Umbiko Wonyaka

Wezi-2019/2020

'Ulwazi olujulile ngesimo sokwakhekha komhlaba luyinsika yentuthuko yabantu'

mineral resources & energy
Department:
Minerals Resources and Energy
REPUBLIC OF SOUTH AFRICA

Council for Geoscience

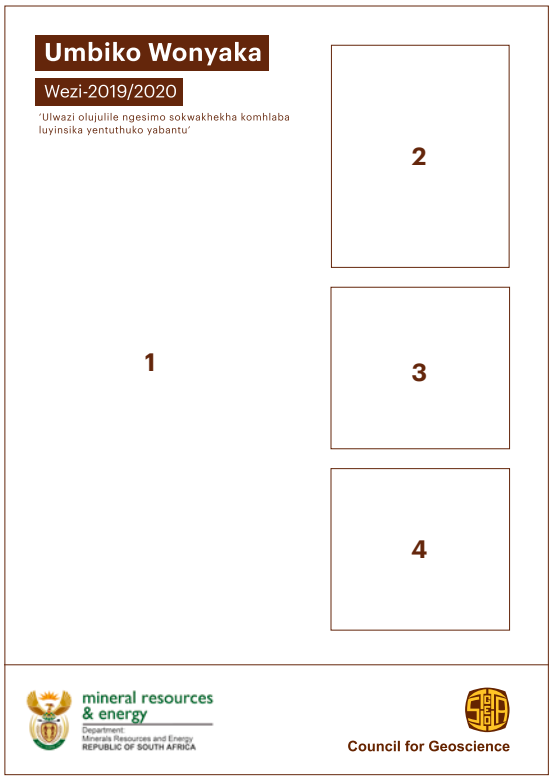
Council for Geoscience

I-Council for Geoscience (i-CGS) ingomunye Wemikhandlu Kazwelonke Yesayensi yaseNingizimu Afrika futhi elandela esikhundleni ngokusemthethweni Isikhungo saseNingizimu Afrika Sokuhlolwa Kwesimo Sokwakheka Komhlaba Ngenhloso Yokudweba Amabalazwe, esasungulwa ngowe-1912 ngokuhlanganiswa kwezikhungo ezintathu zangaphambilini zokuhlolwa kwesimo sokwakheka komhlaba ngenhloso yokudweba amabalazwe, esidala kunazo zonke – Isikhungo Sokuhlolwa Kwesimo Sokwakheka Komhlaba Ngenhloso Yokudweba Amabalazwe sase-Cape of Good Hope–esasungulwa ngowe-1895.

Umthetho Wolwazi Olujulile Ngesimo Sokwakheka Komhlaba, uMthetho Ongunombolo 100 we-1993 wasungula i-CGS yaba kulesi simo ekuso njengamanje.

I-CGS izama ukuba nendawo yomsebenzi enezinhlobo zabantu ezahlukahlukene ngokuhlanganisa ukufaka isandla kwabantu abaphuma emiphakathini ehlukahlukene, ngaleyo ndlela igqugquzela isimo somsebenzi esifaka lonke uhlobo lwabantu futhi sikhombise inhlonipho kumuntu ngamunye.

Sihlinzeka ngokungaguqugugquki ngomsebenzi ngokushesha nangenhlonipho kubabambiqhaza bethu bangaphandle nabangaphakathi.



Ulwazi olujulile lwesimo sokwakhekha komhlaba luyinsika yentuthuko yabantu – isicaphuno sikaMosa Mabuza, sowezi-2019

Ikhava:

1. Izintaba zase-Klinghardt – e-Namibia (Umthwebuli: uDkt. Paul Macey)
2: Ama-ammonite esikhathi sakamuva se-Cretaceous Isakhiwo sase-St Lucia, Nibela Penninsula, Lake St Lucia (Umthwebuli: uDkt. Greg Botha)
3. UNks. Mukosi edweba ibalazwe lezakhiwo zezindilinga zezimbiwa zokusasawoti eNingizimu ne-Namibia, ebheke idwala elibonakala ngaphezu komhlaba elinezimpawu ezilindelekile ze-alkali syenite (Umthwebuli: uMnu. Jabulani Mathebula)
4. Amashubhu emigodi Yeqembu Lamadwala Elikhulu lase-Karoo Ensimini Yamalahle yase-Springbok Flats (Umthwebuli: uDkt. Valerie Nxumalo)

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Ama-ammonite esikhathi sakamuva se-Cretaceous Isakhiwo sase-St Lucia, Nibela Penninsula, e-Lake St Lucia

Ingxenye A: Ulwazi Jikelele

Iqembu lase-Nama phezu Kwesisekelo sase-Namaqua e-Namibia

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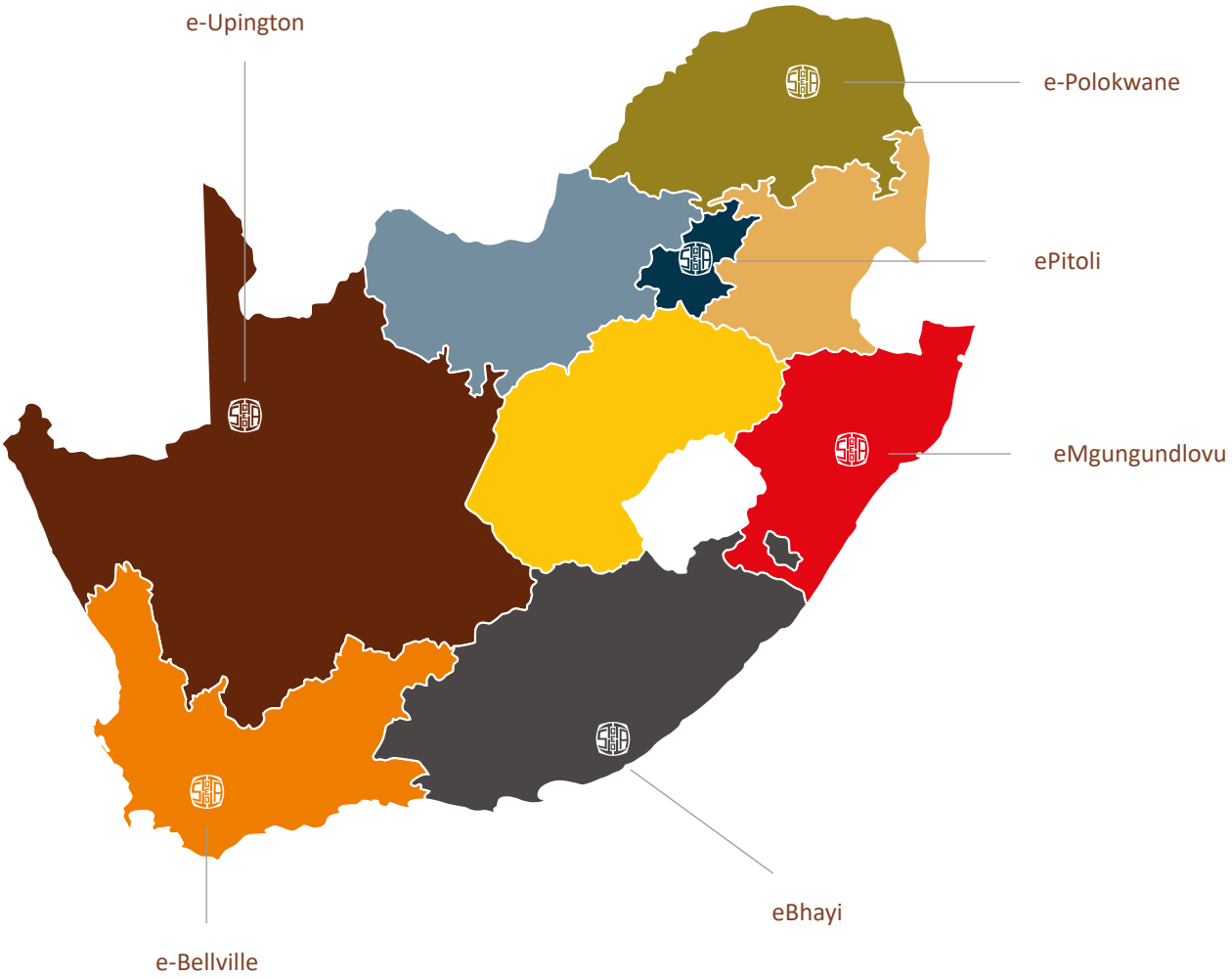
UNOBHALA WEBHODI:	UNks. Nomkhosi Cele

I-Council for Geoscience

Umthetho Wolwazi Olujulile Ngesimo Sokwakheka Komhlaba, Umthetho Ongunombolo 100 we-1993 njengoba uchitshiyelwe, wasungula i-Council for Geoscience (i-CGS) ukuze ithathe, phakathi kokunye, umsebenzi wokwalusa wokwalusa imininingwane ejulile yesimo sokwakheka komhlaba nolwazi kuzwelonke.

I-CGS iguquke yaba isikhungo sesimanje esinezinsiza ezikhethekile, impahla kanye nobuchwepheshe. Imisebenzi isikhungo esigxile kuyo ngokwezesayensi ifaka ukudweba amabalazwe esimo sokwakheka komhlaba, ukufunda ngesimo sokwakheka komhlaba ngokwezomnotho, ukufunda ngesimo somhlaba, ulwazi olujulile ngokwakheka kwesimo somhlaba ngaphansi kolwandle, kanye nolwazi olujulile lwesimo sokwakheka komhlaba okuphathelene nemvelo esizungezile, amanzi angaphansi komhlaba nobunjiniyela. I-CGS inamahhovisi ayisithupha ngokwezifundazwe zaseNingizimu Afrika, nehhovisi eliyinhloko e-Silverton, ePitoli (Umdwebo 1).



Isithombe 1: Amahhovisi ezifunda e-CGS ayisithupha eNingizimu Afrika.

Izifinyezo Nezifushaniso

4IR	FOURTH INDUSTRIAL REVOLUTION
AMD	ACID MINE DRAINAGE
ASTER	ADVANCED SPACEBORNE THERMAL EMISSION AND REFLECTION RADIOMETER
BBBEE	BROAD-BASED BLACK ECONOMIC EMPOWERMENT
BSC	BALANCED SCORECARD
CCMA	COMMISSION FOR CONCILIATION, MEDIATION AND ARBITRATION
CCS	CARBON CAPTURE AND STORAGE
CCUS	CARBON CAPTURE UTILISATION AND STORAGE
CEO	CHIEF EXECUTIVE OFFICER
CGS	COUNCIL FOR GEOSCIENCE
CIO	CHIEF INFORMATION OFFICER
COVID-19	CORONAVIRUS DISEASE 2019
CSIR	COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH
CTBT (O)	COMPREHENSIVE NUCLEAR-TEST-BAN TREATY (ORGANISATION)
DMRE	DEPARTMENT OF MINERAL RESOURCES AND ENERGY
DSI	DEPARTMENT OF SCIENCE AND INNOVATION
EE	EMPLOYMENT EQUITY
EGS	EUROPEAN GEOLOGICAL SURVEYS
ERP	ENTERPRISE RESOURCE PLANNING
EU	EUROPEAN UNION
GDIP	GEOSCIENCE DATA AND INFORMATION POLICY
GEMMAP	GEOLOGICAL MAPPING AND MINERAL ASSESSMENT PROJECT
GRAP	GENERALLY RECOGNISED ACCOUNTING PRACTICE
GTP	GEOSCIENCE TECHNICAL PROGRAMME
ICT	INFORMATION COMMUNICATION TECHNOLOGY
IEA	INTERNATIONAL ENERGY AGENCY
IESBA	INTERNATIONAL ETHICS STANDARDS BOARD FOR ACCOUNTANTS' CODE OF ETHICS FOR PROFESSIONAL ACCOUNTANTS
IMMP	INTEGRATED AND MULTIDISCIPLINARY GEOSCIENCE MAPPING PROGRAMME
IOC	INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
IRP	INTEGRATED RESOURCE PLAN
ISA	INTERNATIONAL STANDARDS ON AUDITING

ISO	INTERNATIONAL ORGANISATION FOR STANDARDISATION
KDD	KAROO DEEP DRILLING
LA-ICPMS	LASER ABLATION INDUCTIVELY COUPLED PLASMA MASS SPECTROMETRY
LIDAR	LIGHT DETECTION AND RANGING
MEWMP	MINE ENVIRONMENT AND WATER MANAGEMENT PROGRAMME
MGB	MURCHISON GREENSTONE BELT
MP	MEMBER OF PARLIAMENT
MPRDA	MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT
MTEF	MEDIUM TERM EXPENDITURE FRAMEWORK
MTSF	MEDIUM-TERM STRATEGIC FRAMEWORK
NDP	NATIONAL DEVELOPMENT PLAN
NIMPO	NATIONAL INTELLECTUAL PROPERTY MANAGEMENT OFFICE
NRF	NATIONAL RESEARCH FOUNDATION
OAGS	ORGANISATION OF AFRICAN GEOLOGICAL SURVEYS
PAA	PUBLIC AUDIT ACT OF SOUTH AFRICA
PFMA	PUBLIC FINANCE MANAGEMENT ACT
PGM	PLATINUM GROUP METAL
PYGMI	PYTHON GEOPHYSICAL MODELLING AND INTERPRETATION
REE	RARE-EARTH ELEMENTS
RPL	RECOGNITION FOR PRIOR LEARNING
SAA	SOUTH AFRICAN AIRWAYS
SABC	SOUTH AFRICAN BROADCASTING CORPORATION
SAMREC	SOUTH AFRICAN CODE FOR THE REPORTING OF EXPLORATION RESULTS, MINERAL RESOURCES AND MINERAL RESERVES
SHEQ	SAFETY, HEALTH, ENVIRONMENT AND QUALITY
SMART	SPECIFIC, MEASURABLE, ACHIEVABLE, REALISTIC AND TIMELY
SNMP	SOUTHERN NAMIBIA MAPPING PROGRAMME
UNESCO	UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANISATION
UNFC	UNITED NATIONS FRAMEWORK CLASSIFICATION
UNISA	UNIVERSITY OF SOUTH AFRICA
XRF	X-RAY FLUORESCENCE

1. Amazwi Okwendulela kaSihlalo weBhodi

'I-CGS yengeze ukudwetshwa kwebalazwe lolwazi olujulile ngokwakheka komhlaba endaweni esemhlabeni owomile engekho olwandle ezweni ngesikali esiningiliziwe sika-1:50 000 ukusuka endaweni encane engama-4% kuya kwenkulu engama-8.8% onyakeni wombiko. Lokhu kuhambisana nemizamo yethu yokwengeza imisebenzi yokuhlola isimo somhlaba ezweni, sikhuthaze ukutshala izimali nokwengeza isabelo sezwe sochithomali lokuhlolwa kwesimo somhlaba emhlabeni wonke ukusukela kwesikhona njengamanje esehle kakhulu saze safinyelela ngaphansi kwe-1% ukuya kuma-5% eminyakeni eyisihlanu ezayo.'

USIHLALO WEBHODI
UDkt. Humphrey Mathe

Ngokuzithoba kwami okunenhlonipho nentokozo nginethulela umbiko wonyaka we-Council for Geoscience (i-CGS) ohlanganisa unyakamali wezi-2019/2020, unyaka wokugcina wesikhathi sokusebenza kwebhodi elikhona njengamanje. Ngithanda ukubonga iBhodi elizophuma elenze imisebenzi yalo yokuphathwa kwezimali ngokuncomekayo kakhulu futhi lanika umhlahlandlela wokwenziwa kwemisebenzi emininganga ebalulekile ye-CGS.

Ngibhala lo mbiko ngesikhathi lapho iNingizimu Afrika kanye, okusempeleni, nomhlaba wonke ubhekene nesimo sezempilo nezomnotho esibucayi futhi ngokusezingeni elingakaze libonwe ngenxa yesifo segciwane elisha iKhorona, eliqubuke ngoDisemba wezi-2019 (kafushane, i-COVID-19) Inhlangano Yezempilo Yomhlaba (i-WHO) eyasimemezela njengobhubhane. Ukuze kubhekwane nalesi simo, uhulumeni waseNingizimu Afrika wamemezela isimo esibucayi, kwamiswa ngokushesha nangokungalindelekile yonke imisebenzi yezomnotho ezweni ukuze kugwenywe ukusabalala kwegciwane. I-CGS yabhekana nesimo ngendlela encomekayo ukuze iqinisekise ukuqhubeka nomsebenzi futhi igcine esimweni ngokugcwele isimo Sezindawo zethu Zikahulumeni Ezibalulekile ngesikhathi Sokuvalwa Thaqa Kokusebenza Kwezinto Ezweni Lonke. Lokhu kwafezeka ngokusungulwa kweKomidi le-COVID-19 le-CGS elaphatha umsebenzi wokungenelela ukuze kuqinisekiswe ukuhlangabezana nezimfuno zomsebenzi e-CGS ngesikhathi kuhlonishwa imiyalelo ebhalwe Kwimithetho-nqubo Yomthetho Kazwelonke Wokuhlangabezana Nezimo Ezibucayi (i-NMDA). IBhodi lazizwa lineqholo kakhulu ngesikhathi i-CGS inikwa umsebenzi wokweseka isinqumo sikahulumeni sokuvula ngokungaphelele imboni yezimayini kuhambisana nokuthobela Imithetho-nqubo ye-NMDA echitshiyelwe, Isahluko 4, S11 (K)(3), eyalela ukuthi "Ukuqapha nokuhlolwa komthelela wokwenzeka nokuvama kokuzamazama komhlaba okwenziwa i-Council for Geoscience kufanele kuqiniswe ngokushesha".

Ubhubhane lwe-COVID-19 lufike futhi nobunzima emnothweni waseNingizimu Afrika ontengantengayo, lokhu kwakhuthaza umyalelo ophuma kuhulumeni wokuqalisa ngokushesha Uhlelo Lokusimamisa Umnotho. Ukuze kulandelwe lo myalelo, i-CGS yathatha izinyathelo ngokushesha zokwenza ukusebenza kangcono Kohlelo Lobuchwepheshe Bolwazi Olujulile Ngokwakheka Komhlaba ukuze lugxile ekuphenyeni ezindaweni okunethemba elikhulu lokuthi zingaba nezimbiwa phansi okungaheha ukutshalwa kwezimali, intuthuko efaka bonke abantu nokudalwa kwamathuba emisebenzi esikhathi esifushane. Inqubekela-phambili kulezi zinhlelo kuzoxoxwa ngayo kunyakamali ophezulu.

Onyakeni obuyekezwayo, i-CGS ifeze amagxathu amakhulu ezinhlelweni zayo zamasu nezomsebenzi. Kuyintokozo kimi ukubika ukuthi i-CGS kanye, okusempeleni, neNingizimu Afrika yonkana izuzile ekuqalisweni nasekuqhutshweni okuqhubekayo Kohlelo Oluhlanganisiwe Lwemikhakha Ehlukene Lokudwetshwa Kwebalazwe (i-MMP), olusonyakeni walo wesithathu wokusebenza nokuqaliswa. Ngokusebenzisa lolu hlelo, i-CGS seyengeze ukudwetshwa kwebalazwe ezweni ngesikali esiningiliziwe sika-1:50 000 ukusuka endaweni encane engama-4% kuya kwenkulu engama-8.8% onyakeni wombiko. Lokhu kuhambisana nemizamo

yethu yokwengeza imisebenzi yokuhlola isimo somhlaba ezweni, sikhuthaze ukutshala izimali nokwengeza isabelo sezwe sochithomali lokuhlolwa kwesimo somhlaba emhlabeni wonke ukusukela kwesikhona njengamanje esehle kakhulu saze safinyelela ngaphansi kwe-1% ukuya kuma-5% eminyakeni eyisihlanu ezayo."

Okusempeleni, i-IMMP seyiqale ukukhipha imiphumela lapho sekutholwe okune okungajwayelekile okuphokophelwe onyakeni wombiko futhi okumbalwa kwalokhu kubekelwe ukuhlolwa ngasekuqaleni konyakamali olandelayo. Isikhungo siyaqhubeka nokwenza ngcono indlela esenza ngayo umsebenzi nezinga lokukhishwayo, okugxile kakhulukazi ekubeni nomthelela omkhulu emphakathini. Kulo nyaka obuyekezwayo, ukwenziwa komsebenzi esikhungweni kwathuthuka ukusukela kuma-69% kunyakamali wezi-2018/2019 (ku-FY2018/19) ukuya kuma-82%. Nginentokozo ngokuthi isikhungo sithole imiphumela yokucwaningwa kwamabhuku okungenasici.

I-CGS iyingxenye yemizamo yeNingizimu Afrika yokuqinisekisa ukuba khona kwamandla anele njengoba kubhalwe Ohlwelweni Oluhlanganisiwe Lwezinsiza lwezi-2019 (i-IRP 2019) nokusiza ukuguqukela emnothweni onekhabhoni ephansi okufanele. Ukuze kwenzeke lokhu, siqinise ucwaningo lwethu ngobuchwepheshe bamalahle obuhlanzekile kanye neminye imithombo engasetshenziswa yamandla njengoba kubonakaliswe imisebenzi efana Namasimu Amalahle eMolteno-Indwe, Amandla Atholakala Ekushiseni Okungaphansi Komhlaba, Izimbiwa Zokwakha Amabhethri, Nezindlela Zokuqoqa, Ukusebenzisa Nokugcina Ikhabhoni (i-CCUS). I-CGS ihlinzeka ngokwesekwa kwezobuchwepheshe kuka-ESKOM ukuze kunwetshwe isikhathi sokusebenza kwemvume yesiteshi sikagesi esisebenza ngamandla enuzi sase-Koeberg ngokusebenzisa Ukuhlaziywa Kwengozi Yokwenzeka Nokuvama Kokuzamazama Komhlaba Okungenzeka (i-PSHA). Ukuze kuqiniswe isimo se-CGS sokufeza umsebenzi wayo wokuqoqa, ukuhlanganisa, ukutolika, nokusatshalaliswa kolwazi olujulile ngokwakheka komhlaba, imininingwane nolwazi lweNingizimu Afrika, ukubunjwa Kwemithetho-nqubo Yomthetho Wolwazi Olujulile Ngokwakheka Komhlaba inhloso yayo okungukwenza Umthetho usebenze ngokugcwele sekusezingeni eliphezulu. Ngokwazi ukubaluleka kolwazi olujulile ngokwakheka komhlaba nemininingwane njengengxenye ebaluleke kakhulu yokuhlolwa kwesimo somhlaba ngokubanzi nezinguquko, (ngokukhethekile), Ibhodi le-CGS ligunyaze Inqubomgomo Yolwazi Nemininingwane ukuze isize ngokusatshalaliswa kolwazi olujulile lokwakheka komhlaba ngendlela eqotho kubabambiqhaza bayo.

Ngineqholo lokubika ukuthi omunye wososayensi bethu abayizinhloko, uDkt Hayley Cawthra, wahlonishwa ngokubekwa ngokwezesayensi ezingeni le-Natinal Research Fund (i-NRF) lokuba phakathi kososayensi abaphambili kunabo bonke ezweni. Ibhodi le-CGS lineqholo ngempumelelo ekhuthazayo neyisibonelo kaDkt. Cawthra futhi likhuthaze bonke ososayensi abavelele base-CGS ukuthi babuke isibonelo esihle kuDkt Cawthra.

Ibhodi lizwakalisa ukuzwelana kweqiniso nokusuka ekujuleni kwenhliziyo emindenini yozakwethu asebesishiyile emhlabeni, okuyilaba, Nks. Lilian Mathonsi, Mnu. Mbube Elijah Nkosi, Mnu. Muhumbulo Ayanda Tshikovhi noMnu. Hlengani Edward Maswanganyi nawo wonke amalungu ethimba le-CGS alahlekelwa abathandiweyo babo.

Uma sengiphetha, ngibonga uNgqongqoshe Ohloniphekile Wezimbiwa Namandla, uMnu. S. G. Mantashe (i-MP) ngokweseka kwakhe i-CGS okuqhubekayo nokubeka kwakhe esikhundleni Ibhodi Elisha eliqale ukusebenza mhla lu-1 kuMeyi wezi-2020. Ngihalalisela futhi ngamukele amalungu Ebhodi asanda kubekwa esikhundleni futhi sengimagange ukubona ukusebenza kwabo okunempumelelo. Ngibonga futhi ngincoma ngokweqiniso uSihlalo Ohloniphekile Wekomidi lasePhalamende Lomsebenzi Wemithombo Yezimbiwa Namandla (i-PPC MRE), uMnu. S. Luzipho (i-MP) kanye Nekomidi lonke le-PPC MRE ngokuhlola umsebenzi wethu ngeso elibukhali kanye nokwesekwa okuqhubekayo. Okokugcina, ngifuna ukuncoma abaphathi abakhulu, ososayensi nabasebenzi bokusekela ngokuzinikela kwabo nokusebenza okuncomekayo ekulandelweni komyalelo wokwenza umsebenzi we-CGS. Ngokuholwa uMnu. Mosa Mabuza ngohlobo lwakhe "lobuholi obunokuthula", umndeni wase-CGS uphakamise isisho sabaphathi Bokuzindla bama-Shayina esithi: "ngaphandle kokuthula, ayikho indlela yokuphikelela; ngaphandle kobubele, ayikho indlela yokwamukela bonke abantu; ngaphandle komusa, ayikho indlela yokunakekela bonke abantu; futhi ngaphandle kokungachemi, ayikho indlela yokuthatha izinqumo ezilungile."

Ngiyakholwa ukuthi unyakamali ozayo uzoba onempumelelo yize kunezinselelo ezilethwe yi-COVID-19.

Ngiyabonga.

UDkt. H Mathe
USihlalo
Ibhodi le-Council for Geoscience
30 September 2020

2. Isifinyezo SikaMphathi Omkhulu

'I-CGS iqhubekisele phambili ngokushesha ukuqaliswa Kohlelo Oluhlanganisiwe Lwemikhakha Ehlukene Lokudwetshwa Kwebalazwe Lolwazi Olujulile Ngokwakheka Komhlaba futhi yaphinda yabeka phambili izindawo okunamathuba amakhulu kakhulu okuthi kutholakale kuzona izinsalela zezingqumbi zezimbiwa ezisezingeni lomhlaba. Ukuze kufezwe le nhloso, izindawo ezinhlanu okunamathuba amakhulu kakhulu okuthi kutholakale izimbiwa kuzona zingukufaka isandla kwe-CGS ohlelweni lokusimamisa umnotho lukahulumeni. Lezi zimbiwa zihlanganisa izimbiwa ezibalulekile ezifana ne-lithium, i-manganese, i-vanadium, i-fluospar, ama-phosphate, nezinsimbi ezijwayelekile ezingesilona igugu, zonke okubhekwe ukuthi zifake isandla ekukhuliseni uchithomali lokuhlola isimo somhlaba eNingizimu Afrika ukuze ifinyelele engxenyeni engama-5% yesabiwomali somhlaba sokuhlola isimo somhlaba'

UMPHATHI OMKHULU
UMnu Mosa Mabuza

Lo nyaka uyisikhumbuzo sokuphela komzungezo Wohlaka Lwamasu Esikhathi Esimaphakathi (i-MTSF) owaqala ngowezi-2014 kuya kowezi-2019 nokuqala kwe-MTSF yowezi-2019 kuya kowezi-2024. I-CGS ngalesi sikhathi, yabhekana noguquko olukhulu kumasu nasesakhiweni sayo okwaholela esikhungweni esihambisana kakhudlwana nemithetho yokusungulwa kwaso. Umyalelo wokwenza umsebenzi we-CGS waqiniswa ngalesi sikhathi, njengoba sasifuna izindlela ezingcono zokukhombisa umthelela emphakathini owenziwa ukusebenzisa ngempumelelo izinhlelo zolwazi olujulile lokwakheka komhlaba. Eswini elihambisana nomyalelo okhishwe umthetho wokwenza umsebenzi okuyiwona odingidwayo, sethula indlela ehlanganisiwe ukuze sichaze ngokuqondile izingxenye eziyindikimba okufanelwe kugxilwe kuzo ezenza ngcono ukufaka isandla kolwazi olujulile lokwakheka komhlaba ekufezweni kwemigomo Yohlelo Lwentuthuko Kazwelonke (i-NDP). Kuyintokozo kimi ukubika ukuthi ososayensi bethu bashicilele ama-athikili angaphezu kwama-200 abuyekezwe ozakwabo ngalesi sikhathi somzungezo weminyaka emihlanu, futhi athole ukucaphunwa izikhathi ezicishe zibe yi-1 440. I-CGS njalo nje ithatha abafundi basemanyuvesi ezobuchwepheshe (ayekade aziwa kuqala ngokuthi ama-technikon) ukuze bafunde ngomsebenzi. Lolu hlelo lusiza abafundi ukuthi baqedele ingxenye yokwenza ngqo umsebenzi ukuze bathole iziqu zabo, eyingxenye eyisidingo esibalulekile okufanele bahlangabezane naso kuqala ukuze baqedele izifundo zabo. Eminyakeni emihlanu edlule, sifake isandla ekuphothuleni izifundo kwabafundi abayi-17, abangaphezu kwama-66% babo abangabesifazane. Kulesi sikhathi, abasebenzi be-CGS bethweswa iziqu ze-Master's Nezobudokotela ezingama-27. Enye impumelelo ephawulekayo yeminyaka emihlanu edlule ifaka, kodwa noma kungaphelele lapho:

- Sengeza ukudwetshwa kwebalazwe likazwelonke ngesikali sika-1:50 000 ukusuka ngaphansi kwendawo engama-4% kuya kwengama-8.8% ekupheleni komzungezo we-MTSF.
- Sazibekela umgomo okhombisa ukuzethemba wokusebenzisa ulwazi olujulile lokuhlolwa kwesimo somhlaba ukuze sengeze kakhulu ukuhlolwa kwesimo semithombo yezimbiwa ukusukela ngaphansi kwe-1% ukuya kuma-5% wesabelo sochithomali lokuhlolwa kwesimo somhlaba emhlabeni wonke.
- Ibalazwe elishicilelwe elinesikali sika-1:1 000 000 lokwakheka komhlaba laseNingizimu Afrika.
- Ibalazwe lokuqala emhlabeni lokwakheka komhlaba wephansi lolwandle nengxenye esogwini eyithafa Yesikhathi Sokwembozwa Komhlaba Ngeqhwa Okukhulu Kokugcina.
- Ukuqaliswa kwemisebenzi yokudwetshwa kwamabalazwe olwazi olujulile ngokwakheka komhlaba e-Grqiqualand West, eNyakatho Kapa eGiyani nakwiphansi lolwandle.
- Ukutholakala kwemithombo yamanzi engaphansi komhlaba esifundeni sase-Beaufort West ngesikhathi sesomiso.

- Ukwehlukaniswa kwezindawo Zedolobhakazi laseGoli ngokwezindawo okungenzeka kuzona ukuzamazama komhlaba.
- Ukuqapha ngempumelelo okuqhubekayo kwamathuba nokwenzeka kokuzamazama komhlaba eNingizimu Afrika yonke.
- Ukusungulwa kwezindlela zokuzwa ukude ukuze kubikezelwe izingozi ezingadalwa isimo sokwakheka komhlaba.
- Ukuchazwa ngokwemikhakha ehlukene kolwazi olujulile ngokwakheka komhlaba kwezimbiwa okwenziwe futhi kwaphokophelwa ukuthi zimbiwe kuqala.
- Ukusetshenziswa kokuhlakanipha okwenziwe ngobuchwepheshe olwazini olujulile lokwakheka komhlaba okusungulwe njengekhono elingumnyombo lesikhungo.

Isinqumo seNingizimu Afrika sokutshala imali olwazini olujulile lokwakheka komhlaba kuhloswe ngaso ukuqhubekisela phambili ukukhula komnotho okufaka bonke abantu, ukukhulisa ukulondolozwa kwemvelo nokufaka isandla, phakathi kokunye, ekutholakaleni kokudla namandla anele (okufaka izinto zokusebenza ukuze siguqukele emnothweni osebenzisa ikhabhoni ephansi), ukuhlelwa kwendawo okulungile nokusetshenziswa komhlaba, nokwesekwa kwezinhlelo zamanzi kuzwelonke.

I-CGS isonyakeni wayo wesithathu wokusebenza Kohlelo Oluhlanganisiwe Lwemikhakha Ehlukene Lokudwetshwa Kwebalazwe (i-MMP), okuhloswe ngalo ukukhiqiza amabalazwe acacile ahlanganisiwe olwazi olujulile lokwakheka komhlaba ezweni lonke ngokwezikali ezahlukene, lapho amabalazwe ayisisekelo okufunda ngokwakheka komhlaba eyisikali sika-1:50 000 kanye namabalazwe okufunda ngokwakheka kwesimo somhlaba ngokuma kwawo nawesimo somhlaba ngokwamakhemikhali akhona emhlabeni ngezikali ezahlukene. Ulwazi olujulile lwesimo sokwakheka komhlaba oluqoqiwe luzosetshenziselwa ukuchaza ngokwakheka komhlaba nomumo wawo okungasiza ekukhuliseni ukuqonda izinqubo eziningana ngokwenzeka emhlabathini, ukusabalala kwemithombo yezimbiwa namandla, amanzi angaphansi komhlaba, ukusetshenziswa komhlaba, ingqalasizinda, izingozi ezidalwa isimo sokwakheka komhlaba kanye nezindaba eziphathelene nokungcola kwezindawo ezisizungezile ngokwemvelo. Phezu kwalokho, ulwazi olujulile lwesimo sokwakheka komhlaba oluveziwe lungasetshenziselwa izinto ezenziwa kwezenhlalo nasemnothweni ezifana nezokuvakasha ezigxile ekufundeni ngokwakheka kwesimo somhlaba nemvelo.

Ngemuva kweminyaka emithathu, i-IMMP isuse ukudwetshwa kwebalazwe lolwazi olujulile ngokwakheka komhlaba endaweni esemhlabeni owomile engekho olwandle ukusuka endaweni engama-4% kuya kwengama-8.8. Ngokwenze njalo, ithole imithombo emisha yamanzi engaphansi komhlaba kanye naleyo okungenzeka kube yiyona emaqenjini amadwala aqavile e-Karoo naseKapa kanye nezinye izakhiwo ezibalulekile okungenzeka zibe nomthelela ezingozini ezidalwa isimo sokwakheka komhlaba. Lolu lwazi njengamanje lusiza ekubhekaneni nezinkinga zokusweleka kwamanzi ezindaweni ezithile kanye nokwenza kangcono ukuvimba izingozi ezidalwa isimo sokwakheka komhlaba. Ngaphezu kwalokho, uhlelo lukhombe lapho kungenzeka kutholakale izimbiwa ezintsha ezindaweni ezinamanzi ashisayo ne-magma ezifundazweni zaseNyakatho Kapa, eNtshonalanga Kapa, eNyakatho Ntshonalanga naseLimpopo ngokwehlukana kwazo. Lezi zimbiwa zihlanganisa izimbiwa ezibalulekile ezifana ne-lithium, i-manganese, i-vanadium, i-fluospar, ama-phosphate, nezinsimbi ezijwayelekile ezingesilona igugu, zonke okubhekwe ukuthi zifake isandla ekukhuliseni uchithomali lokuhlola isimo somhlaba eNingizimu Afrika kuze kufinyelele engxenyeni engama-5% yesabiwomali somhlaba sokuhlola isimo somhlaba."

Inhloso ephakathi nendawo ye-IMMP ukukhulisa isabelomali sokuhlola isimo somhlaba size sifike kuma-5%, ukuthola izinsalela zezingqumbi zezimbiwa namandla amasha ukuze ifake isandla ekukhulisweni komnotho, imisebenzi nokudalwa kwamathuba omsebenzi. Ukuze i-CGS ithole futhi ilinganise ukuthi indawo yaseNingizimu Afrika inezimbiwa ezingakanani futhi ilinganise umthelela we-IMMP, kuphakanyiswe izinhlelo eziningana, ezifana nokusungulwa nokukhuthazwa Komthetho Wolwazi Olujulile Ngokwakheka Komhlaba Nemithethonqubo yawo. Onyakeni obuyekezwayo, i-CGS yaqala ukusungula

imithetho-nqubo ezokwenza ukuthi Umthetho Wolwazi Olujulile Ngokwakheka Komhlaba usebenze ngokugcwele, njengoba uchitshiyelwe. Le nqubo ihambisana Nenqubomgomo egunyaziwe Yolwazi Nemininingwane Yolwazi Olujulile Ngokwakheka Komhlaba (i-GDIP) Nemihlahlandlela yayo ezoshicilelwa onyakeni ozayo. Ukutholakala kolwazi nemininingwane yolwazi olujulile ngokwakheka komhlaba ngendlela ecacile nehlelekile emphakathini izokhuthaza imisebenzi yokumba ezimayini nokuhlola isimo somhlaba ezweni.

Okuhambisana nezinqubo zohlelo lokususa ngobuchwepheshe lonke ulwazi nemininingwane ewumlando lusiwe esizindeni esiyingqalasizinda yesimanje okuzokwenza ukuthi ulwazi nemininingwane kufinyeleleke ngokushesha. Ngineqholo ukunazisa ukuthi amabalazwe cishe ayizi-120 000 angazange ashicilelwe nemibiko okusukela emuva esikhathini seminyaka ye-1800 yokugcina akungobo yomlando e-CGS. Okuningi kwalokhu kusengenzeka ukuthi kube usizo namanje futhi kungabiza ukukubuyisela —okuningi ngeke kukwazi ukubuyiselwa. Ukuskena amarekhodi kuhlonzwe njengengxenye ebalulekile yesu lenhlangano lokuguqukela ekusebenziseni ubuchwepheshe besimanje. Kwasetshenziswa izimo ukuze kubhekanwe nokuhlukahlukana kwamaqoqo, ngoba kokubili izinga nobuningi bamarekhodi kunomthelela oqondile ekutheni imininingwane ingarekhodwa futhi ilondolozwe isikhathi eside. Ukuze kuhanjiswane nenhloso yokuqala yesu, ukufinyeleleka kwamaqoqo amabalazwe abantu bangaphandle kuzoba isinyathelo sesibili sokufeza ukusebenza kwalo ngokugcwele. Uma eseskeniwe, wonke amarekhodi azobekwa ngokwezindawo ukuze kwenziwe lula ukubuyiselwa kwendawo futhi azokwenziwa abe khona ngokuhambisana ne-GDIP Nemihlahlandlela yayo.

Amaqoqo ezinsalela zokwakuphila osekwaguquka kwaba izimo eziqopheke ematsheni ase-CGS aphakathi kwamanye amaningi kunawo wonke ohlobo lwawo eNingizimu Afrika futhi abalulekile ngokwesu lenhlangano ngoba arekhoda umbono ohlukile waseNingizimu Afrika ekuguqukeni kwempilo nesimo semvelo eminyakeni eyizigidigidi ezintathu. Ifa laseNingizimu Afrika lezinsalela zokwakuphila osekwaguquka kwaba izimo eziqopheke ematsheni libalulekile ngoba izinsalela zokwakuphila osekwaguquka kwaba izimo eziqopheke ematsheni kwenza ingxenye Yefa Lezwe futhi kuchaza ubulona. Amaqoqo amabili amakhulu aphethe izifanekiso ezingamakhulu ezinkulungwane amaningana abekwe emahhovisi e-CGS ase-Silverton nase-Bellville. Yize ukufunda ngezinsalela zokwakuphila osekwaguquka kwaba izimo eziqopheke ematsheni kuyingxenye yomsebenzi we-CGS, lo mkhakha uhlale ungasebenzi esikhathini esingamashumi eminyaka ambalwa adlule futhi namaqoqo enganakiwe. Manje, i-CGS isiyakubona ukubaluleka kwefa laseNingizimu Afrika lokuyizinsalela zokwakuphila osekwaguquka kwaba izimo eziqopheke ematsheni njengezimpawu zesizwe okufanele zesekwe, yingakho kubuyiselwa esimweni amaqoqo ayo njengesinyathelo sokuqala sokuvusa umkhakha.

Ngonyakamali wezi-2019/2020, i-CGS yaqala ukwazisa inhlangano yonke nge-ISO 9001, ngokukhethekile amayunithi enza umsebenzi wenhlangano ongumnyombo. Amayunithi omsebenzi asungula izinqubomgomo, izindlela zokwenza izinto, izinqubo, amafomu nezifanekiso njengesisekelo sokuqalisa ukusebenza kwe-ISO 9001 kunyakamali ozayo. Umndeni wase-CGS uhlose ukuthi ube sowugunyazwe ngokugcwele mhla zingama-31 kuMashi wezi-2023.

Ukuqhubekela phambili kwe-ISO 17025 kwathikamezeka ngokuvalwa komsebenzi welabhorethri ye-CGS kwaze kwaba u-Agasti 2019, ngesikhathi kuqedwa imisebenzi yempahla enkulu, okufaka kuyo ukufakwa kwamayunithi okukala isisindo nezinga lokushisa ezintweni zokusebenza, ukuze kuqinisekiswe ukunemba kokukalwa kwemiphumela yokuhlola. Izinhlelo zokugunyazwa kwe-ISO 17025 zahlolwa, kugxilwe ekuhlolweni kwemibhalo, ukwaneliseka kwamakhasimende, ukuhlela ukucwaningwa kwamabhuku kwangaphakathi, nokuqala ukusebenzisa nokuqapha izinhlelo zokulawula amazinga omsebenzi kuzo zonke izingxenye zama-labhorethri. Ukubekwa kwempahla yokusebenza nezimo zemvelo zezindawo akukabi sezingeni elidingekayo futhi kusayisihibe esikhulu sokuqinisekisa izindlela zokuhlaziya. Umsebenzi wokwenziwa kangcono kokushisisa, ukufaka umoya nokupholisa nokomisa umoya uyaqhubeka njengamanje ukuze kubhekwane nalezi zimo.

Ukusimama kuyingxenye ebalulekile yomsebenzi nebhizinisi le-CGS ngokwezimali/ezomnotho, ezenhlalo, ababambiqhaza nemvelo. Ukusimama kusekelwe ekugxileni kwezesayensi nokuqamba amasu amasha okusebenza esikhungweni futhi sinenhlanhla yokuba nabasebenzi abavumelanayo nabemikhakha eyahlukene ababona i-CGS njengomqashi ongcono abamsebenzelayo. Ngithanda ukwamukela ngemfudumalo amalungu amasha ethimba lase-CGS. Kulabo abasishiya, siyabonga ngomsebenzi wenu futhi sinifisela impumelelo emisebenzini yenu emisha.

Unyaka ngamunye unokuvelele kwawo nezikhathi ezingemnandi. Kulo nyaka obuyekezwayo, i-CGS ilahlekelwe abanye babasebenzi bayo abanekhono, kuhlanganisa nezingqalabutho zangempela zolwazi olujulile lokwakheka komhlaba, ngenxa yokuthatha umhlalaphansi. Sincoma ukufaka isandla okuvelele kwalabozakwethu abasisebenzele kahle isikhungo. Laba besilisa nabesifazane baphakathi kwalabo abanikele impilo yabo esikhungweni:

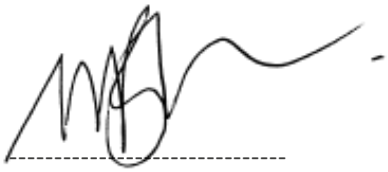
- uMnu. CH de Beer – iminyaka engama-40 Njengososayensi Onguchwepheshe Kuyunithi Yebhizinisi Yokudwetshwa Kwamabalazwe Olwazi Olujulile Ngokwakheka Komhlaba.
- uMnu. RH Sello – iminyaka engama-38 years Njengomsebenzi Wobuchwepheshe Eyunithini Yebhizinisi Yemisebenzi Yaselabhorethri.
- uDkt. M Cloete – iminyaka engama- 35 Njengososayensi Onguchwepheshe Omkhulu Ehhovisi Lamasu Okuphatha.
- uDkt DI Cole – iminyaka engama-34 Njengososayensi Onguchwepheshe Kuyunithi Yebhizinisi Yokudwetshwa Kwamabalazwe Olwazi Olujulile Ngokwakheka Komhlaba.
- uNks EE van Tonder – imiyaka engama-33 Engumsebenzi Wasemtapweni Wolwazi: Isitolo Sezincwadi Nemibiko Engashicilelwe Eyunithini Yebhizinisi Yokuphatha Izindawo Nempahla Yokusebenza.
- uNks S Mahwayi – iminyaka engama-32 Njengonobhala Eyunithini Yebhizinisi Yokuphatha Izindawo Nempahla Yokusebenza.
- uDkt MT Atanasova – iminyaka engama-28 Njengenhloko Yomnyango: Ukufunda Ngezimbiwa Eyunithini Yebhizininsi Yemisebenzi Yaselabhorethri.
- Dr LP Chevallier – iminyaka engama-28 Njengososayensi Onguchwepheshe Kuyunithi Yebhizinisi Yokudwetshwa Kwamabalazwe Olwazi Olujulile Ngokwakheka Komhlaba.
- uNks JD Grobler – iminyaka engama-24 Njengonobhala Wesizindalwazi Eyunithini Yebhizinisi ye-GIS Nezizindalwazi Zesayensi.
- uNks KIG Burger – iminyaka engama-21 Njengomsebenzi Wobuchwepheshe Eyunithini Yebhizinisi Yemisebenzi Yaselabhorethri.
- uNks MD Paweska – iminyaka engama-21 Njengonobhala Wemisebenzi Esigabeni Solwazi Olujulile Olusetshenziswayo Ngokwakheka Komhlaba.
- uMnu. SW Strauss – imiyaka engama-21 Njengososayensi Oyinhloko Eyunithini Yebhizinisi Yokufunda Ngokwakheka Komhlaba Kwezomnotho Nangokwesimo Sokwakheka Komhlaba Ngokwamakhemikhali.
- Nks CJ Skeffers – iminyaka eyi-17 Njengonobhala Eyunithini Yebhizinisi
- Yokudwetshwa Kwamabalazwe Olwazi Olujulile Ngokwakheka Komhlaba.
- uDkt. B Yibas-Babso – iminyaka eyi-14 Njengososayensi Onguchwepheshe Eyunithini Yebhizinisi Yokufunda Ngokwakheka Komhlaba Ngokwezomnotho Nangokwesimo Sokwakheka Komhlaba Ngokwamakhemikhali.

Ngizwakalisa ukuzwelana kakhulu nozakwethu abalahlekelwe amalungu emindeni nabangani onyakeni. Ukudabuka ngokulahlekelwa kwaba kukhulu kakhulu emndenini wase-CGS ngokushona ngokuzuma kukaMnu HE Maswanganyi, Unogada Eyunithini Yebhizinisi Yemisebenzi Yokuvikeleka, noMnu MA Tshikovhi, Umfundi Owayesathola Uqeqesho Eyunithini Yebhizinisi Yokufunda Ngokwakheka Komhlaba Ngokwezomnotho Nangokwesimo Sokwakheka Komhlaba Ngokwamakhemikhali.

Kubo bonke ozakwethu abasalulama ekuguleni njengamanje, sibheke ukuthi sinamukele futhi uma senibuyile.

Ngibonga ngokukhethekile amalungu eBhodi, ngaphansi kobuholi obunobuhlakani bukaDkt Humphrey Mathe, ngesineke sabo, ukuhlola umsebenzi wethu ngokucophelela, ukwesekwa nokuholwa onyakeni wonke. Sibonga futhi, Ikomidi lasePhalamende Lomsebenzi Wemithombo Yezimbiwa Namandla ngokweseka kwalo, ukuzinikela, ukuqapha nobuholi, uNgqongqoshe kanye nabasebenzi Bomnyango Wezimbiwa Namandla.

Ngiphetha lesi sifinyezo nginethemba lokuthi sakhe isisekelo esiqinile se-CGS enamandla, egxile ekufezeni umsebenzi wayo futhi eyisibonelo njengesikhungo sikahulumeni esinekhono. Lokhu sikwaze ukukufeza kuphela ngoba sime ngokwesisho emahlombe alabo abanamandla kakhulu okuyilabo abangokhokho bethu. Asithatheni leli thuba siqhubeke nokwakha ifa elikhulu silakhela izizukulwane ezizayo.



uMnu M Mabuza
Umphathi Omkhulu
i-Council for Geoscience
30 September 2020

3. ISITATIMENDE SESIBOPHO SOLWAZI LWEZINGA LOKWENZIWA KOMSEBENZI

Isitatimede sesibopho solwazi lwezinga lokwenziwa komsebenzi sonyaka ophele mhla zingama-31 kuNdasa 2020

Umphathi Omkhulu (u-CEO) unomsebenzi wokulungisa ulwazi lwezinga lokwenziwa komsebenzi wase-CGS kanye nokwahlulela okwenziwe ngalolu lwazi.

Phezu kwalokho, kungumsebenzi ka-CEO ukusungula nokuqalisa uhlelo lokulawula kwangaphakathi oluhlelelwe ukuhlinzeka ngesiqinisekiso esifanele sobuqotho nokwethembeka kolwazi lwezinga lokwenziwa komsebenzi.

Ngokubona kwethu, ulwazi ngezinga lokwenziwa komsebenzi lukhombisa ngokungachemile okufeziwe uma kuqhathaniswa nezinhloso ezihleliwe, izinkomba zokusebenza nokuphokophelwe kohlelo olunamasu lokusebenza konyaka lwe-CGS lonyakamali ophele zingama-31 kuNdasa wezi-2020.

Ulwazi ngezinga lokwenziwa komsebenzi we-CGS lonyaka ophele mhla zingama-31 kuNdasa wezi-2020 luhloliwe abacwaningimabhuku bangaphandle futhi umbiko wabo wethulwe emakhasini 116 kuya ku-120. Ulwazi ngezinga lokwenziwa komsebenzi lwagunyazwa futhi nayiBhodi le-CGS.

UMnu. M Mabuza
Umphathi Omkhulu
We-Council for Geoscience
Usuku

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uDkt. H Mathe
Usihlalo
WeBhodi Lomkhandlu we-Geoscience
Usuku

4. ISIFINYEZO SAMASU OMSEBENZI

Umongo womsebenzi we-CGS ubhalwe emithethweni yokusungulwa kwayo. Umbono, umsebenzi, nezimiso ezingumongo wesikhungo zithola ukuchazwa, njengoba kuchazwe kafushane, eMthethweni Wolwazi Olujulile Ngesimo Sokwakheka Komhlaba, uMthetho Ongunombolo 100 we-1993, njengoba uchitshiyelwe, ngendlela elandelayo:

Umbono

Umphakathi onempumelelo noguqukile okhuthazwa izixazululo ezilethwa ulwazi olujulile ngesimo sokwakheka komhlaba.

Umsebenzi

- Umsebenzi we-CGS ukufaka isandla eNingizimu Afrika enempumelelo ngokwenza lokhu:
- Ukuhlinzeka ngamabalazwe okufunda ngokujulile ngesimo sokwakheka komhlaba ngendlela yokubambisana, ehlelekile futhi ehlukaniswe ngezihloko nokwenza ucwaningo ngesimo sokwakheka komhlaba emhlabeni owomile nasolwandle lomhlaba waseNingizimu Afrika, njengoba ithunyiwe, ukwenza lokhu:
- Isize ngentuthuko ezokumbiwa, ezamandla nezolimo;
- Isize ekuhlolweni nasekuphathweni okusimeme kwemithombo yezimbiwa, yamanzi atholakala ngaphansi komhlaba nemithombo yesimo sokwakheka komhlaba etholakala endaweni esizungezile;
- Isize ekudwetshweni kwamabalazwe nokuchazwa kobunjiniyela besimo sokwakheka komhlaba nezingozi ezidalwa isimo sokwakheka komhlaba; kanye
- Nokweseka ukuhlelwa kokuthuthukiswa kwengqalasizinda.
- Ukusebenza njengesiphathimandla sikazwelonke sokweluleka ngokungcoliswa kwemvelo nezingozi ezidalwa isimo sokwakheka komhlaba.
- Ukuhlinzeka njengendawo yokugcina ulwazi nenkundla yokusabalalisa ulwazi esiza ngokuthathwa kwezinqumo ezingenzeka ngokwangempela nokutholakala kolwazi olufanelekile kubabambiqhaza abafanelekile.
- Ukwenza umsebenzi ngendlela eyeseka uguquko nokufanele kwenziwe ukuze kuthuthuke izwe lonke.

Izimiso Ezingumongo

- Ukusungula Izinto Ezintsha: Ukuxazulula izinkinga ngokuqamba amasu amasha enza inzuzo kubabambiqhaza base-CGS;
- Ukwehlukahlukana: Ukukhuthaza indlela yokusebenza efaka bonke abantu futhi ehlonipha ukufaka isandla kwabantu abehlukahlukene base-CGS;
- Ukwenza Umsebenzi Omuhle Kakhulu: Ukuzama ukufinyelela ezingeni eliphezulu ngokukhethekile kukho konke i-CGS ekwenzayo;
- Ukukwazi Ukuziphendulela: Ukuzibekela imigomo e-SMART ehambisana nokukuthathela kuwe nokuzinikela ukufeza imiphumela elangazelelwe;
- Ukufunda: Ukwakha isikhungo sokufunda ngokuthuthukisa abasebenzi okuqhubekayo; kanye
- Nosizo: Ukuhlinzeka ngosizo olugculisayo nolunempumelelo kubo bonke, ngokungaguquki.

Imigomo yamasu omsebenzi ehambisana nemiphumela

I-CGS ithathe isu lomsebenzi lokukhuthaza ukusimama kwesikhungo ngesikhathi esiguqukayo sokuphathwa kwezwe, ezomnotho, umphakathi, kanye nesimo sezesayensi nezobuchwepheshe. Izinhloso zamasu okusebenza kanye nemisebenzi ehlobene nazo, ezikhonjiswe ngezansi (Isithombe 2), kuhloswe ngazo ukuguqula indlela yokwenza amasu okusebenza kwe-CGS ukuze kuqhutshekwe nokwenziwa komsebenzi ongumongo okunomthelela.

Umphakathi onempumelelo noguqukile okhuthazwa izixazululo ezilethwa ulwazi olujulile ngesimo sokwakheka komhlaba

	Izinhloso Zamasu Okusebenza e-CGS	Uhlelo Lokuhlola Umsebenzi we-CGS
1	Ukusimama Ngokwezezimali	Ukuqinisekiswa kokwenziwa kwemisebenzi yokuphathwa kwezimali ngempumelelo nangokugculisayo kanye nokuthola ukuxhaswa ngezimali ngokwenziwa kwemisebenzi ngokuhlanganyela kanye nokubambisana. Ukuthola ukuxhaswa ngezibonelelo okwengeziwe ukuze kusimamiswe ukusebenza kwe-CGS ukuze kwesekwe umsebenzi nokufanele kwenziwe ezweni lonke.
2	Ukugculisa Nokuphumelela Kwesikhungo	Izinqubomgomo, izinhlelo, izinqubo nemigomo; izinhlelo zobuchwepheshe ezeseka izinqubomgomo, izinhlelo nezinqubo; ukubambelela ezindleleni ezilungile zokusebenza ukuze kufezwe ukuphatha okusimeme, nezinguquko kwezomnotho ukuze kukhuthazwe ukukhula kokuxhaswa ngezimali kwebhizinisi nokubambelela ezindleleni ezilungile zokusebenza.
3	Abasebenzi Abanikwe Amandla, Abaguqukile, Abakhuthazekile Nabacijwe Ngamakhono	Ukwakha isimo somsebenzi esihehayo; ukuthuthukisa nokunika amandla abasebenzi abanekhono, nokuthuthukisa nokuzinikela ekwenzeni izinguquko kubasebenzi nokwehlukahlukana.
4	Ukwenziwa Komsebenzi	Ukwenza izinhlelo zokudweba amabalazwe nocwaningo ezintsha ezihlanganisiwe, ezihlukaniswe ngezihloko nezihlelekile nokwenza imisebenzi eyenziwa ngamasu esikhona vele.
5	Ukweluleka, Ukusebenzisana Nababambiqhaza Nokuphathwa Kolwazi	Ukuphatha ulwazi lokufunda ngokujulile ngesimo sokwakheka komhlaba, imininingwane nolwazi ukuze kubhekanwe nohlelo olusha oluhlanganisiwe lokudweba amabalazwe; ukusabalalisa nokwenza ulwazi lokufunda ngokujulile ngesimo sokwakheka komhlaba lufinyeleleke nokweluleka ngalo, imininingwane nolwazi, ukuze kwengezwe ukwaziwa kwe-CGS; Uhlelo Lokufunda Kabanzi Ngesimo Sokwakheka Komhlaba Losomaqhinga; ukusebenza njengesiphathimandla sezingozi ezidalwa isimo zokwakheka komhlaba eziphathelene nengqalasizinda nentuthuko. Ukwenza ngcono ubudlelwane bababambiqhaza nokubambisana nezikhungo ezifana nayo ngokwamasu, umkhakha ozimele kanye nomphakathi jikelele.

Isithombe 2: Imiphumela yamasu okusebenza e-CGS ehlobene nezinhloso zamasu okusebenza nezinyathelo.

5. IZINQUBOMGOMO EZISEMTHETHWENI NEZINYE IZINQUBOMGOMO EZIWUMHLAHLANDLELA

Umthetho Wokuphathwa Kwezimali Zikahulumeni (i-PFMA) (Umthetho Ongunombolo 1 we-1999) ufake ohlwini i-CGS Njengebhizinisi Likahulumeni Elisohlelweni 3 A.

Umthetho Wokuchitshiyelwa Kokufunda Ngokujulile Ngesimo Sokwakheka Komhlaba Umthetho Ongunombolo 16 wezi-2010 wawelula ngokuphawulekayo umsebenzi we-CGS ngalezi zigaba 4(c), 4(eA), 4(f), 5(b) no-8 wethula umsebenzi omusha we-GGS wokwamukela ulwazi lokufunda ngokujulile ngesimo sokwakheka komhlaba kulabo abanamalungelo okumba ezimayini nabahlwayayo kanye nasekubuyekezweni nasekuhlolweni kwemibiko yobuchwepheshe yesimo sokwakheka komhlaba, ukulondolozwa kwezinsiza nezindawo ezithile zikazwelonke zokufunda kabanzi ngesimo sokwakheka komhlaba kanye nokuqokwa Kwekomidi Lezikhalo Lobuchwepheshe Bokwakheka Kwesimo Somhlaba. Le mihlinzeko yeqiwa ekumenyezelweni okwamemezela ukwaziswa Komthetho Wokuchibiyela owaqala mhla lu-1 kuNtulikazi wezi-2012 ngenxa yokuba yindlala kwezinsiza ukuze kuqaliswe umsebenzi. I-CGS isizihlelile ukuze izilungiselele ukuthi kuqalwe ukusebenza

ngalezi zinhlinzeko ngezikhathi ezahlukene. Lokhu kufaka ukukhula kwesikhungo ngaphakathi kuphokophelwe ukwenziwa komsebenzi waso ngokugcwele ngokuphela komzungezo Wohlaka Lokusetshenziswa Kwemali Lwesikhathi Esimaphakathi (I-MTSF).

Umsebenzi we-CGS, njengoba uchazwe eMthethweni Wokufunda Ngokujulile Ngesimo Sokwakheka Komhlaba njengokuchitshiyelwa kwawo, ufinyezwe ngale ndlela elandelayo:

Ucwaningo lwesimo sokwakheka komhlaba nokuphathwa kolwazi: I-CGS icwaninga izinhlobonhlobo zokufunda ngokujulile ngesimo sokwakheka komhlaba ngaphezulu komhlaba nangaphansi, emhlabeni owomile nasolwandle. Lokhu kufaka ukufunda ngesimo sokwakheka komhlaba, ukufunda ngesimo samakhemikhali asemhlabeni, ukufunda ngesimo sokwakheka komhlaba ngokokuma kwawo, ukufunda ngobunjiniyela besimo sokwakheka komhlaba, ukufunda ngesimo sokwakheka komhlaba ngokwezomnotho, izingozi ezidalwa isimo sokwakheka komhlaba, nokufunda ngamanzi akhona ngaphansi komhlaba. I-CGS inomsebenzi futhi wokukhuthaza ukuthuthukiswa kwemithombo yezimbiwa nokuqala imisebenzi yemithombo yamandla ezweni. Isikhungo senza le misebenzi ikakhulukazi ngokuxhaswa uhulumeni kanye, ngokuncane, ngokusebenzisana nezikhungo ezizimele nezikahulumeni, kufaka nezikhungo zemfundo ephakeme. I-CGS inalo msebenzi olandelayo, phakathi kweminye:

- Umsebenzi wokwalusa kuzwelonke imininingwane yolwazi olujulile ngesimo sokwakheka komhlaba nokusatshalaliswa kwayo kubabambiqhaza, kanye
- Nokubuyekezwa kwayo yonke imibiko yobuchwepheshe yesimo sokwakheka komhlaba nokunika izeluleko ngokuthuthukiswa kwengqalasizinda ezweni.

Ukuphathwa kwezinsiza nezindawo eziningana zokufunda ngesimo sokwakheka komhlaba kuzwelonke: Lokhu kufaka Ithala Lamashubhu Emigodi, Amaqoqo Amafa Okufunda Ngesimo Sokwakheka Komhlaba Kuzwelonke (Imnyuziyamu Yokufunda Ngokujulile Ngesimo Sokwakheka Komhlaba), Umtapowolwazi Wokufunda Ngokujulile Ngesimo Sokwakheka Komhlaba Kazwelonke kanye Nenethiwekhi Yamathuluzi Okukala Nokuqopha Ukudlidliza Kokuzamazama Komhlaba Kuzwelonke.

Umsebenzi wokweluleka: Kuncike kokutholwe ocwaningweni okutholakale ngokwemisebenzi emininingi yayo, i-CGS inomsebenzi wokweluleka umbambiqhaza wayo oyinhloko, uNgqongqoshe Wezimbiwa, njengoba kuchazwe Umthetho Wolwazi Olujulile Ngesimo Sokwakheka Komhlaba, uMthetho Ongunombolo 100, ezindabeni eziphathelene nezimbiwa. I-CGS iphinde futhi yenze imisebenzi yokweluleka kuzwelonke iziphathimandla zendawo, zezifundazwe, zikazwelonke nezamanye amazwe ngezingozi eziphathelene nesimo sokwakheka komhlaba nezindaba zesimo sokwakheka komhlaba nemvelo esizungezile.

Ukuqeqesha nokuthuthukisa: I-CGS izinikela kakhulu ekuqeqesheni, ukuthuthukisa nokuthola amakhono kwabasebenzi bayo ngokuqeqeshwa nemifundaze. Isebenzisana futhi nezikhungo zemfundo ephakeme ukuze ikhuthaze ucwaningo, ukuqeqesha, nokuthuthuka kososayensi abafunda ngokujulile ngesimo sokwakheka komhlaba.

