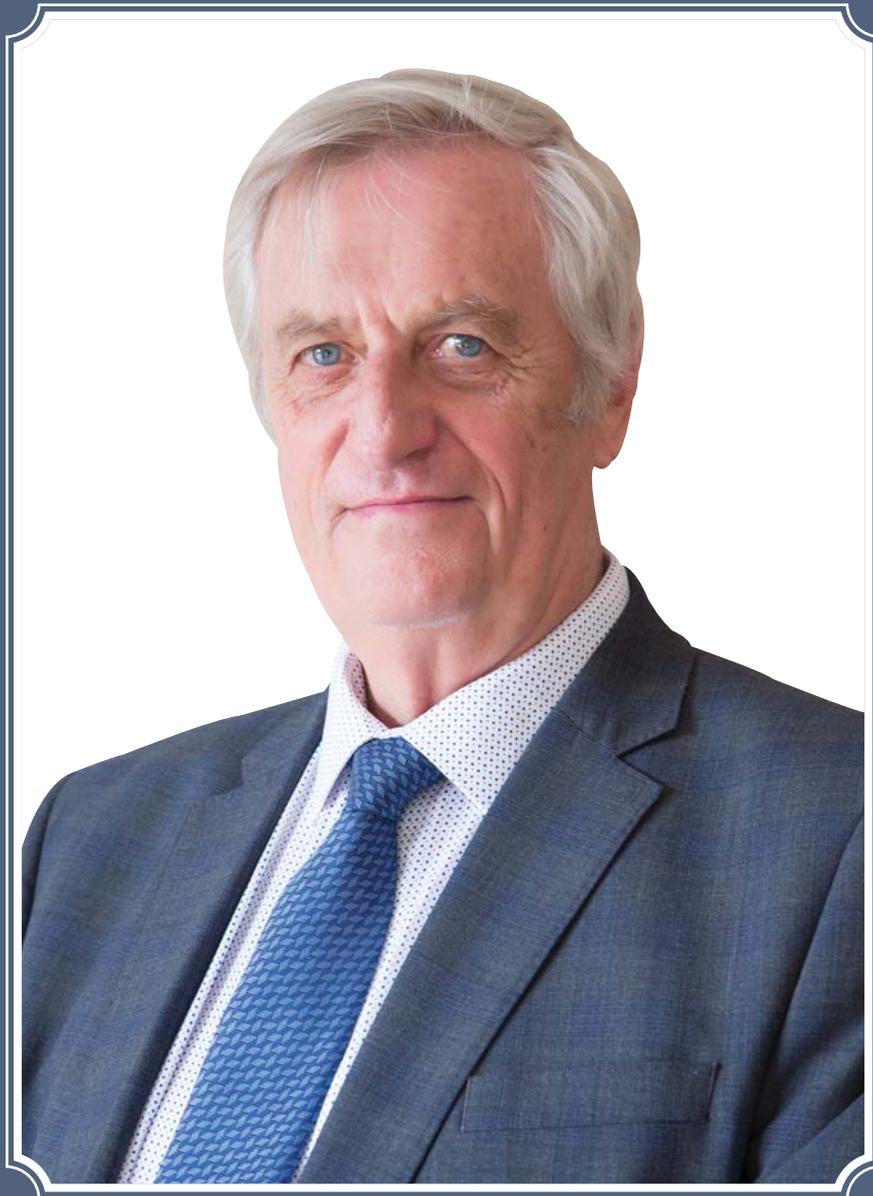




SAIMM

JOURNAL OF THE SOUTHERN AFRICAN INSTITUTE OF MINING AND METALLURGY

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Proceedings of the Annual General Meeting
Annual Report and Accounts

Presidential Address:
Towards the future: African Mining Vision,
Mining Phakisa and the SAIMM
by A.S. Macfarlane

Introduction to our new President...

ALASTAIR STUART MACFARLANE

Alastair was born in rural southwest England, near Plymouth, in 1951. He attended primary and high school in Plymouth, and was a person who had constant interest in everything around him, whether natural history, geology, or just anything happening. Through this, he developed an interest in both the mining geology and industrial archaeology of the historical Cornish and Devon mining industries, and it was this interest that encouraged him to study mining engineering at Camborne School of Mines, in 1970.

After graduating from Camborne, he was recruited by Anglo American, and travelled to South Africa in October 1973. Being inducted into Western Deep Levels in those days as a young engelsman was a deep shock to the system, but one which he survived. Starting as a mining graduate, he moved through the ranks at Western Deeps, up to the position of Section Manager. By 1981, he was managing the largest section on Western Deep Levels, with eight mine overseers reporting to him. Most of his time was spent in production, with a brief spell researching and implementing a novel high-strength backfill system at the mine. This was to become the subject of his MSc dissertation in 1982. It was also while he was at Western Deep Levels that he married Diane, in 1982.

He had a short secondment to Anglo's gold operation in Brazil, at Morho Velho, and was then transferred to Anglo's Cleveland Potash Boulby Mine in Yorkshire in England, in 1987, also on secondment, as Deputy Mining Manager/Technical Services Manager. He has many fond memories of working at Boulby, the most bizarre of which is contract negotiations with a customer in Finland, conducted in the nude in a sauna. That's the way the Finns do things.

1987 to 1989 were very troublesome years for South Africa, and he and Diane anguished over whether to return, when Anglo asked them to do so. Alastair listened intently to a speech given by F.W. De Klerk in 1989, and his interpretation of that speech convinced him that something serious was going to happen in South Africa, and it was time to return, to be part of what was to come.

He returned in 1989 to Western Holdings Mine in the Free State, as Assistant Manager: Production, at a time of great challenges in the Free State goldfields. In 1990, a tornado ravished Welkom, and not only caused catastrophic damage to the mine and hardship for its people living in the town, but also resulted in severe civil unrest. Dealing with these issues took more skills than a traditional mining engineering is trained to possess, and he recalls standing with the General Manager at 2 am and asking 'so what do we do now?'

In 1991, he was moved back to Western Deep Levels, to Mponeng, where he worked as Assistant Manager Production, and also oversaw the sinking of the shafts. While there, he implemented a deep organizational development process, which was groundbreaking in that it involved all employees and organized labour. He acted as the Mine Manger on many occasions, and was moved on promotion to Vaal Reefs in 1996.

At Vaal Reefs, after a stint as Technical Services Manager, he took over the Moab project as Mine Manager. This position required a complete rehash of the feasibility study as well as a significant redesign of the mine, all done while sinking and development of the mine was in progress.

He moved from Vaal Reefs in 1999 to AngloGold Head Office, after having been intimately involved in the formation of both AngloGold and African Rainbow Minerals. At the corporate office he became the Consultant Mineral Resource Management, where his responsibility was the development of MRM across AngloGold's global operations. He did this for two years, until a company restructuring led to him being seconded to Wits University Mining School as a Senior Lecturer. In this position he lectured undergraduate students in financial valuation, massive mining methods, and open pit mining – a course which he developed. He also developed the complete Certificate Programme in Mineral Resource management, a programme aimed at industry practitioners and technicians, and which is still highly in demand today. He lectured up to five postgraduate courses annually in MRM subjects and financial valuation specialization topics.

In 2002 he decided to move to the University on a full-time basis. He also embarked on consultancy work, having established Macsim Mining Consultancy in 2001.

The consultancy work kept him so busy that he left the University in 2008, becoming a visiting lecturer for postgraduate studies while consulting to many mining companies in South Africa, Tanzania, Australia, Zimbabwe, Botswana, the DRC, Zambia, and Lesotho.

In 2002, he worked with a Northern Cape-based group to found a Broad-Based Black Empowerment Company called Sebilo Resources. The aim was to create a truly locally owned and empowered company that would be reflective of the principles and intent of the minerals policy of South Africa and its Act.

Although started with no capital, Sebilo has grown to become a successful company with a strong balance sheet and global customer reputation as a mining and marketing entity, producing medium-grade manganese. During these years he worked as the Technical Director, a position from which he is now exiting so that the company will be 100% black-owned and managed.

In 2015, Alastair was asked by the Chamber of Mines to assist in preparation for the Mining Phakisa, which was held in November of that year. He participated in this multi-stakeholder event, which ended in agreement to reinvigorate mining research and development for the sustainability of the industry. This has involved forming partnerships with state departments such as the Department of Science and Technology, the Department of Trade and Industry, the DMR, and National Treasury, with industry through the Chamber, and with academic Institutions and organized labour. Alastair has continued working on behalf of the Chamber in this initiative, working as Co-Director at the Mandela Mining Precinct, a position which he still holds. The Precinct, which was opened on 4 May 2018, is situated at the old COMRO facility, and is managed jointly by the Chamber and the CSIR. Alastair is very proud to have been associated with this landmark collaborative initiative and development.

Alastair has served for many years on the Council of the Association of Mine Managers (AMMSA), as well as on the Council of the Southern African Institute of Mining and Metallurgy. This was over two periods, initially in the late 1990s and early 2000s, and then after a brief period of absence, again since 2007.

During these times, he formed both the South African Mineral Asset Valuation (SAMVAL) Committee, which drafted the SAMVAL Code, and the International Mineral Valuation Committee, which has developed the IMVAL template. He has also served on the Technical Programme Committee for many years, and has organized many conferences. He has written many papers for the SAIMM and AMMSA.

He is an Honorary Life Fellow of the SAIMM, and has served on Council for the last 11 years.

Alastair has been married to Diane for 36 years and they are blessed with four children, these being Bruce, Christopher, Catherine, and Stevie, an adoptee who has been with them since he was six months old and who is now seven.



Alastair and Diane, with their sons Stevie in the insert, Bruce, Christopher, son-in-law Oscar, Kerry Erikson, and their daughter Catherine next to Alastair with their granddaughter Seanna

Catherine and Oscar recently blessed Alastair and Diane with their first granddaughter, Seanna.

Alastair enjoys the fine arts, and loves impressionist art, and classical music from the same era. He also enjoys a round of golf and a braai with friends and family, and wishes his eyes were still good enough to have a game of cricket, a game he played at Premier league level for many years, and which he played with a development team that he managed until he was over 50.

Alastair is passionate about the future of South Africa and all its people. His ambitions are to further embrace transformation and the development of people, for the good of all. He looks forward to the day when no conversations raise any issue of black or white, and that we are all equally excited about the future of this great country.

He realizes that he enjoyed a privileged position in the industry during the years of apartheid, and while on the one hand being genuinely apologetic for that, hopes that his efforts to change the industry for all, and his enduring support for transformation and development, are sufficient for him to be recognized for his part in supporting the change to democracy, and his efforts in supporting and pursuing Madiba's dream.

Nkosi Sikelel' iAfrika.

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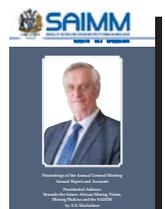
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SAIMM Branch Chairpersons



**Democratic Republic of
Congo Branch
Susa Maleba**

Susa is a Mining Engineer, married with three children.

Education

BSc (Hons), Mining Engineering, with specialization in:

Mining Environment, Pretoria University, 2004

BSc Eng, Mining, University of Lubumbashi, 1999

Postgraduate Certificate, Advanced Taxation, University of South Africa, 2005

Intermediate Certificate, Mine Environmental Control/ Occupational Hygiene, Chamber of Mines of South Africa, University of South Africa, 2004

Registrations/Affiliations

MSAIMM 704782, MVSSA 60872

Specialization

Mining design, mine planning and scheduling, mining ventilation, and mining environmental control.

Expertise

Susa Maleba has been involved in the field of mining engineering for the past 15 years. His expertise includes:

- Underground mine design, layout, and scheduling (Mine 2-4D and EPS)
- Mine ventilation and refrigeration
- Open pit optimization (NPV-Scheduler)
- Feasibility studies on open pit and underground operations
- Open pit design (Mine 2-4D)
- Open pit production scheduling (NPV-Scheduler and EPS)
- Mine environmental control and occupational hygiene
- Projects management
- ESIA projects management and coordination.

Employment

Oct 2009–present: SRK Consulting (Pty) Ltd, Mining Engineer, DRC

Aug 2007–Aug 2009: A & B Global, Mining Consultants,
Mining Consultant, South Africa

Jul 2003–Jul 2007: CSIR MININGTEK, Research Engineer, South Africa

Sep 2002–Jun 2003: SARS, Tax Consultant, South Africa

Sep 1997–Jul 2000: Gecamines – Sodimico, Engineer in training and Junior Engineer, DRC.

Languages

- English–read, write, speak
- French–read, write, speak
- Swahili–read, write, speak.

Publications

1. Maleba, S. Life of the mine plan for Xstrata. Kroondal Chrome, 2008.
2. Maleba, S. and Jager, T. 2005. Best practice guidelines for the mining and rehabilitation of granite mines in the Brits-Rustenburg areas of SA.
3. Els, R. and Maleba, S. Investigation into nanotechnology for mining applications, CSIR Mining Technology STEP Project. 2005.
4. Maleba, S. Critical review of mining taxation in the African mining countries. UNISA, September 2004.
5. McGill, J.E., Maleba, S., Moseme, R., and Peake, A.V. Mining Plan for Ndwedwe Ceramics (Pty) Ltd. 2004.
6. Maleba, S. and Moseme, R. Mining plan for Phuthadijthaba Sandstone, 2004.
7. Matesa, J. and Maleba, S. Heat gains measurement of four insulation systems supplied by Robor. 2004.
8. Matesa, J. and Maleba, S. Measurement of the heat transfer and air pressure drop characteristics of a 350 kW Manos engineering cooling coils. 2003.
9. Maleba, S. Applicability of a mechanised rooms and pillar mining method in the exploitation of the east reef Kisenda Mines (Technical and economical analysis). University of Lubumbashi 1999. ◆

SAIMM Branch Chairpersons



Johannesburg Branch
John Arthur Luckmann

John Arthur Luckmann has been a Fellow of the SAIMM since 1989 and member of the Johannesburg Branch Committee since 2013. John was elected as Vice Chairman in 2014 and Branch Chairman in 2016, 2017, and 2018. He currently serves on the Technical Programme Committee and the Publications Committee of the SAIMM.

After graduating from Silesian University of Technology, Poland in 1974, John started his career as an engineer-in-training at Biprol, Poland. In 1980 John joined JF Thomson (Pty) Ltd, a company based in Perth, Western Australia. In 1984 he teamed up with the Chamber of Mines Research Organization of South Africa (COMRO) as Principal Mining Engineer.

In 1990 John joined the Mufulira copper mine project in Zambia as a Project Manager, and two years later he took up the position of Project Manager of the water treatment plant project at Riffa, Bahrain.

In 1999 John enrolled at the University of Pretoria, graduating in 2002 with Master of Engineering degree in Project Management.

A few months after graduating from University of Pretoria, John joined the French Agency (L'Agence nationale pour la gestion des déchets radioactifs) in Bure, France as a Principal Consultant, to provide input on risk management during shaft sinking operations.

John returned to South Africa in 2006 and joined RSV as a Consulting Engineer on gold and platinum projects. In 2008 he joined CBS Australia (Pty) Ltd as an Executive Director, a position that he currently holds.

Since 2015 John has been studying towards a PhD degree In Mining Engineering at Wits University.

John is married to Evelyn and they have a daughter, Isabella, and two grandsons, Juan and Tatum. John enjoys classical music, and plays accordion and harmonica. ♦



Namibian Branch
Nikowa Mabvuto Namate

Nikowa Namate is an industrial engineer and a mining engineer with 16 years' experience in industry and academia. He has worked in both the mining and the mechanical engineering fields, and is currently deputy head of the Department of Mining and Process Engineering at the Namibia University of Science and Technology, where he lectures in mining law, mining policy, and mine design and also acts as liaison between the engineering faculty and industry. He is a certified energy auditor, and has also served as an advisor to the Minister responsible for mines and consulted on a number of projects both on the small-scale and industrial level.

Nikowa has a passion for policy analysis, legislation, and strategic management. Has recently been involved in the development of government strategy for small-scale mining industry growth, and takes a keen interest in general research and ergonomics. ♦

SAIMM Branch Chairpersons



Northern Cape Branch
Fabian Clint Nieuwenhuys

Fabian Nieuwenhuys has been a Member of the SAIMM since 2014 and a member of the Northern Cape Branch Committee since 2015. He was elected as Branch Secretary in 2016 and Branch Chairman in 2018.

After graduating from the Cape Peninsula University of Technology in 2008, Fabian began his career as a professional-in-training at Namakwa Sands Smelting Operation, a heavy mineral sands smelting facility situated on the west coast of South Africa. In 2011 he was promoted to the position of Senior Plant Metallurgist and subsequently re-assigned to the Namakwa Sands Mineral Separation Plant.

In 2013 Fabian joined the Assmang Group as a Project Metallurgist at the Khumani Iron Ore Mine, and after 2 years was promoted to the position of Production Manager at the wet high-intensity magnetic separation process (WHIMS) in 2015. In 2016 Fabian completed a postgraduate Diploma in Management Practice at the University of Cape Town's Graduate School of Business.

Since 2016 Fabian has fulfilled multiple roles and responsibilities within the Khumani Mine management structure, and is currently assigned as Manager of the Metallurgical Services department, the load-out operations, as well as both primary crushing plants.

Fabian is married to Azalia, with a son and two daughters named, Aden, Logan, and Dyllan. His hobbies include reading, camping, playing the acoustic guitar, and online video gaming. ♦



Pretoria Branch
Roelf Mostert

Professor Roelf Mostert has been Head of the Department of Materials Science and Metallurgical Engineering at the University of Pretoria, since 2015. He is a founding Council Member of FORENSA, the Forensic Engineering Association of Southern Africa, and is the current Chairman of the Pretoria SAIMM Branch. His research interests include experimental mechanics of engineering materials, phase transformations, failure, forensics, and engineering law.

Roelf Mostert has produced a significant body of industrial reports on matters pertaining to failure, materials degradation, and fitness-for-service, specifically for the oil and gas, petrochemical, and construction industries. His academic publications, conference presentations, and patents typically flow from addressing topical problems in industry and society. He is the current Director of the Industrial Metals and Minerals Research Institute (IMMRI), a research facility with a strong focus on analytical high-temperature metallurgy. He is active in engineering dispute resolution, holds postgraduate qualifications in this field, and often appears as an expert witness in litigations. He is a registered Professional Engineer with the Engineering Council of South Africa. ♦

SAIMM Branch Chairpersons



Western Cape Branch
Lawrence Sidney Bbosa

Lawrence Bbosa completed his schooling in Nairobi, Kenya. He gained a BSc in Electro-Mechanical Engineering at the University of Cape Town in 2005, followed by an MSc in Chemical Engineering, specializing in the analysis of theories and models relating to ore breakage, and comparison of breakage behaviour of ores across a series of devices common to comminution research.

From January 2009 to June 2013 he held the position of Senior Scientific Officer at UCT's Centre for Minerals Research, where he coordinated and assisted activities within the research group, conducted numerical modelling simulations and laboratory experiments, and taught and assisted undergraduate and postgraduate students. During this time he completed a PhD in Chemical Engineering. The scope of his research covered both the applied and computational aspects of comminution, including computational modelling of tumbling mills using the discrete element method (DEM), validation with experimental data from positron emission particle tracking (PEPT), and modelling of power draw and energy dissipation in terms of charge motion variables. Since 2013 he has held the post of Senior Lecturer in the Department of Chemical Engineering at UCT, where he teaches in the Chemical Engineering degree programme and also pursues comminution research with the Centre for Minerals Research.

Lawrence is Vice Chair of SAIMM's Western Cape Branch. He has served terms on the University committee for International and Refugee Student Scholarship Awards as well as the Faculty ethics, safety, and first-year committees. He is a keen long-distance runner, and has completed the Two Oceans Half Marathon three times, as well as the Two Oceans Ultra Marathon in 2014. ♦



Zambian Branch
Darius Muma

Darius Muma graduated from the University of Zambia (UNZA) in 2004 with a BSc Chemistry. He worked as an Environmental Project Assistant at UNZA School of Mines with the Advocacy for Environmental Restoration Zambia (AREZ) before joining Konkola Copper Mines' (KCM) Nchanga Mine in Chingola as a graduate chemist. He remained with KCM for 8½ years, progressing through the ranks to Senior Chemist, Sectional Chemist, and Acting Head of Analytical Services. During this time he gained a Diploma in Business Management (Association of Business Executives, UK). In 2014 Darius moved to Mopani Copper Mines' Mufulira Mine to take up his present position of Assistant Superintendent Technical.

While at Mufulira, he completed a Bachelor of Education in Environmental Education at UNZA, and he is currently studying for an MSc in Sustainable Mineral Resource Development under the Education for Sustainable Development in Africa (ESDA) joint programme of the University of Cape Town's Faculty of Engineering and Built Environment and the UNZA School of Mines. Darius is married to Priscilla Chola, a professional nurse and tutor at Nchanga School of Midwifery and Nursing in the Zambian Ministry of Health. The couple have three children: Martin Kazandwe, Precious Mwaba, and Gracious Kunda.

Darius has a wide range of specialized skills and training, including X-ray fluorescence spectrometry, fire assay and related pyrometallurgical analysis techniques, laboratory auditing, chemometrics and intelligent laboratory systems, metallurgical accounting, and laboratory information management systems. He is a member of the SAIMM (currently Chairperson of the Zambian Branch), the Royal Society of Chemistry (RSC), the Chemical Society of Zambia (CSZ) (currently Northern Region Vice President), the Engineering Institution of Zambia (EIZ), and a student member of ABE, UK. ♦

SAIMM Branch Chairpersons



Zimbabwean Branch
Clara Petronella Sadomba

Clara Sadomba graduated from the University of Zimbabwe in 1990 with a Bachelor of Technology (Applied Chemistry & Chemical Technology), and went on to complete a Master's degree in Metallurgical Engineering at McGill University, Montreal, Canada in 1996. After a brief spell in the chemicals and plastics industries, she joined Zimbabwean integrated ferrochrome producer Zimasco (Pvt) Ltd under their graduate learnership programme and has been with the company since then, progressing through the operational, middle, and executive managerial levels. She is currently General Manager – Marketing and Administration, with key responsibilities that include marketing strategy and planning; market analysis; marketing, sales, and logistics process optimization; corporate communication; and administration of head office operations.

Clara has extensive international business experience with cross-sector and cross-cultural exposure. She is registered as a Professional Engineer with the Engineering Council of Zimbabwe, a member of the SAIMM (she is Chairperson of the Institute's Zimbabwe Branch), and a member of the Zimbabwe Institute of Engineers. She is also Chairperson of the Zimasco Pension Fund.

Clara is single, with one son aged eighteen. ♦



Zululand Branch
Christo Mienie

Christo was born on 18 November 1963 in Vereeniging and matriculated in 1981. He obtained his Dip Tech (T5) in Metallurgical Engineering from the Vaal Triangle Technikon. He worked at Iscor (Mittal) Blast furnaces and their Research and Development department. His area of focus was iron manufacturing, with particular interest in the evaluation and characterization of iron ore, coal, and coke for the blast furnace, direct reduction, and Corex processes.

Christo joined Richards Bay Minerals (RBM) in 1992. He gained valuable metallurgical and production experience over the next 14 years at various RBM plants including the roaster, char plant, iron processing, slag processing, and the smelter. His metallurgical responsibilities included increasing the production of prime grade slag and pig iron, furnace rebuilds, working in conjunction with the marketing department to establish new markets and customers, and the introduction of best practices in the process metallurgical field.

His HR responsibilities included the management, training and development of metallurgists. He completed his MDP through the University of Durban Westville during 1997. Christo obtained valuable experience with regards to business restructuring ('right-sizing') while being the team leader responsible for the SHEQ and technical departments.

He resigned from the corporate world when he joined Spectrum Technical (Pty) Ltd in 2006 as a director and shareholder – his current position. Services to clients includes plant feasibility studies, flow sheet design, process equipment selection and supply, pilot-scale test work, plant commissioning, troubleshooting, and cost analyses in the metals and minerals industry.

Christo is married to Marietjie, and they have two boys – Francois and Christo Junior. He is a keen jogger. ♦



Presidential Address: Towards the future: African Mining Vision, Mining Phakisa and the SAIMM

by A.S. Macfarlane

Synopsis

Recent political winds of change blowing through the African continent have created the hope of a new dawn for the mining industry, and a renewed impetus to support the African Mining Vision.

South Africa finds itself well positioned to support the African Mining Vision, and the Mining Phakisa process has laid a solid foundation for the country to play a key role in the attainment of the Vision. Furthermore, the renewed focus on the National Development Plan has increased the need for the mining industry in South Africa to reinvigorate itself, and to be a key contributor to gross domestic product once again.

The Phakisa outcomes have resulted in renewed support for research and development within the mining industry, as well as support for localization in the manufacture of mining equipment, for domestic use and for export to the rest of the continent. Further emphasis is being placed on stimulating alternate businesses near mining communities, through the establishment of small- and medium-sized enterprises.

In the area of research and development, the recent establishment of the Mandela Mining Precinct bears testimony to these renewed efforts by the State, industry, and other stakeholders in developing a vision for Mining 2030.

All of these thrusts are based on the principles of collaboration, open innovation, transparency, and transformation. None of them will be achievable without capacity building, capability creation, and development.

It is within this spirit of collaboration and journey of renewal that the Southern African Institute of Mining and Metallurgy must find its place and the supportive role that it can play.

The incoming President of the SAIMM has been deeply involved in the Phakisa process, and continues to be involved in the research and development initiatives, as well as working with transformation, empowerment, and health and safety issues in the industry.

This Address will therefore unpack the vision and objectives of the African Mining Vision, in terms of how the Mining Phakisa in South Africa aligns to it and how the Institute can and should play a supportive role in the Mining 2030 vision. The SAIMM, being the Southern African institute as it is, can play a pivotal role in supporting skills upgrading, gender equality in the industry, transformation and empowerment, research and development, and social upliftment in mining-based communities.

Introduction

The Presidential Address by our outgoing President, Professor Sehliselo Ndlovu (Ndlovu, 2017) emphasised the need for collaboration in research and between universities. She noted in her conclusion that 'The key to success in an economic downturn is the development and application of innovative, cost-effective exploration, mining and mineral processing technologies that can ensure

sustainability and return on investment. Industry-academic partnerships can go a long way towards facilitating such achievements during these periods. The major benefits that can be gained from such a partnership are in three distinct areas: student training, research, and entrepreneurial activities, which can lead to the transfer of both technology and knowledge'. Her address, with its focus on collaboration and capacity development, forms a perfect backdrop to this one, and the two addresses are perfectly aligned.

This Presidential Address describes the work that has been done to establish research and development capacity and capability, to support the sustainability of the South African mining industry, and the journey that is required to be followed if these efforts are to be sustainable and aligned to national and international imperatives.

By way of introduction, it is informative to review such international and national issues, as well as industry imperatives.

R&D as part of a greater vision : the African Mining Vision

The vision of the African Mining Vision, as defined by Antonio Pedro, Director, Sub-regional Office for Eastern Africa United Nations Economic Commission for Africa (Pedro, 2013) is:

'Transparent, equitable and optimal exploitation of mineral resources to underpin broad-based sustainable growth and socio-economic development'.

The AMV is based on a number of 'tenets' and some of these have been extracted in order to set a context for R&D and industrialization in Africa, and South Africa in particular. Those of particular relevance are:

* Co-Director, Mandela Mining Precinct, Johannesburg, South Africa.

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- Using comparative advantages to build dynamic comparative and competitive advantages: a developmental, transformative, knowledge-driven, and integrated mining sector with downstream, upstream, and sidestream linkages
- Optimal exploitation of finite resources at all levels (large- and small-scale) and of all types (high and low value, including nonmetallic minerals)
- Fostering sustainable development principles based on environmentally and socially responsible mining, which is safe and includes communities and all other stakeholders
- Building human and institutional capacities towards a knowledge economy that supports innovation, research, and development
- Promoting good governance of the minerals sector in which communities and citizens participate in decision-making and in which there is equity in the distribution of benefits
- Unbundle the 'minerals complex' (from exploration to fabrication, markets, and mine closure) to identify entry points for local participation, particularly in the provision of good and services.

These tenets give important direction to the development of a South African research, development, and innovation ecosystem in a continental context. Such direction needs to satisfy the internal needs of the South African economy, and of the mining sector (if it is to be repositioned as an important contributor to the GDP), and also those of the mining equipment and capital goods sectors. The encouragement of localization of supply offers the opportunity to develop internal capacity and capability, and to position South Africa favourably in the export market into Africa, and beyond.

The National development Plan 2030

The National Development Plan (NDP) (National Planning Commission, 2013) is a long-term South African development plan, developed by the National Planning Commission in collaboration and consultation with South Africans from all walks of life. Introducing it on 19 February 2013 Minister Trevor Manuel said 'The plan is the product of thousands of inputs and perspectives of South Africans ... It is a plan for a better future; a future in which no person lives in poverty, where no one goes hungry, where there is work for all, a nation united in the vision of our Constitution'.

The objectives of the National Development Plan are as follows:

- Uniting South Africans of all races and classes around a common programme to eliminate poverty and reduce inequality
- Encourage citizens to be active in their own development, in strengthening democracy, and in holding their government accountable
- Raising economic growth, promoting exports, and making the economy more labour-absorbing
- Focusing on key capabilities of both people and the country
- Developing capabilities include skills, infrastructure,

social security, strong institutions, and partnerships both within the country and with key international partners

- Building a capable and developmental state
- Building strong leadership throughout society that works together to solve our problems.

In regard to the research, development, and innovation agenda, the NDP states that South Africa's competitiveness will rely on national systems of innovation that permeate the culture of business and society. Innovation and learning must become part of our culture. This will require interventions spanning from the schooling system through to shop-floor behaviour, to R&D spending and commercialization. Public policy should focus on R&D in existing areas of competitive advantage where markets are set to grow. These include high-value agriculture, mining inputs and downstream processing, innovation to meet environmental and energy-efficiency objectives, and financial services, among others.

In her budget vote speech in Parliament on 9 May 2018, the Honourable Minister of Science and Technology, Mmamoloko Kubayi-Ngubane (one of our honorary Presidents) said 'we aim to advance the goals of the National Development Plan by harnessing science, technology and innovation for the socio-economic development of all South Africans.' (Kubayi-Ngubane, 2018), She went on to say 'Honourable Members, science, technology and innovation are fundamental not only to achieving the goals of the National Development Plan, but also for implementing the 2030 Agenda for Sustainable Development adopted by UN member states in 2015 ...' She acknowledged in her speech that South Africa currently spends 0.7% of its GDP on R&D, a figure which is less than half that of the global target of 1.5% and well below the rate of expenditure of South Africa's BRICS counterparts.

Reaching these targets is a vital component of the work of the Department of Science and Technology (DST), which has commissioned a new White Paper on Science, Technology, and Innovation, the premise of which is that science, technology, and innovation are vital for shaping an inclusive and sustainable South African society. The draft White Paper seeks, among other things, to take advantage of opportunities presented by global megatrends such as the emergence of new technologies, including artificial intelligence and additive manufacturing.

Reference in her speech to the mining industry being a focus area within the RDI landscape further gives direction to the work that has been done, and which continues to be the focus of the Mandela Mining Precinct.

The Minerals Council South Africa, a critically important stakeholder in the mining industry in South Africa, says in its Facts and Figures Pocketbook 2017 (Minerals Council South Africa, 2017a):

'As mining depths increase and conditions become more challenging, there is an urgent need to modernise the industry. Mechanisation is one pillar of modernisation. Modernisation is not simply mechanisation. It is a process of transition and transformation of the mining industry of yesteryear to that of tomorrow. Modernisation will be driven by technological innovation, which in turn needs to be driven by Research and Development. To be successful, the

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approach to modernisation must be holistic, and be conducted in a systems and people-centric manner. The three key enablers of modernisation are research and development, where massive investment is required, a mining capital goods development programme to turn research effort into development and implementation, and a transition roadmap for modernisation that includes sustainability, impact assessments of future mining scenarios and accelerated skills development of employees in local communities'.

The recent tragic incidents that have resulted in a disturbing regression in mine safety performance in South Africa, along with announcements of cutbacks and retrenchments, have prompted the Honourable Minister of Mineral Resources to express his concern over these trends, and the trends to put operations on 'care and maintenance'. He has also expressed concern over sustainability and community development and engagement, all of which support the need for developing a sustainable RD&I ecosystem for the minerals industry in South Africa.

The Address takes these contexts into account, in describing the journey towards the Mandela Mining Precinct and the modernization of the industry.

The state of the industry and the need for R&D

It is well documented in papers from around the world that successful economies invest strongly in research and development, and that there is a strong correlation between growth, productivity, and R&D activity.

The decline in the prosperity of the mining industry in South Africa is also well documented. From being one of the major mineral-producing countries in the world, South Africa now finds itself in a very different position in terms of market share of production, despite still having a considerable mineral resource endowment. This is indicated in Table I, which shows the remaining reserves, and the

percentages of world reserves and production, as reported by the Council for Geoscience (2013). What is not clear from this table is whether the data actually refers to Reserves, or to Resources. It would appear, however, that it does refer to Resources given the well-known fact that South Africa contains 80% of the world manganese resources, a figure which is reflected in the table. If this data does refer to Resources, then economic factors need to be applied in terms of costs and cut-off grades, each of which will depend on the mining method applied. A further indicator that the data is more than likely referring to Resources is the well-rounded numbers in terms of mass.

However, whichever is the case, the table does indicate that considerable potential exists if appropriate extraction methods can be designed and applied, such that reasonable percentages of these Resources can be turned to account.

The mining industry in South Africa contributed R312 billion to the gross domestic product in 2017, representing 6.8% of the economy. A look at the data since 1946, as shown in Figure 1, illustrates a relatively static contribution since 1970, but a significantly decline in percentage terms against other industries (Minerals Council South Africa, 2017a)

The industry employed 464 667 people directly in 2017, which in fact was a slight increase (by 1.6%) over the year before. This is despite the fact that 30 000 jobs have been lost since 2014, largely in the gold sector.

After the discovery of gold on the farm Langlaagte by George Harrison in 1886, gold became the core of the South African economy, with a peak production of 1000 tons in 1970. This had reduced to just over 250 tons by 2007, further shrinking to 138 tons in 2017. In 2017, some 175 770 people were employed in the sector, compared to 280 000 in 2007.

So, given the 6000 tons of Resources, why is this the case? The answer to this question lies in the combination of

Table I

South Africa's Mineral Resources

| Mineral | | RESERVES | | | PRODUCTION 2009 | | | LIFE |
|---------------------|----|----------|--------|------|-----------------|--------|------|-------|
| | | Mass | %World | Rank | Mass | %World | Rank | Years |
| Alumino-silicates | Mt | 51 | * | * | 0.265 | 60.2 | 1 | 192 |
| Antimony | kt | 350 | 16.7 | 3 | 3 | 1.6 | 3 | 117 |
| Chromium Ore | Mt | 5500 | 72.4 | 1 | 6.762 | * | 1 | 813 |
| Coal | Mt | 30408 | 7.4 | 6 | 250.6 | 3.6 | 7 | 121 |
| Copper | Mt | 13 | 2.4 | 6 | 0.089 | * | * | 146 |
| Fluorspar | Mt | 80 | 17 | 2 | 0.18 | 3.5 | 5 | 444 |
| Gold | t | 6000 | 12.7 | 1 | 197 | 7.8 | 5 | 30 |
| Iron Ore | Mt | 1500 | 0.8 | 13 | 55.4 | 3.5 | 6 | 27 |
| Iron Ore - incl. BC | Mt | 25000 | ~10 | * | 55.4 | 3.5 | 6 | 451 |
| Lead | kt | 3000 | 2.1 | 6 | 49 | 1.2 | 10 | 61 |
| Manganese Ore | Mt | 4000 | 80 | 1 | 4.576 | 17.1 | 2 | 874 |
| Nickel | Mt | 3.7 | 5.2 | 8 | 0.0346 | 2.4 | 12 | 107 |
| PGMs | t | 70000 | 87.7 | 1 | 271 | 58.7 | 1 | 258 |
| Phosphate Rock | Mt | 2500 | 5.3 | 4 | 2.237 | 1.4 | 11 | 1118 |
| Titanium Minerals | Mt | 71 | 9.8 | 2 | 1.1 | 19.2 | 2 | 65 |
| Titanium- incl. BC | Mt | 400 | 65 | 1 | 1.1 | 19.2 | 2 | 364 |
| Uranium | kt | 435 | 8 | 4 | 0.623 | 1.3 | 10 | 698 |
| Vanadium | kt | 12000 | 32 | 2 | 11.6 | 25.4 | 1 | 1034 |
| Vermiculite | Mt | 80 | 40 | 2 | 0.1943 | 35 | 1 | 412 |
| Zinc | Mt | 15 | 3.3 | 8 | 0.029 | 0.2 | 25 | 517 |
| Zirconium | Mt | 14 | 25 | 2 | 0.395 | 32 | 2 | 35 |

Source: SAIMM 2009/2010, DMR 2010; and Wilson & Anhaeusser 1998: "The Mineral Resources of South Africa", CGS Pretoria (for BC- Bushveld Complex)

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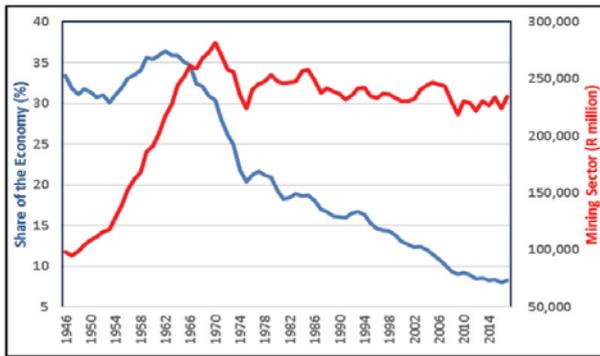


Figure 1—Mining industry contribution from 1946. (Minerals Council South Africa, 2017a)

declining grades, increasing input costs, declining productivity, and relatively static prices. The impact on the unit cost of production, as production has declined, and the cut-off grade, is dramatic. This is illustrated in Figure 2.

Platinum was discovered in 1924, prior to the discovery of the Bushveld Complex, and various small companies (Premier Rustenburg Platinum, Erstegeluk Platinum Mines, and the Rustenburg Platinum Company) were amalgamated into Johannesburg Consolidated Investment Co. Ltd in 1926. Production grew in the 1960s and 1970s, but the real expansion came after 2001.

According to Africa Mining IQ (n.d.) South Africa, which boasts 80% of the world's PGM Resources, has 84 platinum projects/operations, held by 11 companies. At March 2018, 21 of these were operational, one had been closed, and six were under care and maintenance. The remainder are in various stages of development, from grassroots to construction. Price trends for platinum, which indicate a steady rise after 2001, provide the reason for the significant growth in the industry and investment in these projects. This scramble for new production soon led to the realization that the market would be over-supplied, and prices tumbled to where they are now. Employment in the PGM sector remained static between 2007 and 2017, between 180 000 and 200 000, and currently standing at 175 770 employees.

Platinum Resources (Table I) are estimated at 70 000 tons, representing 258 years of mining potential. However,

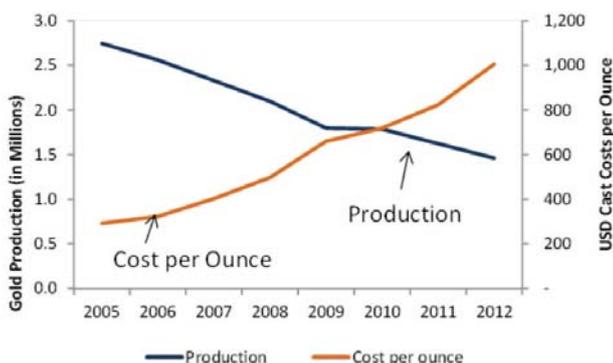


Figure 2—Impact of rising costs and gold production. (Minerals Council South Africa)

the reality of Reserves is very different, with at least 70% of the industry unprofitable at current prices. The problem for the platinum industry is therefore one of costs and prices, and the ability of mines to survive in a market that does not show many signs of price improvement, unless new markets are found.

While most known PGM Resources are covered by existing mining rights, these Resources usually have a cut-off based on depth (usually 2500 metres). This cut-off is based on the assumption that mining below these depths using current methods is not economically or ergonomically possible, because of the severe geothermal gradient, which is double that in the Witwatersrand goldfields.

The platinum industry has responded to these economic challenges through the introduction of mechanization, but only in areas where the orebody is amenable to mechanization. In such cases, efficient operations exist, as at Two Rivers for example, but attempts to 'retrofit' mechanization into conventional operations through 'hybrid' methods have generally been unsuccessful because of existing system constraints. In addition, the massive reefs of the northern limb of the Bushveld Complex may be exploitable by opencast mining, as is the case at Mokolokwena, or by highly mechanized and modernized methods for underground mines, such as at IvanPlats and the Waterburg deposit. However, the majority of PGM mining is currently done through conventional shafts, set up for conventional mining, and the productivity decline has been consistent and enduring.

Safety and health challenges remain in the South African mining industry, despite significant improvement over the years. Figure 3 shows a steady decline in fatality rates since 1993, but with a disturbing reversal in 2017 and to date in 2018. In 2017, a major contributor to the upturn was the PGM sector, whereas the current poor performance is largely attributable to the gold industry.

