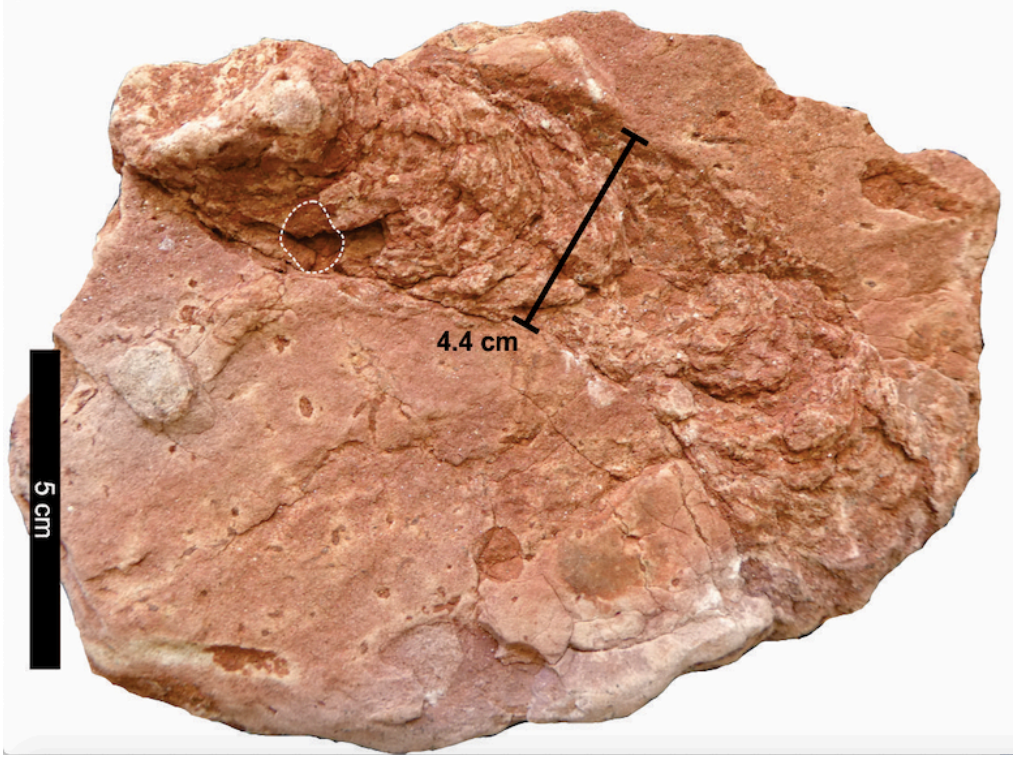
Geological Society of Zimbabwe

Newsletter

May 2022 No. 2 of 3 of 2022



Beaconites isp. Type 2 meniscate burrow preferentially weathering because of carbonate material within burrow lamination. White dashed area indicates secondary cross-cutting burrow(s). *Photo: Lara Scicio, 2021.*

www.geologicalsociety.org.zw

The Geological Society of Zimbabwe, P.O. Box CY 1719, Causeway, Harare

Contents

Editorial

With this, the first issue of the Newsletter under the Chairmanship of Kennedy Mtetwa, it is opportune to welcome him and his new Committee to the leadership of our Society. We wish them well in their endeavours on our behalf. At the same time we acknowledge the sterling work undertaken by the outgoing Committee under the stewardship of Renias Tirivabaya.

The A.E. Phaup Award for the best adjudicated publication advancing the geological understanding of Zimbabwe for 2021 was not made.

The Geoffrey Bond Award for the best Honours Degree dissertation in Geology presented for examination in the Department of Chemistry and Earth Sciences in 2021 was made to Gerald Kupeta for his project entitled *"Petrology and depositional features of the Lower Argillaceous Series, Dunstan Farm, Chimanimani: Possible Charleswood diamondiferous grits extension."*

The James Freeman Wilson Award is to the Geology or Geophysics Honours student who presents the best project report in the year preceding an Annual General Meeting. The nomination is made by the Chairperson of the Geosciences Department in the Faculty of Engineering and Geosciences at the Midlands State University. The inaugural recipient for 2021 was Nyasha Mable Gerema for her dissertation entitled *"An investigation into the structural controls of mineralization at Eureka Gold Mine."*

Willard Makwanya was presented with the Mike Vinyu Award for his project *"Kimberlite orebody delineation of the V8K3 pipe at Sese"* presented in 2020 for his National Diploma in Mining Geology at the Zimbabwe School of Mines.

The Keith Viewing Award for the best presentation at the November 2021 Summer Symposium was to Brian Mapingire for his delivery relating to the *"Structural constraints on the evolution of the south-eastern Mwanesi Greenstone Belt and adjacent granitoids, central Zimbabwe Craton: implications for gold mineralization".*

Congratulations to all recipients. Abstracts and citations for these awards are recorded for your interest as are the abstracts for three publications achieved by members of the Geology Department of the University of Zimbabwe. I encourage news and exposure of other research projects being undertaken through our institutions.

Our thanks are extended to our contributors for keeping us up to date with the activities of our Earth Science institutions, the Geological Survey and our Mining Industry. These columns are insightful and represent a meaningful record for posterity.

Tim Broderick

Chairperson's Chat

Kennedy Mtetwa
kcmtetwa@yahoo.co.uk

Greetings to you All.

It is a great honour for me to be chairing the Geological Society of Zimbabwe Committee for the 2022 term. My first task in this inaugural chat as the Chairperson of the Geological Society of Zimbabwe is heartfelt as I thank Renias Tirivabaya and all Members on last year's Committee for the very good work they undertook on our behalf. As listed in the contact details for your incoming Committee, it is a pleasure to welcome new Members Tenyears Gumede, Tarisai Marazani and Chenjerai Chiumburu who have joined us as we set off on the wonderful journey that 2022 will bring. It is reassuring that many of our stalwarts elected to stay on so as to ensure continuity in our work programmes. To this end Renias will be working on progress towards professional registration for our geologists.

Tenyears Gumede, as Vice Chairperson of the Geological Society of Zimbabwe, has taken over from me as our representative on the Council of the Chamber of Mines for the 2022/2023 term of office. This office allows for improved liaison with Industry.

In particular I would like to congratulate 2021-Committee Members and those comprising the Sub-Committee who organized the very successful November Summer Symposium and Nyanga Field Excursion.

This year we will continue the efforts initiated by the previous Committee in keeping the geological community informed about points of geological interest in Zimbabwe. We will endeavour to organize more talks and field trips to interesting sites around the country. Members are most welcome to volunteer to present talks on any geological subject of their choice either via zoom or in person. Those interested please do contact Steven Duma in this regard.

Our year started off with a talk in May by Omberai Mandigaisa entitled *"Quantification of the impacts of Rock Mass Quality on Stope Width Control and Pillar Stability in a hard rock-narrow reef mine"*.

The highlight of the year will be the prestigious A.M. Macgregor Memorial Lecture to be presented by our old friend **Dr Sharad Master**, which will be delivered in Harare on 21st October in conjunction with the Summer Symposium. Sharad will then lead a field trip, probably to the Magondi Belt on 22nd October before proceeding to Bulawayo for a further public presentation.

I would like to encourage our Members to ensure that they are up-to-date with their annual subscription payments so that your Society remains viable. On your side, as Geological Society of Zimbabwe Members, please encourage your colleagues to become Society Members. Recent geology graduates are encouraged to join the Society as they will be able to benefit

from the soon-to-be-launched Mentorship programme. The Membership Application form is available on our webpage: **www.geologicalsociety.org.zw**

I look forward to your enthusiastic support as we take our journey through 2022, and I wish you all the best for our year ahead.

Profile for the Chairman
Geological Society of Zimbabwe, 2022

Kennedy C. Mtetwa

- Managing Geologist to Great Centre Geological Services (Pvt) Ltd.
- has 31-years of post-graduate experience in Mineral Exploration and Development in South, Central and East Africa and received exploration-technique training in Australia.
- Has gained Proterozoic, Archaean gold belt and Central African Copperbelt experience,
- Leading to proficiency in copper, cobalt, gold, nickel, PGEs, vermiculite, fluorspar and diamond ore assessment.
- As a result of this experience and his qualifications, he is a Qualified Person as defined in National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI43-101).
- He co-authored several technical reports for Toronto-listed First Quantum Minerals as a Qualified Person of the British Columbia Securities Commission NI43-101,
- And was part of the discovery team of First Quantum's Frontier 200 Mt copper deposit in the Democratic Republic of Congo - "A virgin copper deposit discovery".
- Kennedy led the discovery team for the Chaka Gold Deposit near Kwekwe in Zimbabwe.
- He was an adviser on Mineral Resource Development to the Common Market for Eastern and Southern Africa (COMESA) Secretariat based in Lusaka, Zambia (2010-2011).
- Kennedy is a very enthusiastic Exploration Geologist, driven to find new world-class mineral deposits.