Ezinye izinqubomgomo eziyimihlahlandlela

Njengoba kunesidingo esiphuthumayo sokubhekana nokufanele kwenziwe kuzwelonke, i-CGS iqinisekisa ukuthi imodeli yebhizinisi nemisebenzi yayo yonke ibhekana nale miphumelao yamasu kazwelonke elandelayo ngokuhambisana Nombono Wohlelo Lwentuthuko Kazwelonke (i-NDP) yowezi-2030:

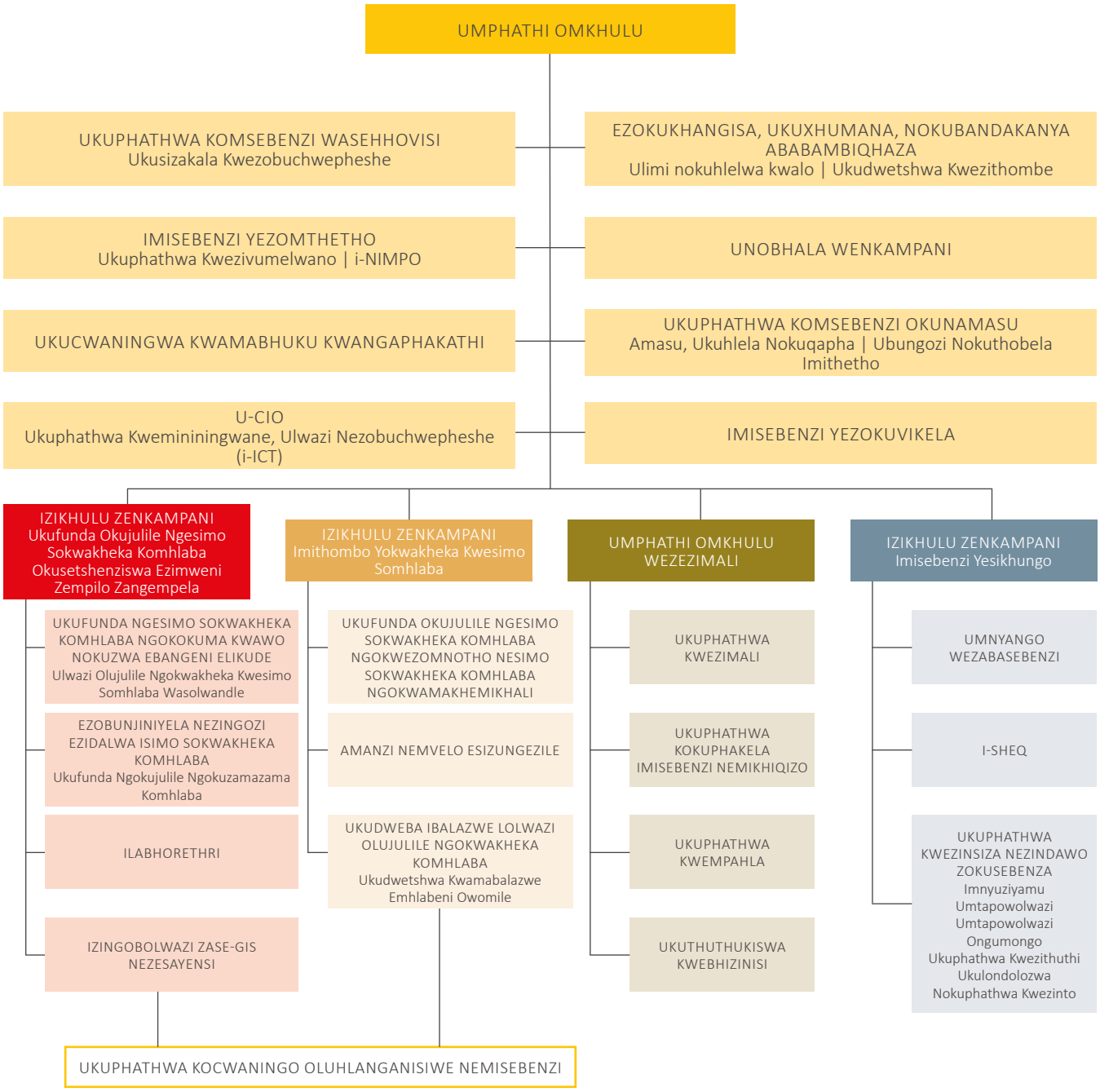
- **Umsebenzi ohloniphekile ngokukhuliswa komnotho:** Ukwengeza imihlomulo yezimbiwa ezweni ngokukhipha imininingwane yokufunda ngokujulile ngesimo sokwakheka komhlaba nemisebenzi ukuze kwengezwe ingqalasizinda yohlelo lwezitimela, amanzi namandla;
- **Abasebenzi abanekhono abaqeqeshekile ukuze kwesekwe umgudu wokukhula ofaka zonke izinto:** Ukukhuthaza ukuthuthukiswa kwamakhono ezesayensi, okusingatha nokuphatha/ukuhola, nasekwakhiweni kwemikhiqizo, izinhlelo nemisebenzi;
- **Inethiwekhi yengqalasizinda yezomnotho egculisayo, esebenza kangcono nesheshe ithathe izinyathelo:** Okufakwe imininingwane ngokufunda okujulile ngesimo sokwakheka komhlaba nemisebenzi kufaka isandla ekuthuthukisweni kwengqalasizinda yaseNingizimu Afrika yezomnotho yamalahle, igesi, ugesi nemithombo yamanzi;

- **Imiphakathi yasemakhaya ephila kahle, elinganayo nesimeme enokudla okwanele kwabo bonke abantu:** Ukusiza kwe-CGS ekuthuthukiseni iNingizimu Afrika nabantu bayo ngokwenza kangcono ukuthuthukisa ingqalasizinda, ukumba ezimayini nezokuvakasha eziphathelene nesimo sokwakheka komhlaba;
- **Impahla yemvelo esizungezile nemithombo yemvelo evikelwe kahle futhi eyenziwa ngcono ngokuqhubekayo:** Ukwenza ucwaningo oluphathelene nokukhipha amanzi ane-esidi ezimayini (i-AMD), ukushintsha kwesimo sezulu nobuchwepheshe bokuqoqwa kwekhabhoni nokugcinwa kwayo, kanye
- **Nemisebenzi yomphakathi egculisayo, enempumelelo nethambekele entuthukweni kanye nobuzwe obunikwe amandla nobufaka konke:** Ukuthuthukiswa kwezinhlelo zokulawula zase-CGS ezihambisana nezimfuneko zezomthetho kanye nemisebenzi kazwelonke ebheka ukulingana ngokobulili nokuqasha ngokulinganisa (i-EE).

Ngaphezu kwe-NDP ne-MTSF, izinhloso ze-CGS zihlelelwe ukweseka izinhloso zoMnyango Wezimbiwa Namandla (i-DMRE), ukugxila kwayo okuwukuthuthukisa intuthuko esimeme yokusebenza kwezimayini, izimbiwa nokuqala imisebenzi yemikhakha yaphethiloli. Ezinye izinhloso ze-DMRE ezesekwa yi-CGS futhi ehambisana nazo zifaka ukufaka isandla ekuthuthukisweni kwamakhono, ekusizeni ukwenzeka kwezinguquko emikhakheni yemisebenzi yezimayini, izimbiwa namandla, kanye nokuba nomthelela ocwaningweni olunesidingo nentuthuko okweseke imisebenzi esimeme yokuhlolwa kwesimo somhlaba. I-CGS ithola ukwesekwa okunamasu ku-MTSF kahulumeni yowezi-2014 ukuya kowezi-2019 ne-MTSF yowezi-2019 ukuya kowezi-2024, Isimemezelo Sababambiqhaza Samasu Okusebenza Sokukhula Okusimeme Nezinguquko Ezinohlonze Zemboni Yezimayini yaseNingizimu Afrika ye-DMRE, Nomthetho Odingidwayo Wesayensi yowezi-2019, Umnyango Wobuchwepheshe Nokusungulwa Kwezinto Ezintsha (i-DSI).

6. ISAKHIWO SESIKHUNGO

Umdwebo okhombisa isakhiwo sesikhungo uchaza isakhiwo sokubika sase-CGS (Isithombe 3) esakhelwa ukweseka ukusebenza kwayo okugculisayo, okunempumelelo nokunamandla nesakhiwo SeBhodi Labaqondisi nabaphathi abakhulu. Ithimba labaphathi abakhulu base-CGS lifaka Umphathi Omkhulu wase-CGS futhi libika kwisiphathimandla esengamele umsebenzi (Ibhodi lase-CGS, bheka Ingxenye C isigaba 2.1 no-2.2). U-CEO wesekwe yithimba labaphathi abengamele imisebenzi emine: Imithombo Yokwakheka Kwesimo Somhlaba, Ukufunda Okujulile Ngesimo Sokwakheka Komhlaba Okusetshenziswa Ezimweni Zempilo Zangempela Nemisebenzi Yesikhungo. Imininingwane yelungu ngalinye lethimba labaphathi abakhulu ihlinzekwe ekhasini 27.



Isithombe 3: Isakhiwo sesikhungo sase-CGS.

7. ITHIMBA LE-CGS LABAPHATHI ABAKHULU

UMPHATHI OMKHULU:
uMnu. Mosa Mabuza

UMPHATHI OMKHULU WOKUFUNDA NGOKUJULILE NGESIMO SOKWAKHEKA KOMHLABA: uNks. Refilwe Shelembe

UMPHATHI OMKHULU WOKUFUNDA NGOKUJULILE NGESIMO SOKWAKHEKA KOMHLABA OKUSETSHENZISWA EZIMWENI ZEMPILO ZANGEMPELA: uDkt. David Khoza

UMPHATHI OMKHULU WEZEZIMALI: uMnu. Leonard Matsepe

UMPHATHI OMKHULU WEMISEBENZI YESIKHUNGO: uDkt. Jonty Tshipa

Ingxenye B: Imininingwane Yezinga Lokwenziwa Komsebenzi

Ososayensi bokufunda ngokujulile ngesimo sokwakheka komhlaba benza umsebenzi wokucoshela ulwazi emiphakathini Esifundazweni saseMpumalanga Kapa

1. UMBIKO WOMCWANINGIMABHUKU-JIKELELE: IZINHLOSO EZINQUNYWE NGAPHAMBILINI

Umcwaningimabhuku-Jikelele wenza izinqubo zokucwaninga amabhuku ezidingekayo ngemininingwane yezinga lokwenziwa komsebenzi ukuze kunikwe isiqiniseko esifanelekile esiyisiphetho sokucwaningwa kwamabhuku. Isiphetho sokucwaningwa kwamabhuku ngezinga lokwenziwa komsebenzi kusetshenziswa izinhloso ezinqunywe ngaphambilini sifakwe embikweni owethulelwa abaphathi, namaphutha aphawulekayo abikwa ngaphansi kwesihloko Sezinhloso Ezinqunywe Ngaphambilini esigabeni Sombiko Ngezinye Izidingo Zezomthetho Nezokulawula embikweni Womcwaningimabhuku-Jikelele.

Umbiko Womcwaningi-mabhuku Jikelele, ushicilelwe Njengengxenye E: Imininingwane Yezezimali, iqukethwe ukusukela ekhasini 112 kuya ekhasini 154.

2. ISIFINYEZO NGEZINGA LOKWENZIWA KOMSEBENZI WE-COUNCIL FOR GEOSCIENCE

Isimo okwenziwa umsebenzi ngaphansi kwaso

I-IMMP yase-CGS onyakeni wayo wesithathu. Ngalolu hlelo lokudweba amabalazwe oluningiliziwe, i-CGS yenza umsebenzi wayo wokuqoqa, ukuhlanganisa, ukutholakala nokusabalalisa ulwazi lokufunda ngokujulile ngesimo sokwakheka komhlaba olusezingeni eliphezulu, imininingwane nolwazi lweNingizimu Afrika ngokuhambisana Nomthetho Wolwazi Olujulile Ngesimo Sokwakheka Komhlaba, uMthetho Ongunombolo 100 we-1993, njengoba wachitshiyelwa ngowezi-2010. Umsebenzi wase-CGS ukhiphe imikhiqizo ehlukahlukene yokufunda ngokujulile ngokwakheka kwesimo somhlaba ukuze

Lesi sigaba sombiko sihlinzeka imininingwane ebalulekile yezinga lokwenziwa komsebenzi ekhombisa okufezweyi-CGS ekwenzeni umsebenzi. Imininingwane ifakazela ukuphatha kwesikhungo okunempumelelo, ukuhlela, ukwaba imali, ukuqaliswa kwemisebenzi, ukuqapha nokuhlola, kanye nokubika. Iphinde futhi ifakazele usizo oluneminxa emibili lokuhlela nokuphatha imizamo nemisebenzi ukuze kufezwe imiphumela elangazelelwe.

Imininingwane yokwenziwa komsebenzi iqinisekisa ukuhambisana nemiphumela/izinhloso ezinamasu futhi ikhombisa okufeziwe uma kuqhathaniswa nezinkomba zokusebenza nokuphokophelwe okuhlonzwe ezinhlelweni ezinamasu, izinhlelo zokusebenza zonyaka nesabelomali.

yeluleke ababambiqhaza abehlukahlukene ngokuhlinzekwa kwemininingwane yokufunda ngokujulile ngesimo sokwakheka komhlaba ukuze kubhekwe izinselelo zezwe zomphakathi nezinto okufanele zenziwe ukuze kwenzeke intuthuko. Onyakeni obuyekezwayo, i-CGS yaqalisa izinhloso zayo ezinamasu ngokusebenzisa izihloko ezingumongo eziyisihlanu (ezisohlwini ngezansi kanye nakulokhu okugqamile ngokwenziwa komsebenzi) futhi lokhu kwanika umhlahlandlela wemisebenzi emisebenzini yayo yezomthetho, ezohwebo nezokubambisana.

- **Ukufunda ngokujulile ngesimo sokwakheka komhlaba kwenzelwa imithombo yezimbiwa namandla:**

Izinhlelo ze-CGS zibeka isikhungo endaweni yokuthi ilandele umyalelo kaNgqongqoshe Wezimbiwa Namandla, uMnu Gwede Mantashe (i-MP), ukuze iNingizimu Afrika ibambe ebuncaneni ama-5% esabelomali sokuhlolwa kwesimo somhlaba emhlabeni wonke esicishe sibe izigidigidi ezingama $10 eminyakeni ezayo emithathu kuya kwemihlanu. Ukuhlinzekwa ngolwazi olubalulekile lokufunda ngokujulile ngokwakheka kwesimo somhlaba olukhishwa ngaphambi kokuqala komsebenzi ngenye yezinto ezibalulekile ekwengezeni imisebenzi yokuhlola izimbiwa, emininingi yayo engaholela emisebenzini yokusetshenziswa kwezimbiwa, ngaleyo ndlela kukhuliswe ukuheha kweNingizimu Afrika njengendawo yokutshala izimali. Umhlaba usuwonke ubhekene nokukhula okukhulu okulindelekile kokudingeka kwezimbiwa namandla ngenxa yokwanda ngokuphindwe kabili okulindelekile kwenani labantu emhlabeni eminyakeni engama-20 ezayo. Ukuthuthukiswa nokusetshenziswa okusimeme kwemithombo yamandla nezimbiwa, okudinga imodeli enezingqimba eziningi okufaka ucwaningo oluyisisekelo nolusetshenziswa ezimweni zempilo zangempela.

Ukuze iphonse esivivaneni esihlokweni semithombo yezokumbiwa nezamandla, i-CGS iyaqhubeka nokukhiqiza ulwazi ngemisebenzi efana neyasensimini yamalahle yase-Molteno-Indwe, ukuchaza ngongqimba lomhlaba oluqinile olungaphezulu lwaseNingizimu Afrika,e-Griqualand West, eLimpopo nase-Bushveld, nemisebenzi yaseNingizimu Afrika yamandla okushisa okutholakala ngaphansi komhlaba okungenzeka kube khona.

- **Ukufunda ngokujulile ngesimo sokwakheka komhlaba kwenzelwa ezempilo, amanzi atholakala ngaphansi komhlaba nemvelo esizungezile:**

Ngokuphathwa kwemisebenzi yezimayini ezingasanakiwe futhi ezingenabanikazi eNingizimu Afrika eyizibopho zombuso ezincike ekwenzekeni kwezinto ezithile (noma izimayini ezinganakiwe noma ezingenabanikazi) nemisebenzi yendawo yasezimayini nokuphathwa kwamanzi (noma amanzi asezimayini), i-CGS yeluleka i-DMRE, ikakhulu ngokungcoliseka kwemvelo, ngaleyo ndlela ikhuthaza ukulondolozwa kwemvelo. Le misebenzi emibili yakhonjiswa izinsika ezimbili

eziyinhloko: ucwaningo (isb. ukuqapha izinga lomoya, ukuhlola izimbiwa zihlolelwa ukuhlolwa kwangomuso, ukuhlanzwa kwamanzi, ukuba khona kanyekanye kokumba ezimayini nokwehlukana kwemvelo) nokwakha (ukwakhiwa kwemisele nokuvalwa kwemigodi). Onyakeni obuyekezwayo, Umsebenzi Wamanzi Asemayini waqala ukulawula ukungena kwamanzi nezinyathelo zokuhlanzwa kwamanzi. Umsebenzi Wezimayini Ezingasanakiwe Nezingenabanikazi wavala imigodi yezimayini engama-21 enobungozi obukhulu ezindaweni ezahlukahlukene zezwe.

Ngokokuqala emlandweni wayo, i-CGS ikhiqize amabalazwe amane amanzi angaphansi komhlaba esikali se-1:100 000 (kanye nezincazelo zawo) ezindaweni ezithile Esifundazweni saseNyakatho Kapa. Ngamaqoqo olwazi lokufunda ngolwazi olujulile ngesimo sokwakheka komhlaba ahlanganisiwe emikhakha ehlukene kusetshenziswa izindlela zokufunda ngemishini Emsebenzini Wokudwetshwa Kwebalazwe laseMaluti Esifundazweni saseFreyistata, i-CGS yakhiqiza futhi imodeli eyi-3D lapho kungenzeka kube khona amanzi angaphansi komhlaba. I-CGS yenza futhi ukudweba amabalazwe amanzi angaphansi komhlaba Esifundazweni saseMpumalanga Kapa (eMakana). Lapha, ukwenza isifanekiso samanzi angaphansi komhlaba sekuqediwe, imithombo yamanzi angaphansi komhlaba okungenzeka ibe khona seyihlonziwe nezindawo eziningana okuzombiwa kuzo kunyakamali ozayo zakhethwa. Phezu kwalokho, i-CGS yakhe ithuluzi elisha lokudweba amabalazwe amanzi angaphansi komhlaba elisebenzisa amaqoqo olwazi lokufunda ngokujulile ngokwakheka komhlaba ahlanganisiwe futhi emikhakha ehlukene kusetshenziswa izindlela zokufunda ngemishini.

- **Ukufunda ngokujulile ngesimo sokwakheka komhlaba kwenzelwa ingqalasizinda nokusebenzisa umhlaba:**

Ukuzinikela kweNingizimu Afrika ohlelweni lwengqalasizinda kubalulekile. I-CGS iphendule kulolu hlelo ngokudweba ububanzi bedwala i-dolomite kuzwelonke ukuze lisetshenziswe njengommeleli wokuphawula izindawo okungazika kuzo umhlaba. Ukuze kwenzeke lokhu, ububanzi bezingqimba ze-dolomite kuzwelonke bukhonjisiwe kusetshenziswa imigodi eyaziwayo. Phezu kwalokho, amathuluzi obuhlakani obenziwe ngobuchwepheshe asakhiwe ukuze kuqagelwe ukuqala kokuzika komhlaba ezindaweni ezine-dolomite. Inethiwekhi kazwelonke yeziteshi zokuzwa ukunyakaza komhlaba iyaqhubeka nokuzwa ukuzamazama komhlaba kwemvelo nalokho okubangwa izimayini eNingizimu Afrika ngesikhathi esiqhubekayo esingamahora angama-24.

- **Ukusungulwa kwezinto ezintsha ekufundeni ngokujulile ngesimo sokwakheka komhlaba:**

Njengomkhandlu wesayensi, i-CGS ikhuthaza ukusungulwa kwezinto ezintsha kwisayensi kuyo yonke imikhakha yokufunda ngokujulile ngesimo sokwakheka komhlaba, ikakhulu ekwenziweni kwayo le misebenzi. Ukuze kwenzeke lokhu, i-CGS yamukele indlela yomhlaba ebheke enguqukweni yesine yokusebenza kwezimboni (i-4IR) ngokusebenzisa ubuchwepheshe obuphezulu bokufunda ngemishini ukuze kuthuthukiswe ukukwazi ukuqagela emikhakheni efana nokudweba amabalazwe obungozi obudalwa isimo sokwakheka komhlaba (ukuzika komhlaba namathuba okwenzeka nokuvama kokuzamazama komhlaba) nokudweba amabalazwe amanzi. Ithuluzi le-software lokudweba amabalazwe amanzi lashicilelwa esikhathini samanje sokubika.

- **Ubusomaqhinga bokufunda ngokujulile ngesimo sokwakheka komhlaba:**

Njengehhovisi eliphethe likanomphela Lesikhungo Sokuhlolwa Kwesimo Sokwakheka Komhlaba sase-Afrika Ngenhloso Yokudweba Amabalazwe (i-OAGS), I-CGS ikhuthaza ukwakheka kobudlelwane obusondele phakathi kwamazwe ase-Afrika angamalungu ocwaningweni lokufunda ngokujulile ngokwakheka kwesimo somhlaba. I-OAGS iqhuba uhlelo lokuqeqesha lwamazwe amaningi njalo ngonyaka ngaphansi komsebenzi we-PanAfGeo oxhaswe ngezimali yiNyunyana yaseYurophu. Lo msebenzi, lapho i-CGS idlala indima ebalulekile, ukhiqize abafundi abaqeqeshiwe abayi-1 074 emazweni ayi-16 ase-Afrika. I-CGS yabandakanyeka futhi ekushicileleni onyakeni obuyekezwayo izincwadi zezindaba eziningana ezagqamisa imisebenzi ebalulekile ye-OAGS kanye namazwe angamalungu ayo.

Phezu kwalokho, i-CGS isebenzisana nezikhungo zokuhlolwa kwesimo somhlaba zase-Namibia nase-Malawi emisebenzini yokudweba amabalazwe acacile anezingxenye eziqinile zokuqeqesha nokudluliswa kwamakhono ukuze kuthuthukiswe abasebenzi.

Umsebenzi we-CGS

Ukudwetshwa kwamabalazwe okufunda ngokujulile ngesimo sokwakheka komhlaba ngezikali ezahlukene umsebenzi ongumongo we-CGS. Onyakeni obuyekezwayo, i-CGS yaqhubeka nohlelo lwayo lokudweba amabalazwe aningiliziwe ngesilinganiso-bukhulu sika-1: 50 000, futhi yengeza indawo edwetshiwe yaze yafika kuma-8.8%. Lokhu kusekelwe kumabalazwe esimo sokwakheka komhlaba akhiqiziwe. Kunyakamali wezi-2019/2020, i-CGS ikhiqize amabalazwe esimo sokwakheka komhlaba angama-32, amabalazwe obuchwepheshe besimo sokwakheka komhlaba ngesilinganiso-bukhulu sika-1:50 000 namabalazwe amane amanzi angaphansi komhlaba ngesilinganiso-bukhulu sika-1:100 000, namabalazwe obungozi bokungena kwamanzi esilinganiso-bukhulu sika-1:50 000 eSigodini sase-Witwatersrand.

I-CGS izibandakanya futhi nemisebenzi yokubambisana ejwayele ukukhonjiswa ngale ndlela elandelayo:

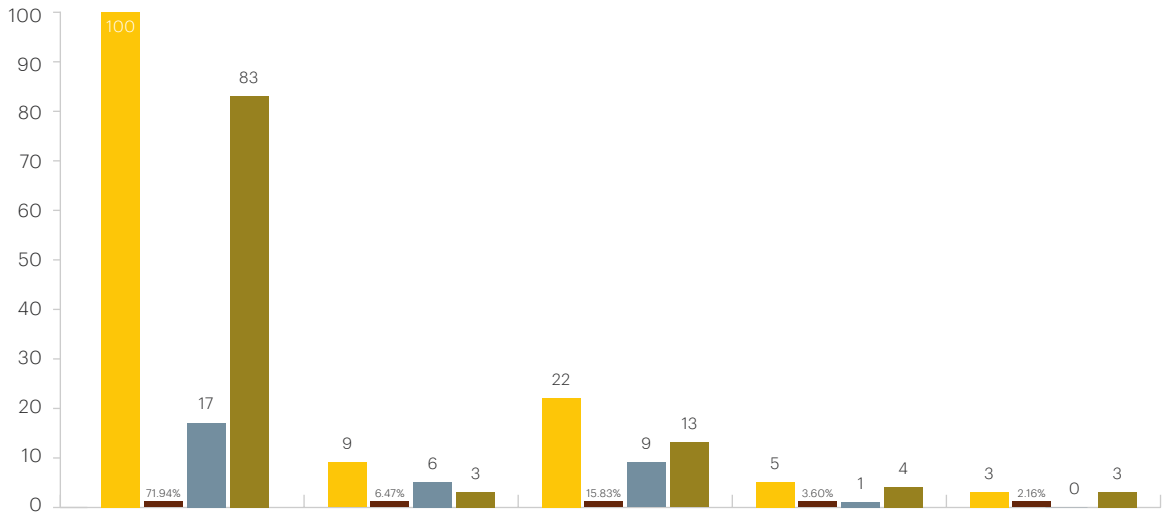
- **Imisebenzi ye-ejensi:** Itholwa ikakhulukazi kweminye iminyango kahulumeni/izikhungo namabhizinisi kahulumeni;
- **Umkhakha ozimele:** Ukusebenzisana nezikhungo zomkhakha ozimele.

I-CGS iphethe ngempumelelo izinsiza nezindawo eziningana zikazwelonke zokufunda ngokujulile ngesimo sokwakheka komhlaba, ezifaka:

- Inethiwekhi yamathuluzi okukala nokuqopha ukudlidliza kokuzamazama komhlaba kuzwelonke, eqapha ukwenzeka nokuvama kokuzamazama komhlaba ezweni nasemhlabeni jikelele; iqapha umsebenzi womsindo ongazwakali njengengxenye yokusebenzisana neSikhungo Sesivumelwano Sokwenqabela Ukuhlolwa Kwezikhali Zenuzi (i-CTBTO);
- Ithala likazwelonke lamashubhu emigodi, elihlinzeka ngeqoqo eliphelele lempahla eyigugu yokufunda ngokujulile ngesimo sokwakheka komhlaba;
- Imnyuziyamu kazwelonke yokufunda ngokujulile ngokwakheka kwesimo somhlaba, ehlinzeka ngolwazi oluyimvela kancane, amasampula ayigugu kwezesayensi namafa esimo sokwakheka komhlaba;
- Umtapowolwazi nesitolo sezincwadi zokufunda ngokujulile ngesimo sokwakheka komhlaba, okuhlinzeka ngezincwadi ezishicilelwe zokufunda ngesimo sokwakheka komhlaba namabalazwe emphakathini, kanye
- Nensiza yokuhlaziya kazwelonke yokufunda ngokujulile ngokwakheka kwesimo somhlaba, ekhona ukuze kuhlaziywe amasampula okufunda ngesimo sokwakheka komhlaba nempahla yezimboni engakaguqulwa.

Indawo yomsebenzi yesikhungo

Onyakeni odlule, i-CGS igxile ezimweni zokuqalisa i-GDIP ngemuva kwalokho yaqasha Umsebenzi Wokukhiphela Ulwazi Emphakathini ukwenza lula umsebenzi wokuphathwa kolwazi nemininingwane phakathi kwesikhungo nababambiqhaza baso abayinhloko. Ukuze kwenzeke lokhu, izibalo Ezisesithombeni 4 zimele inani lababambiqhaza/amakhasimende i-CGS ewasize ngokuwanika ulwazi ngokufunda ngesimo somhlaba nemininingwane ngekwata yokugcina yonyakamali obuyekezwayo. Laba babambiqhaza bafaka izakhamuzi ezizimele, abahloli besimo somhlaba abasafufusa abahambisana nohlelo lwezinguquko olusangumgomo obalulekile wenqubomgomo kahulumeni, abasekela umkhakha, amabhizinisi kahulumeni, izikhungo zemfundo ephakeme nezinkampani zamazwe omhlaba.



	Izimboni/izinkampani	Izikhungo	Amanyuvesi	Izakhamizi ezizimele	Izinkampani zamazwe omhlaba
Inani lezicelo		9	22	5	3
Iphesenti	71,94%	6,47%	15,83%	3,60%	2,16%
Owesifazane	17	6	9	1	0
Owesilisa	83	3	13	4	3

Isithombe 4: Izibalo zolwazi lokufunda okujulile ngesimo sokwakheka komhlaba nokucelwa kwemininingwane e-CGS efaka ikwata yokugcina yowezi-2019/2020.

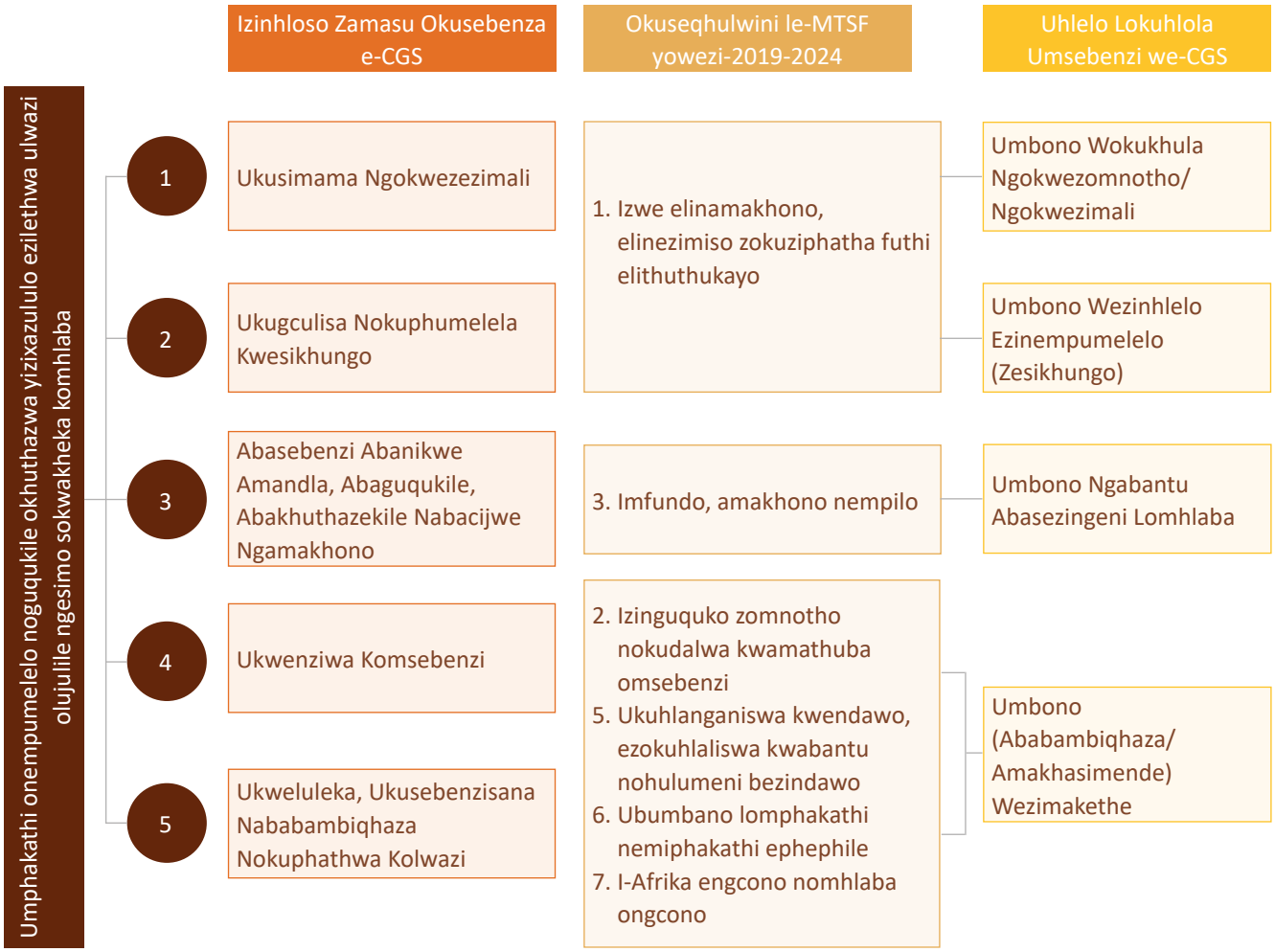
Ukwenziwa kwezinqubomgomo okuyinhloko nezinguquko kwezomthetho

Akukho kwenziwa kwezinqubomgomo okuyinhloko okwenzekile Emthethweni Wokuchibiyela Wolwazi Olujulile Ngesimo Sokwakheka Komhlaba, uMthetho Ongunombolo 16 wezi-2010 ukusukela waqala ukusebenza mhla lu-1 kuNtulikazi wezi-2012. Umthetho Wokuchibiyela ufaka incazelo ebanzi yemisebenzi eyenziwa i-CGS.

Umthetho Wokuchibiyela Ukuthuthuka Kwemithombo yezokumbiwa Nowoyela (i-MPRDA) wezi-2008 uchaza ngokusobala umsebenzi we-CGS kwimininingwane yokufunda ngesimo sokwakheka komhlaba ekhiqizwe ngemisebenzi yokuhlolwa komhlaba eNingizimu Afrika. Ngendlela entsha enamasu, i-CGS iqondanisa imisebenzi yayo nokuvele kamuva ekuchitshiyelweni kwe-MPRDA, Umthetho Kazwelonke Wokuphathwa Kwemvelo, kanye Nomthetho Wokuhlelwa Kwendawo Nokusetshenziswa Komhlaba.

3. ULWAZI NGEZINGA LOKWENZIWA KOMSEBENZI E-CGS

Ngokuhambisana Nesu Lokusebenza le-CGS, kuthathwe indlela yohlelo lokuhlola umsebenzi olufanelekile ukuze kuhlinzekwe ngombiko wokwenziwa komsebenzi wesikhungo uwonke. I-BSC ikala ngokuyisisekelo ukwenziwa komsebenzi yisikhungo ezingeni leyunithi lebhizinisi lenkampani kanye nasezingeni lomuntu ngamunye. Kunezinhloso zamasu eziyisihlanu eziphathelene nekhasimende, inqubo yomsebenzi yangaphakathi, ukufunda nokukhula kanye nemibono yezezimali (Isithombe 5).



Isithombe 5: Izinhloso ezinamasu ezifinyeziwe ze-CGS nokuhlobana kwazo nokuseqhulwini kwe-MTSF yowezi-2019-2024 nohlelo lokuhlolwa komsebenzi wenkampani.

Umbiko wezinga lokwenziwa komsebenzi uchaza kabanzi isimo sesikhungo sokwenza umsebenzi, imikhakha ebanzi okwenziwa kuyo umsebenzi, nezinhlobo zamaklayenti/zababambiqhaza ngokwehlukana abanikwe usizo. Izinhloso, imisebenzi nenqubekelaphambili yemisebenzi nezinhlelo zesikhungo kuchaziwe kafushane.

Ngenhloso yokuhlola izinga lokwenziwa komsebenzi esikhungweni se-CGS, isikhungo sihlele izinkomba zokusebenza, ezifinyeziwe, kanye nokuphokophelwe ekwenzeni umsebenzi ngowezi-2019/2020, ethebuleni eliphelezela lo mbhalo emakhasini 33 ukuya ku-35 (Itafula 1)

3.1 Uhlelo lowezi-2019/2020 Lokuhlola Umsebenzi Wenkampani

Ithebula 1: Uhlelo lowezi-2019/2020 Lokuhlola Umsebenzi Wenkampani

Umbono Wezezimali	UKUSIMAMA NGOKWEZEZIMALI				
Inhloso enamasu 1	Ukusimama Ngokwezezimali				
Izinkomba Zokusebenza	Impumelelo Yangempela ngowezi-2018/2019	Okuphokophelwe Okuhleliwe ngowezi-2019/2020	Impumelelo Yangempela ngowezi-2019/2020	Umehluko phakathi kokuphokophelwe okuhleliwe Nempumelelo Yangempela yowezi- 2019/2020	Ukuphawula ngomehluko
Iphesenti lezindleko zokwenza umsebenzi kuya ezindlekweni eziphelele	Akusebenzi	≤55%	61.04%	+6.04%	Okuphokophelwe akuzange kufezwe. I-denominator yesilinganiso yancishiswa kakhulu ngenxa yokusetshenzwa okugxilile nokutolikwa kolwazi olwaseluvele luqoqiwe onyakeni ongaphambilini.
Iphesenti lezindleko zabasebenzi ukuya ezindlekweni eziphelele	Akusebenzi	≤60%	65.86%	+5.86%	Okuphokophelwe akuzange kufezwe. I-denominator yesilinganiso yancishiswa kakhulu ngenxa yokusetshenzwa okugxilile nokutolikwa kolwazi olwaseluvele luqoqiwe onyakeni ongaphambilini.
Imali engenayo ephuma emisebenzini okusetshenziswana kuyona/ okubanjiswene ngayo	Izi-R30m	Izi-R26.6m	Izi-R29m	Ngaphezu kwezi-R2.4m	Okuphokophelwe kufeziwe. Umsebenzi owengeziwe wezohwebo wenziwa ngesikhathi sonyaka wokugcina obuyekezwayo.
Imali engenayo yoxhaso	Izi-R426.6m	Izi-R414.1m	Izi-R422.4m	Ngaphezu kwezi-R8.3m	Okuphokophelwe kufeziwe. Ukuqaliswa ukusebenza kwe-IMMP kwaholela ekufezweni ngaphezu kokulindelekile futhi nasekuncipheni kwemali engenayo ekhokhwa ngaphambi kokwenziwa komsebenzi.

Umbono Wezinhlelo	IZINQUBOMGOMO, IZINHLELO, IZINQUBO NEMIGOMO; IZINHLELO ZOBUCHWEPHESHE EZESEKA IZINQUBOMGOMO, IZINHLELO NEZINQUBO; UKUBAMBELELA EZINDLELENI EZILUNGILE ZOKUSEBENZA UKUZE KUFEZWE UKUPHATHA OKUSIMEME, NEZINGUQUKO KWEZOMNOTHO UKUZE KUKHUTHAZWE UKUKHULA KOKUXHASWA NGEZIMALI KWEBHIZINISI NOKUBAMBELELA EZINDLELENI EZILUNGILE ZOKUSEBENZA.				
Inhloso enamasu 2	**Impumelelo Nokugculisa Kwesikhungo**				
Izinkomba Zokusebenza	**Impumelelo Yangempela yowezi- 2018/2019**	**Okuphokophelwe Okuhleliwe ngowezi- 2019/2020**	**Impumelelo Yangempela yowezi- 2019/2020**	**Umehluko phakathi kokuphokophelwe okuhleliwe Nempumelelo Yangempela yowezi- 2019/2020**	**Ukuphawula ngomehluko**
Iphesenti lezindleko eziphelele ngokuthengwa kwempahla nokutholakala kwezinsizakalo Emabhizinisini Amancane Kakhulu Naphakathi Nendawo	Isilinganiso esisha	≥30%	48.25%	Akusebenzi*	Okuphokophelwe kufeziwe. Lokhu kudalwe ukusebenza ngokuhlanganyela ukuze kuqhutshekiselwe phambili izinguquko.
Inani lemibiko yokucwaningwa kwamabhuku	0	0	0	0	Okuphokophelwe kufeziwe.

Akusebenzi*: okuphokophelwe okuhlosiwe kwakungesiyona inombolo eqondile yangempela kodwa kwakungukulinganisela.

Umbono Wokufunda Nokukhula	UKWAKHA ISIMO SOMSEBENZI ESIHEHAYO; UKUTHUTHUKISA NOKUNIKA AMANDLA ABASEBENZI ABANEKHONO, NOKUTHUTHUKISA NOKUZINIKELA EKWENZENI IZINGUQUKO KUBASEBENZI NOKWEHLUKAHLUKANA.				
Inhloso enamasu 3	**Abasebenzi Abanikwe Amandla, Abaguqukile, Abakhuthazekile Nabacijwe Ngamakhono**				
Izinkomba Zokusebenza	**Impumelelo Yangempela yowezi- 2018/2019**	**Okuphokophelwe Okuhleliwe ngowezi- 2019/2020**	**Impumelelo Yangempela yowezi- 2019/2020**	**Umehluko phakathi kokuphokophelwe okuhleliwe Nempumelelo Yangempela yowezi- 2019/2020**	**Ukuphawula ngomehluko**
Iphesenti labasebenzi bezesayensi abaneziqu zama-Masters nezobuDokotela	Akusebenzi	≥35%	41.56%	Akusebenzi*	Okuphokophelwe kufeziwe. Lokhu kudalwe ukusebenza ngokuhlanganyela ukuze kuqhutshekiselwe phambili izinguquko.
Izinga lokushiya inkampani kwabasebenzi nokuqasha abasebenzi abasha	1.37%	≤5%	7.99%	+2.99%	Okuphokophelwe akuzange kufezwe. Lokhu kudalwe isinqumo sabaphathi esithathwe ngenhloso yokubhekisisa ukuvalwa kwezinye zezikhala zomsebenzi kuhanjiswana nomyalelo Kahulumeni wokwenza kangcono indlela yokonga imali, kuhlanganisa nokuncishiswa kwesamba semali yokuholela abasebenzi.

Iphesenti lezindleko zokuqeqesha abasebenzi ukuya kwisamba somholo wabasebenzi okufanele sikhokhiswe intela	2.46%	≥2%	3.52%	Akusebenzi*	Okuphokophelwe kufeziwe ngenxa yokugxila kwesikhungo okwengeziwe ekuqeqesheni abasebenzi okuhambisana nezidingo zebhizinisi eziphuthumayo.
Iphesenti labasebenzi abagculisekile	65%	≥75%	69.3%	-5.7%	Okuphokophelwe akuzange kufezwe. Isikhungo sathola izinga lokugculiseka elingamaphuzu angama-69.3%, eliphezulu ngama-4% kunezinga lokugculiseka elatholakala ngowezi-2018/19. Lolu cwaningo lusekelwe ezingeni lokubuya kwabasebenzi elikhulu kakhulu elingama-79%.
Iphesenti labasebenzi abaphila nokukhubazeka	1.59%	≥1.5%	1.66%	Akusebenzi*	Okuphokophelwe kufeziwe. Kwaba khona ukungenelela kokuqwashisa ukuze kukhuthazwe abasebenzi ukuthi bakudalule lokhu.
Izibalo ze-EE, Isilinganiso Sabesilisa Kwabesifazane	49:51	≤50:≥50	49:51	Akusebenzi*	Okuphokophelwe kufeziwe ngenxa yokugxila okwengeziwe ekungeneleleni kokulingana ngokobulili kokubili ekuqasheni abasebenzi kanye nakubasebenzi abalungele ukuqashwa (abanemifundaze).

Akusebenzi*: okuphokophelwe okuhlosiwe kwakungesiyona inombolo eqondile yangempela kodwa kwakungukulinganisela.

Umbono (Ababambiqhaza/ Amakhasimende) Wezimakethe	**UKWENZA IZINHLELO ZOKUDWEBA AMABALAZWE NOCWANINGO EZINTSHA EZIHLANGANISIWE, EZIHLUKANISWE NGEZIHLOKO EZIHLELEKILE NOKWENZA IMISEBENZI EYENZIWA NGAMASU ESIKHONA VELE**				
Inhloso enamasu 4	**Ukwenziwa Komsebenzi**				
Izinkomba Zokusebenza	**Impumelelo Yangempela yowezi-2018/2019**	**Okuphokophelwe Okuhleliwe ngowezi-2019/2020**	**Impumelelo Yangempela yowezi-2019/2020**	**Umehluko phakathi kokuphokophelwe okuhleliwe Nempumelelo Yangempela yowezi-2019/2020**	**Ukuphawula ngomehluko**
Ukufunda ngokujulile ngesimo sokwakheka komhlaba kwenzelwa imithombo yezimbiwa namandla. Inani lemikhiqizo yokufunda ngokujulile ngesimo sokwakheka komhlaba	Isilinganiso esisha	50	54	+4	Okuphokophelwe kufeziwe. Imikhiqizo eyengeziwe iwumsebenzi wezimo ezahlukene ezifana nokusebenzisa osekuvele kukhona okutholakale emsebenzini wocwaningo ovele ukhona.
Ukufunda ngokujulile ngesimo sokwakheka komhlaba kwenzelwa ingqalasizinda nokusetshenziswa komhlaba: Inani lemikhiqizo yokufunda ngokujulile ngesimo sokwakheka komhlaba	Isilinganiso esisha	5	5	0	Okuphokophelwe kufeziwe.

Ukufunda ngokujulile ngesimo sokwakheka komhlaba kwenzelwa ezempilo, amanzi atholakala ngaphansi komhlaba nemvelo esizungezile: Inani lemikhiqizo yokufunda ngokujulile ngesimo sokwakheka komhlaba	Isilinganiso esisha	6	15	+9	Okuphokophelwe kufeziwe. Imikhiqizo eyengeziwe iwumsebenzi wezimo ezahlukene ezifana nokusebenzisa osekuvele kukhona okutholakale emsebenzini wocwaningo ovele ukhona.
Ukusungulwa kwezinto ezintsha ekufundeni ngokujulile ngesimo sokwakheka komhlaba: Inani lemikhiqizo yokufunda ngokujulile ngesimo sokwakheka	Isilinganiso esisha	3	8	+5	Okuphokophelwe kufeziwe. Imikhiqizo yocwaningo eyengeziwe yakhiwa ukuze kukhonjiswe ubuchwepheshe bomsebenzi wase-CGS.
Ubusomaqhinga bokufunda ngokujulile ngesimo sokwakheka komhlaba: Inani lemikhiqizo yokufunda ngokujulile ngesimo	Isilinganiso esisha	3	3	0	Okuphokophelwe kufeziwe.

Inhloso enamasu 5	5 Ukweluleka, Ukusebenzisana Nababambiqhaza Nokuphathwa Kolwazi				
Izinkomba Zokusebenza	**Impumelelo Yangempela yowezi-2018/2019**	**Okuphokophelwe Okuhleliwe ngowezi-2019/2020**	**Impumelelo Yangempela ngowezi-2019/2020**	**Umehluko phakathi kokuphokophelwe okuhleliwe Nempumelelo Yangempela yowezi-2019/2020**	**Ukuphawula ngomehluko**
Inani lama-athikili ashicilelwe emithonjeni yabezindaba	13	16	17	+1	Okuphokophelwe kufeziwe. Umehluko ubangwe intshisekelo yabemithombo yezindaba ngenqubekelaphambili nokubika okuhle ngomsebenzi wase-CGS.
Izinga lokugculiseka kwababambiqhaza	64.9%	≥70%	76%	Akusebenzi*	Okuphokophelwe kufeziwe. Umehluko ungumphumela wohlelo olubanzi lokubambisana nababambiqhaza i-CGS eluqhubile onyakeni obuyekezwayo.
Inani lama-athikili ashicilelwe abuyekezwe ozakwabo babantu abawabhalile	26	22	41	+19	Okuphokophelwe kufeziwe. Kwathathwa okusizayo emathubeni okusebenzisana phakathi kwe-CGS nabalingani bayo abanamasu ukuze kuphokophelwe ukuthuthukisa ulwazi selulonke lokufunda ngokujulile ngesimo sokwakheka komhlaba.
Inani lezincwadi ze-CGS ezishicilelwe	6	10	12	+2	Okuphokophelwe kufeziwe. Ukugxila okwengeziwe ekusetshenzweni nasekutolikweni kolwazi kwakhiqiza izincwadi ezengeziwe.
Inani lokushicilelwe okwenzeka ezingqungqutheleni	136	41	47	+6	Okuphokophelwe kufeziwe. Ukugxila okwengeziwe ekusetshenzweni nasekutolikweni kolwazi kwakhiqiza izincwadi ezengeziwe.

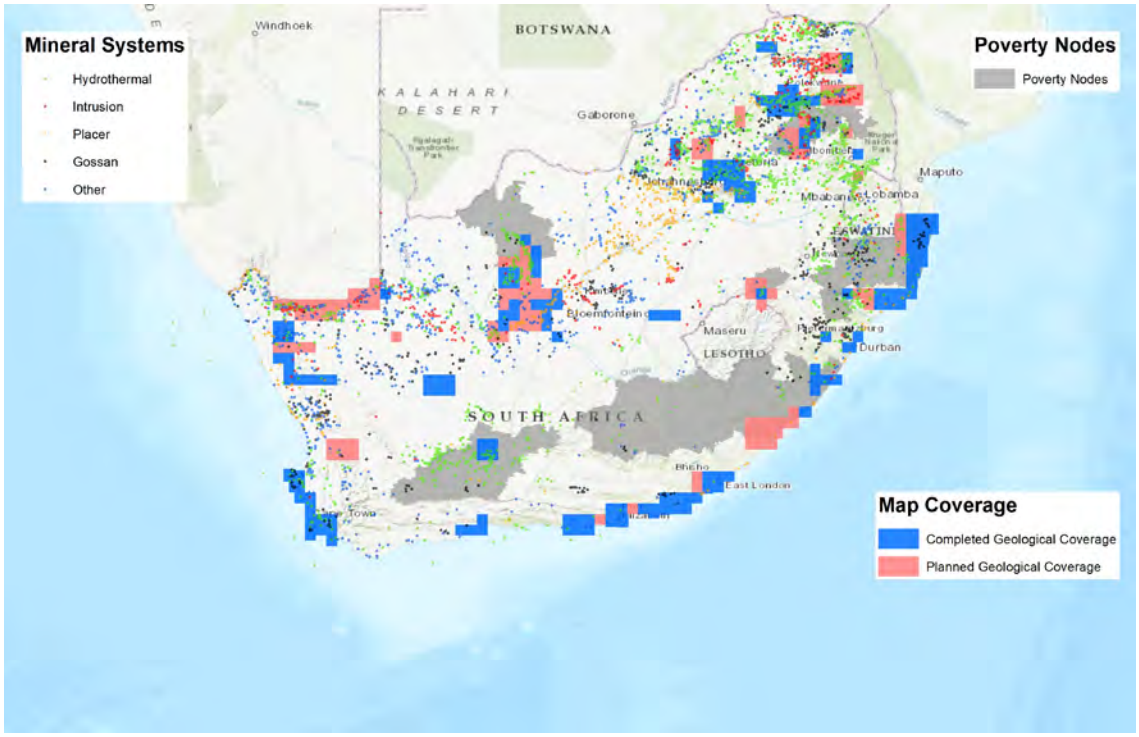
Akusebenzi*: okuphokophelwe okuhlosiwe kwakungesiyona inombolo eqondile yangempela kodwa kwakungukulinganisela.

4. OKUGQAMILE NGOKWENZIWA KOMSEBENZI

4.1. ISETHULO SOHLELO LOBUCHWEPHESHE BOLWAZI OLUJULILE NGOKWAKHEKA KOMHLABA

I-CGS iqalisa ukwenza i-IMMP kazwelonke ngokusebenzisa Uhlelo Lobuchwepheshe Bolwazi Olujulile Ngokwakheka Komhlaba I-GTP yakhiwe ngemisebenzi kazwelonke enamasu yezomthetho, ezokuthunywa, ezohwebo okuhloswe ngayo ukubhekana nezinselelo zomphakathi futhi zifake isandla ekufinyelelweni Embonweni we-NDP yowezi-2030 ngokusebenzisa ulwazi olujulile ngesimo sokwakheka komhlaba. I-GTP ifaka imisebenzi esungulwa futhi yenziwe kuzo zonke izingxenye zezihloko (izimbiwa, amandla, amanzi, ukuthuthukiswa kwengqalasizinda, imvelo esizungezile nokusungulwa kwezinto ezintsha). Ngaphezu kwalokho, i-CGS iyaqhubeka nokwenza imisebenzi ephoqelekile ukuze kufinyelelwe izidingo Zomthetho Wokuchibiyela Wolwazi Olujulile Ngesimo Sokwakheka Komhlaba, UMthetho Ongunombolo 16 wezi-2010 (isb. ukuthuthukisa nokulondolozwa komtapowolwazi ongumongo kazwelonke, noma izizinda eziyizinkomba zesimo sokwakheka komhlaba). I-CGS isebenzisa imisebenzi ekhethiwe ukuze yeluleke i-DMRE ngezindaba zikazwelonke ezibalulekile ngokwamasu. Ukuze kuthuthukiswe futhi kukhuthazwe ukusebenzisana, ikakhulukazi phakathi kwezikhungo zikahulumeni nezomkhakha ozimele zokuhlolwa kwesimo somhlaba, i-CGS ithatha imisebenzi ngaphansi kwezivumelwano zohwebo.

Ukuze kusizwe ukuhlolwa kwemithombo yezimbiwa namandla, i-IMMP yengeza indawo ekhonjiswe kumabalazwe ngesikali esiningiliziwe esisuka kuma-5% ukuya kuma-8% onyakeni obuyekezwayo – yahlinzeka ngolwazi oluyisisekelo oluqoqiwe lwahlanganiswa. I-CGS igxile Esifundazweni saseNyakatho Kapa, njengoba sinokufunda ngokwakheka komhlaba okudidayo okufihlekile, nokuba khona okungenzeka kwezimbiwa namandla. Phezu kwalokho, lesi sifundazwe singesinye salezo ezintula, futhi sidinga ukuhlonzwa nokudwetshwa kwamadwala amasha angaba namanzi. Ungqimba lwe-dolomite, oluningi esifundazweni, ludinga ukukhonjiswa ngendlela efanele. Lokhu kunemithelela ebalulekile ohlelweni lokwakhiwa kwengqalasizinda (bheka Isithombe 6). Inqubekelaphambili nokugqamile kwe-GTP yowezi-2019/2020 kuchazwa ezigabeni ezizolandela.



Isithombe 6: Esigxile kukho kwenzelwa i-GTP (yowezi-2018/2019 kuya kowezi-2019/2020).

ULWAZI OLUJULILE LWEMITHOMBO YEZIMBIWA NAMANDLA NGESIMO SOKWAKHEKA KOMHLABA

Ukumba amalahle ne-uranium e-Springbok Flats Coalfield eLimpopo

Imikhakha yezimbiwa namandla ifaka isandla kakhulu ohlelweni lweNingizimu Afrika lokukhula nokuthuthuka. Isihloko "Solwazi Olujulile Ngesimo Sokwakheka Komhlaba lwemithombo yezimbiwa namandla" senza lula isimo somsebenzi eseseka okufanele kwenziwe ezweni lonke, kufaka nokwenziwa kwemisebenzi yolwazi lwendawo nolwazi olujulile ngesimo sokwakheka komhlaba. Lolu lwazi luheha ukutshalwa kwezimali kwasezweni nokwamanye amazwe ukuze kuthuthukiswe izimbiwa kuqalwe nemisebenzi yemithombo kawoyela. Isihloko sihlose ukufeza izinhloso ezihlanganisa ukwengeza ekuthatheni izimvume zokuhlola nezencithomali, nokutshala izimali okuqondile kwamazwe angaphandle. Iphinde ikhuthaze ukukhula ekutshaleni izimali emkhakheni ozimele futhi ivula ukukhula ngokwezomnotho okusha. Le nhloso engemuva ifaka i-Operation Phakisa – umnotho wolwandle nomnotho oluhlaza. Ekugcineni, umsebenzi kuhloswe ngawo ukwengeza ukweseka ukuhlola, ukuthuthukisa nokukhiqizwa kwegesi yokhethe nokumba ezimayini.

Kufana nezinye izihloko lesi sihloko sikhuthazwa Isigaba 5.1 (c) Somthetho Wokuchitshiyelwa Kolwazi Olujulile Ngesimo Sokwakheka Komhlaba, "ukuze sisebenze umsebenzi wokwalusa kuzwelonke imininingwane yobuchwepheshe ngesimo sokwakheka komhlaba, ulwazi lokuhlwaya kanye nalo lonke ulwazi olujullile ngesimo sokwakheka komhlaba oluphathelene nomhlaba, indawo yasolwandlle nendawo yomhlaba enamandla kazibuthe". Ngaphansi kwesihloko esithi "Ulwazi Olujulile Ngesimo Sokwakheka Komhlaba lwemithombo yezimbiwa namandla," i-CGS iqoqa, ihlaziye futhi isebenze ulwazi olusezingeni eliphezulu lwasemhlabeni owomile nasolwandle (isb. ulwazi olujulile ngokwakheka komhlaba, ulwazi olujulile ngesimo sokwakheka komhlaba ngokwamakhemikhali akhona emhlabeni, ulwazi olujulile ngokwakheka kwesimo somhlaba ngokuma kwawo nolwezimbiwa), oluzokwehlisa ubungozi futhi lwengeze ukuzethemba ekuhloleni nasekumbeni izimbiwa, ikakhulukazi ezindaweni ezingakahlwaywa ngokwanele. Ngokulindelekile, lolu lwazi lusetshenziselwa ukuhlonza imithombo engaba khona ngokwemvelo yezomnotho yamandla efana namalahle, uwoyela, igesi yemvelo, igesi yokhethe namandla atholakala ekushiseni okungaphansi komhlaba.

4.2. IMISEBENZI EPHATHELENE NEMITHOMBO YAMANDLA

Uhlelo Lwezinsiza Oluhlanganisiwe (i-IRP), olwashicilelwa kugazethi ngoMfumfu wezi-2019, uhlelo lokuthuthukisa ingqalasizinda kagesi kusekelwe ekuphakelweni nasekudingekeni kukagesi okubiza kancane kakhulu, kubhekwe ukwanela kokuphakelwa kwawo nemvelo esizungezile (ukunciphisa ukungcola okukhishwayo okungalungile nokusetshenziswa kwamanzi). INingizimu Afrika iyaqhubeka nokufuna imithombo yamandla ekahle, ehlukahlukene eyehlisa ukuthembela emthonjeni owodwa noma embalwa eyisisekelo futhi ikhuthaza ukuguqukela okufanele emnothweni onekhabhoni ephansi ukuze kwehliswe ukukhiqizwa kwekhabhoni eNingizimu Afrika.

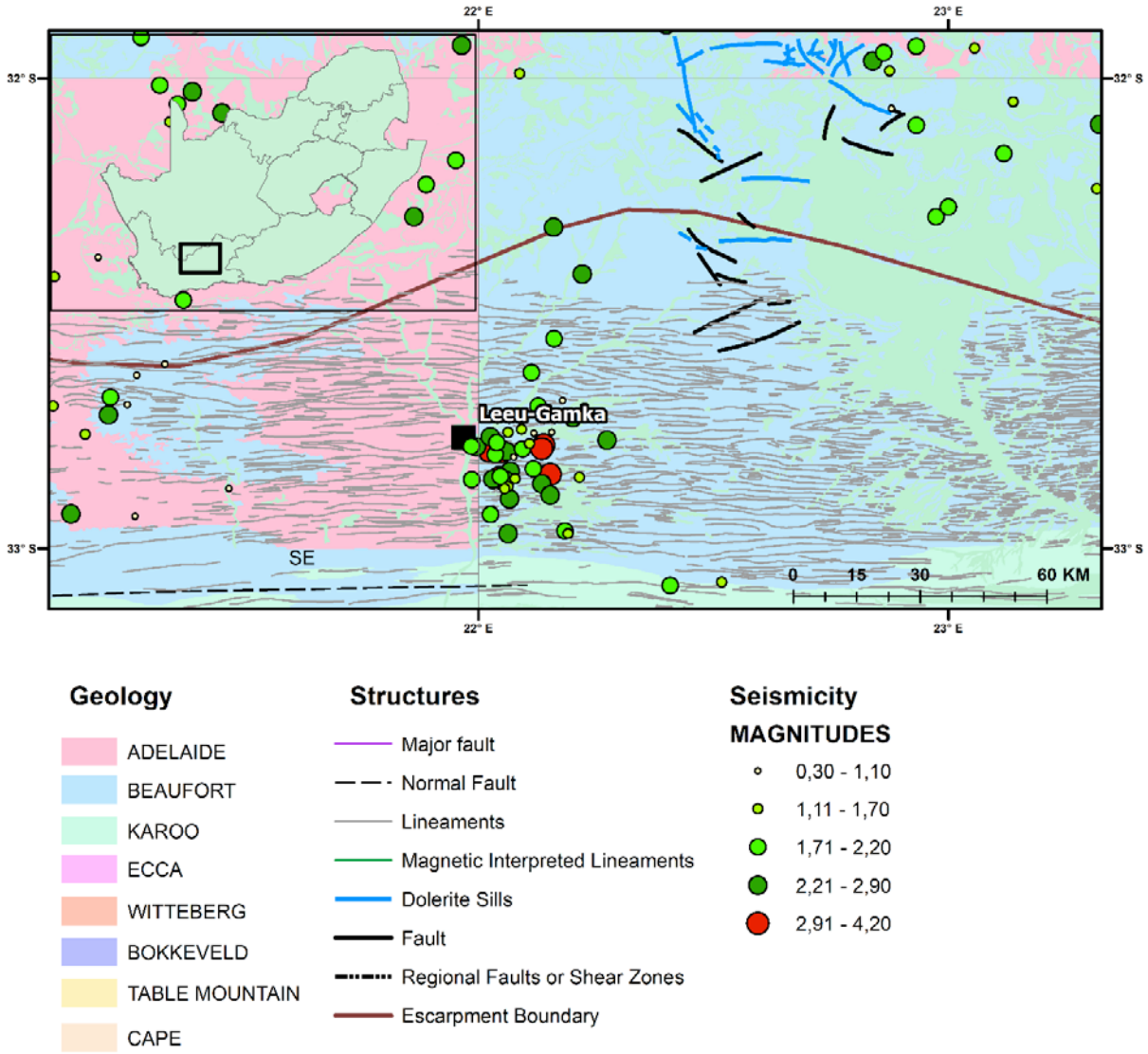
4.2.1. IMISEBENZI EPHATHELENE NEMITHOMBO YAMANDLA

4.2.1.1. Uhlelo Oluyisisekelo lwase-Karoo Lokumba Okujulile (I-KDD) Nendawo Yokucwaninga Isimo Sokwakheka Komhlaba Nemvelo Esizungezile

Isendlalelo nenhloso: Uhlelo lwe-KDD kuhloswe ngalo ukwakha isisekelo solwazi ngesimo sokwakheka komhlaba nemvelo ezungezile eningizimu ne-Karoo ukuze kuthathwe izinqumo kunolwazi nokuqinisa uhlaka lokulawula ukuze kuthuthukiswe igesi yokhethe endaweni. Izingxenye eziyinhloko zesisekelo ukuqonda isimo samanje sokwenzeka nokuvama kokuzamazama komhlaba endaweni nokuphawula izindawo lapho ukuvama nokwenzeka kokuzamazama komhlaba kungabangwa imisebenzi yokuhlola nokusebenzisa igesi yokhethe.

Impumelelo nokugqamile: Uhlelo lwe-KDD lwaphothula ngempumelelo amabalazwe amane anesilinganiso-bukhulu sika-1:50 000 olwazi olujulile ngesimo sokwakheka komhlaba namaphepha okuwachaza endaweni yase-Beaufort West Esifundazweni saseNtshonalanga Kapa. Izinhlelo zokuqapha amanzi angaphansi komhlaba nokwenzeka nokuvama kokuzamazama komhlaba (bheka Isithombe 7 ukuze ubone amaphethini okwenzeka nokuvama kokuzamazama komhlaba) zaqhubeka nokuqoqa ulwazi. Ulwazi olwathathwa eziteshini eziyisithupha zamathuluzi okukala nokuqopha ukudlidliza kokuzamazama komhlaba lwalubalulekile ekucwaningeni izakhiwo eziyimigqa ezikhona nokuhlobana kwazo namaphethini okwenzeka nokuvama kokuzamazama komhlaba endaweni yase-Beaufort West. Lo msebenzi oqhubekayo wokudweba amabalazwe eminkenke usuhlonze izindawo ezinamaqoqo ezehlakalo ezincane zokwenzeka nokuvama kokuzamazama komhlaba ezingabangwa imisebenzi yokuhlola nokusebenzisa igesi yokhethe. Okunye kwalokhu iqoqo lase-Leeu-Gamka, okusolwa ukuthi lihlobene nomnkenke wase-Leeu-Gamka. Izindawo ezifana nalezi kufanele ziphawulwe enqubweni yokugunyaza izimvume zokuhlola igesi yokhethe.

Umsebenzi ube futhi namaphepha amabili ashicilelwe kulo nyaka, analesi sihloko; “Ukuba Khona Kwegesi Yokhethe Okungenzeka Esakhiweni se-Prince Albert: Ucwaningo olwandulelayo” “Nokwakheka Kezingqimba Zamadwala Esakhiwo se-PrInce Albert (iqembu le-Ecca, Iqembu elikhulu lase-Karoo)”. Umsebenzi weseka imisebenzi ye-MSc emithathu omunye wayo owaphothulwa uMatome Sekiba; nomsebenzi we-PhD njengengxenye yemizamo yokukhuthaza nokunika ulwazi.



Isithombe 7: Ibalazwe elikhombisa izehlakalo zokwenzeka nokuvama kokuzamazama komhlaba esigodini sase-Karoo saseNingizimu Afrika.