That safety and health issues are increasingly important to shareholders, employees and the State is clear in the light of class actions, and the determination of the Department of Mineral Resources to attain the safety and health milestone targets.

Figure 4 shows the contribution of various commodities to total sales in 2017, illustrating that while coal takes the most significant share (27%), gold (15%) and PGMs (21%) are also major contributors. Although gold sales have diminished significantly since 1970, both gold and PGM sales still remain extremely important to the South African

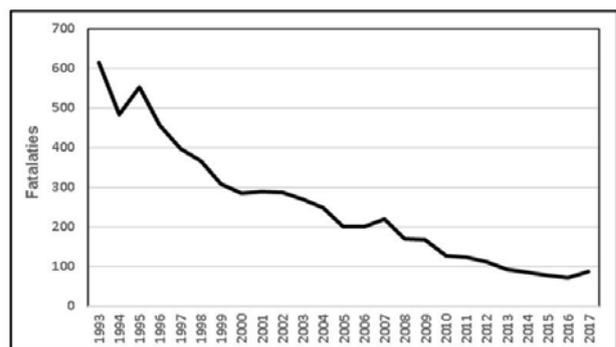


Figure 3—Industry fatality rates. (Minerals Council South Africa)

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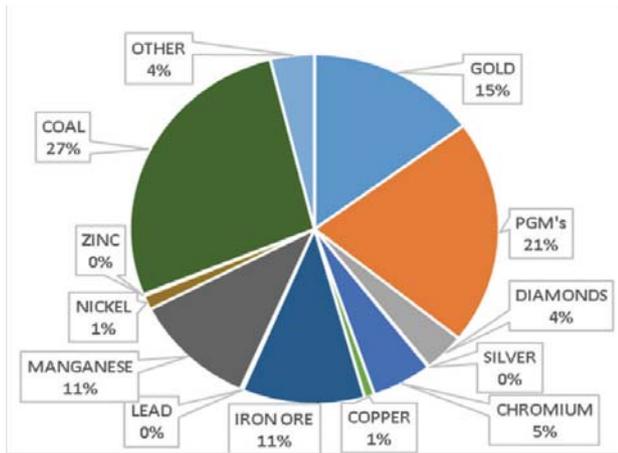


Figure 4—Sector sales contribution. (Minerals Council South Africa)

economy, and since they are still the major employers in the mining industry, these sectors need to find ways to exploit remaining resources cost-effectively and safely.

It is for these reasons that the 'burning platform' for the South African mining industry is in the gold and PGM sectors, where the majority of operations utilize conventional underground, tabular mining methods, which are labour-intensive and increasingly inefficient. While excellent research work has been done in the past through programmes such as DeepMine on rock engineering designs, refrigeration, and rope technology, very little has changed in the stoping area of these operations, apart from the implementation of hydropower to a limited extent.

In order to illustrate the precarious position of the gold and platinum industries, in 2015, as input to the Mining Phakisa, a project was carried out that entailed consolidating the published Mineral Resources of the major gold and PGM mining companies and then, through economic modelling, applying modifying factors to these Resources. The modifying factors included conservative metal price and cost forecasts, and assumed that mining would continue at existing productivity levels using conventional methods. The outcome,

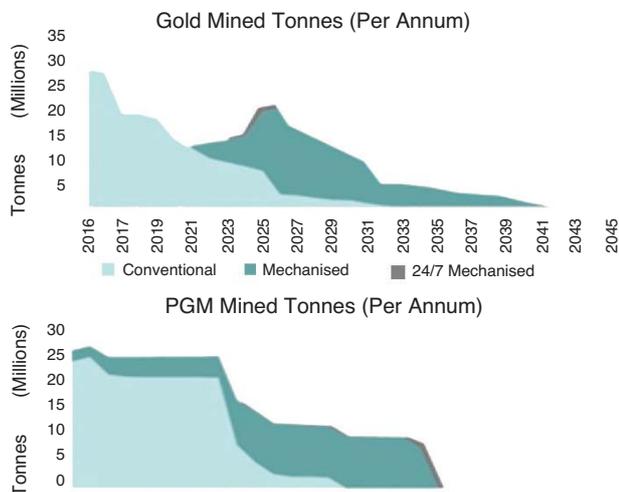


Figure 5—Impacts of 'do nothing' scenario on the gold and platinum industries

which is shown in Figure 5, illustrates that if operations continue as they are, a steady decline in viable gold operations will occur through to the mid-2020s, while the platinum industry will face a crisis at about the same time. These declines are due to the closing of marginal operations due to the combined effects of costs, prices, and grades.

The conclusion from this work and the trends in the mining industry are clear. Research and development is urgently needed to find safer, healthier, and more efficient ways to exploit lower grade and deeper reefs in the gold and PGM industries, if the industry is to be sustainable and if the remaining resources can be exploited.

Exploring the productivity metric

According to Wikipedia, 'A productivity measure is expressed as the ratio of output to inputs used in a production process, *i.e.* output per unit of input.' Unfortunately, in mining everyone has a different view of what productivity means, and it is therefore important to default to this definition, to define productivity as the unit cost of production. Once that is done, the unit cost of production can be seen as a lagging indicator, which is driven by a complete tree of leading indicators that include people, systems, technologies, and capital. Each of these in turn can then be unpacked to determine where the maximum benefits can be gained, in terms of applying research and development, to improve overall productivity.

The history of R&D in the South African mining industry

Figure 6 depicts the history of mining research in South Africa. Initial research started in 1934, with the formation of the 'Minerals Research Laboratory' at the Department of Metallurgy and Assaying, at the University of the Witwatersrand. This was the forerunner of what is now Mintek.

According to du Plessis (2015):

'in 1960, the Chamber members were from the gold and coal mines; platinum miners were not members of the Chamber. At that time, the gold mining members (which therefore had an interest in hard-rock mining) were Anglo American, Anglovaal, Gold Fields, General Mining, JCI, Rand Mines, and Union Corporation.'

'The gold mining industry enjoyed a boom period between 1960 and 1980, with the industry employing more than 800 000 people. The major technological problems then faced by the industry related to safety and occupational health, particularly the risks arising from rockbursts and rockfalls, dust, and the low productivity of mineworkers. The industry accordingly sponsored research to address these issues. At that time, work was undertaken by Wits University, the Bernard Price Institute, the CSIR, Mintek, and the Chamber of Mines Laboratories. Rand Mines had its own formal in-house laboratory. All these organisations conducted research along discipline lines such as mathematics, physics, chemistry, metallurgy and medicine.'

The need for a dedicated mining research organization in South Africa was recognized following the inquiry into the Coalbrook disaster, which highlighted the need for systematic research. The Chamber of Mines Research Organisation

Towards the future: African Mining Vision, Mining Phakisa and the SAIMM

South African Mining R&D Journey

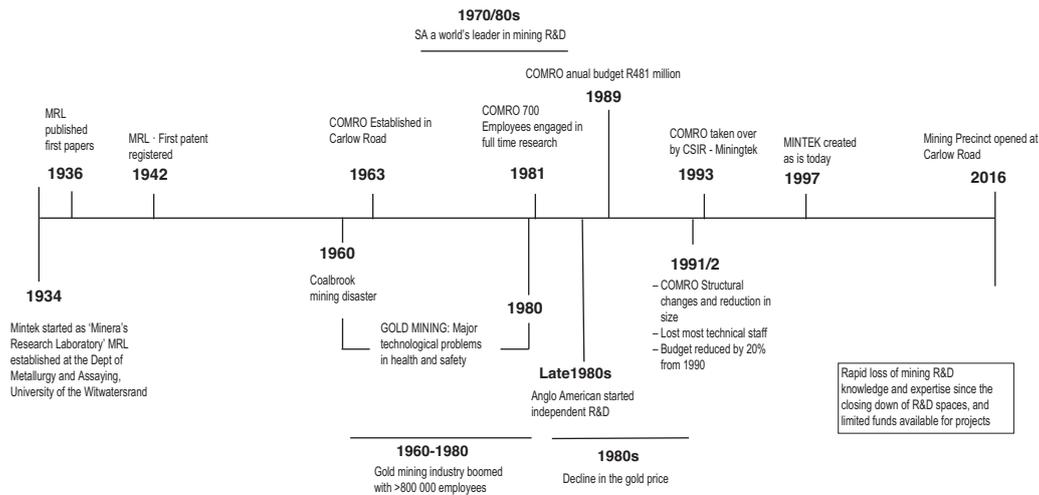


Figure 6—The South African mining RD&I journey, 1934 to present (after RIIS 2018, work on model for Mandela Mining Precinct, March 2018)

(COMRO) was established in 1964 and served as both a mining research laboratory and a physical sciences laboratory. In the early to mid-1970s, COMRO had a 10-year research programme to address current and anticipated future problems, in deep-level gold mines in particular. This was a fully privately-funded organization, being funded by the Chamber of Mines member companies. At its peak in 1989, according to du Plessis (2015), funding amounted to R481 million, equivalent to R581 million in today's terms.

COMRO, as reported by Lowit (2015), at its peak employed up to 1000 staff drawn from around the world, with laboratory facilities and capital equipment that enabled it to stay at the leading edge of mining technology development. COMRO was a world leader in mining patents, both in terms of volume and quality. Lowit ascribes the success of COMRO to it being a 'one-stop shop' that dealt with:

- Research and development
- Development of on-site demonstration models of new products
- The manufacturing sector such that the transition from test model to mass production was seamless
- IP and commercialization issues.

Lowit concludes by stating that 'essentially for close on 30 years COMRO was the benchmark and the gold standard for industry – research collaboration and RD&I in the mining sector globally'. However, in the late 1980s, CoM member companies started to feel that the work of COMRO was

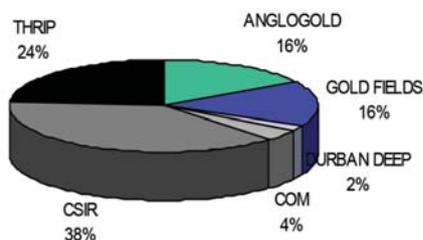


Figure 7—Deepmine funding split

drifting away from industry needs, and that specific work could be done by the establishment of in-house research capacity. As the first company withdrew from COMRO, so the dominoes fell, and the demise of the model was imminent.

Recognizing this, the work of COMRO continued under CSIR Mintek (later the Centre for Mining Innovation – CMI) through programmes such as DeepMine, FutureMine, PlatMine, and the establishment of Coaltech. These were specific programmes, jointly funded by participating companies, universities, and CSIR Mintek.

DeepMine, for example, had a budget of R66 million (Figure 7), funded jointly by industry, the CSIR, and THRIP, with the industry contribution being 38% of the total (Diering, 1999). The model, as a public-private partnership, was successful, and the programme delivered practical, applied research outcomes that were widely accepted by industry.

Subsequent programmes, including FutureMine and PlatMine, were less widely accepted, and mining companies were persuaded to continue their own research in-house. Thus, according to Webber-Youngman (2018) funding into industry programmes had fallen to R100.6 million in 2002/2003 (Figure 8), or R255 million in 2018 money.

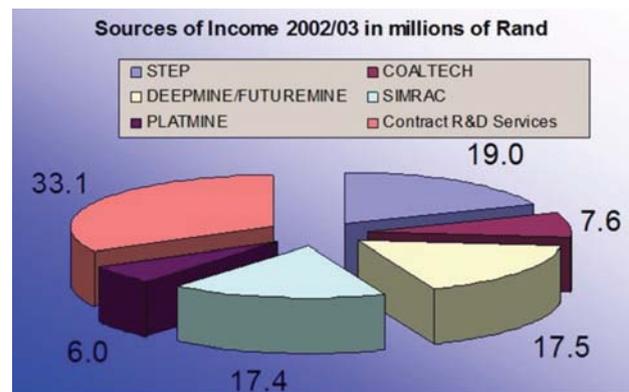


Figure 8—Mining R&D funding in 2002/2003 (Webber-Youngman, 2018)

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The idea was that through the CSIR, the capacity and capabilities of COMRO would be secured for the country. However, the CSIR was unfortunately unable to retain the COMRO researcher base; neither could it maintain the organization's relationship with industry or its specialized facility and capital equipment. Carlow Road and other COMRO facilities were eventually mothballed. The closure of COMRO, and Miningtek and the disaggregation of CMI were perhaps the most important events that impacted on the country's current mining RD&I capacity and capabilities and its future potential.

Various initiatives have been established that are aimed at providing finance for specialist areas of research. These include health and safety research through the Safety in Mines Research Advisory Committee (SIMRAC) and the Mine Health and Safety Council and its Centre of Excellence. At universities, various centres have been established, such as the Centre for Mechanised Mining Systems and the Centre for Sustainability in Mining at Wits, the Wits Mining Institute, and the Mining Resilience Research Centre at the University of Pretoria.

During recent years, State funding for mining R&D through the DST has been directed mainly at the Council for Geoscience and Mintek. Lowit (2015) explains:

'Of programme 5's 1.6 billion Rand budget a mere 54million Rands is set aside for the Mining and Beneficiation Unit. This budget covers operating expenses and funding for the establishment and running of research networks which actually conduct sectoral R&D. The research network budget of R41.25m is dominated by the Advanced Metals Initiative which receives 96% of the unit's total R&D budget. Mining receives R750 000 (1.8%) and Geo Sciences R500 000 (1.2%). This skewing of support is equally visible when it is considered that MINTEK received a R277 million grant from government in 2014/2015, while The Council for Geoscience (CGS) received R287m in the same financial year. No equivalent was invested in mining extraction activity. These allocations are reflective of DST's and the broader government's view of the role of the minerals value chain in the South African economy and a very specific view on how a resource based economy should be leveraged for growth.'

Professor Phillips, in the SAIMM Journal of 2014, (Phillips, 2014) concluded that:

'At present there is no organization or institution commanding sufficient respect from the mining industry to be the leader or custodian of the necessary research. Should it be a government department that initiates a revival of mining engineering research? Should it be the Chamber of Mines, or the CSIR, or indeed a consortium of universities? Time will tell, but time is also running out and the store of knowledge from previous research is dissipating fast.'

Lowit (2015) makes two important observations from the statistics of the last few years. The first is that post-2007 and the financial crisis, there has been a steady increase in private sector expenditure on R&D. In particular, the mining industry increased its share of this (increased) expenditure from 6% in 2004 to 15% in 2013. The second is that since 2009, there has been a major shift from 'experimental' to applied R&D.

The conclusions to be drawn from these observations are that:

- Mining companies had 'ridden the crest of the wave' during the commodity supercycle, during which profits were abundant, and shareholders received superior returns
- Any experimental or fundamental research was largely done through universities
- After the end of the supercycle, companies were forced to find innovative ways of ensuring survival, after a period when little work had been done on applied research. Hence the uplift in applied research done with OEMs and on-mine application.

The author's analysis of R&D spend by mining companies during this period substantiates this, with a collective private expenditure of R635 million in 2015, of which R580 million was direct funding, the remainder being indirect in the form of grants and chairs. The spread of this expenditure was very uneven, with companies such as AngloGold Ashanti (through the AngloGold Technology and Innovation Consortium) and Anglo American spending the bulk of the money.

According to Singh (2018):

'Prior to the Mining Phakisa in October 2015, South African had no single strategy for mining extraction RD&I. The Department of Science and Technology (DST) had developed a draft document called "Development of a South African research agenda for mining and geosciences" and at the same time, the Department of Mineral Resources (DMR) had commissioned a study "A Technology Innovation Roadmap for the South African Minerals Industry" which was also a draft. The CSIR was tasked by the Deputy Minister, Mr. Godfrey Oliphant, following a series of workshops in early 2015 to consolidate these two strategies into one document and update with inclusions of more recent developments. The resultant document called the South African Mining Extraction Research, Development Innovation (SAMERDI) Strategy approved by the DST in June 2015, resulted in funding being increased from R 0.75 million to R 6.7 million for the 2016/17 financial year (FY).'

The programme which was thus developed contained a listing of research projects ranging from fundamental to applied research, but which did not have major industry support or involvement.

In 2014, an industry forum was formed, known as the 'Centre for Technology Innovation in Mining', in an attempt to revitalize collaborative research from an industry perspective. Unfortunately, this initiative did not gain traction due to various issues relating to governance being unresolved.

So, how much should be invested in R&D? A generally accepted global benchmark is that 1.5% of the GDP should be invested in R&D. In South Africa, this would equate to R56.7 billion. Currently this figure is around 0.7%, or R21.84 billion. For mining, with a contribution of R312 billion to the GDP in 2017 (Minerals Council South Africa, 2017a), this would equate to R4.68 billion.

Clearly, to ramp to these levels from a base of R750 000, would be impossible and unaffordable. However, as part of the NDP and Vision 2030, this objective should be reached by 2030, if not before.



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The current need for research and development: safety, health, and productivity

Variations have been made (but failed) to illustrate the widely held belief that the mining industry can be revived only if serious funding is directed towards mining research in South Africa. Traditionally, such research would have been aimed at deep-level mining requirements, involving rock engineering, ventilation, hoisting, and technology research. However, times are changing and we find ourselves in the midst of the Industrial Revolution 4.0, and the exponential rate of change occurring in the communications and digital space. These changes have been embraced in areas like the financial services sectors and aerospace, but the mining industry is playing catch-up.

Luis Canepari, Vice President of Technology at GoldCorp (Canepari, 2018), when asked to describe GoldCorp's future vision of mining, said:

'We believe the mining industry has been slow to adopt technology, slow to innovate, creating an opportunity for Goldcorp to leapfrog. Core to our future mining technology strategy and roadmap, is the intent to create the technology foundation that will enable us to leapfrog – in terms of maximizing production, increasing efficiency, reducing waste, increasing safety, and contributing positively to the stakeholders engaged in our business. As a business, Goldcorp thinks about its future mining operations in terms of the net asset value growth opportunity that will result from technology applications and data insights across all parts of our operations. We know that this will mean reshaping the business and optimising all aspects of operations, it will touch everything that we do.'

This comment comes from a tech-savvy North American mining company, and emphasises the level of catch-up that is required in the mining industry compared to other industries and sectors. This reality is even harsher when painted against a South African conventional mining backdrop.

Canepari goes on to say:

'The environment that we are moving to is one that is fully autonomous, electrified, optimized for a smaller environmental footprint that uses less fresh water and energy, and is 100% connected from the beginning. We are making investments now that are moving towards this future. Our future has a heavy focus on sustainability – in terms of power and water consumption, on minimizing waste and on ensuring the communities near our operations continue to see both social and economic benefits as a result of our operations.'

The term 'Industrial Revolution 4.0' is used to describe a further development in the management and control of the entire value chain process in mining or manufacturing, enabled by data. The transition to 4.0 is described by Deloitte (2018) as being a shift from Industrial Revolution 1.0, starting with the first mechanical weaving loom in 1784, to the first assembly line in 1870 (2.0), to the first programmable logic control system in 1969 (3.0), to the fourth industrial revolution characterized by cyber-physical production systems, and the merging of real and virtual worlds.

BMI (2017) indicated in a research report that *'Miners will increasingly invest in technology integration, including*

automation and internet connectivity, to improve competitiveness in a volatile mineral price environment. Major diversified miners, with the largest budgets, operating in developed markets capable of providing widespread internet access and skilled labour, will drive this trend.' Such moves into automation and connectivity are exemplified by the following observations from BMI.

'The benefits of applying technology to mining operations are clear: increased efficiency lowers costs, improved safety records and lesser waste and environmental impact. Over 2015-2016, at the bottom of the commodity price bust, miners turned to technology to cut costs and improve performance to better withstand future price volatility. For instance, in 2016, top copper miner Codelco increased the 'innovation budget' to USD75mn from USD60mn in 2015 and in December of 2016 created the Codelco Tech unit to drive innovative efforts. In September 2016, top gold miner Barrick Gold partnered with Cisco to develop a flagship digital operation at the Cortez mine in Nevada which will inform the eventual global rollout. Industry leader Rio Tinto rolled out the Processing Excellence Centre in Brisbane, Australia, and autonomous fleet utilisation in 2015.'

In the VCI (2017) 'Innovation State of Play' survey, for which some 800 respondents in the global mining industry were interviewed, the top responses to the question 'which macro-trends will have the biggest impact on the industry over the next 15 years?' were 'technological change and disruption' (62%) and 'technically aware generation entering the workforce' (37%).

These are global perspectives, but what about Africa, and South Africa? The 2017 VCI survey focused on the view of South African CEOs and this showed a subtle but important difference, in that while these CEOs recognized the importance of embracing the digital revolution for competitiveness, their views are tempered by the impacts on labour-intensive operations and surrounding communities, all coupled with the need for skills development. The 'Innovation State of Play, Africa' report by Deloitte (2016) states 'Definitively, now is the perfect time to take African mining into an age where technological and organisational sophistication meet social conscience.'

These views could be the 'view from the top', so what about the 'view from the bottom'?

Any discussion around 'modernization' is a difficult one, because everyone in the conversation has a different view on what it means for South African operations. What may be possible to make an open pit operation globally competitive through automation and artificial intelligence is not possible in older, underground operations. There is thus a need to create a common vision of what modernization means for the very people that it will affect.

South Africa's mining landscape, particularly in the gold and platinum sectors, is populated in the main with labour-intensive operations using methods that have remained relatively unchanged for scores of years. The notion of automated operations in a conventional tabular mining environment is difficult to visualize, and virtually impossible to implement in practice. The result is that, for these operations, modernization involves a combination of changes in the way people work, the tools that they use, the way they communicate, and the way the system is to be optimized.

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These realizations help to define the research focus.

Any R&D work that is to be done for the industry always involves an impact on people, whether this means reskilling, new learning, restructuring, new work cycles, job transfer, or the impact of modernization.

Traditionally, at best, this involved some form of consultation with labour and its representatives. At no point, because of the impact on people, was this legitimate without the full and active involvement of labour and its representatives, in the subject and objective of research and development, and the involvement of operators in design and implementation.

During the Phakisa process, this became patently obvious, but not all labour organizations from the mining sector were present. As a result, limited mandating from labour for the process was obtained. This is obviously problematic in terms of legitimacy and buy-in in the future.

It is therefore essential that the following be achieved.

- All stakeholders must be involved in a fully transparent and meaningful way, that respects their respective mandates, from the start
- A common understanding of the purpose and meaning of modernization is essential, so that a common vision can be developed

- A process of impact assessment, that leads to an acceptable win-win objective, must be developed, jointly
- The work of developing and managing the transition to modernization through research, development, technology transfer, and implementation must be led and shared equitably
- Involvement must be active at every level, from strategic to operational at the mine face, from strategic planning to operator involvement in design.

Mineral resources available: beware of sterilization

As was alluded to earlier, a basic premise for the need for R&D is to have a base of available Mineral Resources to which the R&D can be applied. Research work was done going into Phakisa that indicated that existing gold Resources amount to 592 million tons, based on published information. Where these are situated is illustrated in Figure 9. At average production rates, this is equivalent to 11 new mines. (Minerals Council South Africa, 2017)

In platinum group metals, 360 million tons of production is available (Figure 10), the equivalent of eight new mines.

Obviously, these numbers are sensitive to cut-off grade, and so the R&D work must find methods to unlock these

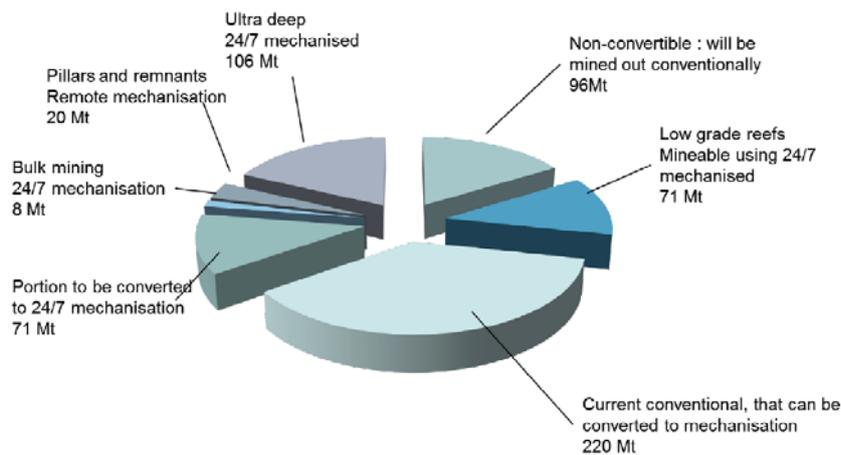


Figure 9—Split of available gold Resources

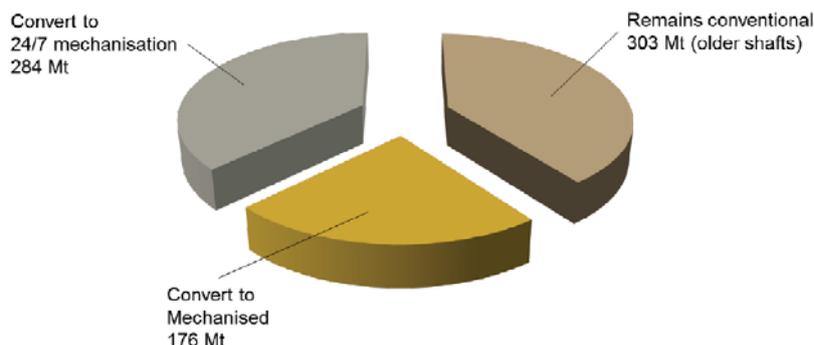


Figure 10—PGM Resources available



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Resources. More recent work, yet to be finalized, indicates that these numbers are seriously understated, in that other mining companies' resources are not included, and there are significant resources held by exploration companies. These figures are not available for publication at present.

R&D and the value chain

In identifying the needs for R&D it is clear, given past funding commitments to R&D, that the mining extraction phase is where the focus is required. This must clearly take account of upstream and downstream work in the value chain, but needs to focus on the mining value chain in particular. Within this context, it is also clear that in order to satisfy the needs of industry in the short, medium, and long term, a mix of fundamental and applied research is required.

Industry needs analysis has indicated that the focus for R&D should be on the development of appropriate mining systems, including emphasis on people, processes, and technologies. Thus, R&D projects need to be integrated into system design and development, with the necessary fundamental and sapiential research to enable and support such design. This also includes the involvement of the OEMs, through the Mining Equipment Manufacturer's Association of South Africa (MEMSA) to enable the identified technologies to be developed through to commercialization.

This, then, illustrates that a multidimensional matrix of R&D needs to be developed, with the required resources being sourced from organizations that can supply such expertise. This requires a further dimension in the programme design, which involves collaboration between researchers, research organizations, and research activities.

The revival: new beginnings through the Mining Phakisa

'Phakisa' in seSothu means 'hurry up', and the aim of the Phakisa labs or workshops was to involve all stakeholders in intensive discussion, in order to develop plans ranging from high-level concepts to operational actions and budgets. The Phakisa process was initiated by the Office of the Presidency, and the Phakisa lab concept was taken from examples in Malaysia for focusing on key areas within the economy in order to support the National Development Plan.

In his Budget Vote address to Parliament in July 2014, Former President Zuma said 'The journey towards prosperity and job-creating growth involves radical change in the manner in which we undertake planning, implementation and monitoring. On Saturday, 19th July, we launched Operation Phakisa, an innovative programme that brings together for the first time, many stakeholders to plan a major economic project.'

The first lab focused on the oceans industries, and the outcomes of this Phakisa were well publicized. The second focused on 'Scaling up the Ideal Clinic Initiative across the Country' and was led by the Department of Health.

Some 120 delegates participated in the Mining Phakisa, representing the State, organized labour, industry, academia, NGOs, communities, and traditional leaders, and including people up to Ministerial and CEO level.

The lab, which lasted for five weeks, was characterized by robust and open discussions, and developed five workstreams. These were:

- Reviving investment into mining
- Cluster employment
- Win-win beneficiation
- Sustainable communities
- Advancing the cluster.

These workstreams achieved varying levels of success, with the first two achieving the least (due to unresolvable differences of opinion on issues associated with the Mining Charter and the lack of a National Skills Development Plan). The third and fourth streams landed on pilot projects only, while the last one, Advancing the Cluster, achieved the most traction. It was also the one where the most constructive engagement happened, and it is likely that this was because, in relation to the other workstreams, this one, having a long-term view, was probably perceived as the least risky.

One very important outcome of the process was the establishment of new relationships that had not existed before. These included relationships with the Department of Science and Technology (DST), the Department of Trade and Industry (dti), the Department of Planning, Monitoring and Evaluation (DPME), National Treasury, mining equipment manufacturers, and the South African Capital Equipment Export Council (SACEEC).

The coalition of the willing

The building of these relationships created a 'coalition of the willing' whereby a common commitment to proceed was established, despite the fact that the outcome report of the Phakisa was not published (and still has not been). This has seriously impacted on the credibility of the work since Phakisa, in terms of the support of certain stakeholders. It was agreed that a public-private partnership should be formed and that the first work would be to co-develop the R&D programme and to form the mining equipment manufacturers into a dti-funded cluster.

Since previous efforts had failed over arguments around governance and structural issues, the 'learning by doing' approach was taken and the vision and strategy established, leaving the bureaucratic issues to be sorted out later. This turned out to be a master-stroke.

Interestingly, where the process required the development of detailed budgets (known as '3 feet plans'), these indicated the need for funding of the order of R300 million to R400 million per annum, which coincidentally is in line with the estimates put forward by du Plessis, and referred to earlier (see Figure 11).

Mining Phakisa outcomes

The first significant outcome from the Phakisa process was the commitment from the CEOs representing the mining companies on the Council of the (then) Chamber of Mines (now the Minerals Council South Africa) to the principle of open innovation in the South African mining industry R&D space. Only a few projects were ring-fenced as 'closed' due to IP issues, but it was agreed that the MMP would have access to in-house R&D projects, and that the information could be shared among other members.

A second, significant outcome was the commitment between the dti, the OEMs, and the SA Capital Equipment Export Council to establish a cluster development programme

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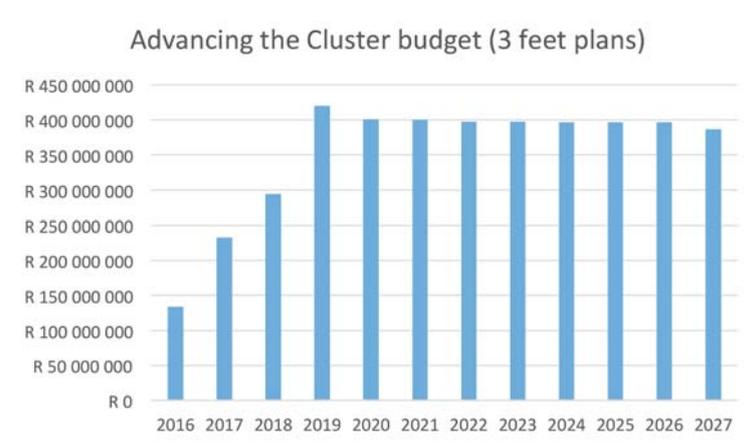


Figure 11 – ‘3 feet plan’ budgets for mining R&D

(CDP) to coordinate the efforts of local mining equipment manufacturers to increase their capacity and capability in terms of local and international markets.

A third commitment was to coordinate the SAMERDI programme that had been developed between the CSIR and the DMR with industry needs, so as to have a single R&D programme for mining that had the support of all stakeholders. Previously, such coordination and collaboration would have been met with scepticism; but still, throw-away comments like ‘don’t do research just for the sake of getting a piece of paper or a PhD’ abounded.

The funding landscape

While the 3-feet plans identified the need for some R400 million in funding for R&D annually, it was quite clear that this would not be readily forthcoming, especially since some of the other workstreams identified funding requirements that were orders of magnitude higher.

It was not clear at this stage where R&D funding could be sourced, and the existing landscape for R&D direct funding and incentives was investigated.

Examination of the state vehicles to provide R&D funding showed a complicated landscape that applied across the board, to all industries, and thus any mining R&D or mining equipment manufacturing funding application would have to compete with applications from other industries. Such competition would be difficult, given the perception in many quarters that mining was a ‘sunset industry’, despite the Phakisa outcomes.

Investigations revealed the following funding options to be available (COVA, 2016).

- Section 11D incentive: Expenditure incurred in the discovery of novel, practical and non-obvious information or devising, developing or creating any invention, design or computer programme or any knowledge essential to the use of the invention, design or computer programme. Deduction increased to 150% for expenditure incurred on or after 2 November 2006 up to October 2022. Pilot plants or prototypes qualify for this allowance.
- Technology for Human Resource Programme: THRIP

supports all companies undertaking science, engineering and technology research in collaboration with educational institutions and will consider the support of projects in which the primary aim is to promote and facilitate scientific research, technology development, and technology diffusion, or any combination of these. THRIP will contribute between 30% and 50% of the funds invested by a company in research projects. For all SMME and all SMME and B-BBEE partners the THRIP funding will contribute between 100% and 200% of the funds invested. The maximum level of THRIP funding per grant holder will be set at R8 million across any number of projects per annum.

- Support Programme for Industrial Innovation: Promote technology development in South Africa through provision of financial assistance to all South African registered enterprises in manufacturing or software development that engage in development of innovative, competitive products and/or processes. Maximum incentive of R5 million under matching scheme. Partnership scheme provides for repayable grant of over R10 million subject to Intellectual Property ownership Issues.
- Manufacturing Competitiveness Enhancement Programme: Providing assistance for participants in the manufacturing and engineering sector, including conformity assessment agencies. This incentive programme is not available to start-ups or companies without at least one year’s manufacturing track record. Maximum incentive of R15 million on product development costs.
- Technology Innovation Agency Programmes: This incentive uses a flexible returns structure be it royalty, equity, convertible loans or combinations thereof, structured as appropriate for each investment.
- Manufacturing Competitiveness Enhancement Programme: Cluster: Support to clusters and partnerships of firms, engineering services and conformity assessment services in the manufacturing industry to define and implement collaborative projects related to production and marketing that will enhance

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productivity and competitiveness. Grant is limited to R50 million. Pilot projects can qualify.

- National Industrial Participation Programme: NIP is an obligation on all suppliers who provide goods and services to Government that have an imported content of \$10 million and above to participate in some form of economic activity through either investment to raise production capacity and competitiveness in strategic sectors of the economy; export promotion; R&D collaboration; technology transfer; and acquisition.

Discussions with mining companies and OEMs revealed the following problems with these funding options.

- The reclamation of incentives is a difficult process, and time-consuming to the extent that refunds or tax relief only become available in a different financial period, if at all. Thus many companies do not bother to enter such claims.
- Access to funds is very onerous and difficult, not only in terms of the effort required and the criteria to be satisfied, but also in terms of the reporting requirements after the award of funds.
- Funds generally require industry contributions up to 50%. This is problematic for industry unless the incentives are accessible.
- Funding windows open and close, sometimes leaving inadequate time to make applications, and sometimes out of synch with budget, academic, and business cycles.

These concerns indicate a need to establish a dedicated funding agency or model that can serve as an easily accessible, user-friendly, one-stop-shop for the mining value chain, similar to that of the automotive industry, where the Automotive Investment Scheme makes targeted grants to support the growth and development of the automotive sector.

In terms of private sector support and mentorship, according to Engineering News (2 February 2018), a R3.5 billion venture fund is being established this year, aimed at boosting black economic empowerment in the automotive manufacturing industry, supported by BMW, Ford, Nissan, Mercedes Benz, Toyota, Isuzu, and Volkswagen.

Developments since Phakisa

The fundamental requirements for a successful R&D programme are:

- Research money
- Support and commitment.
- Research people
- Governance
- Research topics
- Sites and data to do research.

The manner in which these have been secured since Phakisa is covered below.

The Phakisa process delivered a collective commitment to proceed with the work of Advancing the Cluster, and the main features of this demonstrated commitment were as follows.

Funding commitment

The first monetary commitment to the Phakisa outcome came

from the DST. The original site of COMRO, at Carlow Road, had become the property of the DST. In the days of MiningTek, it was used by the CSIR, but after the move and incorporation into the CSIR in Pretoria, the site became vacant. At one stage there was consideration to sell the property for urban development, but the DST then pledged that the site and buildings would be made available to the R&D effort. In this regard, the CSIR would be the landlord of the property, with a rental being paid to the CSIR. As a result, the site was opened in 2016, and researchers and support staff started to move in.

The Chamber of Mines (now the Minerals Council South Africa) had been through a process of reinvention, and part of this process involved demonstrating support from the mining industry towards research, development, and innovation, driven by the Vision 2030, which is described in a position paper on 'People-centred modernisation in mining; (Minerals Council South Africa, 2017b).

The area of modernization has demonstrated support from the chief executives of the Minerals Council South Africa, who have agreed on the strategic objective of promoting innovation, research, and development for the mining sector by facilitating collaborative efforts in innovation that will contribute to achieving zero harm and sustainable, viable, and socially acceptable mining into the future (Minerals Council South Africa website).

In order to back this statement, the Minerals Council South Africa pledged financial support to fund a modernization consultant and an intern, as well as various supporting programmes.

The principle of open innovation that had been agreed allowed the individual expenses of mining companies on their own R&D efforts to become shared. This represents a serious financial commitment to the R&D programme, but the DST saw this as 'in-kind' contribution, rather than 'money on the table'. Despite this, the contribution of experience and knowledge of individual companies to the collective is highly significant.

The next tranche of financial commitment came from the dti. The desire had been expressed at Phakisa to establish a cluster development programme (CDP) for the Mining Equipment Manufacturers of South Africa (MEMSA), in order to stimulate the cluster and to encourage local supply chain development and export potential. The dti pledged R8.4 million to cluster development, which enabled MEMSA to be formed as a Cluster and a registered entity. This required MEMSA to action a series of tasks, which included:

- Advocacy - government and mining industry
- Marketing South African capacity via a range of media, exhibitions, and an interactive website
- Networking and growth sessions
- Information dissemination
- Facilitate equipment testing (with the Mining Precinct)
- Skills development and technology development
- Supply chain development
- Benchmarking and improving manufacturing performance.

The DST had pledged support to research and development in its White Paper, and specifically to the mining industry.

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This commitment was backed up by the pledge of funding for the SAMERDI programme from the DST, in terms of R27 million in FY 2017/18, R63 million in FY 2018/19, and R60 million in FY 2019/20. This funding was conditional on the Minerals Council South Africa contributing direct investment to SAMERDI. This was agreed between the Council members, and funding to the amount of R33 million was pledged for calendar year 2018.

This was announced in the DST Budget Vote speech in Parliament on 16 May 2017 when DST Minister Naledi Pandor said:

'Sustainable mining activities require a substantial investment in research and technology. Over the next three years, R150 million will be invested in re-establishing mining and mining equipment R&D.'

'This investment will help to restore the old CSIR mining research facility in Carlow Road, Johannesburg. This facility, known as the Mining Precinct, will be launched during the second quarter of this financial year. A number of mining-related associations and mining equipment manufacturers clusters are already working in the facility.'

During 2018, the DST pledged a further R60 million for FY 2020/21.

In summary, an annual funding amount averaging R100 million has been realized.

Collaboration and open innovation

As described earlier, the spirit and commitment to collaboration and innovation was established during the Phakisa process, and active participation of mining companies was engaged. The current membership of MEMSA consists of 19 South African companies.

Ongoing discussions between participants led to an agreement that the public-private partnership model should function as a 'Hub-and-Spoke' model, wherein a lean management hub would be established, that then created an R&D network with research organizations, universities, industry and industry sites, OEMs, and other resources. The Hub would be represented by the principal funders, these being the MCSA, the DST, the dti, the DPME, and the CSIR. This model was based on research work that identified best practices in similar organizations worldwide, as well as researching the successes and failures of previous attempts or organizations such as COMRO, CoalTech, and DeepMine.

The global search included the Canadian Mining Innovation Council (CMIC) and the Australian Industry Growth Centres Initiative developed through the Australian government's Department of Industry, Innovation and Science.

The following quote from CMIC was noted. *'From the beginning, CMIC was a volunteer organization with minimal infrastructure and few paid employees. With that lean beginning, CMIC still managed to organize the largest collaborative project funded by NSERC, the Footprints Exploration program involving 14 universities and 26 companies ranging from majors to small technology providers. This program epitomizes CMIC goals – to facilitate broadbased collaborative research and innovation.'*

The Australian model, more formalized than the CMIC, notes 'Growth Centres will lift the levels of collaboration between businesses, industry, research organisations and

government in order to better capitalise on the excellent research and development undertaken and scientific knowledge generated in Australia.' Furthermore, 'The Growth Centres will work closely with state and territory programmes and industry associations to ensure activities delivered by each Growth Centre complements existing activities and services, and to leverage their networks, expertise and experience. One such growth centre established is the mining equipment, technology, and services growth centre'.

These studies indicate that successful hub-and-spoke models have been established elsewhere, and that there are serious learning points that could be incorporated into a South African model.

Further research into regional initiatives that aimed to stimulate regional economies through R&D (such as the Bothnian rim studies) illustrates how sectoral R&D activities can be extended to support regional economic development, through regional collaboration.

