present	Present	Present	Apology	Present	Present	Present	Absent	Apology
	28 August	Present	Present	Present	Apology	Present	Apology	Present	Present	Present	Present	Absent	Present*
	28 July	Present	Present	Apology	Present	Present	Present	Apology	Present	Present	Present*	Absent	Present*
	29 May	Present	Present	Present	Present	Apology	Present	Apology	Present	Present	Apology	Absent	Apology
	MEMBERS	Prof. P E Ngoepe	Mr M W Kota	Mr B A Gerryts	Prof. M A Hermanus	Mr M Mabuza Ms S Mohale*	Dr H Mathe	Dr M Mayekiso Ms D Fischer*	Dr J E McGill <i>Mr D Sibiya*</i>	Ms K R Mthimunye	Mr M P Nepfumbada Ms D Mochothhi*	Ms S Ngxongo	Mr M Riba Ms R Mdubeki*

\* Alternate members

### Audit and Risk Committee

The Audit and Risk Committee of the Council for Geoscience evaluates the annual internal and external audit plans, the internal and external audit reports and the financial statements. The Audit and Risk Committee also assesses the effectiveness of the internal audit function and the risk mitigation procedures which are in place.

In addition, the Audit and Risk Committee, from time to time, assesses its mandate and charter in order to address emerging risks. The composition of the Audit and Risk Committee as at 31 March 2015 was:

Chairperson:	Mr S M Xulu
Members:	Mr M Mabuza
	Ms K R Mthimunye
	Mr M P Nepfumbada
	(resigned in January 2015)
	Dr B Tema

### AUDIT AND RISK COMMITTEE MEETINGS

				2014/1	15			
MEMBERS	20 May	23 July	21 August	3 November (special)	12 November	14 November (special)	16 February	Meetings attended
Mr S M Xulu	Present	Present	Absent	Present	Present	Present	Present	6
Mr M Mabuza	Apology	Apology	Apology	Apology	Apology	Apology	Apology	0
Ms K R Mthimunye	Present	Present	Present	Present	Present	Present	Present	7
Mr M P Nepfumbada	Present	Apology	Present	Present	Present	Present	Not a member	5/6
Dr B Tema	Present	Apology	Present	Present	Apology	Present	Present	5

### 1 APRIL 2014-31 MARCH 2015

### **Finance Committee**

The Finance Committee of the Council for Geoscience addresses a range of corporate financial issues of the organisation such as the recommendation for the approval of the budget, the recommendation for major capital expenditure, the writing off of bad debts and assets and any other financial matters referred to the Committee by the Board for recommendations.

The composition of the Finance Committee as at 31 March 2015 was:

Chairperson:	Ms K R Mthimunye
Members:	Mr M W Kota
	Dr J E McGill
	Mr K Mkwanazi
	Ms D Mochotlhi

### FINANCE COMMITTEE MEETINGS

### 1 APRIL 2014-31 MARCH 2015

	2014/15								
MEMBERS	20 May	23 July	21 August	12 November	16 February	attended			
Ms K R Mthimunye	Present	Present	Present	Present	Present	5			
Mr M W Kota	Present	Present	Present	Present	Present	5			
Dr J E McGill	Present	Present	Apology	Present	Present	4			
Mr K Mkwanazi	Present	Apology	Present	Apology	Present	3			
Ms D Mochotlhi	Present	Apology	Present	Apology	Apology	2			

### Personnel, Remuneration and Transformation Committee

The Personnel, Remuneration and Transformation Committee determines the human resource strategies and policies of the Council for Geoscience. The Committee approves the remuneration structure and salary changes in the organisation and evaluates and makes recommendations on the payment of production bonuses. The Committee also decides upon the remuneration of the Executive Management. The composition of the Personnel, Remuneration and Transformation Committee as at 31 March 2015 was:

Chairperson: Dr H Mathe Members: Mr M W Kota Ms R Mdubeki Ms S Mohale Mr D Sibiya

### PERSONNEL, REMUNERATION AND TRANSFORMATION COMMITTEE MEETINGS

MEMBERS	2014/15				Meetings
	14 May	20 August	11 November	17 February	attended
Dr H Mathe	Present	Present	Present	Present	4
Mr M W Kota	Apology	Present	Present	Present	3
Ms R Mdubeki	Apology	Present	Present	Apology	2
Ms S Mohale	Present	Present	Apology	Apology	2
Mr D Sibiya	Present	Present	Present	Present	4

### 1 APRIL 2014-31 MARCH 2015

### **Technical Committee**

The Technical Committee of the Council for Geoscience attends to the annual scientific and technical programme of the organisation, evaluates the scientific and technical output, oversees the annual technical audit and recommends on such scientific and technical matters as are referred to it by the Board.

The composition of the Technical Committee as at 31 March 2015 was:

Chairperson:	Dr J E McGill
Members:	Mr B A Gerryts
	Prof. M A Hermanus
	Mr M W Kota
	Dr H Mathe
	Ms S Mohale
	Ms S Ngxongo
	(resigned in January 2015)

### **TECHNICAL COMMITTEE MEETINGS**

### 1 APRIL 2014-31 MARCH 2015

	2014/15				
MEMBERS	14 May	20 August	11 November	17 February	Meetings attended
Dr J E McGill	Present	Present	Present	Present	4
Mr B A Gerryts	Present	Present	Apology	Present	3
Prof. M A Hermanus	Apology	Apology	Present	Present	2
Mr M W Kota	Apology	Present	Present	Present	3
Dr H Mathe	Present	Present	Present	Present	4
Ms S Mohale	Present	Present	Apology	Apology	2
Ms S Ngxongo	Absent	Absent	Absent	Not a member	0/3

### **Remuneration of the Board Members**

Remuneration is paid to Board Members in accordance with departmental approved guidelines pertaining to Maximum Remuneration payable to Non-Official Members of Commissions and Committees of Inquiry. Refer to page 146 of the Financial Statements for the remuneration of Board Members for the year 2014/15.

### 4. RISK MANAGEMENT

The Council for Geoscience has to consider a number of strategic risks to the organisation, which are clearly outlined in the Strategic Risk Register. The register describes the impact of the risks on the strategic objectives of the organisation, the root causes, the residual risk scorecard, actions to manage the risks and associated time frames. The Risk Committee of the Council for Geoscience ensures that a proper and effective management process is in place to deal with these risks.

### Strategic risks

The following key strategic risks are tracked on the Strategic Risk Register with the residual risk rating stated:

- 1. Misalignment of the skills base to current and emerging opportunities (Medium)
- 2a. Insufficient financial resources to effectively execute the mandate of the organisation (High)
- 2b. Inability to diversify the income streams to grow the business in order to reach its full potential (diversify projects portfolio) (High)
- 3a. Ineffective marketing strategy (structured, coherent and policy driven) (High)
- 3b. Lack of a coherent and effective stakeholder management and leveraging approach (High)
- 4a. Lack of supportive research infrastructure (High)
- 4b. Ageing scientific and non-scientific infrastructure with maintenance backlog (High)
- 5. Failure to develop and implement an efficient supply chain management (SCM) strategy (High)
- 6. Failure to develop and implement effective and efficient business systems (Medium)
- Fragmented information and communications technology (ICT) infrastructure and compromised information security (Medium)

- 8. Inability to respond to the macro-economic environment (Medium)
- 9. Substandard performance levels and high staff turnover (Low).

### Progress made on addressing the identified risks

A number of projects were undertaken by the Risk Committee with the aim of improving the management of the identified risks. The Strategic Risk Register was captured to an electronic system as a pilot activity to trial activation of reminder mitigation action emails. This activity will continue into the next financial year. Mitigation projects were defined with anticipated dates and are reviewed every quarter for desired progress. These projects included:

- Develop and implement a new HR strategy and resource plan to include a structured learning and development plan and a staff retention policy. A number of policies were reviewed and approved by the Board. This is an ongoing activity
- Conduct stakeholder engagements to demonstrate capabilities and to lobby for sufficient funding to enable the organisation to achieve its mandate
- Develop and implement a new marketing strategy, including a resource plan, stakeholder engagement plan, industry communication and promotion plan and a data release policy review
- Develop an infrastructure strategy to utilise reserves to fund equipment replacement, increase partnerships and focus on innovation
- Developed and initiated the implementation of a change management strategy to include awareness programmes, staff satisfaction, performance incentives and reward and career pathing initiatives
- Developed and initiated the implementation of an ICT strategy
- Plan and develop relevant products and services

- Appropriate project management oversight tools/systems were completed by the introduction of a Project Portfolio Office and the associated training using PMBOK principles
- Develop and implement an efficient SCM strategy.

### **5. INTERNAL CONTROL UNIT**

An Internal Audit Plan is approved annually by the Board of the Council for Geoscience and quarterly reports are provided to the Board by the Internal Auditors. The Internal Auditors also perform adhoc assignments, as required by Management.

### 6. INTERNAL AUDIT AND AUDIT

### **COMMITTEES**

The members of the Audit and Risk Committee of the Council for Geoscience are of the opinion that the system of internal controls is adequately designed to cover organisational, financial and operational risks. The control system provides reasonable, but not absolute, assurance that the assets of the organisation are safeguarded, transactions are authorised and recorded properly, and that material errors and irregularities are either prevented or detected timeously. These controls are monitored throughout the organisation by Management and employees, with the necessary segregation of authority and duties.

The Operational Risk Management Committee, which reports to the Audit and Risk Committee on a quarterly basis, continually evaluates and monitors the effectiveness of all internal control systems in respect of all areas of risk that have been identified.

### 7. COMPLIANCE WITH LAWS AND

### REGULATIONS

The Council for Geoscience complies with National Treasury regulations through the PFMA Compliance Calendar. Compliance with laws and regulations is monitored through the Audit and Risk Committee.

### 8. FRAUD AND CORRUPTION

The general fraud and corruption risks facing an organisation include personnel risks, management risks, cultural risks, structural risks, business risks and computer risks. The Council for Geoscience has a legal responsibility in terms of the Public Finance Management Act (Act No. 1 of 1999, as amended), to take all appropriate steps to prevent unauthorised, irregular, fruitless and wasteful expenditure and losses resulting from any criminal conduct.

A Fraud Prevention Policy is in place, as well as a "whistle blowing facility" that is administered by Deloitte. Reports are issued on a monthly basis and fraudulent conduct is investigated by the Internal Auditors and reported to the Audit and Risk Committee.

### 9. MINIMISING CONFLICT OF

### **INTEREST**

In order to comply with the regulations of National Treasury, all suppliers of goods and services to the Council for Geoscience are required to complete standardised Treasury documentation (SBD4 Declaration of Interest). In view of possible allegations of favouritism, should the resulting bid, or part thereof, be awarded to persons employed by the Council for Geoscience, or to persons connected with or related to them, it is required that the bidder or his or her authorised representative declare his or her position to the evaluation/adjudication authority.

In addition, all staff members of the Council for Geoscience involved in the Bid Evaluation Committee are required to complete a declaration and non-disclosure form at each meeting in order to indicate that the staff member will not favour any business or institution, and further undertakes to disclose all material interest which he/she may have in any bid or quotation or potential contracts. Similarly, the members of the Bid Adjudicating Committee are required to complete a declaration of confidentiality and impartiality at each meeting in order to clarify that the committee members have no interest in a person, form, cooperation or business entity that is competing for a contract within the Council for Geoscience.

Should there be any declaration of interest, the committee member concerned will not be allowed to participate in the evaluation and award of the contract or bid.