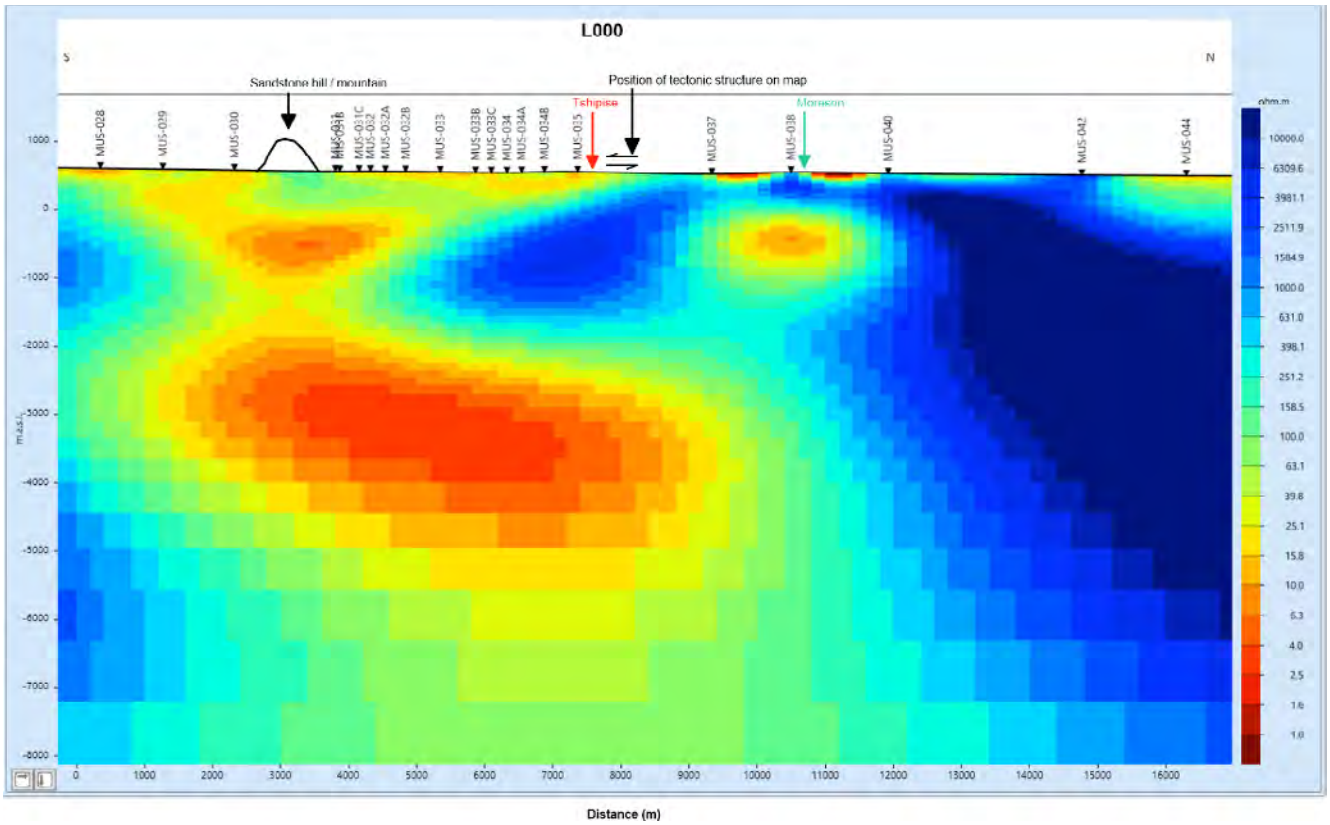
4.2.1.2. Ukutholakala kwamandla atholakala ekushiseni okungaphansi komhlaba okungenzeka kube khona kwaseNingizimu Afrika.

Isendlalelo nenhloso: I-CGS ihlose ukufaka isandla ekuqalweni komsebenzi we-IRP ngokucwaninga ukutholakala kwamandla atholakala ekushiseni okungaphansi komhlaba okungenzeka kube khona njengomthombo wamandla avuselelekayo. Amandla atholakala ekushiseni okuphuma ngaphansi komhlaba asetshenziselwa kokubili ukuwasebenzisa ngokuqondile nokukhiqiza ugesi aphuma ekushiseni okuphuma kuqhubeke ngaphakathi emhlabeni kuphumele ngaphezulu. Amandla atholakala ekushiseni okuphuma ngaphansi komhlaba ahlinzeke ngamandla angabizi, athembekile futhi avuselelekayo ukusukela ngeminyaka yowe-1890 ukuze kufudunyezwe ngokuqondile izakhiwo zohwebo nokuhlalwa kuzo. Ukusukela ngaleso sikhathi, ukusetshenziswa kwawo sekwande kwaze kwafaka ukukhiqizwa kukagesi ngemishini, yasabalalisa izinhlelo zokusebenza zokushisa nokupholisa, nokukhulisa izinqubo ezahlukene zezimboni. Ukuhamba kokushisa okuphuma ngaphansi komhlaba kubonakaliswa ngokubonakalayo ngaphezu komhlaba njengezintabamlilo, ama-fumarole, iziphethu ezishisayo namagiza. Amazinga okushisa nokubanda omthombo wokushisa okuphuma ngaphansi komhlaba ekujuleni okungu-7km ayafinyeleleka ngobuchwepheshe obukhona bokumba.

Impumelelo nokugqamile: Ukucwaninga okwandulelayo kukhombise ukuthi iNingizimu Afrika kungenzeka ukuthi inamandla okushisa okuphuma ngaphansi komhlaba okuphansi. Okokuqala, i-CGS idwebe amabalazwe alezi zindawo

okungenzeka ukuthi zinokushisa okuphuma ngaphansi komhlaba kusetshenziswa ulwazi lukazibuthe womhlaba (Isithombe 8), futhi yahlonza imithelela ezakhiweni namachibi okungenzeka abe khona anamanzi ashisayo angaphansi komhlaba eduze kweziphethu ezishisayo. Ulwazi nge-MT esithombeni esingezansi lukhombisa ukuthi izinhlelo zokushisa okuphuma ngaphansi komhlaba endaweni zikhombisa, ngokuvamile, amanani aphezulu okudlulisa ukushisa kunetshe okuphuma kulo.

Kulo nyaka obuyekwezwayo, lo msebenzi ukhiqize imiphumela yolwazi olujulile ngesimo sokwakheka komhlaba nolwazi ngeziphethu ezishisayo namagiza. Lokhu kuzohlanganiswa nolunye ulwazi olujulile ngesimo sokwakheka komhlaba ukuze kubonakale ukuthi amandla atholakala ekushiseni okuphuma ngaphansi komhlaba angasetshenziswa yini ekuthuthukiseni umnotho. Le miphumela izosetshenziswa futhi ukuthola indawo yokuqala indawo yokusebenza ngokushisa okungaphansi komhlaba yokuqala enokushisa okuphansi.



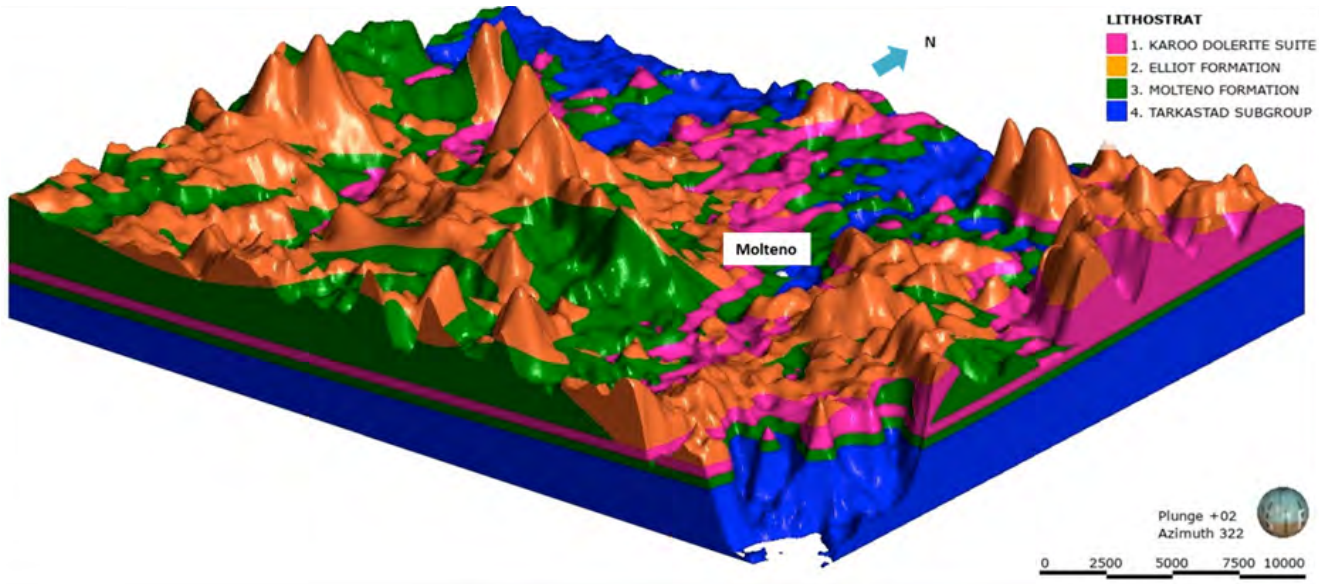
Isithombe 8: Isakhiwo sokudluliswa kukagesi esikhombisa ukuthi kungaba khona amatshe angumthombo "wokushisa" ekujuleni.

4.2.1.3. Umsebenzi wase-Molteno–Indwe Coalfield

Background and purpose: I-Molteno-Indwe Coalfield, Esifundazweni saseMpumalanga Kapa, kwakuyiyona ndawo enkulu ekhiqiza amalahle eNingizimu Afrika ukusukela ngowe-1864 ukuya kowe-1904, imisebenzi eminingi yokumba yayiqoqene ndawonye eduze kwedolobha Indwe. Kodwa-ke, ukutholakala kwamalahle asezingeni eliphezulu e-Witbank (Emalahleni) nakwezinye izindawo kwaholela ekuncipheni kokukhiqizwa kwamalahle e-Molteno-Indwe Coalfield kwagcina ngokuthi ukukhiqiza kume ngowe-1947. Ukukhula ngokushesha kwe-Witbak Coalfield kwaholela ekusungulweni kweziteshi zokuphehla ugesi eMpumalanga, okuphakela kakhulu amandla eNingizimu Afrika. Phakathi kwama-30% nama-70% amandla ayalahleka ngesikhathi sokuhanjiswa kukagesi usuka eMpumalanga uya Esifundazweni saseMpumalanga Kapa. Kungenxa yalesi sizathu ukuthi i-CGS, ngokuyalelwa i-DMRE, yaqala ukuhlolwa komthombo wamalahle e-Molteno-Indwe Coalfield. Inhloso yalo msebenzi ikakhulukazi ukuqonda izinga, ubukhulu nokusabalala kwamalahle ensimini yamalahle, okunganika ulwazi ngokusetshenziswa kwamalahle okungenzeka.

Impumelelo nokugqamile: Onyakeni obuyekezwayo, imiphumela eyandulelayo ikhombisa isisindo samathani esilinganiselwa kumathani ayizigidi ezingama-530, ogqinsini lwamalahle olungasikiwe, namathani angama-470 ebuncaneni obungu-0.8 bogqinsi lwamalahle. Isisindo samathani amalahle esilinganiselwe sincipha sibe amathani ayizigidi ezingama-320 uma kubalwa okulahlekayo kwesimo sokwakheka komhlaba nokumba ezimayini. Imali engangena yamalahle ingaba phakathi kwezigidigidi ezingama-26 (ama-R80 ithani ngalinye) nezigidigidi eziyi-R122 (lapho kungama-R350 ithani ngalinye) e-Molteno-Indwe Coalfield, ngaphambi kokusetshenzwa kwamalahle. Amanani amandla aqukethwe asuka ku-2.7MJ/kg ukuya ku-2.7MJ/kg, okuqukethwe okuwumlotha kusuka kuma-17% kuya kuma-89% futhi amakhemikhali ashintshashintshayo asuka kuma-4% ukuya kuma-18%. Phezu kwaloko, okuqukethwe okuyisibabule ikakhulukazi kungaphansi kwe-1% Indawo enamalahle iyanda ukusuka entshonalanga kuya empumalanga, cishe ngenxa yokucinana kokungena kwamadwala e-dolerite uma uya ngasempumalanga. Okuboniwe ekufundeni nasekuhlukaniseni amadwala kwezingxenye ezisulekile futhi ezizacile (ucwaningo ngesibonakhulu) kwaveza ukuthi ubukhona be-inertinite, i-vitrinite ne-liptinite, i-inertinite kuyiyona eningi kuma-maceral ne-liptinite kuyiyona enama-maceral amancane e-Molteno Indwe Coalfield. Ukuboniswa kwamanani e-vitrinite kusuka ku-1% kuya ku-3.1% (amalahle a-bituminous kuya kwa-anthracite ngokulandelana). Izimbiwa ezahlonzwa zifaka i-quartz, ubumba, i-calcite ne-pyrite. Okuqukethwe kwezimbiwa ezingavamile (ama-REE) emalahleni kubonakalisa ukuthi kungenzeka kwenziwe olunye ucwaningo kule ndawo, kunamasampula ambalwa kakhulu akhombisa ukuqoqana ndawonye kwe-REE kuze kufike kuma-454 ppm kukhona iphethini yezindawo ezinama-REE amaningi ngokufanele. Amasampula asele akhombisa ubukhona bazo obuncane. Izimbiwa okuyizona eziningi i-mozanite, xenotime ne-REE carbonate.

Imiphumela eyandulelayo ikhombisa futhi ukuthi ukusungulwa kwesiteshi samandla esakhiwe ngemishini, esifana nokushiswa kwamalahle okuncane ngemishini kusetshenziswa uketshezi, indawo yokushisa ngemishini ehlukanisiwe noma ukuguqula amalahle abe igesi, kanye nendawo yokushisa amalahle ngemishini iwaguqule abe igesi kusetshenziswa uketshezi, kungahlolwa. Kodwa-ke, kuphakanyiswa ukuthi ukuhlolwa kwamalahle okubanzi okwenziwa ngaphambi kwesikhathi kwenziwe ensimini yamalahle ukuqinisekisa ukuthi lezi zindawo ezinemishini yokusebenza zingasetshenziswa. Phezu kwalokho, ukuba khona okungenzeka kwe-REE kufanele kucwaningwe ngokuthe xaxa, ngoba imiphumela yokuqala iyakhuthaza. Uphenyo onyakeni obuyekezwayo lukhombisa ukuthi olunye ucwaningo, olufana nocwaningo olubanzi lokuhlaziya Isigodi sase-Karoo, kufanele luqalwe onyakeni ozayo. Isithombe 9 sikhombisa ukubona okukhombisa izinhlangothi ezintathu zendawo yase-Molteno ngaphakathi kwe-Molteno-Indwe Coalfield.



Isithombe 9 sikhombisa ukubona okukhombisa izinhlangothi ezintathu zensimu yamalahle yendawo yase-Molteno.

4.3. IMISEBENZI EPHATHELENE NOKUHLOLWA KWEZIMBIWA

4.3.1. IMISEBENZI YOLWAZI OLUJULILE LOKWAKHEKA KOMHLABA YASEMHLABENI OWOMILE

4.3.1.1. Umsebenzi wase-Griqualand West

Isendlalelo nenhloso: Umsebenzi Wokudweba Ibalazwe Lolwazi Olujulile Ngokwakheka Komhlaba wase-Griqualand West ukhombisa izinguquko ezenzeke esikhathini eside esimweni sokwakheka komhlaba esifundeni sase-Griqualand West Esifundazweni saseNyakatho Kapa ukukhulisa ukuqonda ngezinhlelo zokusebenza kwamanzi ashisayo ekwakhekeni kwezimbiwa, izingozi ezidalwa isimo sokwakheka komhlaba, nokulawula okuncike emanzini atholakala ngaphansi komhlaba. Lesi sifunda sasinemboni eyayisibe khona isikhathi eside yokuhlola izimbiwa nokuzimba futhi ukusimama kwayo ngomuso kuzodinga ulwazi oluyisisekelo ngentuthuko engaqedi imthombo yemvelo. Ngokwesimo sokwakheka komhlaba, le ndawo iyindida futhi ikhombisa ukusonteka kwesimo senzika yamakhemikhali, kufaka i-dolomite nesakhiwo sensimbi eyizingqimba. Ezinye zezinsalela zomhlaba eziningi kunazo zonke futhi ezibalulekile kwezomnotho zensimbi ne-manganese ziqoqene ndawonye kule ndawo.

Inhloso yalo msebenzi ukukhombisa izinsalela zezimbiwa ezifana nedayimane, i-Fe, i-Mn ne-tiger's eye kanye nezinhlelo zazo zokwakheka kwezimbiwa, nokweseka ukusetshenziswa komhlaba, amanzi ezolimo nawangaphansi komhlaba kanye nokufunda ngendawo esizungezile ngokukhombisa kusetshenziswa ulwazi olujulile ngesimo sokwakheka komhlaba; ngenhloso yokuthuthukisa ingqalasizinda nokukhulisa umnotho.

Impumelelo nokugqamile: Ngonyakamali wezi-2019/2020, umsebenzi wase-Griqualand West wawugxile ekukhetheni ulwazi olubanzi olwazini oluningi kanye nokwakhiwa kwamaqoqo olwazi amakhulu avele ekhona. Ulwazi olukhona lwabheka ulwazi olukhona lwesimo sokwakheka komhlaba, lwezimbiwa, lokumba ezimayini nemigodi olwengezwa ulwazi olukhona lwamasathelayithi nokuzwa usebangeni elikude. La maqoqo olwazi asetshenziselwa ukuhlonza izikhala esisekelweni solwazi olukhona kuso sonke isifunda sase-Griqualand West. Uma kubhekwa la maqoqo olwazi, ukudweba amabalazwe olwazi ngesimo sokwakheka komhlaba anesilinganiso-bukhulu sika-1:50 000 kwenziwa ukuze kugcwaliswe izikhala zolwazi eziphawuliwe. Lokhu kwafakwa ikakhulukazi ukuze kuqondwe kangcono imithelela ezakhiweni zensimbi, i-manganese, nezinhlelo zokwakheka kwezimbiwa eziyizimbiwa ezijwayelekile ezingesilona igugu, ikakhulukazi ekujuleni, ukuqala nokulawulwa kwemigodi eshona phansi emhlabeni, kanye nokusabalala kwemithombo yamanzi angaphansi komhlaba. Okugqamile kunyakamali wezi-2019/2020 kufaka ukuqonda kangcono umsuka wesimo samakhemikhali okwakhiwe ngawo insimbi ne-manganese, ukwehlukaniswa okungcono nokucacile kwesimo sokwakheka komhlaba ngesikhathi se-Cenozoic nokufakwa kwemininingwane eyengeziwe yesakhiwo. Lokhu okungenhla sekuqalile ukukhombisa ukuba khona okungenzeka kwesimbiwa i-sulphide esijwayelekile esisefundeni. Lo msebenzi ngalo nyaka ukhiqize amabalazwe ayishumi nanye esimo sokwakheka komhlaba anesilinganiso-bukhulu sika-1:50 00 amabalazwe ama-2 obuchwepheshe besimo sokwakheka komhlaba, amabalazwe amane amanzi angaphansi komhlaba anesilinganiso-bukhulu sika-1: 100 000 kanye nemibiko eyisishiyagalombili yokwakheka kwamakhemikhali asemhlabeni.

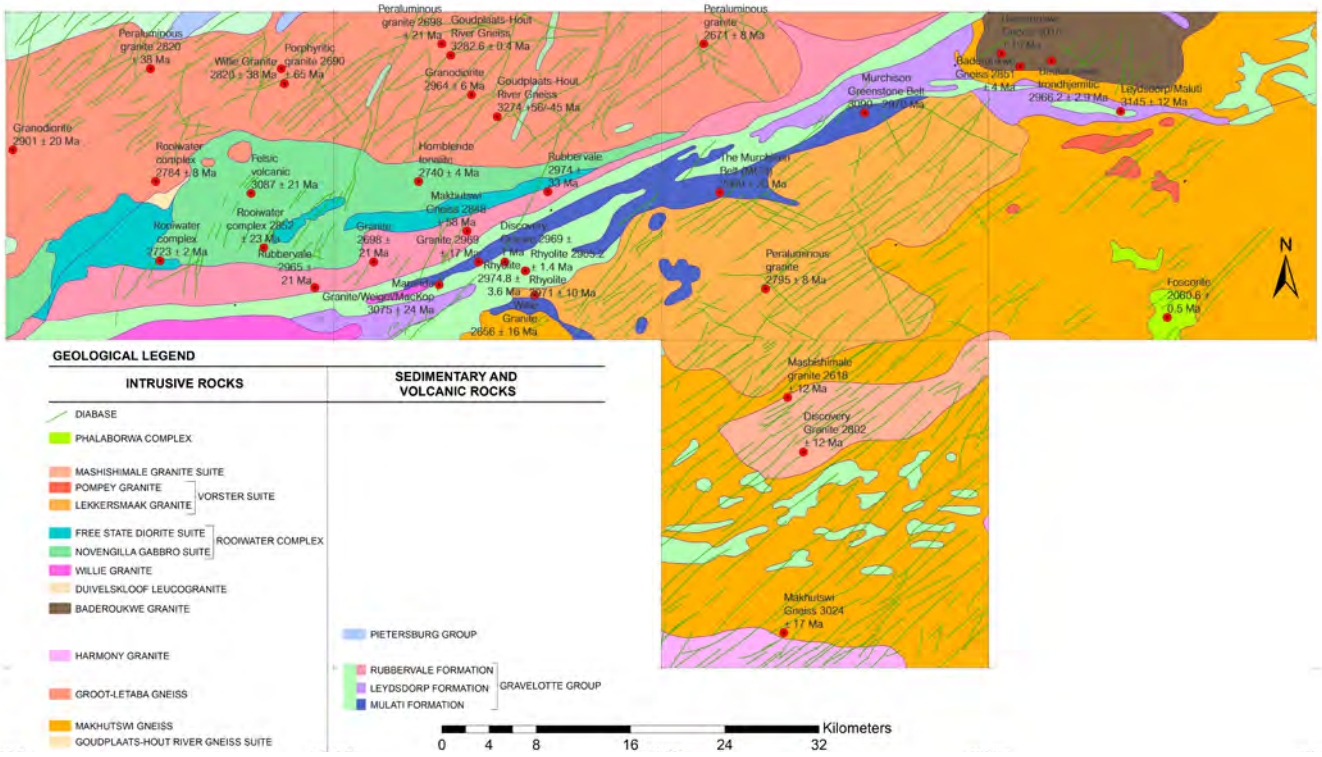
4.3.1.2. Umsebenzi Webhande Lamatshe aseLimpopo Aluhlaza

Isendlalelo nenhloso: Umsebenzi usebenzisa amabalazwe acacile olwazi ngesimo sokwakheka komhlaba ahlanganiswe nezingxenye zolwazi olujulile ngesimo sokwakheka komhlaba ngokwamakhemikhali nangokwesimo sokwakheka komhlaba ngokuma kwawo esifundeni ukuze kuphendulwe imibuzo eyisisekelo ephathelene namabhande amatshe aluhlaza, nezinguquko ezenzeke kuwo esikhathini eside. Ukudweba amabalazwe acacile ngesimo sokwakheka komhlaba akhombisa ukuthintana ngokwesimo sokwakheka komhlaba okwakungazange kuchazwe phambilini. Ingxenye yomsebenzi wesimo sokwakheka komhlaba ngokuma kwawo ibandakanya ukutolikwa kolwazi oselukhona vele nokukhiqizwa kwezingqimba ezitolikiwe kusetshenziswa indlela yokuzwa ukude ukuze kwesekwe umsebenzi wokudweba amabalazwe esimo sokwakheka komhlaba. Ukufunda ngesimo sokwakheka komhlaba ngokwamakhemikhali nangokwenzeka kwezigameko ngokulandelana esimweni sokwakheka komhlaba kukhuthaze ukukhonjiswa kwezinhlobo zamadwala ezahlukene nobudlelwane bazo ngokobudala bawo (Isithombe 10). Ukuhlaziywa okwengeziwe kwesimo sokwakheka komhlaba ngokwamakhemikhali kuhlelelwe unyakamali ozayo. Lokhu kuzosiza ekunqumeni iminyaka yobudala nokuguquka kwesimo samadwala isifunda

sonke. Inhloso isiyonke yalo msebenzi ukukhombisa izinsalela zegolide nezimbiwa ezijwayelekile ezingesilona igugu kumabhande amatshe aluhlaza ase-Murchison-Giyani ukuze kwesekwe ukukhula kwezomnotho ngokudweba amabalazwe esimo sokwakheka komhlaba, ukudweba amabalazwe esimo sokwakheka komhlaba ngokwamakhemikhali nangokwezinga lamanzi nocwaningo lwendawo ezungezile endaweni.

I-MGB ibaluleke kakhulu kwezomnotho ngoba zakheke kahle izimbiwa kuyo futhi iqukethe izinsalela eziningi ezahlukene zezimbiwa eziyigugu nezijwayelekile ezingesilona igugu, kanye nezinsalela zezimbiwa ezingezona ezisansimbi. Cishe kunokuvela kwezimbiwa ezingama-250 endaweni, lapho ukuvela kwegolide kukuningi ngaphezu kwakho konke, kwesinye isikhathi lihlobene ne-arsenic, i-tungsten ne-mercury. I-MGB inomlando wokumba ezimayini ongaphezu kweminyaka eyi-100 futhi izinsalela ezingasanakiwe njengamanje zikhonjiswa udoti olahlwayo ezimayini ngemuva kokumba kanye nemigodi engasanakiwe. Ukumbiwa kwegolide okungekho emthethweni kuvamile kwezinye izimayini ezingasanakiwe nesezavalwa, okuholela emitheleleni eba khona ephathelene nokumba ezimayini kwimvelo ezungezile endaweni.

Impumelelo nokugqamile: Onyakeni obuyekezwayo, umsebenzi wagxila Ebhandeni Eliluhlaza lase-Murchison (i-MGB) futhi kwaqedelwa amabalazwe amabili esimo sokwakheka komhlaba (anesilinganiso-bukhulu sika-1:50 000) afaka Ibhande Eliluhlaza lase-Giyani. Umsebenzi ukhiqize amabalazwe esimo sokwakheka komhlaba amahlanu andulelayo (anesilinganiso-bukhulu sika-1:50 000) kanye nombiko owodwa wokwakheka kwamakhemikhali owaphothulwa.



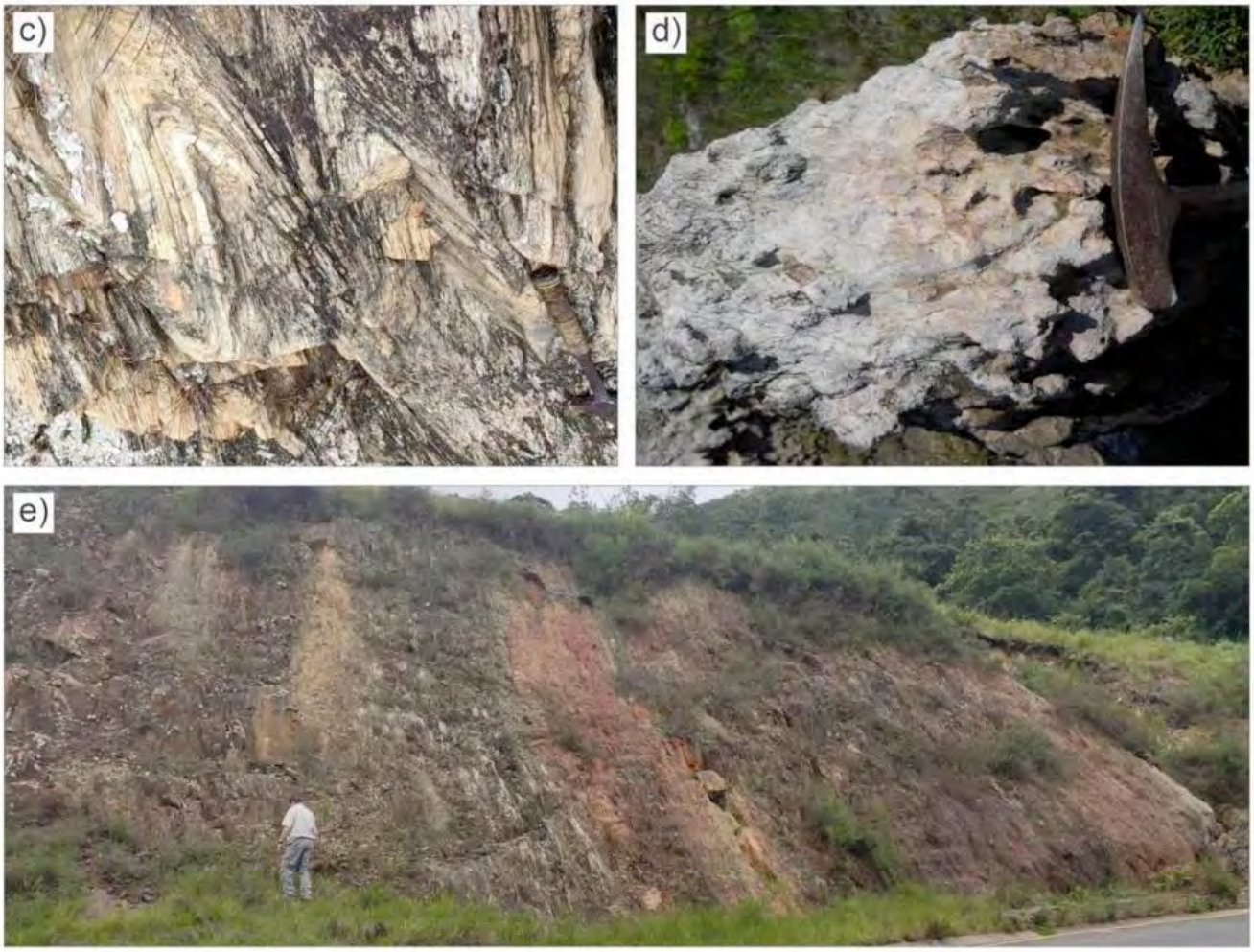
Isithombe 10: Ibalazwe lesimo sokwakheka komhlaba elenziwe lula lendawo ecwaningwayo likhombisa ulwazi ngesimo sokwakheka komhlaba ngokwenzeka kwezigameko ngokulandelana esimweni sokwakheka komhlaba kwamanye amadwala endaweni.

4.3.1.3. Umsebenzi Wokudweba Ibalazwe Lolwazi Olujulile Ngokwakheka Komhlaba Umsebenzi Wokudweba Ibalazwe Lolwazi Olujulile Ngokwakheka Komhlaba Wamaphakathi neKwaZulu-Natal

Isendlalelo nenhloso: Umsebenzi Wokudweba Ibalazwe Lolwazi Olujulile Ngokwakheka Komhlaba Wamaphakathi neKwaZulu-Natal unquma ukulawulwa kokwakheka kwezingqimba zamadwala nokuguqugugquka kokulandelana kokwakheka kwezimbiwa maphakathi neKwaZulu-Natal. Lokhu kufaka izinsalela zegolide ezihleli lapho amadwala ehlukene khona, ezakheke ngenxa yokushisa kwamanzi atholakala ngaphansi komhlaba kanye nezinsalela ezisesihlabathini noma amatshe

asemfuleni emngceleni wonke oseningizimu yase-Kaapval Craton. Inhloso ebalulekile yalo msebenzi ukuhlolwa kwenhlobo yezinsalela zezimbiwa ezikhona njengamanje ngokuqapha imisebenzi yemboni nokucwaninga ukuba khona kwezimbiwa okungaba khona ngomuso nokwakheka kwe-ore; kanye nokukhiqiza ulwazi ngokwakheka kwezingqimba zamadwala nesakhiwo soqweqwe olungaphezulu lomhlaba nesimo sokwakheka kwamadwala maphakathi nesifundazwe saKwaZulu-Natal okungeseka ukukhonjiswa nokuqondwa kwezinsalela zegolide ezakheka ngenxa yokushisa kwamanzi atholakala ngaphansi komhlaba.

Impumelelo nokugqamile: Ukubuyekezwa kolwazi okuningiliziwe komsebenzi wonke okhona owenziwe esifundeni ukusukela ngesikhathi esiphambili sowe-1910 kwakhombisa izindawo ezibalulekile ngaphakathi kwamaphepha amabalazwe aseNkandla nase-Melmoth ezazidinga ukubhekwa futhi nokubuyekezwa. Ngakho-ke, ukudwetshwa kwamabalazwe okuningiliziwe okunqamulayo kwesifunda esiseningizimu ntshonalanga sephepha lebalazwe laseNkandla kwenziwa ukusiza ukuhlanganisa amayunithi ukusuka ohlangothini kuya kolunye lomngcele phakathi kwamaphepha adwetshwe amabalazwe. Isifunda esicwaningwayo sakha okubizwa ngokuthi ukushona phansi kwezingqimba zamadwala “kwase-Ningizimu” noma “kwase-Mome” lapho kwakheka khona izakhiwo zaseHlathini, eMabaleni, eMome eDlabe naseMsukane. Lezi zakhiwo azifani namadwala Aseqenjini Elikhulu lasoPhongolo elihlonzwe ephepheni lebalazwe laseQhudeni okuyindawo eseduze, noma ngaphakathi ephepheni lebalazwe ledwala elehlukile laseMhlatuze ngenhla kwaseNkandla. Ukudwetshwa kwamabalazwe okuningiliziwe nokunqunywa kobudala okuhlobene nakho ngokuthathwa kwezithombe ngomshini ezikhombisa izakhi zezimbiwa (iLA-ICPMS) kwamasampula amaningana kuthenjwe ukuthi kuzosiza ngokuthe xaxa ngokuchazwa kwalesi sifunda. Ukudwetshwa kwamabalazwe okwengeziwe kwagxila esifundeni sasenyakatho ntshonalanga sendawo ecwaningwayo. Lokhu kwafaka ikakhulukazi amayunithi ane-silica akhiwe ngezingcezu zamadwala amadala Eqembu lase-Natal nelase-Karoo. Phezu kwalokho, ububanzi besifunda eningizimu bafaka Ibhande Lamatshe Aluhlaza ase-Ilangwe, elakha indawo esuka empumalanga iya ngasentshonalanga yesimo sendawo ephakeme ikakhulukazi enezakhiwo ezilandelanayo zezingqimba zamadwala i-amphibolite nensimbi eyizingqimba ezakhiwe ngamakhemikhali ahlukene (Isithombe 11). La madwala asontekile kakhulu, ikakhulukazi anokugoqeka okubheke phezulu nezingqimba ezibhekene. Amadwala amatshe aluhlaza aqukethe amathuba amaningi okwakheka okuncane kwegolide, insimbi, ithusi ne-kyanite. Kula mathuba, izingqimba zamadwala ezikhiqiza i-kyanite nama-quartzite Ebhande Eliluhlaza lase-Greenstone eliseningizimu neNkandla kubonakala sengathi ziqukethe ubuningi obuphawulekayo be-ore, kodwa isencane. Izinsalela ze-ore yensimbi engaba khona ziyaziwa kukho kokubili ukulandelana kwamatshe aluhlaza, kodwa izinga kubonakala sengathi liphansi. Okwagxilwa kukho kunyakamali kwafaka ukuhlanganisa nokuhlela amaphepha amabalazwe okugcina nokuphothulwa kokuchazwa kokwakheka kwezingqimba zamadwala Esakhiwo saseSinqeni. Umsebenzi waphothula isilinganiso-bukhulu sika-1:50 000 saseQudeni. Amabalazwe asele andulelayo azodwetshwa ngonyakamali ozayo.



Isithombe 11: (a) Ukubonakala Kokhalo lwaseNomangci olubheke ngaseNyakatho mpumalanga, okwembozwe izingqimba zamadwala e-quartz agugulekile;
(b) izingqimba zamadwala e-quartz-kyanite avele obala emgwaqweni Wasehlathini laseNkandla (qaphela umugqa wongqimba lwamadwala oluluhlaza okusasibhakabhaka okukhanyayo oluhlukaniswe izingqimba ze-quartz).
(c) Isakhiwo saseNomangci esigoqeke kakhulu sezingqimba ze-quartz-sericite eNtumbeni Sericite Mine. Imigqa ehlukanisayo ebhekene nokuma okuningi kwe-N-S lapho amadwala ehlukene khona.
(d) Ungqimba lwe-kyanite olunezigaxa oluvele obala Okhalweni lwaseNomangci.
(e) Izingqimba ze-quartz (i-kyanite-sericite) zihlukaniswe izingqimba zentabamlilo ezinombala osabubende Zesakhiwo saseSimbagwezi Emgwaqweni Wasehlathini laseNkandla eningizimu Nokhalo lwaseNomangci.

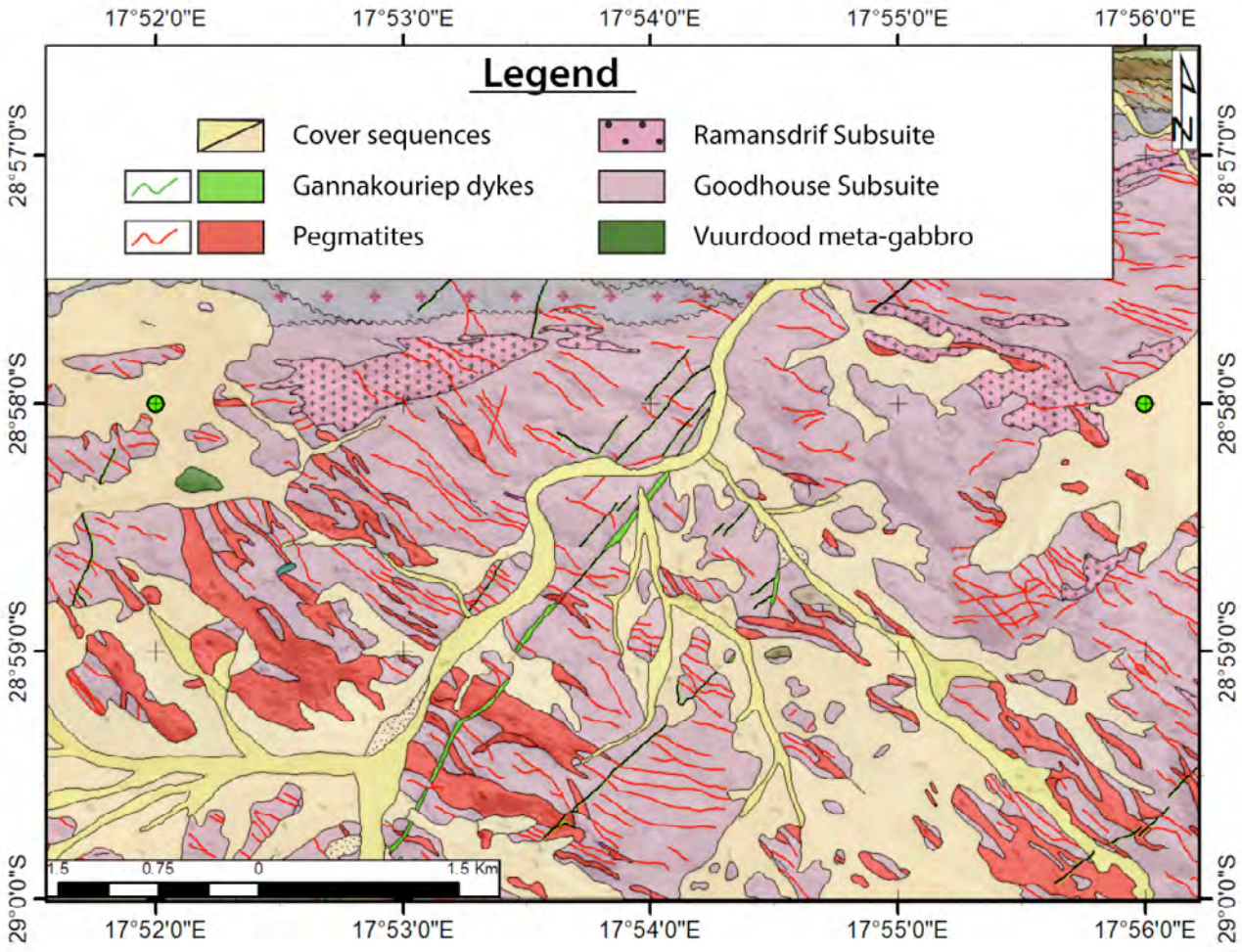
4.3.1.4. Ukukhonjiswa kongqimba lomhlaba oluqinile olungaphezulu lwezwekazi

Isendlalelo nenhloso: Ingxenye yokudwetshwa kwamabalazwe olwazi ngesimo sokwakheka komhlaba kuhloswe ngayo ukugcwalisa izikhala ngolwazi olujulile ngesimo sokwakheka komhlaba olunolwazi oluyisisekelo ngesimo sokwakheka komhlaba olungasiza ekukhombiseni ukulawulwa kokwakheka kwezingqimba zamadwala oqweqweni lomhlaba olungaphezulu kanye nokuguqugugquka kwezinhlelo zezimbiwa ezakheka ngenxa yokushisa kwamanzi atholakala ngaphansi komhlaba (isb. i-orthomagmatic Cu-Ni, i-VMS-type Cu-Pb-Zn, i-U nama-REE aqukethwe i-pegmatite) Indawo yocwaningo ekhethiwe ngalo nyakamali ingase-Namaqua-Natal Orange River pegmatitite Belt, okunamathuba amakhulu ukuthi ibe nokwakheka kwe-lithium ne-REE.

Impumelelo nokugqamile: Ama-pegmatite alesi sifunda manje asedwetshelwe amabalazwe ngokuningiliziwe futhi akhonjiswa okokuqala emaphepheni amabalazwe ngesilinganiso-bukhulu sika:1:50 000 (Isithombe 12). Kufakwe izakhiwo zama-pegmatite ezingakaze zihlonzwe phambilini eziqukethe izimbiwa eziyinkomba yokwakheka kwe-lithium. Ulwazi oluningi

lwasensimini olusha luqoqiwe futhi, luhlanganiswe nolwazi olungumlando olubhalwe ohlwini, lwaholela kungobolwazi enkulu esiza ekuhlanganiseni ulwazi ngesimo sokwakheka komhlaba ngaphesheya kwemingcele kuhlanganiswe nokudwetshelwa amabalazwe kwaseNamibia kolwazi ngesimo sokwakheka komhlaba okusanda kwenzeka. Lokhu kwaholela oguqukweni olukhulu lokwakheka kwezingqimba zamadwala oqweqweni lomhlaba olungaphezulu, okuzokwenza ngcono ukuqonda kokulawulwa kokwakheka kwezingqimba zamadwala oqweqweni lomhlaba olungaphezulu ezinhlelweni zokwakheka kwezimbiwa e-Richtersveld lapho kuphuma khona i-magma, isibonelo ukuhlonza nokukhonjiswa kwezehlakalo ezilawulwa ngokwesakhiwo zokuguqula isakhiwo sezimbiwa. Ukudwetshwa kwamabalazwe kwamanje, ngaphezu kwalokho, kwasizwa imifanekiso emisha esanda kusetshenzwa ethathwa ngogesi kuhlangene nozibuthe eyenza ukuthi kwehlukaniseke amayunithi amadwala enembe kakhulu, futhi okubaluleke kakhulu, kucacisa kakhulu amadwala aguqulwe okusaketshezi. Lezi zimo zokwenzeka kwezinto ezibangwa uketshezi ziletha ithuba lokucwaninga ngokuthe xaxa ngokwakheka kwezimbiwa.

Lo msebenzi wafeza ukushicilelwa kwamabalazwe amane olwazi ngesimo sokwakheka komhlaba anesilinganiso-bukhulu sika-1:50 000.



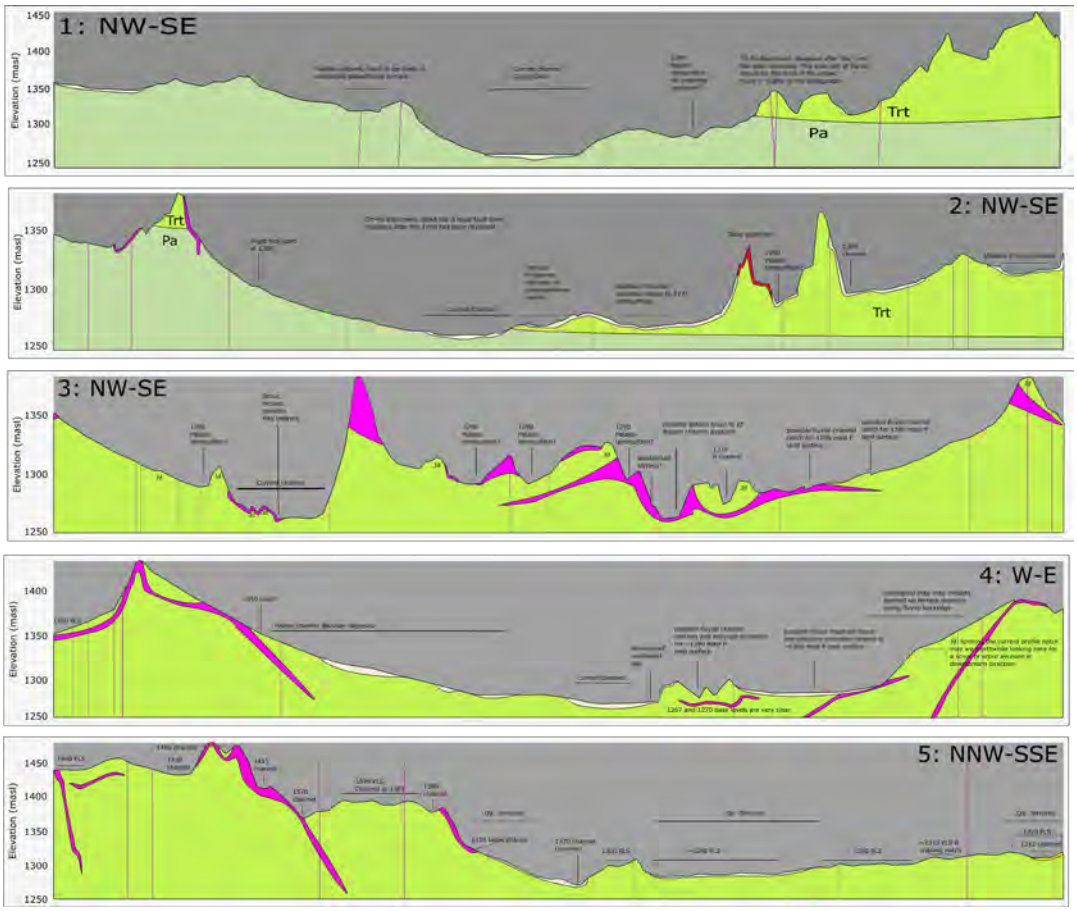
Isithombe 12: Ingcaphuno ethathwe kwibalazwe 1:50 000 2817DD (Nous) lokufunda ngesimo sokwakheka komhlaba, elikhombisa ukuba khona kwama-pegmatite ngokucacile.

4.3.1.5. Umsebenzi Wokudwetshwa Kwebalazwe laseMaluti a Phofong Lolwazi Olujulile Ngesimo Sokwakheka Komhlaba

Isendlalelo nenhloso: Umsebenzi Wokudwetshwa Kwebalazwe laseMaluti a Phofong lisebenzisa ukudwetshwa kwebalazwe lolwazi olujulile ngesimo sokwakheka komhlaba, kanye nokukhombisa ngesimo sokwakheka komhlaba ngokuma kwawo namanzi angaphansi komhlaba, ukuze kunqunywe ukulawulwa okuyisisekelo kokusabalala kwamanzi nezimbiwa kulesi sifunda.

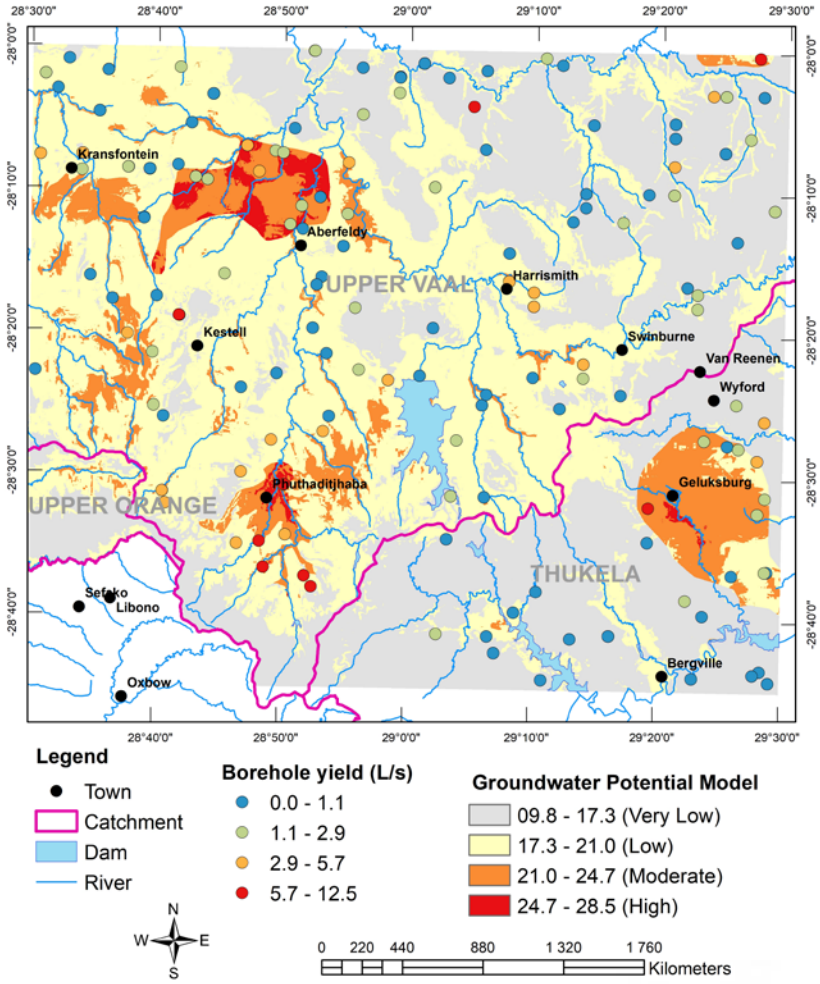
Izindawo ezidwetshelwe amabalazwe kuze kube yimanje zifaka indawo yobuphofu yase-Phuthaditjhaba futhi zinamaphepha ayi-2828BD Tshiame, 2828DB Phuthaditjhaba, 2828DA Monantsa ne-2828DD Mont-Aux-Sources, ezadwetshelwa amabalazwe ngeminyaka yowe-1980 kodwa njengamanje ayabuyekezwa njengenxenye yokwenza ngcono umsebenzi, hhayi kuphela okufaka izwe ngesilinganiso-bukhulu sika-1:50 000, kodwa ukubuyekeza amamodeli akhona olwazi ngesimo sokwakheka komhlaba anesikali nokuhlola izimo ezintsha lapho engasebenziseka khona. Izinhloso zokudweba la mabalazwe ikakhulu ukwakha umdlandla omusha kwizinsalela zezimbiwa, ukwengeza ukutshalwa kwezimali emkhakheni wokumba ezimayini, nokuqonda izinselelo zokwakheka komhlaba nemvelo ezungezile, ukuze kubhekanwe futhi kuncishiswe ukuthi lezi zimo zingaba nomthelela onjani enhlalweni yemiphakathi yasemadolobheni nasemakhaya nabantu abahlala eduze.

Impumelelo nokugqamile: Imisebenzi yaseMaluti yakhiqiza ama-cross section akhombisa indawo enamadwala ngaphansi endawo engaphezulu Yeqembu Elikhulu lase-Karoo, abekwa engxenyeni enkulu Yesigodi sase-Karoo ukusukela ngesikhathi se-Triassic kuya kwese-Jurassic. La madwala kwenzeka kuwo ukusetshenzwa kwe-Cenozoic ne-Quaternary nokuguguleka, okwenza ukwakheka komhlaba kwamanje (Isithombe 13). Ukubekwa kwamayunithi angaphezulu okwakheka kwezingqimba zamadwala ukusukela ku-Triassic ukuya ku-Jurassic kufaka izakhiwo zase-Kartberg nase-Burgersdorp Kweqembu lase-Beaufort, kanye nezakhiwo zase-Molteno, Elliot nase-Clarens Zeqembu lase-Stormberg. Izinsalela zezimbiwa ezisemifuleni ze-scree ne-talus, ukudilika komhlaba nokuwa ngaphezu kwe-alluvium nokuguguleka Kwesakhiwo saseMasotcheni kuqedela ulwazi ngesimo sokwakheka komhlaba okubonakalayo njengamanje. Wonke amaphepha akhiqizwa ngendlela edijithali noma asevele eguquliwe ngendlela edijithali. Ukugxila kwamanje kwenza ubungcono ezingxenyeni ezisetshenzisiwe zolwazi ngesimo sokwakheka komhlaba, okusho ukuthi ucwaningo ngomthelela we-uranium emanzini angaphansi komhlaba endaweni ebanzi yasePhuthaditjhaba, ukuhlolwa komucu we-basalt endaweni ebanzi yaseFreyistata, ukuhlolwa Kwesakhiwo saseMasotcheni njengomthombo obalulekile wempahla yokwakha izitini nokuhlolwa kwamadayimane emhlabathini oshiywa imifula nezikhukhula emigudwini emidala yokuhamba kwamanzi ephuma ezintabeni zasoKhahlamba.



Isithombe 13: Amaphrofayili 1 ukuya ku-5 akhombisa isimo sokwakheka komhlaba nendawo okulindeleke ukuba khona kuyona kwezinsalela emhlabathini owashiywa imifula nezikhukhula kusekelwe ekufaneni nengaphezulu le-palaeoland eduze kwe-Orange River yamanje.

I-CGS isebenzise izindlela zokufunda ngemishini ezinamasu amasha ukuze kuhlanganiswe ulwazi olujulile ngesimo sokwakheka komhlaba lwemikhakha ehlukene ukuze kudwetshwe amabalazwe ezindawo okunamathuba amakhulu okutholakala kwamanzi kuzona. Ibalazwe eliningiliziwe lezindawo okungenzeka kube khona amanzi ngaphansi komhlaba kuzo laphothulwa ngonyaka obuyekezwayo (Isithombe 14). Ucwaningo lwenziwe endaweni yaseMaluti futhi ezinye izindawo eziningana ezinamathuba amakhulu okutholakala kwamanzi kuzona ziyacwaningwa ngokwengeziwe, futhi ukumba kuhlelelwe unyakamali ozayo. Ukuze kwenziwe lokhu, lo msebenzi waphothula isifanekiso esiyi-3D kusetshenziswa izindlela zokuhlakanipha okwakhiwe ngobuchwepheshe.



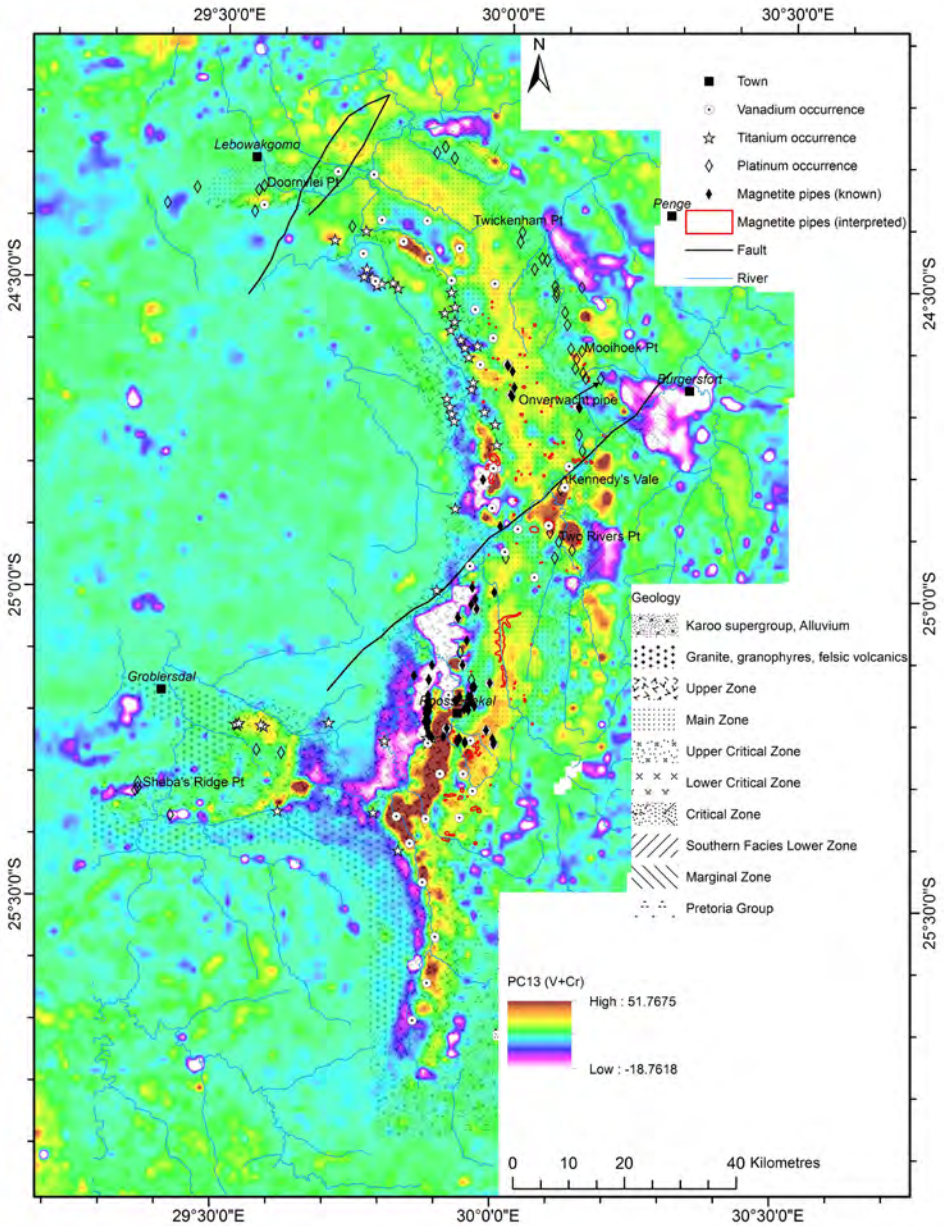
Isithombe 14: Ibalazwe eliningiliziwe lezindawo okungenzeka ukuthi zinamanzi ngaphansi komhlaba endaweni yaseMaluti.

4.3.1.6. Umsebenzi Wokudwetshwa Kwebalazwe lase-Bushveld

Isendlalelo nenhloso: Umsebenzi Wokudwetshwa Kwebalazwe lase-Bushveld ucwaninga ukuguqugquka nokulawulwa kwezinhlelo zokwakheka kwamabalazwe ezi-magmatic nezakheka ngenxa yokushisa kwamanzi atholakala ngaphansi komhlaba, ikakhulukazi lezo ezihlobene nobuchwepheshe bamandla bangomuso. Isihloko esengeziwe salo msebenzi ukukhonjiswa kwezinsalela ezingakaze zichazwe ezingaphezu komhlaba. Okubekwe eqhulwini ocwaningweni ngokwakheka kwe-Fe-Ti-V bekuwukusabalala endaweni, uhlobo nemvelaphi yamapayipi e-vanadiferous magnetite okusafundwe okuncane ngawo. Ukuhlolwa kwezimbiwa ezikhona kwamanye wala mapayipi kukhomba okungaba khona futhi kubaluleke kwezomnotho ukuze kubuyiselwe i-V_2O_5, i-Fe ne-TiO_2 (Isithombe 15).

Impumelelo nokugqamile: ucwaningo olumayelana nezakhi nezimpawu zamadwala olwenziwe onyakeni obuyekezwayo lukhombisa ukuthi ukusabalala okungangezinhlamvu, isimo sokuklwaya noma sokushelela nokuntuleka kwe-silicate gangue emadwaleni ahlobene ne-titanomagnetite kukhomba ukuthi i-ore endaweni yase-Bushveld kuzoba lula ukuyikhipha uma

amadwala egaywa. Isimbiwa esiningi i-XRF kanye nokuhlola kwe-LA-ICP-MS kwezimbiwa ezincane kakhulu ezikhona ze-magnetitite ne-ilmenite emapayipini e-magnetite Endaweni Ephezulu Enkulu, Enxanxatheleni yase-Bushveld, kukhomba ukuthi amapayipi akheka ngokuzika kwezingqimba ze-magnetite ngokujulile zize zifike enqwabeni eqoqene ndawonye. Ulwazi olukhona manje nezindawo okufanele zibhekwe kuqala zocwaningo ngethemba lamathuba e-Tinderbox PGM ngokwedlule lwakhomba ukuthi kungaba nokweluleka komqolo wase-Merensky uqhubekela ngaseningizimu yendawo ephumile empumalanga Yenxanxathela yase-Bushveld 48 ye-Council for Geoscience kuqapheliwe futhi kwachazwa kafushane. Ukweluleka komqolo wase-Merensky ezindaweni eziseningizimu zendawo ephumile yasempumalanga kucwaningiwe kusetshenziswa amaqoqo olwazi omhlabathi wesifunda. Ucwaningo lwemithelela yezakhiwo zezimbiwa eziyisisekelo lwenziwe futhi ukuze kuhlaziywe okwandulelayo nokuthi kutolikwe ulwazi lwesakhiwo kukhomba ukuthi ukushona phansi komhlaba kwase-Wonderkop kulawula izakhiwo zendawo eziletha ukwakheka kwezimbiwa ezahlukahlukene e-Mutue Fides nase-Boschoek. Umsebenzi wonyakamali wagxila futhi ekwakhekeni kwe-vanadium nama-REE endaweni yomsebenzi, abalulekile ezinhlelweni zokusebenza eziningi zesimanje ezisebenzisa ubuchwepheshe obuphezulu. Lo msebenzi waphothula amabalazwe amabili ngesimo sokwakheka komhlaba anesilinganiso-bukhulu sika-1:50 000.



Isithombe 15: Ukusabalala kwezibalo zebalazwe i-PC13 elakhiwe ngesilinganiso solwazi oluphindaphindiwe esichaza izingqimba ze-magnetite kanye namanye amapayipi (ansundu ngombala) kanye nebhande lamapayipi ngaphakathi Engxenyeni Enkulu Yenxanxathela yase-Bushveld.

4.3.1.7. Umsebenzi Wokudwetshwa Kwebalazwe laseSigodini saseKapa

Isendlalelo nenhloso: Inhlosongqangi Yomsebenzi Wokudwetshwa Kwebalazwe laseSigodini saseKapa ukudweba amabalazwe olwazi ngesimo sokwakheka komhlaba ukuze kwesekwe ukuhlonzwa kwemithombo yamanzi angaphansi komhlaba angakatholwa nezizinda zamafa esimo sokwakheka komhlaba.

Umsebenzi ugxile ezihlokweni ezine ezibalulekile: ukudweba amabalazwe olwazi ngesimo sokwakheka nokukhonjiswa kwawo, ubukhona bamanzi ngaphansi komhlaba, ukufunda ngesimo sokwakheka komhlaba ngokwezomnotho namafa esimo sokwakheka komhlaba/ i-palaeoheritage. Lo msebenzi wawugxile ezindaweni ezizungeze i-Clanwilliam, kuqalwa ngocwaningo lwezindawo ezimbili ezimelwe amaphepha amabalazwe esimo sokwakheka komhlaba anesilinganiso-bukhulu sika-1:50 000 kulesi sifunda indawo itholakala ngaphakathi "kwengalo esentshonalanga" eqhekeke kakhulu Yebhande lase-Cape Fold futhi ikhonjiswe amadwala Eqembu Elikhulu laseKapa, kanye namadwala amane aphumele obala e-dolerite esikhathi seminyaka ye-Cretaceous angene kwamanye amadwala ase-False Bay Suite ezinsalela ezisendaweni zesikhathi sobudala se-Cenozoic. Amaqoqo olwazi olwandulelayo atholakele afaka ulwazi lokwakheka nolwendawo eyisisekelo, kanye nolwazi lwakamuva lwezindawo ezaziwa kunazo zonke zamanzi nezindawo zesimo sokwakheka komhlaba ngokwezomnotho.