Articles and Reports

Invertebrate and Plant Trace Fossils from the Terrestrial Late Triassic of Zimbabwe

Lara Sciscio, Timothy J. Broderick, Paul M. Barrett, Darlington Munyikwa, Michel Zondo and Jonah N. Choiniere

ABSTRACT:
Upper Karoo Group (Gwembe Sub-basin, Mid-Zambezi Basin), Zimbabwe. These ichnofossils appear in pedogenically modified siltstone and silty mudstone floodplain deposits and overbank fluvial channels. The ichnofossil-bearing sites show variability in their pedogenic features, maturity and preservation. Invertebrate ichnofossils are primarily recorded as horizontal, vertical and inclined burrows, sometimes branched, lined or unlined and may have an active meniscate infill. The common forms documented are Taenidium, Beaconites, Palaeophycus, Skolithos, and Planolites ispp. with some rare and more unusual morphologies (i.e., 'Y'-shaped burrow type). Ichnofossil-bearing sites show a low-diversity but high-density of traces commonly dominated by Taenidium and Planolites ispp. The greatest diversity of invertebrate ichnofossils are within interbedded overbank sandstones in weakly pedogenically modified overbank sites. Rhizohalos and rhizoliths are common and often include carbonate infilled roots. Given the abundance and dimensions of fossilized wood and the rhizohalos and rhizoliths, the Pebbly Arkose Formation supported both large and small stature plants. Overall, the studied Pebbly Arkose Formation overbank areas are typically well-drained, calcic palaeosols subject to variable discharge, subaerial exposure, and supporting a diversity of plant and invertebrates tracemakers that lived in a semi-arid to sub-humid environment.

PALAIOS, 2021, Vol. 36, pp. 129–140 DOI: http://dx.doi.org/10.2110/palo.2020.071

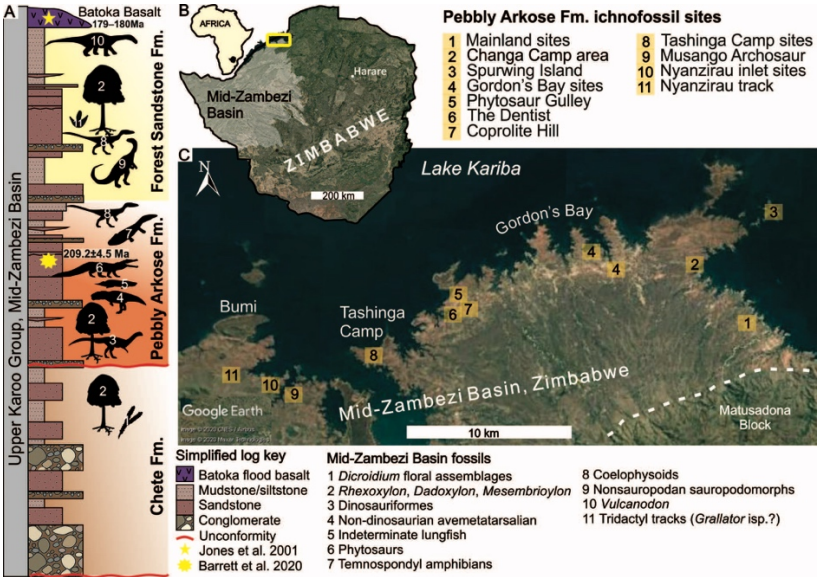


FIG. 1.—Schematic log and map of the study area in Zimbabwe. A) Lithostratigraphy and fossils of the Triassic–Jurassic Chete, Pebbly Arkose and Forest Sandstone formations (Upper Karoo Group) of the Mid-Zambezi Basin (Zimbabwe). Wavy red line - unconformity, Fm. - Formation. B) Google Earth image of Zimbabwe with the Mid-Zambezi Basin delineated and the yellow box illustrates the study area shown in (C). C) Trace fossil-bearing locations along the southern shoreline of Lake Kariba, Zimbabwe. Numbers in yellow boxes correspond to site names. Radioemetric ages are provided by yellow stars. Map data: Google, CNES/Airbus and Maxar Technologies 2020.

Petrography and depositional features of the Lower Argillaceous Series; Dunstan Farm, Chimanimani: Possible Charleswood Diamondiferous Grits extension.

Gerald S.T. Kupeta
A dissertation submitted in partial fulfilment for the requirements
of the
Bachelor of Science Honours Degree in Geology
Department of Chemistry & Earth Sciences
Faculty of Science, University of Zimbabwe

ABSTRACT

This research presents a study conducted on petrographic and depositional features of the Lower Argillaceous Series [Formation] of the Umkondo Group as exposed on Dunstan Farm, Chimanimani in order to delineate the lithologies and to determine whether the study area under investigation is a possible southern extension of the Charleswood diamondiferous grit unit. Diamond mineralization is found in coarse grits, which strike north-south across Charleswood Farm. Further south on Dunstan Farm, surface geological mapping was undertaken to identify any possible extension of this grit unit. The methodologies used include a desktop study, surface geological mapping, X-Ray fluorescence analyses, petrographic analyses, heavy mineral separation analyses, data analysis and interpretation. Within the study area, six lithologies were identified namely dolerite, mudstone, sandstone, quartzite, grit and shale. The high titanium values suggest the Umkondo sediments to have a basic igneous rock parentage. The study area was subjected to Greenschist Facies metamorphism. The white quartzite of Watson, (1969) is sandstone whilst his grey quartzite is the grit unit. The the coincidence of analytical comparison of the grit unit from north to south, including petrographic and heavy mineral analyses, suggest that the study area is a possible southward extension of the Charleswood diamondiferous grit unit.

Reference

Watson, R.L.A. 1969. The geology of the Cashel, Melsetter and Chipinga areas. *Rhod. geol. Surv.,* Bulletin No. 60, 85pp.

CITATION FOR THE GEOFFREY BOND AWARD 2022: Gerald Kupeta

Gerald joined the University of Zimbabwe Geology Department as a first-year student in 2017 and graduated in 2021. He was a hard-working student who improved year by year. In 2020, he did his industrial attachment at the Geological Survey of Zimbabwe where he learnt and assisted in the processing of geophysical data using *oasis montaj*. He also compiled notes on exploration from Exclusive Prospecting Order (EPO) Nos 901 to 920 for inclusion in the next EPO bulletin before moving to the Zimbabwe Consolidated Diamond Company where he worked in the Chiadzwa diamond fields. Here, he became interested in the genesis and deposition of Umkondo-Group diamonds such that he pursued his BSc Honours project on the subject of diamonds by investigating the possible southward extension of the known Chimanimani deposit across Dunstan Farm.

Gerald mastered most analytical methods associated with placer diamond deposits and is keen to further his investigation in this field.

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F.B. Mupaya

The Mike Vinyu Award for 2021 – Willard Makwanya

Mr Willard Makwanya enrolled at the Zimbabwe School of Mines in 2018 and completed his studies in 2020 for a National Diploma in Mining Geology. He completed his project, which is entitled *Kimberlite orebody delineation of the V8K3 pipe at Sese*, in 2019. The aim of the project was the kimberlite ore body delineation of the V8K3 pipe at Sese. In ensuring that the project was carried out successfully, a number of objectives were put in place. The first objective was to identify and distinguish the individual kimberlite facies, namely kimberlite 1, kimberlite 2, kimberlite 3 and kimberlite 4. The second objective in the project was to distinguish the main kimberlite pipe facies from the marginal pipe zone and the country rock. Data quality assurance and quality control with the creation of a preliminary exploration database comprising a detailed lithology file, a collar file and a survey file constituted the third and fourth objectives of the project.

Since the discovery of the V8K3 kimberlite pipe in 2002, a total of seven (7) diamond drill holes and ninety-nine (99) Reverse Circulation holes were drilled to determine the horizontal extent of the intrusion. Although earlier drilling by Rio Tinto had confirmed the existence of a kimberlite pipe, not all the drilling information was available and so could not be used for any interpretive analysis. This absence of critical exploration data necessitated the drilling new campaign to delineate the same kimberlite pipe. Delineation by means of verifiable diamond core drilling is a critical step in determining the economic viability of any deposit, which is carried out to determine the geometry, calculate volumes and subsequent tonnages of various lithologies.

Murowa Diamond Mine had invested heavily in this exploration through the purchase of four Exploration Core Drilling rigs and the hiring of drilling crews to operate them. The delineation drilling of the V8K3 was important in upgrading and making key organizational decisions as whether or not to abandon or invest more in the deposit in order to upgrade the resource/reserve base. The project was seeking to address a critical step in order to enhance feasibility studies. This delineation drilling programme increased confidence in resource modelling and subsequent the diamond resource estimation.

I would like to send my sincere gratitude to the lecturers for guidance that they provided to enable him to reach this stage. These include the Head of Department (Geology) Mrs F. Ndebele, Mr T.L. Matete (Geology Lecturer) and Mrs C. Ndondo (Geology Lecturer). This was preceded in the theoretical part in lectures and practical part during educational trips in the field. I would also want to thank all the persons that worked with him during his learnership and training period both in classroom and in the field, including his classmates and work colleagues. They played a vital role in propelling him to where he is today.

Great honour and respect is extended to the Murowa Diamonds exploration team at Sese who assisted him in making this whole work fruitful. I would like to thank Mr A. Manyumbu (Senior Geologist), Mr I. Emissary (Exploration Geologist), Mr L. Razika (Geologist), Mr V. Mapepa (Geologist) and Mr B. Mqcini (Geological Technician). You are saluted for your exceptional and relentless effort provided during the course of the project.