### **10. CODE OF CONDUCT**

All staff members of the Council for Geoscience abide by the Code of Ethics and Conduct which has been duly adopted. As a result, the Council for Geoscience is committed to ethical and fair business dealings, and promotes a corporate culture which is non-sectarian and which is socially and environmentally responsible. It does so by subscribing to the following values and principles:

- Fairness and integrity in all business dealings, including the ethical handling of actual or apparent conflicts of interest between personal and professional relationships.
- Respect for the human rights and dignity of all employees.
- Acceptance of diverse cultural, religious, race, gender and sexual orientations.
- Honesty, transparency and accountability.
- Adherence to sound standards of corporate governance and applicable laws.

In terms of the Code of Ethics and Conduct, all persons serving on behalf of the Council for Geoscience are required to uphold the highest standard of business ethics and integrity. In furthering this, all staff, contractors, consultants and others acting on behalf of the organisation are required to accurately and honestly represent the organisation, and will refrain from engaging in any activity or scheme intended to defraud anyone of money, property or services. The reputation and integrity of the Council for Geoscience are central to its ability to operate as an effective state-owned organisation.

### **11. QUALITY ASSURANCE**

All services delivered by the Council for Geoscience are rendered within the context of the Quality Management System. The Quality Management System ensures that the creation, delivery and monitoring of services occur in line with international quality standards. The purpose of international recognition is to co-brand the Council for Geoscience with best-practice organisations and to ensure that the stakeholders receive the best services at all times. A Quality Management Forum was initiated and is being used as a steering committee to drive the Quality Management System implementation project, as well as to serve as a platform for sharing best quality assurance practices among the departments of the Council for Geoscience.

Laboratory testing facilities remain a high priority area within the Quality Management System of the Council for Geoscience. The Analytical Laboratory is currently commissioning the Laboratory Information Management System (LIMS). This is a database that is used mainly to store and access customer, quality control as well as sample data. The LIMS system is also being used to control various laboratory support processes, namely calibration records, standard operating procedures and equipment maintenance data, and to perform other related functions.

### 12. HEALTH, SAFETY AND

### ENVIRONMENTAL ISSUES

The Council for Geoscience strives to conduct all its activities in an environmentally sensitive manner. The approach that has been adopted by the organisation is to prevent pollution and resource wastage caused by its activities by developing and implementing a formalised Environmental Management System. The Council for Geoscience has created and sustains the necessary organisational competency to enable the development of health, safety and environment (HSE) plans for the major projects. The Quality, Health, Safety and Environmental Policy Statement has been drafted by Management to provide a statement of intent for the development of systems to drive compliance with occupational health and safety, environmental as well as quality standards and legislation.

Management of the Council for Geoscience is obliged in terms of the Occupational Health and Safety Act to provide a safe workplace without risk to human life, while staff members have a duty to work and behave in compliance with the safety directives of the organisation. The Council for Geoscience uses its Health and Safety Management System to routinely identify hazards, assess risks and prevent potential workplace injuries. A baseline Health and Safety Risk Assessment has been conducted and subsequently followed by a Health and Safety Programme rollout. The Council for Geoscience monitors occupational health and safety performance and ensures improvement in this regard through the use of various management committees, namely the Operational Risk Management Committee (ORMC) and the Business Continuity Committee (BCC). Occupational health and safety is also monitored

quarterly by the CGS Board and the Audit and Risk Committee.

### **13. BOARD ADMINISTRATOR**

The Council for Geoscience has appointed a Board Administrator. The Board Administrator is responsible for preparing the schedule of all Board and Committee meetings for the year and for recording and filing the minutes of these meetings. It is the function of the Board Administrator to submit guarterly compliance reports to the National Treasury, the Department of Mineral Resources and the Auditor-General. and to update Board Member details. The Board Administrator plays a key role in the induction process of new members and must ensure that the annual Strategy Reviews in terms of the National Objectives and the annual Board Assessment as per the PFMA (section 53) Treasury regulation 30.1 take place. The decision was taken to follow this route, which is different to the recommendations in the King Report on Corporate Governance.

### **14. PUBLIC AWARENESS**

The Council for Geoscience participated in the following public awareness initiatives:

Event	Date	Activity	Outcome
Social Responsibility	5 August 2014	The Council for Geoscience donated a lawnmower and 66 fleece tops to learners of the Wolwenkop Special School	A short presentation was given and the Council for Geoscience received a letter of appreciation from the school
Social Responsibility	11 December 2014	Painted the walls of Sun Garden Nursery School	A letter of appreciation and photographs were handed over to the Council for Geoscience

### Visits of Foreign Delegations to the Council for Geoscience

Purpose of visit: Several international delegations visited the Council for Geoscience to investigate opportunities to enter into collaborations for business development purposes.Outcome: Several proposals for business opportunities are awaiting approval or have been finalised.

Delegation from/for:	Date	Outcome
China	2 June 2014	A Memorandum of Understanding was signed
Canada	24 June 2014	Finalisation of a proposal for a Memorandum of Understanding is pending
Parliamentary Portfolio Committee on Mineral Resources	25–26 September 2014	This was an oversight visit to the Council for Geoscience as part of a Gauteng visit to identify areas that experience illegal mining activities
Department of International Relations and Cooperation (DIRCO)	14 November 2014	Preparations for the International Seabed Authority (ISA) Conference that took place from 17 to 19 March 2015 were finalised
Five Year Institutional Review	19–30 January 2015	The Five Year Institutional Review Panel undertook a review and a report was submitted to the Department of Science and Technology
DIRCO and DMR	5 February 2015	Collaboration between DMR, DIRCO and the Council for Geoscience for the ISA Conference
Lesotho	16–17 February 2015	The Council for Geoscience assisted Lesotho with laboratory facilities
MINTEK and DST	20 February 2015	Implementation of mineral processing and training for the member states of the Centre for Science and Technology of the Non-Aligned and Other Developing Countries

Exhibitions			
Event	Date	Outcome	
Mining Lekgotla	11–14 August 2014	The Council for Geoscience exhibited and gave presentations at this conference. Various countries visited the organisation with a view to collaborating in mapping projects	
25th Colloquium of African Geology	14–16 August 2014	The Council for Geoscience exhibited at this event and staff members gave presentations	
OAGS Meeting and Exhibition in Ghana	18–20 September 2014	The Council for Geoscience attended and exhibited at the annual meeting of the Organisation of African Geological Surveys	
Mining Indaba	9–12 February 2015	The Council for Geoscience exhibited and gave presentations at the conference. Various countries visited the organisation with a view to collaborating in mapping projects. The CEO gave a number of presentations at various forums promoting the service offerings of the organisation	
PDAC	1–4 March 2015	The Council for Geoscience attended this exhibition to promote business networking opportunities	

In-House Events					
Event	Date	Outcome			
Nelson Mandela Memorial	18 July 2014	Management and staff of the Council for Geoscience held a memorial service in honour of former President Nelson Mandela			
Women's Day Celebrations	15 August 2014	Female staff members of the Council for Geoscience celebrated Women's Day in recognition of National Women's Month			
Bandana Day	31 October 2014	The Council for Geoscience supported the Sunflower Fund in aid of the South African Bone Marrow Registry			
Institute of the Blind	28 November 2014	A new information centre in Worcester in the Western Cape Province is the first of its kind in Africa, with geological exhibitions and fossil routes for the blind. The exhibits were donated by the Council for Geoscience as part of an initiative by a retired geologist			
CGS Wellness Day	27 March 2015	The Council for Geoscience recognises that a healthy workforce increases productivity and facilitated testing of lifestyle related illnesses			
Career Exposure Events					
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Event	Date	Outcome			
International Museums Day	16 May 2014	The National Geoscience Museum participated at this event to highlight the critical place the museum holds in society and to promote its services to learners and the public			
University of KwaZulu-Natal	7 August 2014	Eighty-six learners attended the CGS Careers Awareness Campaign and were exposed to careers in the geosciences. Presentations were given by the Human Resources Department of the Council for Geoscience			
SAGHOS Roadshow	7–10 October 2014	The Umtata road show was part of the Space Science Week initiative organised by the Department of Science and Technology and the South African Agency for Science and Technology Advancement. The event mainly targeted high school learners and was attended by up to 800 learners			
University of Limpopo	14 February 2015	A student from Polokwane was given exposure to careers in the engineering geosciences by working with scientists in the Engineering Geoscience Unit for a day			



A delegation from Lesotho visited the Council for Geoscience to view the laboratory facilities



Visit by MINTEK and DST to discuss the implementation of mineral processing and training for the member states of the Centre for Science and Technology of the Non-Aligned and Other Developing Countries



Visit by the Parliamentary Portfolio Committee on Mineral Resources



The CGS stand at the Mining Lekgotla

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Council for Geoscience



# **HUMAN RESOURCES MANAGEMENT**

## **1. INTRODUCTION**

The Council for Geoscience is fully aware that the expertise of its employees is central to the achievement of its strategy. The organisation is therefore committed to ensuring that the employees are given the opportunity to develop their potential to meet their own aspirations, aligned to the objectives of the organisation. Further to this, the Council for Geoscience has a strategic objective to continually develop and increase the scientific capabilities and skills of its staff by providing them with access to education and training opportunities. To realise this objective, the Council for Geoscience encourages the conscious pursuit of self-awareness and knowledge to improve personal skills in a learning organisation.

## 2. OVERVIEW OF HR MATTERS

The Council for Geoscience strives to identify and develop leadership that nurtures talent and creates a culture of engagement and fulfilment. Moreover, the Council for Geoscience endeavours to implement consistent and fair people management policies and processes by leveraging best practices to achieve efficiency in the organisation. To this end, the focus of the Council for Geoscience is to implement efficient talent management solutions to ensure that there is a pipeline of pivotal skills in place to support the CGS strategy of being an employer of choice. Within this context, the Council for Geoscience has a clear commitment to a people management agenda ranging from talent management strategies to policies, procedures and related tools in order to move from strategy to execution.

# **3. HR PRIORITIES FOR THE YEAR**

### **UNDER REVIEW**

The HR priorities for the year under review are aimed at ensuring that the Council for Geoscience has adequate capacity in order to leverage its vision of becoming the leading provider of public geoscience expertise in South Africa and beyond. To accomplish its vision, several HR priorities were identified during the reporting period.

#### Organisational design and structure review

Charting an efficient and effective organisational structure is based on the repositioning strategy of the Council for Geoscience. Although the mandate of the organisation remains stable, the delivery model of its mandate has shifted, resulting in the design of a new organisational structure to support the optimisation of the new delivery model in line with the process value chain of the organisation. The completion of the structural design resulted in the successful migration of staff from the old to the new structure, which forms part of the overall strategic intent to reposition the Council for Geoscience to be a high-performing organisation. The migration of staff to roles or positions in the organisation was based on fair, transparent and equitable processes, as stipulated in the Migration Framework.

#### **Diversity and transformation**

As a designated employer, the Council for Geoscience prepared a three year Employment Equity Plan in order to monitor and achieve progress towards employment equity. Overall, the Council for Geoscience achieved its numerical targets according to race and gender in most occupational levels. Similar to most industries operating within the mining environment, there is still a challenge to attract and retain people living with disabilities and those from historically disadvantaged groups in certain occupational levels, in particular in respect of professionally qualified and experienced specialists and mid-management professionals. In addition, the Council for Geoscience successfully completed the Employment Equity Report for the reporting period in compliance with section 21 of the Employment Equity Act (Act No. 55 of 1988, as amended).

#### Employee benefits and compensation

The Council for Geoscience obligates all permanent employees to take out medical cover as principal members either supplied by the three approved medical schemes, Medihelp, Commed and Bonitas, or as a dependent on a spouse's medical cover. Employees are also allowed to take out medical cover of their own choice on condition that proof of cover is produced when required. To maintain appropriate remuneration competitiveness in the labour market, the Council for Geoscience reviews its remuneration practices, taking into account salary market surveys and affordability, on an annual basis. The organisation has an agreement with organised labour to negotiate annual salary increases on behalf of its members.