An important observation from all of these studies was that any collaborative R&D programme must be a part of a wider 'ecosystem' if it is to gain wide support and have a meaningful impact. This ecosystem should extend beyond the immediate focus of the R&D programme, and look in terms of a common strategic vision, and to matching with national and international imperatives.

The development of such an ecosystem and hub-and-spoke model required further work, so rather than wait for this to be developed and implemented, the decision was taken to proceed using the learning-by-doing principle, using the CSIR (then known as the Mining Precinct@Carlow Road) as the 'incubator' for the initiative. This enabled sign-off by a legal entity when contracts and MoUs were to be signed.

The CSIR then, as the incubator and legal entity, was used to assist in the development of policies, procedures, and governance structures, and to sign off on research contracts with the universities on behalf of the DST.

Some previous R&D initiatives were established in terms of competitive bidding for R&D contracts between research institutions. This created some degree of animosity and was not optimal for true collaboration. Therefore, in calling for 'spoke' organizations to become involved in R&D programmes, a collaborative model was formulated that called on the research organizations to collaborate on each programme, and to agree with each other on what their individual inputs would be, to enable the achievement of the objective of the programme and the collective. In terms of making collaboration work, this was a success, but resulted in some practical issues and perceptions in phase 1, which have been identified and are being addressed in phase 2. In particular, it resulted in university researchers offering small amounts of time within their busy schedules, with the result that delivery was problematic. The new model is explained below.

Research people

Since the heady days of COMRO, research capacity in South Africa, particularly as regards senior researchers, has dwindled, either due to retirement or moves offshore, as well as cutbacks in funding and research effort. Research work at universities has tended to become academic and fundamental, and is often criticized for irrelevance. Thus,

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new arrangements have been put in place to reconstitute research capacity and capability through collaborative arrangements (in the hub-and-spoke model) with research institutions. This has been added to through the employment of interns, who are on an intern research development programme, and with people sourced through the Young Professionals Council of the Southern African Institute of Mining and Metallurgy (SAIMM). These 'new' researchers are being coached by a panel of mentors, which consists of senior people drawn from a background in industry, academia, and research (the 'grey-haired club').

Formalizing involvement and governance

Despite not being a legal entity, the Hub has established a series of advisory and governance structures that are fit for purpose, to suit the requirements of the sponsors and interested and affected parties. It has, from the start, been important that clear mandates are delivered from industry. In order to do this, an Innovation Team was established, which initially advised and gave mandates for the Phakisa process, but which then formed an advisory panel to guide the technical programmes. This team consists of senior executives from the member companies of the MCSA. This team, in turn, is mandated by the individual company executives, as well as by the MCSA Board.

Additionally, each research programme has a Steering Committee, which is constituted of industry experts, and these committees meet bi-monthly to advise and sign-off on business plans and close-out reports, and to monitor progress. These committees have been supportive and successful.

A SAMERDI Steering Committee has been established, which consists of members from the DST, dti, MCSA, CSIR, DPME, National Treasury, and MEMSA, as well as the Hub Executive. At this stage, neither the DMR nor organized labour are included, but these are the subject of current discussions, as indicated below.

An Executive Team has been established, consisting of two co-directors representing the CSIR and the MCSA.

Within the Hub, each programme has a programme manager, with principal investigators, senior researchers, researchers, and interns.

The R&D programmes: research topics

Through intensive interaction with industry, six workstreams or programmes have been identified. The three core programmes represent different levels of modernization according to the status of candidate operations.

The first, called Longevity of Current Mining (LoCM), focuses on the opportunities that are available to research short-term solutions to improve current operations and return them to profitability. This programme is particularly important in discussions around job preservation and modernization.

The second programme focuses on mechanization of operations, where mechanization is appropriate (bearing in mind that current operations may be difficult to mechanize on a retrofit basis). There are examples of best practice in underground mechanization in Southern Africa (such as Two Rivers, Zimplats, Mimosa, Target, South Deep, and Bathopele, as well as in the diamond, coal, base metals,

manganese and chrome industries), and these learnings need to be used to identify gaps for achieving global best practice (in an Industrial Revolution 4.0 context), so that whatever level an existing mechanized or hybrid system is at, it can be modernized. This involves mining methods and technologies that allow mechanized and autonomous mining of orebodies that cannot be mined using conventional methods because of cost, grade, safety, health, or mining cycle factors.

The third programme is a long-term programme that focuses on researching and developing continuous mining methods and technologies that allow mechanized and autonomous mining of orebodies that cannot be mined using conventional methods, either because of cost, grade, safety, health, or mining cycle factors.

Three cross-cutting programmes have been identified and actioned which support these three programmes.

The first of these is Advanced Orebody Knowledge, which is a programme aimed at creating real-time 3D models of the orebody and its geological setting. This is important for the proactive management of risks associated with geological structures, and to ensure that orebodies are well enough known to be able to apply capital-intensive mining methods. This programme is to be extended to include greater confidence in mine planning (design and scheduling), optimization studies, and process optimization through geometallurgy and ore flow management.

The second is about people. A central theme in all initiatives is that modernization is people-centric. This being the case, nothing can be done without the inclusion of people in all levels and activities of the R&D. This includes developing a common understanding of what modernization means, impact assessments, change management processes, and extensive engagements. This programme is known as Successful Application of Technology Centred around People (SATCAP).

The third is Real Time Information Management Systems (RTIMS) which focuses on the digital revolution in mining. While a myriad of software developers and suppliers offer 'solutions', many of these are point solutions that create new problems of data integration and transmission complexity. This programme is aimed at designing fit-for-purpose RTIMS for the mining industry, and underground mining operations in particular.

Sites and data to do research

In the early technology readiness levels, research is conducted as desktop research, or at the laboratory or pilot scale. It is not difficult to provide sites and facilities for these activities, whether as dedicated facilities or at research institutions.

Surface testing facilities are also usually available, whether with OEMs, or on mine surface facilities, or at facilities such as Kloppersbos (a CSIR site near Pretoria used for coal gas explosion test work).

The difficulty arises when sites are needed where prototype units can be tested, and tested in production environments. While industry has offered many pilot sites for the testing of individual technologies, these too often become unavailable or inaccessible due to either production pressures, interference due to poor change management processes, or geographic spread.

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A dedicated test mine therefore becomes a necessity in the interests of multiple stakeholders.

Meaningful research requires data, and although the principle of innovation encourages and allows access to data, sometimes data is still protected by intellectual property issues, or is in formats that are not compatible. Sometimes, data is protected by OEMS and cannot be accessed directly by the mining companies.

Delivery

The DeepMine programme took two years to develop before work commenced. By contrast, the SAMERDI programme, through the Precinct, took one year to develop, from February 2016 until March 2017, which is when phase 1 of the programme began. Phase 1 of the programme ran from 1 April 2017 until 31 March 2018, with close-out reports for each programme being completed and approved through Steering Committees by June 2018. Most of the work involved in phase 1 was in the form of reviews of past work, and the identification of research and development work to be done in phase 2, based on these baselines.

Phase 1 work led to the frightful conclusion that much previous research work was either lost and untraceable or was never documented at all. This provided a serious lesson, that all new work should be stored in a secure and open access virtual library, and that in the case of in-house R&D by mining companies, this information should be contained in close-out reports that could be stored for future use and reference. Already AngloPlatinum and AngloGold Ashanti have made such reports available.

Ever-expanding scope

Reference was made earlier to the development of an 'ecosystem', and experience has shown this to be exactly necessary. R&D work on finding solutions to mining problems 'within the mine fence' cannot be done in isolation from what is happening outside of the fence. This becomes particularly important when one considers what the impacts of modernization in the mine will be upon surrounding communities, and on local manufacturing and supply chain management.

Mines inevitably close at some stage. While the LoCM programme aims to keep operations open as long as the remaining resources can be exploited viably through modernization, other programmes aim to open access to new resources through implementing more advanced technology.

A clear aim of Phakisa is to nurture and increase local mining capital goods manufacturing industry's capability and capacity. Attention also needs to focus on the local supply chain for consumables, components, and services.

This prompts the question as to what 'local' actually means. In the context of the draft Mining Charter this would mean anything from the 'shadow of the headgear' to the provincial or national scale. In this context, 'local' opportunities exist for encouraging import substitution by investment into local manufacturing at each of these levels, at appropriate levels of capital intensity and complexity at each level. This offers the opportunity to develop 'companion projects' at local community level, where local SMEs can be developed to supply the mines, thus creating employment opportunities in poverty-stricken communities. Clearly, this

requires intensive and meaningful dialogues to be established with such communities, with real value propositions.

In the African Mining Vision context, 'local' means the African continent. This supports the aims and ambitions of MEMSA to engage with companies investing in African mining and infrastructure, and to offer South African products of superior quality, equal levels of sophistication (if that is what the customer wants), and at competitive prices. South Africa, with its sound infrastructure, strong financial services sector, intellectual capital, and manufacturing capacity, along with its BRICS connections, should be well placed to be the gateway for these opportunities into Africa.

Clearly, these focuses require that research and development goes well beyond pure in-mine technology application, and extends on the one hand to all commodities, and on the other across the full value chain. They also require emphasis on the establishment of open, free trade markets in which South Africa can be competitive.

The five Phakisa workstreams alluded to earlier include sustainable investment, skills development, sustainable communities, and win-win beneficiation. In view of the fact that little work has been done in most of these workstreams, because of the interdependencies with the Advancing the Mining Cluster which cannot be realized because of this inactivity, the Precinct has had to engage in a number of activities that would have been included in these workstreams had they been pursued.

For example, the LoCM initiative now focuses strongly on efficiency, safety, health, and productivity, as well as attracting investment into new, mechanized, and modernized operations (workstream 1). It also has had to engage strongly in the area of skills development, through dialogue with universities, Technical and Vocational Education and Training (TVET) colleges, and the MQA, and ultimately with labour and communities.

In the area of sustainable communities, localization and the development of local agri-businesses on vacant land adjacent to mines and mining communities are also topics on the Precinct agenda.

Engagement is also active in the beneficiation area, through platinum beneficiation, and the stimulation of the local iron and steel value chain to support local capital goods manufacturing.

All of this being on the agenda of the SATCAP programme, for community and other stakeholder dialogues.

Thus it is clear that the scope of work of the Precinct is ever-increasing, but this 'scope creep' is in the national interest. Unfortunately, SAMERDI cannot cover the costs of these important areas of development, and therefore other funding sources must be explored.

Where we are now

A great honour was bestowed upon the Precinct when the Mandela Foundation gave permission for the Precinct to be renamed the Mandela Mining Precinct in 2017. This honour, supported by the Minerals Council and the State, not only gives recognition to the importance of the MMP, but also places pressure on the MMP to deliver in the national interest, in the name of Madiba.

The Precinct now has approximately 70 occupants,

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ranging from researchers and programme managers to learned societies, State representatives, and a value chain simulation facility.

The first phase of the SAMERDI programme is now completed, and work is under way on phase 2, with all close-out reports from phase 1 approved and business plans for phase 2 and beyond approved by the Technical Steering Committees. This in itself is proof that the governance structures are working well.

The collaborative structure that was established in phase 1 did not work well. It relied on universities nominating time that they could spend on research projects, in terms of each individual person's time. Where academics were involved, this conflicted with their teaching workload, and for researchers it meant that the time allocation was inadequate to ensure continuity and a material research effort. At worst, it was perceived as a 'labour broking' model that would not leave behind any meaningful capacity or capability development.

As a result, a new model has been proposed which relies on the establishment of Centres of Competence at universities, with a Centre, and effectively, a Chair, at one participating university for each programme. Although the Chair for a programme will be at one particular university, the research capacity will be spread across various institutions. Additionally, funding will be conditional on a major university 'twinning' with a historically disadvantaged university, to build capacity and capability there. This model will allow more dedicated time to be spent on research projects and will help with building sustainable research capacity and capability.

This model is still under discussion, but the concept has been accepted enthusiastically.

The research work that has been done in phase 1 has delivered successful results thus far. These include:

- High-resolution 3D modelling of chromitite stringers in PGM stope hangingwalls
- Definition of gaps and constraints in conventional mining cycles
- Identification, prioritization, and selection of 40 applicable stope modernization technologies
- Identification of root causes of lost blasts across industry
- Selection of candidate non-explosive continuous mining systems
- Development of an 'Internet of Things' reference architecture
- Opening of dialogues, engaging with all stakeholders, on the impacts of modernization.

This includes the establishment of bilateral discussions with, among others:

- The Association of Mineworkers and Construction Union
- The National Union of Mineworkers
- Solidarity
- The United Association of South Africa
- The Department of Mineral Resources
- The Mine Health and Safety Council
- The Mining Qualifications Authority.

Discussions with organized labour unions are essential to

gain support and meaningful engagement with the programmes and within the governance structures. While these discussions have been fruitful and constructive, the challenge going forward is to engage with all in the same room. This is vital for establishing legitimacy in the research and development work, and all of the associated work of the Mandela Mining Precinct, since all of it focuses on people, whether in the mine or the surrounding communities.

Discussions with the DMR are ongoing. While the DMR supported SAMERDI before Phakisa, involvement with the DMR since Phakisa has been inadequate, and this situation must be rectified under the guidance of the new Minister, in order for the DMR to assume its rightful place within the governance structures.

Discussions with the Mine Health and Safety Council and the Mining Qualifications Authority are ongoing, so as to establish relationships that are complementary and which can support a common vision.

As mentioned earlier, the CSIR has been the 'incubator' for the establishment of the Precinct and the R&D work, and for the formation of the public-private partnership. It can be said with confidence that both the incubation and the PPP formation have been established, although further important stakeholder involvement is essential. This stage could therefore be seen as an interim phase, with a longer term strategic vision indicating the need for a more streamlined and agile organization that aligns to national and international initiatives.

At a departmental briefing session of the DST on 6 June 2018, the Chief Director at the DST referred to the work of the Mandela Mining Precinct and highlighted the following needs for the further development of the mining R&D work:

- The need to manage RD&I for maximum impact on mine survival and competitiveness
- To start the groundwork for a dedicated Mining RD&I Science Council
- To further expand collaboration with the Mine Health and Safety Council, to ensure maximum utilization of investments.

Quo vadis for R&D?

The direction of the R&D programmes in the short to medium term is reasonably well defined through the business plans, on the obvious premise that as research work unfolds, modifications to the programmes may be necessary. The longer term vision for the Mandela Mining Precinct needs to align with the objectives of the National Development Plan and the Africa Mining Vision, which have a strategic focus on 2030 and 2050 respectively.

The work of the R&D, MEMSA, industrial localization and procurement, and agri-industrial development are linked together in a common long-term strategy for 2030, as shown in Figure 12

The strategic vision has the following characteristics.

- A South African research and development capability that supplies researched solutions for globally competitive mining in Africa
- A network of research capacity in Africa, facilitated through mentorship from South Africa
- Globally competitive mining capital goods capacity in

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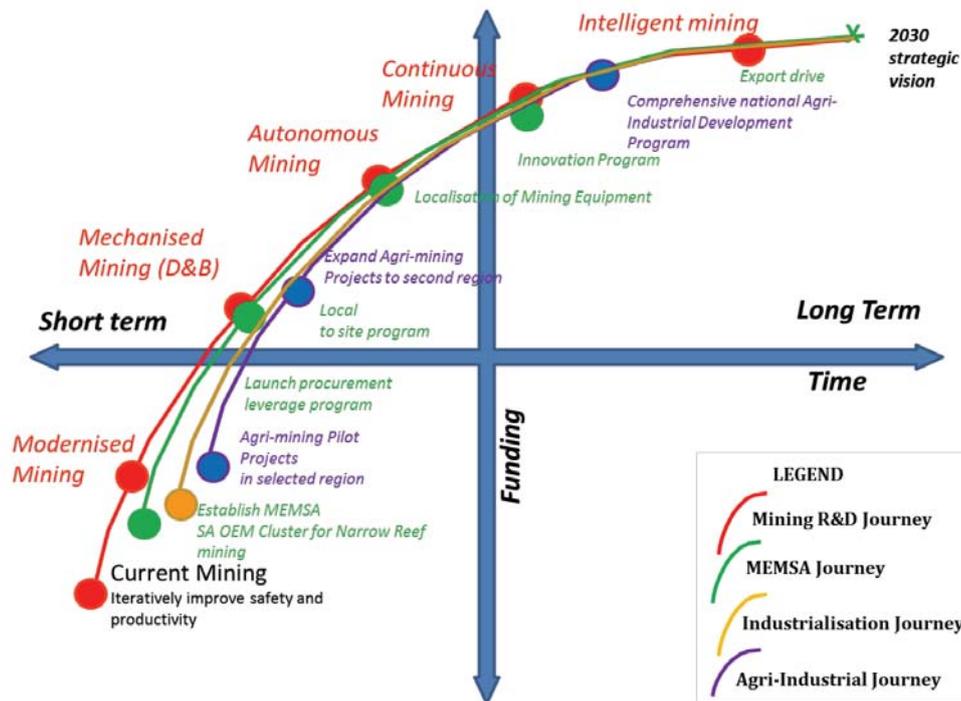


Figure 12—Journey to Mining 2030

South Africa, supplying into the African continent and beyond

- Local supply chain and mining services development that is transformed through local entrepreneurial development and exported into Africa
- Sustainable agri-industrial businesses in mining areas, mining communities, and previous labour-sending areas
- Successful and sustainable community-based industrialization
- A fully transformed mining industry.

In order for this strategic vision to be achieved, an appropriate vehicle is required that will facilitate the development of the ecosystem.

The interim or current model is unlikely to be appropriate for the achievement of this vision and, given the added ambition of an R&D capability funded based on 1.5% of mining's contribution to the GDP, governance structures need to be effective in the disbursement and control of this level of funding.

Work is currently under way to develop such a strategic model for the future.

The role of the SAIMM in R&D

Given the direction of research and development as explained in this address, where does the role of the SAIMM lie in this?

A common thread in all this work, and within wider national and international objectives, is that of collaboration, transparency, and cooperation in order to achieve common objectives.

It is important therefore that the strategic plan of the Institute be aligned to these objectives, and supports the

initiatives wherever the Institute has the capability to do so. Moreover, if modernization is an important objective of the industry, then so should it be for the SAIMM. This is reflected in the new strategy for the Institute, which concentrates on modern means of communication and delivery, and on harnessing the energies of the younger membership to embrace all aspects of digitalization, the Internet of Things, and Industrial Revolution 4.0.

Additionally, the Institute has embraced the need to provide independent platforms to facilitate debates between different stakeholders on matters of common interest. These include the impacts of modernization, skills development for Industrial Revolution 4.0, and the need to discuss issues relating to infrastructure, climate change, innovation, and local industrialization.

The Institute should also aim to be the platform for showcasing and supporting the results of research and development programmes, using its branches across Africa and through conferences, schools, and publications to spread the R&D messages as they develop.

The Institute indirectly supports research through publication and through certain funding flow-throughs from conferences such as Infacon. There may be opportunities to strengthen the capacity of the Institute to support R&D and research capability development, through the research institutions both in South Africa, and in countries where it has branches. This could include the support of research bursaries, depending on the affordability, but within the need for the Institute to serve its members, and also utilizing funds for the growth of the Institute and its activities through reinvestment. It can also facilitate sharing of research capacity between institutions across the continent.

Conclusions

It is hoped that the following conclusions will assist the mapping out of a strategy going forward that will sustain the mining industry.

- 1. PPP has worked, but a new model is needed**
The 'learning by doing' model for establishing a public-private partnership has worked, and has delivered results. The learnings from this experience must now be used to develop a sustainable model for the future.
- 2. Phakisa announcement**
It is vital for full stakeholder engagement that the Office of the Presidency issues an announcement on the outcome of the Mining Phakisa.
- 3. Ecosystem**
The current incubator model has limitations but has worked well in getting the Mandela Mining Precinct and its activities to where they currently are. In the medium term, any concerns may be addressed, but a model must be created that defines the end-use model that will allow the Vision 2030 objectives to be attained.
- 4. Collaboration versus competition**
A model for R&D collaboration has been developed, which has worked. This has resulted in collaboration between mining companies, State departments, and academic institutions. The model is not perfect and needs further refinement, but its ability to create value is far better than a model based on competition.
- 5. Common fund**
It is important that the DST, the dti, and the Department of Higher Education and Training (DHET) develop a common, one-stop shop for mining R&D funding, supply chain development, incentives, and capital goods development.
- 6. New funds for ecosystem**
In line with item 4 above, it is vital that new sources be found to fund the ever-increasing scope of the developing ecosystem.
- 7. Skills and capacity**
Skills development is critical, for research capacity and capability, for operator skilling, and for manufacturing and local supply chain development.
- 8. Emerging miners**
The emerging miners sector is not currently on the agenda of the Mandela Mining Precinct, but it needs attention in order to stimulate this area and allow development and transformation of the industry.
- 9. Supply chain development**
The development of local supply-chain capacity and capability through the development of entrepreneurs and community-based OEMs is vital, and requires a strategy and resources of its own, if draft Charter requirements are to be met, and meaningful localization is to be achieved.
- 10. Alignment and action for sustainability**
Every opportunity must be identified and actioned

to allow for full collaboration, engagement, and cooperation of all stakeholders and initiatives in the R&D space, allowing for the best knowledge and practices to be harnessed in an integrated way.

11. Test mine

It is vital to identify a fully operational test mine site that is funded by multiple sources, and is able to showcase R&D work, and function as a facility for employment and skills development.

12. Into Africa

Opportunities for the export of skills, knowledge, and equipment into Africa must be a strategic focus that supports the African Mining Vision.

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Proceedings of the Special General Meeting, 2018

The 116th Annual General Meeting (AGM) of The Southern African Institute of Mining and Metallurgy (SAIMM) was held at The Country Club, Johannesburg, Napier Road, Auckland Park on Wednesday, 16 August 2018.

Special General Meeting

A Special General Meeting (SGM) of the SAIMM Council was convened to consider the proposed changes to the Constitution was held immediately prior to the AGM.

1. Purpose

In order for the SAIMM to remain relevant and ensure maximum value for all members, the Council proposed additional changes to and clarification of some of the clauses in the Constitution and By-law B. These were proposed at the Council meeting on Friday 18 May 2018; these changes had to be approved by means of a ballot at a SGM.

2. Background

In order for the SAIMM to remain relevant and ensure maximum value for all members, the amendments listed below were forwarded to all Corporate members for their consideration and approval.

3. Conclusion

The proposed amendments below were approved by the requisite two-thirds majority.

The Southern African Institute of Mining and Metallurgy Constitution (as amended)

1. The Institute

- 1.1 The name of the **Institute** is:
The Southern African Institute of Mining and Metallurgy (SAIMM), (the **Institute**).

2. Membership

- 2.7 The Council shall issue to every Fellow, Member and Associate a certificate showing the category to which he/she has been elected. Students shall be issued with proof of membership. A special certificate shall be issued to all Company Affiliates. Such certificates shall remain the property of, and shall on request be returned to, the **Institute**.

3. Council

- 3.1 Subject to the Constitution, and in accordance with the provisions of the relevant By-laws, the management and administration of the affairs of the **Institute** and the power to carry out the key objectives shall be vested in and exercised by the Council.

- 3.2 The fourteen (14) members of the Council shall be nominated, elected and/or removed annually in accordance with the provisions of the relevant By-laws and shall hold office until their successors have been elected.
- 3.3 A minimum of three (3) of the fourteen (14) elected members shall be persons who are not 'connected persons', as defined in the Income Tax Act, in relation to one another.
- 3.4 No single person shall, directly or indirectly, control the decision-making powers of the **Institute**.
- 3.5 The Council shall consist of the following elected, invited and co-opted members:
 - 3.5.7 The fourteen (14) elected Corporate members
 - 3.5.8 The Chairperson or the Vice Chairperson of the Young Professionals Council (the YPC), who shall not be entitled to vote on matters concerning the policy of the SAIMM if they are not Corporate members, and who shall also represent the interests of Associate and Student members of the **Institute**.
- 3.6 The Council shall include the following *ex-officio* members:
 - 3.6.1 The Chairperson of any Division established in terms of Clause 4.6.
 - 3.6.2 The Chairperson of any Branch established in terms of Clauses 4.5 and 4.6.
 - 3.6.3 Representatives nominated by other professional organisations with whom the **Institute** shares common interests, shall be invited to attend the Council meetings in an observer role.
- 3.7 Members of the Council, except Office Bearers, retire annually after conclusion of the AGM, but shall be eligible for re-election in the same or another capacity.
- 3.9 The Council may, to ensure adequate representation based on the identified needs, such as diversity, and the balance of the practice areas of mining and metallurgy, nominate, elect and co-opt not more than six (6) additional Corporate members to the Council in accordance with the provisions of By-law B. Such additional members shall have the privileges and responsibilities of elected members of the Council and shall hold office for that current session.
- 3.10 Should any member of the Council or the Office Bearers Committee be absent without prior approved leave from the relevant Chairperson for more than 2 (two) consecutive meetings, he/she may, at the discretion of the Council, be requested to forfeit his/her seat on the Council.

Special General Meeting and Constitution, 2018

- 3.11 Should any member of the **Institute** have reason to lodge a complaint against another member he/she must do so by referring it to the Complaints Committee.
- 3.12 A member of the Council, an Office Bearer or an Official of the **Institute** may be removed from office:
- 3.12.1 Should he/she be found to infringe any of the provisions of the Constitution or any of the By-laws;
- 3.12.2 Should he/she act in a manner which is detrimental to the interests of the **Institute**.
- 3.13 No member of the Council, an Office Bearer, or an Official of the **Institute** may be removed from office unless he/she has been afforded the opportunity to state his/her case personally at a meeting of the Complaints Committee or any other appropriate manner determined after consultation with the member. This must be done within a time frame stipulated by the Complaints Committee.
- 3.14 A member of the Council, an Office Bearer, or an Official of the **Institute** who has appeared before the Complaints Committee and who is dissatisfied with the decision of the Complaints Committee shall have the right to appeal to the first ensuing meeting of the Council. Notice of appeal shall be submitted, in writing, in the prescribed format to the Manager within a period not exceeding 30 (thirty) days of the date on which the decision of the Complaints Committee was communicated to the person concerned. The decision of the Council in this regard shall be final.
- 3.15.1 Providing medals or other prizes as the Council may direct from time to time.
- 3.16 The Institute will receive the majority of its funding from conference fees, annual membership subscriptions, revenue from advertising or other fees, donations, and contributions.
- 3.17 The accounts of the **Institute** shall be audited annually by the Auditor (-s) whose appointment shall be ratified by the members present at the AGM for the ensuing year based on the recommendation of the Council. No member or official of the Institute shall be eligible for the position of Auditor. Should the Auditor position become vacant, it shall be filled by the next meeting of the incoming Council.
- 3.18 The Council shall submit, at each AGM, a report on the affairs of the **Institute** together with the audited Financial Statements as at 30 June of that year.
- 3.24 The Council shall meet as often as deemed necessary for the proper execution of its duties, but not fewer than four times per year. In the period between meetings, urgent decisions may be taken in a manner prescribed for this purpose by the Council.

4. Subordinate structures

- 4.1 The Council may establish Committees to perform some of the duties of the Council. Non-exclusive examples of such Committees are those for publications, event organization, membership, and young professionals.

5. Office Bearers

To be read in conjunction with the provisions of By-law B.

- 5.1 Office Bearers shall consist of:
- The President
 - The President-Elect
 - The Senior Vice President
 - The Junior Vice President
 - The Immediate Past President
 - The Honorary Treasurer
 - Up to two Corporate members may be co-opted to the Office Bearers Committee.
- 5.2 The Council shall have the right to co-opt up to two additional Corporate members to the Office Bearers Committee if good reason to do so exists.
- 5.6 The Council may, as the only valid decision-making body of the **Institute**, delegate some or all of its powers to the Office Bearers Committee or any other subordinate structure of the **Institute** if such delegation of powers is considered to be in the best interests of the **Institute**. Any such delegation shall be valid only for the current session of the **Institute** or such shorter period as deemed appropriate by the Council.

6. Meetings of the Institute

- 6.2 The Annual Session of the **Institute** shall be from 1 July of any year to 30 June of the succeeding year. The Annual General Meetings of the **Institute** shall be held in August on a date decided by the Council to receive and consider the report of the Council, the audited Financial Statements, as well as the confirmation from the Auditor of the outcome of the voting process for the election of the 14 (Fourteen) members of the Council, the announcement of Clause 3.2 members of the Council and to conduct such other business as the Council may decide.

A complete and updated version of the Constitution and By-Law B is available on the Institute's website (www.saimm.co.za).

BY-LAW B

COUNCIL: ELECTION AND DUTIES

B1 DUTIES AND MEETINGS OF COUNCIL

- B1.1 Subject to 3.2.4, the Council shall meet as often as the business of the **Institute** requires, but not less than four times per year.
- B1.2 At meetings of the **Council**, 12 (twelve) Corporate members of the Council present at the meeting shall constitute a quorum.
- B1.3 All matters shall be decided by vote of a simple majority of Corporate members of the Council who are eligible to vote.
- B1.4 The President as chairperson of the Council meetings shall have a deliberative vote and, in the event of a tied ballot, a casting vote. The President or, in his/her absence, the President Elect, or, in the

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absence of both parties, a member of the Office Bearers Committee shall take the Chair at all meetings of the Council.

- B1.5 During the period between the Council meetings, urgent decisions may be taken in a manner prescribed for this purpose by the Council.
- B1.6 At the request of any 3 (three) Corporate members present, any item on the agenda may be postponed until the next meeting and then shall be decided by a simple majority of members present at the meeting who are eligible to vote. The notice calling for the subsequent meeting must clearly indicate that there is a subject on the agenda that requires discussion and a decision.
- B1.7 When the Council appoints Committees, such appointments and/or representatives may be made from members of the **Institute** or from such other persons as the Council may select to further the interests and work of the **Institute**. The President shall be, *ex-officio*, a member of all committees.
- B1.8 The President or, in his/her absence, the President Elect may extend the privileges of the **Institute** to members of recognised professional bodies with comparable status who are visiting the Republic of South Africa.

B2 NOMINATION, ELECTION, AND REMOVAL OF THE 14 ELECTED MEMBERS OF THE COUNCIL

- B2.1 The Manager shall invite members of the Council not later than the first day of May in each year to submit nominations for the 14 (fourteen) elected members of the Council. Such nominations shall be lodged with the Manager not less than 60 (sixty) calendar days prior to the date of the Annual General Meeting (AGM).
 - B2.1.1 Only Corporate members of the **Institute** are eligible to be nominated as one of the 14 (fourteen) elected members of the Council;
 - B2.1.2 Each nomination for the 14 (fourteen) elected members of the Council must be proposed and seconded by at least 2 (two) Corporate members on the prescribed official nomination form; and
 - B2.1.3 The members of the Council shall be provided with the nomination criteria which apply to the 14 (fourteen) elected members of the Council.
- B2.2 Upon receipt of the nominations, the Manager shall:
 - B2.2.1 Check that each nominee complies with the approved nomination requirements;
 - B2.2.2 Obtain a copy of an abridged CV per nominee, highlighting his/her contribution to the **Institute**; and
 - B2.2.3 Notify each nominee and request his/her acceptance or otherwise of such nomination within 10 (ten) calendar days. Failure by the nominee to accept such nomination will make it null and void.

B2.3 At least 30 (thirty) calendar days prior to the AGM, the Manager shall forward the respective ballot list showing the names, the qualifications, occupations and relevant contact details of eligible nominees to each of the voting members of the Council. The said ballot list shall be accompanied by an abridged CV per nominee.

B2.3.1 The prescribed voting process of voting for the said nominees shall take place over a period of 2 (two) weeks or longer but not later than 14 (fourteen) days prior to the AGM; and

B2.3.2 In the event of the number of votes being found to be equal for any 2 (two) or more nominees, all of whom may not be declared elected; the Office Bearers Committee shall apply the procedure to be followed to finalise a tied ballot.

- B3 Should the list of nominees for 14 (fourteen) members to be elected to the Council not include the names of as many members as are required to fill the vacancies on the incoming Council, the outgoing Council shall, after scrutiny of the ballot list, nominate eligible Corporate members to complete the list and the members thus nominated shall be declared elected at the next AGM.
- B4 The Council shall have the right to request a member of the Council to forfeit his/her position or to resign if there is proof of unacceptable behaviour and/or that he/she is unable to perform his/her duties.
 - B4.1 The Council shall discuss and agree on the process to remove a member of the Council in the absence of the affected member of the Council;
 - B4.2 After consultation and engagement with the affected member of the Council, a request shall be submitted for consideration and final resolution to the Council in the form of a letter setting out the reasons for the recommendation;
 - B4.3 The Manager shall circulate the letter to the members of the Council for their consideration, comment and/or ratification;
 - B4.4 Members of the Council shall be requested to approve or ratify this decision at the next Council meeting; and
 - B4.5 Should any position on the Council become vacant, the same process as detailed herein before shall be implemented immediately following the resignation of or forfeiture of the position of a member of the Council.

B5 OFFICE BEARERS

B5.1 DUTIES AND MEETINGS OF OFFICE BEARERS

- B5.1.1 The duties of the Office Bearers Committee shall include but not be limited to:
 - Assisting the President to promote the aims of the **Institute**;
 - Attending meetings of the Office Bearers Committee;



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- Formulate recommendations to the Council regarding the functioning of the **Institute**;
- Oversee the day-to-day business of the **Institute**.

B5.1.2 During periods between the Council meetings, the Office Bearers Committee shall receive reports from the various Committees of the **Institute** on behalf of the Council and shall then report to the Council at the next meeting of the Council.

B5.1.3 The Office Bearers Committee shall meet on a monthly basis, with the exception of August, when the Council is in recess, and December.

B5.2 NOMINATION, ELECTION, AND REMOVAL OF OFFICE BEARERS

B5.2.1 The Council shall, each year at the May meeting of the Council, ratify all the positions within the Office Bearers Committee to ascertain that all Office Bearers are still willing, available, and able to fulfil the positions to which they have been elected.

B5.2.2 The Council shall have the right to request an Office Bearer to forfeit his/her position or to resign if there is proof of unacceptable behaviour and/or that he/she is unable to perform his/her duties.

B5.2.3 Office Bearers shall discuss and agree on the process to remove a member of the Office Bearers Committee in the absence of the affected Office Bearer.

B5.2.4 After consultation and engagement with the affected Office Bearer, a request, in the form of a letter setting out the reasons for the recommendation, shall be submitted for consideration and finalisation to the Council.

B5.2.5 The Manager shall circulate the letter for consideration, comment and/or ratification to all members of the Council.

B5.2.6 Members of the Council shall be requested to approve or ratify this decision at the next meeting of the Council.

B5.2.7 If any position within the Office Bearers Committee becomes vacant, the same process as detailed here-in before shall be implemented immediately following the resignation/forfeiture of an Office Bearer's position.

B6 NOMINATION, ELECTION, AND REMOVAL OF THE JUNIOR VICE PRESIDENT

B6.1 The Manager shall timeously invite members of the Institute to submit nominations for the position of Junior Vice President for the next year. Such nominations shall be lodged with the Manager in writing three weeks prior to the May meeting of the Council.

B6.2 The members of the Council shall be provided with a Council-approved list of criteria to be considered when submitting the names of eligible nominees.

B6.3 The Manager shall compile a list of eligible nominees received from the members of the Council, for consideration by the Office Bearers Committee.

B6.4 The Office Bearers Committee shall apply their minds to the list and agree on the preferred candidate intended to become the Junior Vice President for the next year; the name of the candidate shall be forwarded for consideration/ratification by the Council at its May meeting.

B6.5 Once a Council member has been appointed as Junior Vice President, there shall will be an automatic annual progression from this position to Senior Vice President, President Elect, and President, subject to ratification by the Council.

B6.6 Should the position of the Junior Vice President become vacant, the Council will fill the vacancy using the process described here-in before.

B6.7 The Council shall have the right to request the Junior Vice President to forfeit his/her position or to resign if there is proof of unacceptable behaviour and/or that he/she is unable to perform his/her duties. The process used to remove a Junior Vice President is described in Clauses B5.2.4, B5.2.5 and B5.2.6.

B7 NOMINATION, ELECTION, AND REMOVAL OF THE HONORARY TREASURER

B7.1 The Honorary Treasurer shall be a Corporate member of the Council, with a working knowledge of and personal interest in finances and accounting, and who is available and willing to take on the position.

B7.2 Members of the Council shall nominate and ratify the appointment of the Honorary Treasurer on an annual basis at the May meeting of the Council.

B7.3 Should the position of Honorary Treasurer be currently filled, the Manager shall timeously request the members of the Council to ratify the appointment of the current incumbent for the next year.

B7.4 Should the position of Honorary Treasurer become vacant, the Manager shall circulate an invitation to members of the Council to submit nominations, in writing, for the position. Nominations must comply with the selection criteria, approved for this purpose by the Council.

B7.5 The Manager shall validate the nominees and confirm which nominees are eligible for the position of Honorary Treasurer.

B7.6 The list of eligible candidates shall be circulated to the Office Bearers Committee for its consideration and recommendation of the preferred candidate for consideration and finalisation by the Council at the May meeting.

B7.7 The Council shall have the right to request the Honorary Treasurer to forfeit his/her position or to resign if there is proof of unacceptable behaviour and/or that he/she is unable to perform his/her duties. The process used to remove the Honorary Treasurer is described in Clauses B5.2.4, B5.2.5 and B5.2.6.. ♦



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The 121st Annual General Meeting of the Southern African Institute of Mining and Metallurgy was held at the Country Club, Napier Road, Auckland Park, Johannesburg on Thursday 16 August 2018.

Welcome

The President, Selo Ndlovu, extended a special welcome to the guests and representatives of our sister institutes and other associations, and also to recipients of awards, senior members of industry, Honorary Life Fellows, Past Presidents, our members, and other guests, among them the following:

Engineering Council of South Africa

Cyril Gamede, *President*

Geostatistical Association of South Africa

Christina Dohm, *Past Chairperson*

Minerals Council South Africa

Roger Baxter, *Chief Executive*

South African Council on Automation and Computation

Otis Nyandoro, *Past President*

South African National Institute of Rock Engineering

Jannie Maritz, *President*

Women in Mining South Africa

Tendani Lukhaimane, *Representative*

Past Presidents attending

| | |
|--------------------|---------------------|
| Nic Barcza | Cuthbert Musingwini |
| Marek Dworzanowski | Joshua Ngoma |
| Henry James | Rams Ramokgopa |
| Rodney Jones | Gordon Smith |
| Gys Landman | Dick Stacey |

Minutes

The minutes of the previous Annual General Meeting, which were published in the September 2017 issue of the *Journal* and sent to all members, were confirmed.

Obituaries

The President announced the deaths, during the year, of the following members:

Honorary Life Fellows

Oskar Steffen

Members

Kevin McMillan, Miklos Salamon, Dee Bradshaw

Retired Members

John Myles Fowlds

Associates

Rendani Sirwali

In memory of the deceased and in sympathy with the bereaved, all rose and observed a moment of silence.

Honorary Life Fellowship

Vaughn Duke: Honorary Life Fellowship is awarded by the Council to Corporate Members of the Institute who have rendered outstanding service to the Institute over many years. It is my pleasure to announce that the Council has decided to award Honorary Life Fellowship to:

- *Michael Woodall*, for his outstanding service and support of the SAIMM over many years.

Brigadier Stokes Memorial Award

Selo Ndlovu: The Brigadier Stokes Memorial Award was instituted in 1980 to commemorate the outstanding contribution to the South African mining industry made by Brigadier R.S.G. Stokes, an Honorary Life Fellow and Past President of this Institute. This is the premier award of the Southern African Institute of Mining and Metallurgy and is made to an individual for the very highest achievement in the South African mining and metallurgical industry. It gives me great pleasure to announce that the award for 2018 is to be made to Michael Solomon Teke.

Selo Ndlovu called upon Mzila Mthenjane to read the citation:

Michael Solomon Teke was born in KwaThema, Springs in 1964 and holds BA (Ed) and BEd (University of Limpopo) 1985-1989; BA (Hons) (Rand Afrikaans University, now the University of Johannesburg) 1995-1996; and MBA (Unisa) 1999-2002. He started his career as a school teacher in 1990, and in 1992 joined Unilever. In 2000 he moved to BHP Billiton, where he rose to the position of Vice President of Human Resources at Ingwe Collieries. He was appointed Head of Human Resources at Impala Platinum in 2005.

Mike served as a Director of Zimplats Holdings Ltd. from January 2006 to February 2007. He was a Member of the IPM from 1992 to 1998, completed a Human Resources Management Programme at IPM in 1992, and has completed a Professional Certificate in Management and an Advanced Diploma in Management through Unisa-SBL. He is a Fellow of the SAIMM.

In 2008, Mike left Impala to be one of the founding members Optimum Coal, a 71% black-owned company whose shareholders included Mlungisi Kwini, Tom Borman, Peter Gain, and the late Eliphus Monkoe. Optimum was listed on the JSE in 2010, with Mike as CEO, after acquiring Optimum Collieries, a stake in Koornfontein Mines, and a stake in Richards Bay Coal Terminal (RBCT) from BHP Billiton. Optimum was South Africa's fourth-biggest coal exporter and was intended to form the foundation for a black-owned coal mining and exploration group, but was acquired by Glencore in 2012. Mike resigned as CEO, but stayed on in the role of Non-Executive Chairman until April 2015.