Fyrence Ndebele

DEPARTMENT OF GEOSCIENCES

An Investigation into the Structural Controls of Mineralization at Eureka Gold Mine.

Nyasha Mable Gerama

Dissertation submitted in partial
fulfilment of the requirements
for the degree of
BACHELOR OF SCIENCE HONOURS IN APPLIED GEOLOGY

October 2021

ABSTRACT

The success of gold mining in the greenstone belts of Zimbabwe relies heavily on careful structural analysis, which plays an important role at all stages in exploration for the precious metal, as there is a clear spatial and structural association between gold deposits and deformation zones. The main objectives in bringing together this project was to delineate the extent to which geological structures influence gold mineralization concentrations, to identify the alteration zones and to outline the structures associated with gold mineralization. The resource model being used at Eureka Mine was not exhaustive since it had not taken into consideration the possible effects of structural controls on mineralisation beyond the studied levels. Taking advantage of the current open pit mine exposure, the researcher carried out an investigation on structural gold mineralization patterns to then determine the extent of mineralization and provide a basis for profitable extraction. There was risk of ore bodies or reefs that might have been missed. Above all, there was need to assure the shareholder that they were deriving maximum possible value before their plans missed out on those resources.

After careful revision of previous geological research work in the area around Eureka, surface mapping of the surroundings at a scale of 1:5000 was done to identify lithological changes and determine local structural patterns. Stereographic projections of geological structural data were also prepared whilst grab samples were collected and sent for gold assay. The assay results assisted in determining variations in the grade of mineralization. Representative samples were collected and made into thin polished sections for petrographic studies and microstructural analysis. Hand specimens were also analyzed for alteration type and to determine the extent

of alteration. Received assays were related with lithology and structures to assess controls associated with mineralization. A more defined model suggests hydrothermal alterations as evidenced by retrograde metamorphism combined with assimilation processes that facilitated the mobilization and leaching of gold.

The project determined alternative ways to identify gold presence, controls and distribution within the Eureka area. An understanding of the structural controls assisted in predicting gold grades in the areas targeted for mining. This also led to a better understanding of gold mineralization within the area of interest whilst increasing potential profits to the mining project. The success of the project gave a certain future in terms of production. New ore bodies meant more profitability compared to previous revenue projections. It granted confidence for continued mining activities and optimistic grade values. These grades would allow mining to be carried out at a profit. This also gave the company a cost risk assessment through the grade values and the measured distance of the reef, and reworking of the resource model. Overall, this assessment has improved mine planning, ore production and mining economics for the Eureka Mine.

Join the Geological Society of Zimbabwe Facebook Group

News

Geology Division: Department of Chemistry and Earth Sciences, University of Zimbabwe

Maideyi Meck

The department continued to move forward in the face of the Covid-19 pandemic. Teaching took place by means of both face-to-face and online lessons. We managed to secure funding from the *Adaption Fund* in order to host a hydrogeology centre, which will offer a Master's degree and other post-graduate courses in the discipline.

The government has requested the University of Zimbabwe to initiate *PAMUST* – (*Pan-African Minerals University of Science and Technology*). All being well this new university will be up and running by August 2022. Those who wish to be a part of this new initiative, whether as lecturers or students, should watch out for advertising through the media.

Academically the department has done well and we have had accepted three publications during the 1st quarter of 2022. These papers are accessible through the following links:-

https://authors.elsevier.com/c/1e-OI14fdG~Jgg

Latest Mesoproterozoic (ca. 1.2–1.1 Ga) amphibolite-facies metamorphism from the Dete-Kamativi Inlier, NW Zimbabwe: Implications for a Rodinia-related intracratonic orogen in Southern Africa

Prince Mandingaisa, Toshiaki Tsunogae, Sam Uthup, Thembiso O. Basupi, Maideyi Lydia Meck and Yukiyasu Tsutsumi

ABSTRACT

The Magondi Belt has been regarded as a Palaeoproterozoic orogen formed by the collision of the Zimbabwe Craton and an unknown continental block. The Dete-Kamativi Inlier (DKI) located approximately 200km west-southwest of the main Magondi Belt has been regarded as an extension of the belt. Here, we report new geochronological data for pelitic schists and a felsic orthogneiss from the DKI using monazites (CHIME method) and zircons (LA-ICP-MS analysis), and discuss the tectonic evolution of the region. Zircons from a felsic orthogneiss in the Kamativi area yielded magmatic and metamorphic ages of 2279 ± 25Ma and 2020 ± 28Ma, respectively. Similar Palaeoproterozoic ages of ca. 2.1–1.8Ga were also obtained from subhedral and rounded monazite grains in the pelitic schists. In contrast, irregular-shaped monazite intergrown with biotite in a different pelitic schist gave three latest Mesoproterozoic isochron ages of 1196 ± 37Ma, 1143 ± 32Ma, and 1070 ± 25Ma, suggesting a long-lived (>120 million years) thermal event with several monazite-growing stages. Consistent isochron ages of 1062 ± 41Ma and 1061 ± 26Ma were obtained from monazites in the felsic orthogneiss and metapelite samples from an adjacent region. The application of phase equilibrium modelling for the peak mineral assemblage in the garnet-andalusite-biotite-cordierite-bearing pelitic schist with 1196–1070Ma metamorphic ages indicated a peak P–T condition of 520–600°C and 1.5–2.5 kbar, suggesting low-pressure amphibolite-facies metamorphism. The condition is lower than that obtained from the hornblende-plagioclase geothermometry of amphibolites (>700°C) from the southwest part of the DKI, which probably corresponds to an earlier (ca. 2.0Ga) high-grade metamorphic condition. The youngest

thermal event, 994–982Ma, from a monazite rim in a mylonitic orthogneiss might correspond to the timing of later deformation. The latest Mesoproterozoic (1.2–1.1Ga) amphibolite-facies metamorphism was likely associated with an intracratonic orogeny related to the activity of broadly coeval orogenic events, such as the Namaqua-Natal orogenic belt related to the amalgamation of the Rodinia supercontinent. Regional magmatic activity of the Umkondo large igneous province at 1112–1108Ma could have also been an additional heat source.

Precambrian Research, 376 (2022) 106688 https://doi.org/10.1016/j.precamres.2022.106688

http://journal.frontiersin.org/article/10.3389/fenvs.2021.754540/full?&utm_source=Email_to_authors_&utm_medium=Email&utm_content=T1_11.5e1_author&utm_campaign=Email_publication&field=&journalName=Frontiers_in_Environmental_Science&id=754540

Community-Based Monitoring Detects Sources and Risks of Mining-Related Water Pollution in Zimbabwe

Désirée Ruppen, Owen A. Chituri, Maideyi L. Meck, Numa Pfenninger and Bernhard Wehrli

ABSTRACT

Although mining and mineral processing are vital for many economies in the Global South, they are associated with enormous challenges of managing potentially devastating environmental impacts. In contexts where environmental oversight agencies often lack financial and personal capacities to fulfil their role, community-based monitoring might be a valid alternative to monitor potential environmental impacts. In this study, we present the setup and the implementation of a citizen science project to monitor water quality parameters in a river downstream of a coal mining area in Hwange, western Zimbabwe. In a joint effort over 1.5 years, community monitors and scientists took close to 800 water samples in the Deka River and effluent channels. The data allowed identifying sources of pollution and relating these to past and present mining activities. The primary source of acid mine drainage came from abandoned underground mine sites. Illegal mine water dumping from active mine sites accentuated the problem and resulted in fish kills and food risks for the local population. Concentrations of manganese, nickel and arsenic were exceeding national fresh water guidelines and international drinking water standards. Manganese concentrations exceeded guidelines by a factor of 70 resulting in a public health risk. In this study, we showed that community-based monitoring offers a promising approach to establish a high-quality dataset for assessing mining-related risks if the implementation of sampling protocols is followed tightly. The monitoring scheme significantly improves the collection and interpretation of water quality data in challenging contexts where governmental institutions and industrial players are not enforcing environmental standards.