Impumelelo nokugqamile: Onyakeni obuyekezwayo, Umsebenzi Wokudwetshwa Kwebalazwe laseSigodini saseKapa wathola okubili okujabulisayo, kwaveza obala okungenzeka kube ngokokuqala (nokudala ngeminyaka kunakho konke) okungubufakazi base-Afrika bezinto eziphilayo ziphumela emhlabeni kanye nokutholakala kwesizinda esibalulekile se-glacigene seminyaka yobudala ye-Ordovician ehlobene nezinsalela zokwakuphila osekwaguquka kwaba izimo eziqopheke ematsheni. Kokubili okwatholakala kubalulekile ekufakeni isandla eqoqweni lolwazi olujulile lwesimo sokwakhekha komhlaba.

Ukushona phansi emhlabeni okubili okukhulu okubheke ngasenyakatho mpumalanga kuhlonziwe endaweni ecwaningwayo. Lezi zinto yilezi: amadwala amade angaphezu komhlaba phakathi kwezindawo ezishona phansi ezimbili e-Olifants River nase-Wupperthal kanye nedwala elide elingaphezu komhlaba phakathi kwezindawo ezishona phansi ezimbili enyakatho ne-Cederberg, okwakha ukushona phansi emhlabeni okubili phakathi kwezindawo ezishona phansi ezimbili ezisezansi. Lokhu kushona phansi emhlabeni kubukeka kuhlangene nokuphakama komhlaba onedwala elide elingaphezu komhlaba enyakatho ne-Cederberg. Lokhu kuphakama komhlaba onedwala elide elingaphezu komhlaba kuhlobene nochungechunge lwamasethi alandelanayo okuqhekeka asuka phakathi nendawo aphumele ngaphandle. Le mimo ayizange ikhonjiswe kumabalazwe esimo sokwakheka komhlaba aphambilini. Kuphakanyiswa ukuthi ukuphakama komhlaba kwangaphambi kokwenzeka eKapa, noma ukushona ngaphansi komhlaba kwamadwala okwenziwa ukucindezeleka, kungenzeka ukuthi kwabanga lezi zakhiwo zomumo. Umsebenzi wokuzwa ukude kusetshenziswa ulwazi lwe-ASTER ne-Sentinel-2 uyaqhubeka ekufuneni imithombo enamanzi angaphansi komhlaba neyezimbiwa okungenzeka ibe khona, ngoba le mithombo yaziwa ngokulawulwa ngokwesakhiwo nangokwezimpawu zamadwala endaweni yocwaningo. Ukuqonda kabanzi ngesimo sokwakheka komhlaba ngokwesakhiwo sawo kwale ndawo entula amanzi nezindawo eziyizungezile kubalulekile kakhulu ekuqondeni ngamanzi atholakala ngaphansi komhlaba kanye nokufuduka kwamanzi amadwala amasha angaba namanzi ngesikhathi. Lokhu kungaholela ekutholakaleni kwamanzi angaphansi komhlaba Imiphumela yalolu cwaningo olwandulelayo yeseka isifanekiso sedwala elisha elingaba namanzi eliqhekekile Leqembu lase-Table Mountain futhi ikhombisa ukusebenza ngendlela kwaleli thuluzi ekuhlonzeni izakhiwo eziyimigqa eziqukatha amanzi, kuholele ekukhonjisweni okungcono kwedwala elisha Laseqenjini lase-Table Mountain elingaba namanzi.

4.4. IZINHLELO ZASOLWANDLE ZOLWAZI OLUJULILE NGOKWAKHEKA KOMHLABA

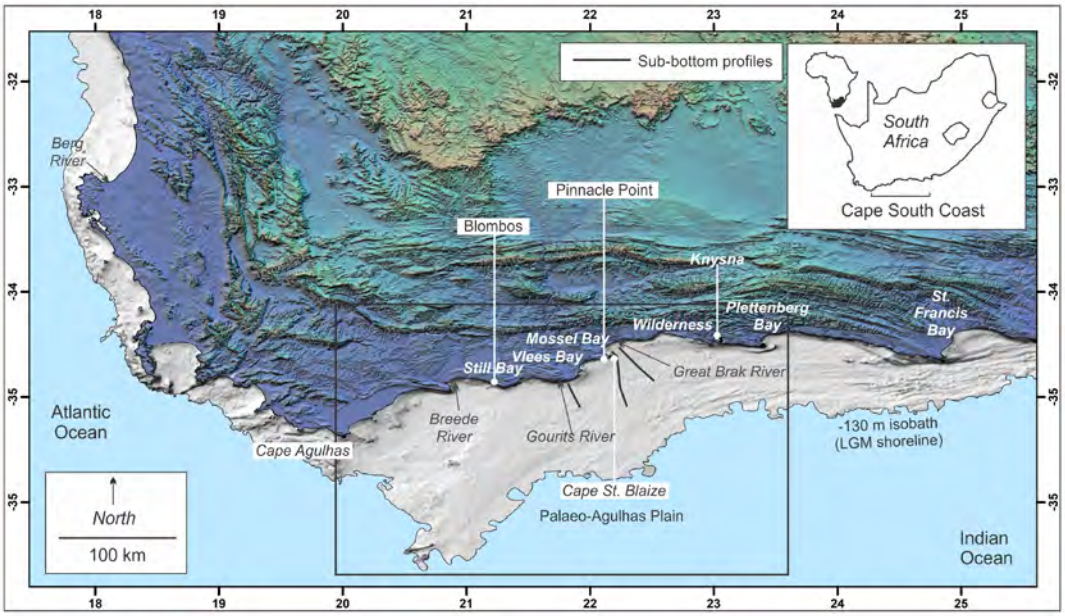
4.4.1. Uhlelo Lwasolwandle Lolwazi Olujulile Ngokwakheka Komhlaba

Isendlalelo nenhloso: Ukubaluleka okukhulu Kwendawo yasolwandle ukuthi iyavunywa njengendawo ye-Operation Phakisa – umnotho wasolwandle. Izindawo zasolwandle zaseNingizimu Afrika zihlanganisa izigidi eziwu-1.54 km^2 kuze kufike emkhawulweni wangaphandle wamamayela asolwandle angama-200 (ama-370 km) endawo yomnotho ekhethekile. Kuzokwengezwa izigidi (million) ezingu-1.87 km^2 uma isicelo seNingizimu Afrika seshalofu lezwekazi elengeziwe samukelwa Izizwe Ezihlangene. Uma kuqhathaniswa, indawo engumhlaba wezwe uqobo lwalo elisemhlabeni owomile iphelele kuphela ezigidini ezingu-1.22 km^2. Indawo yaseNingizimu Afrika esolwandle, ngakho-ke, iyona ezolandela ukuthi ihlolwe, ngoba

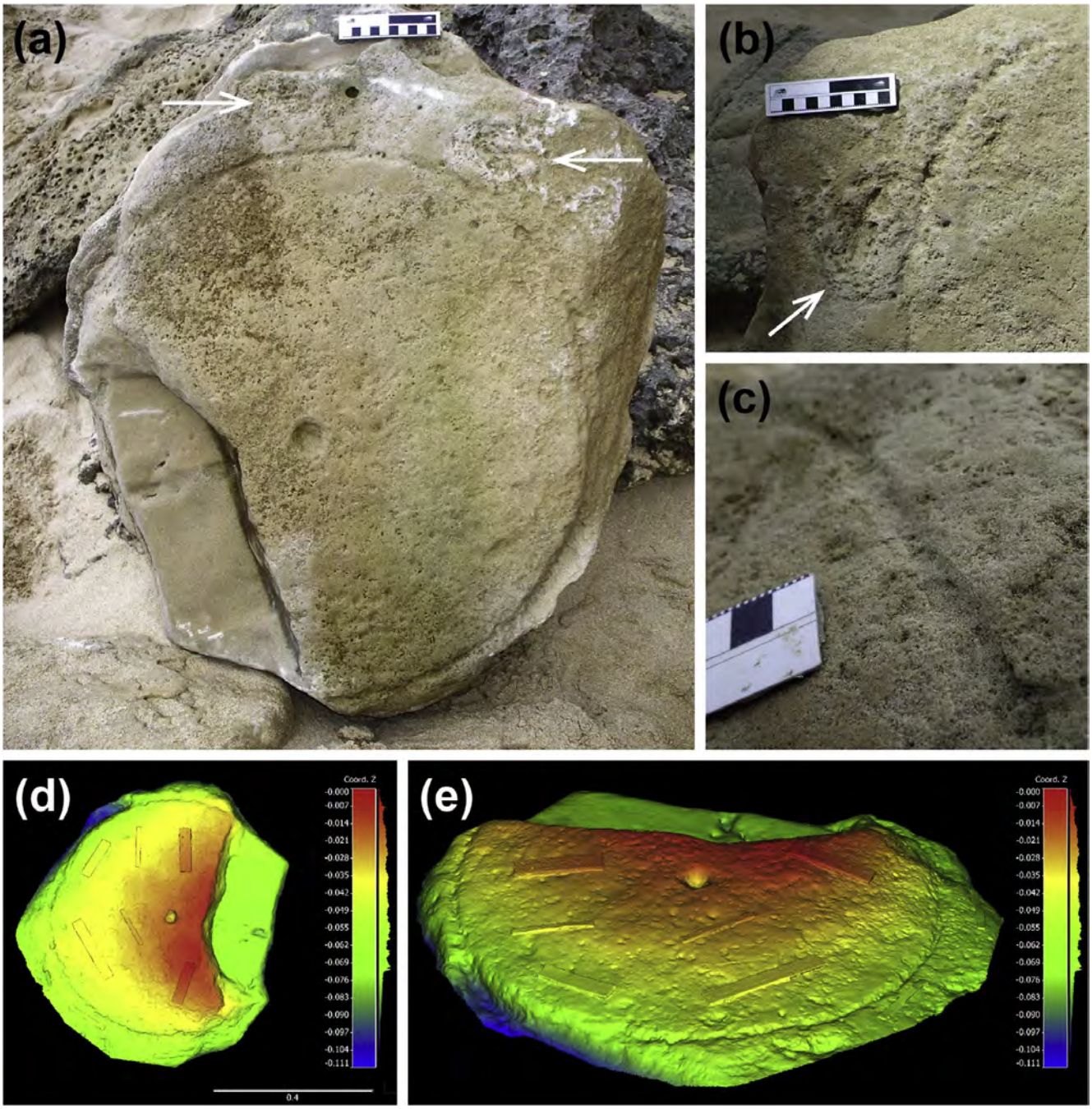
le ndawo inkulu kakhulu ukuthi inganganakwa. Ngokwamazwe omhlaba, kube nokubona okwengeziwe ukuthi indawo yasolwandle yezwe umthombo onesu obalulekile. Inhloso yalo msebenzi ukwenza ngcono ukukhula komnotho ngokwenza ucwaningo ogwini neshalofu lezwekazi eliseNingizimu Afrika futhi, ngokulandela lokho, ukukhulisa Umnotho Oluhlaza Sasibhakabhaka kanye nokuhlela ngempumelelo amasu okuguqula izinto ukuze kubhekanwe nobungozi kwingqalasizinda nomphakathi wasogwini; ukulawula okuqinile emazingeni okukhuphuka kwezinga lolwandle kubalulekile.

Impumelelo nokugqamile: I-CGS isebenzisa uhlelo lwe-sonar olubekwa phezu kwemikhumbi yasolwandle ukuze kudwetshwe amabalazwe ephansi lolwandle, oluhlose ukuthola ulwazi olubonakala ngokucacile ngokubonakala ngama-100%. Ngezinzwa ezibekwe phezu kwemikhumbi yasolwandle emincane nemikhulu, i-CGS isebenzisa iqoqo eligcwele lobuchwepheshe bemishini obungcono kakhulu bamanje, elifaka ama-multibeam echosounder, iside-scan sonar, i-magnetometer yasolwandle, i-boomer sub-bottom profiler, i-pinger sub-bottom profiler ne-sound-velocity profiler. Uhlelo Lwasolwandle Lolwazi Olujulile Ngokwakheka Komhlaba lunenhloso yokudweba ibalazwe "langempela" laseNingizimu Afrika, elifaka izindawo ezisemhlabeni owomile nezisolwandle.

Ukuze kwenzeke lokhu, i-CGS yaqhubeka nokulondoloza nokuhlola le mpahla yokusebenza, yabamba iqhaza ocwaningweni lwasensimini olungasogwini, yabamba iqhaza yafaka isandla ezindabeni eziphathelene nokuphathwa kolwandle (ngokuqondile Iqembu Likazwelonke Elisebenzayo Lokuhlelwa Kwendawo Yasolwandle nomsebenzi wokungenelela Kumlawuli Wephansi Lasolwandle Wamazwe Omhlaba) futhi yaqhubeka nokukhiqiza ulwazi ngokwenza uphenyo locwaningo. Ama-athikili amaningana abuyekezwe ozakwabo babantu abawabhalile ashicilelwa futhi ayegxile kulezi zihloko: i-palaoelandscape engaphansi kolwandle Yethafa lasePalaeo-Agulhas (Isithombe 16), ulwazi ngesimo sokwakheka komhlaba ongaphansi kolwandle nokuguqugugquka kwesimo sase-Table Bay, izinsalela zokwakuphila osekwaguquka kwaba izimo eziqopheke ematsheni kwemikhondo yezinyawo zezilwane okugcinwe ezindundumeni ezinamathele zasogwini lwaseningizimu lwaseKapa, ukuhlanganiswa kokulandelana kwezimbaza ezatholakala ezizindeni zokufunda ngomlando wezwe ukuya kuma-palaeocoastline njengethuluzi lokuqagela uhlobo losebe lolwandle nezinto eziqoqwa lapho kuhlehla noma kubuya ulwandle, ukwakheka kwezingqimba zamadwala ngenxa yokuzamazama komhlaba Kosebe lwase-Agulhas. Okugqamile kulo msebenzi ukutholakala kokuthi imidwebo abantu abayenza osebeni olunesihlabathi esikhathini se-Late Pleistocene ilondolozwe erekhodini le-Quaternary (Isithombe 17), futhi nobufakazi bokuchaza ukuthi kungani izitshalo zase-Cape Fynbos Strandveld ziqukethe ukunotha ngezinhlobo okungaka, zihlobene nemvelo yezinto eziphilayo eyizinhlobo eziningi eseyacwila, isibalo esincane nje esivele obala.



Isithombe 16: Ukuvezwa obala Kwethafa lase-Palaeo-Agulhas Ngesikhathi Sokwembozwa Komhlaba Ngeqhwa Elikhulu Okokugcina (umhlaba ocwile ngaphansi komhlaba ogwini lwaseKapa oluseningizimu) nolwazi ngomhlaba osemuva kusuka kugridi engama-90m nokukalwa kokujula kwamanzi kweshalofu lezwekazi okuphuma ku-de Wet (2013).



Isithombe 17: Umumo womsele oyindingilizi oshonayo phakathi nendawo, owatholakala eduze kwase-Wilderness: (a–c) Imicibisholo ekhombisa ukushona phansi okumise okwedolo okungenzeka; umugqa wesikali= 10cm; (d, e) inhlanganisela yezithombe zokuthola ulwazi ezinemibala ehlukene ze-A-1, kusetshenziswa izithombe ezingama-70. Izithombe zathathwa ngokulinganiselwa kuma-0.465m ukususka phansi.

UKUFUNDA NGOKUJULILE NGESIMO SOKWAKHEKA KOMHLABA KWENZELWA INGQALASIZINDA NOKUSEBENZISA UMHLABA

Ukudilika komhlaba okubangwa izikhukhula ezifika ngokungalindelekile ngenxa yemvula ezindaweni eziphansi endaweni kaMasipala waseThekwini (eThekwini nezindawo ezizungezile)

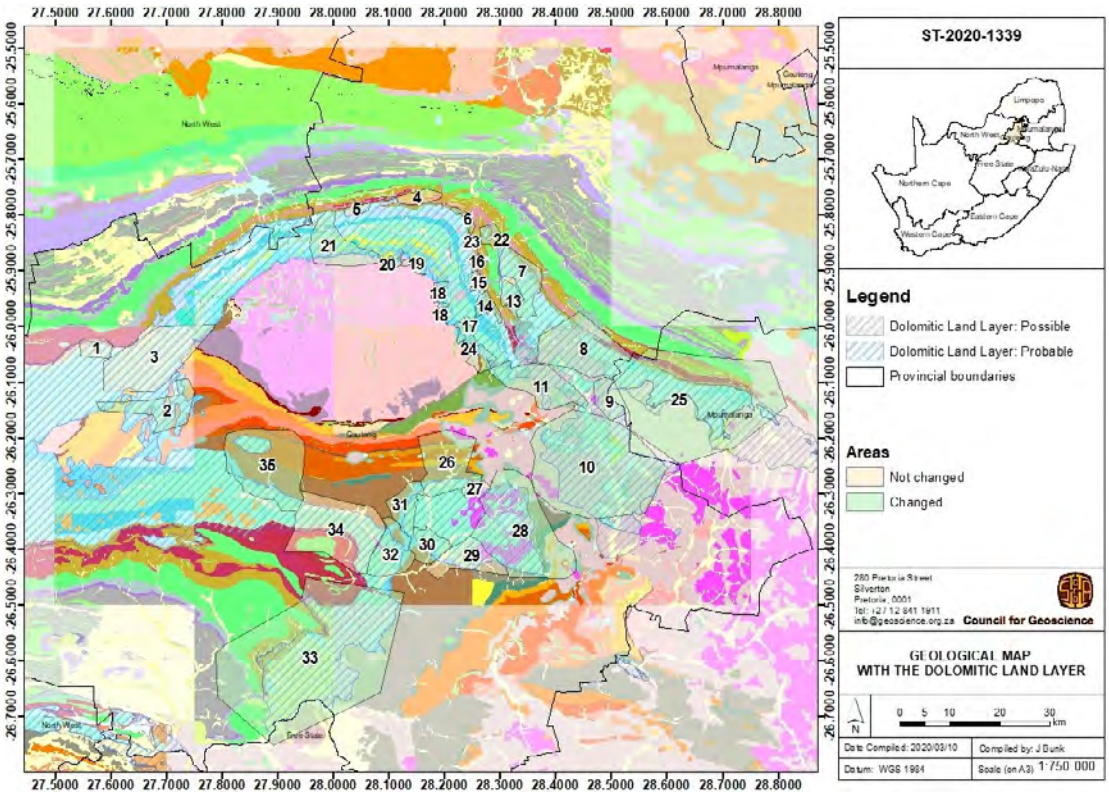
Isihloko "Sokufunda ngokujulile ngesimo sokwakheka komhlaba kwenzelwa ingqalasizinda nokusetshenziswa komhlaba" sihlinzeka ngokudwetshwa kwamabalazwe ngokuhlola okuhamba ngohlelo. Ulwazi olujulile lwesimo sokwakhekha komhlaba luyahlaziywa ukuze kuhlonzwe ukuhlaliswa kwabantu okuphephile nokusimeme, ukusetshenziswa komhlaba okusimeme nokuthuthukiswa kwengqalasizinda. Umthethosisekelo waseNingizimu Afrika Umthetho Wokuchitshiyelwa Kokufunda Ngokujulile Ngesimo Sokwakheka Komhlaba, ngokubekwe Esigabeni 5.1(eA), uthi i-CGS kufanele "ibuyekeze futhi ihlole yonke imibiko yobuchwepheshe yesimo sokwakheka komhlaba ngokuphathelene nezingozi ezidalwa isimo sokwakheka komhlaba ezingaba nomthelela kuyo yonke intuthuko yengqalasizinda ngokwamanani anqunyiwe".

Ngokuhambisana Nombono we-NDP yowezi-2030, izinhlosongqangi zesihloko "Sokufunda ngokujulile ngesimo sokwakheka komhlaba kwenzelwa ingqalasizinda nokusetshenziswa komhlaba" ingqalasizinda enempumelelo nokuthuthukiswa komhlaba. Imithetho yentuthuko eminingana nama-ejensi, afana Ne-ejenti Yokweseka Ingqalasizinda kaMasipala, Umthetho Wokuphatha Izimo Ezibucayi, Umthetho Wokuhlelwa Kwendawo Nokuphathwa Kokusetshenziswa Komhlaba Nomthethosivivinywa Wengqalasizinda Ebalulekile, kukhuthaza futhi isimo sokuthi lesi sihloko seseke okufanele kwenziwe kuzwelonke okubekwe ngenhla. Lesi sihloko asigcini nje ngokuhlinzeka ngolwazi olujulile ngesimo sokwakhekha komhlaba nokufaka isandla ekuthuthukisweni kwengqalasizinda, kodwa seseka intuthuko yezomnotho yaseNingizimu Afrika yezimbiwa, ukuqala imisebenzi yemikhakha ye-petroleum (uwoyela negesi) nemithombo yamanzi. Izingozi ngokwemvelo zaseNingizimu Afrika zifaka ubungozi obukhulu bokuzika komhlaba ezindaweni ezine-dolomite, nokuzamazama komhlaba nezikhukhula, konke okungaba nomthelela obalulekile emnothweni, nokuthuthukiswa okubalulekile kwezakhiwo nengqalasizinda. I-CGS iqinisa ukukwazi kwesizwe ukulawula umthelela wezingozi ezenzeka ngokwemvelo ngokuqoqa ulwazi olujulile ngesimo sokwakhekha komhlaba nokwakha izinhlelo zokuxwayisa kusenesikhathi ezinganciphisa umthelela wezingozi.

4.5. UNGQIMBA LUKAZWELONKE LOMHLABA ONE-DOLOMITE

Isendlalelo nenhloso: Ngokomthetho Wokuchitshiyelwa Kokufunda Ngokujulile Ngesimo Sokwakheka Komhlaba onguNombolo 16 wezi-2010, i-CGS ingumalusi kuzwelonke wemininingwane yobuchwepheshe ngesimo sokwakheka komhlaba, ngenhloso yokuhlanganisa iqoqo lolwazi nge-dolomite nolwazi lobuchwepheshe ngesimo sokwakheka komhlaba olutholakala kalula emphakathini wonke nasezikhungweni zikahulumeni. Ngaphezu kwalokho, lo Mthetho udinga ukuthi umbono, ngokombono wezingozi ezenzeka ngokwemvelo ngokuqoqa ulwazi olujulile (i-dolomite), utholwe e-CGS ngokusimama kwesiza esihlonzelwe ukuthuthukiswa okuthile. Umsebenzi we-CGS ukuhlinzeka ngenqubomgomo enolwazi futhi esekelwe kusayensi ngokwesihloko sezingozi ezenzeka ngokwemvelo nokuhlolwa ngokolwazi lobuchwepheshe ngesimo sokwakheka komhlaba. Lo msebenzi wokweluleka ubalulekile kuziphathimandla zezwe nomphakathi wonke ukuqinisekisa ukuthuthuka okuphephile emhlabeni one-dolomite. Izinhlosongqangi zalo msebenzi ophoqelekile ukunika umhlahlandlela kuziphathimandla zendawo (omasipala) kanye Nomkhandlu Kazwelonke Ophethe Ukwakhiwa Kwezindlu (i-NHRBC) ngokuthuthukiswa komhlaba one-dolomite okuphephile, okusimeme nokunokucophelela kanye nokusiza umphakathi wonke ngokulawula izimo ezinobungozi, ukuqapha nezinyathelo okufanele zithathwe kuqala ngokwemigomo Yendlela Yokusebenza ukuze kuncishiswe umthelela wezingozi ezenzeka ngokwemvelo eziphathelene nomhlaba one-dolomite.

Ungqimba lomhlaba olune-dolomite olubuyekezwe kuyo yonke indawo yasezigodini zase-Transvaal nase-Griqualand West kusetshenziswa amabalazwe olwazi ngesimo sokwakheka komhlaba akhona ashicilelwe (ngezilinganiso-bukhulu zika-1:50 000 no-1:250 000) ukunquma ngokucatshangelwa (kodwa okungenzeka) kongqimba lomhlaba olune-dolomite nezindawo okulindelekile ukuthi zendlalelwe amadwala ane-dolomite endaweni engajulile (okusho ukuthi okufinyelela ku-100m) kodwa ezembozwe izinsalela ezingaphezulu. Ngonyakamali wezi-2019/2020, ulwazi olwathathwa emigodini eyizi-11 735 kuzo zonke izindawo eziklanyiwe ezingama-35 lwasetshenziswa ukuze kubonakale ububanzi bomhlaba one-dolomite. Imigodi yahlukaniswa ngokwezigaba zezingozi zemvelo kusetshenziswa ulwazi lwemigodi olufana nokujula kwedwala le-dolomite eyendlalele indawo, ukuphela kwempahla yomgodi, ukwenzeka, izinsalela ze-dolomite nokunqwabelana kwayo, imigodi, ukujula ukuya emanzini angaphansi komhlaba nezigaba zezingozi ezandulelayo ezikhona ngokwemvelo. Imigodi eyi-1 714 ihlukaniswe ngezigaba futhi nongqimba lomhlaba olune-dolomite lwalungiswa ngokufanele. Ingcaphuno yezindawo ezibuyekeziwe ngalo nyakamali wamanje ikhonjiswe Esithombeni 18.



Isithombe 18: Izithombe zezingqimba zomhlaba ezine-dolomite ezibuyekezwe e-Gauteng ngowezi-2019/2020.

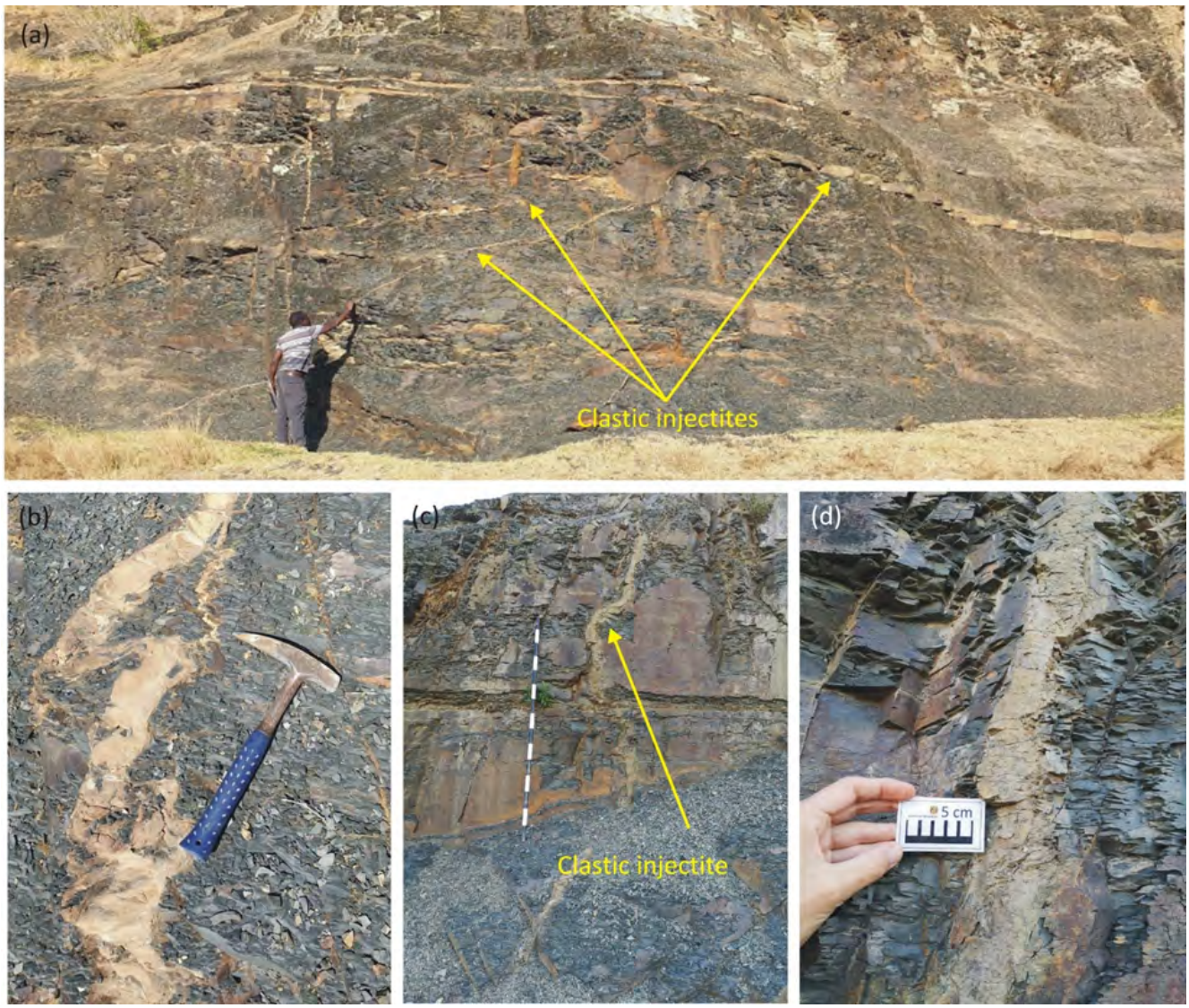
Izindawo ezintathu zocwaningo lwezigameko zakhethwa izwe lonke ukuze kuhlanganiswe izifanekiso eziyi-3D ezandulelayo ngesimo sokwakheka komhlaba obubanzi bomhlaba one-dolomite kusetshenziswa ulwazi lwezifunda olukhona lokumbiwa kwemigodi. Lezi zindawo zifaka iNtshonalanga Randi, iMpumalanga Randi Ezifundazweni zase-Gauteng NaseNyakatho Kapa (e-Danielskuil nase-Kuruman), futhi ucwaningo luzoqhubeka kuze kungenwe kunyakamali ozayo.

4.6. UMSEBENZI WOKUDWETSHWA KWEBALAZWE LASEMPUMALANGA KAPA

Isendlalelo nenhloso: Umsebenzi Wokudwetshwa Kwebalazwe laseMpumalanga Kapa uchaza, uhlaziye futhi uthuthukise ulwazi oluyisisekelo lokufunda ngokujulile ngesimo sokwakheka komhlaba endaweni yaseMthatha nezindawo ezizungezile. Indawo yocwaningo ibekwe esifundazweni esingenayo intuthuko kahle ngokomlando ngaphakathi Kukamasipala Wesifunda wase-OR Tambo, enye yezindawo zasemakhaya zaseNingizimu Afrika ezinobuphofu. Ucwaningo olwenziwe endaweni lweseka ukuthuthuka komnotho okusimeme futhi lusiza abathatha izinqumo nababambiqhaza ukuthi bakhethe benolwazi uma benza izinhlelo zokusetshenziswa komhlaba, ukuqapha, ukulondoloza nokuphathwa kwemvelo kwezindawo lapho indlela yokuziphilisa yemiphakathi yendawo incike khona. Ukuze kuxazululwe ezinye zezinselelo eziphuthumayo zolwazi olujulile ngesimo sokwakheka komhlaba endaweni, umsebenzi ugxile ezinhlosweni eziqondile ezintathu zocwaningo: ukonakala komhlaba namazinga okuguguleka komhlaba kwemihlabathi enengozi, eguguleka kalula; izimpawu zesimo sokwakheka komhlaba nomumo womhlaba okunemithelela ekubeni khona okungenzeka kwamanzi angaphansi komhlaba, nokuhlolwa nokubuyekezwa kokuba khona kwezimbiwa okungenzeka endaweni.

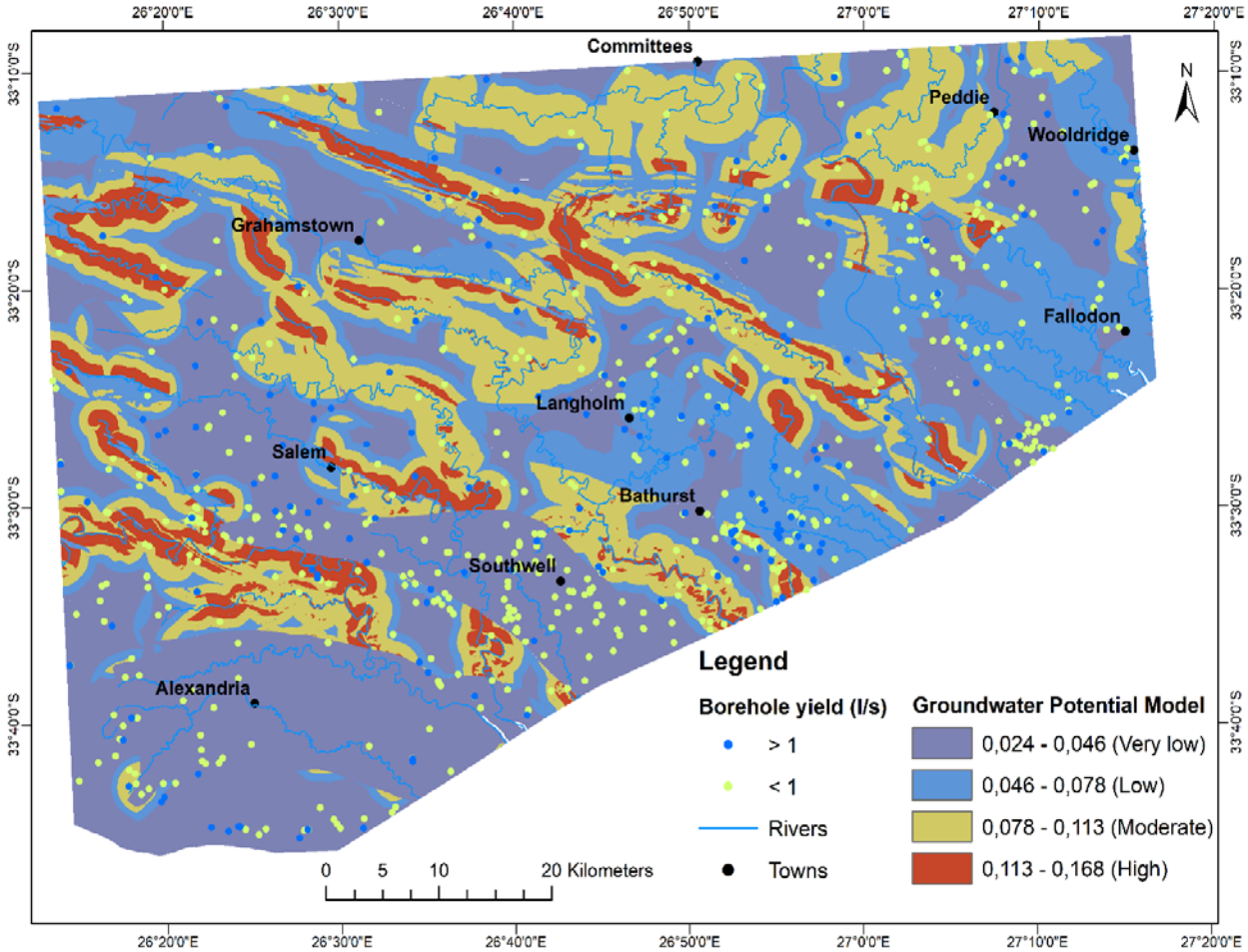
Impumelelo nokugqamile: Ngonyakamali wezi-2019/2020, lo msebenzi wabhekana nesimo sesifundazwe sokonakala komhlaba okwedlulele. Ngokuqondile, imimo yokuguguleka komhlaba eyizi-4780 yahlonzwa futhi kwadwetshwa amabalazwe ayo, kwabalwa ngokuningiliziwe umhlaba okwenzeka kuwo izindonga ngenxa yokuguguleka komhlaba, imifudlana nokuguguleka komhlaba ngokulinganayo (ngokulinganiselwa ku-1.63% noma u-6009ha) kwachazwa, ukuchazwa kwezinhlobo zamadwala okuningiliziwe kwezinsalela zokuguguleka (izingqimba zamadwala ezizacile ezinesakhiwo esehlukile kwamanye amadwala asendaweni eziyisishiyagalolunye ezahlukene) kwenziwa, uphenyo lwendawo nolwesifunda ngezimbangela ezenziwa abantu nezemvelo ezifaka isandla ekwenzekeni kwezimo zokuguguleka komhlaba lwenziwa, futhi amazinga okuqala okuguguleka komhlaba abalwa (ama-0.46m/y) eminyakeni yakamuva engama-81). Ukuthatha amasampula kokubona okukhuthazwe ukukhanya kwezinsalela zokugugulekayo kuzosiza ekusunguleni irekhodi lokuguquguquka komumo komhlaba nokunquma isikhathi okwenzeka ngaso izindonga ezibangwa ukuguguleka komhlaba namazinga okuguguleka komhlaba. Le miphumela ibalulekile ukuze kuqondwe izindima ezilinganiselwe ezidlalwa izenzo zemvelo, zesimo sezulu/kanye/noma zabantu ekwenzekeni kwemimo yokuguguleka komhlaba.

Ukuhlolwa kolwazi oselukhona vele kwakubalulekile ekwehlukaniseni ngokungagcwele imihlahlandlela ehlukahlukene (amadwala amasha angaba namanzi, izindawo ezineziphethu/ezihlobene nazo, umthamo wamanzi angaphansi komhlaba, ukusetshenziswa komhlaba, izinhlangothi imithambeka ebheke kuzo, ama-engela emithambeka, ukucinana kwamadwala angene kwamanye nezindawo zokungena kwamanzi emifuleni zesikhathi se-Quaternary) okucatshangwa ukuthi kulawula ubukhona bamanzi angaphansi komhlaba endaweni ukuze kusetshenziswe kwizinqubo ezisekelwe ohlelweni lolwazi ngomumo womhlaba zokuhlaziya ngokwamazinga. Onyakenimali ozayo, okutholakele kuzohlanganiswa kube uhlelo lwesifanekiso olwenziwe lwabaluleka lokubheka ukufaneleka ukuze kukhiqizwe ibalazwe lendawo lokuba khona kwamanzi okungenzeka. Ukuhlaziywa kokuqala kolwazi kukhombisa amathuba amahle okuba khona kwamanzi ngaphansi komhlaba okungenzeka ezindaweni ezikhombisa ukuvama kokuphambana kwamadwala angena kwamanye. Ukudwetshwa kwamabalazwe endawo ehlonziwe nokubuyekezwa okwenziwe ehhovisi kumakhompuyutha kwesimo sokwakheka komhlaba ngokwezomnotho kwasendaweni kuhlonze ubukhona bezimbiwa okuningana okusha, okuhlanganisa nezinhlobo zobumba nokunye okuqoqene ndawonye. Izakhiwo zemimo yokwakheka komhlaba esanda kubonwa zifaka amadwala amaningana ehlukene angene kwamanye akhiwe ngezingcezu zamadwala amadala akhombisa ukwenzeka kokuguqulwa kwawo abe uketshezi, njengoba kukhonjiswe Esithombeni 19. Lo msebenzi wakhiqiza amabalazwe ayisishiyagalombili ngesimo sokwakheka komhlaba anesilinganiso-bukhulu sika-1:50 000.



Isithombe 19: Amadwala angene kwamanye okhetheni Lweqembu le-Ecca: (a) Amashidi amadwala angene phakathi kwamanye aphakathi kwezingqimba ezivele zikhona namadwala angene kwamanye okhetheni okungenzeka ukuthi luyisakhiwo se-Collingham; (b) idwala elingene kwamanye elakhiwe ngezingcezu zamadwala amadala elizacile elinogqinsi olungama-10 cm eligoqekile; (u-c no-d) idwala elingene kwamanye elakhiwe ngezingcezu zamadwala amadala eliwugqinsi olungama-5-10 cm elibheke phezulu okugwegwile elingene okhetheni Lweqembu le-Ecca.

Imiphumela yokufunda ngemishini nobuchwepheshe bemiphumela engaqondile ngqo ebhulokhini yaseMakana kwakhipha umphumela onamanani aphakathi kuka-0.24 ukuya ku-0.168 (Isithombe 20). Imiphumela yehlukaniswa yaba izigaba ezine (esiphezulu, esiphakathi nendawo, esiphansi nesiphansi kakhulu), yakhombisa amathuba okuba khona kwamanzi angaphansi komhlaba endaweni yocwaningo. Amanani aphezulu angaqondile akhombisa amathuba amahle okuba khona kwamanzi ngaphansi komhlaba, kusekelwe emaqoqweni olwazi asetshenzisiwe, futhi amanani aphansi kunawo wonke akhombisa izindawo ezinamathuba amancane kunawo wonke okuba khona kwamanzi ngaphansi komhlaba. Izindawo ezithembisa kunazo zonke ukuba namanzi angaphansi komhlaba ziseduze nemifula emikhulu. Lezi zindawo zikhonjiswa ukuminyana ngokwesakhiwo, izimo zokwakheka komhlaba ezifanele, ngokuvamile izakhi zamadwala eziyisihlabathi kanye nomthamo wamadwala amasha angaba namanzi ngaphakathi noma ngaphezu kwesilinganiso sika-0.5L/s ukuya ku-2L/s. Kokubili ibalazwe lamathuba okuba khona kwamanzi ngaphansi komhlaba nesifanekiso samanzi angaphansi komhlaba kuzosetshenziswa ukuze kwakhiwe izindawo zokumba.



Isithombe 20: Ibalazwe lalapho kungenzeka kutholakale khona amanzi ngaphansi komhlaba ebhulokhini yaseMakana eMpumalanga Kapa, eligqamise izindawo okunamathuba kuzona amahle namancane okuba khona kwamanzi ngaphansi komhlaba.

UKUFUNDA NGOKUJULILE NGESIMO SOKWAKHEKA KOMHLABA KWENZELWA EZEMPILO, AMANZI ATHOLAKALA NGAPHANSI KOMHLABA NEMVELO ESIZUNGEZILE

Umshini wokumba osizwa umoya uyamba ukuze kutholakale amanzi e-Randjiesfontein, eGoli.

Imboni yezimayini yaseNingizimu Afrika iwumkhakha osuvuthiwe nokho okhulise umnotho, kodwa lokho, kuze kufike ezingeni elithile, kushiye izinselelo zomlando wemvelo ezidinga ukunakwa ngokushesha. Ukuphila kahle ngokwenhlalo nangokomnotho kwemiphakathi kuhlobene ngokuqondile nokuphila kwemvelo eyizungezile lapho le miphakathi ihlala khona, ikhiqiza ukudla kwayo futhi isebenze khona. Ukugxila kokumba ezimayini emhlabeni wonke ukuguqukela ekuhlolweni nasekusetshenzisweni kwazo, kugcizelelwa kakhulu kunakuqala ekulondolozeni imvelo. Njengezwe elintula amanzi, iNingizimu Afrika ibhekene nezinselelo ezinkulu ngokuba khona nokuhlinzekwa kwamanzi kanye nokuqonda ngemithombo yamanzi okungaphelele. Ukuthuthuka kwemiphakathi, ezolimo nemithombo yezimbiwa namandla kuncike ekubeni khona nolwazi ngemithombo yamanzi.

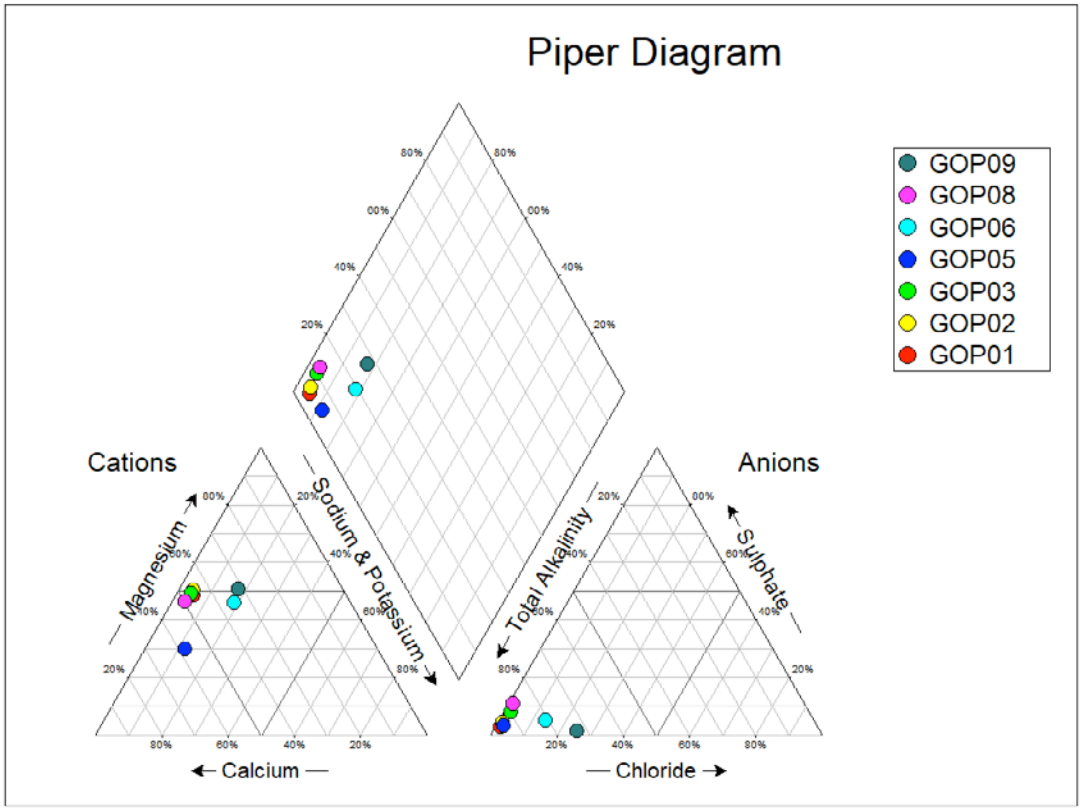
Isihloko “Sokufunda ngokujulile ngesimo sokwakheka komhlaba kwenzelwa ezempilo, amanzi atholakala ngaphansi komhlaba nemvelo esizungezile” sihlelelwe ukukhuthaza ukulondolozwa kwemvelo ngokuqondile ezindaweni okungenzeka ukuthi zingcole ngenxa yezenzo ezifaka ukuhlolwa nokusetshenziswa kwezimbiwa. Ngaphansi kwalesi sihloko, imithombo yamanzi angaphansi komhlaba iyahlonzwa bese ikhonjiswa kwenzelwa imiphakathi, izimboni nezolimo. Ukungenelela okufana nokufaka amanzi okubangwe abantu kuzocatshangelwa nakho.

4.7. UKUPHATHWA KWEMISEBENZI EYIZIBOPHO ZOMBUSO EZINCIKE EKWENZEKENI KWEZINTO EZITHILE YEZIMAYINI EZINGASANAKIWE NEZINGENABANIKAZI ENINGIZIMU AFRIKA

Isendlalelo nenhloso: Inhlosongqangi yalo msebenzi ukwenza izindlela zokunciphisa umthelela wezimayini ezingasanakiwe nezingenabanikazi ngenhloso yokuhlonza, ukwehlukanisa, ukuvala nokuhlunyeleliswa kwalezi zimayini. Lokhu kungaholela, phakathi kokunye, ekuncipheni kwemisebenzi eyizibopho zikahulumeni ngokuvalwa okusimeme nokuhlunyeleliswa kwemigodi evulekile yasezimayini engadala ubungozi ekuphepheni kwemvelo, nokuhlolwa kokuzinza komhlaba ezindaweni ezingashoni kakhulu phansi futhi ezimbiwe kancane.

Impumelelo nokugqamile: Onyakeni obuyekezwayo, ukuvalwa kwezimayini ezingama-21 kwaphothulwa. Imigodi evulekile yezimayini eyishumi nesithupha yaqedwa endaweni yase-Tugela, kanti imigodi evulekile yasezimayini eyisishiyagalolunye endaweni yasePenge yaqedwa. Umsebenzi wokuvala imigodi evulekile emine esele, esendaweni kamasipala wase-Ekurhuleni – yona iyovalwa ngonyaka ozayo. Phezu kwalokho, ukuhlolwa kokuzinza komhlaba ezindaweni ezingashoni kakhulu phansi ezingambiwe kakhulu endaweni yaseGopane Esifundazweni saseNyakatho Ntshonalanga, kwaphothulwa. Uphenyo lobuchwepheshe ngesimo sokwakheka komhlaba endaweni lwesekwa ngokusebenzisa ucwaningo lomhlaba lwesimo sokwakheka komhlaba ngokuma kwawo, ukuzwa ukude, ukufunda ngamanzi akhona ngaphansi komhlaba nokumba ngomshini osizwa umoya, nokumba ngomshini osebenzisa umgxala ukuze kuthathwe amashubhu emigodini embiwe. Imisebenzi efaka ukufunda ngesimo somhlaba ngokuma kwawo emhlabeni phansi, i-LiDAR nocwaningo ngamanzi angaphansi komhlaba kwaphothulwa phambilini. Imiphumela yocwaningo iyahlanganiswa ukuze kwakhiwe ibalazwe lendawo lokuhlola ukuzinza komhlaba.

I-CGS yamba imigodi eyisishiyagalombili embiwa ngosizo lomoya njengengxenye yocwaningo lwayo kuyo yonke indawo yaseGopane. Izinga lamanzi aphuma kuyo yonke imigodi likhombisa ukuba khona kwe-calcium, i-magnesium ne-bicarbonate njengoba kukhonjisiwe emdwebeni ka-piper okhonjiswe Esithombeni 21.



Isithombe 21: Isithombe sika-Piper esikhombisa izinga lamanzi emigodini embiwe eGopane.

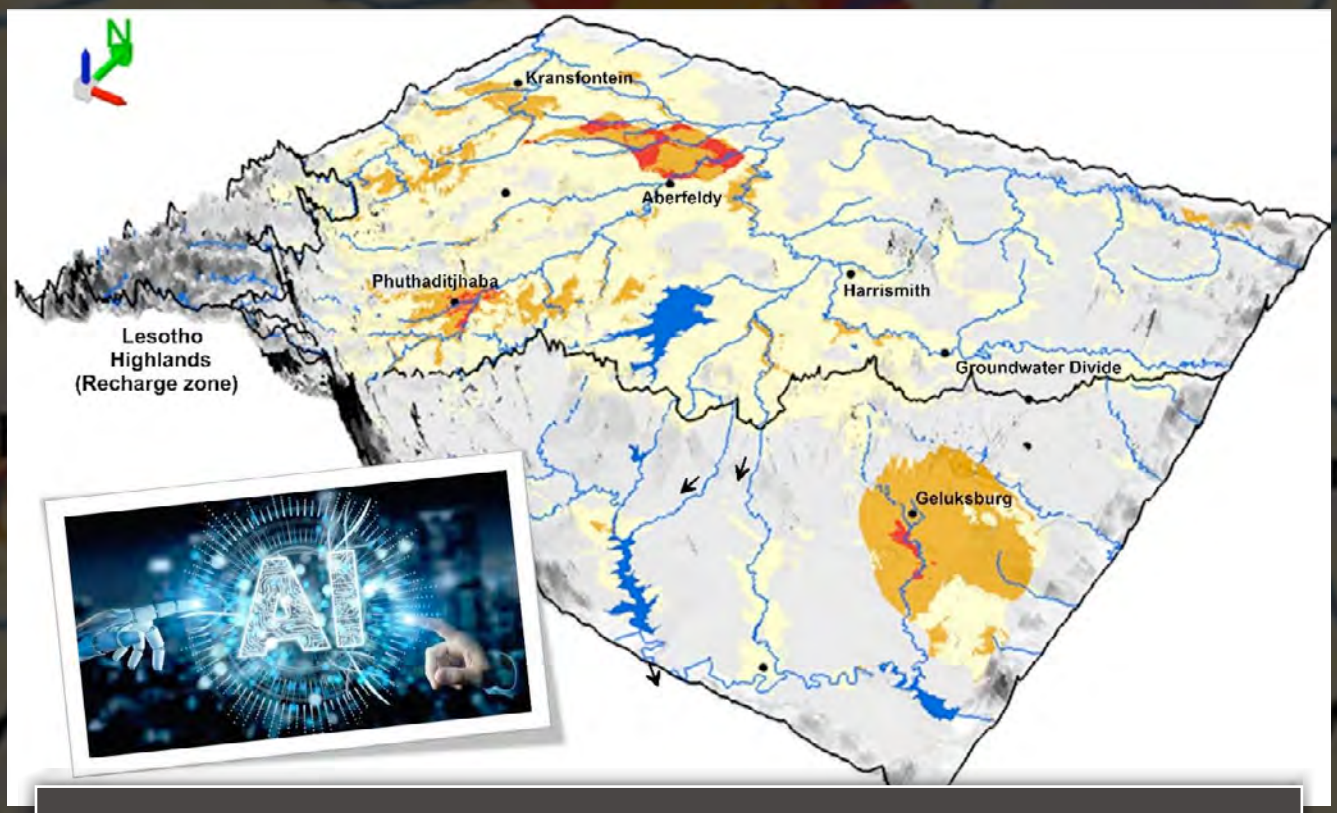
4.8. UHLELO LOKUPHATHWA KWEZINDAWO ZEZIMAYINI NOKUPHATHWA KWAMANZI

Isendlalelo nenhloso: Ukugxila Kohlelo Lokuphathwa Kwezindawo Zezimayini Namanzi (i-MEWMP) kusekuhlonzweni nokuncishiswa kokungena kwamanzi ngaphansi kwezimayini zegolide lapho kusetshenzwa khona e-Witwatersrand, ukuqaliswa kobuchwepheshe bokuhlanza amanzi asezimayini ezizindeni zokumbiwa kwegolide namalahle Ezifundazweni zaseMpumalanga naseGauteng ukuze kubhekanwe nezinselelo zemvelo. Umsebenzi uhlola ukuthi kungenzeka yini ukuthi ukumba ezimayini kuhambisane kanyekanye nokulondoloza imvelo ngokwehlukahlukana kanye nokulondolozwa kokutholakala kwamanzi anele ngokusebenzisa ithuluzi lokweseka isinqumo futhi weseka imithethonqubo yezemvelo yokumba ezimayini kwasogwini nasolwandle. Lo msebenzi uzophinde usize ekukhuthazeni ukuzinza emisebenzini yasezimayini yangomuso.

Impumelelo nokugqamile: Kulo nyakamali wezi-2019/2020, lo msebenzi wabuyekeza amazinga abucayi kwezemvelo asetshenziswa eziteshini zokumpompa amanzi ezimayini. Imiphumela yokubuyekezwa yakhombisa ithemba lokwehlisa la mazinga, okuzokwehlisa amazinga okumpompa nezindleko. Ukwakhiwa Komsele wase-Van Ryn okukade kwalindelwa, okuhloswe ngakho ukunciphisa ukungena kwamanzi e-Witwatersrand kwaqala onyakeni obuyekezwayo. Imisebenzi yokumba imisele iyaqhubeka – amanzi asevele aphambukisiwe aya kude nendawo yawo yokungena eyahlonzwa esikhathini esedlule futhi awasangeni ezindaweni ezingenalutho ngaphansi komhlaba. Ukuhlanganiswa nokukhiqizwa kwezindawo ezinobungozi bokungena kwamanzi kwakhiwa amabalazwe amathathu esifunda obungozi asephothuliwe. Ukukhulisa ithuluzi lokwenza izinqumo ukuze ukumba ezimayini kuhambisane kanyekanye nokulondoloza imvelo kugqamise ukwahlukana kwezinye izindawo ezivikelwe. Okubaluleke ngokuthe xaxa, ucwaningo lwesigameko lwenziwa njengobufakazi bomcabango futhi lukhombise ukusebenza kwethuluzi. Ulwazi lobuchwepheshe olwatholakala kulo msebenzi lwafaka isandla ekwenziweni "Kwezixazululo zezemvelo ezihlelwa kuqala nomhlahlandlela wokuba khona kanyekanye kokumba ezimayini nemvelo" ze-DMRE. Okokugcina, ukufaka isandla kobuchwepheshe ephepheni lokubuyekezwa lamanzi asemayini ane-esidi ngethimba lochwepheshe kwakhombisa ukubaluleka okuqhubekayo nomthelela womsebenzi empokophelweni enkulu yezixazululo zamanzi asezimayini.

Isithombe 22: Imisebenzi yokwakha emseleni wase-Van Ryn.

UKUSUNGULWA KWEZINTO EZINTSHA EKUFUNDENI NGOKUJULILE NGESIMO SOKWAKHEKA KOMHLABA



Ibalazwe lokuba khona kwamanzi okungenzeka lasendaweni yase-Maluti-a-Phofung eFreyistata. Ibalazwe elikhiqizwe kusetshenziswa ukuhlanganiswa kwamaqoqo olwazi lokufunda ngokujulile ngokwakheka kwesimo somhlaba nezibalo zokuhlakanipha okwakhiwe ngobuchwepheshe.

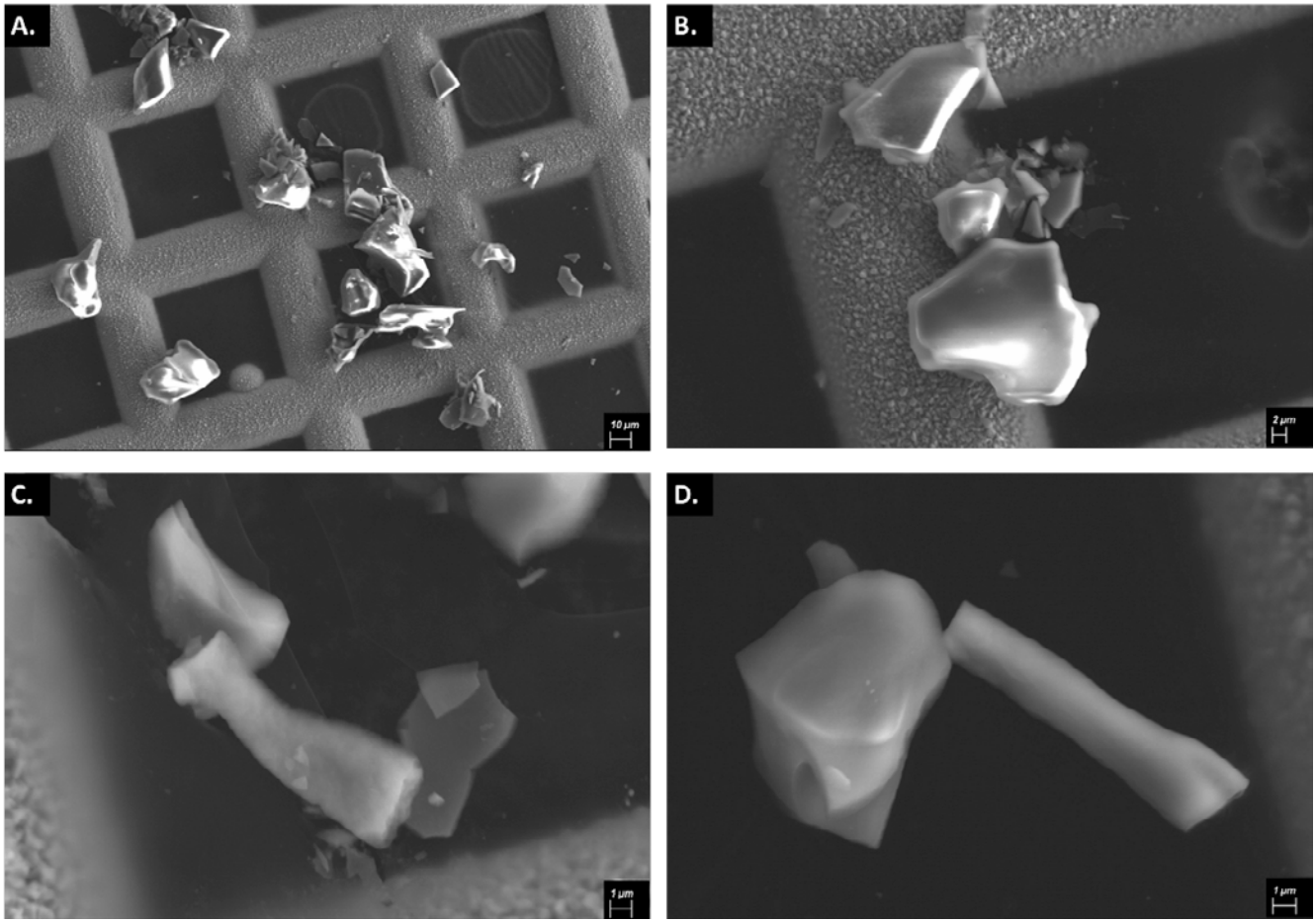
Ukufaka umfutho kwe-CGS ekusunguleni izinto ezintsha kuzogqugquzela futhi kukhuthaze isayensi enomthelela omkhulu, kuholele ekuboneni okunembe ngokuthe xaxa nokuqinile, nezinqumo ezingcono ukuze kwesekwe umsebenzi we-CGS.

Isihloko "Sokusungula izinto ezintsha olwazini olujulile ngesimo sokwakheka komhlaba" sikhuthaza ukuguqulwa kwemibono ibe izixazululo ezingenzeka okuhloswe ngazo ukuxazulula ezinye zezinselelo zezwe zesimo senhlalo, ezifana nokuntuleka kwamanzi, ubuphofu, izingozi ezidalwa isimo sokwakheka komhlaba nokunye. Emaqoqweni olwazi emikhakha emininingi yokufunda ngokujulile ngesimo sokwakheka komhlaba (ulwazi ngesimo sokwakheka komhlaba, ulwazi ngesimo sokwakheka komhlaba ngokokuma kwawo, ulwazi ngesimo sokwakheka komhlaba ngokwamakhemikhali, njll.) ulwazi luyaqoqwa futhi lunqwabelane ngokushesha okukhulu, lokho kwakhe isidingo esiphuthumayo sesizukulwane esisha semicabango yokusebenzisa amakhompuyutha namathuluzi okusiza abantu ekukhipheni imininingwane esizayo (ulwazi) ezinqwabeni zolwazi ezidijithali ezikhula ngokushesha. Isihloko "Sokusungula izinto ezintsha olwazini olujulile ngesimo sokwakheka komhlaba" sibheke futhi ekusetshenzisweni kobuchwepheshe besimanje obufana nokusebenzisa ukuhlakanipha okwakhiwe ngobuchwepheshe ekukhishweni kolwazi. Lokhu kungenza ngcono isivinini, ukugculisa nokunemba kwinqubo yokukhipha ulwazi.

4.9 UKUSETSHENZISWA KWEZINSALELA ZOKUMBIWE ZASE-BUSHVELD UKUZE KWAKHIWE IMPAHLA EYAKHIWE NGEZINHLAYIYA EZINCANE KAKHULU

Isendlalelo nenhloso: Inhloso yalo msebenzi ukuphenya isimo sokufanela kwezinjimbilili zase-Bushveld ezine-plagioclase eningi ukuze kwakhiwe izinhlayiya ezincane ze-calcium aluminate (i-$CaAl_2O_4$). I-$CaAl_2O_4$ ingasetshenziselwa ukukhuphula ngamandla okwakhiwa kwama-geopolymer, impahla yokwakha emele okunye okungasetshenziswa esikhundleni sokusetshenziswa kwezinhlelo zokwendlalela ngokujwayelekile ukuze kuvinjwe ngendlela engabizi ukuphuma okungalawuliwe kwamanzi angcolile anosawoti aphuma ezinqolobaneni zasezimayini aphumela ngaphandle endaweni yemvelo, kuhlanganisa namanzi angaphezulu nangaphansi komhlaba.

Impumelelo nokugqamile: Onyakeni obuyekezwayo, ukugculisa kwendlela okungakhishwa ngayo i-calcium ne-aluminium kwinjimbilili kwaphenywa kusetshenziswa izindlela ezine zokukhipha ezahlukene: Ukukhipha i-esidi okuqondile, ukuhlanzwa ngokushisa nangokusetshenzwa kwamakhemikhali, ukusetshenziswa kwesibabule ekushiseni okuphansi, nokukhipha okusizwa ama-microwave. Ukukhipha i-esidi ngokuqondile kwatholakala kuyiyona ndlela egculisayo kunazo zonke, kwaze kwafinyelela kuma-88% e-plagioclase eyancibilikiswa yaze yaba ingxube ngesikhathi kukhishwa i-esidi. Kodwa-ke, insimbi ne-magnesium nakho kwakhishwa kanyekanye kwaze kwaba yingxube, okwavimba ukwakheka kwezigaba zezimbiwa ezimsulwa eziyi-CaAl2O4. Kulo nyaka, indlela entsha yokukhipha eyahlelwa yapheleliswa ngempumelelo. Kodwa-ke ukuze kwakhiwe ngokugcwele izinhlayiya ezincane, indlela yokuwahlanza amanzi angcolile anosawoti, ezosiza ukwenza ngcono amazinga obumsulwa bezinhlayiya ezakhiwe izophenywa futhi isetshenziswe onyakeni ozayo.