#### Training and professional development

#### Full-time study bursaries

During the period under review, a total of 17 full-time study bursaries were awarded to deserving students with eight full-time study bursaries being granted to students enrolled for Master's programmes.

#### Internships

To leverage marketability and support the career aspirations and development of individuals from historically disadvantaged groups, the Council for Geoscience has, in partnership with the Mining and Qualification Authority (MQA), enrolled an additional fifteen interns in the internship programme. This initiative brings the number of interns currently enrolled in the internship programme to 77, consisting of 39 Black women, 2 Indian women, 35 Black men and 1 White man.

# 4. WORKFORCE PLANNING FRAMEWORK AND KEY STRATEGIES TO ATTRACT AND RECRUIT A SKILLED AND CAPABLE WORKFORCE

The Council for Geoscience considers its talent management process as an integrated process of ensuring that it has a continuous supply of highly productive individuals in the right job at the right time. The organisation believes that talent management is not a one-time event, but that it is a continuous process that plans talent needs, builds an image to attract the best, ensures that new recruits are productive from the beginning of employment, helps to retain pivotal talent and facilitates the continuous movement of talent to where it can have the most impact in the organisation.

The approach of the Council for Geoscience to workforce planning entails scanning both the external and internal environments, including an analysis of the current workforce profile, the projection of the future workforce profile, a gap analysis and closing strategies.

Some of the key strategies aimed at attracting and recruiting a skilled and capable workforce entail an increase in the usage of non-permanent positions, such as rotational assignments, the hiring of interns, the deployment of skills within the organisation and internal promotions.

# 5. EMPLOYEE PERFORMANCE

## MANAGEMENT FRAMEWORK

The Council for Geoscience adopted a Balanced Scorecard approach based on the Performance Management Framework. The process is aimed at continually managing organisational, divisional, departmental and individual performance to ensure the achievement of the strategic objectives of the Council for Geoscience. Performance assessments for all measurement levels take place quarterly.

# 6. EMPLOYEE WELLNESS PROGRAMMES

In order to proactively and effectively address the health and wellbeing of its employees, the Council for Geoscience has, in partnership with NMG Consultant, conducted an annual comprehensive health assessment, the intended purpose of which is the early identification of health risk factors to create awareness and early management of the employee lifestyle programme. To enhance the coping skills of employees, the Council for Geoscience will therefore be looking at encouraging its employees to participate in the health and lifestyle enhancement programme.

# 7. POLICY DEVELOPMENT

In order to support the implementation of the repositioning strategy, new HR policies have been adopted, namely the Secondment, Succession and Career Development and the Migration Framework policies. The Remuneration policies are also in the process of being adopted, pending ministerial approval.

# 8. HIGHLIGHTS OF ACHIEVEMENTS

During the period under review, the Council for Geoscience had a rate of termination of employment of 2.5% against an average headcount of 316 employees, which is below the industry norm. It is noteworthy that the Council for Geoscience was able to retain approximately 97.5% of its staff.

Management, together with organised labour, has successfully managed labour relations, thereby avoiding work stoppage and strikes.

## 9. CHALLENGES FACED BY THE

## ORGANISATION

The Council for Geoscience is facing the challenge of attracting, developing and retaining talent mainly as a result of a shortage of talent locally and internationally and the impact of global mobility on the South African labour market.

The Council for Geoscience recognises that there is a disproportion between the total

number of staff and the number of scientists and that the proportion of scientists will have to increase to meet future mandated commitments. Currently, scientists make up 37.25% of the total staff complement, with 54% having Honours degrees, 30% Master's degrees and 16% Doctorates.

# **10. FUTURE HR GOALS**

The Council for Geoscience intends introducing the Paterson grading system as the preferred job evaluation system to facilitate the implementation of career and pay progression.

The Council for Geoscience will reinforce remuneration practices which are linked to performance in order to encourage and promote high performance through variable remuneration linked to value drivers.

The Council for Geoscience will introduce an integrated HR Information System:

- To provide diagnostic and predictive data that will inform strategies and practices designed to improve the effectiveness of people management in the organisation
- To automate routine HR transactional work
- To provide more complete, accurate and useful information management through the creation of comprehensive, all-encompassing databases and HRIS systems
- To enhance accessibility and selfservice through 24/7 online support for routine operations.

# **11. HUMAN RESOURCES OVERSIGHT STATISTICS**

#### **Personnel cost**

Divisions	Total expenditure of the organisation R'000	Personnel expenditure R'000	Personnel expenditure as a percentage of total expenditure	Number of employees	Average personnel cost per employee R'000
Office of the CEO		13 060	4.02	17	768
Office of the CFO		8 057	2.48	20	403
Office of the COO		85 201	26.24	160	533
Corporate Shared Services		38 270	11.79	119	322
Total	324 690	*144 588	44.53	316	

\* The personnel cost in this instance refers to the total remuneration of all permanent staff as at 31 March 2015

### Personnel cost by job level

Job level	Personnel expenditure R'000	Percentage of personnel expenditure to total personnel cost	Number of employees	Average personnel cost per employee R'000
Top Management	7 260	5.02	4	1 815
Senior Management	16 487	11.40	17	970
Professional qualified	80 144	55.43	146	549
Skilled	23 366	16.16	82	285
Semiskilled	16 115	11.15	58	278
Unskilled	1 216	0.84	9	135
Total	*144 588	100	316	

\* The personnel cost in this instance refers to the total remuneration of all permanent staff as at 31 March 2015

### Performance rewards

No performance rewards were paid during the 2014/15 financial year.

### **Training cost**

Total expenditure of the organisation R'000	Personnel expenditure R'000	Training expenditure* R'000	Training expenditure as a percentage of personnel cost	Number of employees trained	Average training cost per employee R'000
324 690	144 588	2 429	1.68	192	13

\* Training is centralised, hence this aspect could not be partitioned into divisions

#### **Employment and vacancies**

Divisions	Number of employees	Approved posts Vacancies		Percentage vacancies
Office of the CEO	17	30	13	43.33
Office of the CFO	20	27	7	25.93
Office of the COO	160	186	26	13.98
Corporate Shared Services	119	131	12	9.16

The new structure of the Council for Geoscience was approved and implemented during the year under review. Owing to budgetary constraints, vacancies are not prioritised and, as such, not all vacancies could be filled

Levels	Number of employees	Approved posts Vacancies		Percentage vacancies
Top Management	4	5	1	20.00
Senior Management	17	22	5	22.73
Professional qualified	146	176	30	17.05
Skilled	82	91	9	9.89
Semiskilled	58	68	10	14.71
Unskilled	9	12	3	25.00

### **Employment changes**

Levels	Employment at beginning of the period	Appointments	Terminations	Employment at end of the period
Top Management	4	0	0	4
Senior Management	17	2	2	17
Professional qualified	144	11	9	146
Skilled	89	1	8	82
Semiskilled	61	3	6	58
Unskilled	9	1	1	9
Total	324	18	26	316

### **Reasons for staff leaving**

Reason	Number	Percentage of total number of staff leaving
Death	3	11.54
Resignation	12	46.15
Dismissal	3	11.54
Retirement	8	30.77
III health	0	0
Expiry of contract	0	0
Other	0	0
Total	26	100

## Labour Relations: Misconduct and disciplinary action

Nature of disciplinary action	Number
Verbal warning	0
Written warning	0
Final written warning	0
Dismissal	3

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	MALE							
Levels	AFR	CAN	COLO	URED	IND	IAN	WH	IITE
	Current	Target	Current	Target	Current	Target	Current	Target
Top Management	3	4	0	0	0	0	1	1
Senior Management	8	6	0	0	1	1	4	6
Professional qualified	46	45	2	7	2	2	34	33
Skilled	49	48	5	5	0	0	7	7
Semiskilled	11	11	1	2	0	0	2	2
Unskilled	6	5	0	0	0	0	0	0
Total	123	119	8	14	3	3	48	49

## Equity targets and employment equity status

	FEMALE							
Levels	AFRI	CAN	COLO	URED	IND	IAN	WH	IITE
	Current	Target	Current	Target	Current	Target	Current	Target
Top Management	0	1	0	0	0	0	0	0
Senior Management	1	3	0	0	0	0	3	3
Professional qualified	36	43	3	7	3	3	20	20
Skilled	10	20	0	4	1	1	10	11
Semiskilled	30	31	4	3	0	0	10	12
Unskilled	3	4	0	0	0	0	0	0
Total	80	102	7	14	4	4	43	46

	DISABLED STAFF							
Levels	MA	\LE	FEMALE					
	Current	Target	Current	Target				
Top Management	0	0	0	0				
Senior Management	0	0	0	0				
Professional qualified	0	0	1	1				
Skilled	0	0	0	0				
Semiskilled	2	2	0	0				
Unskilled	0	0	0	0				
Total	2	2	1	1				

## Composition of full-time and part-time study bursars of the Council for Geoscience

Study	FULL-TIME MALE			FULL-TIME FEMALE			Total	PART-TIME MALE			PART-TIME FEMALE			Total				
levels	w	A	Т	с	w	A	Т	с	Total	w	A	I	с	w	A	I	с	Total
PhD	-	-	-	-	-	-	-	-	0	3	1		-	4	2	1	-	11
MSc	-	6	-	-	-	1	1	-	8	3	7	-	-	3	8	1	-	22
M Tech	-	-	-	-	-	-	-	-	0	1	-	-	-	-	1	-	-	2
BSc Hons	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	0
3rd Year	-	1	-	-	1	-	-	-	2	-	-	-	-	-	-	-	-	0
2nd Year	1	2	-	-	1	-	-	-	4	-	-	-	-	-	-	-	-	0
1st Year	-	-	-	-	-	2	-	-	2	-	-	-	-	-	-	-	-	0
B Tech	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-	0
ND	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-	0
Total	1	9	0	0	2	4	1	0	17	7	8	1	0	7	11	1	0	35

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# **FINANCIAL INFORMATION**

# **1. STATEMENT OF RESPONSIBILITY**

# Statement of Responsibility for the Annual Financial Statements for the Year ended 31 March 2015

The Board is responsible for the preparation of the Annual Financial Statements of the Council for Geoscience and for the judgements made in this information.

It is the responsibility of the Accounting Authority to establish and implement a system of internal controls designed to provide reasonable assurance as to the integrity and reliability of the Annual Financial Statements.

In our opinion, the financial statements fairly reflect the operations of the Council for Geoscience for the financial year ended 31 March 2015. The external auditors are engaged to express an independent opinion on the Annual Financial Statements of the Council for Geoscience.

The Annual Financial Statements of the Council for Geoscience for the year ended 31 March 2015 have been audited by the external auditors and their report is presented on page 121 to page 124.

The Annual Financial Statements of the Council for Geoscience set out on page 125 to page 153 have been approved.

Alchesang

Mr S M Sikhosana ACTING CHIEF EXECUTIVE OFFICER Council for Geoscience 28 July 2015

Prof. P E Ngoepe CHAIRPERSON OF THE BOARD Council for Geoscience 28 July 2015

Council for Geoscience

## 2. AUDIT AND RISK COMMITTEE REPORT

The Audit and Risk Committee of the Council for Geoscience is pleased to present its report for the financial year ended 31 March 2015.

#### Audit and Risk Committee Responsibility

The Board of the Council for Geoscience has the overall responsibility to ensure that the organisation has and maintains effective, efficient and transparent systems of risk management and internal controls. The responsibility to ensure the adequacy and effectiveness of these systems is delegated to the Audit and Risk Committee. The Audit and Risk Committee is an advisory committee of the Board, with an oversight role that is independent and objective.