Frontiers in Environmental Science, 2021, Vol. 9, article 754540 doi: 10.3389/fenvs.2021.754540

http://journal.frontiersin.org/article/10.3389/fenvs.2022.829900/full?&utm_source=Email_to_authors_&utm_medium=Email&utm_content=T1_11.5e1_author&utm_campaign=Email_publication&field=&journalName=Frontiers_in_Environmental_Science&id=829900

Application of Geochemical Indices in Evaluating Potentially Harmful Element Contamination at Mining Centres in the Sanyati

Daina Mudimbu, Theophilus C. Davies, Dexter Tagwireyi and Maideyi L. Meck

ABSTRACT

The release of potentially harmful elements (PHEs) into the environment in mineralised and mining areas has been associated with a variety of health-related disorders, especially non-communicable diseases such as cancer, heart and kidney failure and mental and cardiovascular disorders. The present study sought to evaluate the application of geochemical indices in assessing the degree of contamination at two sites, Kadoma and Hurungwe, both within the Sanyati Catchment, an important mining and agricultural hub in Zimbabwe. This evaluation was conducted by determining the concentration levels of 16 PHEs in 58 top-soil and stream sediment sample locations. The samples were collected during the period 2015–2017 and analysed for total PHE content using Inductively Coupled Plasma Mass Spectrometry (ICP-MS). To assess the degree of contamination of the soils and stream sediments, contamination indices were computed and the potential ecological risk to the area was evaluated. A correlation analysis revealed PHE associations as strongly influenced by lithology and gold mineralisation in the Kadoma setting. Assessment of multi-element contamination using the pollution load index revealed significant contamination in 52% of the soil sample sites and 38% of the sediment sample sites in Kadoma. The results indicate that As, Cr, Mo, and Sb are the main contaminant PHEs in the Kadoma site. Potential ecological risk ranged from moderate to very high at 71% of soil sample locations and 53% of sediment locations and the key contributors were Sb, As, and Hg. At the Hurungwe site, Cr and Mo were found to be key contaminants with a low potential ecological risk for all samples. This study demonstrates the successful application of geochemical indices in evaluating the degree of single and multi-element contamination as the first step toward a human health risk assessment in mining environments. It is expected that these results would assist municipal authorities in their effort to formulate credible mitigative measures to protect the health of nearby residents and surrounding ecosystems and make an informed decision regarding land use planning and post-mining rehabilitation of contaminated land at mining centres.

Frontiers in Environmental Science, 2022, Vol. 10, article 829900 doi: 10.3389/fenvs.2022.829900

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The Mennell Geological Society

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fbmupaya@gmail.com

MARCH 2022 – REPORT

Work Done

The Mennell Society would like to recognise and appreciate the hard work achieved by their leadership during the time spanning the Covid pandemic restrictions. Interactive discussions on a variety of topics during this period were achieved. In March this year we covered the broad subject of spanning the geological evolution of Southern Africa. We convened a number of meetings to discuss various types of mineral deposit hosted by the Zimbabwe Craton. Some sub-topics included the emplacement of the Chinamora Batholith with particular attention placed on its influence with respect to gold mineralization. During March, we extended our enquiry into understanding the method of emplacement of the Great Dyke, and also studied the development of the major mobile belts, including the Magondi Belt, whilst considering the genesis of various mineral deposits hosted by them.

Field Trip

As we need to visit the Chinhoyi area in order to appreciate karst landforms in particular, but also to appreciate the major shear zone exposed in the Manyame River, **we still appeal to our Mentors in the Geological Society of Zimbabwe to assist us with funds in order to achieve this one-day trip**, for which a date is yet to be fixed.

Notification

ELECTIONS WILL BE HELD FOR THE SOCIETY EXECUTIVE POSTS. ALL OF THE POSTS WILL BE VACANT AT THE END OF MAY 2022. THE OUTGOING EXECUTIVE WILL ASSIST IN ORGANISING THE ELECTIONS. ALL THE POSTS ARE IN THE MENNELL ARTICLE OF 2022.

MIDLANDS STATE UNIVERSITY

FACULTY OF ENGINEERING & GEOSCIENCES
ZVISHAVANE CAMPUS

Updates from the Faculty of Engineering & Geosciences

Introduction

The current Semester at MSU commenced on 23rd May 2022 with an orientation programme for new students. Returning students joined in a week later on 30th May. Face-to-face learning and teaching activities are going on smoothly and are in accordance with the MSU roadmap, which will require students to leave the MSU campuses for a stint of online teaching and learning before they return for another session of face-to-face learning and teaching, as well as for their examinations. This blended learning and teaching has been a very handy approach in the face of the ongoing Covid-19 pandemic.

Staffing

Given the ongoing recruitment processes and the staff development initiatives, the staffing situation in the Faculty is stabilising. The Department of Metallurgical and Materials Engineering and the Department of Fuels and Energy Engineering expect to hold interviews soon to fill critical posts in their establishments. In its ongoing drive for effective collaborations, the Faculty is expecting to host researchers from the University of Johannesburg and the University of Oxford from next month.

Student Activities

Student activities have been low-key due to their long absences from Campus. However, when Covid-19 restrictions were relaxed in April 2022, students took advantage and partook in more out-door activities. In early May, students and staff from the Faculty teamed up with their counterparts from Chinhoyi University of Technology (CUT) and the National University of Science & Technology (NUST) to take in visits to industrial mineral deposits and processing plants in order to learn more about various commodities and their processing and to encourage their potential contributions to research and development in the this subsector. The excursion was funded by the Higher Education Partnerships for sub-Saharan Africa (HEP SSA) project funded by Royal Academy of Engineering in the United Kingdom.

Conclusions

Despite the ongoing Covid-19 pandemic, sufficient learning and teaching activities are being delivered via our blended approach. Outdoor student activities should become more visible as the pandemic relaxes. Meanwhile effective collaborative partnerships should continue to be built upon and strengthened to enhance learning-and-teaching outcomes.

Submitted by Dr Antony Mamuse, Executive Dean
mamusea@staff.msu.ac.zw

ZIMBABWE SCHOOL OF MINES

Serving the SADC mining industry

The ZSM is still trying to attach students and so an appeal is made to all mining houses to consider taking our students onboard as attachment is an important and compulsory part of their training.

We invite a member of the Geological Society to give a lecture on the Great Dyke to the third-year class. This group will have a field trip to the Dyke from 19-25 June. Contact fndebele@zsm.co.zw for more information.

Submitted by Fyrence Ndebele

MANICALAND STATE UNIVERSITY OF APPLIED SCIENCES

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Department of Mining and Processing Engineering

The final set of students under Midlands State University who had enrolled at Manicaland State University of Applied Sciences finished exams well and the class will graduate at a date to be announced later in the year. For the remaining students, lectures progressed well, both face-to-face and online through to completion of semester exams.

The new semester is set to begin with face-to-face lectures resuming for first-year, third-year and final year students on 30th April. The rest of the students will start physical contact on 16th May. We hope that with the improvement of the Covid-19 situation in the country that the teaching and learning process will go more smoothly when compared to the previous two years.

Research efforts are also being made by the Department in the sphere of Artificial Neural Networks for Ore Blending. ANN involves the application of high performance computing to blend high and low-grade ores in order to maintain grade control through the plant. Our industrial key players are being urged to help facilitate the progress of this research as it is mutually beneficial. The Department is also seeking to develop short courses that are well suited to industry requirements.

We continue to encourage our industrial partners to assist our students with industrial attachment, as work-related learning continues to be an essential part of their education.

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Contributed By: Hazel Chibaya

Research. *Innovation.* *Sustainable Development.*

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Geological Survey Department

The professional staffing situation at the Geological Survey remains bad. Recruitment of new geoscientists is frozen, although efforts are being made to have some of the posts filled. However, the staffing situation at province-level is good. Efforts are being made to link the geological efforts being made provincially with aims of the Geological Survey. The following table lists the names of geologists and geological technicians in each of the eight non-urban provinces of the country.

Mashonaland West		
Geologists	Mpindiwa, Sibongubuhle – current PMD	F
	Mudyawabikwa, Junior	F
	Mutengwa, Tinotenda	F
	Zungunde, Tafara	M
Geo-Technicians	Ndebele, Trust	M
	Dzapasi, Monalisa	F
	Waza, Tatenda	F
	Marange, Clarice	F
Mashonaland Central		
Geologists	Makandwa, John – current PMD	M
	Ngadya, Mitshell (nee Maisera) – current Deputy PMD	F
	Loyd, Magombedze	M
	Magidi, Tapiwa	M
	Mahachi, Bernard	M
Geo-technicians	Mushangwe, Precious	F
	Ruze, Brenda	F
Mashonaland East		
Geologists	Kashiri, Tendai – current PMD	M
	Dadirai, Godfrey – acting Deputy PMD	M
Geo-technicians	Gwazayi, Kudzai Yvonne	F

	Mubariri, Zvinodaishe	F
	Sibanda, Archibald	M
Manicaland		
Geologists	Mugandani, Ernest – acting PMD	M
	Mataruse, Tendai	M
	Savieri, Edeleen	F
	Chinhamora, Welton	M
Geo-technicians	Nil	
Masvingo		
Geologists	Chimhuni, Joseph	M
	Zvavamwe, Joseph	M
	Malunga, Benedict	M
Geo-technicians	Chavunduka, Gladys	F
	Mlilo, Clifford	M
Matabeleland South		
Geologists	Mutseka, Thembinkosi	M
	Chibaira, Ngwarai Godfrey	M
	Mafirakureva, Fine	F
	Donga, Gift	M
Geo-technicians	Tafirenyika, Alfred	M
	Moyo, Mkhululi	M
	Dube, Linox	M
Matabeleland North		
Geologists	Sanderson, Lockard	M
	Mpofu, Shantelle Momasiko	F
Geo-technicians	Ngwenya, Nhlanhla	M
	Mkandla, Buhlebenkosi	F
Midlands		
Geologists	Nhlovu, Tariro – current PMD	M
	Muzopa, Takudzwa Stephen	M
	Kunyadidi, Rugare	M
Geo-technicians	Baretto, Stanley	M
	Sibanda, Chelsea	F
	Mutyambizi, Steveas	M

The Director, **Forbes Mugumbate**, accompanied the Minister of Mines and Mining Development to Cape Town to attend the Mining Indaba conference held from 9th to 12th May 2022. While in South Africa he held meetings with representatives of various geological organizations including the Council for Geosciences of South Africa, the Botswana Geosciences Institute, the Geological Survey of India, the German Geological Survey (BGR), the Geological Survey of France (BRGM) and International Geosciences UK. Whilst our traditional partners from Western Governments remain keen to work with the ZGS, it is presently difficult owing to political differences pertaining to Zimbabwe.