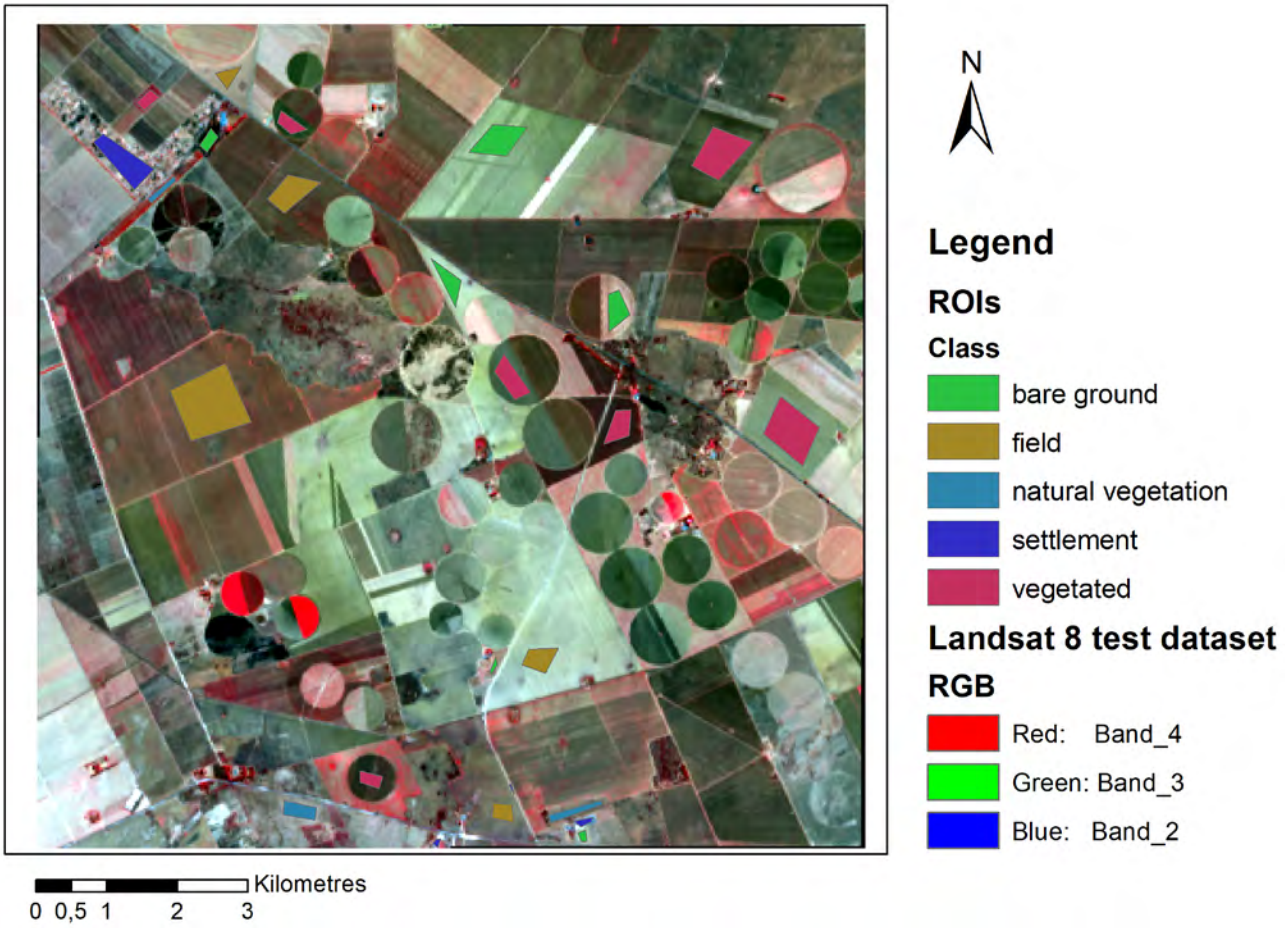


Isithombe 23: Izinhlayiya ezincane ezihlanganisiwe ezakhiwe ngendlela yokushiswa kusetshenziswa ama-reagent adayiswayo.

4.10 UMSEBENZI WE-PYTHON WOKUFANEKISA UKWAKHEKA KOMHLABA NOKUWUCHAZA

Isendlalelo nenhloso: Umsebenzi we-Python Wokufanekisa Isimo Sokwakheka Komhlaba Nokuwuchaza (i-PyGMI) ihlinzeka ngezixazululo ngokwenza izifanekiso zokufunda ngokujulile ngesimo sokwakheka komhlaba nokuwuchaza ngokusungula izinto ezintsha. Izixazululo ziyatholakala mahhala emphakathini obanzi wokufunda ngokujulile ngesimo sokwakheka komhlaba ukuze zisetshenziswe ezweni nakwamanye amazwe. I-PyGMI ihlanganisa amathuluzi okuchaza ahlukene, afaka nolwazi lokusebenziseka ukukala ukuvama nokwenzeka kokuzamazama komhlaba, nolwazi ngokudluliswa kukagesi nozibuthe womhlaba nolwazi ngamandla adonsela izinto phansi, futhi ikhethelwe ukuba lula ukuyisebenzisa, idinga ukuqeqeshwa ngokuyisebenzisa okulingene nje.

Impumelelo nokugqamile: Kulo nyaka, i-PyGMI yenza ngcono ukusebenzisa ubuchwepheshe bokufunda ngemishini, obufaka ukwehlukaniswa kwezimpawu okuqashiwe nokungaqashiwe. Lolu uphawu olwengeziwe lwe-PyGMI (Isithombe 24). Phezu kwalokhu, i-PyGMI inamamojuli aqondile okwenza izifanekiso eziyi-3D zolwazi ngesimo sokwakheka komhlaba kanye nolwazi ngesimo sokwakheka komhlaba ngokuma kwawo, kuhlanganisa nokusetshenzwa kolwazi ngemigodi.

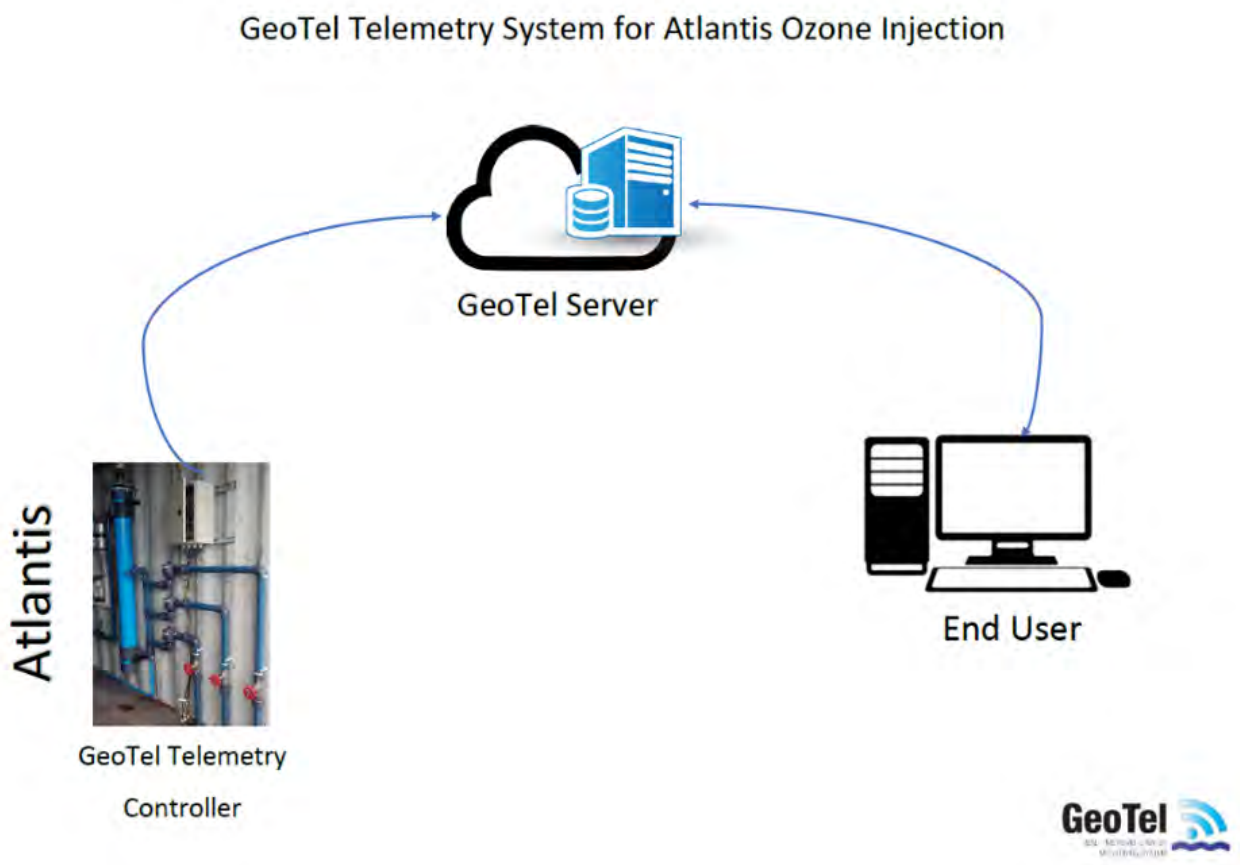


Isithombe 24: Isithombe sesibonelo seqoqo lolwazi nezindawo zentshisekelo ezinamakilasi okuqeqesha ukuhlaziywa kokwehlukanisa.

4.11 UCWANINGO LWESIKHATHI ESIDE LOKUFUNDA NGOKUSEBENZA KOKUKHISHWA KWENSIMBI LAPHO IKHONA NE-MANGANESE KUSETSHENZISWA I-OZONATION: INDLELA ENTSHA YOKUVIKELA IZINHLELO ZAMANZI ATHOLAKALA NGAPHANSI KOMHLABA

Isendlalelo nenhloso: Lo msebenzi kuhloswe ngawo ukuvimba unomphela nangempumelelo ukuvimbeka okuphathelene ne-Fe ne-Mn kwingqalasizinda yokuphakelwa kwamanzi okwenzeka eNingizimu Afrika ngendlela yokukhipha i-Fe ne-Mn okukhona ngokuhlanzwa nge-ozonation. I-CGS isebenzisana ne Nekhomishani Yokucwaninga Ngamanzi ocwaningweni lokuxazulula ukuvimbeka kwemigodi ngenxa yokungcoliswa i-Fe ne-Mn okuhlangene nezinto eziphilayo.

Impumelelo nokugqamile: I-CGS yasungula futhi yathola ilungelo lobunikazi indlela yokuxazulula ukuvimbeka kwemigodi ngenxa yokungcoliswa i-Fe ne-Mn okuhlangene nezinto eziphilayo. Lena inselelo ejwayelekile nebalulekile emadwaleni amasha angaba namanzi abalulekile nasezingeni lesibili eNingizimu Afrika. Lo msebenzi uwukuqhutshwa komsebenzi wesikhathi esedlule owenziwa i-CGS endaweni eyodwa ensimini yemigodi e-Atlantis's Witzand, okwakhipha imiphumela ethembisayo yokusetshenziswa kwalobu buchwepheshe (i-CGS eyathola ilungelo lobunikazi babo) eNingizimu Afrika. Kulo nyaka, i-CGS iqale le ndlela entsha yesikhathi eside yokukhipha i-Fe ne-Mn ekhona nge-ozonation ukuze kuvikelwe izinhlelo zamanzi atholakala ngaphansi komhlaba. Ukuze kufezwe inhlosongqangi, ukusetshenzwa ngokugcwele kwezinkinga zokuvimbeka eziphathelene ne-Fe ne-Mn okwabhekanwa nazo eNingizimu Afrika zingavinjwa unomphela ngendlela engabizi ngokuhlanzwa lapho zikhona nge-ozonation. Kuze kube yimanje, umshini wokuhlanza usuhlanganisiwe futhi ukufaka sekuqaliwe. Uhlelo lokusetshenzwa kolwazi kusetshenziswa imishini oluhlelelwe umsebenzi ukuze luqoqe, lugcine futhi kubonwe ulwazi ukwenye indawo selwenziwe (Isithombe 25).



Isithombe 25: Ukuqapha ukude kolwazi olufakwayo lugcinwa kusetshenziswa uhlelo lokusetshenzwa kolwazi kusetshenziswa imishini yohlelo olwenzelwe umsebenzi.

4.12 UKUSETSHENZISWA KOKUHLAKANIPHA OKWAKHIWE NGOBUCHWEPHESHE OLWAZINI OLUJULILE NGESIMO SOKWAKHEKA KOMHLABA

(a) Ukwakhiwa kohlelo oluzisebenzela lona ngokwalo ukuze kwehlukaniswe izingozi zemigodi embiwa emhlabeni one-dolomite

Isendlalelo nenhloso: Lo msebenzi uhlola izindawo okungenzeka kuzona ukuthi umhlaba ushone phansi ukuze kusetshenziswe umhlaba ngokucophelela ngokusetshenziswa kokuhlakanipha okwakhiwe ngobuchwepheshe. Ukukwazi ukuqagela kubalulekile ukuze kuphathwe futhi kuthuthukiswe ingqalasizinda ebalulekile esizweni.

Amakhulu eminyaka okwakhiwa kwamadolobha nokufudukela kuwo kwabantu nokukhula kwawo kusho ukuthi imiphakathi seyivele ihleli ezindaweni ezingabonakala zingafanele ukuthuthukiswa ngenxa yezingozi zokushona phansi komhlaba. Ukushona phansi komhlaba ingozi edalwa isimo sokwakheka komhlaba ebonakala njengokushona ngaphezulu komhlaba, ngokuvamile ngenxa yokuncibilika noma ukuwa kwezinsalela ezingaphezu komhlaba ziwela emigodini eyizendlalelo zamadwala. Ukushona phansi komhlaba kuvamile ezindaweni ezine-limestone ngaphansi nezakhiwe ngamadwala akheka ngokuhwamuka kolwandle namachibi esikhathini sakudala (indawo yesimo sokwakheka komhlaba lapho isendlalelo samadwala singancibilikiswa amanzi angaphansi komhlaba ane-esidi encane njenge-limestone, i-dolomite ne-gypsum). Ukushona phansi komhlaba kwenzeka ngobukhulu nokuma okwahlukahlukene (okumise okwezindishi noma udonga olume lwabheka phezulu) nokujula.

Ukwenzeka kokushona phansi komhlaba kungathatha isikhathi eside, ngokuqhubeka nokushona kwengaphezulu lomhlaba kancane kancane, okungakhula kube isehlakalo esiyinhlekelele. Ukushona phansi komhlaba nokuzika okuhlobene nakho kungadala umonakalo kanye/noma ukulahlekelwa impilo ezindaweni okungenzeka kuzona ukushona phansi komhlaba. Izehlakalo zokushona phansi komhlaba kunzima kakhulu ukuziqagela, kodwa kuvamise ukuba nokuguquka kwengaphezulu lomhlaba okwandulelayo ezinyangeni noma ngisho iminyaka ngaphambi kokuwa ekugcineni.

I-interferometry ehamba emoyeni, kanye nolwazi olutholakele ezinkulungwaneni zemigodi embiwe ezindaweni ezine-dolomite, ingasetshenziswa ekwakhiweni kohlelo olusebenzayo lokuxwayisa ngokushona phansi komhlaba kusenesikhathi. Ukubikezela okutholakele olwazini ngemigodi kuzothathwa ngokuthi ukushona phansi komhlaba ngomuso kuzokwenzeka ezimweni ezifanayo nokushona komhlaba okwenzeka ngesikhathi esedlule. Amaqoqo olwazi okwenziwa kohlelo lokuxwayisa makhulu kakhulu ukuthi angahlaziywa ngokugculisayo, kodwa ezinye izindlela zingasetshenziswa. Ukuhlakanipha okwakhiwe ngobuchwepheshe, ikakhulukazi izinhlelo zobuchwepheshe obungaqondile nezokufunda ngemishini, kuzosetshenziswa ukuze kwakhiwe uhlelo lokuxwayisa kusenesikhathi kusetshenziswa ulwazi lobuchwepheshe nolwazi lwe-radar interferometry ehamba emoyeni. Wonke la maqoqo olwazi azosetshenziswa ekwakhiweni kohlelo oluxubile, oluzohlanganiswa nemiphumela eziphumela yona ngokwayo ekuhlaziyweni kolwazi lwe-radar interferometry ehamba emoyeni.

Impumelelo nokugqamile: Ubuchwepheshe obuphezulu bokufunda ngemishini basetshenziswa ukukhombisa izindawo ezinomhlaba okungenzeka uzike ezihlobene ne-dolomite eNtshonalanga Randi. Imiphumela yalo msebenzi izosetshenziselwa ukweluleka omasipala ngokuthuthukiswa kwengqalasizinda yabo esikhathini eside.

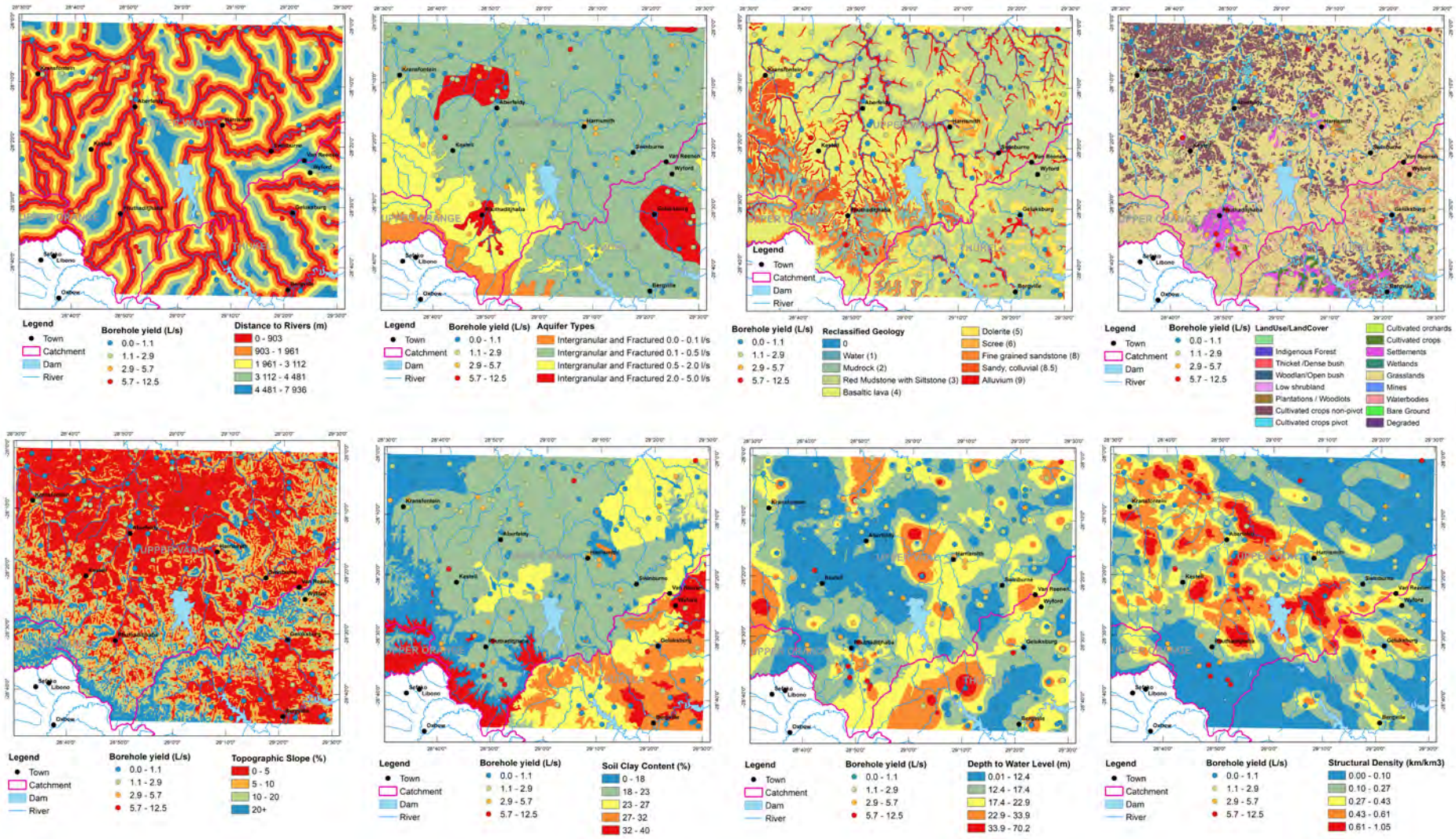
(b) Ukudwetshwa kwamabalazwe esifundazweni kusetshenziswa uhlelo lobuchwepheshe obungaqondile

Isendlalelo nenhloso: Lo msebenzi udweba amabalazwe ezindawo okungenzeka ukuthi zinamanzi ngaphansi komhlaba kusetshenziswa ukuhlakanipha okwakhiwe ngobuchwepheshe. Izifanekiso eziphumayo zisiza ngokukhombisa izindawo ezizombiwa ukuze kuphakelwe imiphakathi entula amanzi ngamanzi ewadinga kakhulu.

Izindlela zokufunda ngemishini kuya ngokukhula kakhulu ukusetshenziswa kwazo ekucwaningeni imithombo yamanzi. I-CGS ithatha indlela ehlanganisiwe yokudweba amabalazwe ezindawo okunamathuba amakhulu okutholakala kwamanzi angaphansi komhlaba kuzona (Isithombe 26). Indlela yokusebenza yase-CGS yahlanganisa imithombo yolwazi eyisishiyagalolunye ehlukene (izinhlobo zamadwala amasha angaba namanzi, imithambeka, ukuminyana kwezakhiwo

eziyimigqa, ukuminyana kohlelo lokukhishwa kwamanzi, ukusetshenziswa/ukwembozwa komhlaba, ibanga elisuka kwizakhiwo eziyimigqa, ibanga elisuka emifudlaneni, ukukwazi ukwenzeka kokugcwaliswa nobukhulu bobumba lomhlaba) ohlelweni olungaqondile oluwukucabangela olwasebenzisa i-software eyakhiwa ngaphakathi ukuze kwakhiwe ibalazwe lesifundazwe lokuba khona kwamanzi ngaphansi komhlaba okungenzeka eFreyistata esenyakatho. Le ndlela yabonakala isebenza kakhulu, inciphisa isikhathi, ukusebenza nezindleko ezidingekayo zokuhlonza izindawo ezinamathuba amakhulu okuba namanzi ngaphansi komhlaba, futhi kufanele isize iziphathimandla zendawo ekuhleleni ukusetshenziswa komhlaba nokuphatha imithombo yamanzi angaphansi komhlaba.

Impumelelo nokugqamile: Le ngxenye yomsebenzi yaphothula ukwakhiwa kwezindlela zokusebenza ngokuhlakanipha okwakhiwe ngobuchwepheshe ekudwetshweni kwamabalazwe amanzi atholakala ngaphansi komhlaba. Le ndlela yabuye yasetshenziswa ekudwebeni ibalazwe lezindawo okungenzeka zibe namanzi Emsebenzini waseMaluti.



Isithombe 26: Izilinganiselo zokufakwayo okusetshenziselwa ukudweba ibalazwe lalapho okungenzeka kutholakale khona amanzi.

UBUSOMAQHINGA BOKUFUNDA NGOKUJULILE NGESIMO SOKWAKHEKA KOMHLABA

I-Biotite-Cordierite-K-Fspar-Sillimanite-Garnet Metapelite.

Uhlobo nokuguquka kwezimo okungaphezulu kweplanethi kuhamba kudlule noma yiliphi izwe elilodwa noma isikhungo. Njengonobhala kanomphela we-OAGS, i-CGS yasebenzisa ikakhulu isihloko "Ubusomaqhinga bokufunda ngokujulile ngesimo sokwakheka komhlaba" njengensika ekufezeni nasekwakheni ubuhlobo beNingizimu Afrika namanye amazwe, ikakhulukazi olwazini lokufunda ngokujulile ngesimo sokwakheka komhlaba. Ngokuhambisana nokuseqhulwini okukhombisa ukuzethemba kokuphatha kwesithupha kokufaka isandla ekwakhiweni "Kwe-Afrika engcono", i-CGS inomlando wokusebenzisana namazwe ase-Afrika ahlukene ngokudweba amabalazwe okufunda ngokujulile ngesimo sokwakheka komhlaba, ukuguqulwa kwezikhungo, ukuhlanganisa amabalazwe neminye imisebenzi. Muva nje, i-CGS ibisebenza ngezimbiwa neminyango yezimayini eMalawi nase-Namibia.

Isihloko "Sobusomaqhinga bokufunda ngokujulile ngesimo sokwakheka komhlaba" sisiza ekwakheni isimo esikhuthazayo sokweseka izinto ezibalulekile okufanele zenziwe kuzwelonke. Ingxenye ebalulekile yalesi sihloko ukuthuthukiswa kwabasebenzi ngokwamakhono okufunda ngokujulile ngesimo sokwakheka komhlaba, awokusingatha/ukuphatha/ukuhola, nokwakhiwa kwemikhiqizo ngokusungula izinto ezintsha, izinhlelo nemisebenzi. Isivumelwano sokusungula indawo yezwekazi lase-Afrika enohwebo olukhululekile inika amathuba amahle okubeka iNingizimu Afrika emgudwini wohwebo oluholwa ukutshalwa kwemali, nokusebenza namanye amazwe ase-Afrika ukuze athuthukise amandla awo okuthuthukisa izimboni.

I-CGS iyaqhubeka nouthuthukisa i-GDP yayo njengengxenye yokusebenza ngokwezihloko ku-GTP yayo. Lesi sihloko seseka imigomo nezidingo ezibanzi zamazwe omhlaba ngokufunda ngokujulile ngesimo sokwakheka komhlaba, ikakhulukazi imiphakathi yase-Afrika. Ukudweba amabalazwe olwazi ngesimo sokwakheka komhlaba kwenziwe e-Namibia naseMalawi ukuze kwesekwe ukukhula komnotho, kanye nokuqeqesha nokuthuthukisa abantu bendawo abasebenza ngolwazi ngesimo sokwakheka komhlaba nabafundi. I-CGS yaqokwa njengomphathi wemisebenzi yase-Cameroon nase-Burkina Faso yolwazi ngesimo sokwakheka komhlaba nolwazi ngesimo sokwakheka komhlaba ngokwamakhemikhali. Njengonobhala we-OAGS, i-CGS iyaqhubeka nokudlala indima yobuholi ukuze kwenziwe ngcono ukubambisana nokusebenzisana kwamazwe ase-Afrika. Inethiwekhi yaseNingizimu Afrika nokuvama kokuzamazama komhlaba, ephethwe i-CGS, idlala indima ebalulekile kukhomishani yokulungiselela i-CTBTO, eyenza ngcono ukubambisana emhlabeni ekuqapheni ukuhlolwa kwezikhali zenuzi.

4.13 UMSEBENZI WE-CTBTO

Isendlalelo nenhloso: i-CTBTO inqabela konke ukuqhunyiswa kwenuzi emhlabeni, noma kungokwenhloso yempi noma yoxolo. INingizimu Afrika seyigunyaze isivumelwano se-CTBT futhi ibamba iqhaza ezinyathelweni eziningana zokuvimba ukuhlolwa kwezikhali zenuzi. Ukuze kwenzeke lokhu, i-CGS iqapha imisebenzi yenuzi kusetshenziswa iziteshi nokuvama nokwenzeka kokuzamazama komhlaba ezweni nasemhlabeni jikelele zemisindo engezwakali (Isithombe 27) ezifakwe eduze kwaseBoshof eFreyistata. Ulwazi oluqoqiwe luhlaziywa ngokuqhubekayo ukuze kwaziswe futhi kukhuliswe imisebenzi yokuqapha yasemhlabeni wonke.

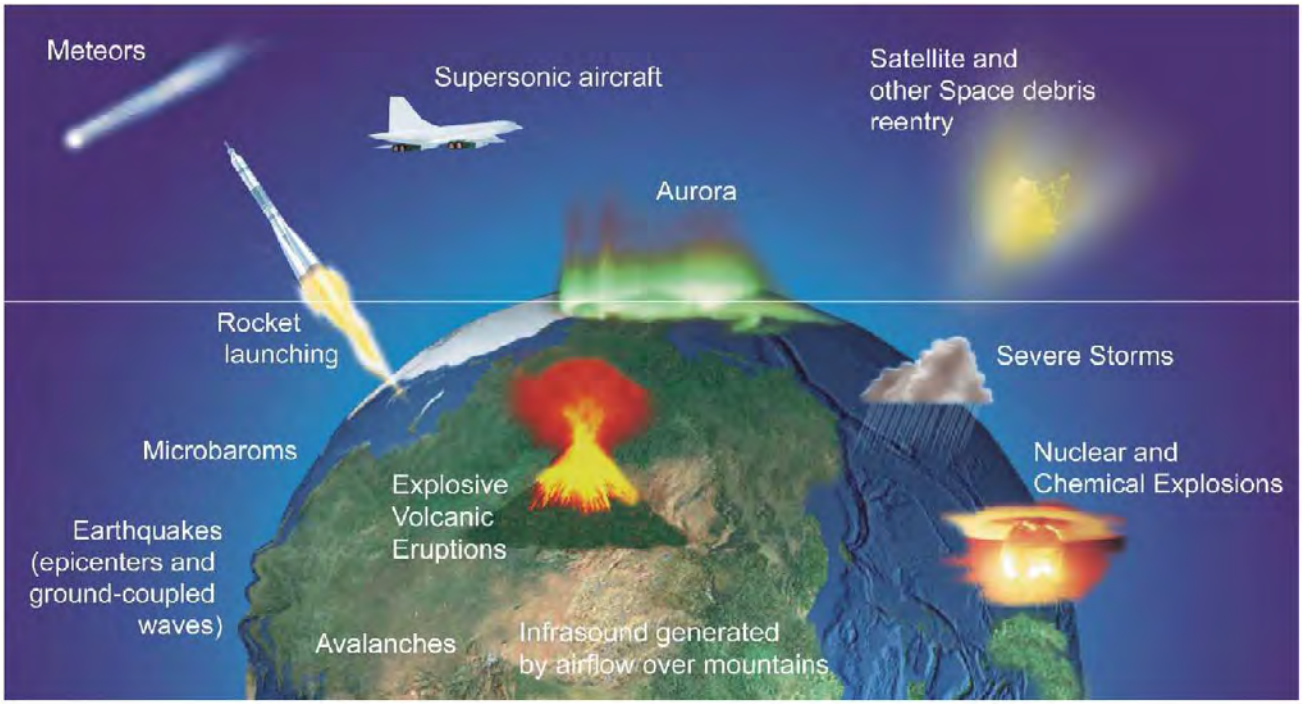
Ukuqapha umsindo ongazwakali obunye bobuchwepheshe obusetshenziswa Uhlelo Lwamazwe Omhlaba Lokuqapha ukuze kuqinisekiswe ukuthobela imithetho ye-CTBT. Ukuqhuma okusemoyeni nokungaphansi komhlaba okungashoni kwenuzi kungakhiqiza amagagasi omsindo ongazwakali ungazwiwa ngenethiwekhi yomsindo ongazwakali (Isithombe 27).

Isithombe 27: Iziteshi zemisindo engezwakali ezifakwe umhlaba wonke zokuqopha imisebenzi yenuzi.

Amagagasi omsindo onamazinga aphansi abizwa ngokuthi umsindo ophansi. Okusempeleni, la magagasi angaphansi kwamazinga azwakala endlebeni yomuntu, avamise ukusuka kuma-20 kuya kuma-20 000 Hertz. Umsindo ongazwakali ukhiqizwa imithombo ehlukene yemvelo neyenziwe abantu: izintabamlilo eziqhumayo, ukuzamazama komhlaba, ama-meteor, iziphepho, ama-aurora emhlabeni wemvelo; ukuqhuma okukhulu kwasezimayini nokwamakhemikhali, kanye nokuthunyelwa emoyeni kwezindiza namarokhethi emisindweni ebangwa abantu (Isithombe 28).

Amagagasi omsindo ngeke esakwazi ukusabalala ezindaweni lapho isivinini somsindo singaphezulu kwalesi lapho igagasi laqala khona (akukho mandla engeziwe). Bese-ke abuyiselwe emuva. Lokhu kwenzeka uma amazinga okushisa ekhuphuka kakhulu (i-thermosphere ama~100 km), uma isivinini somoya ozungezile sikhula ngamandla (i-stratosphere engenhla ama~30–50 km) noma kokubili (ukufudumala kwe-stratosphere). Lokhu kusho ukuthi kuhlala kucishe kube nomgudu owodwa wokuhamba komoya okhethwayo, ukuncipha okuncane uma ibanga elihanjiwe lilifushane.

Impumelelo nokugqamile: Onyakeni obuyekezwayo, umsebenzi wakhiqiza umbiko ohlanganisiwe futhi wabamba nemihlangano yokuqeqesha eminingana.

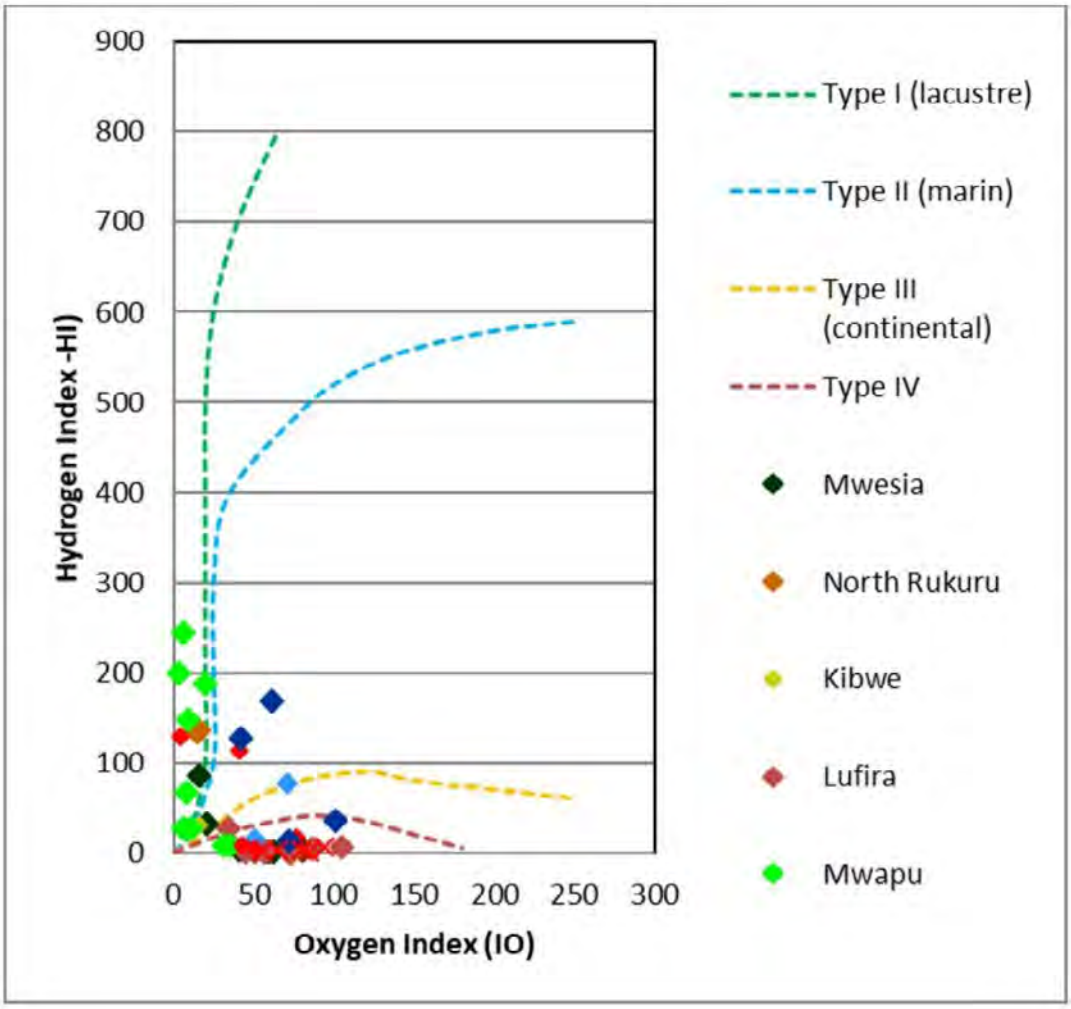


Isithombe 28: Imithombo yezibonakaliso zomsindo ongazwakali.

4.14 UMSEBENZI WASE-MALAWI WOKUDWETSHWA KWEBALAZWE LESIMO SOKWAKHEKA KOMHLABA NOKUHLOLWA KWEZIMBIWA

Isendlalelo nenhloso: Umsebenzi Wokudwetshwa Kwebalazwe Lesimo Sokwakheka Komhlaba Nokuhlolwa Kwezimbiwa (i-GEMMAP) usiza ekuthuthukisweni komnotho waseMalawi ngokwehlukanisa umkhakha wezimbiwa nokuthuthukisa ukwakhiwa kwamakhono abantu, ikakhulukazi ekufundeni ngokujulile ngesimo sokwakheka komhlaba. Umsebenzi unezinhlosongqangi ezintathu: Ukwakha ulwazi oluyisisekelo ukuze kuphathwe imithombo yezimbiwa yaseMalawi yangomuso ngokuhlinzeka iqoqo lamabalazwe ezwe lonke olwazi ngesimo sokwakheka komhlaba esikhathi samanje anezikali eziningi futhi ehlukaniswe ngezihloko; ukwenza amasu ukuze kumbiwe ezimayini ngendlela eqotho ekumbeni okuncane, futhi kuqalwe uhlelo lokukhulisa amakhono ukuze kuthuthukiswe abasebenzi ngokusimeme kumasayensi ezomhlaba eMalawi.

Impumelelo nokugqamile: Onyakeni obuyekezwayo, i-GEMMAP yaphothula isizini yokuqala yokusebenza ensimini futhi yaletha iqoqo lokuqala lamabalazwe olwazi ngesimo sokwakheka komhlaba anesilinganiso-bukhulu sika-1:100 000 kwiklayenti ukuze abuyekezwe. Inqubekelaphambili yenziwa emisebenzini yokuthatha amasampula omhlabathi ngokwesimo sokwakheka komhlaba ngokwamakhemikhali. Amabalazwe ezingozi ezidalwa isimo sokwakheka komhlaba abuyekeziwe akhiqiziwe kuyo yonke iMalawi futhi ukuhlaziywa kwesimo sokwakheka komhlaba ngokwamakhemikhali sekuphothuliwe, isibonelo, ukhethe olunezinto eziphilayo olungaphakathi ezingqimbeni zase-Karoo (Isithombe 29).



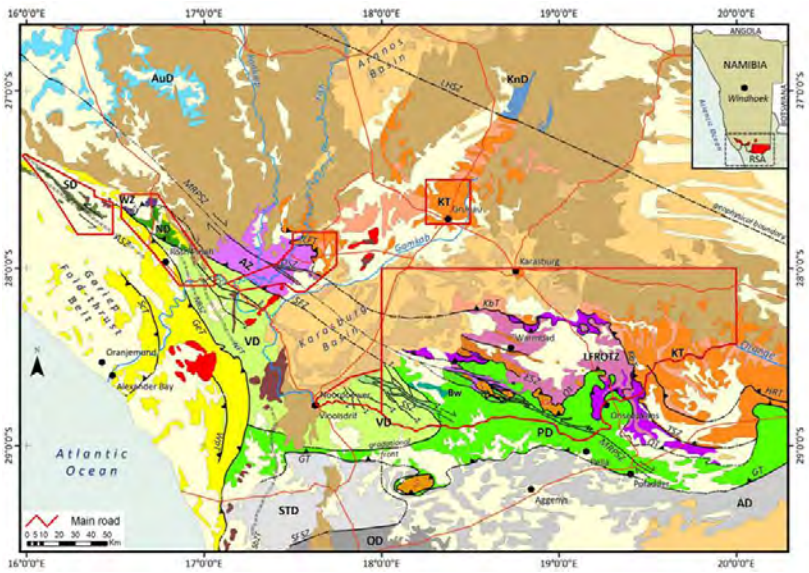
Isithombe 29: umdwebo ka-Van Krevelen okhombisa ukwakheka okuhlanganisiwe kwezinto eziphilayo okunezinto eziphilayo eziphathelene namachibi (inhlobo 1) Nezinto eziphilayo eziyizitshalo ezincane ezikhula emhlabeni owomile (inhlobo3) zamayunithi ase-Karoo ezigodi zase-Karoo ezisenyakatho. Iningi lamasampula anempahla enekhabhoni (uhlobo 4).

4.15 UKUDWETSHWA KWAMABALAZWE NGESIMO SOKWAKHEKA KOMHLABA NOCWANINGO KWENZELWA ISIKHUNGO SASE-NAMIBIA SOKUCWANINGWA KWESIMO SOKWAKHEKA KOMHLABA

Isendlalelo nenhloso: Ukusukela ngowezi-2013, i-CGS ibihola umsebenzi wokudwetshwa kwamabalazwe ezifunda anezikali nomsebenzi wokukhulisa amakhono eningizimu ne-Namibia ngaphansi kwesivumelwano yenzela, futhi ibambisene Nesikhungo sase-Namibia Sokucwaningwa Kwesimo Sokwakheka Komhlaba. Phakathi kowezi-2013 noNdasa wezi-2019, Uhlelo Lokudwetshwa Kwamabalazwe lwaseNingizimu ne-Namibia (i-SNMP) lwakhiqiza amabalazwe angama-59 ngesimo sokwakheka komhlaba anesilinganiso-bukhulu sika-1:50 000 futhi adijithali ngokugcwele afaka indawo engacishe ibe ngama-28 0000 km^2 ogwadule lwasezintabeni olumangelengele futhi olukude ngasemngceleni neNingizimu Afrika oseningizimu we-Orange River. Lawa asadinga ukubuyekezwa iklayenti.

Impumelelo nokugqamile: Onyakeni obuyekezwayo, umsebenzi wamanje wokudweba amabalazwe wase-Namibia wethule ukwelulwa ngezinyanga eziyi-13 (uNdasa 2019 kuya kuNdasa 2020) ku-SNMP ukuze kukhiqizwe amabalazwe amasha angama-27 anesilinganiso-bukhulu sika-1:50 000 olwazi oluyisisekelo ngesimo sokwakheka komhlaba lwesikhathi se-Precambrian sezindawo zase-Sperrgebiet (indawo enomkhawulo yokumbiwa kwamadayimane ehlanganisa i-Lüderitz, i-Aus, i-Witputs ne-Bogenfels) nase-Aussenkehr. Lawa asadinga ukwamukelwa iklayenti. Ibalazwe elisha lokwakheka kwezingqimba zamadwala oqweqweni lomhlaba olungaphezulu laseSifundazweni sase-Namaqua Esiguqugukayo esifundeni esiseningizimu ne-Orange River Esithombeni 30 isibonelo semikhiqizo yomsebenzi. Inhloso eyengeziwe ngokudwetshwa kwamabalazwe ukuhlola okuhamba ngohlelo kwesimo sokwakheka komhlaba kwephepha lase-Oranjemund elinesilinganiso-bukhulu sika-1:250 000 lesikhathi se-Cenozoic. I-SNMP ifaka isandla enhlosweni ebalulekile yokufunda ngokujulile ngesimo sokwakheka komhlaba yokuba namabalazwe aningiliziwe akhava (anesilinganiso-bukhulu sika-1:50 000) izwe lonke ngonyaka wezi-2030, kuhambisana nezinhloso ezibekiwe Zombono wezi-2030, Imigomo Yentuthuko Yeminyaka Eyinkulungwane, i-NDP 4-5 Nohlelo laseHarambe Lwempumelelo lukahulumeni wase-Namibia. Phezu kwalokho, uhlelo lukhulisa amakhono ocwaningo namazinga amakhono ekudwetshweni kwamabalazwe esimo sokwakheka komhlaba ngaphakathi Esikhungweni sase-Namibia Sokucwaningwa Kwesimo Sokwakheka Komhlaba.

Umsebenzi waqhutshwa kahle ngesikhathi sowezi-2019/2020 kodwa izinselelo ekutholeni ulwazi ngesimo sokwakheka komhlaba ngokwenzeka kwezigameko ngokulandelana kwazo esimweni sokwakheka komhlaba kwalibazisa ukubhalwa kwemibiko kokugcina nezincazelo zezifanekiso ezisetshenziswe kumabalazwe. Ukuthuthukisa amakhono kuyaqhubeka nokuba isakhi esibalulekile somsebenzi, ngokuphothulwa kwemisebenzi emine yeziqu ze-onazi abafundi baseNyuvesi yase-Namibia. Umnqamulajuqu womsebenzi welulelwe umhla zingama-31 kuSepthemba wezi-2020.



Isithombe 30: Ibalazwe elisha lokwakheka kwezingqimba zamadwala oqweqweni lomhlaba olungaphezulu isifunda sase-Namaqua Esiguqugukayo esifundeni esiseningizimu ne-Orange River.

4.16 ISIKHUNGO SOKUHLOLWA KWESIMO SOKWAKHEKA KOMHLABA SASE-AFRIKA

Isendlalelo nenhloso: I-OAGS yasungulwa mhla zi-2 kuNhlolanja wezi-2007 ukuze kukhuthazwe ukufunda ngokujulile ngesimo sokwakheka komhlaba wase-Afrika, kuhlinzekwe ngezeluleko ngobuchwepheshe kulabo abathatha izinqumo futhi kwakhiwe inkundla yokuxoxisana kwamalungu. I-OAGS Nesikhungo Samazwe aseYurophu Sokucwaningwa Kwesimo Sokwakheka Komhlaba (i-EGS) bebebambisene ukusukela ngezi-2016, kwaqalwa umsebenzi we-PanAfGeo. Ukwesekwa kokubambisana phakathi kwe-EGSOAGS namazwe ase-afrika wonke uhlelo lokuqeqesha olusebenzisa ukudluliswa kolwazi phakathi kwezikhungo zase-Yurophu nase-Afrika zokucwaningwa kwesimo sokwakheka komhlaba nokuqiniswa kwezikhungo zase-Afrika zokuphatha emazweni azo eziphethe ulwazi ngesimo sokwakheka komhlaba nokumba ezimayini.

Ngalolu hlelo, i-EU ikhuthaza ukulondolozwa kwemvelo, ukuthuthukiswa komnotho nokubandakanywa kwabantu ngokwenhlalo ezwenikazi lase-Afrika lonke, ngesikhathi isiza ukuthola ukuphakelwa ngemikhiqizo engekasetshenzwa okusimeme, kukhuthazwe uhwebo olungafihli lutho futhi olungaguquki lwezimbiwa phakathi kwe-EU ne-Afrika. I-PanAfGeo iyisibonelo sokubambisana kwamazwe omhlaba kwezwekazi nomsebenzi wentuthuko wokufunda ngokujulile ngesimo sokwakheka komhlaba, kuhlinzekwa ngokuqeqeshwa okusezingeni eliphezulu abasebenzi bomkhakha kahulumeni abasebenzela izikhungo zokucwaningwa Kwesimo Sokwakheka Komhlaba.

Impumelelo nokugqamile: Lolu hlelo lweminyaka emithathu (unyaka wezi-2016 kuya kowezi-2019), olusebenza ngemali etshaliwe elinganiselwa kumayuro ayizigidi eziyi-10, luhlinzeke ngokuqeqeshwa okuyizikhathi ezingama-42 kwenzelwa abasebenzi abangaphezu kwe-1 000 abaphuma emazweni angama-49, kwenziwa imithelela ebonakalayo ekwakhiweni kwamakhono ezikhungo nawobuchwepheshe e-Afrika kwaholela, isibonelo ekusungulweni kwe-ejensi kazwelonke yolwazi ngesimo sokwakheka komhlaba (isikhungo) socwaningo ngesimo sokwakheka komhlaba e-Democratic Republic of the Congo, engaphelele nje ekubeni umkhiqizi we-cobalt wokuqala womhlaba, umkhiqizo obalulekile ongekasetshenzwa wemboni yezobuchwepheshe obuphezulu yase-EU, kodwa inezinqolobane zezimbiwa eziqikelelwa kumayuro ayizigidigidigidi ezingama-20. Umsebenzi obalulekile wesikhungo sokucwaningwa kwesimo sokwakheka komhlaba ukuthola, ukudweba nokuhlola izinqolobane zezimbiwa zezwe, nokweseka uhulumeni ekuphoqeleleni ukuqapha ukulondolozwa kwemvelo nokulawula ngokusemthethweni.

I-PanAfGeo inike abaqeqeshwa izinsiza kusebenza zamathuluzi asezingeni eliphezulu, izindlela zokusebenza ngendlela engcono kunazo zonke namathuba okubamba iqhaza ekuhambeni kwasensimini emikhakheni eyisikhombisa yokufunda ngokujulile ngesimo sokwakheka komhlaba: ukudwetshwa kwamabalazwe okufunda ngokujulile ngesimo sokwakheka komhlaba, ukuhlolwa kwemithombo yezimbiwa (isb. Ukuhlola ubukhulu bokuba khona kwemithombo yezimbiwa kwezwe), ukumba ezimayini kobuciko nokuncane (umthombo obalulekile wemali engenayo wamakhulu ezinkulungwane e-Afrika), ukulondolozwa kwemvelo kwezimayini, izingozi ezidalwa isimo sokwakheka komhlaba (isb. ubungozi bemvelo obufana nokudilika komhlaba) nezizinda zamafa esimo sokwakheka komhlaba (isb. ezokuvakasha ezisimeme) nokuphathwa kolwazi olujulile ngesimo sokwakheka komhlaba (isb. amakhono obuchwepheshe bolwazi). I-PanAfGeo yasungulwa ngokuhlanganyela i-EU ngeGatsha-Jikelele Lokubambisana Kwamazwe Omhlaba Nentuthuko nobumbano lwezinhlangano zolwazi ngesimo sokwakheka komhlaba, eziyi-12 zaseYurophu eziholwa i-Bureau de Recherches Géologiques et Minières, isikhungo sokucwaninga ngesimo sokwakheka komhlaba samaFulentshi. I-OAGS yakhiqiza amabhhuku ezindaba aphuma ngekwata amabili ngalo nyakamali obuyekezwayo. Atholakala lapha https://www.oagsafrica.org/.

4.17 UBUCHWEPHESHE BOKUXHUMANA NGOLWAZI

I-CGS ibhekene nenqubo enkulu yezinguquko ezidijithali ukuze kwenziwe kangcono futhi kukhuliswe ukusebenza ngokufanele nangempumelelo kwebhizinisi layo ngesikhathi futhi ibeka isendlalelo sobuchwepheshe be-4IR. Lesi sigaba sethula izindawo okugxilwe kuzo Zobuchwepheshe Bokuxhumana Ngolwazi be-CGS (i-ICT) ngonyaka obuyekezwayo, okufaka inguquko edijithali kanye nezinyathelo zokuvikeleka kolwazi, lezi zinyathelo zifaka:

- Ukusetshenziswa kwesiphakeli esisheshayo, esingabizi, futhi esisebenza ngokufanele, ingqalasizinda yokugcina izinto nokugcinwa kolwazi olwengeziwe olubekwa eceleni olungasetshenziswa futhi ngesikhathi esizayo

- Ukusetshenziswa kwezinhlelo ezihlanganisa umsebenzi wonke wesikhungo ukuze kukhuthazwe ukuphathwa kolwazi ngempumelelo nemininingwane esikhungweni sonke kanye nabo bonke ababambiqhaza
- Ukuqinisa ukuvikeleka nokuphathwa kwemisebenzi ephathelene nemininingwane ye-CGS nababambiqhaza

Ukusetshenziswa kwengqalasizinda ye-ICT esebenza ngokusezingeni eliphezulu nokuqinisa izinqubo zokuphatha ukuze kuphathwe ngempumelelo umsebenzi we-ICT kuhloswe ngakho ukukhulisa ukuphathwa kwemininingwane nolwazi ezikhungweni zonke, kuqinisekiswe ukungafihli kwezindleko ze-ICT nokukhulisa ukuphathwa kokutshalwa kwezimali kubuchwepheshe bolwazi, ukuphathwa kwamazinga okwenziwa komsebenzi nokuphathwa kwezimo ezinobungozi ukuze kusizwe isikhungo ukuthi sifeze umsebenzi waso.

4.17.1 ISIFINYEZO SOBUCHWEPHESHE BOKUXHUMANA NGOLWAZI

Uhlelo olunamasu lwe-ICT lwesikhathi sezi-2018 – 2023 luphakamisa ukuhlelwa nokusetshenziswa kwamakhono e-ICT ukuze kwesekwe izinhloso ezinamasu ze-CGS futhi kumelaniswe amakhono ezobuchwepheshe nezinyathelo zebhizinisi. Onyakeni obuyekezwayo kwaqalwa izinyathelo ze-ICT okuhloswe ngazo ukwenza lokhu:

- Ukweseka ukwenziwa komsebenzi ngokuhlinzeka ingqalasizinda ye-ICT eguqugugquka ngokwanele, engakhuliswa futhi evikelekile ukuze kwesekwe futhi kusimamiswe uhlelo olusebenza kahle kakhulu lokuphathwa kolwazi lokufunda ngokujulile ngesimo sokwakheka komhlaba nokusabalala kwalo.
- Ukuhlinzeka ngobuchwepheshe bokusiza nokweseka imisebenzi yokweluleka, ukusebenzisana nababambiqhaza nokuphathwa kolwazi ngokuhlinzeka ngesipiliyoni esiphelele esidijithali kubababambiqhaza be-CGS.
- Isakhiwo sesimanje sokusiza ukuxhumana, ukusebenzisana kanye nesipiliyoni somuntu ngamunye esikhulisiwe ngokwenza ukuletha ulwazi nemininingwane ngendlela exhumene futhi efinyelelekayo.
- Ukwenza ngcono ukuphatha nokuhlela ngokusemthethweni izinqubo zokusebenza zomsebenzi we-ICT ngokudala isimo somsebenzi esifanele sokuphathwa, ukulawulwa nokuqapha ukuthobela imithetho ye-ICT, izinhlelo zokusebenza nemisebenzi
- Ukwakha nokusebenzisa isu lokuvikeleka kolwazi oluku-inthanethi ukuze kuncishiswe ubungozi bokuvikeleka kolwazi oluku-inthanethi futhi kwakhiwe nokuvikeleka okuqinile
- Ukubeka i-CGS njengesikhungo esihamba phambili esidijithali ngokusungula imikhiqizo emisha nezinsizakalo okukhulisiwe futhi okudijithali.

Isikhungo senze inqubekelaphambili ebonakalayo ngokwenziwa kwemisebenzi ebalulekile yezinguquko efaka: ukuthuthukisa nokwenza inethiwekhi ibe ngeyesikhathi sesimanje, isiphakeli, nengqalasizinda yokugcinwa kolwazi nokugcinwa kolwazi olwengeziwe olubekwa eceleni olungasetshenziswa futhi ngesikhathi esizayo, ukusetshenziswa kwesixazululo Sokuhlelwa Kwemithombo Yesikhungo (i-ERP) nokusetshenziswa kohlelo oluhlanganisiwe lokuphathwa kokufunda ngokujulile ngesimo sokwakheka komhlaba ukuze kwenziwe ulwazi lutholakale futhi lufinyeleleke kubababambiqhaza abagunyaziwe.

5. UKUSATSHALALISWA KOLWAZI

I-CGS isabalalisa imiphumela yalolu cwaningo kubabambiqhaza bayo ochungechungeni lwezincwadi ezishicilelwe ezifaka izinkumbulo, imibiko emifushane, izincazelo, imibiko yonyaka, izincwadi zezindaba, izinqubo zezingqungquthela namabalazwe, futhi lokhu kwethulwe esigabeni 5.1 kuya ku-5.3. Ukugxila futhi kwesikhungo emsebenzini waso wokuthola ulwazi olusha lwemikhakha ehlukene kwaholela ekusebenzisaneni okusha nokubambisana kokukhiqiza ezinye izincwadi ezengeziwe.

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5.3. Izifinyezo zemibhalo yesayensi

(Amagama abasebenzi base-CGS akhonjiswe ngokucacile)

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2. **Botha, G., Havenga, M.** 2019. Re-interpretation of the Cenozoic lithostratigraphy of the Maputaland coastal plain: integration of field mapping and high resolution airborne radiometrics. 16th SAGA Biennial Conference and Exhibition, Durban, South Africa, 6–9 October 2019.
3. **Cawthra, H.C.**, Cowling, R.M., Marean, C.W., Ando, S. 2019. A submerged terrestrial landscape in southern South Africa: Geological and soil maps for the Last Glacial Maximum. GeoHab 2019, St Petersburg, Russia, 13–17 May 2019.
4. **Cawthra, H.C., MacHutchon, M.R., van Zyl, F.W., Pillay, T., Shange, H.** 2019. Updates and highlights from the South African offshore mapping programme. GeoHab 2019, St Petersburg, Russia, 13–17 May 2019.
5. Colarossi, D., Duller, G., Roberts, H., Tooth, S., **Botha, G.** 2019. A new single grain luminescence chronology for a key late Quaternary terrestrial archive: Voordrag, KwaZulu-Natal, eastern South Africa. 20th Congress of the International Union for Quaternary Research, Dublin, Ireland, 25–31 July 2019.
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8. **Doggart, S.**, Buick, I., **Macey, P.** et al. 2019. A new perspective on the origins of the Orange River Pegmatite Belt. 50th Anniversary Conference of the Geological Society of Namibia, Windhoek, Namibia, 1–4 September 2019.
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21. **MacHutchon, M.R.**, de Beer, C.H., **van Zyl, F.W.**, Salzmann, L., **Cawthra, H.C.** 2019. Structural insights into the western branch of the Saldania Belt through the marine geology of Table Bay, South Africa. GeoHab 2019, St Petersburg, Russia, 13–17 May 2019.
22. **Makonto, O.** 2019. Hydrogeological mapping in the Kuruman River Catchment of the Northern Cape Province, South Africa. Proceedings of the 16th Ground Water Division Conference: Conservation, Demand & Surety (GWD), Port Elizabeth, 20–23 October 2019.
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25. **Manzunzu, B., Midzi, V.**, Birch, J., **Mulabisana, T., Pule, T., Zulu, B.S.**, Rathod, G.W. 2019. Determination of shallow shear wave velocity profiles in Johannesburg for Vs30 classification. 16th SAGA Biennial Conference and Exhibition, Durban, South Africa, 6–9 October 2019.
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28. **Midzi, M.**, Mehraoui, M. 2019. Seismotectonic background for a realistic seismic hazard assessment in Africa. 27th IUGG General Assembly, National and Regional Earthquakes Centres: Highlights and Challenges, 8–18 July 2019, Montreal, Canada.
29. **Midzi, V., Manzunzu, T., Pule T., Mulabisana, T.** 2019. Relocation of seismic events in South Africa for ground truth identification and classification. Science and Technology Conference, CTBTO Preparatory Commission, Hofburg Palace, Vienna, Austria, 24–28 June 2019.
30. **Midzi, V., Pule, T., Manzunzu, B., Mulabisana, T., Zulu, B.S.** 2019. Improved monitoring of seismicity in the gold mining regions of South Africa: New Velocity Models Keynote Presentation. 16th SAGA Biennial Conference and Exhibition, Durban, South Africa, 6–9 October 2019.
31. **Muedi, T.**, de Wit, M.J., Linol, B., Nengovhela, V., **Dhansay, T. 2019.** Surface and subsurface description of the early Jurassic Karoo Dolerites: Toward a comprehensive understanding of the emplacement mechanism and possible gas migration. 7th International Science Conference on Large Igneous Provinces, Tomsk, Russia, 28 August–8 September 2019.
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33. **Ncume, M., Craill, C., Hicks, N.**, Hoyer, L. 2019. A structural re-interpretation of the Bumbeni Volcanic Complex, northern KwaZulu-Natal: Insights from high resolution aeromagnetics and field mapping. 16th SAGA Biennial Conference and Exhibition, Durban, South Africa, 6–9 October 2019.
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35. Pargeter, J., Blackwood, A., **Cawthra, H.C.**, Esteban, I., Jacobs, Z., McNeil, J., Saktura, R. 2019. The Msikaba Red Sand Dunes: Technological variability at the Early to Middle Stone Age transition in Pondoland, South Africa. Society for American Anthropologists/SAAs, Albuquerque, New Mexico, USA, 10–14 April 2019.
36. Petitta, M., Absametov, M., **Coetzee, H.** et al. 2019. Launch of the new Groundwater Working Group for implementation of the United Nations Framework Classification (UNFC). 46th IAH Congress, Malaga, Spain, 22–27 September 2019.
37. **Pillay, T., Cawthra, H.C., Lombard, M.** 2019. Characterising marine benthic habitats on the South African continental shelf using geophysical tools. GeoHab 2019, St Petersburg, Russia, 13–17 May 2019.
38. **Saeze, H.** 2019. Hydrochemical characterisation of groundwater in the Evander Goldfields, Mpumalanga, South Africa. Proceedings of the 16th Ground Water Division Conference: Conservation, Demand & Surety (GWD), Port Elizabeth, 20–23 October 2019.
39. Sakala, E., 2019. Automation of interpretation of geoelectrical resistivity using artificial intelligence. Proceedings of the 16th Ground Water Division Conference: Conservation, Demand & Surety (GWD), Port Elizabeth, 20–23 October 2019.
40. **Sakala, E.**, Fourie, F., Ramasenya, K. 2019. Groundwater vulnerability as a tool for policy and decision makers: Case study of coalfields of South Africa. Proceedings of the 7th Water Resources Dialogue, China-Africa, Windhoek, Namibia, 22–27 July 2019.
41. **Sakala, E., Novhe, O.†, Vadapalli, V.R.K.** 2019. Application of artificial intelligence (AI) to predict mine water quality, a case study in South Africa. In: E. Khayrulina, Ch. Wolkersdorfer, S. Polyakova and A. Bogush. Mine Water — Technological and Ecological Challenges, pp. 140–146. Perm State University, Perm, Russia.
42. Sakala, E., Saeze, H. 2019. Application of data mining and knowledge discovery process to extract valuable knowledge from geoscience datasets. 16th SAGA Biennial Conference and Exhibition, Durban, South Africa, 6–9 October 2019.
43. **Sekiba, F.M.**, Fourie, F., **Sakala, E.** 2019. Airborne and ground geophysical surveys to investigate the deep geology and geohydrology in the Beaufort West area, western Karoo, South Africa. Proceedings of the 16th Ground Water Division Conference: Conservation, Demand & Surety ( ), Port Elizabeth, 20–23 October 2019.
44. Shilito, A., Davies, N., **Penn-Clarke, C.** 2019. Africa's earliest pioneers? Subaerial footprints from the Ordovician Graafwater Formation of South Africa. 63rd Annual Meeting of the Palaeontological Association, Valencia, Spain, 15–21 December 2019.
45. **Smith, H., Macey, P.**, Miller, J. et al. 2019. Timing and characterisation of 1200–1100 Ma tectonism in the Namaqua Metamorphic Complex, Southern Namibia. 50th Anniversary Conference of the Geological Society of Namibia, Windhoek, Namibia, 1–4 September 2019.
46. **Van Zyl, W.** 2019. The geological mapping of the inner shelf off Cape Town's Atlantic Seaboard. GeoHab 2019, St Petersburg, Russia, 13–17 May 2019.
47. Zipkin, A., Fisher, E.C., **Cawthra, H.C.**, Gordon, G., Knudson, K. 2019. Beyond the Swartberg: Preliminary findings from an extended strontium isoscape in the South African Karoo. Paleoanthropology Society Annual Meeting, Albuquerque, New Mexico, USA, 9–10 April 2019.