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He became Chairman of the Richard's Bay Coal Terminal in 2012 and is currently serving as an Independent Non-Executive Director. Mike is the founder, Executive Chairman, and controlling shareholder of Masimong Group Holdings, a diversified investment company formed in 2013. Masimong focuses on financial services, energy, agriculture, and industry, and is a member of the Serati Resources consortium, which recently acquired Anglo American's Eskom-tied thermal coal mines. Among his other interests is Dedicool, a service-based mining and beneficiation vehicle that is active in the South African mining sector.

Since his days as an active CEO in the listed equity of the corporate world, Mike has contributed to various associations and educational bodies and has developed and grown his own business interests. He is Vice Chairperson of Council at the University of Johannesburg. He was appointed Vice President of the Chamber of Mines in 2011 and served as President of the Chamber from November 2013 to May 2017. Mxolisi Mgojo, CEO of Exxaro Resources and incoming President, paid tribute to Mike for his '... exemplary leadership of the Chamber and his invaluable contribution to the mining industry during extremely challenging times. His inspired leadership and firm belief that mining really matters for the growth, transformation, and development of South Africa has been instrumental to the industry's drive to achieve growth and transformation and governance outcomes that are in the national interest.'

Throughout his career, Mike has responded diplomatically to the pressures facing the mining industry. 'I don't like being confrontational, particularly in the public space,' he says. However, he is not averse to speaking his mind when necessary. In 2014, when the mining industry came under pressure from then minerals minister Ngoako Ramatlhodi on disagreements over the achievement of Charter targets, Teke, who was then Vice President of the Chamber of Mines, said: 'There is a commitment and will, from our side, to transform, but it is not a flat easy thing to do as some black partners will sell their stake to make money while other empowerment shares are under water'. In 2015, when President of the Chamber, he defended the organization against the accusation that it had 'no backbone', saying that the Chamber's role was advocacy. 'Successful advocacy depends on finding the delicate balance that puts SA first but creates an environment in which the mining sector can function optimally', he stated. And, in his address at the Chamber's AGM in 2017: 'We have stood resolute in our desire for achieving growth and transformation and governance outcomes that are in the national interest. We must have the courage and fortitude to continue pushing for what is right in our country and to get the South African dream, as encapsulated in the NDP, back on track.'

Parentless from an early age, Mike was raised by his grandmother, who he regards as one of the major influences in his life. 'My grandmother always said that if you want to make a difference you have to wake up and act ... early to bed and early to rise makes a man healthy, wealthy and wise. I still live by that credo. I could have easily been a negative human being as I grew up in an ordinary family that did not have enough, and as an orphan I could have taken a back seat in life, but I have always stayed the course

and I am always positive and am driven'. He is also inspired by Philip Hechter, Ram Charan, author Jim Collins, and the late Steve Jobs. His personal key to success? 'The ability to master the art of simplifying complexity. This is what life is all about. Hard work has never killed anyone. Don't be afraid to learn. Just work, deliver, and stay focused!'

Vaughn Duke called upon Mike Teke to come forward to collect his award from *Selo Ndlovu*. The following is an edited version of his acceptance speech:

'The President Professor Sehliselo 'Selo' Ndlovu, Past Presidents, members of the Institute of Mining and Metallurgy, honourable guests, distinguished ladies and gentlemen.

Good afternoon.

Its August, a month designated for Women, but I believe we should dedicate 24/7/365 to women.

In the name of Zero Harm, we must be relentless in our drive to make our mines safe all the time. We presently sit with 55 Fatalities versus 42 this time last year. It is a good thing that at the outset of the long journey called life, we are ignorant of the trials and tribulations that await us on that unpredictable road. I like to say, I was lucky. I was lucky because I was born on the wrong side of the tracks, where I personally learnt that privilege is the enemy of progress. Today, I am honoured to receive the Brigadier Stokes Memorial Award 2018, which was previously received by the greats of the mining industry, great men such as Mr Siphon Nkosi, Mr Patrice Motsepe as well as Harry Oppenheimer and a great many others.

I was born in a place called Masimong or Masimini, in KwaThema, Springs. I believe that it is its harsh winters and the warmth of its people that carved me into the individual that I am. In many ways, I represent their hopes and fears. We hope for a better life for our children, community, and ourselves. And we always fear that poverty, which is something I know so well, is always lurking around the corner.

First, let me tell you about the harshness of KwaThema. The winters are cold, and the cold pierces through the bones. When I was a younger, every day before sunset, you had to make sure that the wood had been chopped and the coal collected to make a fire in the coal stove. Coal was fuel not only for the household, but for the community. There were people like Mr Mathunjwa who had a coal business. Without people like him there was no eating, no heating, no washing — because you had to put the kettle on the stove in order to get hot water to wash for school, and in the case of adults, in order to go to work. Coal was sold on horse-drawn carts, and you knew that it was coming because invariably the coal-sellers would sit in the cart and shout — Yoyoyo... yoyo... Some would use a bell, sing, shout... do something to let people know that the coal-cart was passing by. When we were kids, cars were very few. So we would run out and hold on to the back of the coal cart, letting your legs hang in the air, just to be on something that is moving on four-wheels. It was dangerous but it was fun.

We always knew that coal was both dirty and dangerous. Coal caused death through carbon monoxide poisoning. There were instances where children woke up at the crack of dawn to light up *imbawula*, or the brazier and bring it into the room. Needless to say, the ventilation is poor in a single

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room such as a shack. Mom leaves and tragically, children suffocated and died.

That has always been the dilemma of coal — cheap, dirty, and deadly. Nothing has changed much, even in these the days of environmental awareness. At Seriti alone we employ a number of coal miners, and they are responsible for 5 times that. Their children have to go to school, hopefully under very different circumstances to what I experienced. Shareholders of mining companies are largely pension funds which take care of the savings of retired teachers and nurses and the general public.

The coal dilemma is indicative of the challenges faced by management these days. Management challenges are not between right and wrong, but between right and right, as the Harvard scholar and ethicist Joseph Badaracco argues in his book, *Decisive Moments*. We cannot look at decision-making from a single perspective. We have to look at the impact it has on the environment in which we live, the employees and communities, the country, the shareholders — who are the pension funds of the people as I said earlier.

Our most pressing role as leaders in the mining sector is to stop the bleeding of jobs. When mines close down, they lead to ghost towns and untold suffering. This cannot be achieved by wishes alone. It requires serious engagement among all players. The underlying principle should be that this is our country, we should take pride in it, but most importantly, we must remember that a nation is in good hands when its old people plant trees whose shade they will never enjoy. We should ask the question, which trees are we planting or are we harvesting even before we sow? Are we making sure that in the future there will be new recipients of this august award or are we experiencing its last days, which would be a great pity?

Armed with the vision of the future that we want to create, the mining industry, together with the government of South Africa, should look seriously at strategies of restoring the local industry's global leadership. For instance, a few years ago cars were some of the major polluters. Today, thanks to filters and major progress in science, cars have clean technologies. The countries that are original equipment manufacturers in the automotive sector, such as Germany, are enjoying strong economies underpinned by robust growth.

Likewise, our country should invest in filter technologies that will make power stations emit well-filtered and cleaner air. We need good, reliable power stations if South Africa is to create jobs for the millions of its youth. As things stand today, you cannot power a smelter with wind turbines or solar power.

First we must start at home. Our trading partners, particularly China and the USA, have what they call the Africa strategy. They are actively investing in the continent while we argue and debate about small stuff. We should be active participants in the development of our continent. Mining built cities such as Johannesburg here in South Africa, and we must have a plan on how mining will build better cities throughout the continent. So that most children can have a better life than my childhood and certainly a better future. At this time, ladies and gentlemen, our country's mining industry is facing critical challenges that require strong leadership with an unselfish commitment to

enhancing its performance so that it is able to compete more effectively with other global mining jurisdictions. I am convinced of our ability to compete meaningfully with the United States, China, Canada, Australia, as well as all of the mining sectors that we find elsewhere on our own African continent.

Ladies and gentlemen, I am both honoured and privileged to be here at what is a truly auspicious event and at which I am to be the grateful recipient of an equally auspicious award. And for it I am enormously thankful to my grandmother, Dorothy Teke, who took on the responsibility of raising me with a disciplinary approach concentrated on the value of hard work and integrity. Very little changed when my grandmother passed on and my sister Maria stepped into her responsibly authoritative shoes. It was my additional good fortune to receive support from the broader family and friends. Again, I am deeply indebted to my sister who to all intents and purposes became my mother and has fulfilled that role right up to today. I emphasise, my family is big and virtually all of them supported me. I am eternally grateful.

I thank the Institute and all of its distinguished members for giving me this esteemed award and I intend dedicating it in the first instance to my grandmother, Dorothy Teke, who never wavered in her profound commitment to raising and providing invaluable guidance to an orphaned grandson. It is dedicated as well to my sister Maria and to my wonderful wife, Sandi. All three of these ladies have been infallible pillars of support throughout my life and they occupy a very special place in my heart.

Ladies and gentlemen, I stand here this afternoon as a proud South African who has earned recognition as a long-standing member of the South African mining community. I remain committed to making a positive difference to the industry.

Earlier I spoke about the unpredictability of the journey. There is a saying that if you have to go fast, go alone, but if you want to go far, go with someone. I've been lucky to have met my beloved wife of 26-years, Sandi, who has been my constant companion and invaluable guide and adviser. Sandi knows better than anyone else both the painful times that I have endured, and the good times that I have enjoyed. She is here today to share the honour that has been bestowed upon me and with your indulgence, ladies and gentlemen, I want to thank her for always keeping the home fires burning. Thank you also Sandi for taking care of our two lovely children – our son Boikanyo and our daughter Tshiamo. I woke up one day wanting to take them to school when it dawned on me that I was too late. They had completed matric, were young adults and I had hardly noticed. Why? Mainly because I was consistently busy marvelling at the massive yellow equipment in front of me, the draglines on the horizon and the different stopes and panels at operations with which I was associated.

In conclusion, let me say that I am acutely aware of the distinguished work performed by the Southern African Institute of Mining and Metallurgy and the value that comes out of the Institute's deliberations. I know most of the key people in this organization and I believe that you still have a major role to play in shaping the future of mining in our country.

Thank you for recognizing me.

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Presentation of awards, medals, and certificates

Vaughn Duke announced the following awards, medals, and certificates, which were presented by Selo Ndlovu.

50-year Membership Awards

(with effect from 1 July 1967 to 30 June 1968)

- Hendrik George Albertyn
- Nicholas Adrian Barcza
- Alan George Cameron Merson
- Peter John Cook
- Claude Victor Bruce Cunningham
- Noel Cain Joughin
- Robert Arthur Lindsay
- Herman Egbertus Lombard
- Montaque Cholmondeley William Morris
- William Alan Nairn
- Andrew David Ochse
- Mervyn van Ryneveld Steyn
- Hans Helmut Stotko
- Peter Stenhouse Wentworth

We also have a recipient who was unable to collect his badge last year, who requested to receive it at this year's AGM.

- David Robert Fleming

The Danie Krige Memorial Award

The Danie Krige Memorial Award was instituted in 2013 to honour the memory of Professor Danie Krige, who was one of South Africa's most influential mining engineers and a geostatistician of international repute.

The Danie Krige Memorial Award is considered for the best geostatistical paper published in the *SAIMM Journal* between January and December 2017.

There was no award this year.

Gold and Silver Medals

Papers published in the *Journal* from March 2017 to February 2018 by members of the Institute were considered for medals.

Gold Medals

Gold medals are awarded for papers that are of a world-class standard, and judged to be publications that will become key references in their mining or metallurgy field in the future.

No awards were made.

Silver Medals

Silver medals are awarded for papers that make a major contribution to the professions of mining and metallurgy and to the prestige of the Institute.

Silver Medals were awarded to:

E. Former, S. Archer, V. Coetzee, K. Soldenhoff, and J. Quinn for their paper published in the February 2018 issue of the *Journal* entitled: 'Uranium recovery from high-chloride sulphate leach solutions: A cost trade-off study of using treated water vs saline water as make-up water'.

As non-members, V. Coetzee, K. Soldenhoff, and J. Quinn received certificates of merit.

D. Roberts for his paper published in the July 2017 issue of the *Journal* entitled: 'Calibration of a numerical model for bore-and-fill mining'.

Presentation of Student Prizes

Vaughn Duke announced the student winners of the SAIMM Prestige Prize and Selo Ndlovu presented the awards to the students adjudged by their departments to be the best final-year students in 2017.

University of the Witwatersrand

| | |
|---------------------------|------------|
| Mining Engineering | S. Motha |
| Metallurgical Engineering | M. Dlamini |

University of Pretoria

| | |
|---------------------------|------------------|
| Mining Engineering | J-P. Labuschagne |
| Metallurgical Engineering | J. Wicks |

University of Johannesburg

| | |
|-----------------------|---------------|
| Mining Engineering | No award |
| Extractive Metallurgy | R. Moanakoena |

The following SAIMM student prizes were presented at the Western Cape Branch AGM on 3 September 2018.

University of Cape Town

| | |
|-------------------------|------------------|
| Best final-year student | |
| Mineral Processing | V.L. Dzimbanhete |
| Mineral Processing | D.S. Goho |

University of Stellenbosch

| | |
|-------------------------|----------|
| Best final-year student | |
| Mineral Processing | C. Laker |

Cape Peninsula University of Technology

| | |
|-------------------------|------------|
| Best final-year student | |
| Mineral Processing | R. Mapfumo |

The Western Cape Branch also awards two Outotec postgraduate scholarships for students conducting research in the area of sustainable mineral processing, but there was no award this year.

SAIMM 5 Star Incentive Programme

The SAIMM 5 Star Incentive Programme was introduced in 2015 to thank members who contribute to the growing membership of the SAIMM and to provide additional benefits to Fellows and Members of the SAIMM. The following will receive free attendance at the Annual Banquet in 2019.

The Top 5 proposers were:

Darius Muma
Gangatha Dabula
Sihe Nhleko
Markus Erwee
William Joughin.

The Top 5 referees of papers published in the Journal were:

Marek Dworzanowski
Markus Erwee
Matthew Handley
Norman McGeorge
Steven Rupprecht
The author who submitted and published the most papers in the *Journal* was:
John Bunt.

Top advertiser in the Journal

The award for the *most supportive advertiser* in the *Journal*

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was made to Elbroc. Jan van Jaarsveld received the award on their behalf.

Annual Report

Selo Ndlovu presented the Annual Report with highlights of his year as President.

Accounts

The Honorary Treasurer, *Vaughn Duke*, presented the financial statements, which are reproduced in the Annual Report in this edition of the *Journal*.

Office bearers and Members of Council for 2018/2019

Selo Ndlovu announced the office bearers for the ensuing year, elected by the retiring Council in accordance with Clauses 3.5, 5.1, and 5.2 of the Constitution:

| | |
|--------------------------|---------------------|
| President | Alastair Macfarlane |
| President Elect | Mzila Mthenjane |
| Senior Vice President | Zelmia Botha |
| Junior Vice President | Vaughn Duke |
| Immediate Past President | Selo Ndlovu |
| Honorary Treasurer | Vaughn Duke |

In terms of the election of ordinary members of Council (Clause 3.2.7 of the Constitution and By-law B2.1), there were fourteen vacancies and the following members are now declared elected (in alphabetical order):

| | |
|---------------------|------------------|
| Isabel Geldenhuis | Steven Rupprecht |
| Cornelia Hotzhausen | Navin Singh |
| William Joughin | Andrew Smith |
| Gary Lane | Michael Solomon |
| Elias Matinde | David Tudor |
| Harmony Musivarira | Andrew van Zyl |
| Godknows Njowa | Jeanne Walls |

In terms of By-law F1.7 of the Constitution, the Chairpersons of the branches are as follows:

| | |
|---------------|--------------------|
| Botswana | Len Dimbungu |
| DRC | Susa Maleba |
| Johannesburg | John Luckmann |
| Namibia | Nikowa Namate |
| Northern Cape | Fabian Nieuwenhuys |
| Pretoria | Roelf Mostert |
| Western Cape | Lawrence Bbosa |
| Zambia | Darius Muma |
| Zimbabwe | Clara Sadomba |
| Zululand | Christo Mienie |

The Chairperson of the South African National Council on Tunnelling (SANCOT) is R. Tluczek.

These Chairpersons will be *ex-officio* members of Council.

In terms of By-law I, which governs the Young Professionals Council, Clause 4.1 states that the affairs of the YPC shall, subject to the control of the Council, be managed by the YPC members constituted as follows:

The office bearers of the YPC are:

| | |
|-------------|------------------|
| Chairperson | Katlego Letsoalo |
|-------------|------------------|

| | |
|----------------------------|-------------------|
| Vice Chairperson | Gangatha Dabula |
| Immediate Past Chairperson | Sihsenkosi Nhleko |

The Chairperson and Vice Chairperson will represent the YPC on the SAIMM Council.

Clause 14.4.6 states that the YPC must consist of a minimum of 14 and a maximum of 18 members who are 35 years of age and younger. These members are still to be ratified by Council.

The following Past Presidents have signified their willingness to serve on Council for the ensuing year:

| | |
|---------------------|--------------------|
| Richard Beck | Rams Ramokgopa |
| Roger Dixon | Mike Rogers |
| Marek Dworzanowski | Don Ross-Watt |
| Henry James | Gordon Smith |
| Rodney Jones | Willem van Niekerk |
| Gys Landman | Pat Willis |
| Cuthbert Musingwini | |

Selo Ndlovu thanked those Past Presidents who indicated that they cannot serve on Council for the next year for all their time, effort, and dedication in the past.

She also thanked Past Presidents for their continued support. She congratulated all those elected, and thanked those who agreed to serve another term of office.

Declaration of Honorary Vice Presidents of the SAIMM for the 2018/2019 session

Selo Ndlovu: the SAIMM has a long standing arrangement of inviting the President of the Minerals Council of South Africa as well as the Ministers of the Departments of Mineral Resources, Science and Technology and Trade and Industry to serve as Honorary Vice Presidents.

These positions are intended to create closer collaboration between our organizations so that we may better serve the needs of our members and the industry. These positions will be confirmed for the period 2018/2019.

Election of auditors and honorary legal advisers for 2018/2019

Selo Ndlovu proposed, and it was agreed, that Genesis be appointed as Auditor for the coming year and that Scop Incorporated be appointed as Honorary Legal Advisers.

Induction of President

Selo Ndlovu introduced the new President, Alastair Macfarlane, and then called upon *Vaughn Duke* to read his *curriculum vitae*.

Presidential Address

Alastair Macfarlane presented his Presidential Address entitled *Towards the future: African mining vision, Mining Phakisa, and the SAIMM*, which is reproduced elsewhere in this edition of the *Journal*.

Vote of thanks

Mzila Mthenjane, gave the vote of thanks.

Closure

The meeting closed at 17:55. ♦

Proceedings, 121st Annual General Meeting, 2018

Honorary Life Fellowship Award



Vaughn Duke announcing the award winners



Mike Woodhall, receiving his Honorary Life Fellowship award from Selo Ndlovu

Brigadier Stokes Award



Mzila Mthenjane reading the citation of Mike Teke



Mike Teke, recipient of the Brigadier Stokes Memorial Award, receiving his Platinum Medal



Mike Teke giving his acceptance speech

50-year Membership Awards



Hendrik Albertyn, receiving his 50-year Membership lapel badge



Nic Barcza, receiving his 50-year Membership lapel badge

Proceedings, 121st Annual General Meeting, 2018

50-year Membership Awards



Peter Cook, receiving his 50-year Membership lapel badge



Claude Cunningham, receiving his 50-year Membership lapel badge



Noel Joughin, receiving his 50-year Membership lapel badge



Peter Wentworth, receiving his 50-year Membership lapel badge



David Fleming, receiving his 50-year Membership lapel badge

Silver Medal Award winners



Sydney Archer and Eleanore Forner, receiving the Silver Medal Award, for their paper that was published in the *Journal*



Dave Roberts, receiving the Silver Medal Award, for his paper that was published in the *Journal*

Student Prizes



Juan-Pierre Labuschagne receiving his student prize



Jurgens Wicks receiving his student prize



Reotshepile Moanakoena receiving her student prize

Most Supportive Advertiser in the SAIMM Journal



Jan van Jaarsveld receiving the award on behalf of Elbroc as the Most Supportive Advertiser in the Journal



Selo Ndlovu receiving her Commemorative Plaque from Sam Moolla (Manager)



Alastair Macfarlane delivering his Presidential Address

Proceedings, 121st Annual General Meeting, 2018

Office Bearers for 2017/2018



Office Bearers for 2018/2019: Mzila Mthenjane, Selo Ndlovu, Rodney Jones, Alastair Macfarlane, Vaughn Duke

Council members and Past Presidents of the SAIMM



Front row (from left to right): Gary Lane, Henry James, Marek Dworzanowski, Selo Ndlovu, Alastair Macfarlane, Cornelia Holtzhausen, Jeanne Walls
Back row (from left to right): Gys Landman, Mike Solomon, Mzila Mthenjane, Nic Barcza, Dave Tudor, Elias Matinde, Rams Ramokgopa, Rodney Jones, Cuthbert Musingwini, Steven Rupperecht, Isabel Geldenhuys, Vaughn Duke

Branch Chairpersons of the SAIMM



Nonku Buthelezi, Darius Muma, Christo Mienie, Alastair Macfarlane, John Luckmann, Clara Sadomba, Nikowa Masbutu Namate, Susa Maleba

Past Presidents of the SAIMM



Past Presidents serving on Council — Cuthbert Musingwini (2016–2017), Henry James (1985–1986), Marek Dworzanowski (2013–2014), Dick Stacey (2003–2004), Nic Barcza (1996–1997), Rams Ramokgopa (2002–2003), Rodney Jones (2015–2016), Selo Ndlovu (2017–2018), John Cruise (1994–1995), Joshua Ngoma (2009–2010), Alastair Macfarlane, current President (2018–2019), Gys Landman (2010–2011)

Proceedings, 121st Annual General Meeting, 2018

Members and their guests at the cocktail party



Noel and Helen Joughin, Alex du Plessis, Margaret Archibald, Dave Roberts with Alastair and Diane Macfarlane



Sandi and Mike Teke, Brigadier Stokes Memorial Award recipient



Susa Maleba, Tshepo Mmola, Sihe Nhleko with Cuthbert Musingwini



Claude and Maureen Cunningham with Dick Stacey



Peter and Sheila Cook with Barbara and Peter Wentworth

Proceedings, 121st Annual General Meeting, 2018



Fred Cawood, Tanya Schonwald and Jean-Jacques Verhaeghe



Jannie Maritz, President of SANIRE, Jeanne Walls and Carel Boonzaier



John Luckmann, Hein and Magda Jantzen with Danie Jensen



John Cruise, Patricia and Dave Fleming



Javier Kirigin, John Cruise, Woody and Hennie Albertyn



Henry and Marc James with Nic Barcza

Proceedings, 121st Annual General Meeting, 2018



Rodney Jones, Gary Lane, Mike Solomon with Paul Jourdan

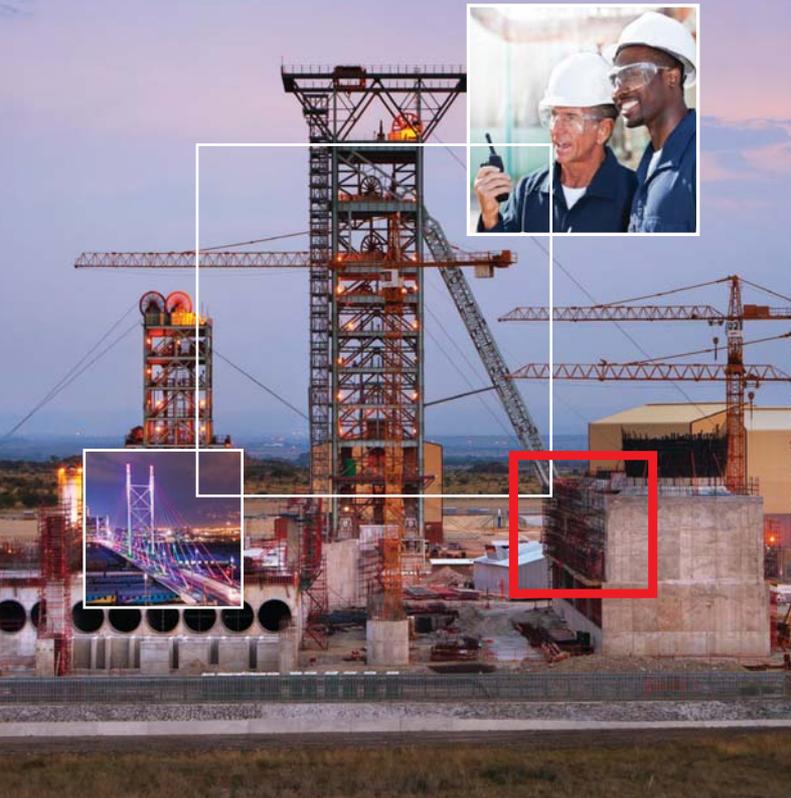


Andrew Hart and Tebogo Louw

Students



Realising possibilities
from **mine to market.**

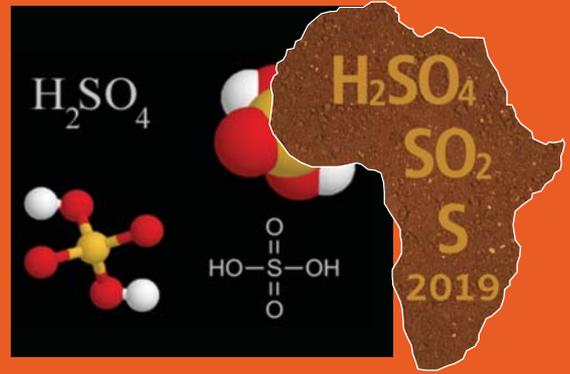


WorleyParsons provides innovative solutions for each step of the mining value chain. We combine world-leading, concept-to-completion expertise with design and major project delivery capabilities for the minerals and metals sector, from bulk commodities to rare earths, with complete mine-to-market solutions from inception to rehabilitation. Our Global Centre of Excellence for Mining and Minerals in South Africa has niche expertise in hard rock and precious minerals and metals, and we have achieved particular recognition for the delivery of complex processing plants and deep shaft mines.



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wprsainfo@worleyparsons.com



7th Sulphur and Sulphuric Acid 2019 Conference

11–12 March 2019 Conference
13 March 2019 Technical Visit

Swakopmund Hotel
Swakopmund, Namibia

BACKGROUND

The production of SO₂ and sulphuric acid remains a pertinent topic in the Southern African mining and metallurgical industry, especially in view of the strong demand for, and increasing prices of, vital base metals such as cobalt and copper.

The electric car revolution is well underway and demand for cobalt is rocketing.

New sulphuric acid plants are being built, comprising both smelters and sulphur burners, as the demand for metals increases. However, these projects take time to plan and construct, and in the interim sulphuric acid is being sourced from far afield, sometimes more than 2000 km away from the place that it is required.

The need for sulphuric acid 'sinks' such as phosphate fertilizer plants is also becoming apparent. All of the above factors create both opportunities and issues and supply chain challenges.

To ensure that you stay abreast of developments in the industry, the Southern African Institute of Mining and Metallurgy invites you to participate in a conference on the production, utilization, and conversion of sulphur, sulphuric acid, and SO₂ abatement in metallurgical and other processes, to be held in March 2019 in Namibia.

For further information contact:

Head of Conferencing: Camielah Jardine, SAIMM
P O Box 61127, Marshalltown 2107
Tel: (011) 834-1273/7, Fax: (011) 833-8156 or (011) 838-5923
E-mail: camielah@saimm.co.za
Website: <http://www.saimm.co.za>



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OF MINING AND METALLURGY



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Co-funded by the
Erasmus+ Programme
of the European Union



The Southern African Institute of Mining and Metallurgy in collaboration with the Erasmus+ Programme of the European Union, Learning and Teaching Tools Fuelling University Relations within the Economic Structures in Mozambique and South Africa

Higher Education Development in the Extractive Industry Workshop 2018

25–26 October 2018

The Wits Club, University of the Witwatersrand, Johannesburg

Revisions to the High Education Qualifications Framework (HEQF) have altered how the tertiary education institutes can package their postgraduate qualifications. This has resulted in a gap between the needs of the South African extractive industry in terms of training and skills development and the manner in which tertiary education institutions are currently delivering and packaging their qualifications. Those tasked with ensuring that their employees are provided with the necessary training in order for them to progress through the company hierarchy are of the opinion that training and skills development are not easily accessible to them. It is therefore essential that the progression for Differently Qualified Applicants (DQA) also be addressed and catered for in any proposals regarding the development of qualifications. The opportunities around dual education and work-integrated models are also to be explored.

TOPICS:

The following topics will be covered:

- Progression of operators into Higher Education
- Recognition of non-formal skills and learning
- Progression of Diplomates
- Industry, experience, qualifications, progression from lower degrees to higher degrees, and addressing the qualification gaps
- Balancing industry needs and Higher Education Institution outputs:
 - Future career paths for graduates
 - The role of work-integrated learning/dual education in Higher Education.

WHO SHOULD ATTEND

People from the mining and metallurgy industry

Mining companies

- Mine managers
- Mining engineers
- Metallurgists
- MRM practitioners
- Human resource development practitioners
- Training managers and officers.

Academics

- Training service provider
- MQA representatives
- Department of Higher Education and Training Representative
- TVET college representatives
- Training service providers
- Students.

KEYNOTE SPEAKER
Mike Teke



SUPPORTED BY:



DEEP MINING 2019 CONFERENCE

NINTH INTERNATIONAL CONFERENCE ON DEEP AND HIGH STRESS MINING 2019

24–25 JUNE 2019 - CONFERENCE

26 JUNE 2019 - SANIRE SYMPOSIUM

27 JUNE 2019 - TECHNICAL VISIT

MISTY HILLS CONFERENCE CENTRE, MULDRSDRIFT, JOHANNESBURG, SOUTH AFRICA



BACKGROUND

The Ninth International Conference on Deep and High Stress Mining (Deep Mining 2019) will be held at the Misty Hills Conference Centre, Muldersdrift, Johannesburg on 24 and 25 June 2019. Conferences in this series have previously been hosted in Australia, South Africa, Canada, and Chile. Around the world, mines are getting deeper and the challenges of stress damage, squeezing ground, and rockbursts are ever-present and increasing. Mining methods and support systems have evolved slowly to improve the management of excavation damage and safety of personnel, but damage still occurs and personnel are injured. Techniques for modelling and monitoring have been adapted and enhanced to help us understand rock mass behaviour under high stress. Many efficacious dynamic support products have been developed, but our understanding of the demand and capacity of support systems remains uncertain.

OBJECTIVE

To create an international forum for discussing the challenges associated with deep and high stress mining and to present advances in technology.

WHO SHOULD ATTEND

- Rock engineering practitioners
- Mining engineers
- Researchers
- Academics
- Geotechnical engineers
- Hydraulic fracturing engineers
- High stress mining engineers
- Waste repository engineers
- Rock engineers
- Petroleum engineers
- Tunnelling engineers

For further information contact:

Camielah Jardine, Head of Conferencing, SAIMM, Tel: +27 11 834-1273/7, Fax: +27 11 833-8156 or +27 11 838-5923
E-mail: camielah@saimm.co.za, Website: <http://www.saimm.co.za>



SAIMM
THE SOUTHERN AFRICAN INSTITUTE
OF MINING AND METALLURGY



CSIRO | The University of Western Australia | Joint Venture

Annual report

FOR THE YEAR ENDED 30 JUNE 2018

Council for 2017/2018

President
S. Ndlovu

President Elect
A.S. Macfarlane

Vice Presidents

Senior

M.I. Mthenjane

Junior

Z. Botha

Immediate Past-President

C. Musingwini

Honorary Treasurer

V.G. Duke

Members of Council

| | |
|-----------------|------------------|
| V.G. Duke | G. Njowa |
| I.J. Geldenhuys | S.M. Rupprecht |
| M.F. Handley | A.G. Smith |
| W.C. Joughin | M.H. Solomon |
| E. Matinde | D. Tudor |
| M. Motuku | D.J. van Niekerk |
| D.D. Munro | A.T. van Zyl |

Branch Chairpersons

| | |
|---------------------|---------------|
| Botswana Branch | L.E. Dimbungu |
| DRC Branch | S. Maleba |
| Johannesburg Branch | J.A. Luckmann |
| Namibian Branch | N.M. Namate |
| Northern Cape | W.J. Mans |
| Pretoria Branch | R.J. Mostert |
| Western Cape Branch | R.D. Beck |
| Zambian Branch | D. Muma |
| Zimbabwean Branch | S. Matutu |
| Zululand Branch | C.W. Mienie |

Past Presidents serving on Council

| | |
|-----------------|------------------|
| N.A. Barcza | R.G.B. Pickering |
| R.D. Beck | S.J. Ramokgopa |
| J.R. Dixon | M.H. Rogers |
| M. Dworzanowski | D.A.J. Ross-Watt |
| H.E. James | G.L. Smith |
| R.T. Jones | W.H. van Niekerk |
| G.V.R. Landman | R.P.H. Willis |

Key objectives of the Institute

To initiate and give effect to the means whereby the requirement for technology and scientific knowledge of the minerals and metals section of the southern African economy is satisfied; and to represent and promote the interests of its members.

Arrangement of this Report

In accordance with the current management policy, this report on the activities of the Institute is presented under eight main headings:

1. Interests of Individual Members
2. Technical Meetings
3. Publications
4. Regional Development
5. Engineering Science and Technology in South Africa
6. State Liaison
7. International Liaison
8. Management and Administration.

1. Interests of Individual Members

Portfolio Holder: S. Ndlovu

J.R. Dixon, Chairperson

As at the end of the 2018 year, total membership across all categories stood at **5077** representing a slight decrease (-4) year on year (Table 1). A total of **3608** are based in South Africa and a further 1084 from our Regional Branches in Southern Africa where healthy growth was seen in DRC and Zimbabwe (Table 2). The balance is made up of members scattered across the globe. The decrease in **Members** is reflective of the South African mining industry with more unemployment in technical occupations and people moving either into alternative industries in South Africa or moving internationally.

Student membership again showed robust growth increasing by **246** or **15.7%** year on year with students now making up **36%** of total membership. The focus on our youth and Young Professionals remains a cornerstone strategy for the long-term health of the Institute. Council continues to

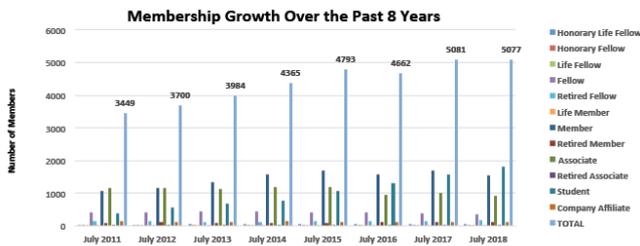
Table 1

Total SAIMM Membership Analysis by year on year

| Membership grade | Figure end of 2016/2017 | Figure end 2017/2018 | Net Gain/Loss |
|----------------------|-------------------------|----------------------|---------------|
| Honorary Life Fellow | 49 | 49 | 0 |
| Honorary Fellow | 2 | 2 | 0 |
| Life Fellow | 7 | 7 | 0 |
| Fellow | 385 | 351 | -34 |
| Retired Fellow | 153 | 172 | 19 |
| Life Member | 1 | 1 | 0 |
| Member | 1 678 | 1 541 | -137 |
| Retired Member | 103 | 122 | 19 |
| Associate | 1010 | 910 | -100 |
| Retired Associate | 12 | 12 | 0 |
| Student | 1 564 | 1 810 | 246 |
| Company Affiliate | 117 | 100 | -17 |
| Total | 5 081 | 5 077 | -4 |

**Table II
Country /Branch Membership Analysis for 2017/8**

| Country Branches | 2016/17 | 2017/18 |
|------------------|-------------|-------------|
| Botswana | 79 | 74 |
| DRC | 28 | 76 |
| Namibia | 91 | 63 |
| Zambia | 196 | 186 |
| Zimbabwe | 609 | 685 |
| Total | 1003 | 1084 |



Graph 1—South African Membership Annual Growth

encourage the initiative of offering support to our members that are financially stressed, either through deferred fees or in exceptional cases, by waiving the annual fee. The number of people receiving this assistance is 1.02% compared with 0.59% last year which reflects the continuing pressure facing our membership in the mining industry.

Progress on the work of the Membership Committee includes the following activities:

- On-going updates of membership By-laws: The criteria for acceptance as a Fellow has been reviewed to take account of the globalisation of the mining industry and movement of professionals from continent

to continent. The new By-law will be presented to Council early in the 2018/2019 year;

- Actively focusing on upgrading members to higher membership grades:

This is an on-going task. Current focus is on Associates who have been at this grade of membership for more than 4 or 5 years. The membership committee have suggested to Council that this task be automated.

- Re-design of the SAIMM web site to further improve application and payment efficiency:
- Recognising our newly elected Fellows at the annual banquet:

Completed and on-going

- Creating an electronic membership archive which enables monitoring of categories of membership and payment details by Branch:

On-going

- Two members of the YPC have been co-opted to the membership committee with the objective of connecting with Student and Associates and improving the conversion rate to Member status.

It is with great sadness that we have to report the passing of many of our members, many whom have played pivotal roles in the Southern African Mining and Metallurgical industries.

| Members who sadly passed on during 2017/2018 | | | |
|--|-----------------|-------------------|----------------------|
| Deceased | Election date | Membership number | Grade |
| Kevin McMillan | 16 May 2014 | 706677 | Member |
| John Myles Fowlds | 6 August 1968 | 2615 | Retired Member |
| Miklos Salamon | 6 June 1974 | 19652 | Member |
| Rendani Sirwali | 21 October 2011 | 705383 | Associate |
| Deirdre Jane Bradshaw | 15 May 1998 | 701738 | Member |
| Oskar Kurt Helmut Steffen | 7 February 1967 | 10978 | Honorary Life Fellow |

Summary of membership for 2017/2018 and comparison of membership grades and total membership from 2011–2018

| Membership grade | July 2011 | July 2012 | July 2013 | July 2014 | July 2015 | July 2016 | July 2017 | July 2018 |
|----------------------|--------------|--------------|--------------|--------------|--------------|-------------|--------------|--------------|
| Honorary Life Fellow | 34 | 36 | 54 | 53 | 53 | 51 | 49 | 49 |
| Honorary Fellow | 3 | 3 | 2 | 2 | 1 | 2 | 2 | 2 |
| Life Fellow | 9 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| Fellow | 420 | 421 | 429 | 434 | 412 | 398 | 385 | 351 |
| Retired Fellow | 137 | 130 | 125 | 123 | 140 | 144 | 153 | 172 |
| Life Member | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Member | 1 075 | 1169 | 1334 | 1584 | 1702 | 1572 | 1678 | 1541 |
| Retired Member | 97 | 99 | 92 | 94 | 96 | 102 | 103 | 122 |
| Associate | 1148 | 1146 | 1132 | 1173 | 1176 | 961 | 1010 | 910 |
| Retired Associate | 13 | 13 | 13 | 12 | 12 | 12 | 12 | 12 |
| Student | 380 | 549 | 672 | 754 | 1069 | 1295 | 1564 | 1810 |
| Company Affiliate | 132 | 126 | 123 | 128 | 124 | 117 | 117 | 100 |
| Total | 3 449 | 3 700 | 3 984 | 4 365 | 4 793 | 4662 | 5 081 | 5 077 |

Geographical distribution of membership, 2017/2018

| Country | Members | Country | Members |
|--------------------|---------|----------------------|-------------|
| Australia | 76 | Mongolia | 1 |
| Austria | 2 | Mozambique | 8 |
| Belgium | 4 | Namibia | 63 |
| Botswana | 74 | Netherlands | 4 |
| Brazil | 10 | New Zealand | 2 |
| Cameroon | 1 | Nigeria | 2 |
| Canada | 28 | Papua New Guinea | 1 |
| Cayman Islands | 1 | Peru | 7 |
| Chile | 8 | Philippines | 1 |
| Colombia | 1 | Russia | 1 |
| DRC | 76 | Rwanda | 1 |
| Dominican Republic | 0 | Singapore | 1 |
| Finland | 4 | South Africa | 3 608 |
| France | 4 | Suriname | 2 |
| Germany | 6 | Swaziland | 4 |
| Ghana | 88 | Sweden | 1 |
| Hong Kong | 1 | Switzerland | 2 |
| India | 8 | Tanzania | 13 |
| Indonesia | 1 | Thailand | 2 |
| Iran | 1 | Turkey | 5 |
| Ireland | 3 | United Arab Emirates | 1 |
| Israel | 2 | UK | 20 |
| Lesotho | 6 | US | 42 |
| Madagascar | 4 | Venezuela | 1 |
| Mali | 2 | Zambia | 186 |
| Mauritius | 2 | Zimbabwe | 685 |
| | | Total | 5077 |

In addition to membership growth, fee collection has remained a focus for the committee. Maintenance of contact with members remains a challenge. Membership and conference fees have been maintained well below inflation parameters to ensure that our members continue to get value for their fees. Unfortunately, it is expected that annual increases will need to be more aligned with cost increases in the coming years.