The Audit and Risk Committee has adopted formal terms of reference, which have been confirmed by the Board through its Charter, and is satisfied that it has discharged its duties and responsibilities as set out in the Charter. In performing its responsibilities, the Audit and Risk Committee has reviewed the following:

- The functioning of the internal control systems
- The functioning of the internal audit programme
- The risk areas of the operations of the entity to be covered in the scope of the internal and external audits
- The reliability and accuracy of the financial information provided to Management and other users
- The accounting or auditing concerns identified as a result of the internal or external audits
- The compliance by the entity with legal and regulatory provisions.

#### The Effectiveness of Internal Control

The members of the Audit and Risk Committee

are of the opinion that the system of internal controls is adequately designed to cover organisational, financial and operational risks. The control system provides reasonable, but not absolute, assurance that the assets of the organisation are safeguarded, transactions are authorised and recorded properly and that material errors and irregularities are either prevented or detected timeously. These controls are monitored throughout the organisation by Management and employees, with the necessary segregation of authority and duties.

The Operational Risk Management Committee, which reports to the Audit and Risk Committee on a quarterly basis, continually evaluates and monitors the effectiveness of all internal control systems in respect of all areas of risk that have been identified.

From the various reports of the Internal Auditors, the Audit Report on the Annual Financial Statements, and the Management Letter of the Auditor-General, it was noted that there were some significant non-compliances with regulations that have been reported. These were subsequently addressed in accordance with the Public Finance Management Act. We can report that the system of internal controls was restored to be efficient and effective during the period under review.

#### In-Year Management and Monthly/ Quarterly Reports

The Audit and Risk Committee met five times during the year under review and submitted monthly and quarterly reports to the Executive Authority.

#### **Evaluation of Financial Statements**

The Audit and Risk Committee has reviewed and discussed the financial statements of the Council for Geoscience for the year ended 31 March 2015 with the Auditor-General. The

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Audit and Risk Committee has also reviewed the Management Letter of the Auditor-General and the responses of Management thereto. The members of the Audit and Risk Committee are of the opinion that the financial statements comply, in all material respects, with the requirements of the Public Finance Management Act (Act No. 1 of 1999, as amended) and the South African Statements of Generally Recognised Accounting Practice (GRAP). The Audit and Risk Committee agrees that the adoption of the going concern premise is appropriate in preparing the Annual Financial Statements.

#### **Auditor's Report**

The Audit and Risk Committee has reviewed the implementation plan of the Council for Geoscience for audit issues raised in the prior year and is satisfied that the matters have been addressed adequately.

The Audit and Risk Committee concurs and accepts the conclusions of the Auditor-General on the financial statements and is of the opinion that the audited Annual Financial Statements be accepted and read together with the report of the Auditor-General.

Mr S M Xulu Chairperson: Audit and Risk Committee Council for Geoscience 23 July 2015

Council for Geoscience

### **3. REPORT OF THE CHIEF**

## **EXECUTIVE OFFICER**

#### General Financial Review of the Council for Geoscience

The statement of financial position shows growth in total assets from R437.3m to R495.6m. Current assets amount to R273.0m and current liabilities to R151.9m for the reporting period, meaning that the Council for Geoscience will be able to meet its current financial obligations. An amount of R31.2m was spent on CGS infrastructure such as scientific and office equipment, machinery and computer equipment. Plans are in place to increase this investment to build a sustainable organisation. For the year under review, the financial performance of the Council for Geoscience shows a decline in total revenue and a loss to the amount of R14.7m.

The decline in revenue and loss are temporary and are attributable to the changes that are being implemented in the organisation for better future performance and stability. There were also challenges in respect of both the ring-fenced MTEF funding and the contracting revenue systems. There was a delay in the conclusion of a work plan agreement for the Water Ingress project. Both the Eskom Nuclear Plant Siting project and the Mine Health and Safety Seismic Stations project did not resume as anticipated.

#### **New Proposed Activities**

The Geoscience Amendment Act (Act No.16 of 2010) mandates the Council for Geoscience to, among others, be the custodian and curator of all geotechnical information in South Africa. The Council for Geoscience is also the national mandatory authority in respect of geohazards related to infrastructure development. Thus, the Act empowers the Council for Geoscience to be the custodian of all geotechnical data, with the purpose of advising government, state institutions, private organisations and the public on the complete geotechnical risk profile of the country.

#### **Request for Rollover of Funds**

In terms of section 53(3) of the Public Finance

Management Act (Act No. 1 of 1999, as amended), the Council for Geoscience has to obtain approval from the National Treasury to retain surpluses. The Council for Geoscience did not make a surplus in the reported year. Approval was obtained for the use of accumulated surpluses for the maintenance of and investment in scientific equipment and infrastructure and the implementation of the repositioning strategy.

#### **Supply Chain Management**

A Supply Chain Services Department is operational under the division of the Chief Financial Officer. This Department provides an appropriate procurement and provisioning system which is fair, equitable, transparent, competitive and cost effective and is established in accordance with section 54 of the PFMA Act of 1999 (as amended by Act No. 29 of 1999).

#### Audit Report Matters

The Council for Geoscience obtained an unqualified audit opinion from the Auditor-General for the year ended 31 March 2015. A number of issues were raised but were resolved during the current financial year.

#### Plans for Future Additional Financial Challenges

The Council for Geoscience is in the process of implementing the repositioning strategy for the alignment of operations to the organisational structure. This shortcoming was evident in the increasing deferred income in current liability on the statement of financial position. The Council for Geoscience is focussing on the delivery on all contracts in a prescribed period and, to this end, a Project Management Office was established and equipped with the necessary project management systems needed both for statutory and commercial projects. The Council for Geoscience is moving away from the "silo" approach to a more integrated operational system delivery.

The endeavour to increase the grant allocated to the organisation through the MTEF process will continue, together with an integrated business development strategy to solicit projects from government departments and from other clients.

# 4. REPORT OF THE AUDITOR-GENERAL TO PARLIAMENT ON THE COUNCIL FOR GEOSCIENCE

#### Report on the financial statements

#### Introduction

1. I have audited the financial statements of the Council for Geoscience set out on pages 125 to 153, which comprise the statement of financial position as at 31 March 2015, the statement of financial performance, statement of changes in net assets, and cash flow statement, as well as the notes, comprising a summary of significant accounting policies and other explanatory information.

#### Accounting authority's responsibility for the financial statements

2. The accounting authority is responsible for the preparation and fair presentation of these financial statements in accordance with the requirements of the South African Standards of the Generally Recognised Accounting Practice (SA Standards of GRAP) and the requirements of the Public Finance Management Act of South Africa, 1999 (Act No. 1 of 1999) (PFMA) and for such internal control as the accounting authority determines is necessary to enable the preparation of separate financial statements that are free from material misstatement, whether due to fraud or error.

#### Auditor-General's responsibility

- 3. My responsibility is to express an opinion on these financial statements based on my audit. I conducted my audit in accordance with International Standards on Auditing. Those standards require that I comply with ethical requirements, and plan and perform the audit to obtain reasonable assurance about whether the separate financial statements are free from material misstatement.
- 4. An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the separate financial statements. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the separate financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the separate financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the separate financial presentation of the separate financial presentation of the separate financial statements.
- 5. I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my audit opinion.

#### Opinion

6. In my opinion the financial statements present fairly, in all material respects, the financial position of the Council for Geoscience as at 31 March 2015 and its financial performance and cash flows for the year then ended, in accordance with the SA Standards of GRAP and the PFMA.

#### Emphasis of matter

7. I draw attention to the matter below. My opinion is not modified in respect of this matter.

#### Restatement of corresponding figures

As disclosed in note 24 to the financial statements, the corresponding figures for 31 March
2014 have been restated as a result of an error discovered during 31 March 2015 in the financial statements of the Council for Geoscience at, and for the year ended, 31 March 2014.

#### Report on other legal and regulatory requirements

9. In accordance with the Public Audit Act of South Africa, 2004 (Act No. 25 of 2004) (PAA) and the general notice issued in terms thereof, I have a responsibility to report findings on the reported performance information against predetermined objectives for selected objectives presented in the annual performance report, non-compliance with legislation and internal control. The objective of my tests was to identify reportable findings as described under each subheading but not to gather evidence to express assurance on these matters. Accordingly, I do not express an opinion or conclusion on these matters.

#### **Predetermined objectives**

- 10. I performed procedures to obtain evidence about the usefulness and reliability of the reported performance information for the following selected objectives presented in the annual performance report of the Council for Geoscience for the year ended 31 March 2015:
  - To address stakeholder needs on pages 25 to 26
  - To generate revenue on pages 26 to 27
  - To attract and retain a skilled workforce on page 28
  - To enhance present levels of excellence on page 29
  - To reflect and embrace the diversity of South Africa on page 29.
- 11. I evaluated the reported performance information against the overall criteria of usefulness and reliability.
- 12. I evaluated the usefulness of the reported performance information to determine whether it was presented in accordance with the National Treasury's annual reporting principles and whether the reported performance was consistent with the planned objectives. I further performed tests to determine whether indicators and targets were well defined, verifiable, specific, measurable, time bound and relevant, as required by the National Treasury's Framework for managing programme performance information (FMPPI).
- 13. I assessed the reliability of the reported performance information to determine whether it was valid, accurate and complete.
- 14. I did not identify any material findings on the usefulness and reliability of the reported performance information for the following objectives:
  - To address stakeholder needs on pages 25 to 26
  - To generate revenue of pages 26 to 27
  - To attract and retain a skilled workforce on page 28
  - To enhance present levels of excellence on page 29
  - To reflect and embrace the diversity of South Africa on page 29.

#### Additional matter

15. Although I identified no material findings on the usefulness and reliability of the reported performance information for the selected objectives, I draw attention to the following matter:

#### Achievement of planned targets

16. Refer to the annual performance report on pages 25 to 29 for information on the achievement of the planned targets for the year.

#### Adjustment of material misstatements

- 17. I identified material misstatements in the annual performance report submitted for auditing on the reported performance information for the below objectives. As management subsequently corrected the misstatements, I did not raise any material findings on the usefulness and reliability of the reported performance information.
  - To address stakeholder needs on pages 25 to 26
  - To attract and retain a skilled workforce on page 28
  - To enhance present levels of excellence on page 29.

#### **Compliance with legislation**

18. I performed procedures to obtain evidence that the public entity had complied with applicable legislation regarding financial matters, financial management and other related matters. My findings on material non-compliance with specific matters in key legislation, as set out in the general notice issued in terms of the PAA, are as follows:

#### Financial statements, performance and annual reports

19. The financial statements submitted for auditing were not prepared in accordance with the prescribed financial reporting framework as required by section 55(1)(a) of the Public Finance Management Act. Material misstatements of non-current assets and disclosure items identified by the auditors in the submitted financial statements were subsequently corrected, resulting in the financial statements receiving an unqualified audit opinion.

#### Procurement and contract management

- 20. Goods and services with a transaction value of below R500 000 were procured without obtaining the required price quotations, as required by Treasury regulation 16A6.1.
- 21. A contract was awarded to a bidder that did not score the highest points in the evaluation process, as required by section 2(1)(f) of the Preferential Procurement Policy Framework Act and Preferential Procurement Regulations.

#### Expenditure management

22. The accounting authority did not take effective steps to prevent irregular expenditure, as required by section 51(1)(b)(ii) of the PFMA.

#### Internal control

23. I considered internal control relevant to my audit of the financial statements, performance report and compliance with legislation. The matters reported below are limited to the significant internal control deficiencies that resulted in the findings on the performance report and the findings on non-compliance with legislation included in this report.