5.4. Ama-athikili abemithombo yezindaba

1. Media advertorial – Geobulletin: Geotechnical and geohazards investigation in municipalities
2. Media advertorial – Leadership magazine: How the Council for Geoscience is working to boost the blue economy
3. Media advertorial – Mining Elites: Access to Information – Key to sustainable geoscientific contributions
4. Media advertorial – Mining Review Africa: Council for Geoscience at the forefront of environmental sustainability
5. Media advertorial – Mining Review Africa: Council for Geoscience: World-class laboratory services
6. Media advertorial – Mining Review Africa: Transforming South African mining for the future
7. Media advertorial – Mining Review Africa: Water in mining: Activities at the Council for Geoscience
8. Media advertorial – Mining Weekly: Council for Geoscience at the forefront of environmental sustainability
9. Media advertorial – Pan African Parliament: Mapping the way
10. Media advertorial – Sawubona: The Council for Geoscience supporting renewable energy technologies
11. Media advertorial – South African Business: Mapping the future
12. Media advertorial – Sustainability Week Publication: Council for Geoscience at the forefront of environmental sustainability
13. Media article – GSSA Geobulletin: Ceres–Tulbagh earthquake
14. Media article – Mining Weekly: CGS to present findings on Harding gold claims
15. Media article – Mining Weekly: Harding has no economically viable gold, Council for Geoscience confirms
16. Media article – Post-matric: Council for Geoscience profile and bursary and internship information
17. Media article – Science Careers SA: How the Council for Geoscience is working to boost the blue economy; plus Marine Geoscientist interview

Ingxenye C: Ukuphatha

Ukuxoxisana ngokufunda ngokujulile ngesimo sokwakheka komhlaba neBhodi le-CGS Nomcwanin-gi-mabhuku Jikelele Ezintabeni zaseMakhonjwa Esifundazweni saseMpumalanga

1. ABAPHATHI ABAKHULU

UNgqogqoshe Wezimbiwa Namandla (uNgqongqoshe) ngokusebenzisana neBhodi le-CGS, unesibopho sokulawula, ukuphatha nokulawulwa kwezinga lokwenziwa komsebenzi e-CGS. Ngokufanelekile, isikhungo sihambisa imibiko njalo ngekwata nanjalo ngonyaka Ngokwemithethonqubo Yomnyango Wezezimali Kuzwelonke (26.1) ku-DMRE, mhla zingama-30 kuMbasa, 31 kuNtulikazi, 31 kuMfumfu no-31 kuMasingana.

2. IBHODI LE-COUNCIL FOR GEOSCIENCE

2.1 Isakhiwo seBhodi nemisebenzi yalo

uNgqongqoshe waqoka iBhodi le-CGS ukusukela mhla lu-1 kuNdasa wezi-2017, ngokweSigaba 4 Somthetho Wokufunda Ngokujulile Ngesimo Sokwakheka Komhlaba (Umthetho Ongunombolo 100 we-1993, njengokuchitshiyelwa kwawo) futhi isikhathi salo saphela mhla zingama-28 kuNhlolanja wezi-2020). Ibhodi lalakhiwe amalungu ayishumi angebona abaphathi abakhulu, amalungu amane ashintshana namanye amalungu nelungu elilodwa elingumphathi omkhulu, u-CEO. Usihlalo weBhodi ilungu elizimele elingesiyena umphathi omkhulu futhi imisebenzi kaSihlalo no-CEO icaciswe kahle. UMnu. O Wilcox, owayeqokwe uNgqongqoshe Wezezimali eBhodini, wesula esikhundleni mhla zingama-31 kuMasingana wezi-2019 futhi uMnu K Ramokgopa, owayesebenza njengelungu elingesiyena umphathi omkhulu, elizimele, wesula esikhundleni mhla zingama-20 kuNhlangulana wezi-2019.

Ukuphathwa kwesikhungo e-CGS kuhlanganisa izinhlelo, izakhiwo nezinqubo isikhungo esikhonjiswa ngayo indlela, esilawulwa ngayo futhi esinesibopho ngayo. Lokhu kusetshenziswa ngemiyalelo yomthetho onika isikhungo igunya lokusebenza, Umthetho Wolwazi Olujulile Ngesimo Sokwakheka Komhlaba, uMthetho Ongunombolo 100 we-1993, njengokuchitshiyelwa kwawo, uMthetho Wokuphathwa Kwezimali Zikahulumeni) (i-PFMA) (Umthetho Ongunombolo 1 we-1999, njengokuchitshiyelwa kwawo), Imithethonqubo Yomnyango Wezezimali Kuzwelonke, uMthetho Olandelwayo Wokuphatha Izikhungo Emkhakheni kaHulumeni, nezinqubomgomo zesikhungo. Le ngxenye yombiko ichaza ngokubanzi izinhlelo zokuphatha zesikhungo, izakhiwo nezinqubo.

- **Ibhodi namakomidi alo** — ukwakheka kweBhodi namakomidi, ukwamukelwa kweBhodi, ukuholelwa kweBhodi nendlela yokuziphatha, umsebenzi nezibopho zeBhodi;
- **Ukuthobela imithetho nemithethonqubo** — isimo se-CGS sokuthobela imithetho ebekwe ngokusemthethweni;
- **Ukulawula kwangaphakathi nokuphathwa kwezimo ezinobungozi** — ukuqaliswa kokusebenza kohlaka lokuphathwa kwezimo ezinobungozi, nokusebenza kokulawula kwangaphakathi esikhungweni;
- **Ukukhwabanisa nenkohlakalo** — izinyathelo zokuthola nokulwa nezenzo zokukhwabanisa;
- **Ukucwaningwa kwamabhuku kwangaphakathi** — okwenziwa uphiko lokucwaninga amabhuku lwangaphakathi;
- **Ukuqinisekiswa kwezinga elifanele lokwenziwa komsebenzi** — isimo sokuqinisekiswa kwezinga elifanele lokwenziwa komsebenzi, kanye
- **Izindaba eziphathelene nezempilo, ukuphepha nezemvelo** — ukuhlangabezana nemigomo yezokuphepha, ezemvelo, nezinga (i-SHEQ).

Ukwakhiwa kweBhodi ukusukela mhla lu-1 kuNdasa wezi-2017 ukuya mhla zingama-28 kuNhlolanja wezi-2020 kwakukanje:

Amalungu eBhodi	Amakhono nesipiliyoni
UDkt. Humphrey Mathe – uSihlalo weBhodi	UDkt. Mathe waqokwa njengoSihlalo weBhodi mhla lu-1 kuNdasa wezi-2017. Uyi-Exploration Geologist ene-BSc ku-Geology ne-Chemistry, i-BSc Honours ku-Geology ne-MSc ne-PhD ku-Exploration Geology. Unesipiliyoni esiningi nolwazi aluthole eminyakeni emininginingi futhi uke wabamba izikhundla zobu-CEO emikhakheni yomibili okuwumkhakha ozimele nokahulumeni.
UMnu. Mosa Mabuza	UMnu. Mosa Mabuza uyi-Geologist ene-BSc Honours ku-Geology ne-Postgraduate Diploma ku-Business Administration. Waqokwa njengelungu leBhodi mhla lu-1 kuNdasa wezi-2017 waqashwa njengo-CEO we-CGS mhla lu-1 kuNtulikazi wezi-2017. UMnu. Mosa Mabuza wasebenza, phakathi kwezinye izindawo, e-De Beers njenge-Explorationist, i-Laboratory Geologist ne-Senior Business Analyst, e-DMRE njengo-Chief Director we-Mineral Promotion, e-Anglo American Platinum Njengenhloko Yezobudlelwane Nohulumeni kanye nase-DMRE njengePhini likaMqondisi Jikelele Wenqubomgomo Yezimbiwa Nokukhuthazwa.
UMnu. Beeuwen Gerryts	UMnu. Gerryts uyi-Mechanical Engineer eneziqu ze-MSc Engineering Management (ukuphathwa kwezobuchwepheshe nokusungulwa kwezinto ezintsha) ayithola eNyuvesi yase-Pitoli. Waqokwa njengelungu leBhodi mhla lu-1 kuNdasa wezi-2017. Usebenza e-DSI njengoMqondisi Oyinhloko we-Technology i-Localisation, i-Beneficiation ne-Advanced Manufacturing. Unesipiliyoni esiningi ocwaningweni nasekuphathweni kokusungulwa kwezinto ezintsha, i-ICT nezincazelo zezinhlelo zemikhiqizo, ukwakhiwa kwezinqubomgomo, nezinye izincwadi ezishicilelwe ku-R&D nokuthuthukiswa kwemboni.
UMnu. Kabelo Koloi	UMnu. Kabelo Koloi waqokwa njengelungu leBhodi mhla lu-1 kuNdasa wezi-2017. Uyilungu Lesikhungo Songcweti Bobuchwepheshe Bobunjiniyela. Une-B-Tech ku-Electrical Engineering ne-Diploma ku-Business Management Uyi-Chemical Engineer e-Infracon.
UDkt. Jeffrey Mahachi	UDkt. Mahachi waqokwa njengelungu leBhodi mhla lu-1 kuNdasa wezi-2017. Ungungcweti obhalisiwe we-Structural Engineer one-PhD, i-MSc ne-Master's ku-Information Technology ne-BSc ku-Civil Engineering. Usesebenze njengomphathi omkhulu wezobuchwepheshe Emkhandlwini Kazwelonke Ophethe Ukwakhiwa Kwezindlu ne-Research Engineer e-CSIR. Njengamanje Uyinhloko ye-Civil Engineering Nesikole Sendawo Eyakhiwe eNyuvesi yaseGoli.

Amalungu eBhodi	Amakhono nesipiliyoni
UDkt. Monde Mayekiso	UDkt. Mayekiso uyilungu leBhodi eline-PhD ku-Marine Estuarine Environmental Science, i-MSc ku-Ichthyology ne-Fisheries Science, ne-BSc Honours ku-Zoology, neSitifiketi Sokuphathwa Kwezimali. Usebenze Njengephini Likamqondisi Jikelele Wophiko Lowandle Nogu loMnyango Wezamahlathi, Ezokudoba Nezemvelo uke wasebenza futhi njengoMphathi Wohlelo Ogwini e-CSIR kanye nakumaphaneli okweluleka Ohlelo Lokuthuthuka Kocwaningo Lwesikhungo lwase-NRF nanjengelungu leBhodi Lesikhungo Sokwahlukahlukana Kwemvelo saseNingizimu Afrika. Njengamanje umele iNingizimu Afrika ezinhlanganweni zamazwe omhlaba ezifana Nekhomishani Yokufunda Ngezilwandle Yohulumeni Bamazwe Omhlaba (i-IOC) kanye Nombuthano Wokulondolozwa Kwemithombo Ephilayo Yasolwandle yase-Antartic (i-CCALMR). Uke wasebenza NjengoSihlalo wakho kokubili i-IOC Subcomission ye-Afrika ne-CCALMR. Umsebenzi wakhe ushicilelwe kumaphephabhuku asezweni nakwamanye amazwe.
UNks. Rosalind Mdubeki	UNks. Mdubeki waqokwa njengelungu leBhodi mhla lu-1 kuNdasa wezi-2017. Une-BSc ku-Surveying, i-National Diploma ku-Surveying neSitifiketi Sokuphathwa Komklamo. Usebenzele i-Eskom njenge-Survey Technician ne-Engineer eqeqeshwayo futhi njengamanje usebenza njenge-Surveyor General: e-Bloemfontein (ephethe iFreyistata neNyakatho Kapa) Emnyangweni Wezokuthuthukiswa Kwezindawo Zasemakhaya Nezinguquko Kwezomhlaba.
UMnu. Kagiso Menoe	UMnu. Menoe une-BSc ku-Chemical Engineering neziqu eziningana zokuphatha. Waqokwa njengelungu leBhodi mhla lu-1 kuNdasa wezi-2017. Usebenzele i-DMRE Njengomqondisi we-Beneficiation Economics, Esikhungweni Somhwebi Ngamadayimane Wezwe Engumhloli Wezinga Elifanele Lokwenza Umsebenzi, ne-De Beers njenge-Optimisation Engineer, i-Ore Processing Engineer ne-Senior Plant Metallurgist.
UNks. Deborah Mochothli	UNks. Mochothli waqokwa njengelungu leBhodi mhla lu-1 kuNdasa wezi-2019 futhi une-Master's ku-Environment ne-Society, i-B-Tech ye-Environmental Health, i-BA Honours ku-Public Administration ne-BA ku-Social Science. Usebenze Emnyangweni Wezamanzi Nenhlanzeko Njengomqondisi Oyinhloko Wemithethonqubo Nokusetshenziswa Kwamanzi, wasebenzela Isikhungo Sikazwelonke Seziqiwi eNingizimu Afrika njengoMphathi: Ukucwaningwa Kwamabhuku Kwezemvelo Nesifunda sase-Mafikeng Njengomphathi Omkhulu Wempilo Yezemvelo.
UMnu. Xolisa Mvinjelwa	UMnu. Mvinjelwa une-BSc ku-Chemistry, i-Master's ku-Business Administration ne-Diploma ku-Production Management. Waqokwa njengelungu leBhodi mhla lu-1 kuNdasa wezi-2017. Usebenze Njengomsizi Kwezobuchwepheshe e-Vereeniging Refractories, nase-Rhino Minerals njenge-Assistant Marketing Manager bese kamuva, njenge-Marketing Analyst Nomqondisi Wemisebenzi Ekhethekile e-SAMREC.
UDkt. Kgosientso Ramokgopa	UDkt. Ramokgopa waqokwa njengelungu leBhodi mhla lu-1 kuNdasa wezi-2017. Une-PhD kuPublic Affairs, i-Master's ku-Public Administration, i-Master's ku-Business Leadership ne-BSc ku-Civil Engineering. Usebenze njengoSodolobha Wedolobhakazi laseTshwane no-CEO we-Metropolitan Trading Company wasebenzela ne-Makethe yaseGoli.
UMnu. Owen Willcox	UMnu. Owen Willcox waqokwa njengelungu leBhodi mhla lu-1 kuNdasa wezi-2017 bese wesula esikhundleni mhla zingama-29 kuMasingana wezi-2019. Une-Master's of Commerce ku-Economics ne-BA Honours ku-Economics ne-Industrial Psychology. Usebenze Emnyangweni Wezezimali Kuzwelonke njenge-Senior Economist, uMqondisi Wezezimali Emazweni Omhlaba Nenqubomgomo Yesifunda Yezomnotho, Umnqondisi Oyinhloko Wezomnotho, uMqondisi Wokubikezela Nomphathi Wohlelo Lokuhweba, phakathi kokunye.
Amalungu eBhodi Ashintshana Namanye	**Amakhono nesipiliyoni:**
UNks. Pontso Tsotetsi	UNks. Tsotetsi waqokwa njengelungu leBhodi elishintshana namanye eshintshana noNks. R Mdubeki mhla lu-1 kuNdasa wezi-2017. Une-BSc ku-Land Surveying, i-Diploma ku-Land Surveying neSitifiketi Sohlelo Lokuthuthukiswa Kokuphatha Okusezingeni Eliphakeme.
UMnu. Paul Nel	UMnu. Paul Nel waqokwa njengelungu leBhodi elishintshana namanye eshintshana noNks. D Mochotlhi mhla lu-1 kuNdasa wezi-2017. Une-BCompt Honours futhi uyi-Chartered Accountant ne-Information Systems Auditor. Usebenze njengoMqondisi Oyinhloko Womnyango Wezamanzi Nenhlanzeko, uMqondisi Ophethe Ukulawulwa Kwamabhizinisi Okuhlanganisiwe eNingizimu Afrika, Umphathi Omkhulu Wezezimali ezikhungweni ezingamabhange ezimbalwa ne-Audit Manager ye-Deloitte & Touche.
UMnu. Ishaam Abader	UMnu. Ishaam Abader waqokwa njengelungu leBhodi elishintshana namanye eshintshana noDkt. Mayekiso mhla lu-1 kuNdasa wezi-2017. Une-Master's Degree ku-Business Administration, iziqu zomthetho (i-BProc) ne-BA nezifundo zomthetho njengemeja. UMnu. Abajer Wayengummeli Wombuso osesikhundleni esiphakeme futhi kamuva waba uMqondisi Wezomthetho Emnyangweni wase-Gauteng Wezolimo, Izinguquko Kwezomhlaba Nokuthuthukiswa Kwasemaphandleni, futhi wake wasebenza njengoMqondisi Oyinhloko: Imisebenzi Yezomthetho Emnyangweni Wezamahlathi, Ezokudoba Nezemvelo. Ubambe ezikhundleni ezahlukene Njengephini Likamqondisi Jikelele (u-DDG) Emnyangweni Wezemvelo: U-DDG: Izindaba Zebhizinisi; U-DDG: Izinga Lezemvelo Nokuvikeleka kanye, njengamanje, u-DDG: Ezomthetho, Izingunyazo, Ukuthobela Umthetho Nokuphoqwa Kwawo. UMnu. Abader usebenze futhi Ebhodini Lemisebenzi Yesimo Sezulu, iBhodi Lokufunda Ngokujulile Ngesimo Sokwakheka Komhlaba kanye neBhodi Lomlawuli Wenuzi Kazwelonke.

2.2 IBhodi eliphethe njengamanje – 1 kuNhlaba wezi-2020 – 30 kuMbasa wezi-2023

IBhodi eliphethe njengamanje laqokwa uNgqongqoshe ukusukela mhla lu-1 kuNhlaba wezi-2020. IBhodi lifaka usihlalo (uzimele), namanye amalungu ayi-11 angesibona abaphathi abakhulu, amalungu ashintshana namanye amalungu kanye no-CEO (ilungu elingumphathi omkhulu).

UDkt. Humphrey Mathe
USihlalo weBhodi

Amakhono nesipiliyoni:
UDKT. Mathe waqokwa futhi njengoSihlalo weBhodi mhla lu-1 kuMhlaba wezi-2020. Uyi-Exploration Geologist ene-BSc ku-Geology ne-Chemistry, i-BSc Honours ku-Geology ne-MSc ne-PhD ku-Exploration Geology. Unesipiliyoni esiningi nolwazi aluthole eminyakeni emininginingi futhi uke wabamba izikhundla zobu-CEO emikhakheni yomibili okuwumkhakha ozimele nokahulumeni.

Izihlalo zangaphandle aziphethe njengamanje:
Usebenza njengoMphathi Omkhulu wase-Tranter Holdings, uyilungu leBhodi futhi ungumqondisi ezikhungweni eziningana, ezifaka i-Howden Africa Holdings ne-Westcoal Holdings Limited. UnguSihlalo wase-Scinta South Africa.

UMnu. Mosa Mabuza
Umphathi Omkhulu

Amakhono nesipiliyoni:
UMnu. Mosa Mabuza uyi-Geologist ene-BSc Honours ku-Geology ne-Postgraduate Diploma ku-Business Administration. Waqokwa njengelungu leBhodi mhla lu-1 kuNhlaba wezi-2020 waqashwa njengo-CEO we-CGS mhla lu-1 kuNtulikazi wezi-2017. UMnu. Mosa Mabuza wasebenza, phakathi kwezinye izindawo, e-De Beers njenge-Explorationist, i-Laboratory Geologist ne-Senior Business Analyst, e-DMRE njengoMqondisi Oyinhloko we-Mineral Promotion, e-Anglo American Platinum Njengenhloko Yezobudlelwane Nohulumeni kanye nase-DMRE njengePhini likaMqondisi Jikelele Wenqubomgomo Yezimbiwa Nokukhuthazwa.

Izihlalo zangaphandle aziphethe njengamanje:
Usebenza njengelungu Lomkhandlu wase-Wits University futhi unesipiliyoni esiningi ekuholeni ngokwamasu, ukuhlola, ukubhala izinqubomgomo nezindaba zabasebenzi.

UDkt. Jennifer Mirembe
Ilungu leBhodi

Amakhono nesipiliyoni:
UDkt. Mirembe Uneziqu Zobudokotela Ekuhlelweni Kwamadolobha, i-Master's Ekuhlelweni Kwamadolobhakazi neziqu zezokuphatha ezimbalwa. Usebenze ezikhundleni eziningana eziphezulu, ezifaka umsebenzi wakhe wamanje njengoMqondisi Wokuphathwa Komgudu Wokwenziwa Komsebenzi Nokuphatha Ukuhlelwa Kwamadolobhakazi Njengenhloko Emnyangweni Kazwelonke Wezokuhlaliswa Kwabantu.

Izihlalo zangaphandle aziphethe njengamanje:
Waqokwa njengelungu leBhodi mhla lu-1 kuNhlangulana wezi-2020.

UNks. Adila Chowan
Ilungu leBhodi

Amakhono nesipiliyoni:
UNks. Chowan waqokwa njengelungu elizimele leBhodi mhla lu-1 kuNhlaba wezi-2020. Uyi-Chartered Accountant futhi uneziqu ze-LLB Usebenze emabhodini ezinkampanini zikahulumeni nalezo ezizimele njengomqondisi.

Izihlalo zangaphandle aziphethe njengamanje:
Njengamanje usebenza eBhodini Labaqondisi Bosizo Lwezomthetho laseNingizimu Afrika kanye Nenkampani Yamandla Enuzi yaseNingizimu Afrika Nosizo Lwezenzo eNingizimu Afrika.

UMnu. Beeuwen Gerryts:
Ilungu leBhodi

Amakhono nesipiliyoni:
UMnu. Gerryts uyi-Mechanical Engineer eneziqu ze-MSc Engineering Management (ukuphathwa kwezobuchwepheshe nokusungulwa kwezinto ezintsha) ayithola eNyuvesi yasePitoli. Waqokwa futhi njengelungu leBhodi mhla lu-1 kuNhlaba wezi-2020. Usebenza e-DSI njengoMqondisi Oyinhloko we-Technology i-Localisation, i-Beneficiation ne-Advanced Manufacturing. Unesipiliyoni esiningi ocwaningweni nasekuphathweni kokusungulwa kwezinto ezintsha, i-ICT nezincazelo zezinhlelo zemikhiqizo, ukwakhiwa kwezinqubomgomo, nezinye izincwadi ezishicilelwe ku-R&D nokuthuthukiswa kwemboni.

Izihlalo zangaphandle aziphethe njengamanje:
Njengamanje usebenza eBhodini le-CGS futhi unguSihlalo Wekomidi Lezobuchwepheshe. Usebenza futhi njengelungu leBhodi Lokweluleka Lokuphathwa Kwesikole Sobuchwepheshe Seziqu Eziphakeme (i-GTSM) Enyuvesi yasePitoli.

UMnu. Xolisa Mvinjelwa:
Ilungu leBhodi

Amakhono nesipiliyoni:
UMnu. Mvinjelwa une-BSc ku-Chemistry, i-Master's ku-Business Administration ne-Diploma ku-Production Management. Waqokwa futhi njengelungu leBhodi mhla lu-1 kuNhlaba wezi-2020. Usebenze Njengomsizi Kwezobuchwepheshe e-Vereeniging Refractories, nase-Rhino Minerals njenge-Assistant Marketing Manager bese kamuva, njenge-Marketing Analyst Nomqondisi Wemisebenzi Ekhethekile e-SAMREC.

Izihlalo zangaphandle aziphethe njengamanje:
Uyilungu leBhodi le-CGS futhi usebenza njengoSihlalo Wesikhwama Semali Ekhokhwa Iyisamba Uma Usuthatha Umhlalaphansi e-SAMREC futhi unguSihlalo Wesikhwama Sempesheni sase-ECCA Mineral. Wayeyinhloko Yomnyango Wabasebenzi, Imisebenzi Yamasu Neyenkampani e-Imerys South Africa. Njengamanje unguMqodisi Ophethe Wezimiso Zokuziphatha Nezinguquko e-Imerys South Africa. Futhi unguSihlalo we-Coastal Fuels, inkampani encane yokumba ezimayini futhi unguSihlalo we-Ejensi Yentuthuko yase-Port St Johns, uMqondisi Ophethe nelungu leBhodi, futhi unguSihlalo Wekomidi Lokuphathwa Kobudlelwane Nababambiqhaza e-Imerys South Africa.

UDkt. Thuli Khumalo:
Ilungu leBhodi

Amakhono nesipiliyoni:
UDkt. Khumalo une-PhD Yesayensi Yezemvelo, nesitifiketi sohlelo lokuthuthukisa ezokuphatha asithola e-Gibs ne-Master of Philosophy ku-Corporate Strategy. Usebenze ezikhundleni eziningana eziphezulu, ezifaka umsebenzi wakhe wamanje njengoMqondisi Wokuphathwa Kwezinga Lomoya Emnyangweni Wezamahlathi, Ezokudoba Nezemvelo.

Izihlalo zangaphandle aziphethe njengamanje:
Waqokwa njengelungu leBhodi le-CGS mhla lu-1 kuNhlangulana wezi-2020.

UMnu. Smunda Mokoena:
Ilungu leBhodi

Amakhono nesipiliyoni:
UMnu. Mokoena waqokwa njengelungu elizimele leBhodi le-CGS mhla lu-1 kuNhlaba wezi-2020. Une-B Sc ku-Engineering, i-MBA futhi une-Sitifiketi Sikahulumeni Samakhono (i-GCC) Sezimayini Nemisebenzi. Unesipiliyoni esiningi njengoba esebenze njengomqondisi emabhodini amaningana. Njengamanje usebenza e-DSI njengoMqondisi Oyinhloko e-Best Infrastructure and Investments, nase-Service Delivey Solutions (Pty) Ltd. Uneminyaka emininga yesipiliyoni ezimbonini zezimayini namandla emikhakheni yomibili okuwumkhakha ozimele nokahulumeni.

Izihlalo zangaphandle aziphethe njengamanje:
Njengamanje usebenza Njengelungu Elingasebenzi Ngokugcwele noSihlalo Womlawuli Kazwelonke Wezokuthutha Zikahulumeni (i-NPTR) futhi Uyilungu Elingagcwele Elilawulayo Kumlawuli Kazwelonke Wezamandla (i-NERSA

UNks. Rosalind Mdubeki:
Ilungu leBhodi

Amakhono nesipiliyoni:
UNks. Mdubeki waqokwa futhi njengelungu leBhodi mhla lu-1 kuNhlaba wezi-2020. Une-BSc ku-Surveying, i-National Diploma ku-Surveying neitifiketi Sokuphatwa Komklamo. Usebenzele i-Eskom njenge-Survey Technician ne-Engineer eqeqeshwayo futhi njengamanje usebenza njenge-Surveyor General: e-Bloemfontein (ephethe iFreyistata neNyakatho Kapa) Emnyangweni Wezokuthuthukiswa Kwezindawo Zasemakhaya Nezinguquko Kwezomhlaba.

Izihlalo zangaphandle aziphethe njengamanje:
Uyilungu leBhodi futhi unguSihlalo Wekomidi le-CGS Lezabasebenzi, Amaholo Nezinguquko. Uyilungu leBhodi Lamalokishi aseFreyistata nelungu lomkhandlu we-SAGC.

U-Adv Ntika Maake:
Ilungu leBhodi

Amakhono nesipiliyoni:
U-Adv Maake une-Master of Laws Ezimbonini Zokumba e-Afrika, i-Diploma ku-Project Management neziqu eziphakeme emthethweni wokuguquka kwesimo sezulu namandla, phakathi kokunye. Usebenze ezikhungweni zikahulumeni eziningana, ezifaka i-Eskom holdings, Idolobhakazi laseTshwane Nomyango Wezobulungiswa Nokuthuthukiswa KoMthethosisekelo.

Izihlalo zangaphandle aziphethe njengamanje:
Unesabelo samasheya ezinkamapanini eziningana, ilungu leBhodi le-CGS nomqondisi kwezinye izinkampani eziningana.

UNks. Sibongile Malie:
Ilungu leBhodi

Amakhono nesipiliyoni:
UNks. Malie uneziqu ze-Baccalaureus Legum (LLB) futhi unesipiliyoni esiningi embonini yokumba ezimayini nezimbiwa, engisithole ngeminyaka yami yesipiliyoni eyi-14 ngisebenzela i-DMRE. Wathola ukuqonda ngokujulile uhlaka lwezomthetho nokulawula oluphathelene nomkhakha wokumba ezimayini nezimbiwa. UNks. Malie njengamanje usesikhundleni sokuba uMqondisi Ekwenziweni Kwenqubomgomo Yezimbiwa e-DMRE.

Izihlalo zangaphandle aziphethe njengamanje:
Waqokwa njengelungu leBhodi mhla lu-1 kuNhlangulana wezi-2020.

UNks. Deborah Mochothli:
Ilungu leBhodi

Amakhono nesipiliyoni:
UNks. Mochothli waqokwa njengelungu leBhodi mhla lu-1 kuNdasa wezi-2020 futhi une-Master's ku-Environment ne-Society, i-B-Tech ye-Environmental Health, i-BA Honours ku-Public Administration ne-BA ku-Social Science. Usebenze Emnyangweni Wezamanzi Nenhlanzeko Njengomqondisi Oyinhloko Wemithethonqubo Nokusetshenziswa Kwamanzi, wasebenzela Isikhungo Sikazwelonke Seziqiwi eNingizimu Afrika njengoMphathi: Ukucwaningwa Kwamabhuku Kwezemvelo Nesifunda sase-Mafikeng Njengomphathi Omkhulu Wempilo Yezemvelo.

Izihlalo zangaphandle aziphethe njengamanje:
Uyilungu leBhodi le-CGS, futhi uyilungu Labesifazane Bezemvelo kanye Nekomidi Leminyango Ehlukene laseNyakatho Ntshonalanga.

UNks. Ms Lebogang Madiba:
Ilungu leBhodi

Amakhono nesipiliyoni:
UNks. Madiba waqokwa njengelungu leBhodi mhla ziyi-5 ku-Agasti wezi-2019. Une-BCom Hons ku-Economics, i-Master of Finance ku-Economic Policy Nesitifiketi Ohlelweni Lobuholi Obuphezulu. Njengamanje usebenza njengoMqondisi Oyinhloko: Imisebenzi Yezomnotho, Izimali Zikahulumeni Emnyangweni Wezezimali Kuzwelonke. Imisebenzi yakhe yangaphambilini ifaka ukuba iPhini likaMgcinimafa e-Transnet SOC Limited, uMqondisi: Isimo Sezwe Sobungozi, Umhlaziyi Ophezulu Wezezimali: Isimo Sezwe Sobungozi, neSazi Sezomnotho Esiphezulu: Imisebenzi Yokubuyiswa Kwezimali Zikamasipala Emnyagweni Wezezimali Kuzwelonke, kanye Nongoti: Isimo Sobungozi Sentengo Nokuphathwa Kokudluliswa Kwezindaba esebenzela Uhulumeni Wesifundazwe sase-Gauteng.

Izihlalo zangaphandle aziphethe njengamanje:
Uyilungu leBhodi le-CGS futhi usebenza emakomidini okucwaningwa kwamabhuku, awezimo ezinobungozi nawezezimali.

UMnu. Paul Nel:
Ilungu LeBhodi Elishintshana namanye

Amakhono nesipiliyoni:
UMnu. Paul Nel waqokwa njengelungu leBhodi elishintshana namanye eshintshana noNks. D Mochotlhi mhla lu-1 kuNhlaba wezi-2020. Une-BCompt Honours futhi uyi-Chartered Accountant ne-Information Systems Auditor.

Usebenze njengoMqondisi Oyinhloko Womnyango Wezamanzi Nenhlanzeko, uMqondisi Ophethe Ukulawulwa Kwamabhizinisi Okuhlanganisiwe eNingizimu Afrika, Umphathi Omkhulu Wezezimali ezikhungweni ezingamabhange ezimbalwa ne-Audit Manager e-Deloitte & Touche. Usebenze njengoMqondisi Oyinhloko Womnyango Wezamanzi Nenhlanzeko, uMqondisi Ophethe Ukulawulwa Kwamabhizinisi Okuhlanganisiwe eNingizimu Afrika, Umphathi Omkhulu Wezezimali ezikhungweni ezingamabhange ezimbalwa ne-Audit Manager e-Deloitte & Touche.

Izihlalo zangaphandle aziphethe njengamanje:
UMnu. Nel uyilungu leBhodi le-CGS elishintshana namanye.

UNks. Pontso Tsotetsi:
Ilungu LeBhodi Elishintshana namanye

Amakhono nesipiliyoni:
UNks. Tsotetsi waqokwa njengelungu leBhodi elishintshana namanye eshintshana noNks. R Mdubeki mhla lu-1 kuMeyi wezi-2020. Une-BSc ku-Land Surveying, i-Diploma ku-Land Surveying ne-Certificate ku-Advanced Management Development Programme.

Izihlalo zangaphandle aziphethe njengamanje:
Usebenze Njengochwepheshe Wokucwaningwa Komhlaba Kuchwepheshe Wokucwaningwa Komhlaba-Jikelele e-Pietermaritzburg, Ungoti Wokucwaningwa Komhlaba Kuchwepheshe Wokucwaningwa Komhlaba-Jikelele e-Bloemfontein nePhini Lokucwaningwa Komhlaba-Jikelele ePitoli.

UMnu. Adries Moatshe:
Ilungu LeBhodi Elishintshana namanye

Amakhono nesipiliyoni:
UMnu. Moatshe waqokwa futhi njengelungu elishintshana namanye kuNks. Malie mhla lu-1 kuNhlaba wezi-2020. Une-Master's Ekuphathewni Kwezemvelo ne-Higher Diploma Kwezempilo Yomphakathi. Njengamanje usebenza e-DMRE, njengoMqondisi Oyinhloko Wokuphathwa Kwezemvelo futhi ufake isandla ekwenziweni kwenqubomgomo yomnyango.

Izihlalo zangaphandle aziphethe njengamanje:
UMnu. Moatshe uyilungu elishintshana namanye eBhodini le-CGS.

UDkt. Sabelo Malaza:
Ilungu LeBhodi Elishintshana namanye

Amakhono nesipiliyoni:
UMnu. Malaza une-B Phil Neziqu Zobudokotela Kwezokuphathwa Kwamabhizinisi. Ungumsebenzi Wezokuphathwa Kwemvelo onesipiliyoni esingaphezu kweminyaka eyi-16 emkhakheni kahulumeni. Usebenze Emnyagweni Wezamanzi Nenhlanzeko Nomnyango Wezamahlathi, Ezokudoba Nezemvelo enza imisebenzi eyahlukahlukene.

Izihlalo zangaphandle aziphethe njengamanje:
Waqokwa njengelungu leBhodi le-CGS elishintshana namanye mhla lu-1 kuNhlaba wezi-2020.

IBhodi leseka futhi lamukela ukwenza imisebenzi yokuphatha ngokwethembeka nangokuncomekayo kweBhodi echazwe Esigabeni 50 se-PFMA (uMthetho Ongunombolo 1 yowe-1999, njengokuchitshiyelwa kwawo), odinga, phakathi kokunye, ukuthi amalungu eBhodi:

2.1.1 Asebenze ngokunakekela okuphezulu kakhulu ukuze kuqinisekiswe ukuvikelwa kwempahla namarekhodi esikhungo;
2.1.2 Asebenze ngokwethembeka, iqiniso, nobuqotho futhi ngendlela esiza i-CGS ekuphatheni izindaba zezimali ze-CGS;
2.1.3 Angenzi izinto ngendlela engahambisani nezibopho ezabelwe amalungu eBhodi;
2.1.4 Bangasebenzisi isikhundla sabo kanye/noma izimfanelo noma ulwazi oluyimfihlo abaluthole njengamalungu eBhodi ukuze bazuze bona ziqu noma bazuzise omunye umuntu ngokungafanele, futhi
2.1.5 Badalule futhi baveze obala ukubandakanyeka okuqondile noma okungaqondile ilungu noma umlingani noma umndeni osondele okungenzeka kube nokushayisana kokubandakanyeka kwawo nomsebenzi wesikhungo.

Ibhodi lenze umsebenzi wokuvezwa obala kokubandakanyeka okwenziwa njalo ngonyaka kuyo yonke imihlangano yamakomidi neyeBhodi ukuze kuqinisekiswe ukuthi amalungu adalule ukushayisana kwangempela okukhona noma okucatshangelwayo kunoma yiluphi udaba phambi Kwesiphathimandla Esengamele Umsebenzi. Amalungu eBhodi kufanele ahoxe kokwenzekayo uma udaba ludingidwa ngaphandle uma iBhodi linquma ngenye indlela.

Kuncike emihlinzekweni yoMthetho Wokufunda Ngokujulile Ngesimo Sokwakheka Komhlaba, ufundwa kanyekanye ne-PFMA, iBhodi linesibopho sokwenziwa komsebenzi e-CGS. IBhodi lizolawula futhi liphathe izindaba ze-CGS, likhombe indlela yamasu esikhungo, futhi ligunyaze umbono, umsebenzi, izinhloso ezinamasu nezinqubomgomo zesikhungo.

Phezu kwalokho, iBhodi liqapha ukuthotshelwa kwezinqubomgomo nokwenziwa komsebenzi kusetshenziswa izinhloso zezesayensi, ezokusingatha nezezimali. IBhodi kungumsebenzi walo lilonke ukuqinisekisa ukuthi i-CGS inezinhlelo noma ilondoloza izinhlelo eziphumelelayo nezigculisayo futhi ezingafihli lutho zokuphathwa kwezimali, zokuphathwa kwezimo ezinobungozi, ukucwaningwa kwamabhuku kwangaphakathi, nokuthengwa kwempahla nokutholakala kwezinsizakalo okungachemile, okulinganayo, okusezingeni elifanele nokungabizi.

IBhodi linegunya lokuhola, ukulawula nokuphatha ibhizinisi le-CGS, futhi lithathe uhlaka oluphelele lokunikezwa kwegunya okuphelele ngokuhambisana Nesigaba 56 se-PFMA, esinika u-CEO igunya lokuphathwa komsebenzi wansukuzonke we-CGS. Inqubomgomo yokunikezwa kwegunya lokuphatha ayikwenzi nangayiphi indlela ukwephuca iBhodi igunya lokwenza umsebenzi nokukwazi ukuziphendulela kwenzelwa isikhungo.

2.3 Umbhalo Ochaza Ngemisebenzi yeBhodi nemisebenzi yeBhodi

Umbhalo Ochaza Ngemisebenzi yeBhodi, obuyekwezwa njalo ngonyaka, uhlinzeka ngalokhu okulandelayo:

a) Indima yeBhodi yokuhola, ukwahlulela nendlela yokwenza umsebenzi enamasu;
b) Isakhiwo seBhodi;
c) Ukukwazi ukuziphendulela, imisebenzi yokuphatha ngokwethembeka nangokuncomekayo nemisebenzi;
d) Indlela yokuziphatha yeBhodi;
e) Umthethosisekelo nokuqokwa kwamakomidi;
f) Ukuphatha nezinqubo zemihlangano;
g) Ukuphathwa kokushayisana kokubandakanyeka;
h) Umsebenzi wokusebenzisa izinhlelo ezinamasu kanye nokuqapha ukwenziwa komsebenzi nokuphatha;
i) Ukunqunywa nokugunyazwa kwezinqubomgomo;
j) Ukuphathwa kwezimo ezinobungozi, kanye
k) Nokukhethwa, ukuqeqeshelwa umsebenzi omusha nokuhlolwa kweBhodi.

2.4 Ukwamukelwa kweBhodi nokuqeqeshelwa umsebenzi omusha

I-CGS inohlelo lokwamukela iBhodi.

2.5 Ukuqeqeshwa kwamalungu amasha eBhodi

Uhlelo lokuthuthukiswa kwabaqondisi luqinisekisa ukuthi amalungu eBhodi aqeqeshwa ngokwanele futhi nangokuqhubekayo futhi anolwazi oludingekayo futhi ayathuthuka endleleni engcono yokwenza umsebenzi nemigomo yokuphatha inkampani. Ngenxa yemibiko yamakwata nezinqubomgomo, amalungu eBhodi ahlala azi ngezakhiwo ze-CGS zokuphatha, imisebenzi enamasu, nokwenziwa komsebenzi esikhungweni ukuze bakwazi ukufeza imisebenzi yabo nezibopho zabo.

2.6 Imihlangano yeBhodi

IBhodi laba nemihlangano eyisihlanu ngowezi-2019/2020. La mathebula aphelezela lo mbhalo achaza kabanzi ukuba khona emihlanganweni kwelungu leBhodi ngalinye onyakeni.

Ithebula 2: Imihlangano yeBhodi

Amalungu eBhodi	25 Mbasa 2019	29 Nhlaba 2019	25 Ntulikazi 2019	29 Mfumfu 2019	29 Masingana 2020	Imihlangano eyethanyelwe
UDkt. H Mathe (uSihlalo)	Wayekhona	Wayekhona	Wayekhona	Wayekhona	Wayekhona	5
UMnu. M Mabuza	Wayekhona	Wayekhona	Wafaka Isixoliso	Wayekhona	Wayekhona	4
UDkt. M Mayekiso	Wayekhona	Wafaka Isixoliso	Wafaka Isixoliso	Wafaka Isixoliso	Wafaka Isixoliso	1
UMnu. I Abader*	Wafaka Isixoliso	Wayekhona	Wafaka Isixoliso	Wafaka Isixoliso	Wayekhona	2
UNks. D Mochothli	Wafaka Isixoliso	Wafaka Isixoliso	Wafaka Isixoliso	Wayekhona	Wayekhona	2
UMnu. P Nel*	Wayekhona	Wafaka Isixoliso	Wafaka Isixoliso	Wafaka Isixoliso	Wafaka Isixoliso	1
UNks. R Mdubeki	Wafaka Isixoliso	Wafaka Isixoliso	Wafaka Isixoliso	Wayekhona	Wayekhona	2
UNks. P Tsotetsi*	Wayekhona	Wayekhona	Wafaka Isixoliso	Wafaka Isixoliso	Wafaka Isixoliso	2
UDkt. J Mahachi	Wayekhona	Wayekhona	Wayekhona	Wayekhona	Wayekhona	5
UMnu. X Mvinjelwa	Wayekhona	Wayekhona	Wayekhona	Wayekhona	Wafaka Isixoliso	4
UMnu. K Koloi	Wafaka Isixoliso	Wafaka Isixoliso	Wafaka Isixoliso	Wafaka Isixoliso	Wayekhona	1
UDkt. K Ramokgopa	Wayekhona	Wafaka Isixoliso	-	-	-	1/2
UMnu. B Gerryts	Wayekhona	Wafaka Isixoliso	Wayekhona	Wayekhona	Wayekhona	4
UMnu. A Moatshe*	Wafaka Isixoliso	Wafaka Isixoliso	Wafaka Isixoliso	Wafaka Isixoliso	Wafaka Isixoliso	-
UMnu. K Menoe	Wafaka Isixoliso	Wayekhona	Wayekhona	Wayekhona	Wayekhona	4
UNks. L Madiba	-	-	-	Wafaka Isixoliso	Wayekhona	1

** Amalungu ashintshana namanye – Akakabi ilungu ** Wesula esikhundleni*

2.7 Ukuholelwa kweBhodi

Ukuholelwa kwamalungu eBhodi kunqunywa uNgqongqoshe we-DMRE ngokubonisana noNgqongqoshe Wezezimali, njengoba kuvezwe enothini 12 lamanothi ezitatimende zezimali.

2.8 Amakomidi eBhodi

NgokweSigaba 15 Somthetho Wokufunda Ngokujulile Ngesimo Sokwakheka Komhlaba (Umthetho Ongunombolo 100 we-1993, njengokuchitshiyelwa kwawo), iBhodi lingasungula ikomidi elingenza imisebenzi yeBhodi, kuncike ekuyalelweni iBhodi, ngokunqunywa isikhathi nesikhathi. Phezu kwalokho, Isigaba 56 se-PFMA (Umthetho Ongunombolo 1 we-1999, njengoba kuchitshiyelwe) sihlinzeka ngeminye yemisebenzi yeBhodi engadluliselwa kumakomidi eBhodi nokuphathwa kwe-CGS ngaphandle kokwephuca iBhodi igunya lokwenza imisebenzi nezibopho zalo. Amakomidi eBhodi, ngakho-ke, kudingeka ukuthi enze izincomo eBhodini lonke ngaphambi kokuthi kwenziwe izinqumo ezinamasu ezenziwa abaphathi.

Ngokuthunywa Isigaba 15 Somthetho Wokufunda Ngokujulile Ngesimo Sokwakheka Komhlaba, Umthetho 56 we-PFMA nezincomo ze-King Code, iBhodi lakhe futhi ladlulisa eminye yemisebenzi yalo kula makomidi eBhodi amane alandelayo:

2.8.1 Ikomidi Locwaningomabhuku Nezimo Ezinobungozi

Ikomidi Locwaningomabhuku Nezimo Ezinobungozi lasungulwa ngokweSigaba 77 se-PFMA Nomthethonqubo 27 Womnyango Wezezimali Kuzwelonke. Ikomidi Locwaningomabhuku Nezimo Ezinobungozi lenza imisebenzi yalo Ngokwemibhalo Yemisebenzi Yekomidi Locwaningomabhuku Nezimo Ezinobungozi, elibheka ukwakheka kwalo ikomidi, imisebenzi nezibopho. Ikomidi Locwaningomabhuku Nezimo Ezinobungozi liqapha ngokuqhubekayo izinga nokwethembeka kolwazi lwezezimali le-CGS olusetshenziswa iBhodi, izitatimende zezezimali ezikhishwa i-CGS nemisebenzi ehlukene yesikhungo. Ikomidi Locwaningomabhuku Nezimo Ezinobungozi liqinisekisa ukuthi ubungozi obuvelayo buhlonzwa kusenesikhathi nokuthi izinyathelo zokulawula ezifanele nezigculisayo ziyathathwa ukuze kuncishiswe ubungozi.

Ukwakhiwa nokuthanyelwa kwemihlangano Ikomidi Locwaningomabhuku Nezimo Ezinobungozi ukusukela mhla lu-1 kuMbasa wezi-2019 ukuya mhla zingama-31 kuNdasa wezi-2020 kuboniswe ngezansi.

Ithebula 3: Imihlangano Yekomidi Locwaningomabhuku Nezimo Ezinobungozi

Amalungu ekomidi	Ngowezi-2019/2020					Imihlangano eyethanyelwe
	17 Mbasa	15 Nhlaba	16 Ntulikazi	11 Mfumfu	17 Masingana	
UMnu. SM Xulu (uSihlalo)	Wayekhona	Wayekhona	Wayekhona	Wayekhona	Wayekhona	5
UMnu. P Nel	Wayekhona	Wayekhona	Wayekhona	Wafaka Isixoliso	Wayekhona	4
UNks. D Morabe	Wayekhona	Wayekhona	Wafaka Isixoliso	Wafaka Isixoliso	Wayekhona	3
UMnu. O Willcox	-	-	-	Wayekhona	Wayekhona	2/2
UNks. KR Mthimunye	Wafaka Isixoliso	Wafaka Isixoliso	Wayekhona	Wayekhona	Wayekhona	3
UDkt. K Ramokgopa	Wayekhona	Wayekhona	-	-	-	2/2

***Wesula esikhundleni, - Ngaphambi kokuqokwa, #Umhlangano ohlanganyelwe Wekomidi Lezezimali Nekomidi Locwaningomabhuku Nezimo Ezinobungozi*

2.8.1.1 Umbiko Wekomidi Locwaningomabhuku Nezimo Ezinobungozi

Ikomidi Locwaningomabhuku Nezimo Ezinobungozi libika ukuthi liwenzile umsebenzi walo osukela Esigabeni 77 se-PFMA Nomthethonqubo 27.1 Womnyango Wezezimali Kuzwelonke. Ikomidi libika futhi ukuthi lithathe Umbhalo Ochaza Ngemisebenzi Yekomidi Locwaningomabhuku Nezimo Ezinobungozi njengombhalo elisebenza ngawo, lilungise izindaba zalo ngokwemigomo yalo mbhalo futhi lenze imisebenzi yalo equkethwe lapho.

Ekwenzeni imisebenzi yalo, ikomidi lenze, phakathi kokunye, le misebenzi elandelayo:

2.9 Ukuhlola kokulawula kwangaphakathi

Ikomidi likhombise indlela, laqapha futhi lahlola imisebenzi yophiko Locwaningomabhuku Lwangaphakathi. Ngokusebenzisa uphiko Locwaningomabhuku Lwangaphakathi, ikomidi laqapha zonke izikhathi ukusebenza ngempumelelo kokulawula kwangaphakathi lahlola ukuthi uphiko Locwaningomabhuku Lwangaphakathi layifeza yini imisebenzi yalo. Ngonyaka wezi-2019/2020, ukulawula kwangaphakathi kwabikwa ukuthi kwaba ngcono kakhulu, futhi ukuthobela imithethonqubo enqunyiwe kanye nezinqubo kwabikwa ukuthi kwaba okwanelisayo. Kodwa-ke, kusengenziwa kangcono kunalokhu kulokhu:

a) Ukuthengwa kwempahla nokutholakala kwezinsizakalo;
b) Ukuphathwa kwezimali;
c) Ukuphathwa kwabasebenzi;
d) Ukuphathwa kwezinga lokwenziwa komsebenzi;
e) Izinyathelo eziphathelene nokulawula ingqalasizinda yobuchwepheshe bolwazi, kanye
f) Izinyathelo zokuvimbela ukukhwabanisa nezenzo eziphathelene nenkohlakalo.

Ikomidi linokuzethemba ngokubika ukuthi izinyathelo zokulungisa zathathwa ukuze kuxazululwe okwakutholakele okumayelana nobuthakathaka bokulawula kwangaphakathi.

2.10 Ukuhlolwa kombiko wonyaka

Ikomidi lenze lokhu:

a) Labuyekeza umbiko we-CGS wezinga lokwenziwa komsebenzi enkampanini;
b) Labuyekeza imithethonqubo ye-CGS yokugcinwa kwamarekhodi ezimali ezingenayo neziphumayo nendlela yokusebenza.
c) Labuyekeza ukwanelisa nokuba usizo kolwazi lwezezimali olunikezwe Umcwaningimabhuku-Jikelele;
d) Lahlola, labuyekeza futhi laxoxa Nomcwaningimabhuku-Jikelele Ngezitatimende Zezimali ezicwaningiwe ezifakwe embikweni wonyaka;
e) Labuyekeza umbiko Womcwaningi-mabhuku Jikelele wabaphathi, nombiko Womcwaningi-mabhuku, futhi
f) Kusekelwe olwazini oluhlinzekwe ekomidini, ikomidi labheka futhi laphetha ngokuthi Izitatimende Zezimali Ezikhishwa Njalo Ngonyaka ziyavumelana nezidingo ze-PFMA, Nomthethonqubo Womnyango Wezezimali Kuzwelonke Nemigomo yaseNingizimu Afrika Yezindlela Zokugcina Amarekhodi Okungena Nokuphuma Kwezimali Ezamukelekile Jikelele (Imigomo yaseNingizimu Afrika ye-GRAP).

2.11 Ukuphathwa kwezimo ezinobungozi

Ikomidi libika ukuthi ngonyaka obuyekezwayo lagunyaza Inqubomgomo Yerejista Yezimo Ezinobungozi Ngokwamasu Nokulwa Nokukhwabanisa Nenkohlakalo, okwadluliswa kubasebenzi kamuva bese kwahlanganiswa nendlela yokusebenza yase-CGS. Ikomidi labuyekeza:

a) Amazinga esikhungo okwamukela izimo ezinobungozi ngokubanzi namazinga okwamukela izimo ezinobungozi ngokuqondile, futhi
b) Ukuchayeka okuphawulekayo ezimweni zezimali ezinobungozi, futhi lakhombisa abaphathi ukuthi baqaphe futhi badale amasu okunciphisa lokho kuchayeka, kuhlanganisa izinhlelo zesithunzi sesikhungo, ezokusebenza, ukukhwabanisa, ezamasu, ubuchwepheshe bolwazi nokuxhumana, kanye nesimo sobungozi sokubuyiselwa kwesimo ngemuva kwesimo esibucayi nokuqhubeka kwebhizinisi.

2.12 Ukuhlolwa kwezitatimende zezimali

Ikomidi labuyekeza futhi laxoxisana Nomcwaningimabhuku-Jikelele ngezitatimende zezimali zase-CGS zonyaka ophele mhla zingama-31 kuMashi wezi-2020. Ikomidi labuyekeza futhi incwadi yabaphathi Yomcwaningimabhuku-Jikelele nezimpendulo zabaphathi kuyona. Ikomidi linombono wokuthi izitatimende zezimali ziyavumelana, ngayo yonke indlela ebalulekile, nezidingo ze-PFMA Nemigomo yaseNingizimu Afrika ye-GRAP.

2.13 Umbiko Womcwaningimabhuku-Jikelele

Ikomidi libuyekeze uhlelo lokusetshenziswa ngokutholwe ngokucwaningwa kwamabhuku konyaka ophambilini futhi libika ukuthi inani eliphawulekayo lokutholiwe sekuxazululiwe. Ikomidi lizoqinisekisa ukuthi abaphathi baxazulula konke okutholiwe ngemuva kocwaningo lwamabhuku olusaqhubeka. Ikomidi liyavumelana futhi liyazamukela izinqumo zikaMcwaningi-mabhuku-Jikelele ngezitatimende zezimali futhi linombono wokuthi Izitatimende Zezimali ezicwaningiwe Ezikhishwa Njalo Ngonyaka kufanele zamukelwe futhi zifundwe nombiko Womcwaningi-mabhuku-Jikelele.

UNks. KM Maroga
USihlalo
Ikomidi Locwaningomabhuku Nezimo Ezinobungozi
Usuku

2.14 Imisebenzi nesakhiwo Sekomidi LEZEZIMALI

Ikomidi Lezezimali le-CGS lithunywe ukuthi libheke futhi lincome ukuze iBhodi ligunyaze lokhu okulandelayo:

- Imisebenzi yezezimali ephawulekayo;
- Ubukhona bemali nesimo sezimali sase-CGS;Ukwesulwa izikweletu ezimbi;
- Ukwehlukana okubalulekile kwizabelomali ezigunyaziwe zonyaka kanye/noma ezibuyekeziwe ngokuhambisana Nohlelo Lohlaka Lokubaluleka Nokuphawuleka;
- Isabelomali esiphakanyisiwe semisebenzi emikhulu ebalulekile nesabelomali sokwenza umsebenzi ojwayelekile nezindleko zokulondoloza impahla yesikhungo;
- Izitatimende zezimali zombiko wonyaka;
- Zonke izinqubomgomo ezinemithelela kwezezimali, futhi
- Ukuphathwa kolwazi ngokwenziwa komsebenzi enkampanini kuqhathaniswa nesabelomali esigunyaziwe.

Ikomidi Lezezimali lakhiwe amalungu ayisithupha angebona abaphathi abakhulu njengoba kuchazwe kabanzi ethebuleni elingezansi, kanye nokuthanyelwa kweminhlangano ukusukela mhla lu-1 kuMbasa wezi-2019 ukuya mhla zingama-31 kuNdasa wezi-2020.

Ithebula 4: Imihlangano Yekomidi Lezezimali

Amalungu ekomidi	Ngonyaka wezi-2019/2020					Imihlangano eyethanyelwe
	17 Mbasa	15 Nhlaba	16 Ntulikazi	11 Mfumfu	17 Masingana	
Unks KR Mthimunye (uSihlalo)	Wafaka Isixoliso	Wafaka Isixoliso	Wayekhona	Wayekhona	Wayekhona	3
UMnu. P Nel	Wafaka Isixoliso	Wayekhona	Wayekhona	Wafaka Isixoliso	Wayekhona	3
UNks. L Madiba	-	-	-	Wafaka Isixoliso	Wafaka Isixoliso	-
UNks. D Morabe	Wayekhona	Wayekhona	Wafaka Isixoliso	Wafaka Isixoliso	Wafaka Isixoliso	2
UDkt. J Mahachi	Wayekhona	Wayekhona	Wayekhona	Wayekhona	Wayekhona	5
UMnu. K Koloi	Wayekhona	Wafaka Isixoliso	Wafaka Isixoliso	Wayekhona	Wayekhona	3
UMnu. M Mabuza	Wayekhona	Wayekhona	Wayekhona	Wayekhona	Wayekhona	5
UMnu. O Willcox	-	-	-	Wayekhona	Wayekhona	2/2

*Wesula esikhundleni, - Ngaphambi kokuqokwa, #Umhlangano ohlanganyelwe Wekomidi Lezezimali Nekomidi Locwaningomabhuku Nezimo Ezinobungozi

2.15 Ikomidi Lezobuchwepheshe

Ikomidi Lezobuchwepheshe le-CGS lithunywe ukuthi libheke futhi lincome ukuze iBhodi ligunyaze uhlelo lwesikhungo lonyaka nonyaka lwezesayensi nobuciko obunamasu, lihlole okukhishwayo kwezesayensi nobuchwepheshe futhi lengamele ukusetshenziswa kwesu le-ICT kanye nokuhlola Kokuphela kwesikhathi sokusebenza.

Ukwakhiwa nokuthanyelwa kwemihlangano yeKomidi Lezobuchwepheshe ukusukela mhla lu-1 kuMbasa wezi-2019 ukuya mhla zingama-31 kuNdasa wezi-2020 kuboniswe ngezansi.

Ithebula 5: Imihlangano Yekomidi Lezobuchwepheshe

Amalungu ekomidi	Ngonyaka wezi-2019/2020					Imihlangano eyethanyelwe
	16 Mbasa	17 Nhlaba	12 Ntulikazi	10 Mfumfu	17 Masingana	
UMnu. B Gerryts (uSihlalo)	Wayekhona	Wayekhona	Wayekhona	Wafaka Isixoliso	Wayekhona	4
UMnu. X Mvinjelwa	Wafaka Isixoliso	Wayekhona	Wafaka Isixoliso	Wafaka Isixoliso	Wafaka Isixoliso	1
UDkt. M Mayekiso	Wafaka Isixoliso	Wafaka Isixoliso	Wayekhona	Wafaka Isixoliso	Wayekhona	2
UDkt. J Mahachi	Wayekhona	Wayekhona	Wafaka Isixoliso	Wayekhona	Wayekhona	4
UMnu. K Menoe	Wayekhona	Wafaka Isixoliso	Wayekhona	Wayekhona	Wayekhona	4
UNks. P Tsotetsi	Wayekhona	Wafaka Isixoliso	Wafaka Isixoliso	Wayekhona	Wafaka Isixoliso	2
UMnu. D Sibiya	Wayekhona	Wayekhona	Wafaka Isixoliso	Wayekhona	Wayekhona	3
UMnu. M Mabuza	Wayekhona	Wayekhona	Wayekhona	Wayekhona	Wayekhona	5

- Ngaphambi kokuqokwa

2.16 Ikomidi Lezabasebenzi, Amaholo Nezinguquko

Ikomidi Lezabasebenzi, Amaholo Nezinguquko lithunywe ukuthi libheke futhi lincome ukuze iBhodi ligunyaze amasu okuphathwa kwabasebenzi nezinqubomgomo zase-CGS. Liphinde libheke futhi lincome ukuze iBhodi ligunyaze imodeli yesikhungo yamaholo, amaholo abaphathi abakhulu nokukhushulwa kwamaholo okwenzeka njalo ngonyaka, futhi lihlola lenze izincomo ngokukhokhwa kwamabhonasi ezinga lokwenziwa komsebenzi. Ikomidi liphinde futhi libheke imibiko yokwenziwa komsebenzi esikhungweni ephathelene nezindaba ezimayelana nabasebenzi, ukuqasha ngokulinganisa nezindaba zokuqeqeshwa nokuthuthukiswa kwabasebenzi.

Ukwakhiwa nokuthanyelwa kwemihlangano Yekomidi Lezabasebenzi, Amaholo Nezinguquko ukusukela mhla lu-1 kuMbasa wezi-2019 ukuya mhla zingama-31 kuNdasa wezi-2020 kuboniswe ngezansi.

Ithebula 6: Imihlangano Yekomidi Lezabasebenzi, Amaholo Nezinguquko

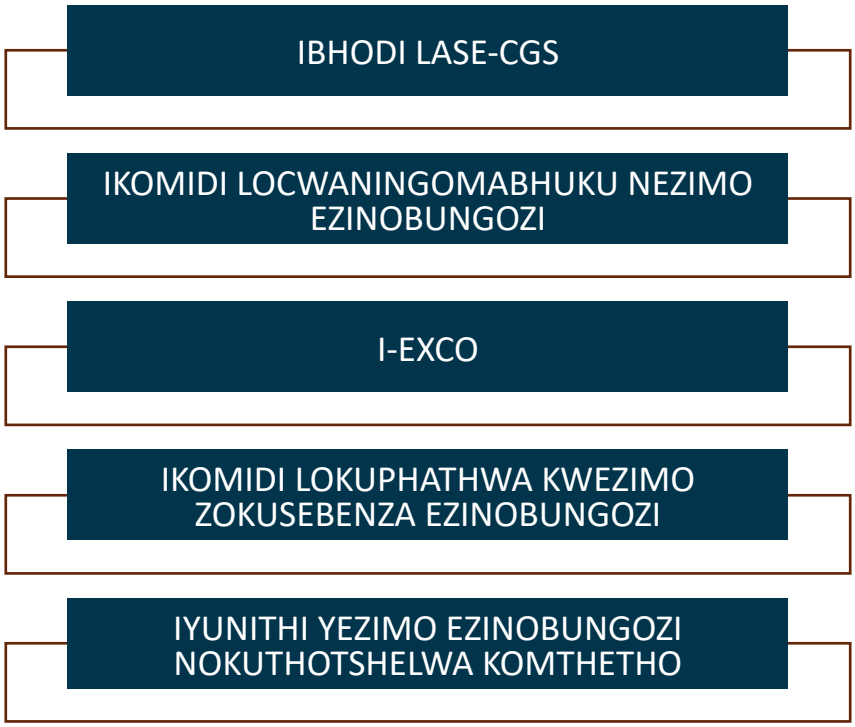
Amalungu ekomidi	Ngonyaka wezi-2019/2020				Imihlangano eyethanyelwe
	15 Mbasa	16 Nhlaba	15 Mfumfu	16 Masingana	
Ms R Mdubeki (Chairperson)	Wayekhona	Wayekhona	Wayekhona	Wayekhona	4*
Dr K Ramokgopa	Wayekhona	Wafaka Isixoliso	-	-	1/2
Mr K Menoe	Wayekhona	Wafaka Isixoliso	Wayekhona	Wayekhona	3
Mr I Abader	Wafaka Isixoliso	Wafaka Isixoliso	Wafaka Isixoliso	Wafaka Isixoliso	0
Mr X Mvinjelwa	Wafaka Isixoliso	Wayekhona	Wayekhona	Wafaka Isixoliso	2
Mr D Sibiya	Wayekhona	Wayekhona	Wayekhona	Wayekhona	4
Mr M Mabuza	Wayekhona	Wayekhona	Wayekhona	Wayekhona	4

* Ilungu elishintshana namanye, - Ngaphambi kokuqokwa

3. UKUPHATHWA KWEZIMO EZINOBUNGOZI

IBhodi lase-CGS kungumthwalo walo ukugxilisa ukusingatha kokuphathwa kwezimo ezinobungozi ngokusebenzisa ubuholi obuphumelelayo. Abaphathi baphendula eBhodini ngokuhlanganiswa kokuphathwa kwezimo ezinobungozi nomsebenzi wansukuzonke wase-CGS kanye nangokusebenzisa nokuqapha inqubo yokuphathwa kwezimo ezinobungozi. Ikomidi Locwaningomabhuku Nezimo Ezinobungozi ikomidi elizimele elinomsebenzi wokwengamela ukuchayeka ezimweni ezinobungozi eziphathelene nokuphatha kanye nokuphathwa kwezimo ezinobungozi ngaphakathi e-CGS. I-CGS yenza irejista yezimo ezinobungozi ngokwamasu njalo ngonyaka kusekelwe eswini lesikhungo, eqashwa njalo ngekwata futhi ehlinzeka isiqinisekiso kwiBhodi sokuthi i-CGS iphethe ngokwanelisayo ubungozi obuhlonziwe.

Isakhiwo sokuphatha sesikhungo sokuphathwa kwezimo ezinobungozi se-CGS sethulwe esithombeni esingezansi.



Isithombe 31: Isakhiwo sase-CGS sokuphatha sesikhungo sokuphathwa kwezimo ezinobungozi.

4. UKULAWULA KWANGAPHAKATHI

ukuze kunikwe isiqiniseko ngempumelelo nokugculisa kokwenziwa komsebenzi kanye nokwethembeka kokubika ngezezimali, kanye nokuvikela nokuqhubeka ukukwazi ukuphendula ngezindaba zempahla yesikhungo. Lokhu kulawula kuqashwa kuyo yonke i-CGS abaphathi nabasebenzi, nokwehlukaniswa kwemisebenzi okudingekayo. Ukucwaningwa kwamabhuku kwangaphakathi kwenza ukubuyekeza okuzimele ngokuphumelela kwalokhu kulawula njengengxenye yohlelo lwayo lonyaka lokucwaningwa kwamabhuku ngaphakathi, futhi imibiko yokucwaningwa kwamabhuku yethulwa Ekomidini Locwaningomabhuku Nezimo Ezinobungozi.