Maintaining a quorum at the Membership Committee has proved a challenge in the past year despite tele-conferencing. In the coming year thought will be given as to how the process can be further streamlined.

I wish to extend my personal thanks to the members of the Committee for their commitment and support during the past year.

1.1 Membership Committee

J.R. Dixon, Chairperson

N.A. Barcza

R.D. Beck

J.A. Cruise

G.V.R. Landman

J.C. Ngoma

R.G.B. Pickering

S.J. Ramokgopa

M.H. Rogers

D.A.J. Ross-Watt

G.L. Smith

T.R. Stacey

O.K.H. Steffen

J.N. van der Merwe

D.J. van Niekerk

M. Woodhall

Membership

The SAIMM membership comprises engineers, metallurgists, chemists, physicists, geologists, certificated managers, and technikon diplomates, and other disciplines, all of whom have an interest in the fields of mining, extractive metallurgy, metals

technology, and other related areas.

Requirements for Corporate membership

HONORARY LIFE FELLOW: An Honorary Life Fellow shall be a person whom the Institute specifically desires to honour in consideration of services rendered to the Institute, to science, or to industry. Honorary Life Fellows shall have all the privileges of Corporate Members.

- The election of an Honorary Life Fellow shall take place at a Council meeting, due notice having been given at the preceding Council meeting of Council's intention to nominate a person as an Honorary Life Fellow. The election shall require the majority vote of Corporate Members of Council present at a Council meeting
- The election of an Honorary Life Fellow shall be announced at the following Annual General Meeting of the Institute
- An Honorary Life Fellow will have all membership fees and subscriptions waived.

FELLOW: A candidate for admission to or transfer into the category of Fellow shall:

- Be at least 35 (thirty-five) years of age
- Have, for a period of at least 5 (five) years, been practising in a senior technical position in mining or metallurgical undertakings, or in governmental, educational, or research organizations concerned with those industries, or
- Have, for a period of at least 5 (five) years, been practising as a consultant in the skills of mining and metallurgy, and
- Be practising his/her profession at the time of application, satisfy Council that he/she is a fit and proper person to become a Fellow, and Council shall be satisfied that his/her qualifications, training, and technical experience justify such professional status, and
- Have been a Member of good standing for 5 (five) years and have promoted the interests of the SAIMM through:
 - Serving on committee structures, and/or
 - Publishing in the SAIMM Journal or conference proceedings, and/or
 - By other means acceptable to Council.

MEMBER: A candidate for admission to or transfer into the category of Member shall:

- Be at least 25 (twenty-five) years of age
- Have, for a period of at least 2 (two) years, been practising in a responsible or senior technical position in minerals and metals industry undertakings or in governmental, service, educational, or research organizations concerned with those industries, or
- Have, for a period of at least 2 (two) years, been practising as a consultant in the minerals and metals industries, and
- Be practising his/her profession at the time of his/her application, satisfy Council that he/she is a fit and proper person to become a Member, and Council shall be satisfied that his/her qualification, training, and technical experience justifies such professional status.

Requirements for Non-corporate membership

COMPANY AFFILIATE: Companies involved in or associated with

the mining and metallurgical industries are eligible for admission to the category of Company Affiliate.

HONORARY FELLOW: Honorary Fellows shall be persons of distinction in public service, science, or the arts and shall be elected or re-elected by Council for the current year. They shall enjoy all the privileges and rights of members, except those of holding office and voting.

ASSOCIATE: A candidate for admission into the category of Associate shall:

- Be at least 18 (eighteen) years of age, and
- Be involved in minerals and metals industry undertakings or in governmental, service, educational, or research organizations concerned with those industries, but not meet requirements to be registered as a Corporate Member
- Satisfy Council that he/she is a fit and proper person to become an Associate Member.

STUDENT: A candidate for admission into the category of Student shall:

- Be a person in the third or further year of being educated or trained in a manner approved by Council to occupy a technical position or associated with the minerals or metals industries
- Satisfy Council that he/she is a fit and proper person to become a Student Member
- Remain a Student Member only while he/she is being educated in a manner approved by Council
- Confirm their membership at the beginning of each academic year by submitting proof of registration at their applicable tertiary institution. Failure to submit proof of registration will result in termination of membership
- Not remain a Student Member after the end of the Institute's financial year in which he/she attains the age of 28 (twenty-eight) years. Council may relax the provisions of this clause in such cases as it considers appropriate.

Membership roll

Members of the Institute are divided into Corporate and Non-Corporate Members, all of whom are entitled to attend and speak at meetings. Only Corporate Members are entitled to vote. All applications for membership or transfer require one proposer and one seconder.

RESIGNATION: A Member may resign from the Institute by sending his or her written resignation to the Secretary together with payment of any monies due.

RETIRED MEMBERSHIP: A Fellow or Member who has *bona fide* retired from active business may retain membership at a reduced subscription providing he or she has been a member for 20 years. Members can contact the Secretary to establish the number of years of service prior to submitting a written request for Retired Membership to the Institute.

STUDENTS: A candidate may remain a Student Member only while he or she is being educated or trained in a manner approved by the Council.

When he or she no longer qualifies as a Student Member, he or she shall automatically be transferred to the category of

Associate. Students are reminded to forward a copy of their degree certificates to the Institute on graduation.

A candidate may not remain a Student Member after the end of the Institute's financial year in which he or she attains the age of twenty-eight years, unless the Institute receives written confirmation from the university or technikon that the Student Member is still a full-time student.

CHANGE OF DETAILS: It is essential that members contact the Institute without delay about change in designation, change in employer, payment address, or change in postal address. Without this the communication link to members is broken. Also, members must ensure that, where subscriptions are paid by a company, the Institute has on record the correct payment address.

Benefits of membership

Individuals derive various benefits from membership of the Institute:

- Contact with fellow members
- Special reduced fees when attending congresses, symposia, colloquia, conferences, schools, discussion groups, *etc.*
- Notices of events promoting technology transfer, which also satisfy the need for continuing education
- A monthly *Journal* with a balanced content and of high technical standard, which serves as a communication medium to keep members informed on matters relating to their professional interests
- Participation in technical excursions, banquets, and other social events, which create further opportunities for professional association and fellowship
- Tax deduction of membership fees in most cases
- Reduced registration fees for professional registration through the Engineering Council of South Africa.

Companies that become Members of the Institute:

- Benefit from the opportunities to exchange knowledge, particularly about new developments and research
- Receive the Institute's publications of international conferences held in South Africa, as well as monographs on a variety of subjects and regular copies of the monthly *Journal*
- Are entitled to send two non-member employees to mining and metallurgical schools, colloquia, congresses, visits, and excursions at member rates
- Receive newsletters and notices about all Institute activities
- Benefit from the fact that Company Affiliateship is tax deductible
- Have ample opportunity to send delegates to attend technical meetings to obtain information and to benefit from the experience of others.

1.2 Young Professionals Council

A.S. Nhleko, Chairperson

K.M. Letsoalo Vice Chairperson

T.M. Mmola, Immediate Past President

N. Tshiongo-Makgwe, Secretary

G. Dabula, Treasurer

A.T. Chinhava
D.E.P. Klenam
L.T. Lumbwe
T. Mahomedy
S.F. Manjengwa
G. Marape
Z. Maruma

Observers

I.J. Geldenhuys
S. Ndlovu

M. Mogalanyane
R.P. Molehe
K. Nnyenyiwa
G. Nxumalo
K. Shame
F. Uahengo

S.M. Rupprecht

Strategy Focus for 2017-2018

In the 2017–2018 term the main strategy of the Young Professionals Council (YPC) was to initiate YPC activities in different regions where the Institute has branches and thus continue furthering the mandate of the SAIMM. The YPC was successful in taking significant steps to engage young professionals in Zimbabwe and Namibia.

The YPC also developed strategic guiding documents for portfolios and related action plans. The portfolios are Membership, Technical Programme Committee, Publications, Funding, Strategic Partnership, Advocacy, and Marketing.

Zimbabwe

YPC Zimbabwe (YPC-Zim) presented at the Zimbabwe Branch Conference 2017, which was the first activity of YPC-Zim. Institutional visits followed, resulting in the launching of student chapters, student recruitment, and engagement. As of June 2018, over 400 student applications had been submitted to the SAIMM head office in Johannesburg.

YPC-Zim also facilitated the participation of a student from Zimbabwe for the first time at the Student Colloquium 2017, who happened to be the runner-up in the mining category. Later that year, two associate members joined the YPC Committee, Audrey Mabiza and Mati Nemasasi. In 2018, a partnership with IOM3 was formed to start a Young Person's Lecture Competition in Zimbabwe. The event was held on 7 June, and three student finalists proceeded to represent Zimbabwe in the regional competitions. One of the students won the regional competition and will be representing Africa at the World Finals. An agreement is being negotiated with the University of Zimbabwe to have the competition held annually.

As of late, YPC-Zim has given one keynote presentation at one of the institutions. Other programmes lined up for the 2018–2019 year are student exchange programmes and student debating competitions. The Champion of the YPC-Zimbabwe Branch is Mr. Adrian Chinhava.

Namibia

The YPC-Namibia branch visited the UNAM José Eduardo Dos Santos Campus in the northern region of Namibia to give its first promotional presentation in the country. The aim of the visit was to promote the YPC and SAIMM among the students and staff at the UNAM campus. The presentation took place on 8 May 2018 and was attended by over 30 personnel and students. In addition to the presentation at the UNAM Campus, a stakeholders' dinner was held in Otjiwarongo in order to arrange the next roadshows in that town. The Champion of the YPC-Namibia Branch is Ms Foibe DL Uahengo.

YPC Activities

During the term, the YPC organized several events, which the YPC sees as being important in developing young professionals in general and in developing the capacity to deliver on the needs of the young professional members of the Institute.

Education Working Group

The YPC continues to support initiatives that focus on attracting learners to fields of study associated with the minerals industry. The YPC participated in the Sci-Bono Career Guidance events, giving career guidance to high school students. The YPC also ran a raffle at the SAIMM Banquet to raise funds for the Scholarship Trust Fund.

The Education Working Group (EWG) of the YPC was involved in hosting soft skills workshops at the University of Johannesburg (UJ), the University of the Witwatersrand (Wits), University of South Africa (UNISA), and University of Pretoria (UP). Topics included research and innovation, time management, interview skills, curriculum vitae writing, and presentation skills. Workshops planned for the remainder of the 2018 academic year include personal branding, financial skills, and entrepreneurship. The purpose of these workshops is to prepare well-rounded graduates for the minerals industry.

On 24 August 2017, mining and metallurgy students from UJ and Wits participated in the annual student debate, with the theme 'The Future of Artisanal and Small-Scale Mining in the South African Mining Industry'. The debate was co-hosted by the SAIMM Johannesburg Branch and the YPC.

On 5 August 2017 the YPC, in partnership with students bodies from UP and UNISA, hosted the Careers and Leadership Conference held at the University of Pretoria. Students from Wits, UJ, UP, and UNISA were in attendance.

The SAIMM held the Annual Student Colloquium on 25 October 2017 at Mintek. The special student edition of the Journal was published in April 2018, containing papers from the top five students.

In June 2018, the YPC published a second edition of the e-magazine Youth in Mining and Metallurgy (YIMM). The e-magazine was fully authored by university students and covers topics that matter to the student population.

Career Guidance Working Group

The YPC has initiated the development of a Graduate Development Programme for mining and metallurgical graduates. Once the programme is ready, it will be circulated for comments. The YPC and SAIMM Johannesburg Branch co-hosted a technical presentation by Maptek, titled 'Maptek innovative mining technology' at Worley Parsons on 24 May 2018. The YPC also organized site visits to mining operation and equipment manufacturers such as Komatsu.

Enterprise Working Group

The Enterprise Working Group is mainly focused on ensuring that young professionals within the SAIMM have a full appreciation of the mining value chain. The working group provides opportunities for young professionals through seminars and conferences. A mining entrepreneurs conference was held in 2017–2018. The conference, entitled 'Entrepreneurship in Mining Forums', was a success and well attended across the board. The next entrepreneurship in mining

conference has been tentatively earmarked for May 2019, with smaller events to be hosted in the lead-up to the main event.

Mentorship Programme

The YPC mentoring programme is in its third year of running. There are 40 protégés and 40 mentors participating in the 2018 programme. The programme allows young professionals to build connections with experienced practitioners and to develop into future leaders of the industry.

Graduate Employment Database

The YPC is sensitive to the challenge faced by young professionals to find meaningful and gainful employment in the minerals industry. Over 400 SAIMM members have registered on the Graduate Employment Database (GED) and the SAIMM sends out regular communication to these members alerting them on career, internship, or education opportunities. During the 2017-2018 term, six internship, career, and education opportunities were e-mailed through the database.

Social media activity

The SAIMM social media presence has grown extensively over the past financial year. The Facebook following has increased from 1876 to 2971. Around 63% of the Facebook following comprises young professionals in the industry who are 35 years of age and younger. The Twitter following has grown from 1430 to 1700 over the past year. An Instagram account was created for the YPC in January 2018, and the profile currently has 199 followers, with an increase expected in the forthcoming year. LinkedIn has seen the highest growth in followers over the year 2017-2018. At the beginning of the financial year the SAIMM had 646 followers, and ended the year with 4256 followers, 34% of whom are entry-level professionals in the industry. The SAIMM YouTube channel currently has 11 subscribers.

1.3 Promotion of the SAIMM

Portfolio holder: S. Ndlovu

The 2017/2018 financial year was characterized by a host of activities and initiatives organized by the Institute and supported by a slowly recovering global mining industry. The SAIMM continued to implement strict measures to absorb as much of the financial impact as possible. However, the Institute also continued to recognize that the needs of its members always come first, and did not compromise on the quality of service offered. Overall, the Institute did reasonably well and for the first time since 2004/2015 managed to show a small but noteworthy surplus for the financial year. This is attributed to the hard work and commitment of the staff and conference teams, as well as volunteers among members of the Institute.

Strategic Planning for the SAIMM

The SAIMM is focusing on its strategic planning for the next 5-10 years, and started the process by holding a strategy session for the Technical Programme Committees. (TPCs) The TPCs have agreed on a mandate as well as six work streams which include digitalization, stakeholder engagement, publicity, KPI successes, conference delivery mechanisms, and data gathering and analysis. The SAIMM Office Bearers have held a number of facilitated sessions during which they spent some time

developing a vision for the Institute, as well as a number of work streams that seek to support the vision, and focusing more on the overall future performance and outlook for the Institute. The work streams are still to be finalized.

Financials

Our financial performance is covered in detail in the Honorary Treasurer's report. In 2015 it was forecast that our Institute would operate under serious financial strain due to the economic downturn and deficits were predicted for three consecutive years. In the past year, however, the Institute managed to reach a turning point and recorded a surplus of R5 018 353. This was realized through the continuing of strict cost control measures, and more significantly through the revenue brought in by our conferences. In particular, the Infacon conference held in Cape Town did exceedingly well and contributed considerably to the positive financials of the Institute. We are thankful to our dedicated conference team of both staff and volunteers who continue to work diligently in this regard. The remainder of the income was derived from contributions from Branches, sales of books, and Journal subscriptions. Revenue from advertising, on the other hand, continues to be down, which is a consequence of the challenges faced by the mining industry and indicates a potential change in terms of advertising needs and trends.

The investment started the financial year at R29 714 155 and ended the year at R31 697 557. An amount of R2.5 million was drawn down from our AFC-managed investment portfolio. Part of this drawdown (R500 000) includes a pay-out from the Infacon funds that the SAIMM has held on behalf of Infacon since 2004. The money was released on request to provide support for research being undertaken in the ferroalloy industry.

Membership

Our membership is drawn from more than 50 countries and currently stands at 5 077. About 90% of the membership continues to be drawn from the Southern African region, and almost half of the total membership is drawn from the younger professionals. More importantly, female membership is now standing at 20%, which is a significant improvement from the 18% recorded in the 2016-2017 term. The fact that the SAIMM manages to attract young professionals is a sure indication that the Institute is a dynamic organization that is going to be around for many more years to come. A few of our members continue to need support due to the unemployment situation arising from the industry downturn. Being the caring organization that we are, the SAIMM has deferred the payment of the membership fees at the request of those members. It is, however, noteworthy that some of the members that had requested deferment of membership subscription in the past have since found employment and settled their outstanding fees, and thus continue to receive the numerous benefits of being a SAIMM member.

Publications

The Institute continued to deliver on one of its key objectives, that of disseminating scientific and technical knowledge to the benefit of the minerals industries. Technical and scientific knowledge was shared through the Journal, which is published monthly and distributed to all members either electronically or

through the post. There continues to be a significant drop in the demand for the hard copy, and it is hoped that this trend will continue so that the Institute can save on the cost of printing and postage. Significant highlights from the Publications Department include the following:

- There were eight themed issues of the Journal with papers for these publications being drawn from various conferences. This is a testament that our conferences not only attract high-quality speakers, but also high-quality papers and presentations that can be converted to Journal papers.
- The introduction of the Open Journal System (OJS) for managing and reviewing the papers submitted for publication to the SAIMM Journal. This is part of benchmarking the Institute against international standards and makes the submission and reviewing process much more efficient and easier for both the authors and the reviewers.
- Indexing of our Journal in the Directory of Open Access Journals (DOAJ). This is expected to benefit the Institute and its members through increased dissemination, and hence a wider audience for published papers and better visibility for the authors.
- Completion of a peer review of the Journal by the Committee on Scholarly Publishing in South Africa under the direction of the Academy of Science of South Africa (ASSAf), which concluded that our Journal should continue to be listed on the Department of Higher Education and Training (DHET) list of accredited journals.
- A year-on-year improvement of 10% in our Journal Impact Factor and a source normalized impact per paper (SNIP) factor of 0.8. This is a clear indication that our Journal is finding a wider readership with each passing year.

Technical Conferencing

The Mining and Metallurgy Technical Programme Committees (TPCs) successfully organised 19 events on a variety of topics that are relevant to the minerals industry. The delegate attendance increased slightly by 100, up from 3 146 recorded for last year. Some of the successful events included both international and regional conferences such as AfriRock, which the delegates described as a world-class international event with excellent technical content and outstanding keynote speakers. The Infacon XV conference drew a large attendance (450 people from 32 countries) and was deemed by the delegates to be the best ferroalloy conference currently available, with the major benefits of providing delegates with an opportunity to meet technical leaders in the industry and discuss the latest trends. The Seventh International Platinum Conference was held in conjunction with the Advanced Metals Initiative (AMI) conference in Polokwane, allowing the delegates the opportunity to attend both conferences, and this is another successful initiative from the SAIMM.

Another conference worth noting is Digitalization in the Minerals Industry, which was held in June. The presentation topics highlighted the fact that digitalization is seen as a strategic imperative in the industry and there were many really great examples of tangible value-add. The conference is the first in a series of conferences, forums, and business breakfasts

that the SAIMM will be hosting in collaboration with industry and other partners to assist the industry on its journey towards Mining 4.0.

The SAIMM has also been on a drive to hold major conferences in collaboration with our regional branches, and the 2017–2018 term saw the Uranium 2017 conference being held as part of this initiative. This conference was held in Swakopmund, Namibia on the outskirts of the Namib Desert and was well attended by both regional and overseas delegates. Other branches also held a number of events, with the Western Cape focusing on student-oriented events, Zimbabwe organizing an event that focused on building a robust economy in that country, and the Johannesburg Branch holding a number of successful presentations which included the annual Student Debate, organized for the first time jointly with the YPC. The annual Student Colloquium was also well attended by both local and regional universities, with students from regional universities such as the National University of Science and Technology in Namibia and the University of Zimbabwe giving the local students some serious competition.

A number of breakfast sessions were also held, chief among these being the bi-monthly breakfast talks hosted by the SANCOT Committee. Two other noteworthy sessions were the Mining Charter breakfast and the Women in Mining breakfast, which was held jointly with Women in Mining South Africa (WiMSA). The Mining Charter breakfast was the first breakfast forum organized by the SAIMM and was well attended, indicating that the ability of the Institute to tap into topical issues is an important consideration for its members. The Women in Mining breakfast was the first ever event run by the SAIMM that focuses on the challenges faced by women in the mining industry. This session was also well attended, generated positive feedback, and more events along this line such as a workshop and a conference are expected in the future.

Despite the continuing economic challenges faced by mining and mining-related companies, the SAIMM has continued to receive sponsorship support for most of our technical events, thereby enabling us to reduce the registration cost per delegate, which is of significant benefit to our members. The Institute is very grateful for this generous support.

Collaboration through the Global Mineral Professionals Alliance (GMPA)

In March 2018 the SAIMM, represented by Sam Moola, the Office Manager, attended the annual meeting of the Global Mineral Professionals Alliance (GMPA) hosted by the CIM in Vancouver, Canada. The GMPA is a collaboration between leading professional minerals-related organizations around the world and comprises the Australasian Institute of Mining and Metallurgy (AusIMM), the Canadian Institute of Mining, Metallurgy and Petroleum (CIM), the Institute of Materials, Mining and Metallurgy (IOM3), the Southern African Institute of Mining and Metallurgy (SAIMM), the Society for Mining, Metallurgy and Exploration Inc. (SME), and the Instituto de Ingenieros de Minas del Peru (IIMP).

GMPA members are required to:

- Work together to identify and deliver collaborative projects that are of mutual benefit

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- Share knowledge and resources regarding effective ways to support the professional development of institutal members
- Be a partner of – or commit to joining – the OneMine global mining database.

The participation of the SAIMM in the GMPA ensures that members are able to enjoy reciprocal benefits from the other participating societies. It also enables the SAIMM to gain an understanding of how sister organizations in the minerals industry are operating, which helps benchmark the Institute's performance and activities for the benefit of our members.

Collaboration with local professional associations

The SAIMM maintained interaction with a number of local kindred professional associations affiliated to the minerals industry. This was done in several ways, including attending their annual general meetings and other annual functions, having reciprocal observer status at each other's council meetings, and in some cases by jointly organizing technical events. A typical example is the MineSafe Conference, which is organized in conjunction with . These associations include the:

- Geological Society of South Africa (GSSA)
- Association of Mine Managers of South Africa (AMMSA)
- Mine Metallurgical Managers Association (MMMA)
- Institute of Mine Surveyors of South Africa (IMSSA)
- Mine Ventilation Society of South Africa (MVSSA)
- South African Colliery Managers Association (SACMA)
- Southern African Coal Processing Society (SACPS)
- Fossil Fuel Foundation (FFF)
- South African Institution of Chemical Engineers (SAIChE)
- South African Institute of Electrical Engineers (SAIEE)
- South African Academy of Engineering (SAAE)
- Women in Mining South Africa (WIMSA).
- South African National Institute of Rock Engineering (SANIRE).

The SAIMM is also part of the South African Forum of Engineers (SAFE), a forum that provides a platform for voluntary associations (VAs) to speak with a common voice on matters that affect the engineering community. One of the pertinent issues being considered by the VAs which are part of SAFE is the ECSA court case. This case challenges the legitimacy of the ECSA Council appointed in 2016, and was brought to court in March 2017. Although the case is still ongoing the VAs, through SAFE, are also investigating other alternatives in order to solve this issue such that there is minimum adverse impact on both the VAs, their members, and ECSA.

The SAIMM has also initiated closer ties with the Minerals Council South Africa (formerly known as the Chamber of Mines), and two meetings were held with their executive members. The Chief Executive of the Council, Mr Roger Baxter, was the recipient of the SAIMM's most prestigious award, the Brigadier Stokes Memorial Award, in 2017. The relationship is expected to develop and grow in the coming year to the benefit of both parties.

The Young Professionals Council (YPC)

One of the most successful initiatives of the SAIMM is the Young Professionals Council. I was fortunate enough to be present at the initial establishment of the YPC in 2013. The

growth and development of the YPC since its establishment has continued to surpass expectations.

The YPC replaced the previous Career and Guidance Committee, and its main aim is to focus on matters that affect the young members (35 years and younger) of the Institute. Some of the successful initiatives include the establishment of an e-magazine known as 'Youth in Mining and Metallurgy', the mentorship programme, and the graduate employment database. All of these are making an impact on the lives and careers of the student and young professional members of the Institute. After focusing all its energy on harnessing and establishing the brand through local activities since its founding, the YPC started branching out into regional branches in the 2017–2018 term. The YPC was successful in taking significant steps to engage young professionals in Zimbabwe and Namibia through student chapters. The section on the YPC in this report gives further details of activities undertaken in the past year. The significant success of these activities indeed highlights that the SAIMM managed to identify a gap and subsequently provide support to the challenges faced by our younger members.

The Committee for Diversity and Inclusion in the Minerals Industry

The SAIMM established a new initiative in the 2017–2018 term through the committee for Diversity and Inclusion in the Minerals Industry (DIMI). The committee will seek to advance diversity (gender, ethnicity, religion, and other diversifying factors) and inclusion in the industry through initiatives and activities that address the professional needs and aspirations of persons actively pursuing a career in the minerals industry. The committee will serve to bring awareness to the industry on the importance of valuing the contributions brought by all diverse individuals. The committee aims to achieve the above professionally through sharing of knowledge and learning via activities such as presentation of technical papers at conferences, seminars, and running of workshops. The committee will also be looking at topics that draw men into the discussions so as to create a more open dialogue. The committee is made up of both males and females, young and experienced members, who are all passionate about seeing positive changes in the minerals industry.

The SAIMM annual banquet

We held the annual banquet early in February and it attracted 340 attendees from 22 companies embracing academia, consulting firms, operations, and kindred organizations. We were privileged to also have companies from our regional branches sponsoring and attending the event. It is interesting to note that although the mining industry is still recovering from the economic downturn, there remains a significant interest in attending the banquet for the social and networking opportunities that it affords the attendees. This has indeed become a social highlight for the Institute and this year we were honored to be entertained by the young and vibrant Parktown Boys Brass Band. The SAIMM is pleased to have been able to afford the youngsters the opportunity to entertain our guests, and the boys were well received. And as in the past, the banquet also provided an opportunity to introduce and recognize new Fellows and as part of the Incentive Programme, recognize contributions made by our members who went the extra mile in supporting key activities of the Institute.

Staff

Following on the number of changes to the SAIMM staff in 2017, there was a period of learning over the financial year but the staff have come through it stronger, with a greater ability to take on challenges and work as a team. During the 2017–2018 term Gugu Charlie gave birth to a beautiful baby girl on 27 June. Yolanda Ndimande (previously Ramokgadi) rejoined the SAIMM on 1 of March as Conference Coordinator. She left the SAIMM in 2016 due to a relocation, and we are excited to have her back. Tshepiso Lethlaku (previously Letsogo) attended a professional switchboard, reception, and frontline skills course, and has become the vibrant and confident voice of the SAIMM.

In total, the SAIMM staff of 15 have an accumulated 129 years of service, which is quite an achievement. Anna Panana (28 years of service) Aphathia Sello (19 years), Julie Malgas (18 years), and Nazli Mamdoos (18 years) are testament to the SAIMM being a family and not just a business.

Conclusion

The activities of the SAIMM mentioned in this report clearly indicate a dynamic and forward-looking Institute that is attuned to its members. The Institute continues to adapt to the changing mining landscape while keeping its eyes always on the needs and interests of its members. In a couple of years the SAIMM will turn 125 years old. However, the Institute remains young, vibrant, active, and strong, with the source of its strength remaining in its members. Members who have and continue to show an interest in the Institute’s activities, thus forcing the Institute to always reassess and re-evaluate its offerings so as to remain relevant. Members who selflessly participate at all levels, and leaders of the Institute who dedicate enormous effort and time to ensuring that the values and mission of the Institute are kept alive. I have no doubt that we will leave a legacy to our children who, together with their descendants, will see another 125 years of the Institute in the future.

1.4 Awards and Adjudication Committees

Awards and Adjudication Committee—Mining

M.H. Rogers, Chairperson

| | |
|------------------|-------------|
| M.F. Handley | G.L. Smith |
| R.G.B. Pickering | T.R. Stacey |

Awards and Adjudication Committee—Metallurgy

D. Tudor, Chairman

| | |
|-------------|-----------|
| R.D. Beck | R.L. Paul |
| P. den Hoed | |

Honorary Life Fellows

Honorary Life Fellowship is awarded by Council to Corporate Members of the Institute who have rendered outstanding service to the industry or to the Institute over a considerable period. Council has conferred Honorary Life Fellowship on the following persons:

| | | |
|------|--------------|---------------|
| Pre- | | |
| 1923 | A. Aiken | S.H. Pearce |
| | A.F. Crosse | J.P. Williams |
| | J. Littleton | |
| 1923 | J. Moir | |

| | | |
|------|------------------------|------------------------|
| 1930 | H.A. White | |
| 1931 | P. Cazalet | J.A. Wilkenson |
| | A. Whitby | |
| 1932 | J.R. Thurlow | |
| 1934 | Wm. Cullen | A. McArthur Johnston |
| | W.R. Feldtmann | G.H. Stanley |
| | E.H. Johnson | |
| 1938 | G. Melvill | F.W. Watson |
| | S. Newton | |
| 1941 | J. Henderson | |
| 1943 | Sir R.N. Kotzé | |
| 1946 | J. van N. Door | T.K. Prentice |
| | C.J. Gray | R.S.G. Stokes |
| | J. Gray | S.J. Truscott |
| | J.V. Muller | G.A. Watermeyer |
| | J. Orr | J.A. Woodburn |
| 1951 | W.W. Mein | |
| 1953 | P.E. Hall | B. St. J. van der Riet |
| 1954 | C. Biccard Jeppe | |
| 1955 | P.N. Lategan | |
| 1958 | R.A.H. Flugge-de-Smidt | |
| 1960 | G. Hildick-Smith | A.J. Walton |
| | A.J. Orenstein | F. Wartenweiler |
| | H.J. van Eck | |
| 1961 | C.S. McLean | |
| 1966 | F.G. Hill | F. Meyer |
| 1970 | H.E. Cross | D.M. Jamieson |
| | R.C.J. Goode | |
| 1974 | R.J. Adamson | C.J. Irving |
| | W. Bleloch | J.F. Reid |
| | H. Britten | |
| 1975 | M. Barcza | J.T. McIntyre |
| | J. de V. Lambrechts | |
| 1976 | D.G. Maxwell* | A.R.O. Williams |
| 1978 | J.K.E. Douglas | V.C. Robinson |
| | D.D. Howat | |
| 1979 | J.P. Hugo | P.W.J. van Rensburg |
| 1980 | Hon. S.P. Botha | R.P. Plewman |
| | Hon. P.G.J. Koornhof | R.E. Robinson* |
| | A. Louw | |
| 1982 | M.G. Atmore | |
| 1983 | C.S. MacPhail | |
| 1985 | P.R. Jochens | M.D.G. Salamon |
| | D.G. Malan | |
| 1986 | D.G. Krige | G.Y. Nisbet |
| 1987 | A.N. Brown | |
| 1988 | J.D. Austin | D.A. Viljoen |
| | R.P. King | |
| 1989 | P.A. von Wielligh | |
| 1990 | S. Budavari | G.T. van Rooyen |
| | L.W.P. van den Bosch | |
| 1991 | H. Wagner | |
| 1992 | J. Lurie | |
| 1993 | No award | |
| 1994 | B.C. Alberts | |
| 1995 | R.D. Beck | H.E. James |
| | P.R. Janisch | |
| 1996 | R.J. Dippenaar | H.G. Mosenthal |
| | J.S. Freer* | |
| 1997 | J.A. Cruise | |
| 1998 | D.A.J. Ross-Watt | |

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| | | |
|------|-------------------------|------------------|
| 1999 | No award | |
| 2000 | N.A. Barcza | J.R. Dixon |
| | R.P. Mohring* | |
| 2001 | M.H. Rogers | D.J. van Niekerk |
| 2002 | L.A. Cramer | R.F. Sandenbergh |
| | C.T. O'Connor | J.H. Selby |
| 2003 | A.A.B. Douglas | P.J. Knottenbelt |
| 2004 | No award | |
| 2005 | F.A. Camisani-Calzolari | |
| 2006 | T.R. Stacey | |
| 2007 | No award | |
| 2008 | E.U.H. Sachse | |
| 2009 | I. Walton | |
| 2010 | R.T. Jones | |
| 2011 | No award | |
| 2012 | No award | |
| 2013 | No award | |
| 2014 | G.V.R. Landman | R.G.B. Pickering |
| | A.S. Macfarlane | |
| 2015 | O.K.H. Steffen* | M.F. Handley |
| 2016 | R.C.A. Minnitt | S.J. Ramokgopa |
| | J.L. Porter | G.L. Smith |
| 2017 | D. Tudor | |
| 2018 | M. Woodhall | |

* Deceased

Brigadier Stokes Memorial Award

The Brigadier Stokes Memorial Award, which takes the form of a platinum medal, is awarded to an individual for the very highest achievement in the South African mining and metallurgical industry, and is not necessarily based on technical expertise.

The Award was established in 1980, and the previous recipients were as follows:

| | |
|------|------------------------------|
| 1980 | H.F. Oppenheimer |
| 1981 | W. Bleloch |
| 1982 | F.G. Hill |
| 1983 | A.W. Whillier (posthumously) |
| 1984 | D.G. Krige |
| 1985 | R.E. Robinson |
| 1986 | M.D.G. Salamon |
| 1987 | T.F. Muller |
| 1988 | W.J. (Wim) de Villiers |
| 1989 | R.A. Plumbridge |
| 1990 | W.G. Boustred |
| 1991 | P. du P. Kruger |
| 1992 | E. Pavitt |
| 1993 | D.A. Pretorius |
| 1994 | H. Wagner |
| 1995 | O.K.H. Steffen |
| 1996 | B.E. Hersov |
| 1997 | D.W. Horsfall (posthumously) |
| 1998 | B.P. Gilbertson |
| 1999 | L. Boyd |
| 2000 | A.H. Mokken |
| 2001 | T.L. Gibbs |
| 2002 | J. Ogilvie Thompson |
| 2003 | P.V. Cox |
| 2004 | H.J. Smith |
| 2005 | P. Motsepe |
| 2006 | G.T. van Rooyen |

| | |
|------|-----------------|
| 2007 | D.H. Laubscher |
| 2008 | T.R. Stacey |
| 2009 | C.J. Fauconnier |
| 2010 | C.T. O'Connor |
| 2011 | B.C. Alberts |
| 2012 | R.P. Mohring |
| 2013 | H.R. Phillips |
| 2014 | R.M. Godsell |
| 2015 | S.A. Nkosi |
| 2016 | M.A. Hermanus |
| 2017 | R.A. Baxter |
| 2018 | M.S. Teke |

This year the award is made to Michael Solomon Teke for his outstanding contribution to the industry over many years.

SAIMM 50 Year Club

The Institute established the 50 Year Club in 1989 to recognize the faithful and loyal support of its senior members with 50 years' unbroken membership. They become members of the club on the 50th anniversary of their joining the Institute. Their names are published each year in the Annual Report and they are presented with a gold lapel badge on a suitable occasion. There are no fees, and the only obligation of members is to wear their lapel badges with pride and affection at all meetings of the Institute. The present members of the club are as follows:

Year to

| Year to | Member |
|---------|--|
| 1924 | E.C. Polkinghorne* |
| 1926 | R.M. Martin* |
| 1927 | W. Allen* |
| 1930 | E.T. Dunstan* (posthumously) |
| | P.L. Ward* |
| 1931 | F. Bowdler* |
| 1932 | J.E. Laschinger* |
| 1933 | F.D. Cartwright* E.R.C. O'Connor* |
| | C.H. Coxon* B.M. Roberts* |
| | J. Levin* A.A. von Maltitz* |
| | D.D. McWilliam* T. Waterman* |
| 1934 | A.C.M. Cornish-Bowden* J.W.V. Mortleman* |
| | H.E. Cross* K. Rood* |
| | E.F. Laschinger* A. Siff* |
| | E. Margo O. Weiss* |
| 1935 | O.B. Swallow* |
| 1936 | O. Deane* A.H. Mokken* |
| | T.L. Gibbs* H.L. Munro* |
| | R.C.J. Goode* R.M.F. Seawright* |
| | F.G. Hill* A.C. Pigott* |
| | D.M. Jamieson* J.S. van Zijl* |
| | D.J. Rogers* L. Walter* |
| 1937 | W. Bleloch* J.J. Klein* |
| | L.A. Bushell* C.D. Storrar |
| | K.W. Findlay* |
| 1938 | V.C. Barnes* C.A. McKechnie* |
| | E.T.S. Brown* J.A. Nixon |
| | R.S. Cooke* E. Popplewell* |
| | J.K.E. Douglas C.G. Sowry* |
| | A.L.A. Forder* E.W. Thiel* |
| 1939 | G. Armstrong-Smith* R.S. Pearson* |
| | D.E.R. Ayres* D.C.J. Squirrell* |
| | E.H.D. Carman R.F.J. Teichmann* |

Annual report

| | | | | | |
|------|--------------------|----------------------|------|-------------------|-----------------------|
| | W.G.H. Jackson* | I.S. van Eyssen* | 1959 | H.E.K Allen | H.A.G. Slater |
| | T.A. Newman | S.J. Venning* | | D.C. Brink | G.T. Van Rooyen |
| 1940 | L.D.C. Bok* | G.D. Gettliffe* | | G.D. Louw | |
| | A.W.L. Brereton* | G.G. Stanley* | 1960 | R. Hemp | C.T. Shaw* |
| 1941 | A.H.H. Davison* | D. de V. Oxford* | | G. Joynt | L.W.P. van den Bosch* |
| | D.J. Forder | E. Pavitt | | B. Moore | H. von Rahden |
| | A.R.C. Fowler* | A.C. Petersen* | | R.E. Robinson* | M. Wishart |
| | H.F.W. Ketelbey* | E.R. Rudolph* | | C. Roper | |
| | J.D. McNamara* | P.W.J. van Rensburg* | 1961 | W.B. Evans | G.S. Lee |
| | T.F. Muller* | | | R.A. Featherstone | B.J. Love |
| 1942 | R.E. Burnton* | O.L. Papendorf* | | I.R.H. Forrest | P.J. Muller |
| | R.C. Espley-Jones* | V.O. Steed | | J.S. Freer* | G.J.C. Young |
| | N.M. Hayne* | J.E. van Leeuwen* | | B.W. Holtshousen | W.J.G. Young |
| | R.T. Naudé* | W.C. Walmsley* | 1962 | S.I. Du Preez | E. Schmid |
| 1943 | D.J. Molony* | R.P. Plewman* | | P.J. Heystek | |
| | J.D. McMorran* | | 1963 | L. Anderson | J.N. Gallie |
| 1944 | A.F. Dick | V.M. Reinecke* | | H.K.R. Cahnbley | J.J. Geldenhuys |
| | R.B. MacGillivray* | A.S. Swartz | | G.C. Clatworthy | T.J. Kotze |
| | L.J. Prince* | A.H. Taute* | | R.E.F. Cowley | A.H. Munro |
| | J.F. Reid* | P.B. Weehuizen* | | J.A.J. De Cuyper | A.G. Netto |
| 1945 | J.L. Curtis* | K.E. Steele* | 1964 | J. Douglas | A.W. John |
| | E.T. Pinkney* | | | K. Imre | A. Simon |
| 1946 | W.I. Spence | | 1965 | P. Andersson | W. Mitchell |
| 1947 | G.H. Grange | J.D. Pollard | | J.A. Cruise | D.I. Ossin |
| | W.B. Howe | V.C. Robinson* | | F.S.A. De Frey | M.H. Rogers |
| | J. Marr-Levin | A.N. Shand* | | F.M.G. Egerton | E.H.J. Stoyell |
| | C.J. Parr* | G.R. Still | | F. Fenwick | R.S. Traviss* |
| 1948 | D.F. Foster | J. Pope* | | M.R. Fuller-Good | J.W. Walls |
| | M.H. Grusd* | N.A. Stacey | | P.G. Gaylard | I.C. Watson |
| | P.A. Laxen* | J.A. Tyser | | J.P. Hoffman* | J.C.M. Wethmar |
| | G.Y. Nisbet | | | J.P. Loo | |
| 1949 | G.P. Bennett* | J.P. Hugo | 1966 | D.A. Arnold | N.F. Peverett |
| | J.F. Curtis* | D.A. Immelman | | C. Fauconnier | J.C. Simms |
| | O. Davel | | | D.R. Fleming | P.J.C. Smith |
| 1950 | D.F. Grieve | R.P. Plasket* | | E. Fletcher | O.K.H. Steffen* |
| | B.E. Hersov | V.C. Ward | | P.G.P. Mrkusic | D.J. van Niekerk |
| | D.G. Maxwell* | | 1967 | H.G. Albertyn | H.E. Lombard |
| 1951 | D.G. Krige* | N.C. Pope | | N.A. Barcza | M.C.W. Morris |
| | B.H.L. Leach | W.T. Ruhmer | | A.G.C. Merson | W.A. Nairn |
| | M.J. Martinson | T. Zadkin* | | P.J. Cook | A.D. Ochse |
| | W.D. Ortlepp* | | | C.V.B. Cunningham | M.v.R. Steyn |
| 1952 | A.N. Brown | E.P. Mortimer | | N.C. Joughin | P.S. Wentworth |
| | M.J. Deats | D.J. Murphy | | | |
| | W. Lurie* | H.J. Stucke* | | | |
| | N. Martincevic | R.G. Williams | | | |
| 1953 | B.G. Fordyce | G.D. Tainton | | | |
| | G. Langton* | J. Uys* | | | |
| | A.A. Sealey | N. Zolezzi | | | |
| 1954 | R.C. Bertram | R.B.W. Wiggill | | | |
| 1955 | R.A.O. Chelius* | G.R. Parker | | | |
| | S.P. Ellis | W.B. Parker | | | |
| | C.T. Fenton | | | | |
| 1956 | G.A. Brown | M.A. Madeyski* | | | |
| | D.R. Chelius | D. Rankin | | | |
| | M.F. Dawson* | G.C. Thompson | | | |
| | L.M. Falcon | | | | |
| 1957 | K. Babich | A.M. Edwards | | | |
| | J.J. Blom | R.C. More O'Ferrall | | | |
| | R. Campbell | N.C. Officer | | | |
| 1958 | J.F. Dear* | B.S. Tatterson | | | |
| | R.H. Swan | P.J. van der Walt | | | |

* Deceased since becoming members of the Club

The Danie Krige Memorial Award

Following discussions at Office Bearers and Council during 2013 it was agreed to honour the memory and contribution to the minerals industry made by the late Professor Danie Krige.