#### Leadership

24. Oversight responsibility over financial and performance reporting and compliance and the effective operation of related internal controls was not completely effective. Material adjustments in the financial and performance information that was submitted for audit as well as the non-compliance matters in procurement could have been prevented had leadership addressed the internal control deficiencies that were reported in the previous financial year.

#### Financial and performance management

- 25. Management did not prepare regular, accurate and complete performance reports that are supported and evidenced by reliable information.
- 26. Management did not adequately review and monitor compliance with applicable legislation.

#### **Other reports**

#### Investigations

27. The public protector has performed an investigation during the current financial year on a contract awarded by the Council for Geoscience. A report from the public protector has not been issued.

fuditor : General

Pretoria 31 July 2015



Auditing to build public confidence

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# 5. ANNUAL FINANCIAL STATEMENTS FOR THE PERIOD ENDED 31 MARCH 2015

# 1 STATEMENT OF FINANCIAL POSITION AT 31 MARCH 2015

	Notes	2015 R'000	2014 R'000
Assets			
Non-current assets			
Property and equipment	3	201 424	190 864
Intangible assets	4	3 579	4 363
Heritage assets	25	17 567	-
Current assets		273 026	242 040
Inventories	5	5	5
Trade and other receivables	7	21 084	16 190
Cash and cash equivalents	8	251 937	225 845
Total assets		495 596	437 267
Net assets and liabilities			
Net assets			
Accumulated surplus		336 658	333 746
Non-current liabilities			
Post-employment benefit liabilities	6	7 012	5 357
Current liabilities		151 926	98 164
Trade and other payables	9	24 130	11 846
Deferred income	10	112 996	72 265
Accruals	11	14 800	14 053
Total net assets and liabilities	495 596	437 267	

Council for Geoscience

# 2 STATEMENT OF FINANCIAL PERFORMANCE FOR THE PERIOD ENDED 31 MARCH 2015

	Notes	2015 R'000	2014 R'000
Revenue	12	287 266	293 122
Cost of commercial projects	12	(20 875)	(25 203)
Cost of statutory projects	12	(114 376)	(114 759)
Gross surplus		152 015	153 160
Other operating income	12	9 401	9 295
Administrative expenses		(184 188)	(167 019)
Other operating expenses	12	(5 231)	(5 348)
Interest received	13	13 368	14 182
Surplus from operations		(14 635)	4 270
Finance cost	14	(20)	(496)
Net (loss)/surplus for the year	(14 655)	3 774	

# 3 STATEMENT OF CHANGES IN NET ASSETS FOR THE PERIOD ENDED 31 MARCH 2015

	Notes	Accumulated surplus R'000	Total R'000
Balance at 31 March 2014		334 726	334 726
Correction of prior period error	24.2	2 324	2 324
Correction of prior period error	24.2	(4 368)	(4 368)
Correction of prior period error	24.1	1 064	1 064
Balance at 31 March 2014 as restated		333 746	333 746
Effect of take-on of heritage assets	25	17 567	17 567
Balance at 31 March 2015		351 313	351 313
Net loss for the period		(14 655)	(14 655)
Balance at 31 March 2015		336 658	336 658

# 4 CASH FLOW STATEMENT FOR THE PERIOD ENDED 31 MARCH 2015

	Notes	2015 R'000	2014 R'000
Cash inflow from operating activities		57 833	38 158
Cash receipts from customers		286 073	322 425
Cash paid to suppliers and employees		(241 589)	(297 953)
Cash generated from operations	15	44 485	24 472
Interest received	13	13 368	14 182
Finance cost	14	(20)	(496)
Cash outflow from investing activities		(31 741)	(19 731)
Acquisition of:			
Property and equipment	16.1	(31 192)	(16 843)
Intangible assets	16.2	(549)	(2 898)
Proceeds on disposal of property and equipment		-	10
Net increase in cash and cash equivalents		26 092	18 427
Cash and cash equivalents at beginning of period	8	225 845	207 418
Cash and cash equivalents at end of period	8	251 937	225 845

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# 5 NOTES TO THE FINANCIAL STATEMENTS FOR THE PERIOD ENDED 31 MARCH 2015

- 1 Accounting policies
- 1.1 Basis of preparation

#### Statement of compliance

1. The financial statements have been prepared in accordance with the Standards of Generally Recognised Accounting Practice (GRAP) including any interpretations, guidelines and directives issued by the Accounting Standards Board.

The financial statements have been prepared on a historic cost basis and accounting policies are consistent with prior years.

These annual financial statements have been prepared on a going concern basis, i.e. the assumption that the Council for Geoscience will continue to operate as a going concern for at least the next twelve months.

- 2. The cash flow statement has been prepared in accordance with the direct method.
  - Specific information has been presented separately on the statement of financial position such as: (a) receivables from non-exchange transactions, including taxes and transfers;
    - (b) taxes and transfers payable;
    - (c) trade and other payables from non-exchange transactions.

Paragraphs 11 to 15 of GRAP 1 have not been implemented due to the fact that the budget reporting standard has not been developed by the local standard setters and the international standard is not effective for the current financial year. Although the inclusion of budget information would enhance the usefulness of the financial statements, non-disclosure will not affect the objective of the financial statements.

#### 1.2 Revenue recognition

3.

Revenue comprises the revenue from non-exchange transactions recognised as income in the current year, contract income and sales of publications.

#### 1.2.1 Recognition of income

The Council for Geoscience measures revenue at the fair value of the consideration received or receivable. Revenue is recognised only when it is probable that the economic benefits associated with a transaction will flow to the Council for Geoscience, and the amount of revenue and associated costs incurred or to be incurred can be measured reliably.

#### 1.2.2 Revenue from non-exchange transactions

The Council for Geoscience received grants in the form a baseline allocation from the Department of Mineral Resources.

Revenue from non-exchange transactions is recorded as deferred income when it is received. It is then recognised as income on a systematic basis over the period intended to match this revenue with the related costs.

#### 1.2.3 Revenue from exchange transactions

Revenue from exchange transactions comprises sales and contract revenue as follows:

#### Sales revenue

Sales revenue represents the invoiced value of goods and services supplied by the Council for Geoscience. This revenue is recognised when the revenue recognition criteria are met.

#### **Contract revenue**

Revenue from contracts is recognised by means of progress payments over the duration of the contracts. Revenue from contracts in progress is recognised when the revenue criteria are met. When the outcome of a contract can be estimated reliably, revenue is recognised by referring to the stage of completion of the contract outcome.

#### 1.3 Interest received

Interest is recognised on a time-proportionate basis with reference to the principal amount receivable and the effective interest rate applicable.

### 1.4 Property and equipment

Property and equipment are tangible non-current assests that are held for use in the production or supply of goods and services, or for administrative purposes, and are expected to be used during more than one period.

The cost of an item of property and equipment is recognised as an asset when:

- it is probable that future economic benefits associated with the item will flow to the Council for Geoscience; and
- the cost of the item can be measured reliably.

Land and buildings were valued at initial recognition and subsequently only the buildings are depreciated on a straight line method.

Costs include costs incurred initially to acquire or construct an item of property and equipment and costs incurred subsequently to add to, replace part of, or service it. If the cost of a replacement part is recognised in the carrying amount of an item of property and equipment, the carrying amount of the replaced part is derecognised. Property and equipment are carried at cost less accumulated depreciation and any impairment losses.

Day to day expenses incurred on property and equipment are expensed directly to surplus and deficit for the period. Where an asset is acquired at no cost, or at a nominal cost, its cost is its fair value as at the date of acquisition. Major maintenance that meets the recognition criteria of an asset is capitalised.

Depreciation is provided on all property and equipment other than freehold land, to write down the cost, less residual value, by equal instalments over their average useful lives, as follows:

- Land Buildings Motor vehicles Equipment Aircraft and helicopter - Body Aircraft and helicopter - Components Boat Office furniture Computer equipment Specialised equipment
- Not depreciable 30 years 5 to 8 years 5 to 7 years 15 years Useful hours per Civil Aviation Authority 10 years 20 years 6 years 15 years

The depreciation charges for each period are recognised in the statement of financial performance, unless they are included in the carrying amount of another asset.

The average useful lives and residual values are reviewed on an annual basis and changes are reflected as change in accounting estimates on a prospective basis.

#### 1.5 Intangible assets

An intangible asset is recognised when:

- it is probable that the expected future economic benefits that are attributable to the asset will flow to the entity; and
- the cost of the asset can be measured reliably.

Capitalised computer software is carried at cost less accumulated amortisation and less accumulated impairment losses. Computer software is tested annually for impairment or changes in estimated future benefits. Amortisation is provided to write down the intangible assets to their residual, on a straight line basis, being two to five years.

#### **1.6 Heritage assets**

Heritage assets are assets held for their cultural, environmental or historical significance. Heritage assets are initially recognised at fair value which has been determined, due to the nature of heritage assets, by specialised valuators. Heritage assets are reflected at fair value and are not depreciated.

#### 1.7 Inventories

The Council for Geoscience is a custodian of scientific information and produces publications in the form of books, maps and map explanations, etc. These publications are distributed to the public for free or at a nominal charge.

Inventories are initially measured at fair value.

#### 1.8 Translation of foreign currencies

#### Foreign currency transactions

A foreign currency transaction is recorded, on initial recognition in Rands, by applying to the foreign currency amount the spot exchange rate between the Rand and the foreign currency at the date of the transaction.

At each balance sheet date:

• foreign currency monetary items are translated using the closing rate.

Exchange differences arising on the settlement of monetary items or on translating monetary items at rates different from those at which they were translated on initial recognition during the period or in previous annual financial statements are recognised in the statement of financial performance in the period in which they arise.

Cash flows arising from transactions in a foreign currency are recorded in Rands by applying to the foreign currency amount the exchange rate between the Rand and the foreign currency at the date of the cash flow.

#### 1.9 Research and development

Expenditure on research activities is recognised as an expense in the period in which it is incurred.

An internally generated intangible asset arising from research and development is recognised as part of intangible assets only if all of the following conditions are met:

- An asset is created that can be identified;
- It is probable that the asset created will generate future economic benefits;
- The development cost of the asset can be measured reliably;
- It is technically feasible to complete the intangible asset so that it will be available for use or sale;
- It is possible to use or sell the intangible asset; and
- It is the intention to complete the intangible asset so that it will be available for use or sale.

Where no internally generated intangible asset can be recognised, development expenditure is recognised as an expense in the period in which it is incurred. Internally generated assets are amortised on a straight line basis over their useful lives.

#### 1.10 Deferred income

Deferred income is recognised using the accrual basis and accounted for in the statement of financial position in the period in which it satisfies the revenue recognition criteria.

#### 1.11 Retirement benefit costs

#### Short-term employee benefits

The cost of short-term employee benefits (those payable within 12 months after the service is rendered, such as bonuses, paid vacation leave and sick leave) is recognised in the period in which the service is rendered and is not discounted.

The expected cost of compensated absences is recognised as an expense as the employees render services that increase their entitlement or, in the case of non-accumulating absences, when the absence occurs.

#### Defined contribution and defined benefit plans

The Council for Geoscience operates both a defined contribution pension and provident fund and a defined benefit plan in respect of post-retirement medical aid contributions. For the defined benefit plan, the defined benefit obligation and the related current service cost is determined by using the projected unit credit method. The defined benefit plan is subject to an annual actuarial valuation. The qualifying plan asset of this scheme is held and administered by Momentum Group Limited.

The actuarial gains or losses are further limited to the extent that the net cumulative unrecognised actuarial gains or losses (before recognition of that actuarial gain or loss) exceed the unrecognised part of the transactional liability. Payments to defined contribution retirement benefit plans are charged to the statement of financial performance in the year to which they relate.