5. UKUCWANINGWA KWAMABHUKU KWANGAPHAKATHI

Uphiko lokukhwabanisa lwangaphakathi lwasungulwa ngokwemigomo ye-PFMA futhi lwenza ucwaningo lwamabhuku oluphathelene nobungozi oluvumelana Nemigomo Yobungcweti Yokwenziwa Komsebenzi Wokucwaningwa Kwamabhuku Ngaphakathi. Umbhalo osemthethweni ochaza ngemisebenzi yokucwaningwa kwamabhuku kwangaphakathi wabuyekezwa futhi wagunyazwa Ikomidi Locwaningomabhuku Nezimo Ezinobungozi.

Uhlelo lonyaka lokucwaningwa kwamabhuku kwangaphakathi lwagunyazwa ikomidi Locwaningomabhuku Nezimo Ezinobungozi, futhi imibiko yokucwaningwa kwamabhuku kwangaphakathi yethulwa Ekomidini Locwaningomabhuku Nezimo Ezinobungozi njalo ngekwata. Ukucwaningwa kwamabhuku kokulandelela kwenziwa ngokwakutholwe ngonyaka ongaphambili. Uphiko lokucwaningwa kwamabhuku lwenza neminye imisebenzi eyayidingeka ngokucelwa abaphathi.

6. UKUTHOBELA IMITHETHO NEMITHETHONQUBO

I-CGS ivumelana Nemithethonqubo Yomnyango Wezezimali Kuzwelonke ngohlu lokuhlola ukuthobela i-PFMA nekhalenda, okuqashwa ngokuqhubekayo futhi kubuyekezwe. Ukuthobela imithetho nemithethonqubo kuqashwa ngemisebenzi Yekomidi Locwaningomabhuku Nezimo Ezinobungozi.

7. UKUKHWABANISA NENKOHLAKALO

I-CGS inomthwalo ngokwezomthetho ngokwemigomo ye-PFMA ukuthi ithathe izinyathelo ezifanele ukuze kuvinjwe incithomali engagunyaziwe, engafanele, engenazithelo futhi emoshayo nokulahlekelwa okungumphumela wokuziphatha ngokobugebengu. Inqubomgomo yokulwa nokukhwabanisa nenkohlakalo yabuyekezwa ngoJanuwari 2020, kanye nensiza yokwazisa ngezenzo zokwephulwa komthetho esingathwe i-Deloitte. Imibiko ikhishwa njalo ngenyanga, futhi izenzo zokukhwabanisa ziyaphenywa abacwaningi mabhuku bangaphakathi bese zibikwa Ekomidini Locwaningomabhuku Nezimo Ezinobungozi.

8. UKUNCIPHISA UKUSHAYISANA KOKUBANDAKANYEKA

Bonke abaphakeli bemikhiqizo nezinsizakalo e-CGS kudingeka bagcwalise amaphepha asemthethweni Womnyango Wezezimali Kuzwelonke (Ukudalulwa Kokubandakanyeka i-SBD4). Uma kubhekwa izinsolo zokwenzelela ezingenzeka, uma ibhidi etholakalayo, noma ingxenye yayo, inikwa abantu abasebenzela i-CGS, noma abantu abaxhumene noma abahlobene nabo, kudingeka ukuthi lowo owenza ibhidi noma lowo ommele ogunyaziwe adalule isimo sakhe kusiphathimnadla esihlolayo/esahlulelayo.

Phezu kwalokho, abasebenzi base-CGS ababandakanyeka Ekomidini Lokuhlola Nokwahlulela Amabhidi kudingeka ukuthi bagcwalise amafomu okudalula nokungavezi izimfihlo emhlanganweni ngamunye.

9. INDLELA YOKUZIPHATHA

Bonke abasebenzi base-CGS bathobela Indlela Nezimiso Zokuziphatha. I-CGS izinikele ekwenzeni ibhizinisi nobudlelwane ngendlela ehlonipha izimiso zokuziphatha futhi engachemi futhi ikhuthaza indlela yokusebenza enkampanini engabandlululi, futhi eqotho ngokwesimo senhlalo nangokwezemvelo. Yenza lokho ngokuthobela lezi zimiso nemigomo:

- Ukungachemi nobuqotho kukho konke ukwenza ibhizinisi nobudlelwane, okuhlanganisa ukuphatha ngendlela enezimiso zokuziphatha ukushayisana kokubandakanyeka okwenzeka ngempela noma okungenzeka phakathi kobudlelwane umuntu anabo nabanye abantu ngaphandle komsebenzi kanye nobudlelwane umuntu anabo ngokomsebenzi;
- Ukuhlonipha amalungelo abantu nesithunzi sabo bonke abasebenzi;
- Ukwamukela izimo ezahlukene zendlela yokuphila, ubuhlanga, ubulili nobunjani bomuntu ngokocansi;
- Ukuba neqiniso, ukungafihli nokukwazi ukuziphendulela, kanye
- Nokubambelela emigomweni ephilayo yokuphatha inkampani nemithetho efanele.

Ngokwemigomo Yendlela Nezimiso Zokuziphatha, bonke abantu abasebenza egameni le-CGS kudingeka babambelele emigomweni ephezulu kunayo yonke yezimiso zokuziphatha nobuqotho endleleni yokusebenza. Phezu kwalokho, bonke abasebenzi, osonkontileka, abeluleki nabanye abasebenza egameni lesikhungo kufanele bamele isikhungo ngokufanele nangokuneqiniso futhi bazithibe ekubandakanyekeni ezenzweni noma amacebo okuhloswe ngawo ukukhwabanisa imali, impahla noma imisebenzi kanoma ubani. Isithunzi nobuqotho be-CGS kubalulekile ekukwazini kwayo ukusebenza njengesikhungo sikahulumeni esiphumelelayo.

10. UNOBHALA WENKAMPANI

UNobhala wenkampani uhlinzeka ngemisebenzi yokweluleka iBhodi futhi wazisa amalungu eBhodi ngezinguquko zemithethonqubo nokusha okuvelayo ekuphatheni inkampani. Phezu kwalokho, UNobhala Wenkampani uhlinzeka iBhodi namakomidi eBhodi ngomhlahlandlela wendlela yokwenza umsebenzi wabo ngendlela esiza inkampani. UNobhala WeNkampani uphatha futhi wethamela imihlangano yeBhodi neyamakomidi eBhodi, futhi ugcina imibhalo yezinqubomgomo ephathelene nakho.

11. UKUQINISEKISWA KWEZINGA ELIFANELE LOKWENZA UMSEBENZI

Imisebenzi eyenziwa i-CGS yenziwa esimweni sohlelo lokuqinisekiswa kwezinga elifanele lokwenza umsebenzi eliqinisekisa ukuthi ukwakhiwa, ukwenziwa nokuqashwa kwemisebenzi kuhambisana nemigomo yezinga elifanele kazwelonke nelamazwe omhlaba. Ukuphathwa kokuqinisekiswa kwezinga elifanele lokwenza umsebenzi e-CGS kuqinisekisa ukuthi ababambiqhaza bathola ukusizakala okuhle kakhulu sonke isikhathi.

Kulandela ukuqeqeshwa kwezinga lokwazi ngezinga lokwenza umsebenzi kwe-ISO 9001:2015 konyakamali ongaphambilini okwenzeka kuso sonke isikhungo, ukubhalwa kwemibhalo ukuze kuqinisekiswe izinga elifanele lokusebenza sekuqaliwe. Lokhu kufaka ukubuyekezwa kwesitatimende senqubomgomo ye-SHEQ, ukubhala izinqubo (kuhlanganisa izinqubo zezesayensi) nokuqaliswa kwamasheduli emithombo yokuqapha nokukala. Izinhlelo zokuthola isitifiketi se-ISO 9001 ngasekupheleni kowezi-2022/2023.

Ilabhorethri yase-CGS namanje iseyisikhungo esiphambili sokuhlola amasampula ahlukene ukuze kuqinisekiswe ukusizakala kwamaklayenti nababambiqhaza. Imisebenzi eyenziwe onyakeni ukuze kutholakale ukugunyazwa kwe-ISO 17025 ifaka izinhlelo zokuhlola indlela yokwenza, ukuqinisekiswa nokubika (i-pH, ukudluliswa kukagesi, ukuba nosawoti, ama-oxide amakhulu namancane, izithako zemvelo ezincane, ikhabhoni, i-nitrogen, i-hydrogen nama-calorific value), ukuqeqeshwa kwe-ISO 17025:2017 koguquko kwabasebenzi baselabhorethri ababalulekile abayi-19, ukubuyekezwa kohlelo lokuqinisekiswa kwezinga elifanele lokwenza umsebenzi nokuqalisa ukusebenza kohlelo lokulawula izinga elifanele lokwenza umsebenzi. Isikhungo sisendleleni yokuthola ukugunyazwa okugcwele ngasekupheleni kowezi-2020/2021.

12. EZEMPILO, UKUPHEPHA NEZEMVELO

Abaphathi abakhulu base-CGS banesibopho, ngokwemigomo Yomthetho Wezempilo Emsebenzini Nokuphepha, yokuhlinzeka indawo yokusebenzela ephephile engenabo ubungozi empilweni yabantu, kanti abasebenzi banesibopho sokusebenza futhi baziphathe ngokuhambelana nemiyalelo yokuphepha yesikhungo. Izinqubomgomo zokuphepha, ezempilo nezemvelo zenza isikhungo ukuthi sikhuthaze ukuthobela imithetho yezempilo, ukuphepha nezemvelo.

Ukwenziwa komsebenzi wezempilo nezokuphepha uqashwa ngezibonakaliso ezahlukene (izinga lomoya wangaphakathi endlini nokungena komoya, izinto eziphilayo ezinobungozi, izinto ezinamakhemikhali ezinobungozi) ukuze kuqinisekiswe ukuthobela imithetho efanele. Ukuhlolwa kwabasebenzi ngokwezempilo kwenziwa kubasebenzi base-CGS kulandelwa ukuhlola okubanzi ngokwezempilo kwabasebenzi belabhorethri yase-CGS.

Ikomidi Locwaningomabhuku Nezimo Ezinobungozi neBhodi le-CGS baqapha ukwenziwa komsebenzi wezempilo nokuphepha emsebenzini kwesikhungo njalo ngekwata.

Abasebenzi base-CGS abangamashumi amahlanu nane bathola ukuqeqeshelwa ukucisha umlilo ngalo nyakamali.

Imisebenzi yokuphepha kwemisebenzi eyenziwayo yenziwe emisebenzini ye-CGS yezesayensi ngonyakamali yafaka imihlangano yokufunda ngokuhlonzwa kwezimo ezinobungozi kwempilo emsebenzini nokuphepha nabasebenzi base-CGS, ukuhlolwa kwezemvelo kwezempilo, nokuphepha Kohlelo Oluyisisekelo lwase-Karoo Lokumba Okujulile e-Beaufort West nokuhlolwa kwesimo esinobungozi kubasebenzi base-CGS abachayeke ekusetshenzweni kwe-asbestos endaweni yase-Griqualand West.

13. UHLELO LWEZOKUKHANGISA, UKUXHUMANA, NOKUBANDAKANYA ABABAMBIQHAZA

Ukwakha igama le-CGS

Ngonyaka wezi-2019/2020, i-CGS yahlanganisa izenzo zokwazisa ngegama layo ukuze iqhakambise umsebenzi wesikhungo kubo bonke ababambiqhaza bayo. Lokhu kwabandakanya imicimbi, imikhankaso, ukubamba iqhaza ezingqungqutheleni, ubudlelwane nabezindaba, nokusungula nokulondoloza ukusebenzisana okunamasu nokubambisana.

Okugqamile kokwakha igama lenkampani kwakufaka:

- I-athikili Yesonto Lomsebenzi Wasezimayini embikweni we-CGS ngokutholakala kwegolide okucatshangelwayo endaweni yase-Harding, KwaZulu-Natal.
- Isikhangiso sabezindaba ePhalamende le-Afrika Yonke, esinesihloko esithi “Ukuthola Indlela Ngokudweba Amabalazwe”.

- Isikhangiso sabezindaba Ngezicebi Zezimayini e-Afrika esichaza ukufinyeleleka kolwazi okubalulekile ekufakeni isandla kolwazi olujulile ngesimo sokwakheka komhlaba okusimeme.
- Isikhangiso sabezindaba ephephabhukwini le-SAA elibalulekile iSawubona elichaza ukweseka kwe-CGS ubuchwepheshe bamandla avuselelekayo.
- Izikhangiso zabezindaba eziyishumi nantathu emithonjeni yezindaba ehlukahlukene nejwayelekile.
- Izindaba ezijwayelekile ngesikhathi sangempela ngesikhungo ezifake isandla ekukhuleni okuzinzile kwabalandeli ezinkundleni zokuxhumana ze-CGS u-Facebook, i-Twitter ne-LinkedIn.

Izingxoxo zabezindaba

- I-CGS yathola ukubikwa kwabezindaba okulandelayo: -Ingxoxo eNCA Night News yethulwa u-Faith Mangope ngendawo yasemalokishini nokuzinza komhlaba eThekwini (u-CEO).
- Ingxoxo ye-SABC News ngombiko wokutholakala kwegolide okucatshangelwayo e-Harding, KwaZulu-Natal (u-CEO).
- Ingxoxo ye-Newzroom Afrika ngedayimani eliwu-20.8 carat elatholwa i-Petra Diamond e-Cullinan (u-CEO).
- Ingxoxo ye-Newzroom Afrika ngombiko wamalahle we-International Energy Agency (i-IEA) eGoli (u-CEO).
- Ingxoxo e-Mining Indaba 2020 eyenziwa i-Newzroom Afrika eyagqamisa ubuningi bezimbiwa ezingakahlolwa ezihlolwa ngokubanzi uhlelo lokudweba amabalazwe eNingizimu Afrika (u-CEO).
- Ingxoxo eyethulwa uBongani Bingwa we-702 ngezinkampani ezizimele namabhange ngokungatshali izimali emisebenzini yamalahle eNingizimu Afrika (u-CEO).
- Ingxoxo eyethulwa nguTumisang Ndlovu we-Power FM ngombiko wamalahle we-IEA eNingizimu Afrika (u-CEO).
- Ingxoxo ku-eNCA ngokuzamazama komhlaba okwenzeka endaweni yaKwaZulu-Natal (uDkt Eldridge Kgaswane).
- Ingxoxo eyethulwa uNtombi Phiri we-Radio 2000 ihambisana Nengqungquthela Yokutshalwa Kwezimali yaseFreyistata ngomsebenzi we-CGS embonini yezimayini neNingizimu Afrika yonke (u-CEO).
- Ingxoxo ku-Radio Sonder Grense ngohlelo lokudwetshwa kwamabalazwe lweminyaka eyi-10 (uDkt. Johann Neveling).
- Ingxoxo ku-Chai FM ngomkhakha wokufunda ngokujulile ngesimo sokwakheka komhlaba ohlelweni olwalubhekiswe kubantwana abancane abaneminyaka yobudala ephakathi kweyisishiyagalolunye neyi-11. (uNks. Portia Munyangane noNks. Zama Sibewu).
- Ingxoxo ku-Jacaranda FM ngokuzamazama komhlaba okwenzeka endaweni yaKwaZulu-Natal (uDkt. Eldridge Kgaswane)
- Ingxoxo ngokuzamazama komhlaba okwenzeka endaweni yaKwaZulu-Natal (uDkt. Eldridge Kgaswane). (uMnu. Ian Saunders)
- Ingxoxo kuKaya FM ngokuzamazama komhlaba okwenzeka endaweni yaKwaZulu-Natal (uNks. Mahlatse Mononela).

Phezu kwalokho, i-CGS yaphendula imibuzo emininingi eyaqhamuka ngezikhathi ezahlukene yabezindaba ezishicileliwe neziku-Inthanethi ngokuzamazama komhlaba.

Imikhankaso nemicimbi

Imikhankaso nemicimbi ebalulekile yonyaka yafaka:
- Ukukhangisa kumabhilibhodi endaweni yase-Silverton, ePitoli ukusukela ngoNcwaba ukuya kuMfumfu wezi-2019. Amabhilibhodi ayechaza ngomsebenzi nezinsizakalo ze-CGS.
- Amavidiyo okukhangisa nawezinkundla zokuxhumana akhiqizwa futhi akhonjiswa ezinkundleni ezahlukene, efinyeza umsebenzi wesikhungo.
- Umkhankaso wezinkundla zokuxhumana kuwo wonke uNcwaba uchaza ngabesifazane abenza imisebenzi eyahlukene e-CGS, nomunye umkhankaso okhombisa abantu abehlukene nezindlela zokuphila kwabo Ngenyanga Yamagugu.
- Ukugujwa Kosuku Lwamagugu, lapho abasebenzi base-CGS babegqoke imvunulo yabo yomdabu futhi babelana ngokudla komdabu.

Izithunywa ze-CGS zethamela umcimbi wokuklomelisa wabesifazane base-DMRE mhla zingama-23 kuNcwaba wezi-2019 e-CSIR ePitoli ukuze kwaziswe futhi kubongwe abesifazane emnyangweni nezikhungo zawo. UNks. Refilwe Shelembe wawina Umklomelo Wabesifazane Abanempumelelo Ngokuvelele, kanti uDkt. Hayley Cawthra noDkt. Valerie Nxumalo bawina Imiklomelo Yabesifazane Ekhethekile emisebenzini yabo ngokwahlukana.

Imibukiso yezinhlobo zemisebenzi eyahlukene nezemfundo

I-CGS yabamba iqhaza kule mibukiso yemisebenzi eyahlukene:

- Yamema abafundi bamabanga ahlukene ukuze baziswe ngamathuba ngemisebenzi ehlukene yokufunda ngokujulile ngesimo sokwakheka komhlaba mhla zi-4 kuNtulikazi wezi-2019.
- Iviki Likazwelonke Lezesayenzi e-Mittah Seperepere Convention Centre e-Kimberley mhla zingama-27 kuNtulikazi wezi-2019, okwazisa abafundi abangaphezu kwezi-2 000 ngemisebenzi yesayensi, ubunjiniyela nobuchwepheshe.
- Usuku lwemisebenzi Yokufunda Ngokujulile ngesimo Sokwakheka Komhlaba lwase-Wits mhla zingama-20 kuNtulikazi wezi-2019.

Isibopho senkampani sokunikela emphakathini

- Ukunikela amaphedi ayi-1 000 eBotlokwa Special School.

Isithombe 32: Abamele i-CGS beholwa usihlalo weBhodi, uDkt. Humphrey Mathe, engqungqutheleni ye-Mining Indaba.

Isithombe 33: U-CEO we-CGS, uMnu. Mosa Mabuza, exoxisana nababambiqhaza edokodweni lombukiso.

Isithombe 34: UNks. Sisanda Makubalo exoxisana nabafundi ekuvulweni Kweviki Likazwelonke Lezesayensi.

Isithombe 35: Ithimba lase-CGS engqungqutheleni ye-SAGA eyayibanjwe eThekwini.

Isithombe 36: UNks. Ponani MthembI nabafundi ababethamele uhlelo lokufundiswa ngemisebenzi eThomo Village.

Isithombe 37: Othisha baseBotlokwa Special School bamukela amaphedi egameni labafundi.

14. ULWAZI NGOKWENZIWA KOMSEBENZI WOKUTHOBELA I-B-BBEE

Ithebula elilandelayo (Ithebula 7) ligcwaliswe ngokuthobela izidingo zokuthuthukiswa ngokubanzi kwabamnyama kwezomnotho (i-BBBEE) Komthetho we-BBBEE wezi-2013 futhi njengoba kunqunywe Umnyango Wezohwebo Nezezimboni.

Ithebula 7: Ulwazi lokwenziwa komsebenzi ngokuthobela i-BBBEE

Ngabe umnyango/isikhungo sikahulumeni sisebenzise noma iziphi izindlela ezamukelekile zokusebenza ngokufanele (isitifiketi se-BBBEE amazinga 1 ukuya ku-8) kulokhu okulandelayo:		
Imibandela	**Impendulo** **Yebo/Cha**	**Ingxoxo** ***(faka ingxoxo empendulweni yakho bese ukhombise ukuthi yiziphi izinyathelo ezithathiwe ukuze nithobele umthetho)***
Ukunquma imibandela yokufaneleka ukuze kukhishwe amalayisensi, izimvume noma ezinye izigunyazo noma yiziphi ukuze kwenziwe imisebenzi yezohwebo ngokwemigomo yomthetho noma yimuphi?	Cha	I-DMRE kuphela enganika lezo zimvume I-CGS ayiwakhiphi amalayisensi.
Ukubhalwa nokusetshenziswa kwenqubomgomo ekhethiwe yokuthengwa kwempahla nokutholakala kwemisebenzi?	Yebo	Ukuphathwa kokuphakela imisebenzi nemikhiqizo kwe-CGS kuhlanganisa imihlinzeko yokuthengwa kwempahla nokutholakala kwezinsizakalo eziqukethwe Emthethweni Wohlaka Lwenqubomgomo Yokuthengwa Kwempahla Nokutholakala Kwezinsizakalo.
Ukunquma imibandela yokufaneleka ukuze kudayiswe amabhizinisi kahulumeni?	Yebo	Amathenda athile aqukethe imibandela yokufaneleka ngaphambi kwesikhathi ukuze kuqhutshelwe phambili amabhizinisi amancane angabaliwe kanye namabhizinisi afanelekile akhethekile.
Ukunquma imibandela yokufaneleka ukuze kubanjiswane nomkhakha ozimele?	Yebo	Kuncike ekuhloweni kwezidingo nesidingo sokuthengwa kwempahla nokutholakala kwezinsizakalo, i-CGS ingabheka lokho kubambisana.
Ukunquma imibandela yokunika imihuheko, izibonelelo, namacebo okutshala izimali ukuze kwesekwe ukuthuthukiswa ngokubanzi kwabamnyama kwezomnotho?	Cha	I-CGS ayinayo inqubomgomo enikeza izibonelelo kubaphakeli.

Ingxenye D: Ukuphathwa Kwabasebenzi

Umtapowolwazi Kazwelonke e-Donkerhoek ePitoli

1. ISIFINYEZO SEZINDABA ZOKUPHATHWA KWABASEBENZI

1.1 OKUFINGQIWE

Unyaka obuyekezwayo wawunezinselelo ngokwezimali. UNgqongqoshe Wezezimali wethula izinyathelo zokwehlisa ubukhulu bemali eholelwa izisebenzi zikahulumeni ngezigidigidi ezingama-R27 eminyakeni emithathu, ukuqala ngonyakamali wezi-2019/2020, futhi wacela inselelo kuzo zonke izikhungo zikahulumeni ukuthi zidlale indawo yazo ekwehliseni amaholo, ngokwenza, phakathi kokunye, ukumisa ukuqasha abasebenzi abasha ukuze kuncishiswe imali yamaholo nokukhuthaza ukuthatha umhlalaphansi ngaphambi kwesikhathi kwabasebenzi abaneminyaka yobudala engama-55 nangaphezulu kanye nokunqamula ukukhokhwa kwamabhonasi okwenziwa kahle komsebenzi. I-CGS yakwenza lokhu ngokuthi ingaqashi bantu esikhundleni sezikhala zezesayensi ezavuleka ngenxa yokuthatha umhlalaphansi nokuthatha umhlalaphansi ngaphambi kwesikhathi kwabasebenzi asebekhulile. Ukumiswa kokukhushulwa kwamaholo namabhonasi okwenziwa kahle komsebenzi ngokwesikhathi esingakaliwe nakho kwafaka isandla, ngokungaphelele, ekwesuleni emsebenzini kwabanye abasebenzi, njengoba kukhonjiswe emibikweni yezingxoxo ezibanjwa uma umuntu ezoshiya emsebenzini ezabanjwa isikhungo. Umthelela owalandela wokunciphisa ukuqashwa kwabasebenzi kwaholela ekutheni i-CGS ingafiki ku-5% ophokophelwe wezinga lokwesula kwabasebenzi emsebenzini nokuqasha abasebenzi abasha.

Isikhungo senze imizamo ephawulekayo enanini labantu besifazane abasisebenzelayo nabantu abaphila nokukhubazeka. Ngokuphawulekayo, abasebenzi besifazane bangama-44% eqembu lezesayesni, bese abesifazane base-Afrika babe ama-30%. Inani labantu abaphila nokukhubazeka liphezulu kakhulu kunakuqala ngenxa yomkhankaso wangaphakathi wokwazisa ngokukhubazeka, okhuthaza abasebenzi ukuthi badalule ukukhubazeka kwabo.

Amaphesenti angamashumi amathathu nanhlanu abasebenzi bezesayensi baneziqu ze-Master's neze-PhD, okuhlangabezana nesidingo esibekiwe. Abaphathi bazoqhubeka nokuqasha iqembu lezesayensi ukuze kuqinisekiswe ukuthi isikhungo nezwe zinososayensi abasezingeni eliphezulu.

Ukwakha isimo sokusebenza nendawo ekhuthazayo kwenzelwa abasebenzi

Ukugxila kwe-CGS ukwakha isimo sokusebenza okusezingeni eliphezulu, okudingekayo ukuze kuqhutshwe futhi kugxiliswe i-GTP ukuze kufakwe isandla ezidingweni zomphakathi. Ukuze kwenzeke lokhu, abaphathi bagunyaze futhi bakhipha umyalelo wokungenelela ezingeni lokwenziwa komsebenzi okuvuma amakhono okwenza umsebenzi wokuphatha angumongo afana nokuphathwa kwezimo ezinobungozi nokuphathwa kwezinga lokwenziwa komsebenzi kwenzelwa iqembu labaphathi, kanye nezingxenye zokuziphatha kubasebenzi sebebonke.

Lesi sigaba sethula izindawo okugxilwe kuzo zomnyango Wokuphathwa Kwabasebenzi ngalo nyaka obuyekezwayo, kuhlanganisa nemisebenzi yokuqeqesha nezinguquko.

Sifaka futhi:

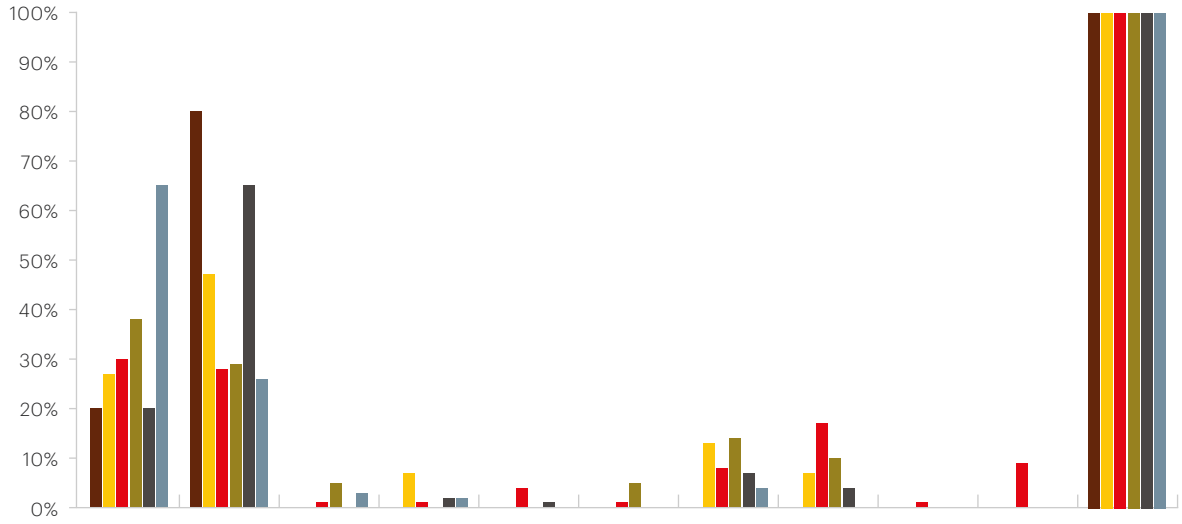
- Izinhlelo zokukala izinga lokwenziwa komsebenzi ukuze kuhlolwe izinga lokwenziwa komsebenzi;
- Ukuphathwa kwempilo yabasebenzi ukuze kuqinisekiswe impilo nenhlalakahle yabasebenzi;
- Imisebenzi yokuphathwa kwabasebenzi ebalulekile yonyaka;
- Izinselelo zokuphathwa kwabasebenzi;
- Izinhloso zokuphathwa kwabasebenzi, kanye
- Nezibalo zokuphathwa kwabasebenzi.

I-CGS ithatha absebenzi bayo njengomthombo obaluleke kakhulu futhi ebalulekile ekufezweni kwezinhloso zayo ezinamasu. Ukuze kwenzeke lokhu, umnyango Wezabasebenzi ungumlingani onamasu esikhungweni ondima yakhe ukuqinisekisa ukuthi i-CGS iheha futhi igcina absebenzi abadingekayo nobuchwepheshe ukuze yenze umsebenzi wayo ngokomthetho futhi ifeze izinhloso zayo ezinamasu.

1.2 UKWEHLUKAHLUKANA NEZINGUQUKO

I-CGS inabasebenzi abehlukahlukene. Ukuchazwa kwabasebenzi ngokobuhlanga, ubulili nesigaba somsebenzi konyaka ophela mhla zingama-31 kuNdasa wezi-2020 kufingqwe Esithombeni 38 ngezansi:

Ukuchazwa kwabasebenzi: Imininingwane ngokwamanani abantu Ngokobuhlanga, Ubulili, Nesigaba Somsebenzi



	I-AF	I-AM	I-CF	I-CM	I-IF	I-IM	I-WF	I-WM	I-FN-F	I-FN-M	Okuphelele
Izikhullu Zenkampani	20%	80%	0%	0%	0%	0%	0%	0%	0%	0%	100%
Abaphathi abakhulu	27%	47%	0%	7%	0%	0%	13%	7%	0%	0%	100%
Ososayensi	30%	28%	1%	1%	4%	1%	8%	17%	1%	9%	100%
Abasingatha umsebenzi abafundele umsebenzi	38%	29%	5%	0%	0%	5%	14%	10%	0%	0%	100%
Abezobuchwepheshe	20%	65%	0%	2%	1%	0%	7%	4%	0%	0%	100%
Abasingatha umsebenzi	65%	26%	3%	2%	0%	0%	4%	0%	0%	0%	100%

Isithombe 38: Ukuchazwa kwabasebenzi ngokobuhlanga, ubulili nezinga lomsebenzi.

U-JOHANN NEVELING

Isiqubulo
Ngibeka eqhulwini ukwenza kahle kakhulu umsebenzi futhi angiceli abanye ukuthi benze nami engingakwenzi.

Iziqu:
I-BSc (Hons), MBA, ne-PhD

Isipiliyoni:
Isipiliyoni seminyaka engama-25 sokucwaninga ngokwakheka kwamadwala akhiwa yizinsalela ezigugulwa umoya noma zifike namanzi nokwakheka kwezingqimba zamadwala
Isipiliyoni seminyaka eyi-16 sokuphatha amaprojekthi

Isiphiwo: Ukukwazi ukubona nokugxila ekuboneni umsebenzi usuwonke

Waluthola lunjani uhlelo?
Kwakuyisehlakalo esinika umdlandla

Owakufunda okubalulekile
Kwanginika umdlandla ukuthola ithuba lokubona ungaphandle (ikakhulukazi umsebenzi weBhodi) umsebenzi wase-CGS.

ULEBOGANG LEDWABA

Isiqubulo
Ukuze wazi kudingeka unakisise, futhi ukuze unakisise kudingeka ukwazi

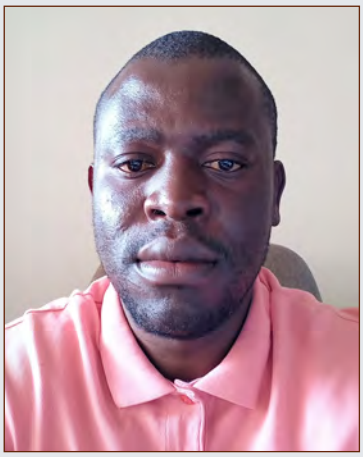
Iziqu:
Ngonyaka wezi-2013-2015, i-MSc (ku-Exploration Geology), e-Rhodes University, e-Grahamstown
Ngonyaka wezi-2007-2008, i-BSc Honours (ku-Geophysics), Inyuvesi yase-Witwatersrand, eGoli
Ngonyaka wezi-2001-2006, i-BSc Honours (ku-Mathematics ne-Physics), Inyuvesi yase-Witwatersrand, eGoli

Isipiliyoni: Isipiliyoni esingaphezu kweminyaka eyi-12 ekufundeni ngokujulile ngesimo sokwakheka komhlaba. Ngingusosayensi onolwazi olunhlobonhlobo othanda izibalo

Isiphiwo: Ulwazi ngesimo sokwakheka komhlaba ngokokuma kwawo nokuhlola isimo sokwakheka komhlaba, ngenxa yemisebenzi yami eyahlukene kwiyunithi yokuzwa ukude nolwazi ngesimo sokwakheka komhlaba ngokokuma kwawo kanye nakwamanye amayunithi

Waluthola lunjani uhlelo?
Lwangivula amehlo, ikakhulukazi ngokuthi izikhungo ezinkulu ziphathwa kanjani futhi nezinguquko kuzona zenziwe kanjani. Kwakulula ukuxoxisana nethimba labaphathi abakhulu futhi ngathola ukuthi imibono yabo bonke abantu yalalelwa futhi yacatshangelwa. Indlela yokubanjwa kwemihlangano yanginika ukuzethemba ukuthi ngiphakamise amaphuzu ami futhi engadlula kukho kwangifundisa ukuthi umsebenzi onzima uhlala uphetha ngokuthola imiphumela emihle.

Owakufunda okubalulekile
Uhlelo luyisandisi esinamandla esakha amakhono ami okucabangisisa, afana nobuholi ngokwemvelo, ukuxhumana, ukucabanga nokuhlaziya okujulile, konke okufanele kube khona ukuze usebenzisane nababambiqhaza abehlukene ngaphakathi nangaphandle kwesikhungo. Ibe nomthelela ngokuqondile endleleni engibona ngayo imodeli yobuholi kanye nokuqonda ngokusebenza kwezimali ebhizinisini engisebenza kulo. Ngifunde ngezinhlelo zabaphathi abakhulu ezinamasu nokubuyekezwa kwendlela yokusebenza. Njengoba ngifake isandla ekusungulweni nasekusetshenzisweni Kohlelo Olunamasu lwamanje lwase-CGS, sengiyakwazi manje ukuqonda okwenzeka ngezokuphathwa kwezinguquko, ukuthuthuka okunamasu, ukuqapha nokuhlola. Ukuba khona kulo msebenzi okuqhubekayo kusheshise ukwakheka kwamakhono kwami ngokwemvelo kanye namakhono amasha futhi sengiyakwazi ukubona ukufaka kwesandla kwebhizinisi ekubhekaneni nezinye zezinselelo eziphathelene nesimo senhlalo nesomnotho ezikhona ezweni lethu. Ngifunde futhi ukuthi ukusuka kusayensi emsulwa ukuya ebuphathini obukhulu kudinga umqondo obuka izinto ngendlela ehlukile, futhi ngingakwazi ukwenza lolo guquko.



ULITSHEDZANI MUTELE

Isiqubulo
Ubuhlakani nolwazi amathuluzi abalulekile ukuze kutholakale impumelelo noma enjani

Iziqu:
I-BSc emeja nge-Geology, i-Applied Mathematics ne-Chemistry yase-Rhodes University (ngowezi-2011)
I-BSc (Hons) ku-Geology yase-Rhodes University (ngowezi-2012).
I-MSc ku-Geology yase-Nyuvesi yaKwaZulu Natal (isaqhubeka)

Isipiliyoni:
Ngonyaka wezi-2012, ngathola ithuba lokuqeqeshelwa umsebenzi e-CGS Eyunithini Yezimbiwa Nentuthuko, eyaziwa njengamanje ngokuthi Iyunithi Yesimo Sokwakheka Komhlaba Ngokwezomnotho Nesimo Sokwakheka Komhlaba Ngokwamakhemikhali. Ngathola amakhono okufunda ngokujulile ngesimo sokwakheka komhlaba nolwazi olufana nokudwetshwa kwamabalazwe ngesimo sokwakheka komhlaba kanye nokwakheka kwezinsalela zezimbiwa, futhi ngashicilela ibalazwe nokwakheka kwezinsalela zezimbiwa elinencazelo ewumbiko omfishane wendawo yaseLephalale. Ngonyaka wezi-2014, ngaqashwa njengososayensi osezingeni eliphansi. Ngihlanganise imibiko emininganga yangaphakathi yezobuchwepheshe yase-CGS, imibiko emifishane namaphepha abuyekezwe ozakwabo babantu abawabhalile.

Ngathola imiklomelo yase-CGS yokusebenza kahle kakhulu kosayensi osezingeni eliphansi (ngowezi-2017) nososayensi osezingeni eliphakathi nendawo (ngowezi-2018).

Umsebenzi wami wamanje ngingumsizi kwezobuchwepheshe ehhovisi Likamphathi Omkhulu Wemithombo Yezimbiwa, nginomsebenzi wokuhlanganisa imibhalo ye-GTP nemibiko yezobuchwepheshe ekhishwa njalo ngekwata.

Lena inkundla elungile yokufundisa nokuqeqesha, ngokuqondile abasebenzi abasemazingeni aphansi mayelana nomsebenzi nesu le-CGS.

UTHATO KGARI

Isiqubulo
Impumelelo ikulindile ukuze inothise impilo yakho, ngakho-ke zama ukwenza kangcono

Iziqu:
I-MSc (i-cand) ku-Hydrogeology

Waluthola lunjani uhlelo?
Kwakuyithuba lokufunda kabanzi kimi.

Owakufunda okubalulekile
Ukuphathwa kwenkampani kanye nemisebenzi yakho (ababambiqhaza, amasu, i-Exco, amakomidi/iBhodi, njll); imithetho yokuphatha, izinqubomgomo nokusetshenziswayo; ukuphathwa kwamasu nokuxhumana kwawo nesikhungo nohulumeni - ukulandela uhlelo lokulindelekile lomkhondo wokwenziwa komsebenzi, ukwakha izindlela zokuqapha inqubekelaphambili nokwenziwa komsebenzi ukuze kufezwe le migomo; ukuphathwa kwamaphrojekthi - ukuhlanganisa imisebenzi eyinkinga nokuqhuba izenzo nezinyathelo ngaphakathi komnyango Wemithombo Yesimo Sokwakheka Komhlaba futhi kumayunithi ebhizinisi wonke; izinqubo zokucwaningwa kwamabhuku kwangaphakathi nokusetshenziswa; ukuphathwa kwezinga lokwenziwa komsebenzi - ukuphatha nokulandela izinga lokwenziwa komsebenzi kumayunithi ebhizinisi nohlelo lokuhlola umsebenzi wenkampani, ukuhlela, ukwenza isabelomali, ukwenziwa nokuqashwa kwezinhlelo zokufunda ngokujulile ngesimo sokwakheka komhlaba kanye namaphrojekthi kazwelonke ngaphakathi esikhungweni, nomsebenzi wokweluleka nokusingatha ehhovisi lomphathi omkhulu.

Ukukhuphuka ngokwezikhundla

I-CGS izinikela ekuthuthukiseni abasebenzi ngokwengeza amakhono adingekayo okusebenza, obuchwepheshe, aqondene nomsebenzi nawokuziphatha kwabasebenzi bayo kanye nokwakha amakhono okuphathwa kolwazi okweseka ukugcinwa kwabasebenzi nokuyiswa kwezinye izindawo. UMatome Sekiba usendleleni ekhuphukayo.

UMatome uselungele ukuthatha isibonelo encwadini ka-Warren buffet, ngenxa yesicaphuno sakhe asithandayo -

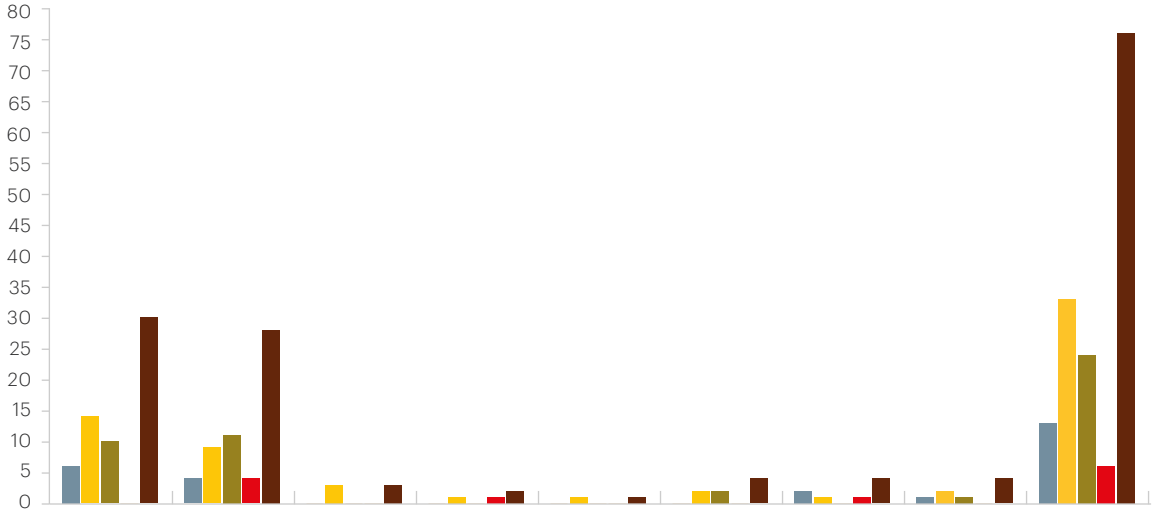
'Umuntu uhleli emthunzini namhlanje ngoba kunomuntu owatshala isihlahla kudala.'

UMatome waqala ukusebenza e-CGS ngonyaka wezi-2005 enikwe isivumelwano somsebenzi sezinyanga eziyi-12 njengomsizi wezobuchwepheshe umsebenzi wakhe ikakhulu okwawukwenza ucwaningo lwamandla adonsela phansi izinto. Ngonyaka wezi-2008, wathola isivumelwano somsebenzi sezinyanga eziyisithupha sokufundela umsebenzi, okwamnika amathuba ezindlela zokusebenza ngesimo sokwakheka komhlaba okufana nohlelo lokucwaninga nokuhlelwa kolwazi. Ngonyaka wezi-2009, ngaleso sikhathi wayengumuntu onomfundaze oziqhenyayo owayene-National Diploma ku-Geology, uMatome waqashwa njengomsebenzi wezobuchwepheshe eyunithini Yolwazi Ngesimo Sokwakheka Komhlaba Nokuma Kwawo. Kulowo nyaka, waphothula izifundo zezinyanga eziyisithupha zokuphathwa kwamaphrojekthi okuyisisekelo eNyuvesi yaseNingizimu Afrika, bese waqhubeka wathola iziqu ze-BTech kuGeology eNyuvesi Yobucwhepheshe yaseTshwane ngowezi-2010. Ngaphandle ensimini, wahlanganisa indawo ephumile eningizimu esempumalanga nenye indawo ephumile Enxanxatheleni e-Igneous yase-Bushveld ukuze kunqunywe ukuthi izimpawu ezifanayo zingakhonjiswa yini. Imiphumela yocwaningo yayiyisihloko se-dissertation yakhe enesihloko esithi "I-magnetostratigraphy yasendaweni ephumile eningizimu mpumalanga yeNxanxathela yase-Bushveld". Ngemuva kweminyaka eyisishiyagalolunye yemisebenzi yolwazi ngesimo sokwakheka komhlaba, uMatome wathatha isinqumo sokuzethemba sokuphothula iziqu zakhe ze-Bsc Honours ngowezi-2014. Wabe esenikwa ithuba lokufunda enze iziqu zakhe ze-MSc eyayixhaswe Umsebenzi wase-Karoo Wokumba Ngokujulile.

Lo muntu okhuthele wolwazi ngesimo sokwakheka komhlaba ngokuma kwawo uthole isipiliyoni esiningi ekusetshenzisweni kwezinqubo zolwazi ngesimo sokwakheka komhlaba ngokuma kwawo, ezifundweni zokuhlolwa kobuchwepheshe ngesimo sokwakheka komhlaba, izimbiwa namanzi angaphansi komhlaba futhi wenze ucwaningo ngesimo sokwakheka komhlaba ngokuma kwawo ukuze kuxazululwe izinkinga ezahlukene ezihlobene nokufunda okujulile ngomhlaba. Ubandakanyeke emisebenzini emininingi lapho izinqubo zolwazi ngesimo sokwakheka komhlaba zisetshenziselwe ukukhombisa izakhiwo ezikhipha amanzi angaphansi komhlaba, kuhlanganisa nokukhombisa izindlela ezingaholela ekungcolisweni kwamanzi angaphansi komhlaba noma amanzi angaphezu komhlaba. "Nginentshisekelo kakhulu ngezifundo zolwazi ngamanzi akhona ngaphansi komhlaba, ikakhulukazi ngokuphathelene nokuhlolwa kwemithombo yamanzi angaphansi komhlaba," ephawula.

Ukuzama ukufinyelela emazingeni omsebenzi aphezulu ngokwenza umsebenzi wakhe kahle kakhulu kugcina uMatome ekhuthazekile, futhi ukubekezela kwakhe nomsebenzi oncomekayo kakhulu kwavuzwa ngomklomelo wase-CGS wezesayensi nobuchwepheshe ngokwenza umsebenzi oncomekayo ngowezi-2018, awuchaza ngokuthi, "kwakuyimpumelelo enhle kakhulu, eyafaka kakhulu isandla ekukhuleni kwami ngokomsebenzi". "Ngibonga i-CGS ngokungivumela ukuthi ngisebenzise ulwazi lwami lokufunda ngokujulile ngesimo sokwakheka komhlaba ukuze ngisize abantu bakithi eNingizimu Afrika," esephetha.

Uhlelo Lomfundaze Lwabafundi Abafunda Ngokugcwele

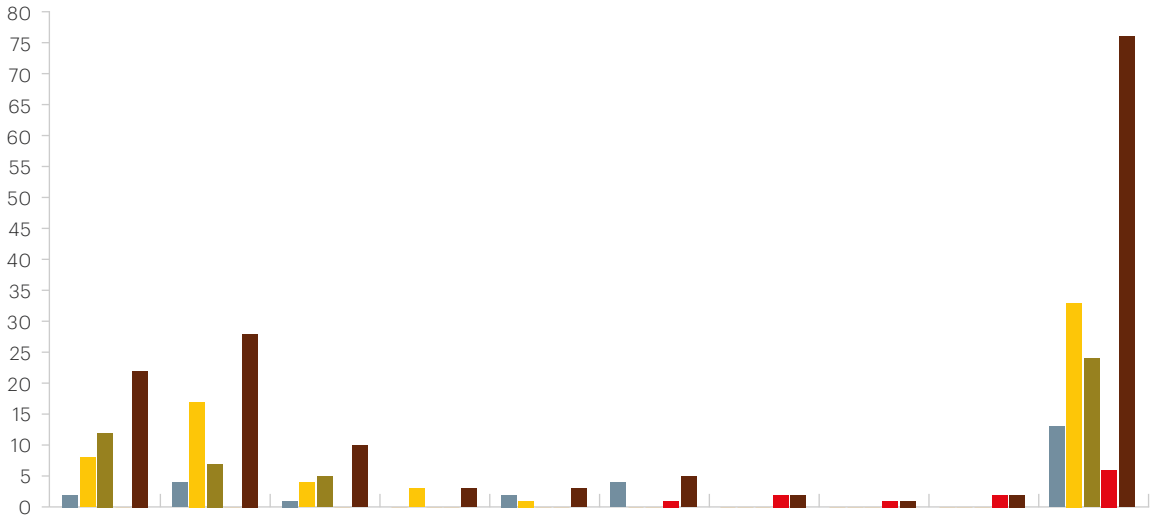


	I-AF	I-AM	I-CF	I-CM	I-IF	I-IM	I-WF	I-WM	Okuphelele
I-PhD	6	4	0	0	0	0	2	1	13
I-MSc	14	9	3	1	1	2	1	2	33
i-BSc Hons	10	11	0	0	0	2	0	1	24
I-BSc	0	4	0	1	0	0	1	0	6
Okuphelele	30	28	3	2	1	4	4	4	76

Isithombe 39: Uhlelo Lomfundaze Lwabafundi Abafunda Ngokugcwele

I-CGS izinikele ekukhiqizeni ama-PhD ezinga eliphezulu ukuze kukhiqizwe ulwazi futhi kukhuthazwe ukusungulwa kwezinto ezintsha. Njengoba kukhonjisiwe Esithombeni 39, kunabafundi abangama-76 ohlelweni lwabafundi abanomfundaze abafunda ngokugcwele, abangama-17% babo babhalisele iziqu ze-PhD futhi abangama-43% babhalisele iziqu ze-MSc.

Isithombe 40 ngezansi sikhombisa abafundi okulindeleke ukuthi baphothule izifundo zabo ngesikhathi sezimali sowezi-2019/2020 ukuya kowezi-2026/2027. Lapho kunezikhala khona, laba abanemifundaze bazofakwa basebenze e-CGS.

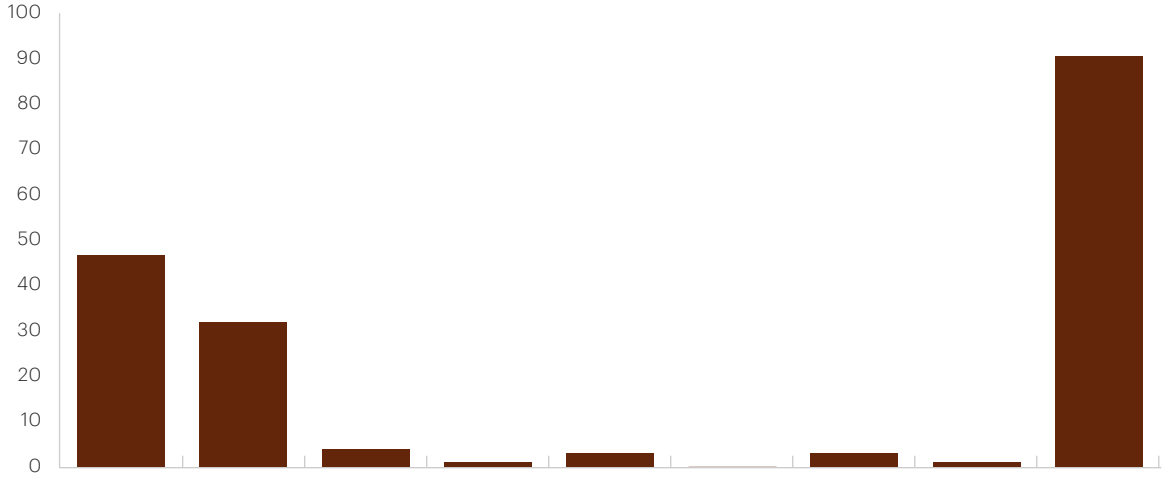


	2019	2020	2021	2022	2023	2024	2025	2026	2027	Okuphelele
I-PhD	2	4	1	0	2	4	0	0	0	13
I-MSc	8	17	4	3	1	0	0	0	0	33
i-BSc Hons	12	7	5	0	0	0	0	0	0	24
I-BSc	0	0	0	0	0	1	2	1	2	6
Okuphelele	22	28	10	3	3	5	2	1	2	76

Isithombe 40: Abafundi abafunda ngomfundaze abafunda ngokugcwele ngokosuku okulindeleke ngalo lokuphothula kwabo izifundo

1.3 ABAFUNDI ABANEMIFUNDAZE ABANGAFUNDI NGOKUGCWELE

Uhlelo lwemifundaze lwabafundi abangafundi ngokugcwele luyingxenye ebalulekile yokuthuthuka ngokomsebenzi kwesikhungo kanye namasu okugcina abasebenzi bangashiyi umsebenzi wabo esikhungweni. Njengamanje, abasebenzi abangama-91 emayunithini ebhizinisi ahlukene noma iminyango bazuza kulokhu kungenelela.

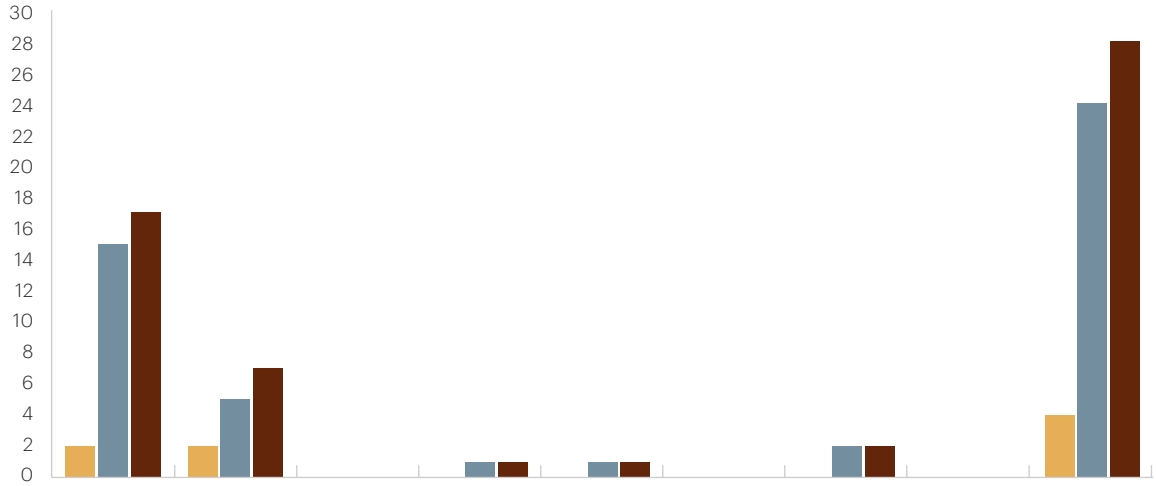


Inani labafundi Abanemifundaze Abangafundi Ngokugcwele	I-AF	I-AM	I-CF	I-CM	I-IF	I-IM	I-WF	I-WM	Okuphelele
	47	32	4	1	3	0	3	1	91

Isithombe 41: Abafundi abangafundi ngokugcwele abanomfundaze ngokobuhlanga nokobulili

1.4 UHLELO LOKUQEQESHELWA UMSEBENZI

Njalo ngonyaka, abaphothule iziqu abanentshisekelo futhi abaneziqu ezifanele bayamenywa ukuthi bafake izicelo zomsebenzi benzela uhlelo lwe-CGS lokuqeqeshelwa umsebenzi lweminyaka emibili. Uhlelo lokuqeqeshelwa umsebenzi lweseka futhi luhlomise abafundi abaphothule iziqu ngesipiliyoni somsebenzi sokusebenza kwangempela futhi lubahlinzeka ngethuba lokwenza umsebenzi emikhakheni abayifundele. Njengamanje, abaqeqeshelwa umsebenzi abangama-28 ababambe iqhaza ohlelweni, ama-90% abo afakwa ezinhlelweni ezingumongo.

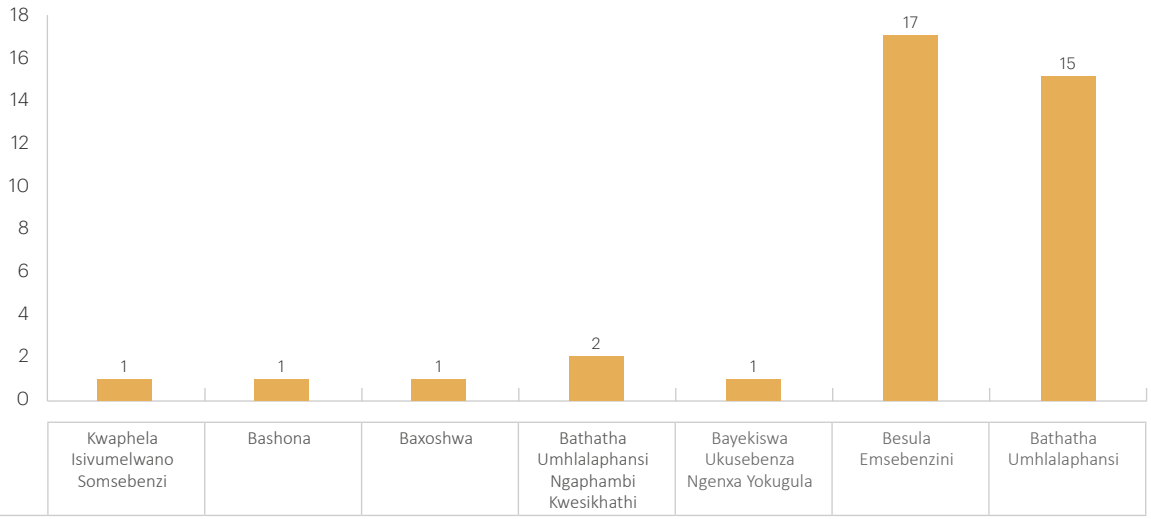


	I-AF	I-AM	I-CF	I-CM	I-IF	I-IM	I-WF	I-WM	Okuphelele
Lokufunda Kokuqeqeshelwa Umsebenzi Uhlelo	2	2	0	0	0	0	0	0	4
Abaphothule Iziqu Lokuthuthukisa Uhlelo	15	5	0	1	1	0	2	0	24
Okuphelele	17	7	0	1	1	0	2	0	28

Isithombe 42: Uhlelo Lokuqeqeshelwa Umsebenzi

1.5 UKUHLAZIYWA KOKUSHIYA INKAMPANI KWABASEBENZI NOKUQASHA ABASEBENZI ABASHA

Isithombe 43 sikhombisa ukuthi, kubasebenzi abashiye inkampani ngonyaka obuyekezwayo, abangama-39% bazihambela ngokwabo (besula emsebenzini) – abangama-50% ababesemisebenzini engumongo – abangama-61% abazihambelanga ngokuthanda kwabo.

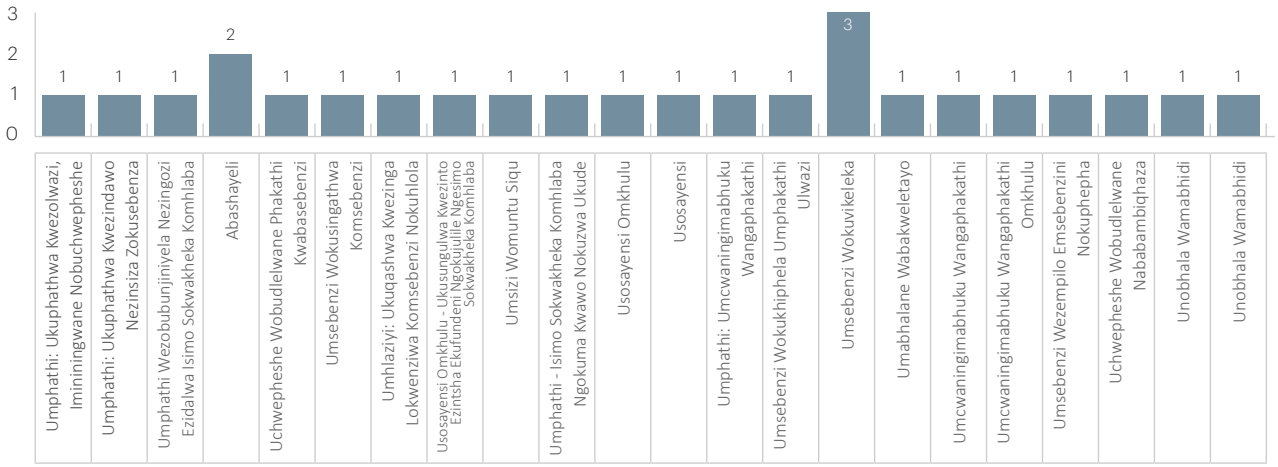


Isithombe 43: Ukushiya Inkampani Kwabasebenzi Nokuqasha Abasebenzi Abasha

1.6 UKUQASHWA KWABASEBENZI NENQUBO YOKUKHETHELWA KWABO UMSEBENZI

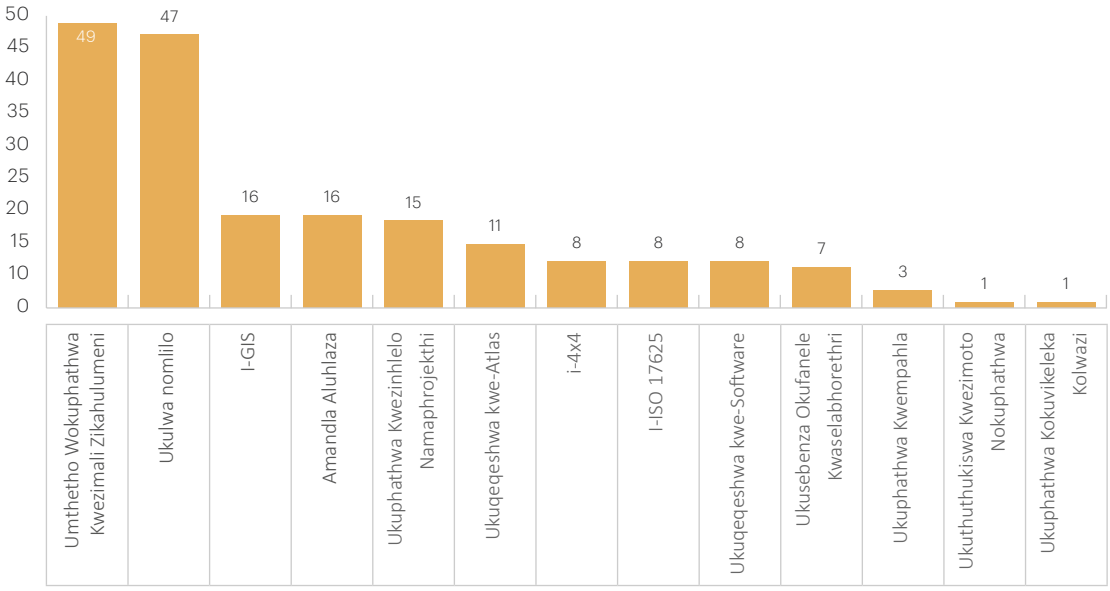
Ngonyaka obuyekezwayo kwagcwaliswa izikhala ezingama-25, njengoba kukhonjiswe Esithombeni 43 ngenhla. Njengoba i-CGS iyisikhungo sikahulumeni, izikhala ziyakhangiswa, kuncintiswane ngazo bese kuqashwa lowo owenze kangcono kwesekwe ekuhlolweni. Ezikhaleni ezingama-25 ezigcwalisiwe, ezine zagcwaliswa ababefake izicelo zomsebenzi abasebenza ngaphakathi, lokhu kukhombisa ukufaneleka kwemisebenzi yase-CGS yokuqeqesha nentuthuko, okunika abafake izicelo zomsebenzi abasebenza ngaphakathi ukuzethemba ukuze bakwazi ukuncintisana nababefake izicelo zomsebenzi bangaphandle. Phezu kwalokho, izikhathi nezikhathi, abaphathi bamema abasebenzi abasemazingeni aphansi babamemele emihlanganweni yokuphumula namasu, enye indlela yokuthuthukisa abasebenzi.