It was agreed, amongst other activities, to make an annual award of a Danie Krige medal for a qualifying geostatistics paper published in the *SAIMM Journal* of the previous year.

There is no award this year.

Gold and Silver Medals

Papers published in the *Journal* from March 2017 to February 2018 by members of the Institute were considered for medals.

Gold Medals

Gold medals are awarded for papers that are of a world-class standard, and judged to be publications that will become key

references in their mining or metallurgical field in the future.

There was no award this year.

Silver Medals

Silver medals are awarded for papers that make a major contribution to the professions of mining and metallurgy and to the prestige of the Institute.

Silver Medals were awarded to:

E.L. Forner, S.J. Archer, V.E. Coetzee, K. Soldenhoff, and J. Quinn, for their paper published in the February 2018 issue of the *Journal* entitled: 'Uranium recovery from high-chloride sulphate leach solutions: A cost trade-off study of using treated water vs. saline water as make-up water'.

As non-members, V.E. Coetzee, K. Soldenhoff, and J. Quinn will receive certificates of merit.

D. Roberts for his paper published in the July 2017 issue of the *Journal* entitled: 'Calibration of a numerical model for bore-and-fill mining'.

Student Prizes

Prizes were awarded to the following students and were presented at faculty prizegiving ceremonies held at the respective universities.

The prize winners were as follows:

University of the Witwatersrand

| | |
|---------------------------|------------|
| Mining Engineering | S.T. Motha |
| Metallurgical Engineering | M. Dlamini |

University of Pretoria

| | |
|---------------------------|-------------------|
| Mining Engineering | J.-P. Labuschagne |
| Metallurgical Engineering | J. Wicks |

University of Johannesburg

| | |
|-----------------------|---------------|
| Extractive Metallurgy | R. Moanakoena |
|-----------------------|---------------|

University of Cape Town

| | |
|--------------------|-----------------|
| Mineral Processing | To be announced |
|--------------------|-----------------|

University of Stellenbosch

| | |
|--------------------|-----------------|
| Mineral Processing | To be announced |
|--------------------|-----------------|

Cape Peninsula University of Technology

| | |
|----------------------|-----------------|
| Chemical Engineering | To be announced |
|----------------------|-----------------|

The prizes for the universities of Cape Town and Stellenbosch and the Cape Peninsula University of Technology will be awarded at the Western Cape Branch Annual General Meeting on 3 September 2018.

In addition, the Western Cape Branch also awards two Outotec Postgraduate Scholarships for students conducting research in the area of sustainable mineral processing.

There was no award this year.

SAIMM 5 Star Incentive Programme

The SAIMM 5 Star Incentive Programme was introduced in 2015 to thank members who contribute to the growing membership of the SAIMM and to provide additional benefits to Fellows and Members of the SAIMM.

The Top 5 proposers are:

D. Muma
G. Dabula
S. Nhleko
M. Erwee
W. Joughin

The Top 5 referees of papers published in the *Journal* are:

M. Dworzanowski
M. Erwee
M. Handley
N. McGeorge
S. Rupprecht.

The author who has submitted and published the most number of papers in the *Journal* is:

J. Bunt.

Top Advertiser in the Journal

The award for the *Most Supportive Advertiser* in the *Journal* is to be made annually by the SAIMM and it is the Institute's way of recognizing the continued and loyal support of those companies that advertise in our *Journal*. The award is made not only on the strength of the amount of money spent by an advertiser, but also on factors like general cooperation, meeting of deadlines, and the timely settling of accounts. Our advertisers make a major contribution to the Institute's ability to provide our members and associates with a quality *Journal*.

The Most Supportive Advertiser for 2017/18, and for the second year running, is Elbroc Mining Products.

1.5 SAIMM Scholarship Trust Fund

J.R. Dixon, Chairman

| | |
|-----------------|------------------|
| A.S. Macfarlane | M.H. Rogers |
| T.M. Mmola | W.H. van Niekerk |

Nothing to report this year.

1.6 Complaints Committee

R.C.D. Phillis (Chairperson)

| | |
|--------------------|---------------|
| M. Dworzanowski | A.J. McDonald |
| A.M. Garbers-Craig | |

Nothing to report this year.

1.7 Banquet Committee

| | |
|-----------------|-----------|
| S. Ndlovu | Z. Botha |
| A.S. Macfarlane | V.G. Duke |
| M.I. Mthenjane | |

The banquet was held on Saturday, 17 February 2018 in the Ballroom at the Sandton Convention Centre.

There were 340 guests in total. There were three VIP tables, which included the SAIMM Office Bearers and Presidents of kindred organizations. Twenty-three companies ranging from academia institutions, consultants, operations, and kindred organizations sponsored the event.

The presentation of certificates to Fellows who were elected in the preceding year was instituted in 2016. This year it was once again well received, and the Fellows were pleased to be awarded their certificates at the event. In addition, it was agreed that the top five members in the different categories of

the Five Star Incentive Programme and their partners would also be invited to the banquet at no cost. This opportunity was also received positively by these members, who provide essential support to the SAIMM.

The Parktown Boys Brass Band provided the entertainment. The youngsters rose to the occasion and their talent was self-evident from the accolades of the guests.

The evening flowed well, and the entertainment, presentations, good food and wine, and networking were complimented on by a number of the guests.

As always, the SAIMM extends its appreciation to the companies who sponsored the event and we look forward to seeing them all at the next banquet.

2. Technical Meetings

Portfolio Holders: R.T. Jones and C. Musingwini

Although the mining and metallurgy TPCs are managed separately committees, the focus this year has been on working more closely and integrating mining and metallurgy in our industry programmes. Therefore for the first time this report is combined.

Thanks to the members of the respective committees for their contributions to a full programme this year.

2.1 Technical Programme Committee—Mining

G.R. Lane, Chairperson

| | |
|-----------------|------------------------|
| R. Armstrong | D. Muma |
| L. Dimbunu | C. Musingwini |
| N. Dirande | N.M. Namate |
| N. Diyambas | A. S. Nhleko |
| W.C. Joughin | J.L. Porter |
| D. Limpitlaw | S. Pule |
| J.A. Luckmann | S. Rungan |
| A.S. Macfarlane | S. Rupprecht |
| A. Mainza | C.B. Smith |
| S. Maleba | M.H. Solomon |
| H. Marsden | A.L. Swart |
| S. Matutu | M. Tlala |
| C.W. Mienie | C. van Wyk |
| R.C.A. Minnitt | R.C.W. Webber-Youngman |
| T.M. Mmola | M. Woodhall |
| B. Morena | |

2.2 Technical Programme Committee—Metallurgy

Z. Botha, Chairperson

I. Geldenhuys, Co Chairperson

| | |
|-----------------|----------------------|
| R.D. Beck | A. Mulaba-Bafubiandi |
| N.G.C. Blackham | D. Muma |
| T. Claassens | N. Namate |
| P. den Hoed | N. Naude |
| N. Dirande | S. Ndlovu |
| N. Diyambas | A.S. Nhleko |
| M. Dworzanowski | N. Segapela |
| D. Groot | J.H. Selby |
| R.T. Jones | H. Simonsen |
| A. Mainza | K.C. Sole |
| E. Matinde | J.D. Steenkamp |
| S. Matutu | A.L. Swart |
| C. Mienie | M.M. Valenta |
| T.M. Mmola | P. van Staden |
| M. Motuku | C. van Wyk |

The TPC recognizes the changing needs of our members and other industry stakeholders. Therefore the TPC held a strategy workshop session in November 2017 and agreed a TPC vision and mandate for 2018. Great participation from committee members resulted in a mandate that was signed off by the SAIMM Council.

The final approved mandate for 2018 is as follows.

- Innovate
- Facilitate the dissemination of relevant knowledge and experience to the benefit of all SAIMM members and stakeholders
- Facilitate independent fact-based discussion of topics of relevance to SAIMM members and stakeholders
- Foster collaboration in the interests of all our members and global stakeholders
- Encourage SAIMM members and our stakeholders to propose topics of interest for conferences or other events, and provide an independent platform for these events to be held
- Coordinate and support the events programme to ensure overall financial sustainability of the SAIMM.

The strategy session also identified six priority strategic projects required to deliver on this TPC mandate. Each workstream has a project leader and workgroup made up of TPC Committee members and any other volunteers as may be required.

Digital strategy – leverage innovative digital solutions to assist with the efficient delivery of the TPC mandate – **Innovate, Collaborate, Facilitate, and Coordinate.**

G. Lane (Workgroup Lead)

C. Jardine, Secretariat

N. Wernecke, Secretariat

R.T. Jones

W. Joughin

A. Mulaba-Bafubiandi

M. Woodhall / J. Liebenberg

This workstream was completed in April 2018 and delivered the following:

1. **Digital conferencing facilities** for all SAIMM meetings using the latest Zoom technology – this allows remote members and Branches to join all meetings, with significant savings in travel costs, and also encourages participation by remote members.
2. **Social media strategy** for marketing of all conferences
3. **Digital portal for refereeing technical papers.** The SAIMM Journal system was evaluated and found to meet all requirements, and this will be rolled out as soon as it is fully implemented for the Journal
4. **Digital conference streaming globally** – leveraging of the Zoom technology to stream conferences to the audience both locally and internationally. This is not intended to replace the physical conference but to reach a broader audience. This will be rolled out during 2018 on a trial basis.
5. **Conferencing app** – an app for conferences enabling delegates to see the programme, presenter biographies, presentation downloads, and communications. This was piloted at the recent Digitilization in Mining conference and proved very successful. This will now be rolled out as a standard for conferences, and at a later point as a

The conference programme for the last financial year is shown in the accompanying table.

The TPCs fulfil a critical role in terms of providing a platform for innovation, facilitation, coordination, and collaboration as regards industry knowledge. The delivery of this also ensures the financial sustainability of the SAIMM and we greatly appreciate industry's willingness to sponsor events to the total of R4.48 million during the period.

Thank you to all our members, company affiliates, and other stakeholders for their participation and support during this last financial year.

2.2 South African National Committee on Tunnelling (SANCOT)

H.J. (Ron) Tluczek, Chairperson

C. Viljoen, Vice Chairperson

L. Nene, Chairperson: Young Members Group

G. Davis

D. Roos

P.H. Ferreira

T.R. Stacey

I. Jacobs

F.B. Stevens

J. Jansen

E.J. Walls

K. Jordaan

M. Wainstein

M. Lebitsa

A. Widlake

J.L. Porter

H. Wolfgang

S. Rhodes

International Tunnelling Association (ITA) News

The International Tunnelling and Underground Space Association (ITA) held its 44th General Assembly along with the 2018 World Tunnel Congress (WTC) in Dubai (UAE) from 22 to 25 April 2018. Seventy-four member nations participated in the conference and New Zealand became the 75th member nation.

South African representatives participate in three of the ITA Working Groups. Ron Tluczek is Vice-Animateur of WG 2 (Research), Chris Viljoen participates in WG 12 (Sprayed Concrete Use), and Monica Wainstein in Working Group 21 (Life Cycle Asset Management). Unfortunately, due to work pressure, none of the South African representatives were able to attend this year's Congress.

Two reports were published in the previous year from two ITA Working Groups, namely:

WG 5: Guidelines for the Provision of Refuge Chambers in Tunnels Under Construction – V2

WG 5: Guidelines for Good Working Practice in High Pressure Compressed Air – V2

These documents are available free of charge on the ITA website, and comments are invited.

The next annual meetings of the ITA General Assembly will be held at the following venues:

Naples, Italy, from 2 to 9 May, 2019, during the ITA-AITES WTC 2019 *Tunnels and Underground Cities: Engineering and Innovation meet Archaeology, Architecture and Art*.

Kuala Lumpur, Malaysia, from 15 to 21 May, 2020, during the ITA-AITES WTC 2020 *Innovation and Sustainable Urban Connectivity*.

Copenhagen, Denmark, from 14 to 20 May, 2021.

A moment of silence was held during the opening speech at the 44th General Assembly to honour ITA members who had passed away, notably:

Franz Pacher, who was one of the chief developers of the New Austrian Tunnelling Method (NATM)

Don Deere, the inventor of the rock mass assessment tool, the RQD – Rock Mass Designation

Z.T. (Richard) Bieniawski, who invented the world-famous Rock Mass Rating (RMR).

SANCOT News

One of the main focus areas for SANCOT is to promote interaction and closer communication between personnel and companies in the mining and civil industries, and to create a platform where expertise and experience gained in underground excavation can be shared.

To this end, an initiative was implemented in September 2017 where a breakfast talk is given prior to the regular SANCOT committee meetings. The talk is given at the offices of GIBB Engineering and Architecture, who also sponsor the breakfast. The breakfast talks are held every two months and anyone is welcome to attend. The topics have included:

- ▶ Tunnelling trends in South Africa – past, present and future
- ▶ The use of micro-tunnelling with a lake tap for a proposed dam outlet
- ▶ Horizontal raiseboring technology and its advantages in mechanized mining
- ▶ The use and benefits of utility tunnelling

Future talks will include topics such as:

- ▶ Geotechnical considerations in recent Scandinavian tunnelling projects
- ▶ Cement injection for mining and tunnelling

The talks have been well received and are attended by consultants, contractors, academics, students, managers, financiers, and sales personnel. At the last talk, a group of PDI women who have started their own businesses attended to see where they may be able to assist.

With the prospect of several major tunnelling projects on the horizon, the active SANCOT membership is increasing. Major projects that are either current or imminent are:

- (a) The Lesotho Highlands Water Scheme, Phase II, which will incorporate the Polihali dam, the extension of the Muela hydroelectric complex, and the construction of 38 km of water transfer tunnel. This scheme is current and will augment the water supply to the Gauteng area.
- (b) The uMkhomazi Water Transfer Scheme, which will incorporate the Smithfield dam and 34 km of water transfer tunnel. This scheme is imminent and will augment the water supply to the area under the jurisdiction of the Umgeni Water Board.
- (c) The Overvaal tunnel, a new double-bore railway tunnel. This scheme is imminent and will be constructed to alleviate the bottleneck on the Richards Bay Coal Line due the existing single-track tunnel.
- (d) Remedial works to the Mohale tunnel which links the Mohale and Katse reservoirs. This scheme is current and will entail reinstating the grouted annulus behind the tunnel segmental lining.

Three Working Groups are active within SANCOT, namely:

WG 14: Vertical Tunnelling

WG 21: Life Cycle Asset Management

The third Working Group is looking at hosting the ITA World Tunnel Congress in Cape Town, South Africa in 2022. This is a result of numerous enquiries that Ron Tluczek received at recent ITA World Tunnel Congresses, and there would appear to be a lot of international support to hold a WTC in Africa, and specifically in South Africa.

Currently, SANCOT is preparing to host a seminar on micro-tunnelling on 4 September. This conference will highlight the advantages of installing utilities in underground works and will be aimed at the numerous municipalities, water utilities, and mines that have underground utilities. Due to rapid urbanization, it is often no longer possible to install utilities in conventional ‘cut and cover’ trenches. A common call on the international tunnelling stage at present is ‘Surface Problems – Underground Solutions’.

3. Publications

Portfolio Holder: A.S. Macfarlane

D. Tudor, Chairperson

- | | |
|-----------------|----------------|
| R.D. Beck | H. Lodewijks |
| P. den Hoed | C. Musingwini |
| M. Dworzanowski | S. Ndlovu |
| B. Genc | J.H. Potgieter |
| M.F. Handley | N. Rampersad |
| R.T. Jones | T.R. Stacey |
| W.C. Joughin | M.R. Tlala |
| J.A. Luckmann | |

3.1. Journal

The breakdown of papers published during the year and previous years is as follows:

| Year | Mining | Metallurgy | Other | Total |
|------|--------|------------|-------|-------|
| 2016 | 59 | 76 | 2 | 137 |
| 2017 | 87 | 41 | 7 | 135 |
| 2018 | 64 | 72 | 5 | 141 |

Of the 141 papers published in 2017/18, 58 were from outside South Africa. The rejection rate of papers received was 31%. There were seven themed editions of the *Journal* during the year.

Advertising revenue for the year was some 2% below last year’s figure. The continuing decline in advertising revenue is a direct reflection of the challenges that the mining industry as a whole faces.

A gradual reduction of the monthly print run from 2325 to 1775 copies was achieved during the year, which was some way short of the target of 1500 copies. This was mainly due to the fact that only 33% of the membership has replied to the survey questionnaire to establish the number of members that no longer require a hard copy of the *Journal* and would prefer to receive an electronic copy.

In March 2018 we received the final report on the peer review of the *Journal*. The peer review process is run under the auspices of the Academy of Science of South Africa (ASSAf) and is intended to improve the *Journal*’s quality, visibility, and impact. The peer review panel’s consensus was that the *Journal* should continue to be listed on the Department of Higher Education and Training (DHET) list of accredited journals. A

number of suggestions for improvements were made, which are under consideration by the Publications Committee.

The potential publication of a number of books covering a range of topics remains in the early stages of investigation.

The award for the Most Supportive Advertiser in the *Journal* for the year 2017/18 is to be made to Elbroc.

During the course of the year we gradually migrated the reviewing of papers that are submitted to the *Journal* to the Open Journal System (OJS), which can be viewed at <https://saimmjournals.co.za> Authors and reviewers are required to register on the OJS and this has enabled a substantially paper-free process for managing the progress of a paper from submission to publication. Refining of the system to suit all the needs of the *Journal* continues.

We are indebted to our members who undertake the onerous task of refereeing papers. The meaningful feedback that the referees provide to the authors of papers has contributed enormously to maintaining the standard of the content of the *Journal*.

The publications team of Kelly Matthee and Zuliakha Malgas, with occasional input from Dawn van der Walt and Naomi Wernecke, has continued its good work in producing the *Journal*.

4. Regional Development

Key Performance Areas

To promote the interests of members based in different regions, the SAIMM:

- *Supports the establishment and maintenance of branches to satisfy the local needs of its members for professional association and the exchange of technical information*
- *Co-operates with other member societies of AS&TS and with associations and interest groups that have close ties with operating mines and metallurgical plants by holding joint technical meetings and collaborating in the field of publication.*

4.1 SAIMM Branches

4.1.1 Botswana

L.E. Dimbungu, Chairperson

No report was available at the time of going to print.

4.1.2 DRC Branch

S. Maleba, Chairperson
 D. Sambwa, Vice-Chairperson
 G. Kalama, Vice-Chairperson
 D. Tshibanda, Secretary

P. Kalala
 R. Kazembe
 C. Byakoukou

No report was available at the time of going to print.

4.1.3 Johannesburg Branch

J.A. Luckmann, Chairperson
 H. Jantzen, Vice Chairperson
 D. Jensen, Secretary
 J. Clarke
 D. Porter

| | |
|-------------|---------------|
| D. De Wit | D. Powell |
| G. Dellas | N. Rampersad |
| A. Dougall | J. Ruddy |
| C. Heili | S. Rupprecht |
| R. Heins | G. Stripp |
| A. Kinghorn | M. Tlala |
| M. Mostert | B. Van Houten |
| S. Nhleko | |

I am pleased to report on the activities of the SAIMM Johannesburg Branch for the period 1 July 2017 to 30 June 2018.

The Branch's main activity was the organizing of technical presentations on a monthly basis, excluding the December–January holidays. These technical presentations were generally held on the third Thursday of each month, at the premises of WorleyParsons at Melrose Arch. During the period under review, the Branch Committee succeeded in securing eight technical presentations, plus one students' debate which was held in August 2017.

The Branch greatly values students' involvement in its presentations, and notes that many of those attending have chosen to become Student Members of the Institute, with a good conversion ratio to Associate Membership after graduation. Student attendance was understandably constrained over the current session by external events impacting on transport, and is of course subject to academic commitments.

The challenging economic situation continues to put pressure on sponsorship received, while the Branch's success in encouraging student participation may be expected to impact on the costs associated with the technical presentations and associated networking events. The Committee has therefore endeavoured to continue to control costs, with the most significant measure being the change in approach to sponsorship undertaken by Branch Secretary Danie Jensen.

Events

The Committee was able to secure twelve sponsors to support Branch events in the 2017–2018 session. The sponsorships received and accounted for ensured that the entire programme of technical presentations held between July 2017 and June 2018 was fully funded.

The 2017–2018 session commenced on 20 July 2017 with a technical presentation entitled 'Petra Diamonds latest diamond processing technologies' presented by Deon Swanepoel, Executive of Petra Diamonds (Pty) Ltd and fully sponsored by the company.

The Annual Student Debate, entitled 'The Future of Artisanal and Small Scale Mining in the South African Mining Industry', followed on 24 August 2017. The students were clearly well prepared, which resulted in a lively and interesting debate.

On 19 October, Richard Ferreira from the IMS addressed the Branch on the subject of 'Unlocking value in comminution and separation processes'. IMS South Africa provided full sponsorship for this event.

The November technical presentation, held on 16 November 2017, was entitled 'Anatomy of a modern diamond plant in the mid-tier sector', presented by Derek Lahee from Consulmet South Africa and kindly sponsored in full by Consulmet SA.

We started the New Year on 15 February 2018 with a

presentation entitled 'Is the South African coal mining industry ready for women?' by Moses Ramokhothoane, General Manager of New Denmark Colliery and sponsored by the New Denmark Colliery South Africa.

Following this, on 15 March 2018, Clive Stewart, Business Development Manager of Traxys, spoke on the subject of 'The business of Commodity Trader – getting the result of your efforts to market'. Traxys (Pty) Ltd provided full sponsorship on this occasion.

On 19 April 2018 the Branch held a technical presentation entitled 'The new paradigm of abundance versus the old paradigm of scarcity and how mining might assist'. This thought-provoking topic was examined by Professor Anthony Turton and sponsored by the Johannesburg Branch.

The May technical presentation, held on 17 May 2018, considered the topical issue of 'Converting artisanal mining to small-scale mining in Africa', with Professor Steven Rupprecht from the University of Johannesburg reviewing developments on the continent. The Johannesburg Branch was again the sponsor of the presentation.

The Branch also provided sponsorship for the concluding presentation of the 2017–2018 session, entitled 'Exact art and subtle science of metal recovery in a DC arc furnace', held at WorleyParsons on 21 June 2018 and presented by Isabel Geldenhuys from Mintek.

Finance

The Committee succeeded in achieving its objective of fully funding the planned twelve-month programme of Branch activities, with a modest surplus of R19 887 reported for the year ending 30 June 2018.

AGM

The Johannesburg Branch AGM was held on 21 June 2018, immediately after the final Branch meeting of the 2017–2018 session.

The outgoing Chairperson welcomed Branch members and guests, including SAIMM President Selo Ndllovu and President Elect Alastair Macfarlane.

After confirmation of a valid quorum, sixteen members of the Branch who had been nominated to serve on the Committee for 2018–2019 were duly elected by a show of hands. John Luckman, Hein Jantzen, and Danie Jensen were re-elected to serve as Branch Chairperson, Vice Chairperson, and Secretary, respectively. Kelly Clarke was welcomed as a new member of the Committee for 2018–2019, while the Chairperson bade farewell to Jeremy Clarke, Andre Dougall, Russell Heins, Maurice Mostert, and Mpho Tlala, thanking them for their invaluable contribution to the outgoing Committee. He also expressed his appreciation of the role of the SAIMM Secretariat, including Sam Moolla, Kea Shumba, Prudence Ntumuleng, and Naomi Wernecke, for their co-ordination and administration of Branch events.

The AGM concluded with welcome words of encouragement from the current SAIMM President and the President Elect, who both confirmed the importance of young professionals' involvement in the Institute's future development.

4.1.4 Namibian Branch

N.M. Namate, Chairperson

B. Sililo

F. Uahengo (YPC Coordinator)

Referees of papers submitted during 2017/2018

| | | | |
|--------------------------|-----------------------|-----------------------|-------------------------|
| Abbasy, Farzaan | Geldenhuis, Isabel | Maree, Jannie | Schmitz, Peter |
| Aken, Mark | Genc, Bekir | Marriott, John | Schoeman, Janine |
| Aldrich, Chris | Gentle, Frank | Marshall, Tania | Sellers, Ewan |
| Andrews, Anthony | Gericke, Mariekie | Marx, Wynand | Sheridan, Craig |
| Auret, Lidia | Gerritsen, Terry | Matinde, Elias | Shoosmith, David |
| Austin, Mark | Gibson, William | McGarr, Art | Sibanda, Vusumuzi |
| Badenhorst, Heinrich | Goldbach, Olaf | McGeorge, Norman | Simonsen, Henry |
| Bals, Alex | Goode, John | Miller, Graeme | Simser, Brad |
| Barcza, Nicholas | Grenon, Martin | Minnitt, Richard | Siyasiya, Charles |
| Barker, Ian | Grobler, Hendrik | Mitra, Rudra | Smit, Abre |
| Bartlett, Hugh | Guest, Alan | Moller, Heinrich | Smith, Gordon |
| Basson, Frans | Gunther, Peter | Morris, Dave | Sole, Kathy |
| Beck, Richard | Gwynn, Xander | Motsa, Bongani | Spearing, Sam |
| Behrang, Farshadi | Hadjigeorgiou, John | Moult, Steve | Spottiswoode, Steve |
| Bepswa, Paul | Hall, Ian | Mousset-Jones, Pierre | Stacey, Thomas |
| Beukes, Paul | Handley, Matthew | Mpunzi, Philani | Stenzel, Gerhard |
| Bilgin, Nuh | Harker, William | Muaka, Joseph | Stewart, Paul |
| Birtles, Andy | Harley, Michael | Muller, Jacques | Strauss, Kobus |
| Blackham, Norman | Hattingh, Christo | Mutemeri, Nellie | Stripp, Graham |
| Blinderman, Michael | Hattingh, Teresa | Naik, Sandip | Surridge, Tony |
| Bluhm, Steven | Hay, Kevin | Napier, John | Sweet, Jenni |
| Botin, Jose | Heugh, David | Nasiri, Mehdi | Terbrugge, Peter |
| Bryson, Mike | Hiskey, Brent | Ndlovu, Selo | Theron, Kobus |
| Burnett, Mark | Horsch, Hanna | Neale, John | Thomson, Andrew |
| Canbulat, Ismet | Houman, Jaco | Nehring, Micah | Tluczek, Ron |
| Carstens, Riaan | Howell, Graham | Nel, Jacques | Tudor, David |
| Chatterjee, Snehamoy | Human, Louie | Nell, Johan | Tulu Ihsan, Berk |
| Chown, Lesley | Hundermark, Rodney | Ngwato, Tara | Turton, Anthony |
| Claassen, Marius | James, John | Njowa, Godknows | Uludag, Erhan |
| Clark, Isobel | Johnson, Hilton | North, Brian | Uludag, Sezer |
| Conradie, Phil | Joughin, William | O'Connor, Donald | van Aswegen, Gerrie |
| Cornish, Lesley | Kalala, Johnny | O'Keefe, Christian | van der Linde, Gerhard |
| Coulson, Nancy | Kapageridis, Ioannis | Ooosthuizen, Shaan | van Der Merwe, Josias |
| Cowen, Dennis | Kauchali, Shehzaad | Osanloo, Morteza | van der Merwe, Nielen |
| Craddock, Mark | Kennedy, Mark William | Oxtoby, Oliver | van Der Riet, Mark |
| Cresswell, Mark | Killick, Andrew | Pariche, Morteza | van Der Vyver, Mientjie |
| Crundwell, Frank | King, Matt | Patel, Bilal | van Dyk, Johan |
| Cunningham, Claude | Knights, Peter | Peake, Andrew | van Hout, Gert |
| De Graaf, Phil | Kotze, Hanlie | Phakathi, Sizwe | van Niekerk, Dirk |
| De Jager, Kobus | Krassnokutski, Alexei | Phillips, Huw | van Rooy, Louis |
| De Korte, Johan | Kruger, Buks | Pickering, Rod | van Schoor, Jan |
| Deglon, David | Kruger, Leon | Pienaar, Marine | van Schoor, Michael |
| Degraaf, Wolter | Kucukkaragoz, Cevat | Pinheiro, Henrique | van Staden, Petrus |
| Dempsey, Paul | Kumral, Mustafa | Pistorius, Chris | van Zyl, PG |
| Den Hoed, Paul | Lane, Gary | Pistorius, Pieter | Vanderlingen, Elma |
| Di Giovinazzo, Michael | Leach, Tony | Plint, Neville | Velasquez, Raul |
| Dimitrakopoulos, Roussos | Legodi, Christopher | Potgieter, Herman | Vervoort, Andre |
| Dixon, Roger | Leshomo, Joyce | Power, David | Vietti, Andrew |
| Dougherty, Heather | Lewis, Martin | Priest, Graham | Vogt, Declan |
| Dreisinger, David | Limpitlaw, Daniel | Prins, Chris | Von Glehn, Frank |
| Dunn, Michael | Lindsay, Colin | Prout, Barry | Vreugdenburg, Kobus |
| Dworzanowski, Marek | Linzer, Lindsay | Radcliffe, Peter | Vusumuzi, Sibanda |
| Engelbrecht, Andre | Lloyd, Philip | Ram, Rahul | Wagner, Nicola |
| Erasmus, Lourens | Lodewijks, Henk | Ravary, Benjamin | Wakefield, Tim |
| Eric, Rauf | Lomberg, Ken | Redman, Kelly | Watson, Ingrid |
| Erwee, Markus | Lorig, Loren | Reynolds, Quinn | Wells, John |
| Esterhuizen, Essie | Loveday, Brian | Richards, Jill | Wertz, Marcin |
| Falcon, Rosemary | Luckmann, John | Riesgo, Pedro | West, Richard |
| Farmer, Iain | Luckos, Adam | Rivoirard, Jacques | Whittle, David |
| Farshadi, Behrang | Lynch, Richard | Roberts, Dave | Whittle, Jeff |
| Ferreira, Pete | Mackenzie, James | Roger, Paul | Whyte, Rod |
| Fouché, Marnus | Madani, Nasser | Roode, Carel | Yahorava, Olga |
| Fourie, Henk | Mainza, Aubrey | Rorke, Tony | Yahyaie, Mohsen |
| Freeman, Robert | Majozi, Thokozani | Ross, Victor | Zindi, Luke |
| Garbers-Craig, Andrie | Malan, Francois | Rupprecht, Steven | Zungu, Lindiwe |
| Gaylard, Jeremy | Malovichko, Dmitriy | Sandenbergh, Roelf | |

The job market for mining-related professions remains under severe pressure. Major mines continue with care and maintenance or contract mining activities. Others have suspended operations completely. However, conditions are improving as there are a number of small mines entering production. The suspended operations at the major mines are on their way to being resuscitated and global commodity prices are improving.

Generally, the period has been slow, with not many members participating in Branch activities. Activities are largely voluntary and based on individual personal cost, which discourages participation. The Branch continues to observe that work pressure on potential members gives them little time attend to SAIMM affairs.

Membership Recruitment

The Branch Chair visited a number of mines in early March 2018 to raise awareness of the SAIMM and its activities. The tour took in Langer Heinrich, Husab, and Areva. Enthusiasm for membership still exists although actual registration is low. Discussions were held with a number of senior members in the industry to explain the need to support the Branch.

Major Events in and around Namibia

Mining Expo

The Branch participation at the Mine Expo in Windhoek on 25 and 26 April, 2018 was a success, with reasonable attention and interest being shown by professionals, some of which may translate into membership. However, the occasion was not as high flying as it could have been as the Branch participated under the auspices of NUST at their Chamber of Mines complimentary premises. The Branch's own budget would allow for the booking of an independent stand to conduct its own recruitment campaigns, and this should be the objective in future.

Visit to University of Namibia Engineering Campus

The Branch visited the UNAM José Eduardo Dos Santos Campus to give its first promotional presentation in the country. The aim of the visit was to promote the YPC and SAIMM among the students and staff. The presentation took place on 8 May 2018 and was attended by over 30 personnel and students. In addition to the presentation at the UNAM Campus, a stakeholders' dinner was held in Otjiwarongo in order to network with B2Gold (Otjikoto gold mine) and Gekko (Okorusu graphite mine) staff.

The presentation started with an introduction to the SAIMM, which was followed by the YPC promotional presentation by Ms Uahengo, who engaged the young professionals and the students regarding how they can add value to the professions of mining and metallurgy through the YPC. The students, most of whom were in their final year, showed interest in being part of the Institute and some embraced the invitation to become office bearers. This will be followed up in their second semester (mid-July), as the presentation took place close to examination time. Students who attended the presentation also communicated with other students who could not attend, and they too expressed their interest in becoming members of the YPC.

Three more presentations are planned for the central, south and coastal regions of Namibia (Otjiwarongo, Rosh Pinah, and

Windhoek) before the end of year.

Financial

The financial report from the Uranium Conference hosted in September 2017 is still awaited.

General

During his visit to Tanzania in June on other duties, the Branch Chair promoted the SAIMM to staff at the Mining and Chemical Engineering Department at the University of Dar es Salaam. The presentation was well received. Unfortunately, no application forms were carried on this trip, but potential members were encouraged to apply online.

4.1.5 Northern Cape

W.J. Mans, Chairperson

I. Lute, Vice Chairperson

F. Nieuwenhuys, Secretary

N. Buthelezi, Treasurer

E. Tanyane

J. Stoffels

H. Thomoli

Strategy

Increase membership numbers

- Marketing
- Facebook page
- Internet
- Local newspapers
- Posters
- Magazine articles

Events and networking visits

- Technical knowledge sharing
- Socializing
- Fun events

Corporate buy-in event

- Understanding technical difficulty
- Get specialist involvement
- More involvement by sponsors
- Technical involvement
- One strategy event – market trends
- Specialist presenter

Other events

- AGM (August)
- Student event (January)
- YPC (June)
- Evening event (November)
- Site visit (March)

Women in industry event (high tea) (February)

- Get to know
- Sponsorship

CSR (Corporate social responsibility event) (July)

- Tax rebate
- Presentation to scholars about the Industry
- Each Committee member to take different location

- ▶ Take along bursary brochures – Introduction of industry and upliftment

Membership Recruitment Activities and Proposals

- Defined the strategy of the Northern Cape Branch and submit to Council
- Define current status of Northern Cape Branch (how many members, cash flow, sponsorships, *etc.*)
- Distribute the Constitution of SAIMM for branches
- SAIMM Northern Cape membership list and distribution group
- Reconciliation required on all outstanding actions from previous branch minutes – outstanding items needs to be closed-out
- SAIMM Northern Cape Branch KPIs, calendar, and induction pack distributed to members
 - The updated SAIMM Northern Cape Branch calendar for the year to be sent out for comments, committed dates. and responsible person
- Event planning discussion
 - Creating SAIMM Northern Cape event planning group
 - Use guidelines for event organizing as tool of assistance
 - Evening events (finger lunch with drinks and one presentation from 18h00 to 19h30 in various towns (Kathu, Hotazel, Lime Acres, Postmasburg, Springbok, Kimberley, *etc.*)
 - Create an event for GMs to build relationships between management and the SAIMM. Also include the Mine Managers Association
 - Need to thank all sponsors and presenters
 - Tshipi Borwa and Kolemela agreed to host site visits with presentations
 - More events will be held through videoconferencing, especially for remote branches like the Northern Cape
 - Need to get more buy-in from big contracting companies (Barlows, Komatsu, AEL, BME, Sasol Nitro, *etc.*) to sponsor and host events
- Create a SAIMM Northern Cape magazine editing group
 - Create a SAIMM Northern Cape marketing group
 - What will we publish (6 months in advance)?
 - All the mines in the Northern Cape with diversity of resources
 - Mine-specific details
 - Need to supply background on mines and progress made on mining, metallurgy, and geological processes in the Northern Cape
 - Visit the SAIMM website and report in the monthly meeting on the latest listings
- Technical library not really utilized
- Technical papers from mines not materializing
- Obtain involvement of HR Departments and assist in Professional CV distribution
- Find out about memorabilia (jackets *etc.*)
-
- Try to obtain a better venue than KCC. How do Members get CPD points for other professional councils like ESCA, MMASA, MEMSA, GSSA, *etc.* by attending SAIMM events?

Upcoming Events

Year-end function: Hosted by the Chairman and Vice Chairman at the Chairman's house. A very pleasant evening and well attended.

Site visits: Unfortunately, no site visits materialized

Sponsored evening events:

- Event with MineWare, 16 May. This was the first sponsored evening event for the Branch, and very good feedback was received
- Advertisement for the second sponsored evening event to go out 18 July. Hoping for better attendance after the first event that really went down well
 - 12 requests for sponsorship for evening events were sent out but only two companies came back to finalize. The rest of the companies will be invited to the AGM, which is already sponsored by Assmang
- AGM and presentations at the AGM

Activities

Request to use facilities at KCC for meetings – not granted by Kumba Iron Ore

Request to use facilities at Uitkoms for meetings – not granted by Assmang

AGM venue request to use facilities at Uitkomst for the AGM granted by Assmang – AGM sponsorship and venue confirmed

Important events in and around the region

A Mining Expo again took place in June at various venues in the province. The organizers were willing to give the SAIMM a stand in exchange for Branch support at their next event, probably in September. Promotional material and support will be required from the SAIMM secretariat.

Financial

The costs of the planned events will be fully covered but no income will be generated at this stage. The main focus is on creating awareness of the SAIMM and encouraging membership.

Annual General Meeting

The Annual General Meeting is being organized for 3 August 2018. Nomination forms for Council and notices of the AGM are in the process of being sent out.

4.1.6 Pretoria Branch

R.J. Mostert, Chairperson

G. Ngema, Secretary

W.W. de Graaf

N. Naude

Professor Roelf Mostert accepted the position of Branch Chair after the emigration of Mr Bredell.

In August, the Pretoria Branch hosted a very successful YPC Career and Leadership event. The outgoing SAIMM President and a number of eminent keynote speakers gave inspirational talks to an audience that included a good number of students.

Next-generation bainitic steel with remarkable properties was the central theme of a colloquium coordinated by the Pretoria Branch and hosted by the Department of Materials Science and Metallurgical Engineering at the University of

Pretoria on 4 December 2017. Sir Harry Bhadeshia, a global leader in metallurgy and the Tata Steel Professor at Cambridge University, was the main speaker. About 50 metallurgists from all over South Africa participated in the discussions.

A two-day seminar was co-hosted by the Branch on 7 and 8 March. The title of the seminar was ‘Iron ore: mineralogy, fines processing, pelletizing and sintering’. The central SAIMM office assisted with promotion of the event, and it was very well attended (59 attendees). The Dean of the Faculty of Engineering, Built Environment and Information Technology at the University of Pretoria, Professor Sunil Maharaj, presented the welcoming address. Over the two days, three leading international scholars in the field (Dr Liming Lu from Australia, Dr Joseph Poveromo from the USA, and Professor Leal Laurindo from Brazil), as well as four local researchers, shared their knowledge and experience in this important field.

A fruitful meeting was held between office bearers of the SAIMM (Professor Selo Ndlovu, Ms Sam Moolla, Ms Kea Shumba) and the Pretoria Branch leadership. One outcome was that the current SAIMM President would present a talk to senior mining and metallurgical engineering students at the University of Pretoria as part of a drive to increase student membership. The talk was held and good feedback received. In another event, a previous SAIMM President, Professor Rodney Jones, presented a paper to metallurgical students from junior to senior levels.