#### 1.12 Provisions and contingent liabilities

#### Provisions are recognised when:

- the entity has a present obligation as a result of a past event;
- it is probable that an outflow of resources embodying economic benefits will be required to settle the obligation; and
- a reliable estimate can be made of the obligation.

The amount of a provision is the present value of the expenditure expected to be required to settle the obligation.

#### Commitments

The Council for Geoscience classifies commitments as contracted future transactions that are non-cancellable or only cancellable at significant cost, and that will normally result in the outflow of cash. This excludes steady routine transactions such as salary commitments relating to employment contracts or social security benefits.

A distinction is made between operational and capital commitments. Disclosure is made of the aggregate amount of operational and capital expenditure contracted for at the reporting date, to the extent that the amount has not been recorded in the financial statements.

If a commitment is for a period longer than a year, it is stated in the note to the commitments. No disclosure of expenditure that has been approved, but that has not yet been contracted for, is made.

#### 1.13 Financial instruments

#### **Initial recognition**

The entity classifies financial instruments, or their component parts, on initial recognition as a financial asset, a financial liability or an equity instrument in accordance with the substance of the contractual arrangement.

Financial assets and liabilities are recognised on the entity's statement of financial position when the Council for Geoscience becomes party to the contractual provisions of the instrument.

Financial assets and liabilities are recognised initially at fair value.

#### **Derecognition of financial instruments**

The entity derecognises a financial asset only when the contractual rights to the cash flows from the asset expire; or it transfers the financial asset and substantially all the risks and rewards of ownership of the asset to another entity.

The entity derecognises financial liabilities when the entity's obligations are discharged, cancelled or they expire.

#### Impairment of loans and receivables

Financial assets are assessed for indicators of impairment at each balance sheet date. Financial assets are impaired where there is objective evidence that, as a result of one or more events that occurred after the initial recognition of the financial asset, the estimated future cash flows of the investment have been impacted.

The carrying amount of trade receivables is reduced through the use of an allowance account (bad debt provision). When a trade receivable is considered uncollectible, it is written off against the allowance account. Subsequent recoveries of amounts previously written off are credited against the allowance account. Changes in the carrying amount of the allowance account are recognised in surplus or deficit.

Fair values of trade and other payables are determined at a price charged at transaction date and impaired when indicators of impairment are present. At period end there were no differences between the book value and the fair values of trade and other payables.

#### Fair value of trade and other receivables

Fair values of trade and other receivables are determined at a price charged at transaction date and impaired when indicators of impairment are present. At period end there were no differences between the book value and the fair values of trade and other receivables because of the short-term maturity.

#### Financial assets carried at amortised cost

Loans and receivables are measured at amortised cost less any impairment losses recognised to reflect

irrecoverable amounts. Impairment is determined on a specific basis, whereby each asset is individually evaluated for impairment indicators. Write-offs of these assets are expensed in surplus or deficit.

#### Cash and cash equivalents

Cash and cash equivalents are short-term, highly liquid investments that are readily convertible to known amounts of cash. Cash and cash equivalents are measured at fair value.

#### Financial liabilities carried at amortised cost

Trade and other payables are initially measured at fair value, and are subsequently measured at amortised cost.

#### 1.14 Operating leases

Leases of assets under which all the risks and rewards of ownership are effectively retained by the lessor are classified as operating leases. Lease payments under an operating lease are recognised as an expense on a straight line basis over the lease term.

Any contingent rents are expensed in the period they are incurred.

#### 1.15 Impairment

The entity assesses at each balance sheet date whether there is any indication that an asset may be impaired. If there is any indication that an asset may be impaired, the recoverable amount is estimated for the individual asset. The recoverable amount of an asset is the higher of fair value less costs to sell and its value in use.

If the recoverable amount of an asset is less than its carrying amount, the carrying amount of the asset is reduced to its recoverable amount. That reduction is an impairment loss recognised immediately in surplus or deficit.

At each reporting date the entity assesses impairment losses recognised in prior years for continued existence or decreases. If such indication exists, the recoverable amounts of those assets are estimated. The increase in the carrying amount of an asset attributable to a reversal of an impairment loss does not exceed the carrying amount that would have been determined had no impairment loss been recognised for the asset in prior periods. A reversal of an impairment loss of assets carried at cost less accumulated depreciation or amortisation is recognised immediately in surplus or deficit.

#### 1.16 Critical accounting estimates and judgements

#### Provision for bad debts

Past experience indicates a reduced prospect of collecting debtors over the age of four months. Debtor balances are regularly assessed by management and provided for in line with the policy.

#### Provisions

Provisions were raised and management determined an estimate based on the information available and in line with the policy.

#### **Property and equipment**

Management has made certain estimations with regard to the determination of estimated useful lives and residual values of items of property and equipment.

#### Leases

Management has applied its judgement to classify all lease agreements to which the entity is party as operating leases, as they do not transfer substantially all risks and ownership to the entity. Furthermore, as the operating lease in respect of premises is only for a relatively short period of time, management has made a judgement that it would not be meaningful to classify the lease into separate components for the land and for the buildings for the current lease of the Polokwane office, and the agreement will be classified in its entirety as an operating lease.

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### 1.17 Sources of estimation uncertainty

There are no key assumptions concerning the future and other key sources of estimation uncertainty at the balance sheet date that could have a significant risk of causing material adjustment to the carrying amounts of assets and liabilities within the next financial year.

### 2 New standards and interpretations

### 2.1 Standards and interpretations issued, but not yet effective

The Council for Geoscience has not applied the following standards and interpretations which have been approved but are not yet effective for accounting periods beginning on or after 1 March 2014 or later periods:

GRAP statement	Description	Impact	Effective date
GRAP 18	Segment reporting	None	No effective date
GRAP 20	Related party disclosure	None	No effective date
GRAP 105	Transfer of functions between entities under common control	None	No effective date
GRAP 106	Transfer of functions between entities not under common control	None	No effective date
GRAP 107	Mergers	None	No effective date

### 3 Property and equipment

	Land	Buildings and fixtures	Equipment	Office furniture	Aircraft and boat	Motor vehicles	Computer equipment	Total
2015	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Gross carrying amount	18 231	139 080	111 083	14 585	23 263	20 082	22 399	348 723
Accumulated depreciation at the beginning of the period	-	(35 712)	(80 828)	(7 447)	(9 264)	(9 347)	(15 261)	(157 859)
Opening net carrying amount at 31 March 2014	18 231	103 368	30 255	7 138	13 999	10 735	7 138	190 864
Movements during the pe	eriod:							
Work in progress prior year	-	2 377	80	-	8 173	-	-	10 630
Acquisitions	-	-	15 560	305	-	947	3 750	20 562
Adjustments	-	-	41	(32)	(8)	6	(226)	(219)
Adjustments - Cost	-	-	41	(32)	(64)	61	(640)	(634)
Adjustments - Depreciation	-	-	-	-	56	(55)	414	415
Disposals	-	-	(2 325)	(142)	(35)	(625)	(392)	(3 519)
Disposals - Cost	-	-	(13 805)	(258)	(48)	(2 168)	(2 004)	(18 283)
Disposals - Depreciation	-	-	11 480	116	13	1 543	1 612	14 764
Depreciation	-	(4 858)	(6 956)	(703)	(586)	(1 931)	(1 860)	(16 894)
Closing net carrying amount at 31 March 2015	18 231	100 887	36 655	6 566	21 543	9 132	8 410	201 424
Gross carrying amount	18 231	141 457	112 959	14 600	31 324	18 922	23 505	360 998
Accumulated depreciation	-	(40 570)	(76 304)	(8 034)	(9 781)	(9 790)	(15 095)	(159 574)

### Property and equipment (continued)

	Land	Buildings and fixtures	Equipment	Office furniture	Aircraft and boat	Motor vehicles	Computer equipment	Total
2014	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Gross carrying amount	18 231	138 069	116 929	15 174	21 687	16 150	25 581	351 821
Accumulated depreciation at the beginning of the period	-	(31 066)	(83 418)	(7 372)	(8 501)	(8 085)	(18 838)	(157 280)
Opening net carrying amount at 31 March 2013	18 231	107 003	33 511	7 802	13 186	8 065	6 743	194 541
Movements during the pe	eriod:							
Adjustments	-	-	(367)	-	-	-	-	(367)
	-	-	632	339	2	24	67	1 064
Cost	-	-	3 909	708	14	243	381	5 255
Accumulated depreciation	-	-	(3 277)	(369)	(12)	(219)	(314)	(4 191)
Acquisitions	-	1 011	7 318	389	1 562	4 369	2 561	17 210
Disposals	-	-	(3 737)	(667)	-	(109)	(450)	(4 963)
Disposals - Cost	-	-	(16 706)	(1 686)	-	(680)	(6 124)	(25 196)
Disposals - Depreciation	-	-	12 969	1 019	-	571	5 674	20 233
Depreciation	-	(4 646)	(7 102)	(725)	(751)	(1 614)	(1 783)	(16 621)
Closing net carrying amount at 31 March 2014	18 231	103 368	30 255	7 138	13 999	10 735	7 138	190 864
Gross carrying amount	18 231	139 080	111 083	14 585	23 263	20 082	22 399	348 723
Accumulated depreciation	-	(35 712)	(80 828)	(7 447)	(9 264)	(9 347)	(15 261)	(157 859)

The transfer of the following land and buildings as stipulated under section 26 of the Geoscience Act (Act No. 100 of 1993) has not yet been completed.

### Location

### Fair value

R2 800 000

R94 000 000

474 Carl Street, Town Lands 351 JR, Pretoria West 280 Pretoria Street, Silverton, Pretoria

The value of these properties has been included in the carrying amount of land and buildings as at 31 March 2015 and was determined by an independent valuator.

Details regarding land and buildings are kept at the head office of the Council for Geoscience and will be supplied upon written request.

### Property and equipment (continued)

### Property and equipment fully depreciated but still in use

The categories of assets listed below have been fully depreciated to their residual value as at 31 March 2015, but are still currently in use.

Category	Salvage amount R'000
Audio and visual equipment	90
Aircraft	15
Office furniture	6
Office equipment	30
Vehicles	464
Computer equipment	626
Computer software	163
Technical equipment	402
Scientific equipment	2 685
	4 481

### 4 Intangible assets

	2015	2014
	R'000	R'000
Computer software		
Gross carrying amount	10 950	14 083
Accumulated amortisation	(6 587)	(11 449)
Opening net carrying amount at 31 March 2014	4 363	2 634
Movements during the period:		
Adjustments	(237)	-
Cost	179	-
Accumulated depreciation	(416)	-
Acquisitions	549	2 898
Disposals	(327)	(303)
Disposals - cost	(2 800)	(6 031)
Disposals - amortisation	2 473	5 728
Amortisation	(769)	(866)
Closing net carrying amount at 31 March 2015	3 579	4 363
Gross carrying amount	8 878	10 950
Accumulated amortisation	(5 299)	(6 587)

### 5 Inventories

	Publication inventories 5 5
--	-----------------------------

### 6 Retirement benefit

2015	2014
R'000	R'000

### 6.1 Post-retirement medical aid fund

The Council for Geoscience has made provision for the medical aid fund covering substantially all its employees. All eligible employees are members of the defined benefit scheme. To improve management of this defined benefit scheme the Council for Geoscience established a qualifying plan asset in October 2010 which is held and administered by Momentum Group Limited and evaluated annually as at 31 March.