The Director was part of a Ministerial delegation that attended some plenary sessions of the Zimbabwe-Russia Joint Commission held in Harare from 30th May to 1st June 2022. He took advantage of this time to hold side meetings with representatives of ROSGEO (Russian Geological Survey) and Zarubezhgeologia (the arm of the Russian Geological Survey responsible for foreign affairs) to discuss possible areas of co-operation. He also took the Russians on a geo-tour to parts of the Great Dyke.

Submitted by: *Forbes Mugumbate (Director)*
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MINING INDUSTRY COMMENTARY

Forbes Mugumbate

Zimbabwe has the worst mining jurisdiction?

The Fraser Institute's Survey of Mining Companies for 2021 put Zimbabwe as the least-attractive jurisdiction for investment attractiveness (see table below). An overall Investment Attractiveness Index is constructed by combining the Best Practices Mineral Potential index, which rates regions based on their geological attractiveness, and the Policy Perception Index (PPI), a composite index that measures the effects of government policy on attitudes toward exploration investment. This goes to show how much work the country needs to do to improve investment attractiveness. Areas that immediately come to mind include the time that is taken for a company to get an EPO approved from the submission of an application; the time it has taken to formulate and approve a new mining law Act; the bureaucracy involved in the processing of an export permit for samples from exploration or mine development projects; and the shambolic state of mining titles.

A summary of questions asked by people who visited Zimbabwe's kiosk at the Mining Indaba in Cape Town clearly show that the Policy Perception Index for Zimbabwe is high. These are:

- Is there a policy that guarantees protection of investments?
- When will Zimbabwe computerize the mining cadastre?
- Why does it take so long to process and issue exploration licences in Zimbabwe?
- What is the electricity power situation for mining in Zimbabwe?
- How much geological information relating to Zimbabwe is available, and how easily accessible is it?

Most-attractive jurisdictions	Least-attractive jurisdictions
1) Western Australia	84) Zimbabwe
2) Saskatchewan	83) Spain
3) Nevada	82) DRC
4) Alaska	81) Mali
5) Arizona	80) Nicaragua
6) Quebec	79) China
7) Idaho	78) Panama
8) Morocco	77) Argentina: Mendoza
9) Yukon	76) Venezuela
10) South Australia	75) South Africa

A mega deal collapses?

Zimbabwe's US$3 billion platinum project touted as a game changer for Zimbabwe's mining sector is reported to be on the verge of collapse. The project was a potentially significant contributor to the country's US$12 billion target for the mining industry by 2023 that would help to transform Zimbabwe into an upper middle income economy by 2030. The mine lying south of Darwendale, about 65km west of Harare, and owned by Great Dyke Investments (GDI), has the potential to become one of the world's biggest platinum mines. A bankable feasibility study undertaken in 2017 by African Export-Import Bank showed that the project had potential to contribute to Zimbabwe's economic turn-around. Peak production of the mine was expected to be 860,000 ounces per annum. The 6500-hectare mine life expectancy is 40 years. The GDI project was also expected to create at least 8000 skilled jobs at its peak, producing four million tonnes of ore per annum.

The GDI project has stalled ostensibly for many reasons. Suspicions began when GDI approached Zimplats, the country's largest platinum producer, to buy a stake in the Darwendale project. The move, however, failed due to GDI's perceived opaque shareholding structure, especially regarding Kuvimba. Contractors withdrew and workers were retrenched. A lack of funding was therefore one of the visible causes for the failure of the mining project. There are also suspicions relating to mismanagement, and mistrust exists between the Russian investors and their local partners. For instance, there are indications that the geology and geotechnical reports relating to the decline areas that have been cut concluded that ground conditions are poor and unstable and hence not suitable for underground excavation. This is a poor reminder of the situation at Hartley Platinum to the south of GDI's project, which had to close down due to poor ground conditions.

Chinese footprints in Zimbabwe's lithium

Lithium, the wonder metal at the heart of the global shift to electric cars, is in a full-blown crisis. Demand has outstripped supply, pushing prices up almost 500% in a year. Bloomberg estimates that the global lithium industry needs as much as $42-billion in investment by the end of the decade in order to meet demand for the material. For battery makers, the lithium supply woes have been compounded by the Covid-19 pandemic and Russia's war in Ukraine. These interferences have affected supplies of other ingredients including nickel, graphite and cobalt needed in battery manufacturing.

China makes about 80% of the world's lithium-ion batteries, hence the frantic acquisitions of lithium properties by companies from that country. In addition to the recent well-publicised takeover of the Arcadia lithium deposit by China's Zhejiang Huayou Cobalt , there are now several other deposits under Chinese companies. These include Bikita Minerals now controlled by Sinomine; Kamativi where a Chinese company has a joint venture with the ZMDC; and Sabi Star in the Bepe Hills, which is partly owned by the Chengxin Lithium Group. Chengxin Lithium Group acquired a 51 percent interest in MaxMind Investments' Sabi Star Lithium Mine in Buhera North at a cost of US$77 million. Extensive trenching and drilling is currently under way ahead of development of this deposit.

Aim-listed Premier African Minerals, which is conducting a definitive feasibility study (DFS) on its Zulu lithium and tantalum project near Fort Rixon, has accepted a subscription of £12-million before expenses from Suzhou TA & A Ultra Clean Technology that is sufficient to fully fund completion of the DFS and the additional resource work that is already under way. The subscription also provides assured take-off for whatever spodumene concentrate the Zulu project will produce.

Diamonds and Russia's war

Prices of rough diamonds are surging, as sanctions on one of the world's two giant miners ripple through the supply chain. Diamond cutters, polishers and traders are struggling to source stones after the US levied sanctions on Alrosa, which accounts for about a third of global diamond production. The Ukraine conflict makes it difficult for natural diamond miners to fill the supply gap as ramping up their operations requires significant investment. There are therefore fears that the ban on Russian diamonds may push prices up to the point that the gap in demand could end up being filled through production of synthetic diamonds. Once synthetics get into the market, there is a fear that buyers will begin to treat all natural diamonds as conflict diamonds and therefore shift to unnatural stones. This will lead to the eventual collapse of natural diamond mining.

Mining opportunities from global warming

The quest to limit the effects of global warming is presenting significant opportunities to the mining industry. For instance, the International Energy Agency predicts a quadrupled demand for the so-called energy transition minerals such as lithium, cobalt, graphite, nickel, platinum, and copper that are necessary for new technologies in electric vehicle batteries, and for solar and wind energy projects. Other implications are that the mining industry would need to produce about ten times more metals than it currently produces by 2030 if it is to meet the needs of the battery industry alone. This is because the production of EVs requires two to three times more metal than a normal petrol and diesel car.

Zimbabwe has great potential for most of these minerals. The question, however, is how much is Zimbabwe prepared to ride on the wave of the impending mineral boom?

The road to the US$12 billion mining industry by 2023

The Minister of Mines and Mining Development has indicated that the country is on course towards achieving its target of delivering a US$12 billion mining industry by 2023. This was after the mining industry performance for 2021 stood at US$5.3 billion against a 2017 benchmark of 2.7 billion. This achievement is probably more the result of increases in metal prices than development of the mining industry. For instance, one of the benchmarks for achieving the US$12 billion was an annual gold production of 100 tonnes. Gold production last year stood at 35 tonnes and is unlikely to reach the 100 tonnes target by end

of this year. This is also against a prediction by the Chamber of Mines that Zimbabwe's mining industry sees a funding shortfall of $10 billion over the next five years, a challenge compounded by erratic power supplies and exchange-rate volatility.

The Bucks Mine accident

We end this contribution on a sad note about the accident that happened at Bucks Mine near Gwanda on 14 May 2022. What could have been knocking-off time at the end of a shift became the tragic end of the lives of seven gold mine workers who were killed when the skip used in hoisting them to the surface fell down a 240 meter-deep shaft after the wire rope snapped. With so many accidents including over 380 reported last year from small-scale mines, the sector's otherwise appreciable contribution to mineral production is overshadowed by these accidents.