Isithombe 44 sikhombisa ukuhlaziywa kokuqasha ngokwezigaba zomsebenzi wonyaka obuyekezwayo:



Isithombe 44: Ukuqashwa kwabasebenzi

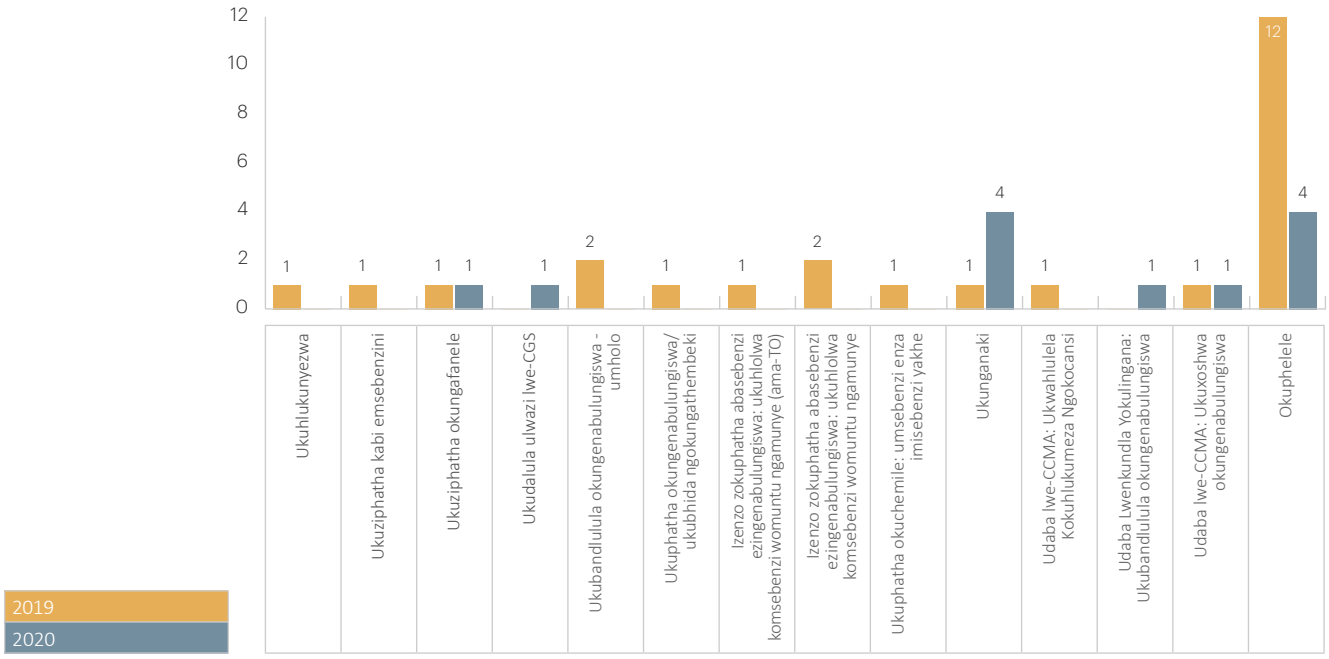
1.7 UKUQEQESHWA NOKUTHUTHUKA NGOKOMSEBENZI



Isithombe 45: Ukuqeqesha nokuthuthukisa

1.8 UBUDLELWANE PHAKATHI KWABAPHATHI NABASEBENZI/ UBUDLELWANE PHAKATHI KWABASEBENZI

Ngaphandle kwesehlakalo esingejwayelekile sokuhlukumeza, zonke izikhalazo zaziphathelene nokuchema ekubekweni kwabasebenzi emazingeni afanele omsebenzi nokufanelwe kwenziwe emsebenzini womuntu ngamunye, njengoba kukhonjiswe Esithombeni 46 ngezansi. Njengoba izehlakalo zazifana, isikhungo senza umsebenzi wokuhlola imisebenzi yabantu ukuze kulungiswe ukwehluka nokuqinisekisa ukulingana nokungachemi ekubekweni kwabasebenzi emazingeni afanele omsebenzi nokufanelwe kwenziwe emsebenzini womuntu ngamunye. Ukuhlola umsebenzi womuntu ngamunye ekubekweni emazingeni afanele omsebenzi kuzohlinzeka ngesisekelo sezidingo ngqangi.



Isithombe 46: Ubudlelwane phakathi kwabasebenzi

1.9 UKUPHEPHA NESIKHATHI ESILAHLEKILE NOKULIMALA

Akukho kulimala emsebenzini okwabikwa onyakeni obuyekezwayo.

1.10 UHLELO LWEZEMPILO YABASEBENZI

I-CGS inesivumelwano ne-Careways ukuze kukhuthazwe ukuphila kahle kwabasebenzi emsebenzini. Umbiko wokuphila kahle wekwata ebuyekezwayo ukhombisa izinga lokusetshenziswa abasebenzi base-CGS elingama-10% uma kuqhathaniswa nomgomo wemboni ka-9.5% nomgomo kahulumeni ongama-8.43%. Izinkinga ezibalulekile eziphathelene nomsebenzi ezibalulwe embikweni yilezi ezilandelayo:

a) Isihluku sasemsebenzini
b) Izinkinga nabaphathi
c) Ukuhlukumezeka ngokocansi

Abaphathi babeke izinqubo ukuze kubhekanwe nalokhu okungenhla. Lokhu kufaka ukubuyekezwa kwenqubomgomo yasemsebenzini, iBhodi eselikugunyazile vele, nokubanjwa kwemihlangano yokufunda ngowezi-2020/2021 ukuze kuqwashiswe futhi kukhuthazwe ukuthi abasebenzi babike. Ukhomishani omkhulu wase-CCMA uzophatha le mihlangano yokufunda.

1.11 IMISEBENZI EHLELIWE YANGONYAKA OZAYO

a) Ukwamukelwa Kokufunda Kwangaphambilini (i-RPL)
b) Ukubuyekezwa kwezinqubomgomo okuqhubekayo
c) Inqubo yokuphathwa kokufundiswa nokujwayezwa umsebenzi kufanele iqaliswe
d) Ukuhlanganisa ithuluzi lamakhono omsebenzi adingekayo emisebenzi ethile esikhungweni sonke

Ingxenye E: Ulwazi ngezezimali

Amashubhu emigodi Yeqembu Elikhulu lase-Karoo Ensimini Yamalahle yase-Springbok Flats

1. ISITATIMENDE SESIBOPHO SOKWENZA UMSEBENZI

Isitatimende sesibopho sokwenza umsebenzi Sezitatimende Zezimali Zonyaka zalo nyaka ophele mhla zingama-31 kuNdasa wezi-2020

Ibhodi kungumsebenzi walo ukulungisa Izitatimende Zezimali Zonyaka zase-CGS kanye nokwahlulela okwenziwe kulolu lwazi.

Kungumsebenzi Wesiphathimandla Esengamele Umsebenzi ukusungula futhi nokusebenzisa uhlelo lokulawula kwangaphakathi oluhlelelwe ukuhlinzeka ngokuqinisekiswa okufanelekile kobuqotho nokwethembeka Kwezitatimende Zezimali Zonyaka.

Ngokubona kwethu, izitatimende zezimali zikhombisa ngokufanele umsebenzi wase-CGS ngonyakamali ophele mhla zingama-31 kuNdasa wezi-2020.

Abacwaningimabhuku bangaphandle bayabandakanywa ukuze baveze umbono ozimele mayelana Nezitatimende Zezimali Zonyaka zase-CGS.

Izitatimende Zezimali Zonyaka zase-CGS zonyaka ophele mhla zingama-31 kuNdasa wezi-2020 zicwaningiwe abacwaningimabhuku bangaphandle, futhi umbiko wabo wethulwe emakhasini 116 ukuya ku-120.

Izitatimende Zezimali Zonyaka zase-CGS ezethulwe emakhasini 121 ukuya ku-154 zamukelwe.

UMnu. M Mabuza
Umphathi Omkhulu
We-Council for Geoscience
Usuku

uDkt. H Mathe
USihlalo weBhodi
Le-Council for Geoscience
Usuku

Le ngxenye yombiko ihlinzeka ngokuqonda ngesimo sezimali esihle sesikhungo futhi iphathelene nalezi zihloko ezilandelayo:

- Isitatimende sesibopho sokwenza umsebenzi Sezitatimende Zezimali Zonyaka zalo onyaka ophele mhla zingama-31 kuNdasa wezi-2020, sisayindwe u-CEO, UMnu. M Mabuza, noSihlalo weBhodi uDkt. H Mathe;
- Umbiko ka-CEO, ofaka ukubuyekezwa kwezezimali jikelele nezindaba eziphathelene nemisebenzi ephakanyisiwe, ukugcinwa kwemali esele, ukuphathwa kokuphakela imisebenzi nemikhiqizo, umbiko wocwaningomabhuku kanye nezinhlelo zangomuso;
- Umbiko Womcwaningi-mabhuku-Jikelele ePhalamende mayelana ne-CGS. Lo mbiko unikeza umbono mayelana nobulungiswa Bezitatimende Zezimali Zonyaka ekwethuleni isimo sezezimali sesikhungo, ukwenziwa komsebenzi ngokwezimali, ukungena nokuphuma kwemali ngokuhambisana Nemigomo yase-SA ye-GRAP nezidingo ze-PFMA ngazo zonke izindlela ezibalulekile. Ubika ngokwenziwa komsebenzi wokuthobela imithetho ngokwesimo somthetho nesemithethonqubo, ukulawula kwangaphakathi nezindaba eziphathelene nalokho, kanye
- Nezitatimende Zezimali Zonyaka, ezihlanganisa Nesitatimende Sesimo Sezezimali, Isitatimende Sokwenziwa Komsebenzi Wezezimali, Isitatimende Sezinguquko Enanini Lokubiza Kwempahla Yesikhungo, Isitatimende

2. Umbiko Womphathi Omkhulu Wezimali

'Ukutshalwa kwezimali Olwazini Olujulile Ngesimo Sokwakheka Komhlaba kuzosheshisa ukubuya kwamandla omnotho waseNingizimu Afrika. I-CGS iyaqhubeka nokusebenzisa ulwazi lwayo oluningi lokufunda ngokujulile ngesimo sokwakheka komhlaba, ulwazi nobungcweti kwezesayensi ukuze ithole ukuxhaswa ngezimali okusimeme'

UMPHATHI OMKHULU WEZEZIMALI
UMnu. Leonard Matsepe

Isendlalelo

I-CGS ifakwe ohlwini Njengebhizinisi Likahulumeni Elisohlelweni 3 A ngokwemigomo ye-PFMA. Izinhloso ze-CGS ukusungula nokushicilela imikhiqizo yolwazi olujulile ngesimo sokwakhekha komhlaba esezingeni lomhlaba futhi nokunikeza izinsizakalo eziphathelene nolwazi olujulile ngesimo sokwakhekha komhlaba emphakathini waseNingizimu Afrika nasezimbonini.

Isimo Sezezimali

Isimo sesitatimende senani lemali nempahla inkampani enayo, kuhlanganisa nezimali ezikweletwayo sigcinwe sifana eminyakeni yakamuva eyi-11 futhi impahla isiphelele ikhule ngokuvamile ngezinga lama-7% eminyakeni eyishumi edlule. I-CGS inempahla enenani eliphelele eliyizigidi ezingama-R614.3 onyakenimali wezi-2020 nesilinganiso sobukhona bemali esingama-1.7.

Izindleko zokulondoloza impahla yesikhungo

Onyakeni, i-CGS yatshala izigidi ezingama-92.7 zamarandi (ngowezi-2018/19: izigidi ezingama-28.7zamarandi) empahleni, izinsizakusebenza, nempahla ongeke ukwazi ukuyibona ngamehlo. Ukuqhubeka kokutshala imali kwingqalasizinda yezesayensi nezinsizakusebenza kuseseqhulwini ukuze kuqinisekiswe ukuthi izinsiza nezindawo nezinsizakusebenza ezisezingeni lomhlaba ziyatholakala futhi zilondolozwe.

Ukuphathwa kokungena nokuphuma kwezimali

Ukwesekwa ngezezimali okusheshayo Kohlelo lwethu OLUHLANGANISIWE FUTHI LWEMIKHAKHA EHLUKENE Oluhlanganisiwe futhi Lwemikhakha Ehlukene Lokudweba Amabalazwe Okufunda Ngokujulile Ngesimo Sokwakheka Komhlaba kunciphise imali nokulingana nemali kuncipha ukusuka ezigidini ezingama-253.6 zamarandi ngowezi-2019 kuya ezigidini ezingama-232 zamarandi ngowezi-2020, kwaba nomphumela wokuphuma kwemali ebhizinisini eyizigidi ezingama-21.6 zamarandi.

Inkampani eqhubekayo nomsebenzi

Izitatimende Zezimali Zonyaka zase-CGS zilungiswe ngokusekelwe enkampanini eqhubekayo nokwenza umsebenzi. Abaphathi abakhulu benze ukubuyekezwa okusemthethweni kokukwazi kwe-CGS ukuqhubeka njengenkampani eqhubekayo nomsebenzi esikhathini esizayo esibonakalayo futhi ngokusekelwe kulokhu kubuyekezwa, ibona ukuthi ukwethulwa kwezitatimende zezimali ngokusekelwe kulokhu kufanele.

Izehlakalo ngemuva kwamhla zingama-31 kuNdasa wezi-2020

Izehlakalo ezingaguquli lutho

Ubhubhane lwe-COVID-19
Ubhubhane Lwegciwane Elisha i-Corona nenkulumo eyalandela yokwengeza yesabelomali akuzange kube nomthelela ongako e-CGS, kodwa-ke uhlelo lwe-CGS lulungiselelwe ukukhulisa ukwenziwa komsebenzi nomthelela. Akukho maqiniso noma izimo ezibalulekile ezavela phakathi kokuphela konyakamali nosuku lwalo mbiko okudinga ukubikwa njengengxenye yalezi zitatimende zezimali zonyaka ngaphandle kwalezi zinto ezibalwe ngenhla.

Uhlelo lokumba okujulile e-Beaufort West
I-Council for Geoscience yenza isivumelwano nomhlinzeki ngomsebenzi wokumba umgodi wocwaningo Ojulile Oshona Phansi Wokufunda Ngezingqimba Zamadwala kwenzelwa uhlelo lwase-Karoo lokumba Okujulile e-Beaufort West owabiza imali eqikelelwa ezigidini ezingama-R35.

Ukuhlaziywa kwezingozi ezingenzeka ezidalwa isimo sokwakheka komhlaba
I-Council for Geoscience yenza isivumelwano nomhlinzeki ngomsebenzi wokuqapha ukuhlola, ukuthuthukisa nokwenziwa komsebenzi ngobuchwepheshe wokuhlaziywa kwezingozi ezingenzeka ezidalwa isimo sokwakheka komhlaba wesizinda senuzi owabiza imali eqikelelwa ezigidini ezingama-R34.

I-CGS yaqokwa njenge-ejenti yokwenza umsebenzi Wokuqoqwa, Ukugcinwa Nokusetshenziswa Kwekhabhoni (i-CCSU)
I-Council for Geoscience iqokwe njenge-ejenti yokwenza umsebenzi Wokuqoqwa, Ukugcinwa Nokusetshenziswa Kwekhabhoni (i-CCSU). UMqondisi Jikelele Wezimbiwa Namandla wacela Isikhungo Sikazwelonke Sokuthuthukiswa Kwamandla saseNingizimu Afrika (i-SANEDI) ukuthi sidlulise izabelo zokuxhaswa ngezimali yi-MTEF ezakhishelwa umsebenzi Wokuqoqwa, Ukugcinwa Nokusetshenziswa Kwekhabhoni (i-CCSU) e-CGS. Inani eliphelele lezindleko zomsebenzi lisabhekisiswa.

Imisebenzi emisha ephakanyisiwe

Umthetho Wokuchitshiyelwa Kokufunda Ngokujulile Ngesimo Sokwakheka Komhlaba (Umthetho Ongunombolo 16 wezi-2010) uyalela i-CGS ukuthi, phakathi kokunye, ibe umgcini nomlondolozi walo lonke ulwazi lobuchwepheshe ngesimo sokwakheka komhlaba eNingizimu Afrika. I-CGS futhi iyisiphathimandla sikazwelonke esithunyiwe sezingozi ezidalwa izimo zokwakheka komhlaba eziphathelene nokuthuthukiswa kwengqalasizinda. Ngakho-ke, Umthetho unika amandla i-CGS ukuthi ibe ngumalusi walo lonke ulwazi lobuchwepheshe ngesimo sokwakheka komhlaba ngenhloso yokweluleka uhulumeni, izikhungo zikahulumeni, izikhungo ezizimele kanye nomphakathi ngobungozi obuphelele kobuchwepheshe ngesimo sokwakheka komhlaba kwezwe.

Phezu kwalokho, i-CGS ikhonjwe ngokuqondile ngomsebenzi wokuqapha ukuvama nokwenzeka kokuzamazama komhlaba okuphathelene nokuqhutshwa kwemisebenzi yokumba ezimayini ngesikhathi sokuvalwa thaqa kokusebenza kwezinto ezweni.

Isicelo sokugcinwa kwemali esele

Ngokwemigomo Yesigaba 53 (3) se-PFMA ye-1999, i-CGS kufanele ithole ukugunyazwa Umnyango Wezezimali Kuzwelonke ukuze kugcinwe izimali ezisele. Isigunyazo satholakala ukuze kusetshenziswe izimali ezisele eziqongelelwe ukuze kulondolozwe futhi kutshalwe izimali ezinsizenikusebenza zezesayensi nengqalasizinda, nokuqala ukusetshenziswa kwesu lokumisa kabusha. Isicelo esisha sizokwenziwa kwenzelwa unyaka obuyekezwayo.

Ukuphathwa kokuphakela imisebenzi nemikhiqizo

Iyunithi Yokuphathwa Kokuphakela Imisebenzi Nemikhiqizo iyasebenza ngaphansi Komnyango Womphathi Omkhulu Wezimali. Le yunithi yebhizinisi ihlinzeka ngohlelo lokuphakela imisebenzi nemikhiqizo nokuletha izinhlinzeko, okunobulungiswa, okulinganayo, okungafihli lutho, okunokusebenza kangcono nokungabizi, futhi isungulwe ngokuhambisana Nesigaba 54 se-PMFMA SE-1999 (njengoba kuchitshiyelwe Umthetho Ongunombolo 29 we-1999). Ngokwemigomo ye-BBBEE, Isigaba 13G (1) Somthetho we-B-BBEE, i-CGS yathobela Ukuthuthukiswa kokulawula Ukuphatha Nabaphakeli Bamabhizinisi.

Izindaba zombiko wocwaningomabhuku

I-CGS ithole umphumela wokucwaningwa kwamabhuku okumsulwa oqhamuke Kumcwaningimabhuku-Jikelele wonyaka ophele mhla zingama-31 kuNdasa wezi-2020 futhi izoqhubeka ukwenza ngcono isimo sokulawula kwangaphakathi.

Ukusimama Ngokwezezimali

I-CGS iyaqhubeka nokusebenzisa ulwazi lwayo oluningi lokufunda ngokujulile ngesimo sokwakheka komhlaba, ulwazi nobungcweti kwezesayensi ukuze ithole ukuxhaswa ngezimali okusimeme. Ukuze kwenzeke lokhu, i-CGS iqala futhi ithuthukise izitatimende zokukhangisa ngenkampani ezilungele ukutshalwa kwezezimali kanye nezowebo. I-CGS namanje isazinikele futhi igxila ikakhulukazi ekwesekeni okufanele kwenziwe kuzwelonke ngokwenza komsebenzi wayo.

3. UMBIKO WOMCWANINGIMABHUKU-JIKELELE EPHALAMENDE NGE-COUNCIL FOR GEOSCIENCE

Umbiko wocwaningomabhuku lwezitatimende zezimali

Opinion

1. I have audited the financial statements of the Council for Geoscience set out on pages 121 to 154 which comprise the statement of financial position as at 31 March 2020, statement of financial performance, statement of changes in net assets and cash flow statement for the year then ended, as well as the notes to the financial statements, including a summary of significant accounting policies.

2. In my opinion, the financial statements present fairly, in all material respects, the financial position of the Council for Geoscience as at 31 March 2020, and its financial performance and cash flows for the year then ended in accordance with the Standards of Generally Recognised Accounting Practice (Standards of GRAP) and the requirements of the Public Finance Management Act of South Africa, 1999 (Act No. 1 of 1999) (PFMA).

Basis for opinion

3. I conducted my audit in accordance with the International Standards on Auditing (ISAs). My responsibilities under those standards are further described in the auditor-general's responsibilities for the audit of the financial statements section of this auditor's report.

4. I am independent of the public entity in accordance with sections 290 and 291 of the *Code of ethics for professional accountants* and parts 1 and 3 of the *International Code of Ethics for Professional Accountants (including International Independence Standards)* of the International Ethics Standards Board for Accountants (IESBA codes) as well as the ethical requirements that are relevant to my audit in South Africa. I have fulfilled my other ethical responsibilities in accordance with these requirements and the IESBA codes.

5. I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my opinion.

Emphasis of matters

6. I draw attention to the matters below. My opinion is not modified in respect of these matters.

Restatement of corresponding figures

7. As disclosed in note 24 to the financial statements, the corresponding figures for 31 March 2019 were restated as a result of an error in the financial statements of the public entity at, and for the year ended, 31 March 2020.

Events after reporting date

8. I draw attention to note 23 to the financial statements, which deals with subsequent events, and specifically the possible effects of the future implications of COVID-19 on the public entity's future prospects, performance and cash flows.

Responsibilities of the accounting authority for the financial statements

9. The accounting authority is responsible for the preparation and fair presentation of the financial statements in accordance with the Standards of GRAP and the requirements of the PFMA, and for such internal control as the

accounting authority determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

10. In preparing the financial statements, the accounting authority is responsible for assessing the public entity's ability to continue as a going concern, disclosing, as applicable, matters relating to going concern and using the going concern basis of accounting unless the appropriate governance structure either intends to liquidate the public entity or to cease operations, or has no realistic alternative but to do so.

Auditor-general's responsibilities for the audit of the financial statements

11. My objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes my opinion. Reasonable assurance is a high level of assurance but is not a guarantee that an audit conducted in accordance with the ISAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

12. A further description of my responsibilities for the audit of the financial statements is included in the annexure to this auditor's report.

Umbiko wocwaningomabhuku lombiko wezinga lokwenziwa komsebenzi konyaka

Introduction and scope

13. 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 on the usefulness and reliability of the reported performance information against predetermined objectives for selected objectives presented in the annual performance report. I performed procedures to identify material findings but not to gather evidence to express assurance.

14. My procedures address the usefulness and reliability of the reported performance information, which must be based on the approved performance planning documents of the public entity. I have not evaluated the completeness and appropriateness of the performance measures included in the planning documents. My procedures do not examine whether the actions taken by the public entity enabled service delivery. My procedures also do not extend to any disclosures or assertions relating to planned performance strategies and information in respect of future periods that may be included as part of the reported performance information. Accordingly, my findings do not extend to these matters.

15. I evaluated the usefulness and reliability of the reported performance information in accordance with the criteria developed from the performance management and reporting framework, as defined in the general notice, for the following selected objective presented in the annual performance report of the public entity for the year ended 31 March 2020:

Objectives/	Pages in the annual performance report
Objective 4 – Delivery of the mandate	32 - 33

16. I performed procedures to determine whether the reported performance information was properly presented and whether performance was consistent with the approved performance planning documents. I performed further procedures to determine whether the indicators and related targets were measurable and relevant, and assessed the reliability of the reported performance information to determine whether it was valid, accurate and complete.

17. I did not identify any material findings on the usefulness and reliability of the reported performance information for this objective:

- Objective 4 – Delivery of the mandate

Other matters

18. I draw attention to the matters below.

Achievement of planned targets

19. Refer to the annual performance report on pages 34 to 35 for information on the achievement of planned targets for the year and explanations provided for the under/over achievement of a number of targets.

Adjustment of material misstatements

20. I identified material misstatements in the annual performance report submitted for auditing. These material misstatements were in the reported performance information of objective 4: delivery of the mandate. As management subsequently corrected the misstatements, I did not raise any material findings on the usefulness and reliability of the reported performance information.

Umbiko wocwaningomabhuku ngokuthotshelwa komthetho

Introduction and scope

21. In accordance with the PAA and the general notice issued in terms thereof, I have a responsibility to report material findings on the public entity's compliance with specific matters in key legislation. I performed procedures to identify findings but not to gather evidence to express assurance.

22. The material findings on compliance with specific matters in key legislation are as follows:

Annual financial statements

23. The financial statements submitted for auditing were not prepared in accordance with the prescribed financial reporting framework, as required by section 55(1) (b) of the PFMA.

24. Material misstatements of non-current assets, current liabilities, revenue, expenditure, disclosure items and statement of changes in net assets identified by the auditors in the submitted financial statement were corrected, resulting in the financial statements receiving an unqualified audit opinion.

Olunye ulwazi

25. The accounting authority is responsible for the other information. The other information comprises the information included in the annual. The other information does not include the financial statements, the auditor's report and those selected objectives presented in the annual performance report that have been specifically reported in this auditor's report.

26. My opinion on the financial statements and findings on the reported performance information and compliance with legislation do not cover the other information and I do not express an audit opinion or any form of assurance conclusion thereon.

27. In connection with my audit, my responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements and the selected objectives presented in the annual performance report, or my knowledge obtained in the audit, or otherwise appears to be materially misstated.

28. If based on the work I have performed, I conclude that there is a material misstatement in this other information, I am required to report that fact. I have nothing to report in this regard.

Okusilele ekulawuleni kwangaphakathi

29. I considered internal control relevant to my audit of the financial statements, reported performance information and compliance with applicable legislation; however, my objective was not to express any form of assurance on it. The matters reported below are limited to the significant internal control deficiencies that resulted in the findings on compliance with legislation included in this report.

30. Management did not adequately prepare accurate and complete financial statements that are supported and evidenced by reliable information; as a result, there were material adjustments to the financial statements.

Eminye imibiko

31. I draw attention to the following engagements conducted by various parties which had, or could have, an impact on the matters reported in the public entity's financial statements, reported performance information, compliance with applicable legislation and other related matters. These reports did not form part of my opinion on the financial statements or my findings on the reported performance information or compliance with legislation.

32. An independent consultant investigated an allegation of possible misappropriation of the public entity's assets, at the request of the public entity, which covered the period 1 April 2017 to 30 April 2018. The investigation was concluded in October 2018 and resulted in further inquiries into the implicated employees. These proceedings were concluded and the implicated employees resigned on 16 May 2019 and 31 July 2019.

33. An independent consultant investigated an allegation of irregular procurement of assets, at the request of the public entity, which covered purchases made in 2016. The investigation was concluded in May 2019 and resulted in further inquiries into the implicated employees. These proceedings were concluded and the implicated employees resigned on 31 July 2019.

Auditor-General

Pretoria
30 September 2020

AUDITOR-GENERAL
SOUTH AFRICA

Auditing to build public confidence

Isithasiselo –Umsebenzi Womcwaningimabhuku-Jikelele wocwaningomabhuku

1. As part of an audit in accordance with the ISAs, I exercise professional judgement and maintain professional scepticism throughout my audit of the financial statements and the procedures performed on reported performance information for selected objective and on the public entity's compliance with respect to the selected subject matters.

Izitatimende zezimali

2. In addition to my responsibility for the audit of the financial statements as described in this auditor's report, I also:
   - identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error; design and perform audit procedures responsive to those risks; and obtain audit evidence that is sufficient and appropriate to provide a basis for my opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations or the override of internal control
   - obtain an understanding of internal control relevant to the audit 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 public entity's internal control
   - evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the accounting authority
   - conclude on the appropriateness of the accounting authority's use of the going concern basis of accounting in the preparation of the financial statements. I also conclude, based on the audit evidence obtained, whether a material uncertainty exists relating to events or conditions that may cast significant doubt on the ability of the Council for Geoscience to continue as a going concern. If I conclude that a material uncertainty exists, I am required to draw attention in my auditor's report to the related disclosures in the financial statements about the material uncertainty or, if such disclosures are inadequate, to modify my opinion on the financial statements. My conclusions are based on the information available to me at the date of this auditor's report. However, future events or conditions may cause a public entity to cease operating as a going concern
   - evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and determine whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation

Ukuxhumana nalabo abanomthwalo wokuphatha

3. I communicate with the accounting authority regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that I identify during my audit.

4. I also confirm to the accounting authority that I have complied with relevant ethical requirements regarding independence, and communicate all relationships and other matters that may reasonably be thought to have a bearing on my independence and, where applicable, actions taken to eliminate threats or safeguards applied.

4. IZITATIMENDE ZEZIMALI EZIKHISHWA NJALO NGONYAKA ZONYAKA OPHELE MHLA ZINGAMA-31 KUNDASA WEZI-2020

Isitatimende Sesimo Sezimali

Kuze kufike mhla zingama-31 kuNdasa wezi-2020

	Note(s)	2020	2019 (Restated)
		R'000	R'000
Assets			
Non-current assets			
		345 147	279 168
Property and equipment	3	326 633	260 051
Intangible assets	4	952	1 555
Heritage assets	25	17 562	17 562
Current assets		**269 202**	**388 562**
Inventories	5	5	5
Trade and other receivables from exchange transactions	7	37 184	134 975
Cash and cash equivalents	8	232 013	253 582
Total assets		**614 349**	**667 730**
Net assets and liabilities			
Accumulated surplus		445 081	384 135
Non-current liabilities			
Post-employment benefit liabilities	6	9 254	7 661
Current liabilities		**160 014**	**275 934**
Trade and other payables	9	25 688	29 461
Deferred income	10	109 127	221 360
Accruals	11	25 199	25 113
Total net assets and liabilities		**614 349**	**667 730**

Isitatimende Sokwenziwa Komsebenzi Wezezimali

Sesikhathi Esiphele mhla zingama-31 kuNdasa wezi-2020

	Note(s)	2020 R'000	2019 (Restated) R'000
Total Revenue		**486 198**	**484 085**
Revenue from exchange transactions	12	287 659	284 750
Revenue from non - exchange transactions	12	198 539	199 335
Total cost of projects		**(165 673)**	**(178 817)**
Cost of commercial projects	12	(22 698)	(20 775)
Cost of statutory projects	12	(142 975)	(158 042)
Gross surplus		**320 525**	**305 268**
Administrative expenses		(255 959)	(304 394)
Other operating expenses	12	(3 600)	(6 457)
Surplus from operations		**60 966**	**(5 583)**
Finance cost	13	(20)	(28)
Net surplus for the year		**60 946**	**(5 611)**

Isitatimende Sezinguquko Enanini Lokubiza Kwempahla Yesikhungo

Sesikhathi Esiphele mhla zingama-31 kuNdasa wezi-2020

	Note(s)	Accumulated surplus R'000	Total R'000
Opening balance at 31 March 2018		**384 417**	**389 746**
Correction of prior period error	24	5 329	5 329
Restated balance at 31 March 2018		**389 746**	**389 746**
Net (loss) for the period		(1 086)	(1 086)
Correction of prior period error	24	(4 525)	(4 525)
		(5 611)	(5 611)
Restated balance at 31 March 2019		**384 135**	**384 135**
Net surplus for the period		60 946	60 946
Balance at 31 March 2020		**445 081**	**445 081**

Isitatimende Sokungena Nokuphuma Kwezimali

Sesikhathi Esiphele mhla zingama-31 kuNdasa wezi-2020

	Note(s)	2020 R'000	2019 (Restated) R'000
Cash inflow from operating activities		**67 891**	**16 989**
Cash receipts from customers		549 165	342 754
Cash paid to suppliers and employees		(504 583)	(346 869)
Cash generated from operations	15	44 582	(4 115)
Interest received	12	23 329	21 132
Finance cost	13	(20)	(28)
Cash outflow from investing activities		**(89 460)**	**(28 013)**
Acquisition of:			
Property and equipment	15,1	(92 543)	(28 542)
Intangible assets	15,2	(207)	(132)
Proceeds from sale of asset	12	874	339
Insurance proceeds for property and equipment	3,1	2 416	322
Net (decrease) in cash and cash equivalents		**(21 569)**	**(11 024)**
Cash and cash equivalents at beginning of period	8	**253 582**	**264 606**
Cash and cash equivalents at end of period	8	**232 013**	**253 582**

Izinqubomgomo zokugcinwa kwamarekhodi ezimali ezingenayo neziphumayo

Zezitatimende Zezimali Zonyaka zalo nyaka ophele mhla zingama-31 kuNdasa wezi-2020

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 Practices (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.

3. Specific information is 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.

The budget reporting standard does not apply to the Council for Geoscience as our budget is tabled as part of the Department of Mineral Resources & Energy budget.

1.2 Revenue recognition

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

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.

1.2.1 Revenue from non-exchange transactions

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

Revenue from non-exchange transactions is recorded as deferred income when it is received. It is then recognised as income proportionate to the costs incurred.

1.2.2 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 assets that are held for use in the production or supply of goods or 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 building is 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 or 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 date of acquisition.

Major refurbishment 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, on a straight line basis over their average useful lives, as follows:

Land	**Not depreciable**
Buildings	30 years
Motor vehicles	5 to 10 years
Equipment	5 to 10 years
Aircraft & Helicopter - Body	15 years
Aircraft & Helicopter - Components	Useful hours per Civil Aviation Authority
Boat	10 years
Office furniture	20 to 23 years
Computer equipment	6 to 11 years
Specialised equipment	15 years

The depreciation charges for each period are recognised in the statement of financial performance, unless it is 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 value, on a straight-line basis, being two to eight years.

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.

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.

1.6 Heritage assets

Heritage assets are assets held for their cultural, environmental or historical significance. Heritage assets are initially recognised at deemed cost which has been determined, due to the nature of heritage assets, by specialist valuators. Heritage assets are reflected at deemed cost and are not depreciated. At each reporting date Heritage assets are assessed for indications of impairment. If any such indication exists, an estimate of the recoverable amount or the recoverable service amount of the heritage assets will be determined and tested against the carrying amount.

1.7 Inventories

The Council for Geoscience is a custodian of scientific information that 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 deemed costs (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 Deferred income

Deferred Income is accounted for in the statement of financial position. The related revenue is recognised on an accrual basis in the statement of financial performance in the period in which it satisfies the revenue recognition criteria.

1.10 Retirement benefit costs

Short-term employee benefits
The cost of short-term employee benefits (those payable within twelve 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.

1.11 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.

Disclosure of expenditure that has been approved, but that has not yet been contracted for, is made.

1.12 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.

1.13 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.

1.14 Impairment

The Council for Geoscience identifies cash generating assets as assets that are managed with the objective of generating a commercial return, and non-cash generating assets as assets that do not generate market related cash flows from that asset.

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 assumed 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.

1.15 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 that the entity is party to 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 Polokwane office current lease, and the agreement will be classified in its entirety as an operating lease.

1.16 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.

1.17 Irregular expenditure

Irregular expenditure is recorded in the notes to the financial statements when confirmed. The amount recorded is equal to the value of the irregular expenditure incurred, unless it is impractical to determine, in which case reasons therefore must be provided in the notes. Irregular expenditure receivables are measured at the amount that is expected to be recovered and are de-recognised when settled or written-off as irrecoverable.

1.18 Post-reporting date events

Events after the reporting date are those events, both favourable and unfavourable, that occur between the reporting date and the date when the financial statements are authorised for issue. Two types of events can be identified:

- Those that provide evidence of conditions that existed at the reporting date (adjusting events after the reporting date)
- Those that are indicative of conditions that arose after the reporting date (non-adjusting events after the reporting date).

The CGS will adjust the amounts recognised in the financial statements to reflect adjusting events after the reporting date once the event occurred.

The CGS will disclose the nature of the event and estimate its financial effect or a statement that such estimate cannot be made in respect of all material non-adjusting events, where nondisclosure could influence the economic decisions of users taken on the basis of the financial statements.

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 2019/2020:

GRAP statement	Description	Impact	Effective date
GRAP 32	Service Concession Arrangements: Grantor	None	01 April 2020
GRAP 34	Separate Financial Statements	None	01 April 2020
GRAP 35	Consolidated Financial Statements	None	01 April 2020
GRAP 36	Investments in Associates and Joint Ventures	None	01 April 2020
GRAP 37	Joint Arrangements	None	01 April 2020
GRAP 38	Disclosure of Interests in Other Entities	None	01 April 2020
GRAP 110	Living and Non Living Resources	None	01 April 2020
IGRAP 1	Applying the probability test on initial recognition revenue (amendments)	None	01 April 2020
IGRAP 20	Adjustments to revenue	None	01 April 2020

3 Property and equipment

2020	Land R'000	Buildings and Fixtures R'000	*Equipment R'000	Office furniture R'000	Aircraft and Boat R'000	Motor vehicles R'000	Computer equipment R'000	Total R'000
Gross carrying amount	18 231	195 082	166 001	13 315	22 348	29 264	20 552	464 793
Accumulated depreciation at the beginning of the period	(1 960)	(65 334)	(90 541)	(8 382)	(10 286)	(13 695)	(14 543)	(204 741)
Opening net carrying amount at 31 March 2019	**16 271**	**129 748**	**75 460**	**4 932**	**12 062**	**15 569**	**6 009**	**260 051**
Movements during the period:								
Work in progress (refer to note 3.2)	-	14 854	25 825	-	1 282	-	29 810	71 771
Acquisitions	-	485	10 653	356	-	872	8 406	20 772
Reversal of impairment	360	2 881	-	-	-	-	-	3 241
Disposals	-	-	(2 221)	(83)	(7)	(524)	(348)	(3 182)
Disposals - Cost	-	-	(7 306)	(346)	(75)	(3 236)	(4 592)	(15 555)
Disposals - Depreciation	-	-	5 085	264	68	2 712	4 244	12 373
Depreciation	-	(6 165)	(14 362)	(628)	(102)	(2 466)	(2 297)	(26 020)
Closing net carrying amount at 31 March 2020	**16 631**	**141 803**	**95 355**	**4 579**	**13 234**	**13 450**	**41 580**	**326 633**
Gross carrying amount	18 231	210 421	195 173	13 325	23 555	26 899	54 176	541 781
Accumulated depreciation/impairment	(1 600)	(68 618)	(99 819)	(8 746)	(10 321)	(13 449)	(12 596)	(215 148)

Property and equipment (continued)

2019	Land R'000	Buildings and Fixtures R'000	*Equipment R'000	Office furniture R'000	Aircraft and Boat R'000	Motor vehicles R'000	Computer equipment R'000	Total R'000
Gross carrying amount	18 231	189 610	154 354	14 162	22 348	33 763	20 653	453 121
Accumulated depreciation at the beginning of the period	(1 960)	(59 933)	(81 838)	(8 557)	(10 184)	(12 937)	(13 422)	(188 831)
Opening net carrying amount at 31 March 2018	**16 271**	**129 677**	**72 516**	**5 605**	**12 164**	**20 826**	**7 231**	**264 290**
Movements during the period:								-
Work in progress (refer to note 3.2)	-	2 131	4	-	-	-	-	2 135
Reversal of impairment	-	631	-	-	-	-	-	631
Acquisitions	-	3 341	19 245	234	-	1 956	1 633	26 409
Disposals	-	-	(475)	(233)	-	(4 077)	(638)	(5 422)
Disposals - Cost	-	-	(7 602)	(1 081)	-	(6 456)	(1 735)	(16 874)
Disposals - Depreciation	-	-	7 127	849	-	2 379	1 097	11 452
Depreciation	-	(6 032)	(15 830)	(674)	(102)	(3 137)	(2 218)	(27 993)
Closing net carrying amount at 31 March 2019	**16 271**	**129 748**	**75 460**	**4 932**	**12 062**	**15 569**	**6 009**	**260 051**
Gross carrying amount	18 231	195 082	166 001	13 315	22 348	29 264	20 552	464 793
Accumulated depreciation/impairment	(1 960)	(65 334)	(90 541)	(8 382)	(10 286)	(13 695)	(14 543)	(204 741)

* Equipment in the tables above include the following categories of equipment: Specialised Equipment, Audio & Visual, Technical Equipment,Office Equipment and Scientific Equipment

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 at date of transfer R'000
474 Carl Street, Town Lands 351JR, Pretoria West	R2 800
280 Pretoria Street, Silverton, Pretoria	R94 000

The value of these properties has been included in the carrying amount of land and buildings as at 31 March 2020 and was determined by an independent valuator.

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

Property and equipment (continued)	2020 R'000	2019 R'000

3.1 Compensation from third parties for property and equipment lost

Proceeds from insurance	2 416	322

3.2 Property and equipment in the process of being constructed

Cumulative expenditure recognised in the carrying value of property and equipment being developed/ constructed

	Buildings and Fixtures R'000	*Equipment R'000	Aircraft and Boat R'000	Total R'000
Gross carrying amount	32 062	1 497	1 040	34 599
Opening net carrying amount at 31 March 2019	**32 062**	**1 497**	**1 040**	**34 599**
Movement	14 854	55 635	1 282	71 771
Closing net carrying amount at 31 March 2020	**46 916**	**57 132**	**2 322**	**106 370**

Property and equipment in the process of being constructed with delays

Included in the work in progress for buildings and fixtures is a carrying amount of R36,649m in respect of a ventilation system in the Silverton building that has been delayed.

	Buildings and Fixtures R'000
Gross carrying amount	24 724
Opening net carrying amount at 31 March 2019	**24 724**
Movement	11 925
Closing net carrying amount at 31 March 2020	**36 649**

3.3 Property and equipment continued

Repairs and maintenance expenditure incurred for the year to repair and maintain property and equipment

Repairs and Maintenance		
Land and Buildings	2 931	4 933
Office Equipment and Furniture	27	5
Technical and Scientific Equipment	1 947	1 224
Specialised Equipment	-	58
Computer Equipment	99	150
Aircraft	777	366
	5 781	**6 736**

	2020 R'000	2019 R'000

4 Intangible assets

Computer software		
Gross carrying amount	9 865	9 733
Accumulated amortisation	(8 310)	(6 990)
Opening net carrying amount at 31 March 2019	1 555	2 743
Movements during the period:		
Acquisitions	207	132
Disposals	(2)	-
Disposals - Cost	(671)	-
Disposals - Amortisation	669	-
Amortisation	(810)	(1 320)
Closing net carrying amount at 31 March 2020	952	1 555
Gross carrying amount	9 402	9 865
Accumulated amortisation	(8 450)	(8 310)

5 Inventories

Publication inventories	5	5

6 Retirement benefit

6.1 Post-retirement medical-aid fund (PRM)

The Council for Geoscience has made provision for the medical-aid fund covering all its qualifying 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	48	73
Interest charge	2 074	2 020
Expected return on planned assets	(1 517)	(1 441)
Actuarial (gain)/loss recognised	3 947	(1 026)
Recognition of loss on asset realisation	(2 959)	-
	1 593	**(374)**

6 Retirement benefit (continued)

The amount included in the statement of financial position arising from Council for Geoscience obligation in respect of PRM is as follows:

	2020	2019	2018	2017	2016
Present value of fund obligations	24 348	24 214	25 565	23 084	22 931
Fair value of planned assets	(15 094)	(16 553)	(17 530)	(15 034)	(15 059)
Liability recognised in statement of financial position	9 254	7 661	8 035	8 050	7 872

	2020			2019		
Movement in net liability during the period is as follows:	Liability	Planned asset	Net	Liability	Planned asset	Net
Liability at beginning of period	24 214	-	24 214	25 565	-	25 565
Value of planned assets at beginning of period	-	(16 553)	(16 553)	-	(17 530)	(17 530)
	24 214	(16 553)	7 661	25 565	(17 530)	8 035
Interest charge/expected return of planned asset	2 074	(1 517)	557	2 020	(1 441)	579
Contributions received	-	(2 959)	(2 959)	-	-	-
Current service costs	48	-	48	73	-	73
Benefits paid	(2 179)	2 179	-	(1 742)	1 742	-
Actuarial (gain)/loss	191	3 756	3 947	(1 702)	676	(1 026)
Closing balance	24 348	(15 094)	9 254	24 214	(16 553)	7 661

Contributions expected to be paid

Top up payments are expected to be made during the 2021 financial year

Expected rate of return on assets	11,03%
Assumptions	
Discount rates	11,03%
Basis of discount rates: JSE zero coupon bond yield after the market closed on 31 March 2020	
Return on assets	11,03%
Expected salary increases	5,00%
Health care cost inflation rate	7,47%

6 Retirement benefit (continued)

Sensitivity analysis-on accrued liability (R Millions) for the year ending 31 March 2020

Assumption	Change	In service	Continuation	Total	Change
Central assumptions	-	1.825	22,523	24.348	-
Health care inflation	1%	2.101	24,184	26.285	8%
	-1%	1.596	21,034	22.630	-7%
Discount rate	1%	1.605	21,092	22.697	-7%
	-1%	2.094	24,143	26.237	8%
Post retirement mortality	-1 year	1.875	23,416	25.291	4%
Average retirement date	-1 year	1.935	22,523	24.458	0%
Continuation of membership at retirement	-10%	1.643	22,523	24.166	-1%

The table above indicates, for example that if medical inflation is 1% greater than the long-term assumptions made, the liability will be 8% higher than that shown.

Sensitivity analysis for current service and interest cost (R Millions) for the year ending 31 March 2020

Assumption	Change	Current service	Interest cost	Total	Change
Central assumptions	-	47 800	2 074 100	2 121 900	-
Health care inflation	1%	58 800	2 264 700	2 323 500	10%
	-1%	39 100	1 907 600	1 946 700	-8%
Discount rate	1%	39 600	2 121 100	2 160 700	2%
	-1%	58 300	2 014 100	2 072 400	-2%
Post retirement mortality	-1 year	49 100	2 160 700	2 209 800	4%
Average retirement date	-1 year	51 800	2 083 100	2 134 900	-1%
Continuation of membership at retirement	-10%	43 300	2 039 400	2 082 700	-2%

The table above indicates, for example, that if medical inflation is 1% greater then the long-term assumptions made, the liability will be 10% higher than that shown.

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 R13,994m (2019: R13,755m) represents equal contributions of 7.5% by the employer and employee.

	2020 R'000	2019 R'000

7 Trade and other receivables from exchange revenue

Trade receivables	1 024	1 977
Contract customers	30 677	127 574
Other receivables	7 530	7 599
	39 231	137 150
Less - Provision for bad debts	(2 047)	(2 175)
	37 184	134 975
Provision for bad debts		
Opening balance	2 175	18
Movement	(128)	2 157
Closing balance	2 047	2 175
Analysis of Impairment		
Long overdue debtors considered impaired	2 047	2 175
	2 047	**2 175**

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

8 Cash and cash equivalents

Cash and cash equivalents at the end of the period are represented by the following balances:

Cash at bank	24 197	17 333
Call accounts	207 816	236 249
Cash and cash equivalents at the end of the period are represented by the following balances:	232 013	253 582

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

9 Trade and other payables

Trade payables	8 323	9 621
Other payables	17 365	19 840
	25 688	**29 461**

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

	2020 R'000	2019 R'000

10 Deferred income

Exchange revenue

10.1 Deferred income arising as a result of an agreement entered into with the Department of Science and Innovation to develop an intellectual property management office. (Geoscience Act par 5(1)(g))

Carrying amount at the beginning of period	3 264	3 879
Amounts used during the period	(655)	(615)
Carrying amount at the end of period	2 609	3 264

10.2 Deferred income arising as a result of an agreement with the Organisation of African Geological Surveys.

Carrying amount at the beginning of period	48	48
Amounts received	200	-
Carrying amount at the end of period	248	48

10.3 Deferred income arising as a result of an agreement with the Department of Science and Innovation for the environmentally friendly and efficient methods for the extraction of Rare Earth Elements.

Carrying amount at the beginning of period	182	182
Carrying amount at the end of period	182	182

10.4 Deferred income arising as a result of an agreement with the Department of Science and Innovation in terms of the Earth Observation and Geohazards Assessment.

Carrying amount at the beginning of period	-	2 922
Amounts used during the period	-	(2 922)
Carrying amount at the end of period	-	-

10.5 Deferred income arising as a result of an agreement entered into with the National Research Foundation.

Carrying amount at the beginning of period	110	110
Carrying amount at the end of period	110	110

10.6 Deferred income arising as a result of an agreement entered into with the Department of Mineral Resources & Energy to develop and implement various measures to mitigate the effect of mining-induced contamination.

Carrying amount at the beginning of period	217 756	112 264
Amounts received	215 523	206 648
Amounts used during the period	(327 301)	(101 156)
Carrying amount at the end of period	105 978	217 756
Total deferred income	**109 127**	**221 360**

	2020 R'000	2019 R'000

11 Accruals

Accruals for leave pay		
Carrying amount at the beginning of period	18 983	16 060
Provision current period	2 839	4 061
Amounts used during the current period	(2 018)	(1 138)
Carrying amount at the end of period	19 804	18 983

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

Accruals for 13th cheque		
Carrying amount at the beginning of period	6 130	5 204
Provision current period	(735)	926
Carrying amount at the end of period	5 395	6 130

The 13th cheque accrual relates to the structuring of the employee costs to company and is paid out on employees' birthdays.

Total accruals	**25 199**	**25 113**

12 Surplus/Deficit from operations

Operating surplus/deficit is arrived at after taking the following items into account:

Revenue	**486 198**	**484 085**
Non-exchange revenue		
Total grant received	414 062	405 983
Project related revenue	(215 523)	(206 648)
Total non-exchange revenue	**198 539**	**199 335**
Exchange revenue		
Department of Mineral Resources & Energy project related revenue	223 839	227 288
Contracting revenue	25 822	25 812
Publication revenue	3 276	3 601
	252 937	**256 701**
Other exchange revenue		
Foreign currency gains	835	1 744
Proceeds from sale of asset	874	339
Recovery of asset losses	2 416	322
Sundry income	6 863	4 512
	10 988	**6 917**

12 Surplus/Deficit from operations (continued)

	2020 R'000	2019 R'000
Interest received		
- Interest income on call accounts	17 100	17 698
- *Interest income on current accounts	6 634	3 434
(* includes interest accrued to the amount of R404,835)	23 734	21 132
Total exchange revenue	**287 659**	**284 750**
Total cost of contracts	**165 673**	**178 817**
Cost of contracts		
Direct cost	10 613	10 755
Personnel expenditure	12 085	10 020
	22 698	**20 775**
Cost of statutory projects		
Direct cost	35 302	59 825
Personnel expenditure	107 673	98 217
	142 975	**158 042**
Administrative expenses include :		
Audit fees	3 820	5 586
- Current period	2 084	2 756
- Internal audit	1 736	2 830
- Fee for other services	-	-
Bad debts written off	-	-
Provision for bad debts	(2 047)	(2 157)
Depreciation - on owned assets	26 020	27 993
- Buildings	6 165	6 032
- Equipment	14 362	15 830
- Office furniture	628	674
- Motor vehicles	2 466	3 137
- Aircraft	102	102
- Computer equipment	2 297	2 218
Reversal of impairment	3 241	631
Amortisation - intangible assets		
- Computer software	810	1 320
Rentals in respect of operating leases		
- Land and buildings	1 044	1 045
- Multifunctional printers	1 400	519

12 Surplus/Deficit from operations (continued)

	2020 R'000	2019 R'000
Other operating expenses		
Net loss on disposal of equipment	2 221	475
Net loss on disposal of vehicles	524	4 077
Net loss on disposal of intangible assets	2	-
Net loss on disposal of computer equipment	348	639
Net loss on disposal of office furniture	83	233
Net loss on disposal of aircraft	7	-
Write-off of bad debts	-	-
Foreign currency losses	415	1 034
	3 600	**6 457**
Staff costs	280 074	294 552
Included in staff costs are:		
Defined benefit plan expense for the post-retirement medical-aid fund	4 552	(374)
- Current service cost	48	73
- Interest cost	2 074	2 020
- Expected return on plan assets	(1 517)	(1 441)
- Recognised actuarial (gain)/loss	3 947	(1 026)
Defined contribution plan expenses for the pension and provident fund	13 994	13 755

Emoluments

Senior management	2019/2020				
	Pensionable salary R'000	Performance bonus R'000	Provident/ Pension fund contributions R'000	*Other contributions R'000	Total R'000
Mr Mabuza M	2 736	-	167	97	**3 000**
Mr Matsepe L D	2 455	-	150	133	**2 738**
Ms Shelembe P R	1 849	-	121	108	**2 078**
Dr Tshipa J	1 959	-	118	110	**2 187**
Dr Khoza T D	1 857	-	113	96	**2 066**

12 Emoluments (continued)

Senior management	2018/2019				
	Pensionable salary R'000	Performance bonus R'000	Provident/ Pension fund contributions R'000	*Other contributions R'000	Total R'000
Mr Mabuza M	2 736	244	166	103	**3 249**
Mr Matsepe L D	2 455	318	149	120	**3 042**
Mr Ramagwede L F	1 877	283	122	101	**2 383**
Ms Shelembe P R	1 850	274	111	99	**2 334**
Dr Tshipa J	1 633	-	98	91	**1 822**
Dr Khoza T D	1 351	-	85	72	**1 508**

Board emoluments	2020 R'000	2019 R'000
Non-executive Board Members		
Dr Mathe H	120	170
Dr Mahachi J	139	110
Mr Koloi K	55	67
Mr Ramokgopa K	23	172
Mr Mvinjelwa X	68	101
Dr Mayekiso M	-	-
Mr Abader I	-	-
Mr Nel P	-	-
Ms Mdubeki R	-	-
Mr Menoe K	-	-
Ms Mochothli D	-	-
Ms Tsotetsi P	-	-
Ms Madiba L	-	-
Mr Wilcox O	-	-
Mr Moatshe A	-	-
Mr Gerryts B	-	-
	405	**620**

*** Other contributions relate to employer contributions towards statutory deductions.**

Details regarding Board Members' service contracts:

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

13 Finance cost

Finance cost on motor vehicle fleet cards.	20	28

	2020 R'000	2019 R'000

14 Reconciliation of net surplus/(loss)for the period to cash generated from operations

Net surplus for the period	60 946	(5 611)
Interest	20	28
Depreciation on property and equipment	26 020	27 993
Amortisation - intangible assets	810	1 320
Reversal of impairment of assets	(3 241)	(631)
Proceeds from sale of an asset	(874)	(339)
Compensation from third parties for property and equipment lost	(2 417)	(322)
Net loss on disposal of fixed assets	3 182	5 423
Interest earned	(23 329)	(21 133)
Provision for post-retirement medical-aid benefits	1 592	(374)
Operating cash flows before working capital changes	62 711	6 354
Working capital changes:		
Increase in provision for accumulated leave pay and 13th cheque	87	3 848
(Increase)/Decrease in trade and other receivables	97 792	(113 519)
Increase/(Decrease) in trade and other payables	(3 774)	(2 752)
Increase/(Decrease) in deferred income	(112 233)	101 954
Cash generated from operations (including finance costs)	44 582	(4 115)

15 Acquisition of:

15.1 Property and equipment		
Land and buildings	485	3 341
Equipment	10 653	19 245
Office furniture	356	234
Motor vehicles	872	1 956
Computer equipment	8 406	1 633
	20 772	**26 409**
Work in progress - Acquisitions		
Land and buildings	14 854	2 131
Computer equipment	29 810	-
Equipment	25 825	2
Aircraft and boat	1 282	-
	71 771	**2 133**
Total acquisitions	**92 543**	**28 542**
15.2 Intangible assets		
Computer software	207	132
	207	**132**

		2020 R'000	2019 R'000
16	**Contingent liability**		
16.1	**Bank guarantees**		
	Performance bonds and bid bonds issued for contract work to various financial institutions.	1 927	1 431
		1 927	**1 431**
16.2	**Pending legal action**		
	The Council for Geoscience has an estimated legal liability due to pending labour cases.	-	1 078
		-	**1 078**

17 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.

18 Operating lease commitments

18.1	**Lease of office space**		
	The operating lease between a supplier and the Council for Geoscience entered into from 01 December 2017 to 30 November 2020.		
	At reporting date, the outstanding commitments under non-cancellable operating leases, which fall due are as follows:		
	Up to I year	385	621
	2 to 5 years	-	705
	Total lease commitments	**385**	**1 326**
18.2	**Lease of office printing equipment**		
	The operating lease between a supplier and the Council for Geoscience entered into from 01 October 2015 to 31 July 2020.		
	At the reporting date, the outstanding commitments under non-cancellable operating leases, which fall due are as follows:		
	Up to I year	1 121	1 140
	Total lease commitments	**1 121**	**1 140**
18.3	**Commitments**		
	Operating expenditure		
	Approved and contracted	29 274	25 289
	Approved but not yet contracted	-	-

18 Operating lease commitments (continued)

	2020 R'000	2019 R'000
Capital expenditure		
Approved and contracted: Property and equipment	69 701	5 101
Approved but not yet contracted: Property and equipment	1 548	889
Total commitments	**100 523**	**31 279**
Commitments		
Up to I year	52 950	25 623
2 to 5 years	47 573	5 656
Total commitments	**100 523**	**31 279**

The Council for Geoscience has usage based contracts for the provision of the following services

- Sampling Services Geophysics
- Accommodation and travel
- Courier services

19 Financial instruments

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

19.1 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 on-going basis. The Council for Geoscience does not have any significant exposure to any individual customer or counterparty.

Trade receivables and other payables are carried at amortised costs. Refer to notes 7 and 9.

19.2 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 2020

19 Financial instruments (continued)

	2020 Weighted average effective interest rate %	2019 Weighted average effective interest rate %
Assets		
Cash	3.90%	3.94%
Call accounts	6.87%	7.22%

Short-term deposits

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.
- Short-term deposits are only reinvested or invested with Management approval.

19.3 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 2020 is disclosed in note 20.

19.4 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.

20 Foreign currency exposure

	2020 R'000			2019 R'000		
	Exchange rate	Foreign amount	R-value	Exchange rate	Foreign amount	R-value
20.1 Trade receivables						
Foreign currency						
Euro	R 19.27180	€ 0,00	0	R 14.34280	€ 0,00	0
US$	R 17.62600	$34	596	R 14.28750	$72	1 032
20.2 Banks						
Foreign funds						
Euro	R 19.27180	€ 240	4 625	R 16.02640	€ 240	3 846

	2020 R'000	2019 R'000

21 Related-party transactions

During the period, the following related-party transactions took place between the Council for Geoscience and the Department of Mineral Resources & Energy:

Total grant received	414 062	405 983

Refer to note 10 for further details regarding transactions with the Department of Mineral Resources & Energy.

All other related-party transactions were concluded at arm's length.

Relationships:

Parent National Department: Department of Mineral Resources & Energy

22 Irregular expenditure

Opening balance	-	74
Irregular expenses identified in the current year	-	-
Expenditure condoned	-	(74)
	-	-
Details of irregular expenditure identified in the prior year		
Non-compliance with National Treasury's instruction on local content when purchasing field clothing.	-	-
	-	-

23 Events after reporting date

Non-Adjusting events

Deep drilling programme in Beaufort-West

The Council for Geoscience awarded a contract to a service provider for a Deep Vertical Stratigraphic research core borehole for the Karoo Deep drilling programme in Beaufort-West with an estimated value of R35 million.

Probalistic seismic hazard analysis

The Council for Geoscience awarded a contract to a service provider to oversee the planning, development and technical execution of a probalistic seismic hazard analysis for a nuclear site with an estimated value of R34 million.

23 Events after reporting date (continued)

CGS appointed as implementing agent for the Carbon Capture, Storage and Utilisation project (CCSU)

The Council for Geoscience has been appointed as the implementing agency of the CCSU project. The Director General of Minerals and Energy requested South African Nation Energy Development Institute (SANEDI) to transfer the MTEF funding allocations that were made available for the Carbon Capture, Storage and Utilisation project to the CGS. The total value of project is still being evaluated.

COVID-19 Pandemic

The Novel Corona Virus pandemic and subsequent supplementary budget speech has not materially impacted the CGS, however the programme of the CGS has been streamlined to maximise on delivery and impact.

No facts nor circumstances of a material nature arose between the financial year-end and the date of this report which needs to be reported as part of these annual financial statements apart from the items mentioned above.

24 Correction of prior year error

Nature	Period	2020 R'000	2019 R'000
A correction was made to the financial statements on revenue that was not recognised in the period to which it relates.	31-Mar-18	-	(2 544)
A correction was made to the financial statements on revenue that was not recognised in the period to which it relates.	31-Mar-15	-	(35)
A correction was made to the financial statements on other income that was not recognised in the period to which it relates.	31-Mar-19	(279)	-
A correction was made to the financial statements to depreciation/amortisation for prior period.	31-Mar-18	-	514
A correction was made to the financial statement to prepaid expenses for the prior period.	31-Mar-19	(397)	-
A allocation correction was made from expenditure and capitalised.	31-Mar-19	(2)	(286)
A correction was made to expenditure that was not recognised in the correct period. .	31-Mar-19	5 203	378
An adjustment was made to payables in the prior period relating to a construction project retention.	31-Mar-18	-	(2 257)
An adjustment was made to fixed asset in the prior period for the capitalisation of the construction project retention.	31-Mar-18	-	2 257
Adjustment was made to estimated useful life of property and equipment. Correction could only be made in 2018/2019 financial year due to impractibility of calculation for prior years. This is due to the unavailability of information from inception of the affected property and equipment.	31-Mar-19	-	(3 356)
		4 525	**(5 329)**

24 Correction of prior year error (continued)

	2020 R'000	2019 R'000
Effect		
Statement of financial performance as at 31 March 2019		
Revenue recorded in the incorrect period - MTEF	-	(2 544)
Revenue recorded in the incorrect period - Commercial Revenue	-	(35)
Other income recorded in the incorrect period - Recovery of study debt/Insurance claims	(279)	-
Expenditure recorded in the incorrect period	5 203	-
Prepaid expenses not accounted for correctly	(397)	-
Depreciation/amortisation recorded in the incorrect period	-	514
Work in progress captured as an expense	(2)	(286)
Adjustment to depreciation/amortisation as a result of change in estimated useful life of property and equipment	-	(3 356)
Reallocation of expenditure erroneously capitalised	-	378
	4 525	**(5 329)**
Effect		
Statement of financial position as at 31 March 2019		
Government Grant Project Related Revenue Recognised - Deferred income	-	2 544
Commercial Revenue - Deferred income	-	35
Study debt recovered and insurance claim accounted for correctly	279	-
Work in progress not provided for - Payables	-	(2 257)
Work in progress not provided for - Property & Equipment	-	776
Capitalisation of technical asset	-	1 481
Expenditure recorded in the incorrect period not provided for	(5 203)	-
Prepaid expenses not accounted for correctly	397	-
Accumulated depreciation/amortisation recorded in the incorrect period	-	(514)
Work in progress captured as an expense	2	286
Adjustment to accumulated depreciation/amortisation as a result of change in estimated useful life of property and equipment	-	3 356
Adjustment for asset capitalisation error	-	(378)
Statement of net assets for the period ended 31 March 2019		
Accumulated surpluses	(4 525)	5 329

24 Correction of prior year error (continued)

		2020 R'000	2019 R'000
Correction of Prior year disclosure			
Nature			
Disclosure as at 31 March 2019			
Restatement of closing balances of cumulative expenditure recognised in the carrying value of property and equipment being developed/constructed:			
Buildings and Fixtures	31-Mar-19	-	5 919
Equipment	31-Mar-19	-	1 865
Aircraft and Boat	31-Mar-19	-	57
Restatement of closing balances of commitments			
Approved and contracted	31-Mar-19	-	(25 370)

Effect

None (only disclosure item)

25 Change in accounting estimate

The useful lives and residual values of property and equipment was reassessed. This resulted in change of estimated remaining lives of certain assets in categories listed below:

	Old	New
Equipment	5 - 7 years	5 - 10 years
Office furniture	20 years	20 - 23 years
Motor vehicles	5 - 8 years	5 - 10 years
Computer equipment	6 years	6 - 11 years
Computer software	2 - 5 years	2 - 8 years

The effect of the change in accounting estimate has resulted in depreciation amounting to R 3,117,150 in 2019/2020.

The change of R4,675,726 will be reflected in future periods.

Due to the change in accounting estimate regarding the useful life of assets, the depreciation expense is reported at:	20 563	23 178
Equipment	14 362	15 830
Office furniture	628	674
Motor vehicles	2 466	3 136
Computer equipment	2 297	2 218
Computer software	810	1 320

25 Change in accounting estimate (continued)

	2020 R'000	2019 R'000
Depreciation expense using the previous rates would have been reported at:	23 679	21 082
Equipment	16 756	14 617
Office furniture	635	671
Motor vehicles	2 670	2 863
Computer equipment	2 719	1 889
Computer software	899	1 042
Difference	(3 117)	2 096
Equipment	(2 394)	1 213
Office furniture	(8)	3
Motor vehicles	(204)	274
Computer equipment	(422)	329
Computer software	(89)	278

26 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:		
- Gemstone collections	1 445	1 445
- Meteorite collections	2 804	2 804
- Mineral collections	13 313	13 313
	17 562	**17 562**

The heritage assets were at initial recognition valued at fair value using evaluators with the following credentials :

Fossils -	Professor for Paleontological Research, University of the Witwatersrand
Mineral collections -	M.Sc. Geology and Professor and Chairman of the Department of Geology, University of the Witwatersrand
Meteorite collections -	Author of "Meteorites", Private collector of meteorites
Gemstones -	M.Sc. Geology

26 Heritage assets disclosure (continued)

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 (fossil) 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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Council for Geoscience

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