The amount recognised in the statement of financial performance is determined as follows:						
Current service costs	207	360				
Interest charge	1 631	2 144				
Expected return on planned assets	(1 219)	(1 100)				
Actuarial (gain)/loss recognised	1 335	(8 628)				
Recognition of loss on asset realisation	(300)	(1 800)				
	1 654	(9 024)				

	2015 R'000	2014 R'000	2013 R'000	2012 R'000
The amount included in the statement of financial position arising from 0 retirement medical aid contributions is as follows:	Council for Geo	oscience obliga	tion in respect	of post-
Present value of fund obligations	21 863	19 504	26 226	21 155
Fair value of planned assets	(14 851)	(14 147)	(11 844)	(11 090)
Liability recognised in statement of financial position	7 012	5 357	14 382	10 065

		2015		2014			
Movement in net liability during the period is as follows:	Liability	Planned asset	Net	Liability	Planned asset	Net	
Liability at beginning of period	19 504	-	19 504	26 226	-	26 226	
Value of planned assets at beginning of period	-	(14 147)	(14 147)	-	(11 845)	(11 845)	
	19 504	(14 147)	5 357	26 226	(11 845)	14 381	
Interest charge/expected return of planned asset	1 631	(1 219)	412	2 144	(1 100)	1 044	
Contributions received	-	(300)	(300)	-	(1 800)	(1 800)	
Current service costs	207	-	207	360	-	360	
Benefits paid	(1 402)	1 402	-	(1 281)	1 281	-	
Loss/(gain) recognised on realisation of planned asset	-	-	-	(4 800)	-	(4 800)	
Actuarial loss/(gain)	-	(587)	(587)	-	(683)	(683)	
Actuarial loss/(gain) recognised on curtailment	1 923	-	1 923	(3 145)	-	(3 145)	
Closing balance	21 863	(14 851)	7 012	19 504	(14 147)	5 357	

### Retirement benefit (continued)

### Contributions expected to be paid

No top up payments are expected to be made during the 2016 year

Expected rate of return on assets		7.79%
Assumptions		
Discount rates		7.79%
Basis of discount rates	JSE zero coupon bond yield after the market closed on 31 March 2015	
Return on assets		7.79%
Expected salary increases		7.50%
Health care cost inflation rate		7.04%

### Sensitivity analysis on accrued liability (R Million)

Assumption	Change	In service	Continuation	Total	Change
Central assumptions	-	4.360	17.503	21.863	-
Health care inflation	1%	5.116	19.061	24.177	11%
	-1%	3.747	16.130	19.877	-9%
Discount rate	1%	3.747	16.113	19.860	-9%
	-1%	5.13	19.111	24.241	11%
Post-retirement mortality	-1 year	4.505	18.280	22.785	4%
Average retirement date	-1 year	4.501	17.503	22.004	1%
Continuation of membership at retirement	-10%	3.936	17.503	21.439	-2%

The table above indicates, for example, that if medical inflation is 1% greater than the long-term assumptions made, the liability will be 11% higher than that shown

### Sensitivity analysis for current service and interest cost for the year ending 31 March 2015

Assumption	Change	Current service	Interest cost	Total	Change
Central assumptions	-	207 486	1 630 546	1 838 032	-
Health care inflation	1%	243 557	1 812 788	2 056 345	12%
	-1%	178 016	1 474 021	1 652 037	-10%
Discount rate	1%	179 734	1 644 235	1 823 969	-1%
	-1%	241 878	1 606 155	1 848 033	1%
Average retirement age (60)	-1 year	174 375	1 657 250	1 831 625	0%

The table above indicates, for example, that if medical inflation is 1% greater than the long-term assumptions made, the liability will be 12% higher than that shown

### Retirement benefit (continued)

### 6.2 Pension and provident fund benefits

The Council for Geoscience and its employees contribute to a defined contribution plan. The assets of the scheme are held separately from the Council for Geoscience in funds under the control of trustees. The total cost charged to income of R8 462 352 (2014: R8 047 015) represents equal contributions of 7.5% by the employer and employee.

2015	2014
R'000	R'000

### 7 Trade and other receivables for exchange revenue

Trade receivables	7 750	5 055
Trade receivables - Retention	-	2 571
Contract customers	10 979	4 778
Other receivables	3 757	3 568
Prepaid expenses	(1 217)	386
Personnel debt	33	50
	21 302	16 408
Less - Provision for bad debts	(218)	(218)
	21 084	16 190
Provision for bad debts		
Opening balance	218	2 058
Movement	-	(1 840)
Closing balance	218	218

### Analysis of ageing of receivables past due but not impaired

Retention on foreign project - Over 120 days	-	2 571
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### Analysis of impairment

Debtors liquidated	27	27
Long overdue debtors considered impaired	191	191
	218	218

There is no difference between the fair value of trade and other receivables and their book value.

8	Cash	and	cash	equivalents
---	------	-----	------	-------------

	2015	2014
	R'000	R'000
Cash and cash equivalents at the end of the period are represented by the following balance	ces:	
Cash at bank	27 864	14 021
Call accounts	224 073	211 824
Cash and cash equivalents at the end of the period are represented by the following balances:	251 937	225 845
Certain foreign funds are considered not available for use	12 717	10 333

There is no difference between the fair value of cash and cash equivalents and their book value.

### 9 Trade and other payables

Trade payables	20 576	8 312
Other payables	3 555	3 534
	24 131	11 846

There is no difference between the fair value of trade payables and their book value.

### 10 Deferred income

### Exchange revenue

10.1	Contamination of the groundwater in the Witwatersrand area		
	Deferred income arising as a result of an agreement entered into with the Department of Mineral Resources to develop and implement various measures to mitigate the effect of mining-induced contamination of the groundwater in the Witwatersrand area.		
10.1.1	Contamination of the groundwater in the Witwatersrand area 1		
	Carrying amount at the beginning of the period	-	1 044
	Interest earned	-	34
	Amounts used during the period	-	(1 078)
	Carrying amount at the end of the period	-	-

10.1.2	Contamination of the groundwater in the Witwatersrand area 3		
	Carrying amount at the beginning of the period	-	10 024
	Amounts used during the period	-	(10 111)
	Interest earned	-	87
	Carrying amount at the end of the period	-	-

### Deferred income (continued)

		2015	2014
		R'000	R'000
10.1.3	Contamination of the groundwater in the Witwatersra	nd area 2	
	Carrying amount at the beginning of the period	-	20 254
	Amounts used during the period	-	(20 567)
	Interest earned	-	313
	Carrying amount at the end of the period	-	-
10.0	Deferred income evicing on a result of an egreemen	t optored into with	the Department

### 2 Deferred income arising as a result of an agreement entered into with the Department of Mineral Resources to develop and implement the closing of mine holes.

Carrying amount at the beginning of the period	-	68
Amounts used during the period	-	(70)
Interest earned	-	2
Carrying amount at the end of the period	-	-

### 10.3Deferred income arising as a result of an agreement with the Department of Mineral<br/>Resources in terms of the Sustainable Development Through Mining project.

Carrying amount at the beginning of the period	-	887
Amounts used during the period	-	(916)
Interest earned	-	29
Carrying amount at the end of the period	-	-

### 10.4 Deferred income arising as a result of a contract entered into with the European Commission for Earth Observation and Observing Environmental and Societal Impacts of Mineral Resources Exploration and Exploitation.

(	Carrying amount at the beginning of the period	1 371	1 371
,	Amounts received	(1 338)	-
(	Carrying amount at the end of the period	33	1 371

### 10.5

Deferred income arising as a result of an agreement with the Department of Science and Technology for the Environmentally Friendly and Efficient Methods for the Extraction of Rare-Earth Elements.

Carrying amount at the beginning of the period	-	-
Amounts received	1 299	-
Carrying amount at the end of the period	1 299	-

### Deferred income (continued)

		2015	2014
		R'000	R'000
10.6	Deferred income arising as a result of an agreemen and Technology in terms of the Earth Observation a	t with the Departm nd Geohazards As	ent of Science sessment.
	Carrying amount at the beginning of the period	2 922	3 500
	Amounts received	-	3 500
	Amounts used during the period	-	(4 078)
	Carrying amount at the end of the period	2 922	2 922

10.7	Deferred income arising as a result of an agreement with the Department of Science and Technology to study the Witwatersrand Central Basin Mine Water Apportionment.		
	Carrying amount at the beginning of the period	1 867	1 386
	Amounts received	-	481
	Amount used during the period	(1 832)	-
	Carrying amount at the end of the period	35	1 867

10.8	Deferred income arising as a result of an agreemen Research Foundation.	t entered into with	the National
	Carrying amount at the beginning of the period	110	110
	Carrying amount at the end of the period	110	110

## 10.9Deferred income arising as a result of an agreement entered into with the Department<br/>of Mineral Resources to develop and implement various measures to witigate the effectCarrying amount at the beginning of the period65 99547 432Amounts received136 752116 521

	100 102	110 021
Amounts used during the period	(94 150)	(97 958)
Carrying amount at the end of the period	108 597	65 995
	112 996	72 265

Accruals for leave pay		
Carrying amount at the beginning of the period	10 038	8 970
Provision current period	1 456	1 703
Amounts used during the current period	(638)	(635)
Carrying amount at the end of the period	10 856	10 038

The leave pay provision relates to the estimated liabilities as a result of leave days due to employees.

### Deferred income (continued)

		2015	2014
		R'000	R'000
11	Accruals (continued)		
	Accruals for 13 <sup>th</sup> cheque		
	Carrying amount at the beginning of the period	4 015	-
	Amounts used during the current period	(71)	4 015
	Carrying amount at the end of the period	3 944	4 015
	The $13^{th}$ cheque accrual relates to the structuring of the employee costs to c employees' birthdays.	company and is paid out in t	he months of the
	Total accrual	14 800	14 053

12	Deficit/surplus from operations		
	Operating deficit/surplus is arrived at after taking the following items into account:		
	Revenue		
	Non-exchange revenue		
	Total grant received	292 839	271 232
	Project related revenue	(136 752)	(116 521)
		156 087	154 711
	Exchange revenue		
	Department of Mineral Resources project related revenue	94 150	97 958
	Contracting revenue	36 803	40 209
	Publication revenue	226	244
		131 179	138 411
		287 266	293 122

Cost of contracts		
Direct cost	12 411	13 469
Personnel expenditure	8 464	11 734
	20 875	25 203

Cost of statutory projects		
Direct cost	61 661	64 549
Personnel expenditure	52 715	50 210
	114 376	114 759

### Deficit/surplus from operations (continued)

	2015	2014
	R'000	R'000
Other operating income		
Foreign currency gains	383	2 606
Profit on disposal of fixed assets	-	10
Recovery of asset losses	204	226
Recovery of bad debts	-	103
Provision for bad debts	-	1 839
Sundry income	8 814	4 511
	9 401	9 295
Administrative expenses include		
Audit fees	2 967	2 970
- Current period	1 076	734
- Prior period	969	1 226
- Internal audit	605	547
- Fee for other services	317	463
Bad debts written off	112	1 602
Provision for bad debts	-	-
Depreciation - on owned assets	16 894	16 621
- Buildings	4 858	4 646
- Equipment	6 956	7 102
- Office furniture	703	725
- Motor vehicles	1 931	1 614
- Aircraft	586	751
- Computer equipment	1 860	1 783
Amortisation - intangible assets		
- Computer software	769	866
Rentals in respect of operating leases		
- Land and buildings	834	447
- Photocopying machines	22	1 767
Other operating expenses		
Net loss on disposal of equipment	4 300	5 265
Foreian currency losses	931	83
	5 231	5 348
Staff costs	176 844	160 392
Included in staff costs are:		
Defined benefit plan expense for the post-retirement medical aid fund	1 955	(9024)
- Current service cost	207	360
- Interest cost	1 631	2 144
- Expected return on plan assets	(1 219)	(1 100)
		()

### Deficit/surplus from operations (continued)

	2015	2014
	R'000	R'000
Other operating income (continued)		
- Recognised actuarial loss	1 336	(10 428)
Defined contribution plan expenses for the pension and provident funds	8 462	8 047

### Emoluments

Senior management	2014/2015			
	Pensionable salary R	Provident/ Pension fund contributions R	Other contributions R	Total
Mr Kota M W (CEO)	2 235 216	144 913	302 047	2 682 176
Mr Matsepe L D	1 462 331	88 926	81 811	1 633 068
Mr Ramagwede L F	1 478 097	96 398	83 393	1 657 888
Dr Graham G	1 484 238	90 258	83 856	1 658 352

	2013/2014			
	Pensionable salary B	Provident fund contributions B	Other contributions B	Total
Mr Kota M W (CEO)	2 092 076	136 325	297 623	2 526 024
Mr Matsepe L D	1 375 664	83 655	80 947	1 540 266
Mr Ramagwede L F	1 390 496	90 684	81 216	1 562 396
Dr Graham G	1 396 273	84 909	79 710	1 560 892

Board emoluments					
Non-executive Board Members					
	2015	2014			
	R	R			
Prof. Ngoepe P E	277 654	198 188			
Ms Mthimunye K R	152 624	129 538			
Dr Mathe H	175 880	85 766			
Mr Sibiya D	34 680	24 049			
Prof. Hermanus M A	71 232	61 104			
Dr McGill E	115 056	100 766			
	827 126	599 411			

Details regarding Board Members' service contracts:

Board Members representing government departments are not included above as they received no emoluments.