A Regional Report on Mining Activity
Submitted to the
Geological Society of Zimbabwe

Compiled by

Antony Mamuse

February 2022 - May 2022

PROVINCE	MINING TITLE	EXPLORATION	MINING AND MINERAL PROCESSING
Mash East *Contributor:* ***Bonface Ngwereva***	• Approximately 800 hectares is set to be reserved for mining activities by youths. Reservations pending approval. • Major interest since February 2022 has been in lithium exploration. Main targeted areas are: *Sowa UMP (Pfungwe), stretching to Mudzi in the vicinity of Benson Mine. *Chisambiro-Gooddays pegmatites, associated with the Makaha Greenstone Belt. The area from Chisambiro to Suswe is covered by the Welscan EPO 2018	• Pulserate Investments is commencing exploration for lithium in the Chisambiro on an area approximately 10,000 hectares in extent. A total of 80 claims in Mudzi District. *Main ore found is lepidolite. *Elevation mapping by airborne photogrammetry was done in the first quarter of 2022. *Field mapping and sampling of outcrops has been done giving a range of 1-3 percent lithium.	• Milmath Mine (Pvt) Ltd, a medium-scale gold mine commences heap leach pad in May 2022. *At approximately 14 kg gold production so far this year, Milmath has been the province's largest single producer against the province's total of 115 kgs gold over the same period. • So far in 2022, 2 gold processing plants and 1 boiler were commissioned in the Province. • Yang sheng black granite mining company is

	application, which is yet to be granted.		targeting cutting of 2000 blocks of black granite per month in the Katiyo area in UMP District.
Mash West *Contributor:* ***Trust Ndebele***	• 5 current EPOs. • 13 current EPO applications. • 7 reserved areas. • Mining cadastral data capturing ongoing.	• Bravura Company completing phase 2 drilling on its PGM Special Grant in the Selous area. • Riozim's One-Step Mine: ongoing exploration and some production.	• Resuscitation of Empress Nickel Refinery underway.
Masvingo *Contributor:* ***Clifford Mlilo***	• 9 current EPOs. • 14 current special grants. • 5 reserved areas excluding those held by Parks & Wildlife, Rural District Councils, ZINWA and municipalities. • Cadastral Progress: Data capturing in progress. Larger operators have submitted coordinates of all titles to the MMMD (including mining leases, special grants, mining blocks).	• TRINIMZIM: Gold exploration in the Masvingo Greenstone Belt. • Domus: Copper exploration in Malipati . • Mutoko Resources: Gold exploration in Ngundu • RioZim: Copper exploration in Devure range, and ongoing exploration around Renco Mine. • Diamond exploration at Sese.	• Dewatering at Gaths Mine. • Resuscitation of Empress gold mine heap leach pads. • A lot of ASM activities within the Masvingo greenstone Belt.
Mat South *Contributor:* ***Alfred Tafirenyika***	• All greenstones covered by EPOs. ASM subsector not amused. • Several special grants in the province. • Cadastral Progress: Larger operators have submitted coordinates of titles to the MMMD (including mining leases, special grants, mining	• ZCDC has several special grants in the province. Alrosa carrying out a significant exploration programme. • Ongoing coal exploration at Tuli and Diti deposits. • Ongoing lithium exploration at Zulu, now on Phase 2, more than 13,000	• Ongoing limestone mining at Colleen Bawn (PPC) near Gwanda. • Small-scale mining of corundum, garnet and aventurine within the Limpopo Belt.

	blocks). Database capturing still ongoing to implement the cadastre programme.	drilling metres completed so far. • No significant exploration in EPOs granted, but airborne survey across Gwanda, Lower Gwanda, Filabusi, Bulawayo and Shangani belts initiated.	
Bulawayo, Mash Central, Manicaland, Midlands & Mat North	**No report**		

MINING NEWS

gleaned from https://www.mining.com/

by Kennedy Mtetwa

Zimbabwe makes U-turn on mining royalties to halt currency slide

Bloomberg News | February 4, 2022 | 8:04 am Africa Diamond Platinum

Zimbabwe's finance minister requested mining companies to pay up to half of their royalties in local currency, as part of measures to stem a decline in the unit that has been fanning inflation. The order reverses a 2020 decision requiring mining companies to pay the tax only in foreign currency. A similar rule has been imposed on taxes and duties levied on imported vehicles, while taxes due from exporters are now payable in both foreign and local currencies in proportion to approved retention levels, Finance Minister Mthuli Ncube said in a statement posted on his Twitter account Friday.

"These measures reflect government's commitment to promote the wider use of the Zimbabwean dollar and to continuously strengthen the economy so as to build lasting macro-economic stability," he said.

The Zimbabwean dollar has weakened 6.8% this year to 116.65 per dollar, after losing almost a quarter of its value last year, and changes hands at more than twice that rate on the streets of the capital, Harare. The decline has fueled inflation, which quickened to more than 60% in January, from 54% in October. The policy change comes days after the central bank agreed with business leaders that it would "continue fighting inflation through restrictive monetary policy and building foreign exchange reserves as a way of augmenting the defense of the value of the local currency."

(By Godfrey Marawanyika)

Zimbabwe platinum miners ask government to defer 5% export tax

Bloomberg News | February 7, 2022 | 8:55 am Top Companies Africa Platinum

Platinum miners in Zimbabwe asked the government to push back a tax on exports of semi-processed metals, requesting more time to invest in processing plants at home. The Treasury announced the tax in 2020, giving miners two years to prepare before its planned introduction early this year. The levy of as much as 5% is aimed at spurring the companies to develop their own processing facilities, allowing Zimbabwe to increase the value of its mineral resources.

The miners want the government to "reconsider the policy and further defer" the tax, Alex Mhembere, chairman of the Platinum Producers Association of Zimbabwe, said in a letter to Finance Minister Mthuli Ncube. "This will allow the producers more time to invest in the beneficiation facilities while building sufficient feedstock."

Ncube confirmed receiving the letter, which was dated Jan. 24 and seen by Bloomberg News, and said the government is considering the miners' request. "The Treasury is analyzing the matter and its implications," the minister said by phone from the capital, Harare. "We will get back to them once we have concluded our analysis and reached a decision."

Mhembere is also chief executive officer of Impala Platinum Ltd.'s Zimplats unit, the country's biggest producer of the metal. Companies have made "significant progress" toward processing platinum-group metals locally, Mhembere said. Zimplats itself plans to spend $1.8 billion to expand mining and processing, including rehabilitating an old base-metals refinery built by the BHP Group.

The southern African nation generates more than half of its earnings from exports of minerals including gold, chrome and diamonds. Zimbabwe holds the world's third-largest known reserves of platinum, which occurs with base metals including nickel and copper.

(By Godfrey Marawanyika)

Zimbabwe's state-owned miner selected to revive steel firm

Bloomberg News | February 22, 2022 | 10:14 am Africa Iron Ore

Zimbabwe has selected Kuvimba Mining House Ltd, a state-owned company, which has been shrouded in controversy, to revive one of the continent's largest steel mills. The miner, which already has vast interests in gold and nickel, has been picked as the "investment partner" to breath new life into the Zimbabwe Iron and Steel Company, which has been shut for 14 years. At its peak, the plant produced nearly 1 million tons of steel a year. Kuvimba Mining has said it bought its assets from a company linked to Kudakwashe Tagwirei, a Zimbabwean tycoon who was sanctioned by the U.S. Treasury in 2020 because of allegations he bribed government officials and used political influence to win lucrative state deals.

The government invited bids in April 2021 from investors in a bid to bring back Ziscosteel, which is located in the Midlands province, an area with vast deposits of chrome and platinum. Previous attempts to re-start the mill, including interest by India's Essar Steel Ltd, stalled as prospective investors haggled over a $300 million debt burden and obsolete machinery at the plant. Farai Koronga, the chief executive officer for Ziscosteel, said the company needs "$350 million to $400 million to revive the project," in a phone interview from the mining town of Redcliff. "It all depends on the new investor on what they want to do." The Zimbabwe Investment Development Authority, a state-owned investment

vehicle, recommended the choice of Kuvimba after carrying out due diligence, according to Joram Gumbo, the Minister of State for Presidential Affairs.
(By Ray Ndlovu, with assistance from Godfrey Marawanyika)

Impala stalls Zimbabwe platinum approach over ownership concern

Bloomberg News | February 28, 2022 | 9:49 am Intelligence Africa Palladium Platinum Rhodium

Zimbabwe's plan to develop one of the world's biggest platinum mines stalled after Impala Platinum Holdings Ltd asked for greater transparency on the ownership of a state-run company before considering a joint venture. Impala was approached by Great Dyke Investments Ltd, which owns the Darwendale project, but the company wants more information about the government's Kuvimba Mining House Ltd, which is 35% owned by private shareholders the state has yet to identify. Kuvimba and Russian tycoon Vitaliy Machitskiy's Vi Holding each own 50% of Great Dyke.

While Zimbabwe's government says it controls Kuvimba, its assets are the same as those that were owned until at least late 2020 by Sotic International Ltd, a company linked to Kudakwashe Tagwirei, an adviser to Zimbabwean President Emmerson Mnangagwa. Tagwirei was sanctioned in 2020 by the U.S. Treasury, which alleged that he bribed government officials and used political influence to win lucrative state deals. Tagwirei hasn't commented on the sanctions.