4.1.7 Western Cape Branch

R.D. Beck, Chairperson

L. Bbosa, Vice Chairperson

E. Chaikinya, Treasurer

C. Pomario, Secretary

M. Winter, Finance

M. Becker

D. Deglon

J.A. Cruise

C. Dorfling

A. Mainza

A. Nesbitt

T. Ojumu

J. Petersen

C. Sweet

J. Sweet

M. Solomon

M. Tadie

Geometallurgy Conference

As reported last year, the Branch plans to hold a Western Cape minerals research showcase every two years. This will be the traditional focus on research and activities of the Western Cape tertiary institutions, UCT, Stellenbosch, and CPUT.

In the interim years a national/international conference will be held. This year the subject of geometallurgy has been selected. It is believed that the value of geometallurgy is not fully appreciated. Geometallurgy is a highly structured, integrated multidisciplinary collaborative approach for optimizing the value of an ore deposit. The ability to manipulate and handle large amounts of data makes for many opportunities in this area.

Five keynote addresses and 23 papers make for interesting presentations and show the many opportunities presented by this field of interest, along with a better understanding of the subject.

The conference includes an interactive workshop on ore-to-metals optimization that demonstrates the application of geometallurgy.

IMPC 2020

Planning has continued for the 2020 International Mineral Processing Conference, which is a major event on the international calendar.

Students’ Evening

The 2018 students’ evening, which introduces students to the SAIMM and the mining industry, will be held in September at Stellenbosch.

Thanks

My thanks to all Branch Committee Members, and in particular Megan Becker and the Geomet Conference Committee for their work during the year.

4.1.8 Zambian Branch

D. Muma, Chairperson

C. Mwale, Vice Chairperson

W. Munalula, Treasurer

C. Ngulube H. Zimba

There has been significant growth in membership at all levels in the past 18 months, and this trend is expected to continue.

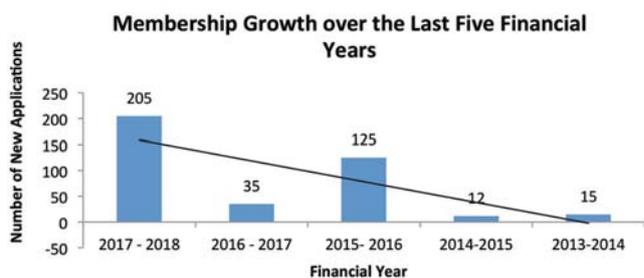
Recent Activities

There were few activities in the 2017–2018 term, apart from the informal membership awareness campaigns that have resulted in a spectacular growth in membership. Planned activities for the Branch are shown in the accompanying table.

Other Activities

Young Professionals Council (YPC)

An awareness campaign on the objectives of the SAIMM YPC formally commenced in May 2018. It is gratifying that we have for the first time been able to secure the nominations of three vibrant young Zambian mining professionals to the SAIMM



| Zambian Branch, membership growth by category | | | | | | |
|---|---------|---------|------------|----------|--------------------|-------|
| Year | Members | Fellows | Associates | Students | Company Affiliates | Total |
| 2017-2018 | 38 | 6 | 14 | 147 | 0 | 205 |
| 2016-2017 | 11 | 0 | 2 | 22 | 0 | 35 |
| 2015-2016 | 4 | 0 | 4 | 117 | 0 | 125 |
| 2014-2015 | 7 | 0 | 4 | 1 | 0 | 12 |
| 2013-2014 | 10 | 0 | 5 | 0 | 0 | 15 |

| Planned Activity schedule | | | |
|---------------------------|----------------------------------|-----------------------------|---|
| Date | Activity | Venue | Comment |
| 25 May 2018 | Student Colloquium | Copperbelt University Kitwe | Did not take place due to cholera outbreak resulting in changes in school programme |
| 5-7 June 2018 | Copperbelt Mining Technical Expo | Kitwe | Did not take place, due to inadequate preparations |
| 27 July 2018 | AGM | Chingola | Pending |
| 27 September 2018 | Technical Event | Mufulira Boating Club | Pending |

YPC. The Branch YPC activities are expected to increase with the inclusion of the members from the local universities.

Copper-Cobalt Conference

The Branch's involvement in the preparation of the July 2018 Copper-Cobalt Conference, in collaboration with the conference organizing team at the Secretariat, has been very fruitful. This has resulted in an increased number of local participants compared to the last Copper-Cobalt Conference.

4.1.9 Zimbabwean Branch

Stanley Matutu, Chairperson
 C. Sadomba, Vice Chairperson
 O. Zvarevashe, Secretary
 W. Kutekwatekwa, Treasurer
 M. Hungwe, Youth Development
 A. Chinhava, Youth Development
 S. Gaihai S. Ndiyamba
 Prof. Dzinomwa C. Tahwa
 Prof. Ityokumbul

Membership

The membership drive targeted students from tertiary institutions offering mining and metallurgy programmes. The universities include the University of Zimbabwe, Midlands State University, Manicaland State University, and Zimbabwe School of Mines. Activities at each institution are facilitated by a student leadership committee which coordinates all the SAIMM activities. The focus will be on offering more presentations from industry and senior members of the SAIMM to encourage active participation. Membership recruitment from the mining industry was subdued during the year due to the harsh economic situation affecting the sector. The new political dispensation in Zimbabwe is expected to usher in new investments and promote growth in the mining sector, which will ultimately benefit the Branch.

An international conference on building a robust minerals sector in Zimbabwe was successfully held in July 2017. There was good attendance by around 200 delegates over the two days of the conference. The conference also offered an opportunity to recruit more members, particularly from students.

Networking events

The Youth Development Committee held a number of SAIMM membership presentations with students from tertiary institutions in Zimbabwe. The Branch hosted an international conference, 'Building a Robust Mineral Industry', in Harare in

July 2017. A number of local and regional presenters presented papers during the conference.

Branch events

The Branch had planned to visit the Mazoe mine dump retreatment project and the Cam and Motor mine gold project in Kadoma during the year. However, these events could not take place as the mines could not host the Branch due to the economic difficulties they are facing, and the projects they intended to showcase could not be commissioned in time. The hardships being experienced by mining companies in Zimbabwe continue to make it difficult to organize Branch events.

International Conference on Innovation in Mining

The Branch successfully hosted a two-day international conference on building a robust mineral industry in July 2017. The conference was held at Cresta Lodge, Msasa, in Harare. A total of 25 papers were presented by speakers from both international and local institutions. The attendance was very good, with delegates averaging 190 to 200 over the two days. A number of high-level dignitaries, including the Zimbabwe Minister of Mines and his deputy, the President of the Zimbabwe Chamber of Mines, and the SAIMM President, attended the conference. The conference was generously supported by various international and local mining companies and equipment suppliers.

The delegates requested the Branch to host another international conference in 2018. This is planned for November 2018, and will take place held over three days, with a site visit to a lithium project near Harare on the first day. The theme of the conference is 'The Future of Mining in Zimbabwe, Opportunities and Challenges'. The Branch Committee has begun planning for the conference, and potential sponsors are being approached.

Branch Elections

The annual general meeting, which had been planned for May 2018 to coincide with a Branch event, did not take place due to the inability of the sponsor to host the event. However, a new Branch Committee has been elected for the period July 2018 to June 2019. The members are as follows:

Forthcoming events

The following three events are planned for the year 2018/2019:

- ▶ November 2018: Future of Zimbabwe Mining Industry International Conference
- ▶ March 2018: Branch Event
- ▶ May 2018: Branch Event and AGM

Financial

The Branch continues to operate an account under the Chamber of Mines of Zimbabwe, since we have encountered difficulties in opening our own separate account as directed by the SAIMM office. More avenues will be explored in the coming year to make this initiative possible. The Branch had a cash balance in the account of around US\$13 000 as at end June 2018, after paying a deposit of US\$7 500 towards the November 2018 conference venue. Some money from the last international conference (July 2017) was transferred into the main branch account in South Africa. The reconciliation of the

accounts is still to be finalized.

The Branch is sponsoring the attendance by the Zimbabwe youth development leadership at the main branch youth development meetings in South Africa.

The part-time administrator was sponsored by the Zimbabwe Branch to attend a conference in Cape Town with the SAIMM administration staff. This was part of the training planned for the administrator. The initiative is intended to build more capacity and capability within the Zimbabwe Branch Committee to promote the growth of the SAIMM in Zimbabwe.

A budget for 2018/2019 is being prepared and will be submitted to the SAIMM office in Johannesburg by the end of August 2018.

A budget for the year 2018/2019 is being prepared and will be circulated to the main branch by the end of August 2018.

4.1.10 Zululand Branch

C. Mienie, Chairperson

E. Clare

W. Jordaan

R. Kutama

P. Strydom

There is no report for this year.

5. International liaison

Portfolio Holder: S. Ndlovu

There is nothing to report this year.

Key Performance Areas

To achieve its objectives, the SAIMM

- ▶ *Participates in and represents South Africa on bodies such as the Mining, Metals & Minerals Society (TMS), and together with Mintek on Infacon*
- ▶ *Appoints corresponding members in areas such as Australasia, Botswana, Brazil, Canada, Chile, Europe, the Far East, Ghana, New Zealand, the UK, and the USA, and interacts with sister institutions in other countries to promote international exchange of scientific and technical information.*

5.1 APCOM

C. Dohm, Chairperson

There is no report for this year.

5.2 INFACON

R.T. Jones, Chairperson

I.J. Geldenhuys, Secretary General

The International Ferro-Alloys Congress (Infacon) was founded in South Africa in 1974 by the SAIMM, the National Institute for Metallurgy (NIM, now Mintek), and the Ferro-Alloy Producers' Association (FAPA) when the first Infacon was held in Johannesburg. Infacon events are overseen by an international governance structure that is now known as the International Committee on Ferro-Alloys (ICFA), which has representation from major countries that produce and consume ferro-alloys. ICFA has the primary objectives of promoting the holding of the International Ferro-Alloys Congress every three years in appropriate locations around the world, and ensuring that the high technical standard of papers and presentations is maintained. Mintek provides the secretariat for ICFA.

Infacon has become established as the premier technical conference serving the international ferro-alloys industry. Congresses have been held in twelve different countries around the world. Previous events have taken place in the following locations:

- 1974: Infacon I – Johannesburg, South Africa
- 1980: Infacon II – Lausanne, Switzerland
- 1983: Infacon III – Tokyo, Japan
- 1986: Infacon IV – Rio de Janeiro, Brazil
- 1989: Infacon V – New Orleans, USA
- 1992: Infacon VI – Cape Town, South Africa
- 1995: Infacon VII – Trondheim, Norway
- 1998: Infacon VIII – Beijing, China
- 2001: Infacon IX – Quebec City, Canada
- 2004: Infacon X – Cape Town, South Africa
- 2007: Infacon XI – New Delhi, India
- 2010: Infacon XII – Helsinki, Finland
- 2013: Infacon XIII – Almaty, Kazakhstan
- 2015: Infacon XIV – Kyiv, Ukraine
- 2018: Infacon XV – Cape Town, South Africa

The Fifteenth International Ferro-Alloys Congress (Infacon XV) was held at the Century City Conference Centre in Cape Town from 25–28 February 2018, and was attended by 450 delegates from 32 countries. The Congress was co-chaired by Professor Rodney Jones and Professor Hurman Eric. After a cycle of four congresses in the northern hemisphere (New Delhi, India, 2007; Helsinki, Finland, 2010; Almaty, Kazakhstan, 2013; and Kyiv, Ukraine, 2015), it was appropriate that Infacon should return to South Africa at a time of great change in the region.

This Congress reflected a changing industry in a changing world. There have been major structural changes in the ferro-alloys industry over the past few years, as companies seek to find the global economic optimum of where and how important metals are produced. For example, in 2012, China replaced South Africa as the leading producer of ferrochromium. More recently, we see further evidence of change in South Africa's new political leadership, and levels of optimism have started improving. The drought in Cape Town emphasized the importance of adapting to a changing climate, and prompted delegates to reflect on how, as responsible citizens of our planet, we can improve the environmental performance and energy efficiency of our industry. South Africa has played a leading role in the global ferro-alloys industry for a long time. Even if the nature of its contribution changes, the country will continue to be a major player in this arena.

Infacon XV covered the major ferro-alloys (especially FeCr and FeMn) extensively. The primary focus was on technical aspects of production processes, furnaces, and power supplies, but safety, environmental, and legislative aspects were covered too. The topics discussed reflected many of the needs and challenges faced by ferro-alloy producers today.

The peer review process was taken very seriously, and the organizers drew on the expertise and insights of 146 experts from around the world who generously offered constructive criticism and suggestions, as a result of which the papers were improved greatly. About 150 papers were selected from 199 abstracts that were submitted. Each paper was thoroughly reviewed by at least two independent experts in their respective specialist fields. We are very grateful to these reviewers who gave their time freely in undertaking this monumental task,

and appreciate their valuable technical and editing inputs. We also appreciate the time and effort that the authors put into their papers and presentations.

Infacon is set up on the principle that the sharing of technical information is of great benefit to the industry. The publication of scientific and engineering work is vital. The Infacon series of congresses is well known for the quality of the papers, due largely to the considerable work that is put into the reviewing process. ICFA has a policy of making papers from all Infacon events, current and past, freely available via open access, and these are now available online.

Delegates were pleased to have Infacon return to Cape Town – a city of great scenic beauty and a world heritage site. A welcoming function was held on the evening before the conference at 'On the Rocks' in Bloubergstrand, with a spectacular view of Table Mountain and the sunset over Robben Island. The conference dinner was held at Kirstenbosch National Botanical Garden, accompanied by an extensive and wide-ranging cultural programme of dancing and singing.

At the conclusion of the conference, an African drum, a tangible symbol of Infacon XV, was handed over by Professor Hurman Eric, on behalf of South Africa, to Benjamin Ravary from Norway, as that is where the next Infacon will be held in 2021. Further details regarding the next congress will be available in due course from the conference website at <http://infacon16.com>

ICFA Contacts:

Chairperson: Professor Rodney Jones rtjones@global.co.za
Secretary General: Isabel Geldenhuys IsabelG@mintek.co.za
Infacon website: <http://www.pyrometallurgy.co.za/Infacon/>

5.3 SAMCODES Standards Committee (SSC)

| | |
|---------------------|-------------------------------|
| M, Mullins | Chair |
| T. Marshall | Deputy Chair |
| S. Moola | Administrator |
| A. Donnelly | Scribe |
| K. Lomberg | SAMREC / CRIRSCO |
| K. Redman | SAMVAL |
| P. Dekker | SAMOG |
| S. Magnus | SAMESG |
| R. Dixon | SAIMM / CRIRSCO |
| S. Siwela | GSSA |
| A. de Bruyn | JSE |
| R. Ingram | (Solid Minerals) |
| A. Clay (Oil & Gas) | Readers Panel |
| J. Cato | ECSA |
| A. Bals | SAGC |
| L. Koorsse | IMSSA |
| N. Kramer | SAOGA |
| C. Dohm | GASA |
| M. Booysen | Law Societies of South Africa |
| G. Grobler | General Council of the Bar |
| K. Davies | SAICA |
| B. Williamson | IASSA |
| M. Tsanwani | Council for Geoscience |
| S. Mabaso | DMR |
| O. Moumakwa | DMR |
| C. Teffo | Minerals Council South Africa |

Observer Organizations

P. Rampersadh

G. Botha
 M. Kabai SACNASP
 K. Motjale Financial Sector Conduct Authority (FCSA)

Strategic direction

The SSC continues to build on the excellent foundation that has been laid over the past decade, and particularly under the leadership of the immediate past Chair, Tania Marshall.

The SSC has strengthened its relationship with its Patrons, with extended institutes, and with securities exchanges in South Africa and abroad. We have built on our foundation through continuing our strong education and promotion portfolio, through ensuring that our governance procedures are in place and working smoothly, and through promoting the SAMCODES Way, both in South Africa and abroad.

Our relationship with the JSE has been strengthened, particularly through the new mandate of the Readers Panel, and through co-branding with the JSE wherever possible.

SAMCODES Committee activities

Ken Lomberg, Kelly Redman, and Sarah Magnus continue as Chairs of the SAMREC and SAMVAL Code Committees and the SAMESG Guideline Committee respectively. Peter Dekker is the new Chair of the SAMOG Committee.

SAMREC Committee

- The Committee continues to engage with the South African Bureau of Standards (SABS) to assist in updating SANS 10320:2004, which is now out of date and out of step with both SAMREC and with international developments. Issues have been raised with respect to content, jurisdiction, copyright, cost, and training, and these are currently ongoing.
- The Code is being critically reviewed for its applicability to possible future technological developments, particularly in reporting the new 'green' minerals such as lithium.

SAMVAL Committee

- The 'Parked Issues' are being reviewed through a sub-committee, which has developed a position paper which has been widely circulated for comment.
- The Committee continue with the work on registration with statutory bodies.

SAMOG Committee

- The Committee commented on the 2018 proposed PRMS update and reviewed the impact the update might have on the existing SAMOG Code.
- Discussions were held with the Alberta Securities Commission on the planned update of the COGE handbook (expected in 2018). The impact of the updates on the SAMOG Code will be reviewed.
- A short training course on the reporting systems and SAMOG Code is being prepared, which most likely will be given during the AAPG Convention and Exhibition in Cape Town in November 2018.

Education and promotion

The SSC continues its high level of Code education and promotion, focusing equally on students, young professionals, and experienced practitioners. Where possible these events are

organized through the Patrons, and either form part of existing conferences or are stand-alone events.

Educational events continue to be organized for interested parties, such as the JSE, the Institute of Directors of SA, the Council for Geoscience, and the DMR.

The Squirrel Awards through the Investment Analysts Society of South Africa, for the best Public Reporting, are the premier promotion activity on the SSC calendar, were presented on 21 June 2018 .

Key activities 2017/18

- SAIMM: YPC (presentation)
- SAIMM: International Platinum Conference (two presentations)
- GSSA: SAMCODE Compliance and JSE reporting for CPs (three-day workshop)
- SAIMM: Project Valuation workshop (three-day course)
- SAIMM: Advanced SAMREC/SAMVAL (two-day workshop)
- JSE: Valuation for non-technical Professionals (two half-day workshops)
- Two personalized workshops for the DMR (two full days)
- One personalized workshop for the CGS (one full day)
- A short presentation was given at Stats-SA, to encourage compliant reporting of National Accounts and National Inventory data (or at least reporting that does not confuse various local and international reporting systems)
- Geo-Skills Conference (March 2018)
- Global Mineral Resource and Valuation Reporting Standards: Their evolution, convergence and effectiveness. Presentation at Minex Asia, Kazakhstan, April 2018 by M. Mullins.

Organized and proposed activities

| | |
|---|---------------------|
| Diamond Reporting Workshop – Tania Marshall | 11 June 2018 |
| Junior Indaba Panel discussion – Matt Mullins | June 2018 |
| GSSA/SAMCODES/JSE Reporting Workshop (Tania Marshall) | 28–29 June 2018 |
| Copper Cobalt Conference (Steven Rupprecht and Matt Mullins) | 9 July 2018 |
| SAMCODES Workshop at Geocongress | 17 July 2018 |
| SAMREC/SAMVAL Advanced Training Workshop | 16 – 17 August 2018 |
| SAMVAL for non-technical Professionals – SAMVAL Committee/JSE. | 5–6 September 2018 |
| Joburg Indaba | October 2018 |
| SAMOG Workshop at AAPG Conference (Peter Dekker) | 4–7 November 2018 |
| International Conference on Public Reporting in the Extractive Industries | 2019 |

International developments

CRIRSCO is developing into a strong International force in Reserve and Resource reporting, with 13 current national members. Traditionally SAMREC, one of the founding members, has been represented on the Executive Committee.

CRIRSCO members as at June 2018



This continues, with Ken Lomberg being the incumbent Deputy Chairperson and future Chairperson. Roger Dixon remains on the CRIRSCO Committee and provides critical long-term continuity. In this way SAMREC will continue to have a material influence on the direction of CRIRSCO.

The annual CRIRSCO meeting is scheduled to take place in London in September 2018. The two main drivers are to increase membership, with some 10 countries interested in becoming part of CRIRSCO. An updated template has been drafted for comment, which can be used to guide new members, to include recent code updates, as well as to provide leadership in critical areas such as environmental and social issues.

IMVAL is developing into a global forum for international coordination and direction of Valuation reporting, and Kelly Redman is the current SAMVAL representative on the Committee. SAMOG has been given Observer status, with Peter Dekker sitting on the Committee.

The third edition of the IMVAL template has been circulated. A number of sub-committees have been formed and ratified by the IMVAL Committee. One of these is the Template Committee, which will look at adding issues such as company valuations, which will be included in the next IMVAL template. There is also Liaison Committee and a Membership Committee.

A desire has been expressed to have a forum for presentation of the various Codes at PDAC next year, which could eventually develop into an annual meeting of all members.

The UNFC continues to drive the evolution of national reporting, with Roger Dixon representing CRIRSCO at its most recent meeting in Geneva. The key outcomes of this meeting are as follows.

- There was a strategic move away from a classification system to a resource management system that supports the 17 Sustainable Development Goals (SDGs).
- There was a definite move towards the green economy rather than a fossil fuel economy. Therefore, there would be more emphasis on specifications for renewable energy resources and anthropogenic resources.

Visit by Chinese Delegation

The SSC has begun planning for the official visit by the Mineral Resources and Reserves Evaluation Centre of the Ministry of Land and Resources, PR China, for a training visit to South Africa from 14 October to 3 November this year. There will be about 20 senior government officials attending the training

programme, some of whom will be of Director General level. Attendees will be from the central government and also from the provinces, and will be principally interested in how the SAMREC/SSC Codes work in practice for market reporting, government reporting, and their relationship to trading in mineral rights reporting.

6. Management and Administration

Portfolio Holder: S. Ndlovu

The Secretariat consists of:

- Sam Moolla (Manager)
- Gugu Charlie (Conference Coordinator)
- Camielah Jardine (Head of Conferencing)
- Tshepi Letlhaku (Receptionist and Assistant to the Manager)
- Dennis Makondesa (Accountant)
- Portia Malatji (Accounts Assistant)
- Zuliakha Malgas (DTP Operator)
- Nazli Mamdoo (Conference Publications Coordinator)
- Kelly Matthee (Journal Coordinator)
- Yolanda Ndimande (Conference Coordinator)
- Prudence Ntumeleng (Membership Assistant)
- Anna Panana (Conference Secretary)
- Aphathia Sello (Administration Clerk)
- Keabetswe Shumba (Membership and Branch Liaison Administrator)
- Naomi Wernecke (Communications Coordinator)

The SAIMM, Office Bearers, and Council record their appreciation to the above for their service.

6.1 Finance

Portfolio Holder: V.G. Duke

Highlights

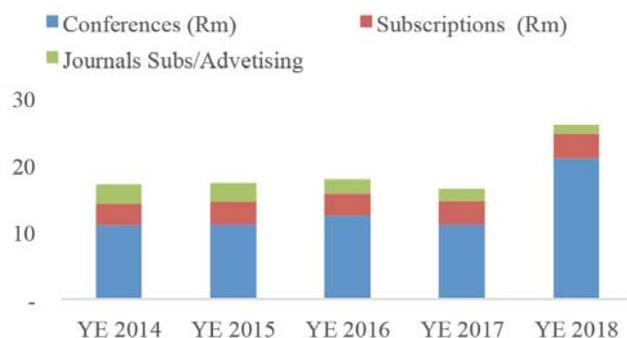
- Income up by 58% year on year.
- Expenditure up by only 42% year on year.

Despite a difficult year, your Institute has recorded an operating surplus of R143k for the 2017/18 financial year (YE2018) against losses over the previous three years.

Income

Total income amounted to R26m against an annual average of R18.9m over the past five years.

Conference revenue grew by 88% from R11m to R21m. This was due to the committed efforts of your Technical Programmes Committee (TPC) and solid contributions from international conferences like AfriRock, Copper Cobalt, and Infacon. There are unfortunately no international conferences planned for next year, but your Institute’s conferences remain world class and are also priced to facilitate aggressive



competition in this difficult market.

Income from subscriptions grew by 5%, with the number of paying members now at 5 077. Collections continue to be difficult and 245 members, with fees outstanding for more than two years, were removed from our register. Our annual subscription increases have not exceeded the inflation rate.

Your Institute’s debtor’s book has also been under considerable strain due to late payments from conference attendees and renewed attention will be given to this during the coming year. Total trade and other receivables stands at R4.1m and R3.8m of this is due to the debtor’s book.

Total Expenditure

Overall operating expenses and cost of sales have been prudently managed and some difficult cost containment measures are beginning to yield results.

The cost of sales went up by R5.0m (38%), which is much lower than the associated increase in revenue.

Operating expenses were up by R2.6m from the previous period, with the larger expenses being attributable to:

- A donation of R242 000 to the Scholarship Trust Fund.
- A 458 000 loan write off against the Scholarship Trust Fund.
- A 800 000 write off of bad debts with the bulk of this amount being due to non-payment of membership fees.
- A R112 000 contribution to the Global Mining Standards Group (GMG).

Investment Portfolio

Our investments are critical for both short term stability and the long term sustainability of your Institute. It is pleasing to report that despite market volatility over the past year, the investment portfolio has performed relatively well.

The closing balance was R31.7m as at 31 June 2018; an overall net increase of R1.9m after:

- A fair value adjustment of R3.9m
- Income from dividends of R0.9m
- Income from interest of R0.1m
- A drawdown of R2.5m.



This drawdown followed a significant withdrawal of R5.75m to cover losses during the 2015/16 year and a further drawdown of R2.0m during the following year. These were all necessary to finance three years of losses and the operational cash movements over the December holiday periods.

The latest drawdown included R0.5m which was 50% of an Infacon research fund commitment. The remaining 50% will be required this coming year.

When looking ahead, there are indications from improved budgeting in the form of a three-year projection of our likely maximum and minimum cash flow requirements, that further funding from our reserves are unlikely to be necessary through to 2021.

Closing Comments

In summary, the total surplus for the year stands at R5m a great improvement from last year's deficit of R63 000. Other key metrics from the 2017/18 Financial Statements are provided below:

| Heading | 2018 | 2017 | % |
|------------------------|---------------|-----------------|-------------|
| Assets | R38.9m | R33.4m | 16 |
| Equity | R36.0m | R31.4m | 14.7 |
| Liabilities | R 2.9m | R 1.9m | 52.6 |
| Revenue | R26.0m | R16.4m | 58.5 |
| Cost of Sales | R18.0m | R13.0m | 38.5 |
| Operating Exp. | R 8.6m | R 6.0m | 43 |
| Operating Surp. | R 0.1m | R -1.0m | -110 |
| Total Surplus | R 5.0m | R -0.63k | 8037 |

On behalf of the Institute, I wish to thank Professor Jim Porter who recently resigned as the Honorary Treasurer, and understand that I have sizeable boots to fill according to the admin staff, who all work very well with him. I would also like to specifically thank Sam Moolla your Office Manager and this wonderful mix of SAIMM staff for their sterling work and for assisting me in picking up the responsibility of Honorary Treasurer.

Your Institute welcomes Genesis Chartered Accountants, who have assumed the Auditor's role with effect from 01 July 2018, and at the same time thanks Robert Kitching for the services that we have enjoyed over recent years.

Finally, we have received excellent returns from our AFC investment and thank Dee Campourogrou (AFC Account Manager) for this.

New Members

Members

J.D. Ackermann, F.O. Aramide, S.J. Archer, M.C. Bahome, V. Bailey, D. Benson, A. Berghorst, B. Besa, B.J. Brahmipuri Janakiram, M. Carlos, C.G. Chasaya, C. Chilufya, T. Chinhengo, H. Chiswaswa, W. Chitate, B.R. Crompton, E. de Villiers, K. Dikosha, M.S. Dzimba, Y. Fan, J. Gnoinski, T.L. Grewar, B. Gwavava, M.H. Hanson, G. Hawlitschek, M.T. Hlambelo, C. Hlangabeza Khumalo, H. Joubert, J.C. Kanku, M.K.M. Kaonda, J. Kapobe, B.T. Katiyo, L.Q. Kebatsetse, P. Kegaisitse, J.M. Koorts, S.G. Lavery, J.W.D. Lumb, G.C. Luzendu, T.E. Magama, J. Makgatho, L.P. Makhubu, N.B. Maledi, B. Mamogale, T.R. Marshall, J. Masua, J. Meadows, P.B. Moletsane, Z.C. Msimang, J. Mufara, B. Muleya, J.B. Mulunda, O. Munachoonga, P.N.C. Mutsinya, I. Muzinda, E. Mwampokota, D. Naidoo, P. Ngwenya,

F.C. Nieuwenhuys, P. Nkhwalume, L. Noveve, J.O. Okeniyi, T.T. Phakathi, R.T. Rakotomalala, N. Rampersad, P. Selema, K.S. Shandavu, B.B. Sithole, W. Tsanulani, E. Vascotto, D. Zeelie, A. Zezekwa, W.H. Black, E.R. Brümmer, J. Deacon, O. Mahenga, S. Mulonda, R. Reddy.

Associates

K.A. Clarke, G.G. Dembetembe, H.R. Muhali, A.P. Ogunode, R.A. Wildenboer, S. Biswas, S.L. Burger, R. L. Chosi, N.H. Dire, N.Z. Dzimunya, B.R. Hietbrink, C. Mazala, H.T. Mushonga, R. Nyirenda, R. Phiri, L.P. Tsibane, U. Hall, M. Lekobotja, T.V. Mwayi, J. Scholtz, M.S. Gerke, T.R. Monepya, M.F. Msibi, T.L. Mathevula, C. Chivazve, L. Ranieri, K. Dzwiti, K. Basvi, T. Masuku, K.A. Shame, S. Soqinase, V. Zitsenga, R.L. Sakaran, A.M. Le Grange, P.J.A. Bezuidenhout, N. Chipilingu, M.A. Mello, K.V. Morudu, J.J. Munnik, C. Swart, R.G. van der Colff.

Associates from Conferences

M.M.N. Amwaama, M.N. Amwele, H.Z. Bakare, W. Botha, B. Bowman, N.G. Chauke, S.T. Chingowe, C. Chipare, T.K. Chivese, H.P. De Wet, M.B. Dlame, C. Dobola, C.R. Eimann, M. Ferentinou, J.M. Githiria, J.H. Goosen, E.D.C. Hingston, P. Kaluzi, T. Lebeta, R. Leo, S.M. Mabaso, N.G. Mafurutu, C. Mahanyele, K. Mahuma, B. Makichi, T. Mapaura, T. Masango Chabiamupeu, M. Mathuthu, B. Matoba, E.O. Mensah, C. Mhindu, N.D. Mokhine, U. Mokoena, P. Moleko-Boyce

Students

S.N.N. Akawa, B.T. Amadhila, O.S. Aron, N. Bakasa, T.P. Baloi, H. Baloyi, L.R. Baloyi, S.B. Baloyi, M.T. Banda, N. Bhebhe, H. Bhudhe, L.V. Chambara, S.C. Chanda, A. Chapfika, X.V. Chauke, R. Chauke, A. Chazarira, I.S. Chenjera, L. Chidanhika, K. Chifamba, P. Chifura, N.C. Chikonye, A.M. Chimombe, A.A.V. Chioreso, B.K. Chipunza, T.B. Chiura, K.P. Chivamba, T. Chivlera, A.A. Chiwara, L.M. Choma, B.K.S. Cidibi, L.M. Daobanes, J.N. Dlamini, M.M. Dlamini, E. Duve, V.S. Dzarira, R. Fombe, T.F. Gabashane, G.R. Gariseb, N. Gina, B. Godama, T.I. Gota, T.J. Gotore, Z.P. Gqweta, T.E. Gumede, H.A. Gumede, A.T. Guzha, S.L. Hadebe, M. Hlongwa, S. Hove, A. Ile, C. Kamonja, A.T. Kapuma, J.N. Kayembe, N. Kekana, D. Kganane, M.M. Khodumo, M.K. Khoele, R.B. Khosa, A.T. Khoza, K.S. Khumalo, F.C. Khupe, M. Kombora, N.J. Kopanye, R.S. Kupa, W.D. Kureya, A.H. Kusano, T. Kuvarega, H.A. Laewamo, K.K. Langa, O. Laquela, P.D. Lefu, R.M. Lekaka, M.T. Lekhuleni, M.M. Lekwadu, R.J. Lerotholi, N. Lesoga, M. Letsoalo, G. Lunga, O.M. Luvhengo, S.T. Mabaso, M.D. Mabelane, T. Maboko, T.S.I. Mabuoa, M. Madihlaba, N. Madlala, W. Madyambwa, T. Maera, D. Mafukidze, N. Mafumo, B.N. Mahlangu, R.N. Mahlangu, S.T. Makazhe, G.S. Malefo, F.S. Maluleke, M.B. Mampuya, T. Mangope, P. Manika, H.D. Mantsonyane, K. Manyelo, T.D. Mapfumo, A. Maqude, R.M. Marume, N.S. Masango, N.L. Maseko, P.M. Mashaba, K.K. Mashifane, M.J. Mashilo, M.E. Masinga, O.N. Masirika, R. Masuvhelele, G. Masvanhise, L.N. Maswanganye, M.T. Maswaya, C.M. Matete, D.C. Mathaba, P.N. Mathabatha, M.D. Matlakala, N.J. Matsimane, R.T. Matsokotere, M. Mavankere, A. Mawango, N. Mawela, S.N. Mayisa, A. Mbiri, L.N. Mbiza, F.M.N. Mfeka, Y.A. Mgwebi, S. Michaels, K.E. Mochologi, T.M. Mohale, M.E. Moitsi, K.M. Mojalefa, T. Mokgomola, Q.M.P. Mokgopo, D.M. Molefe, G.M. Molepo, N.C. Moloi,

Annual report

A.G. Moloto, K. Monene, M.R. Morajane, T.E. Morakile, R.P. Moreki, E.O. Mosako, L.A. Mosima, P.W. Motshegare, P.D. Motsoane, D.C. Moyaha, A.T. Moyo, R.Q. Mphahlele, M.P. Mphaphathi, T. Mphephu, A. Mponya, A.A. Mqoqi, K. Msibi, L.N. Msipha, H.J. Msweli, S. Matabikwa, S.S. Mthanti, C. Mtombo, B.T. Mtungwa, J.A. Muchemwa, B.J. Mudema, R.Y. Mudereri, G.N. Mudzembweh, T. Mugova, M.T. Mukubonda, M.C. Mulala, K. Munyai, T. Mupambwi, M.R. Mupini, C.S. Mupudzi, I.S. Murove, B.T. Murowanidzwa, R.L. Mutepe, R. Mutsiwa, G. Mutukura, G. Muzamba, C. Muziringa, B. Mvindo, B. Mwewa, S. Mxhonywa, F.P.N. Nampweya, M.M. Napo, P.H.V. Ncube, P. Ncube, T. Ncube, V. Ncube, O. Ndabangaye, C. Ndebele, S.M. Ndebele, T. Neka, S.B. Nemaramba, N. Netshaulu, K. Ngani, S.P. Ngidi, T. Ngobeni, R.E. Ngoveni, T.T. Ngwenya, K.D. Nhongo, S. Nkabinde, B. Nkoana, P.C. Nkogotse, M. Nkopodi, N.G. Nkosi, S. Nkunkuma, P.R. Nyoni, S.K. Nzimande, T.J. Olaniyi, B.T. Pamire, P. Pedzisi, R.R. Phahlane, M.M.K. Phetla, M.K. Phiri, D.J. Poopedi, P. Pudikabekwa, C.K.S. Ramafoko, E. Ramohlale, M. Ramudzwagi, S. Ramusi, P.J. Raolane, L.A. Raphala, G.D. Raselabe, K.T. Rathupetsane, A. Ratshalingwa, T.R. Sadomba, M.E. Sebola, L. Sekwati, K. Seotsanyana, K. Serumula, S.S. Shabangu, T. Shabangu, D. Shabangu, E.I. Shawelaka, N. Shindi, M. Shirinda, L. Shoko, C.T. Shumba, M.W. Siaga, B. Sibanda, M. Sibanda, V. Sibanda, T.M. Sigauke, M.C. Simango, T. Simango, M.L. Sithole, R.S. Tadzavshe, B.D. Tandana, B.T. Taruwedzera, R. Thanyani, T.K. Thathane, A.T. Thela, T. Thlomani, I.S. Thusi, T.J.N. Tladi, P.M.G. Tlhabi, D.K. Togara, K.M. Tshagemeno, O.M.R. Tshipa, M.C. Umba, E.O. Umeh, D. Viljoen, T. Witbooi, M. Xulu, K.L. Youlton, N. Zhou, A. Zimema, L. Zulu, M.K. Zulu, W. Zvangayidza.

Resignations

Fellows

M. Ram Reddi, D.M. Walters, P.D. Scott, J. Dixon, J.P. Bloemsma.

Members

M.L. Petrick, N.C. Barnard, L. Sherman, U. Drews, C.M. Digby, M.E. Berger, N.T. Middleton, L.P.V. De Villiers, M. Stewart, L.S. Maphaha, N. Reddy, M.S. Hunt, B. Elezaj, K.T. Luden, R. Khatri, D. Shah, B. Mulcahy, C. du Plessis, E.R. Els, S.B. Mbonani, K. Nkole.

Associates

D. Govender, E.N. Nkwamba, E.L. De Beer, L.E. Lottering, A. Sowards, T. Pillay, E. Moodley, M. S. Motlhabane, C.B. Masango, R.L. Mojela, B. Schoevaerts, M.T. Mamina, O. Biribauer, L.B. Sekhokoane, G. Panopoulos, G.M. Pearson, C.F. Vos, W.V. Aarde, G. Panopoulos, D.J. Robinson, A. van der Westhuizen.

Retired Fellows

J.P. Deetlefs, I.P. Douglas

Company Affiliates

Bell Equipment Limited, SMS Group Technical Services South Africa (Pty) Ltd, Goba (Pty) Ltd.

Members transferred to Higher Grade

Transfer from Retired Fellow to Fellow

E.J. de Jager.

Transfer from Member to Fellow

M.J. Burnett, W. Assibey-Bonsu, E.R. Klue, M. Mostert, B. Genc, H. Jacobs, M.F. Breed, D.R. De Wit, N. Singh.

Transfer from Associate to Member

W.H. Pretorius, M. Baxter, R. Minango, P.F. de Almeida Hopp.

Transfer from Student to Member

C.E. Dekker.

Transfer from Student to Associate

A.P. Mlombo, D.L. McKay, C. Mwachikorera, A.T. Nhapi, T.W. Gwishiri.

Members who retired

Fellows

M.A. Ford, S.P. Moulton, B. Prout, R.G. Wadley, D.R. Betton, J.A. Johnson, E.J. Magri, L.G.D. Napier, M.R. Sharpe, J.C. Steenkamp, M.A.J. Button, S.M. Gould, P.R.S. van Dorssen, I. Matunhire, C.T. Morley, A.W. Dougall, C. Van Zyl, F.W. Taylor, P.A. Townsen.

Members

M.J. Boylett, T.R. Curr, P.P. Jourdan, S. Wade, R.I. Skelton, F.T. Kruger, M.A. Smith, D.A.J. Starley, N. Wilson, P.M. Craven, P. Roger, D.S. Du Toit van den Bergh, R.J. van der Schyff, J.A. Richards, A.G.W. Knock, R.J. van der Schyff, M.H.G. Heyns, J.P.W. Fisher, J.F. Kotze, R. Roux.

Members who were re-admitted

Re-admitted as a Member

R.J. Mostert, S.K. Makuza, P.L. Sibiya, H. Mutonwana, T. Punzul, M.T. Hlambelo, A. Lubbe, S. Monnanyana, K.I. Phalakatshela, W.H. Pretorius, D.P. Roberts, M.E.M. Mahlambi, Z. Setete, J. Winnan, F.K. Mduli, R.E.L. Pobe, F. Kwangwari.

Re-admitted as an Associate

K.T. Kekana, T. Matabane, M. Ravhura, S.F. Manjengwa, M. Munkombwe.

Re-admitted as a Student

M.C. Apua.

Members who were re-instated

Re-instated as a Member

A.M. Berejena, M. Mahlangu, D.S. Mathebula, L.B. Mukumbi, M.M. Motlounge, J.M. Musasaidzwa, E. Mnisi.

Re-instated as an Associate

G.A. Khonkhobe, F.J.J. Fourie, M.C. Moyo, T. Macha, S.V. Mkhathswa, J.M. Snyman, T. Nyazaya, M. Pelser.

Deceased

Honorary Life Fellows

O.K.H. Steffen.

Retired Members

J.M. Fowlds.

Members

D.J. Bradshaw, M. Salamon, K. McMillan.