The current term of office of the non-executive Board Members expires on 30 September 2015.

		2015 R'000	2014 R'000
13	Interest received		
	- Interest income on call accounts	11 469	13 419
	- Interest income on current accounts	1 899	763
		13 368	14 182

14	Finance cost		
	Interest	20	496

### 15

### Reconciliation of net surplus for the period to cash generated from operations

Net surplus for the period	(14 655)	3 774
Adjustments for -		
Prior period error	-	-
Interest	20	496
Depreciation on property and equipment	16 894	16 621
Amortisation - intangible assets	769	866
(Net proceeds) on disposal of fixed assets	-	(10)
Net loss on disposal of fixed assets	4 300	5 265
Interest earned	(13 368)	(14 182)
Provision for post-retirement medical aid benefits	1 655	(9 024)
Operating cash flows before working capital changes	(4 385)	3 806
Working capital changes -		
Increase in provision for accumulated leave pay and $13^{\mbox{\tiny th}}$ cheque	747	1 068
Decrease/(increase) in trade and other receivables	(4 893)	31 625
Increase in trade and other payables	12 284	1 784
(Decrease)/increase in deferred income	40 732	(13 811)
Cash generated from operations	44 485	24 472

16	Acquisitions		
16.1	Property and equipment		
	Land and buildings	2 377	1 011
	Equipment	15 640	6 951
	Office furniture	305	389
	Aircraft and boat (including WIP aircraft)	8 173	1 562
	Motor vehicles	947	4 369
	Computer equipment	3 750	2 561
		31 192	16 843

### Acquisitions (continued)

		2015 R'000	2014 R'000
16.2	Intangible assets		
	Computer software	549	2 898
		549	2 898

17	Contingent liability		
17.1	Bank guarantees		
	Performance bonds and bid bonds issued for contract work to various financial institutions for an amount of \$33 950	407	-
		407	-

17.2	Pending legal action		
	The Council for Geoscience has an estimated legal liability due to a pending labour case	900	-
	The Council for Geoscience has an estimated legal liability due to a pending labour case	15	100
		915	100

18	Taxation
	No provision for income tax was made as the Council for Geoscience is exempted in terms of section 10(1)(Ca)(i) of the Income Tax Act

19	Operating lease commitments		
19.1	Lease of office space		
	At reporting date, the outstanding commitments under non- cancellable operating leases which fall due are as follows:		
	Up to 1 year	447	447
	Total lease commitments	447	447

### 19.2 Lease of office printing equipment

The operating lease between a supplier and the Council for Geoscience entered on 1 July 2012 to 30 June 2015.

At the reporting date, the outstanding commitments under noncancellable operating leases which fall due are as follows:

Up to 1 year	3 025	1 117
2 to 5 years	-	-
Total lease commitments	3 025	1 117

### **Operating lease commitments (continued)**

		2015 R'000	2014 R'000
19.3	Commitments		
	Operating expenditure		
	Approved and contracted	64 016	54 250
	Capital expenditure		
	Approved and contracted: Property and equipment	44 283	3 192
	Total commitments	108 299	57 442
	Commitments		
	Up to I year	100 856	46 853
	2 to 5 years	7 443	10 589
	Total commitments	108 299	57 442
	The Council for Geoscience has usage based contracts for the provision	n of the following services:	

- Sampling services - Geophysics

- Accommodation and travel
- Courier services

### 20 Financial instruments

Financial instruments consist of cash and cash equivalents, investments with financial institutions, trade and other receivables and trade and other payables.

# 20.1 Credit risk Financial assets, which potentially subject the Council for Geoscience to concentrations of credit risk, consist principally of cash, short-term deposits and trade receivables. The Council for Geoscience's cash equivalents and short-term deposits are placed with high credit quality financial institutions. Trade receivables are presented net of the allowance for doubtful debts. Credit risk with respect to trade receivables is limited due to the large number of customers being dispersed across different industries and geographical areas. Accordingly, the Council for Geoscience has no significant concentration of credit risk. The carrying amounts of financial assets included in the statement of financial position represent the Council for Geoscience's exposure to credit risk in relation to those assets. Trade and other receivables are controlled by well-established policies and procedures which are reviewed and updated on an ongoing basis. The Council for Geoscience does not have any significant exposure to any individual customer or counterparty. The maximum exposure to credit risk amounts to R23 447 (2014: R16 365).

20.2	Interest rate risk	
	The organisation's exposure to interest rate risk and the effective interest rates on the financial instruments at reporting date are:	
	31 March 2015	

### Financial instruments (continued)

		2015 R'000	2014 R'000
20.2	Interest rate risk (continued)		
		Weighted average effective interest rate	Weighted average effective interest rate
		%	%
	Assets		
	Cash	3.95%	3.28%
	Call accounts	6.40%	5.21%
	Investments		
	The risk is perceived to be low due to the following factors:		
	- Funds are only invested with approved financial institutions according	to the policy of the Council for	Geoscience.
	- Investments are only reinvested or invested with management approve	al.	

## 20.3 Foreign currency risk The Council for Geoscience undertakes certain transactions denominated in foreign currencies, hence exposures to exchange rate fluctuations arise. It is not policy for the Council for Geoscience to take out cover on these outstanding foreign currency transactions due to the fact that these transactions take place on an ad-hoc basis. The Council for Geoscience exposure at 31 March 2015 is disclosed in note 21.

### 20.4 Airborne operations risk

It is the policy of the Council for Geoscience to transfer risk in respect of airborne operations to third parties, namely insurance and an external operator.

21	Foreign currency expos	ure					
				2015 R'000			2014 R'000
		Exchange rate	Foreign amount	R value	Exchange rate	Foreign amount	R value
21.1	Trade receivables						
	Foreign currency						
	British Pound	R17.69040	£43	761	R14.31590	£257	3 679
	US\$	R11.97730	\$77	922	R10.37850	\$26	270

21.2	Banks						
	Foreign funds						
	Moroccan Dirham	R1.21271	7 934	9 622	R1.28766	8 025	10 334
	Euro	R12.83340	€240	3 080	R14.31590	€30	429

		2015 R'000	2014 R'000
22	Related party transactions		
	During the period, the following related party transactions took place between the Council for Geoscience and the Department of Mineral Resources:		
	Total grant received	292 839	271 232
	Refer to note 10 for further details regarding transactions with the Dep	partment of Mineral Resources	3.
	All other related party transactions were concluded at arm's length.		
	Relationships:		
	Parent National Department:	Department of Mineral Resou	urces
	Other government departments and entities:	Mine Health and Safety Cour	ncil

23	Irregular expenditure		
	Opening balance	5 301	-
	Irregular expenses current year	1 428	5 301
		6 729	5 301
	Analysis of expenditure not condoned per age classification		
	Current year - payments not in line with supply chain management requirements	1 314	-
	Prior year	-	-
		1 314	-
	Analysis of expenditure condoned per age classification	1 314	-
	Analysis of expenditure condoned per age classification	1 314	- 409
	Analysis of expenditure condoned per age classification Current year Prior year	1 314 114 -	- 409 2 567
	Analysis of expenditure condoned per age classification Current year Prior year	1 314 114 - 114	- 409 2 567 2 976
	Analysis of expenditure condoned per age classification Current year Prior year Details of irregular expenditure recoverable condoned	1 314 114 - 114	- 409 2 567 2 976

24	Correction of prior year errors
24.1	Correction of prior year cost and accumulated depreciation
	Nature Capitalisation of small assets to comply with GRAP 17
	Effect Statement of financial position
	Property and equipment

### Correction of prior year errors (continued)

		2015 R'000	2014 R'000		
24.1	Correction of prior year cost and accumulated depreciation (continued)				
	Cost	5 254	19 379		
	Accumulated depreciation	(4 190)	(13 614)		
		1 064	5 765		
	Statement of financial performance for the period ended 31 March 2014				
	Administration expenses				
	Depreciation	-	680		
		-	680		

### 24.2

### Correction of prior year unrecorded revenue and accruals

	Nature		
	Revenue recorded in the incorrect period	2 324	-
	13th cheque not accrued for in prior year	4 016	-
	Expenditure captured in the incorrect period	353	-
	Re-instatement of equipment	1 064	-
	Effect		
	Statement of financial position as at 31 March 2014		
	Government grant project related revenue recognise	(2 324)	-
	13th cheque not accrued for in prior year	4 016	-
	Expenditure captured in the incorrect period	353	-
	Re-instatement of equipment	(1 064)	-
	Statement of financial performance for the period ended 31 March 2014		
	Revenue	-	(849)
	Statement of net assets for the period ended 31 March 2015		
	Accumulated surpluses	981	-

### 24.3

### Correction of prior year committments disclosure Nature 7 365

			2015 R'000	2014 R'000	
25	Heritage assets disclosure				
	GRAP 103 defines heritage assets as assets which have a cultural, environmental, historical, natural, scientific, technological or artistic significance and are held indefinitely for the benefit of present and future generations.				
	Certain heritage assets are described as inalienable items, thus assets which are retained indefinitely and cannot be disposed of without consent as required by law or otherwise.				
	Nature				
	The Council for Geoscience has the following different classes of heritage;				
	- Fossil collections		-	-	
	- Gemstone collections		1 445	-	
	- Meteorite collections		2 804	-	
	- Mineral collections		13 318	-	
			17 567	-	
	The heritage assets were at initial recognition valued at fair value using the following evaluators:				
	Fossils	Professor for Palaeontological Research, University of the Witwatersrand			
	Mineral collections	MSc Geology, Professor and Chairman of the Department of Geology, University of the Witwatersrand			
	Meteorite collections	Author of "Meteorites", Private collector of meteorites			
	Gemstones	MSc Geology			
	Various valuation methods were used taking into account the different types of heritage assets held by the Council for Geoscience.				
	The valuations reports are held at the Council for Geoscience offices and are available for inspection.				
	The Palaeontological (fossils) assets have no monetary value as legislation does not permit the purchase or sale of fossils (National Heritage Resources Act 1999 par 35(4)(c)).				
	The Council for Geoscience is in possession of old scientific equipment only for display purposes. This equipment does not carry any value.				

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