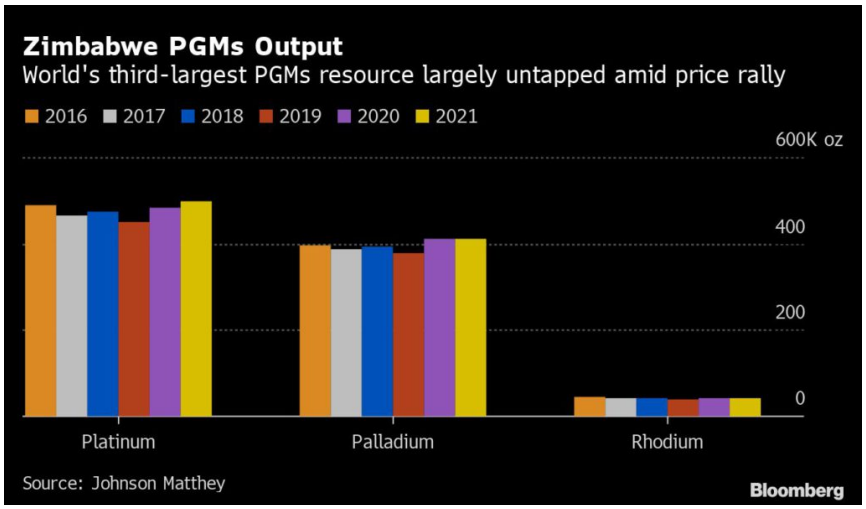
The opacity of Kuvimba's ownership has effectively halted development of the Darwendale mine, 65 kilometres east of Zimbabwe's capital, Harare, leaving the project that is central to Zimbabwe's economic recovery stagnant. A project by Eurasian Resources Group on land taken from Anglo American Platinum Ltd has also stalled, as have Tharisa Plc's plans for a new platinum mine.

The talks between Great Dyke and Impala unravelled after the Johannesburg-based mining company said its internal processes required that it conduct due diligence on the project and its ownership. Impala had contemplated taking a stake as well as processing its output.

Zimbabwe's Ministry of Mines referred queries to the Ministry of Finance, which did not respond to questions. Tagwirei did not answer calls to his mobile or immediately respond to text messages. Impala declined to comment.

Alex Ivanov, the chief executive officer of Great Dyke, did not respond to a request for comment. Igor Higer, Great Dyke's vice chairman, confirmed the receipt of questions and said he would respond. He has yet to do so.

Simba Chinyemba, Kuvimba's CEO, said by email that the mine plan is being remodelled and an open pit rather than underground mine may be developed. While open-pit mining is cheaper, ultimately an underground mine would need to be dug to fully exploit the orebody and a partner would be needed to process the ore. Chinyemba said the start of construction would depend on the study and declined to comment on the talks with Impala or the identity of Kuvimba's shareholders.



Great Dyke needs a partner to help fund the mine, which could ultimately cost $2 billion and potentially produce 860,000 ounces of platinum group metals annually, and process its ore. The company has been battling to raise $650 million to get the project underway with initial production originally scheduled for next year.

Kuvimba has said that Tagwirei has nothing to do with the company but has not explained how it came to control the assets, which include gold and nickel operations. Impala has a listing in the U.S. and assets in Canada, meaning that it will need to comply with any instructions regarding Tagwirei issued by the U.S. Treasury. Tagwirei has also been sanctioned by the U.K.

Bloomberg in May reported on a trove of emails, documents and WhatsApp messages that delineated the links between Tagwirei and Sotic. The *Financial Times* and *The Sentry* followed with reports giving details of the relationship. The documents and communication seen by Bloomberg showed his participation in company decision-making and demonstrated that he at least partially controlled Sotic.

An agreement with Impala would have made it easier for financiers led by Cairo-based African Export-Import Bank to raise the funding for the project, it has been said. Afreximbank's head of southern Africa, Humphrey Nwugo, declined to comment citing client confidentiality.

Impala owned the land upon which the Darwendale project is based until 2006, when it ceded a substantial portion of its mining concessions in the country after pressure to do so from the government of former President Robert Mugabe. Zimbabwe has the world's third-biggest reserves of platinum group metals.

(By Felix Njini and Godfrey Marawanyika)

Tharisa acquires Karo platinum project in Zimbabwe

Reuters | March 31, 2022 | 7:29 am Africa Palladium Platinum

Platinum producer Tharisa Plc has acquired a controlling stake in a platinum group metals (PGMs) project in Zimbabwe, which will eventually double its output, it said on Thursday.

Tharisa exercised an option to increase its stake in Karo Mining Holdings Limited from 26.8% to 66.3% in an all-share deal valued at $27 million. The Karo project, expected to start producing in two years, will produce 150,000 ounces a year of PGMs in concentrate in its first phase, the company said.

Prices of PGMs including platinum and palladium have surged since Russia's invasion of Ukraine, as Western sanctions on Russia squeeze supply of the metals. Russia produces 25-30% of the world's palladium.

"With the challenges and uncertainty to the supply chain of these vital precious metals, a new short-dated source of primarily platinum and palladium metals is a significant risk mitigant for global users and provides security and certainty of supply," said Tharisa CEO Phoevos Pouroulis.
The Karo project's resources are split between platinum (45%), palladium (42%), rhodium (4%) and gold (9%).
(By Helen Reid; Editing by Mark Potter)

Tharisa plans to start platinum output in Zimbabwe in two years
Bloomberg News | April 4, 2022 | 7:48 am Africa Platinum

Tharisa Plc, the South African miner run by the Pouroulis family, plans to start producing platinum in Zimbabwe within 24 months after acquiring a controlling interest in the Karo mine. While Zimbabwe has the world's third-biggest reserves of platinum-group metals, development has been stymied by political instability, economic collapse and previous local-ownership rules. Impala Platinum Holdings Ltd, Anglo American Platinum Ltd and Sibanye Stillwater Ltd also have operations in the country.
Infrastructure works for the first $250 million phase of the open-pit mine will start later this year, Tharisa Chief Executive Officer Phoevos Pouroulis said in an interview. The operation, 120 kilometres west of Zimbabwe's capital Harare, will produce 150,000 ounces of PGMs in its first phase and have a 20-year life.
"We've kick-started the development," Pouroulis said. "There is potential to expand further."
Tharisa, which also has interests in chrome, paid $27 million for control of Karo on March 31. The first-phase development will also include a pilot smelter.
"We want to do the whole value chain in Zimbabwe," the CEO said.
The Pouroulis family set up the South African platinum-mining ventures Lefkochrysos and Eland Platinum. Eland was sold to Xstrata Plc in 2007 for the equivalent of $1.1 billion.
(By Godfrey Marawanyika)

Russia diamond supply curb may benefit Zimbabwe miner's gems
Bloomberg News | March 22, 2022 | 8:19 am Top Companies Africa Europe Diamond

Zimbabwe's biggest miner of rough diamonds sees Russia's invasion of Ukraine triggering far-reaching consequences for the global gem industry and possibly lifting demand for its own stones. Russia's Alrosa is the world's biggest diamond producer by volume at 30% and the slightest disruption to its ability to supply distorts the market, according to Zimbabwe Consolidated Diamond Co. Chief Executive Officer Mark Mabhudhu.
"It may end up creating the supply gap that may drive demand for our product, as well as that of other players," he said in an interview Monday. "However, we don't wish for the worst case, but if it happens we will be able to sell our production."
The southern African country is targeting $12 billion of mining industry revenue by next year, and state-owned ZCDC plans to contribute $1 billion of that, Mabhudhu said. The company produced 2.3 million carats of diamonds in 2020 and last year, the miner operating in eastern Zimbabwe had 4 million carats of output, surpassing its target of 3 million, he said. That resulted in profit for the first time since its inception in 2015.
"For 2022, we are set to not only achieve, but exceed our diamond production target by more than 40% when compared to the 2021 baseline target," he said.

ZCDC will resume diamond auctions in April after an eight-month hiatus as a result of the coronavirus and expects buyers from Dubai, Israel, India and South Africa.
"We have sizeable parcels for sale and the ultimate quantum per sale is determined in consultation with our selling agent, the Minerals Marketing Corporation of Zimbabwe," Mabhudhu said.
(By Godfrey Marawanyika)

Trafigura seeks control of Zimbabwe's metals for unpaid debts

Bloomberg News | April 29, 2022 | 8:43 am Intelligence Top Companies Africa Gold Nickel

Trafigura Group and Zimbabwe's government have discussed a deal that would give the commodities trader control over output from some of the nation's biggest mines as repayment for debts, documents seen by Bloomberg show. Under the agreement, Trafigura will be paid $225.6 million by nickel- and gold-mining subsidiaries of state-run Kuvimba Mining House Ltd for fuel bills Zimbabwe owes Trafigura on contracts dating back to 2016, the documents show. Zimbabwe's government was represented by the Finance Ministry in the agreement.
Trafigura is one of the world's biggest oil and metals traders, with a history of deals in Africa that have drawn scrutiny from authorities, including in South Sudan and South Africa. Zimbabwe, which has racked up more than $10 billion in external debt that it is struggling to service, has been heavily dependent on Trafigura for fuel supplies.
Bloomberg has previously reported on Kuvimba's apparent links to Kudakwashe Tagwirei, a Zimbabwean tycoon who's been sanctioned by the U.S. and U.K. over corruption allegations, and who was part-owner of many of the mining assets that are now part of Kuvimba. Zimbabwe has not explained how it obtained the assets, and says that Tagwirei has no role in Kuvimba. Tagwirei is also an adviser to Zimbabwe President Emmerson Mnangagwa.
In response to detailed questions from Bloomberg, the Singapore-based trading house confirmed a deal in which it will be repaid by Zimbabwe for credit it extended for imports of fuel products. It said it ended a previous fuel-trading business relationship it had with Tagwirei in 2019, before he was sanctioned.
"Trafigura Zimbabwe has provided credit on petroleum product deliveries into Zimbabwe and is scheduled to receive payments," the company said. "Trafigura operates a robust compliance program, aligned with international standards. In accordance with this program, Kuvimba has undergone and satisfied our strict KYC requirements," it said, referring to so-called "know your customer" policies meant to prevent engagement with people involved in money laundering or other financial crimes. The arrangement seen by Bloomberg shows that the unpaid bills, incurred by the Reserve Bank of Zimbabwe, would be transferred to the Finance Ministry, which has control over Kuvimba.
It's unclear when the agreement was put into effect, but a person familiar with the situation said a deal has been reached matching the terms of the documents seen by Bloomberg. It was drawn up by the London branch of law firm Reed Smith LLP and gives Trafigura exclusive access to a large portion of two of Zimbabwe's biggest exports. According to the deal, Kuvimba would pay Trafigura $6 million a month and retain 40% of payments to the Freda Rebecca and Shamva gold mines, as well as the nickel mines owned by Bindura Nickel Corporation, in so-called collection accounts. Freda Rebecca, Shamva and Bindura Nickel are subsidiaries of Kuvimba. Trafigura would also have the right to approve buyers of the metal selected by Bindura and would have right of first refusal on the metal, the

documents show. It would also have the right to buy the gold produced by Freda Rebecca and Shamva. Trafigura did not respond to queries about those arrangements.
The payments will not be subject to tax and the transaction documents will not need to be lodged with any authority in Zimbabwe, the agreement says. Reed Smith did not respond to requests for comment.
Finance Ministry officials in Zimbabwe and central bank Governor John Mangudya acknowledged requests for comment on the arrangement, but did not respond to questions. Kuvimba Chief Executive Officer Simba Chinyemba did not answer calls or reply to emails. Kuvimba's assets were previously listed as being owned by Sotic International Ltd, in which Tagwirei had a stake. Tagwirei did not respond to text messages and emails and did not answer his mobile phone when contacted by Bloomberg.
The government has not disclosed how it came to own 65% of Kuvimba or who holds the 35% private stake. Trafigura did not answer a question on whether the private shareholders had assented to the agreement. The agreement includes clauses prohibiting any of the parties involved in the agreement from entering into "any transactions with any person which is a sanctioned person." Trafigura said such language was "common and prudent business practice" in commercial arrangements. The Kuvimba subsidiaries involved in the deal are also not allowed to change their shareholding.
(By Felix Njini and Antony Sguazzin)

Barrick sees scope to grow Zambia copper output

Bloomberg News | March 23, 2022 | 11:20 am Markets Top Companies Africa Copper Gold

Barrick Gold Corp., the world's second-biggest producer of the precious metal, sees opportunity to grow its copper production in central Africa, especially with a pro-business government having won power in Zambia last year, Chief Executive Officer Mark Bristow said. The company already operates the Lumwana copper mine in northwestern Zambia. It considered selling that operation in 2019 after receiving interest from potential buyers following its merger with Randgold Resources Ltd and Bristow's appointment as CEO earlier that year but never followed through.
"The Lumwana copper mine in Zambia has been a real success following our merger with Randgold," Bristow said in response to emailed questions. "We see the central African copper belt as offering significant opportunity for our copper initiative and the new business-friendly government there is a breath of fresh air."
Prices for copper used in electric vehicles and wind turbines have surged to records this month, intensifying the hunt for new projects to meet growing demand. Interest in Zambia's mining industry has grown since Hakainde Hichilema won presidential elections in August last year and began following through on pledges to revive the economy and boost employment by attracting private investment.
Pamela O'Donnell, Canada's High Commissioner to Zambia, on Tuesday told Hichilema that companies from her country, including Barrick and First Quantum Minerals Ltd, were interested in investing in Zambian copper mines previously operated by Glencore Plc and Vedanta Resources Ltd. First Quantum Minerals, which owns Zambia's two biggest mines, said it has no plans to acquire the Mopani and Konkola copper mines, but is rather focusing on its own expansion plans, the company said in a statement. Barrick has not ruled that option out.
"We are already invested in Zambia and would consider further opportunities which meet our investment filters and leverage our established in-country investment base," Bristow said.
(By Matthew Hill and Taonga Clifford Mitimingi)

On-Line Talks and Upcoming Events

The Society continues with our online talks programme, details for which can be downloaded from our web site. The Society will continue to host these zoom-based online talks and we would like to thank the membership for participating. We continue with our collaborative link with the Geological Society of South Africa to participate in their series of online talks and other events, notification for which is circulated through our Secretariat. A link has also been established with the Geological Society of Namibia in order to share online events.

Omberai Mandigaisa's talk entitled *"Quantification of the impacts of Rock Mass Quality on Stope Width Control and Pillar Stability in a hard rock-narrow reef mine"* was presented on 17th May 2022.

Kudzi Musiwa, Hon. Secretary, reports that he was able to negotiate a few free places for the online Structural Geology for Exploration and Mining short course, which started on 6th June. This offer is courtesy of Prof. Tom Blenkinsop.

https://www.cardiff.ac.uk/professional-development/available-training/short-courses/view/structural-geology-for-exploration-and-mining

The criteria for the candidates are:

1. They are not a full-time student (i.e. they are either working part-time, full-time or are currently unemployed)
2. They are an independent consultant or a professional working for a micro or small start-up (<50 employees), not a professional working for a medium or large mining company (>50 employees)

The following information is needed to register, at the latest by 10th June

- Full name
- Telephone
- Email
- Address

GSZ Research and Development Fund

Enquiries relating to the distribution of funds through this facility should be made with the standing Chairperson.

SEG Timothy Nutt Memorial Fund

This fund will be available to provide financial support for geology students and young economic geologists located in Zimbabwe or in southern Africa with ties to Zimbabwe. The fund may be used to support SEG student chapter activities, travel to meetings, field trips, for research or study grants, technical lectures or any other activities approved by the SEG Regional Vice President for Africa.

Strong preference will be given to those applicants who are SEG Student Members.

To become an SEG Student member visit www.segweb.org/join

Applicants must describe what the project is, why the research is important and how it is to be done.

An estimate of expenses for the project must be included with the application.

Grants are expected to be fully utilized by April 30 following the calendar year in which they are awarded / dispersed. .

Grant recipients are required to provide a year-end accounting of how the money was spent together with a suitable progress report or final abstract.

A 2018 Research Grant application form may be downloaded from
www.segweb.org/StudentResearchGrants

Student Research Grants Committee c/o Assistant for Student Affairs, Society of Economic Geologists Foundation 7811 Shaffer Parkway, Littleton, CO 80127-3732 USA

Phone: +1.720.981.7882/Fax: +1.720.981.7874

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Conferences

Geological Society of South Africa
Overberg Geoscientists Group
Diamonds from Exploration to Manufacturing
20-30 June 2022
With Mine and Field Visits, July 2022

A Virtual Short Course Programme will run in two parts from 20-24 June and 27-30 June and will cover a variety of topics.
Registration can be made on the following URL
https://www.cognitoforms.com/GeologicalSocietyOfSouthAfrica/DiamondsFromExplorationToManufacturing2030June2022

http://www.gssa.org.za/

12th International Kimberlite Conference
30 years of diamonds in Canada
Postponed - 15 to 19 August 2022
Yellowknife, Canada
secretariat@12ikc.ca

GSSA Geocongress 2023
Stellenbosch, Western Cape
The next 125 years of Earth Sciences
11-13 January 2023
https://allevents.eventsair.com/geocongress/

GEOLOGICAL SOCIETY OF ZIMBABWE: CONTACT DETAILS OF MEMBERS OF THE EXECUTIVE COMMITTEE FOR 2021

NAME	PORTFOLIO	EMAIL
Mtetwa, Kennedy	Chairperson	kcmtetwa@yahoo.co.uk
Gumede, Tenyears	Vice Chairman	tenyearsgumede@gmail.com
Musiwa, Kudzai	Hon. Secretary	kudzimusi@gmail.com
Mwatahwa, Collins	Hon. Treasurer	collinsm885@gmail.com
Mabhanga, Shephard	Newsletter & A.E. Phaup Award	smabhanga@gmail.com
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Tirivabaya, Renias	Professional Registration	rennyt80@gmail.com
Chiumburu, Chenjerai	Assistant to Hon. Secretary	chenjerai.chiumburu@zimplats.com
Matsanga, Miriam	Assistant to Hon. Treasurer	mmatsanga22@gmail.com

Institutional Membership, 2022

Bruker RSA

Chamber of Mines of Zimbabwe

Freda Rebecca Mine

Invictus Energy

MaxGeo

Metallon Gold

Mimosa Mining Company (Pvt) Ltd

New Dawn Mining

Optimum Drilling

Prospect Resources

RioZim Limited

RZM Murowa (Pvt) Limited

Samrec Vermiculite Zimbabwe (Pvt) Limited

Sandvik

SMC Drilling

Trojan Nickel Mine

University of Zimbabwe Geology Department

Unki Mines (Pvt) Limited

Vast Resources

Zimbabwe Geological Survey

Zimbabwe Platinum Mines Limited