Associates

R. Sirwali. ♦

The SAIMM would like to thank the following sponsors for their support throughout the year



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YUNIBESITHI YA PRETORIA

UNIVERSITY OF THE
WITWATERSRAND,
JOHANNESBURG



THE SOUTHERN AFRICAN INSTITUTE OF MINING AND METALLURGY
ANNUAL FINANCIAL STATEMENTS
FOR THE YEAR ENDED 30 JUNE 2018

Annual Financial Statements

General Information

| | |
|--|---|
| Country of incorporation and domicile | South Africa |
| Nature of business and principal activities | The Southern African Institute of Mining and Metallurgy is a professional institute with local and international links aimed at assisting members to source information about technological developments in the mining, metallurgy, and related sectors. This non-profit entity operates in South Africa. |
| Office Bearers | Professor S. Ndlovu V.G. Duke A.S. Macfarlane M.I. Mthenjane Z. Botha Professor C. Musingwini Professor R.T. Jones |
| Registered office | 5 Hollard Street Marshalltown Minerals Council South Africa Johannesburg 2001 |
| Postal address | PO Box 61127 Marshalltown 2107 |
| Bankers | Standard Bank |
| Auditors | Genesis Chartered Accountants Chartered Accountants (SA) Registered Auditors |
| Trus registration number | IT 6837/02 |
| Preparer | The annual financial statements were independently compiled by: J. Den Drijver CA(SA) J. Den Drijver CA(SA) |

Annual Financial Statements

Index

The reports and statements set out below comprise the annual financial statements presented to the Office Bearers:

| | Page |
|---|---------|
| Statement of Office Bearers' responsibilities and approval | 970 |
| Office Bearers' Report | 971 |
| Independent Auditor's Report | 972–973 |
| Statement of Financial Position | 974 |
| Statement of Comprehensive Income | 974 |
| Statement of Changes in Equity | 975 |
| Statement of Cash Flows | 975 |
| Accounting Policies | 976–977 |
| Notes to the Annual Financial Statements | 978–980 |
| The following supplementary information does not form part of the annual financial statements and is unaudited: Detailed Income Statement | 981–982 |

Statement of Office Bearers' responsibilities and approval

The Office Bearers are required, to maintain adequate accounting records and are responsible for the content and integrity of the annual financial statements and related financial information included in this report. It is their responsibility to ensure that the annual financial statements fairly present the state of affairs of the Institute as at the end of the financial year and the results of its operations and cash flows for the period then ended, in conformity with the accounting policies appropriate to the Institute. The external auditors are engaged to express an independent opinion on the annual financial statements.

The annual financial statements are prepared in accordance with the accounting policies appropriate to the institute and are based upon appropriate accounting policies consistently applied and supported by reasonable and prudent judgements and estimates.

The Office Bearers acknowledge that they are ultimately responsible for the system of internal financial control established by the Institute and place considerable importance on maintaining a strong control environment. To enable the Council to meet these responsibilities, the members set standards for internal control aimed at reducing the risk of error or loss in a cost effective manner. The standards include the proper delegation of responsibilities within a clearly defined framework, effective accounting procedures and adequate segregation of duties to ensure an acceptable level of risk. These controls are monitored throughout the institute and all employees are required to maintain the highest ethical standards in ensuring the Institute's business is conducted in a manner that in all reasonable circumstances is above reproach. The focus of risk management in the Institute is on identifying, assessing, managing and monitoring all known forms of risk across the Institute. While operating risk cannot be fully eliminated, the Institute endeavours to minimize it by ensuring that appropriate infrastructure, controls, systems and ethical behaviour are applied and managed within predetermined procedures and constraints.

The Office Bearers are of the opinion, based on the information and explanations given by management, that the system of internal control provides reasonable assurance that the financial records may be relied on for the preparation of the annual financial statements. However, any system of internal financial control can provide only reasonable, and not absolute, assurance against material misstatement or loss.

The Office Bearers have reviewed the Institute's cash flow forecast for the year to 30 June 2019 and, in the light of this review and the current financial position, They are satisfied that the company has or has access to adequate resources to continue in operational existence for the foreseeable future.

The external auditors are responsible for independently auditing and reporting on the Institute's annual financial statements. The annual financial statements have been examined by the Institute's external auditors and their report is presented on pages 972-973.

The annual financial statements set out on pages 974-982, which have been prepared on the going concern basis, were approved by the Office Bearers and are signed on their behalf by:



Professor S. Ndlovu



V.G. Duke

Office Bearers' Report

The Office Bearers have pleasure in submitting their report on the annual financial statements of The Southern African Institute of Mining and Metallurgy for the year ended 30 June 2018.

1. Nature of business

The Southern African Institute of Mining and Metallurgy is a professional institute with local and international links aimed at assisting members to source information about technological developments in the mining, metallurgy, and related sectors.

There have been no material changes to the nature of the company's business from the prior year.

2. Review of financial results and activities

The annual financial statements have been prepared in accordance with International Financial Reporting Standard for Small and Medium-sized Entities and the accounting policies for this Institute. The accounting policies have been applied consistently compared to the prior year.

Full details of the financial position, results of operations and cash flows of the company are set out in these annual financial statements.

3. Office Bearers

The Office Bearers in office at the date of this report are as follows:

| Office Bearers | Designation |
|-------------------------|--------------------------|
| Professor S. Ndlovu | President |
| V.G. Duke | Honorary Treasurer |
| A.S. Macfarlane | President Elect |
| M.I. Mthenjane | Senior Vice President |
| Z. Botha | Junior Vice President |
| Professor C. Musingwini | Immediate Past President |
| Professor R.T. Jones | Past President |

4. Events after the reporting period

The Office Bearers are not aware of any material event which occurred after the reporting date and up to the date of this report.

5. Going concern

The Office Bearers believe that the company has adequate financial resources to continue in operation for the foreseeable future and accordingly the annual financial statements have been prepared on a going concern basis. The Office Bearers have satisfied themselves that the company is in a sound financial position and that it has access to sufficient borrowing facilities to meet its foreseeable cash requirements. The Office Bearers are not aware of any new material changes that may adversely impact the company. The Office Bearers are also not aware of any material noncompliance with statutory or regulatory requirements or of any pending changes to legislation which may affect the company.

6. Auditors

Genesis Chartered Accountants will continue in office.

Independent Auditor's Report

To the members of The Southern African Institute of Mining and Metallurgy

Opinion

We have audited the annual financial statements of The Southern African Institute of Mining and Metallurgy set out on pages 974–982, which comprise the statement of financial position as at 30 June 2018, and the statement of comprehensive income, statement of changes in reserves and statement of cash flows for the year then ended, and a summary of significant accounting policies and other explanatory notes.

Qualification

We draw attention to Note 7 of the annual financial statements which indicates a bank account with a balance of R596 936 for the Western Cape branch. Due to a lack of supporting documentation, we have been unable to carry out all of the audit procedures that we deem necessary to satisfy ourselves to the completeness, existence and valuation of this bank account.

In our opinion, except for the matter referred to above, the annual financial statements present fairly, in all material respects, the financial position of The Southern African Institute of Mining and Metallurgy as at 30 June 2018, and its financial performance and cash flows for the year then ended in accordance with the accounting policies appropriate to the Institute.

Basis for opinion

We conducted our audit in accordance with International Standards on Auditing. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the annual financial statements section of our report. We are independent of the company in accordance with the Independent Regulatory Board for Auditors Code of Professional Conduct for Registered Auditors (IRBA Code) and other independence requirements applicable to performing audits of annual financial statements in South Africa. We have fulfilled our other ethical responsibilities in accordance with the IRBA Code and in accordance with other ethical requirements applicable to performing audits in South Africa. The IRBA Code is consistent with the International Ethics Standards Board for Accountants Code of Ethics for Professional Accountants (Parts A and B). We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Office Bearers' responsibilities for the Annual Financial Statements

The Institutes' Office Bearers are responsible for the preparation and fair presentation of the annual financial statements in accordance with the accounting policies appropriate to the Institute, and for such internal control as the council members determine is necessary to enable the preparation of annual financial statements that are free from material misstatement, whether due to fraud or error.

Independent Auditor's Report

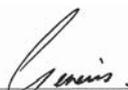
Auditor's responsibilities for the audit of the Annual Financial Statements

Our objectives are to obtain reasonable assurance about whether the annual 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 our opinion. We conducted the audit in accordance with International Standards on Auditing. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these annual financial statements.

As part of an audit in accordance with International Standards on Auditing, we exercise professional judgement and maintain professional scepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the annual 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 our 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 company's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the Office Bearers.
- Conclude on the appropriateness of the Office Bearers use of the going concern basis of accounting and based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the company's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the annual financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the company to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the annual financial statements, including the disclosures, and whether the annual financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with the Council members regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.



Genesis Chartered Accountants
Registered Auditor
CWB White CA(SA)
Partner

3 August 2018
Johannesburg

Statement of Financial Position as at 30 June 2018

| | <i>Note(s)</i> | 2018 R | 2017 R |
|-------------------------------------|----------------|-------------------|-------------------|
| Assets | | | |
| Non-Current Assets | | | |
| Property, plant and equipment | 2 | 317 704 | 193 826 |
| Loans to group companies | 3 | – | 452 918 |
| Other financial assets | 4 | 30 501 055 | 27 350 363 |
| | | 30 818 759 | 27 997 108 |
| Current Assets | | | |
| Inventories | 5 | 316 494 | 227 295 |
| Trade and other receivables | 6 | 4 132 362 | 1 272 256 |
| Prepayments | | 233 747 | – |
| Cash and cash equivalents | 7 | 3 375 635 | 3 909 689 |
| | | 8 058 238 | 5 409 240 |
| Total Assets | | 38 876 997 | 33 406 348 |
| Equity and Liabilities | | | |
| Equity | | | |
| Reserves | | 4 958 977 | 5 458 977 |
| Accumulated Funds | | 30 995 264 | 25 976 911 |
| | | 35 954 241 | 31 435 888 |
| Liabilities | | | |
| Current Liabilities | | | |
| Trade and other payables | 8 | 2 842 984 | 1 748 354 |
| Provisions | | 79 772 | 222 115 |
| | | 2 922 756 | 1 970 460 |
| Total Equity and Liabilities | | 38 876 997 | 33 406 348 |

Statement of Comprehensive Income

| | <i>Note(s)</i> | 2018 R | 2017 R |
|-----------------------------------|----------------|------------------|--------------------|
| Revenue | | 25 995 485 | 16 497 764 |
| Cost of sales | | (18 081 252) | (13 086 419) |
| Gross profit | | 7 914 233 | 3 411 345 |
| Other income | | 809 062 | 1 564 529 |
| Operating expenses | | (8 580 276) | (6 025 514) |
| Operating profit (loss) | | 143 019 | (1 049 640) |
| Investment revenue | 10 | 960 157 | 899 844 |
| Fair value adjustments | | 3 921 619 | 86 014 |
| Finance costs | | (6 442) | – |
| Profit (loss) for the year | | 5 018 353 | (63 782) |

Statement of Changes in Equity

| | Funds | Accumulated Funds R | Total equity R |
|--------------------------------|------------------|------------------------|-------------------|
| Balance at 1 July 2016 | – | 26 040 693 | 26 040 693 |
| Loss for the year | – | (63 782) | (63 7825) |
| Funds | 5 458 977 | – | 5 458 977 |
| Total changes | 5 458 977 | – | 5 458 977 |
| Balance at 1 July 2017 | 5 458 977 | 25 976 911 | 31 435 888 |
| Profit for the year- | – | 5 018 353 | 5 018 353 |
| Fund Donation | (500 000) | – | (500 000) |
| Total changers | (500 000) | – | (500 000) |
| Balance at 30 June 2018 | 4 958 977 | 30 995 264 | 35 954 241 |
| Note(s) | 9 | | |

Statement of Cash Flows

| | Note(s) | 2018 R | 2017 R |
|---|---------|--------------------|--------------------|
| Cash flows from operating activities | | | |
| Cash used in operations | 11 | (2 312 016) | (2 556 906) |
| Interest income | | 126 286 | 282 688 |
| Dividends | | 833 871 | 617 156 |
| Finance costs | | (6 442) | – |
| Net cash from operating activities | | (1 358 301) | (1 657 062) |
| Cash flows from investing activities | | | |
| Purchase of property, plant and equipment | 2 | (194 683) | – |
| Loans to group companies | | 452 918 | (246 450) |
| Sale of financial assets | | 566 012 | 1 307 149 |
| Net cash from investing activities | | 824 247 | 1 060 699 |
| Cash flows from financing activities | | | |
| Proceeds on share issue | | – | 235 076 |
| Total cash movement for the year | | (534 054) | (361 287) |
| Cash at the beginning of the year | | 3 909 689 | 4 270 976 |
| Total cash at end of the year | 7 | 3 375 635 | 3 909 689 |

Accounting Policies

1. Basis of preparation and summary of significant accounting policies

The annual financial statements have been prepared on a going concern basis in accordance with the accounting policies appropriate to the Institute. The annual financial statements have been prepared on the historical cost basis, and incorporate the principal accounting policies set out below. They are presented in South African rands.

These accounting policies are consistent with the previous period.

1.1 Significant judgements and sources of estimation uncertainty

Critical judgements in applying accounting policies

Management did not make critical judgements in the application of accounting policies, apart from those involving estimations, which would significantly affect the annual financial statements.

Key sources of estimation uncertainty

The financial statements do not include assets or liabilities whose carrying amounts were determined based on estimations for which there is a significant risk of material adjustments in the following financial year as a result of the key estimation assumptions.

1.2 Property, plant and equipment

Property, plant and equipment are tangible assets which the entity holds for its own use or for rental to others and which are expected to be used for more than one period.

Property, plant and equipment is initially measured at cost.

Cost includes costs incurred initially to acquire or construct an item of property, plant and equipment and costs incurred subsequently to add to, replace part of, or service it. If a replacement cost is recognized in the carrying amount of an item of property, plant and equipment, the carrying amount of the replaced part is derecognized.

Property, plant and equipment is subsequently stated at cost less accumulated depreciation and any accumulated impairment losses, except for land which is stated at cost less any accumulated impairment losses.

Depreciation of an asset commences when the asset is available for use as intended by management. Depreciation is charged to write off the asset's carrying amount over its estimated useful life to its estimated residual value, using a method that best reflects the pattern in which the asset's economic benefits are consumed by the entity.

The useful lives of items of property, plant and equipment have been assessed as follows:

| Item | Depreciation method | Average useful life |
|------------------------|---------------------|---------------------|
| Furniture and fixtures | Straight line | 10 years |
| Office equipment | Straight line | 6 years |
| IT equipment | Straight line | 3 years |

The depreciation charge for each period is recognised in profit or loss unless it is included in the carrying amount of another asset. Impairment tests are performed on property, plant and equipment when there is an indicator that they may be impaired. When the carrying amount of an item of property, plant and equipment is assessed to be higher than the estimated recoverable amount, an impairment loss is recognized immediately in profit or loss to bring the carrying amount in line with the recoverable amount.

Accounting Policies

1.3 Financial instruments

Initial measurement

Financial instruments are initially measured at the transaction price (including transaction costs except in the initial measurement of financial assets and liabilities that are measured at fair value through profit or loss) unless the arrangement constitutes, in effect, a financing transaction in which case it is measured at the present value of the future payments discounted at a market rate of interest for a similar debt instrument.

Financial instruments at amortized cost

These include loans, trade receivables and trade payables. Those debt instruments which meet the criteria in section 11.8(b) of the standard, are subsequently measured at amortized cost using the effective interest method. Debt instruments which are classified as current assets or current liabilities are measured at the undiscounted amount of the cash expected to be received or paid, unless the arrangement effectively constitutes a financing transaction.

At each reporting date, the carrying amounts of assets held in this category are reviewed to determine whether there is any objective evidence of impairment. If there is objective evidence, the recoverable amount is estimated and compared with the carrying amount. If the estimated recoverable amount is lower, the carrying amount is reduced to its estimated recoverable amount, and an impairment loss is recognized immediately in profit or loss.

Financial instruments at cost

Commitments to receive a loan are measured at cost less impairment.

Equity instruments that are not publicly traded and whose fair value cannot otherwise be measured reliably without undue cost or effort are measured at cost less impairment.

Financial instruments at fair value

All other financial instruments, including equity instruments that are publicly traded or whose fair value can otherwise be measured reliably, without undue cost or effort, are measured at fair value through profit and loss.

If a reliable measure of fair value is no longer available without undue cost or effort, then the fair value at the last date that such a reliable measure was available is treated as the cost of the instrument. The instrument is then measured at cost less impairment until management are able to measure fair value without undue cost or effort.

1.4 Inventories

Inventories are measured at the lower of cost and estimated selling price less costs to complete and sell, on the weighted average cost basis.

1.5 Impairment of assets

The entity assesses at each reporting date whether there is any indication that an asset may be impaired.

If there is any such indication, the recoverable amount of any affected asset (or group of related assets) is estimated and compared with its carrying amount. If the estimated recoverable amount is lower, the carrying amount, and an impairment loss is recognized immediately in profit or loss.

1.6 Provisions and contingencies

Provisions are recognized when the institute has an obligation at the reporting date as a result of a past event; it is probable that the institute will be required to transfer economic benefits in settlement; and the amount of the obligation can be estimated reliably.

Provisions are measured at the present value of the amount expected to be required to settle the obligation using a pre tax rate that reflects current market assessments of the time value of money and the risks specific to the obligation. The increase in the provision due to the passage of time is recognized as interest expense.

Provisions are not recognised for future operating losses.

1.7 Revenue

Revenue is recognised to the extent that the entity has transferred the significant risks and rewards of ownership of goods to the buyer, or has rendered services under an agreement provided the amount of revenue can be measured reliably and it is probable that economic benefits associated with the transaction will flow to the entity. Revenue is measured at the fair value of the consideration received or receivable, excluding sales taxes and discounts.

Interest is recognized, in profit or loss, using the effective interest rate method.

Dividends are recognized, in profit or loss, when the entity's right to receive payment has been established.

Notes to the Annual Financial Statements

2018
R

2017
R

2. Property, plant and equipment

| | 2018 | | | 2017 | | |
|------------------------|---------------------|--------------------------|----------------|---------------------|--------------------------|----------------|
| | Cost or revaluation | Accumulated depreciation | Carry value | Cost or revaluation | Accumulated depreciation | Carry value |
| Furniture and fixtures | 395 554 | (368 810) | 26 744 | 395 554 | (366 165) | 29 389 |
| Office equipment | 127 725 | (16 784) | 110 941 | 28 225 | (13 034) | 15 191 |
| IT equipment | 1 407 666 | (1 227 647) | 180 019 | 1 312 482 | (1 163 236) | 149 246 |
| Total | 1 930 945 | (1 613 241) | 317 704 | 1 736 261 | (1 542 435) | 193 826 |

Reconciliation of property, plant and equipment- 2018

| | Opening balance | Additions | Depreciation | Closing balance |
|------------------------|-----------------|----------------|-----------------|-----------------|
| Furniture and fixtures | 29 389 | - | (2 645) | 26 744 |
| Office equipment | 15 191 | 99 499 | (3 749) | 110 941 |
| IT equipment | 149 246 | 95 184 | (64 411) | 180 019 |
| | 193 826 | 194 683 | (70 805) | 317 704 |

Reconciliation of property, plant and equipment- 2017

| | Opening balance | Depreciation | Closing balance |
|------------------------|-----------------|-----------------|-----------------|
| Furniture and fixtures | 39 746 | (10 357) | 29 389 |
| Office equipment | 20 547 | (5 356) | 15 191 |
| IT equipment | 201 849 | (52 603) | 149 246 |
| | 262 142 | (68 316) | 193 826 |

3. Loans to/(from) group companies**Associate Entity**

The SAIMM Scholarship Fund - 452 918

The loan is unsecured, bears no interest and has no fixed terms of payment.

4. Other financial assets**At fair value**

| | | |
|------------------------------------|-------------------|-------------------|
| Listed shares/bonds - Appleton AFC | 30 166 984 | 27 350 364 |
| Medals - Gold | 131 181 | - |
| Medals - Platinum | 202 890 | - |
| | 30 501 055 | 27 350 364 |

Non-current assets

At fair value 30 501 055 27 350 364

Notes to the Annual Financial Statements

| | 2018 R | 2017 R |
|---|------------------|------------------|
| 5. Inventories | | |
| Merchandise | 316 494 | 227 295 |
| 6. Trade and other receivables | | |
| Trade receivables | 3 834 913 | 1 261 480 |
| VAT | 286 673 | – |
| Franking machine deposit | 10 776 | 10 776 |
| | 4 132 362 | 1 272 256 |
| 7. Cash and cash equivalents | | |
| Cash and cash equivalents consist of: | | |
| Cash on hand | 36 938 | 45 524 |
| Bank balances | 1 209 746 | 903 436 |
| Short-term deposits | 1 510 824 | 2 360 952 |
| Appleton AFC Settlement | 21 191 | 2 841 |
| Standard Bank Account - Western Cape Branch | 596 936 | 596 936 |
| | 3 375 635 | 3 909 689 |
| 8. Trade and other payables | | |
| Trade and payables | 544 975 | 1 708 962 |
| Debtors in Credit | 1 847 383 | – |
| VAT | – | 15 458 |
| Standard Bank Credit Card | 450 626 | 23 925 |
| | 2 842 984 | 1 748 345 |
| 9. Funds | | |
| Balance at beginning of the year | 5 458 977 | 5 223 902 |
| Withdrawal for the year | (500 000) | – |
| Interest received | – | 235 075 |
| | 4 958 977 | 5 458 977 |
| Professor R.E. Robinson Fund (Book Publication Fund) | 883 177 | 845 145 |
| Interest received | – | 38 145 |
| | 883 177 | 883 290 |
| Brigadier Stokes Memorial Fund | 8 048 | 7 702 |
| Interest received | – | 346 |
| | 8 048 | 8 048 |

Notes to the Annual Financial Statements

| | 2018 R | 2017 R |
|---|--------------------|--------------------|
| 9. Funds (continued) | | |
| P.W.J. van Rensburg Memorial Fund (Education Fund) | 1 339 909 | 1 282 210 |
| Interest received | – | 57 699 |
| | 1 339 909 | 1 339 909 |
| MacArthur Forest Memorial Fund (Awards Fund) | 563 974 | 539 688 |
| Interest received | – | 24 286 |
| | 563 974 | 563 974 |
| Infacon X Research Fund | 2 422 094 | 2 317 793 |
| Interest received | – | 104 301 |
| Withdrawal | (500 000) | – |
| | 1 922 094 | 2 422 094 |
| SANCOT Fund | 153 694 | 147 076 |
| Interest received | – | 6 618 |
| | 153 694 | 153 694 |
| The Dave Ortlepp Fund | 88 081 | 84 288 |
| Interest received | – | 3 793 |
| | 88 081 | 88 081 |
| 10. Investment revenue | | |
| Dividend revenue | | |
| Dividend - Argon | 833 871 | 617 156 |
| Interest revenue | | |
| Interest received | 48 610 | 282 688 |
| Other interest | 77 676 | – |
| | 126 286 | 282 688 |
| | 960 157 | 899 844 |
| 11. Cash used in operations | | |
| Profit (loss) before taxation | 5 018 353 | (63 782) |
| Adjustments for: | | |
| Depreciation and amortisation | 70 805 | 68 316 |
| Loss (profit) on sale of assets | 204 916 | (1 110 034) |
| Dividends received | (833 871) | (617 156) |
| Interest received | (126 286) | (282 688) |
| Finance costs | 6 442 | – |
| Fair value adjustments | (3 921 619) | (86 014) |
| Loss (profit) on sale of assets - prior year figure | – | (3 399) |
| Movements in provisions | (142 343) | (94 436) |
| Withdrawal from investment | (500 000) | – |
| Changes in working capital: | | |
| Inventories | (89 199) | (16 808) |
| Trade and other receivables | (2 860 106) | (868 830) |
| Prepayments | (233 747) | – |
| Trade and other payables | 1 094 639 | 517 925 |
| | (2 312 016) | (2 556 906) |

Detailed Income Statements

| | Notes | 2018 R | 2017 R |
|-------------------------------------|-------|---------------------|---------------------|
| Revenue | | | |
| Rendering of services | | 25 995 485 | 16 497 764 |
| Cost of sales | | | |
| Opening stock | | (277 295) | – |
| Purchases | | (18 170 451) | (13 313 714) |
| Closing stock | | 316 494 | 227 295 |
| | | (18 081 252) | (13 086 419) |
| Gross profit | | 7 914 233 | 3 411 345 |
| Other income | | | |
| Administration fees recovered | | 720 585 | 324 768 |
| Dividend revenue | 10 | 833 871 | 617 156 |
| Fair value adjustments | | 3 921 619 | 86 014 |
| Gains on disposal of assets | | – | 1 110 034 |
| Interest received | 10 | 126 286 | 282 688 |
| Miscellaneous sales | | 31 342 | 21 124 |
| Refunds received | | – | 441 |
| Royalties OneMine | | – | 55 608 |
| Royalties publications | | – | 8 144 |
| SAMREC/SAMVAL contribution | | 57 135 | 44 410 |
| | | 5 690 838 | 2 550 387 |
| Expenses (refer to page 982) | | (8 580 276) | (6 025 514) |
| Operating profit (loss) | | 5 024 795 | (63 782) |
| Finance costs | | (6 442) | – |
| Profit (loss) for the year | | 5 018 353 | (63 782) |

Detailed Income Statement

| | Note(s) | 2018 R | 2017 R |
|---|---------|------------------|------------------|
| Operating expenses | | | |
| Annual General Meeting | | 104 781 | 18 035 |
| Annual General Meeting medals | | 148 860 | 10 972 |
| Auditors remuneration | | 81 750 | 72 150 |
| Bad debts | | 830 989 | (5 685) |
| Bank charges | | 52 713 | 53 206 |
| Cleaning | | 1 154 | 3 556 |
| Computer expenses | | 202 644 | 171 080 |
| Consulting fees | | 163 768 | 97 056 |
| Council dinner | | 53 678 | 15 582 |
| Credit card charges | | 126 211 | 61 709 |
| Delivery expenses | | 19 070 | 16 936 |
| Depreciation, amortisation and impairments | | 70 805 | 68 316 |
| Discount allowed | | – | 827 |
| Donations | | 6 000 | – |
| Employee costs | | 3 595 462 | 3 540 582 |
| Flowers, plants and decor | | 143 510 | 2 432 |
| General expenses | | 579 | 1 374 |
| Gifts | | 5 764 | 25 739 |
| Infacon expenses | | – | 25 092 |
| Insurance | | 59 615 | 52 136 |
| Internet charges | | 151 229 | 49 993 |
| Lease rentals on operating lease | | 253 689 | 207 661 |
| Legal expenses | | 24 950 | 21 850 |
| Library services | | 2 250 | 10 120 |
| Loss on exchange differences | | 38 328 | 13 979 |
| Loss on sale of investments | | 204 916 | – |
| Management fees - investment | | 237 174 | 211 687 |
| Meeting expenses | | 22 830 | 35 373 |
| Membership internet connection | | – | 65 814 |
| Office Bearers/Council expenses | | 62 610 | 77 140 |
| Parking expenses | | 104 181 | 88 060 |
| Photocopier expenses | | 394 960 | 319 085 |
| President's expenses | | 7 196 | 12 218 |
| Printing and stationery | | 52 103 | 83 428 |
| Refunds | | – | 310 |
| Repairs and maintenance | | 30 886 | 26 228 |
| Secretarial fees | | 45 660 | 36 625 |
| Setcom/paygate charges | | 12 008 | 3 963 |
| Scholarship Trust Fund donations - prior year | | 458 768 | – |
| Scholarship Trust Fund donations - current year | | 242 000 | – |
| Software expenses | | 115 360 | 52 111 |
| Staff expenses | | 7 201 | 25 785 |
| Staff welfare | | 36 899 | 39 887 |
| Student prizes | | 5 500 | – |
| Subscriptions | | 355 221 | 366 515 |
| Training | | 8 740 | 11 842 |
| Website development/maintenance | | 2 515 | 35 745 |
| Website hosting | | 35 749 | – |
| | | 8 580 276 | 6 025 514 |

THE SOUTHERN AFRICAN INSTITUTE OF MINING AND METALLURGY
WESTERN CAPE BRANCH
ANNUAL FINANCIAL STATEMENTS
FOR THE YEAR ENDED 30 JUNE 2018

General Information

| | |
|--|---|
| Country of incorporation and domicile | South Africa |
| Nature of business and principal activities | The Southern African Institute of Mining and Metallurgy is a professional institute with local and international links aimed at assisting members to source information about technological developments in the mining, metallurgy, and related sectors. This non-profit entity operates in South Africa. |
| Office Bearers | Professor S. Ndlovu A.S. Macfarlane M.I. Mthenjane Z. Botha Professor C. Musingwini V.G. Duke Professor R.T. Jones |
| Registered office | University of Cape Town Private Bag X3 Rondebosch 7701 |
| Postal address | PO Box 61127 Marshalltown 2107 |
| Bankers | Standard Bank of South Africa |
| Auditors | Genesis Chartered Accountants Chartered Accountants (SA) Registered Auditors |
| Preparer | The annual financial statements were independently compiled by: J. Den Drijver CA(SA) |

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The reports and statements set out below comprise the annual financial statements presented to the Office Bearers:

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| Office Bearers' Responsibilities and Approval | 988 |
| Office Bearers' Report | 989 |
| Independent Auditor's Report | 990 |
| Statement of Financial Position | 991 |
| Statement of Comprehensive Income | 991 |
| Statement of Changes in Equity | 992 |
| Statement of Cash Flows | 992 |
| Accounting Policies | 993 |
| Notes to the Annual Financial Statements | 994–995 |
| The following supplementary information does not form part of the annual financial statements and is unaudited: Detailed Income Statement | 996 |

Office Bearers' Responsibilities and Approval

The Office Bearers are required to maintain adequate accounting records and are responsible for the content and integrity of the annual financial statements and related financial information included in this report. It is their responsibility to ensure that the annual financial statements fairly present the state of affairs of The Southern African Institute of Mining and Metallurgy Western Cape Branch as at the end of the financial year and the results of its operations and cash flows for the period then ended, in conformity with the International Financial Reporting Standard for Small and Medium-sized Entities. The external auditors are engaged to express an independent opinion on the annual financial statements.

The annual financial statements are prepared in accordance with the International Financial Reporting Standard for Small and Medium-sized Entities and are based upon appropriate accounting policies consistently applied and supported by reasonable and prudent judgements and estimates.

The Office Bearers acknowledge that they are ultimately responsible for the system of internal financial control established by the Branch and place considerable importance on maintaining a strong control environment. To enable the Office Bearers to meet these responsibilities, the Office Bearers sets standards for internal control aimed at reducing the risk of error or loss in a cost effective manner. The standards include the proper delegation of responsibilities within a clearly defined framework, effective accounting procedures and adequate segregation of duties to ensure an acceptable level of risk. These controls are monitored throughout the Branch and all employees are required to maintain the highest ethical standards in ensuring the Branch's business is conducted in a manner that in all reasonable circumstances is above reproach. The focus of risk management in the Branch is on identifying, assessing, managing and monitoring all known forms of risk across the Branch. While operating risk cannot be fully eliminated, the branch endeavours to minimize it by ensuring that appropriate infrastructure, controls, systems and ethical behaviour are applied and managed within predetermined procedures and constraints.

The Office Bearers are of the opinion, based on the information and explanations given by management, that the system of internal control provides reasonable assurance that the financial records may be relied on for the preparation of the annual financial statements. However, any system of internal financial control can provide only reasonable, and not absolute, assurance against material misstatement or loss.

The Office Bearers have reviewed the Branch's cash flow forecast for the year to 30 June 2019 and, in the light of this review and the current financial position, they are satisfied that the Branch has or has access to adequate resources to continue in operational existence for the foreseeable future.

The external auditors are responsible for independently auditing and reporting on the Branch's annual financial statements. The annual financial statements have been examined by the Branch's external auditors and their report is presented on page 990.

The annual financial statements set out on pages 991–996 have been prepared on the going concern basis, were approved by the Office Bearers on 31 July 2018 and were signed on their behalf by:



Professor S. Ndlovu



V.G. Duke

Office Bearers' Report

The Office Bearers have pleasure in submitting their report on the annual financial statements of The Southern African Institute of Mining and Metallurgy Western Cape Branch for the year ended 30 June 2018.

1. Nature of business

The Southern African Institute of Mining and Metallurgy is a professional institute with local and international links aimed at assisting members and source information about technological developments in the mining, metallurgy and related sectors. There have been no material changes to the nature of the Institute's business from the prior year.

2. Review of financial results and activities

The annual financial statements have been prepared in accordance with the International Financial Reporting Standards, and the accounting policies for this Branch. The accounting policies have been applied consistently compared to the prior year.

Full details of the financial position, results of operations and cash flows of the Southern African Institute of Mining and Metallurgy Western Cape branch are set out in these annual financial statements.

3. Office Bearers

The Office Bearers in office at the date of this report are as follows:

| Office Bearers | Designation |
|-------------------------|--------------------------|
| Professor S. Ndlovu | President |
| A.S. Macfarlane | President Elect |
| M.I. Mthenjane | Senior Vice President |
| Z. Botha | Junior Vice President |
| Professor C. Musingwini | Immediate Past President |
| V.G. Duke | Honorary Treasurer |
| Professor R.T. Jones | Past President |

There have been no changes to the above mentioned structure for the period under review.

4. Events after the reporting period

The Office Bearers are not aware of any material event which occurred after the reporting date and up to the date of this report.

5. Going concern

The Office Bearers believe that the Branch has adequate financial resources to continue in operation for the foreseeable future and accordingly the annual financial statements have been prepared on a going concern basis. The Office Bearers have satisfied themselves that the Branch is in a sound financial position and that it has access to sufficient borrowing facilities to meet its foreseeable cash requirements. The Office Bearers are not aware of any new material changes that may adversely impact the Branch. The Office Bearers are also not aware of any material non-compliance with statutory or regulatory requirements or of any pending changes to legislation which may affect the Branch.

6. Auditors

Genesis Chartered Accountants will continue in office-.

Independent Auditor's Report

To the Office Bearers of The Southern African Institute of Mining and Metallurgy Western Cape Branch

Disclaimer of opinion

We were engaged to audit the annual financial statements of The Southern African Institute of Mining and Metallurgy Western Cape Branch set out on pages 991–996, which comprise the statement of financial position as at 30 June 2018, and the statement of comprehensive income, statement of changes in equity and statement of cash flows for the year then ended, and notes to the annual financial statements, including a summary of significant accounting policies.

We do not express an opinion on the annual financial statements of The Southern African Institute of Mining and Metallurgy Western Cape Branch because of the significance of the matters described in the basis for disclaimer of opinion section of our report. We have not been able to obtain sufficient appropriate audit evidence to provide a basis for an audit opinion on these annual financial statements.

Basis for disclaimer of opinion

Due to a lack of supporting documentation, we have been unable to carry out all of the audit procedures that we deemed necessary to satisfy ourselves as to the completeness, existence and valuation of Other financial assets (R596 936), Trade receivables (R66 237), Accruals (R8 451) and Other financial liabilities (R223 351).

Other information

The Office Bearers are responsible for the other information. The other information comprises the Office Bearers' Report which we obtained prior to the date of this report. Other information does not include the annual financial statements and our auditor's report thereon.

We have read the other information and, in doing so, considered whether the other information is materially inconsistent with the annual financial statements or our knowledge obtained in the audit, or otherwise appears to be materially misstated. However, due to the disclaimer of opinion in terms of the International Standard on Auditing (ISA) 705 (Revised), Modifications to the Opinion in the Independent Auditor's Report, we are unable to report further on this other information.

Responsibilities of the Office Bearers for the Annual Financial Statements

The Office Bearers are responsible for the preparation and fair presentation of the annual financial statements in accordance with International Financial Reporting Standard for Small and Medium-sized Entities, and for such internal control as the Office Bearers determine is necessary to enable the preparation of annual financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the annual financial statements, the Office Bearers are responsible for assessing the Branch's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the Office Bearers either intend to liquidate the Branch or to cease operations, or have no realistic alternative but to do so.

Auditor's responsibilities for the audit of the Annual Financial Statements

Our responsibility is to conduct an audit of the Branch's annual financial statements in accordance with International Standards on Auditing and to issue an auditor's report. However, because of the matter described in the Basis for disclaimer of opinion section of our report, we were unable to obtain sufficient appropriate audit evidence to provide a basis for an audit opinion on these annual financial statements.

We are independent of the Southern African Institute of Mining and Metallurgy Western Cape Branch in accordance with the Independent Regulatory Board for Auditors Code of Professional Conduct for Registered Auditors (IRBA Code) and other independence requirements applicable to performing audits of annual financial statements in South Africa. We have fulfilled our other ethical responsibilities in accordance with the IRBA Code and in accordance with other ethical requirements applicable to performing audits in South Africa. The IRBA Code is consistent with the International Ethics Standards Board for Accountants Code of Ethics for Professional Accountants (Parts A and B).


Genesis Chartered Accountants
Registered Auditor
CWB White CA(SA)
Partner

3 August 2018
Johannesburg

Statement of Financial Position as at 30 June 2018

| | <i>Note(s)</i> | 2018 R | 2017 R |
|-------------------------------------|----------------|------------------|------------------|
| Assets | | | |
| Non-Current Assets | | | |
| Other financial assets | 2 | 596 936 | 596 936 |
| Current Assets | | | |
| Trade and other receivables | 3 | 18 463 | 4 165 |
| Cash and cash equivalents | 4 | 558 313 | 514 922 |
| | | 576 776 | 519 087 |
| Total Assets | | 1 173 712 | 1 116 023 |
| Equity and Liabilities | | | |
| Equity | | | |
| Accumulated funds | | 846 038 | 853 932 |
| Liabilities | | | |
| Non-Current Liabilities | | | |
| Other financial liabilities | 5 | 223 351 | 223 351 |
| Current Liabilities | | | |
| Trade and other payables | 6 | 104 323 | 38 740 |
| Total Liabilities | | 327 674 | 262 091 |
| Total Equity and Liabilities | | 1 173 712 | 1 116 023 |

Statement of Comprehensive Income

| | <i>Note(s)</i> | 2018 R | 2017 R |
|--------------------------|----------------|-----------------|-----------------|
| Revenue | 7 | 178 700 | – |
| Cost of sales | | (190 390) | – |
| Gross loss | | (11 690) | – |
| Other income | | – | 41 585 |
| Operating expenses | | (17 933) | (112 266) |
| Operating loss | | (29 623) | (70 681) |
| Investment revenue | 8 | 21 729 | 28 673 |
| Fair value adjustments | | – | 37 743 |
| Loss for the year | | (7 894) | (4 265) |

Statement of Changes in Equity

| | Accumulated surplus R | Total equity R |
|-------------------------|--------------------------|-------------------|
| Balance at 1 July 2016 | 858 197 | 858 197 |
| Loss for the year | (4 265) | (4 265) |
| Balance at 1 July 2017 | 853 932 | 853 932 |
| Loss for the year- | (7 894) | (7 894) |
| Balance at 30 June 2018 | 846 038 | 846 038 |

Statement of Cash Flows

| | Note(s) | 2018 R | 2017 R |
|---|---------|----------------|-----------------|
| Cash flows from operating activities | | | |
| Cash generated from (used in) operations | 10 | 21 662 | (35 451) |
| Interest income | | 21 729 | 28 673 |
| Net cash from operating activities | | 43 391 | (6 778) |
| Cash flows from investing activities | | | |
| Decrease in financial assets | | - | (37 742) |
| Net cash from investing activities | | - | (37 742) |
| Cash flows from financing activities | | | |
| Repayment of other financial liabilities | | - | 223 351 |
| Net cash from financing activities | | - | 223 351 |
| Total cash movement for the year | | 43 391 | 178 831 |
| Cash at the beginning of the year | | 514 922 | 336 091 |
| Total cash at end of the year | 4 | 558 313 | 514 922 |

Accounting Policies

1. Basis of preparation and summary of significant accounting policies

The annual financial statements have been prepared on a going concern basis in accordance with the International Financial Reporting Standard for Small and Medium-sized Entities. The annual financial statements have been prepared on the historical cost basis, and incorporate the principal accounting policies set out below. They are presented in South African rands.

These accounting policies are consistent with the previous period.

1.1 Significant judgements and sources of estimation uncertainty

Critical judgements in applying accounting policies

The Office Bearers did not make critical judgements in the application of accounting policies, apart from those involving estimations, which would significantly affect the annual financial statements.

Key sources of estimation uncertainty

The financial statements do not include assets or liabilities whose carrying amounts were determined based on estimations for which there is a significant risk of material adjustments in the following financial year as a result of the key estimation assumptions.

1.2 Financial instruments

Initial measurement

Financial instruments are initially measured at the transaction price (including transaction costs except in the initial measurement of financial assets and liabilities that are measured at fair value through profit or loss) unless the arrangement constitutes, in effect, a financing transaction in which case it is measured at the present value of the future payments discounted at a market rate of interest for a similar debt instrument.

Financial instruments at fair value

All other financial instruments, including equity instruments that are publicly traded or whose fair value can otherwise be measured reliably, without undue cost or effort, are measured at fair value through profit and loss.

If a reliable measure of fair value is no longer available without undue cost or effort, then the fair value at the last date that such a reliable measure was available is treated as the cost of the instrument. The instrument is then measured at cost less impairment until management are able to measure fair value without undue cost or effort.

1.3 Impairment of assets

The branch assesses at each reporting date whether there is any indication that property, plant and equipment or intangible assets or goodwill may be impaired.

If there is any such indication, the recoverable amount of any affected asset (or group of related assets) is estimated and compared with its carrying amount. If the estimated recoverable amount is lower, the carrying amount is reduced to its estimated recoverable amount, and an impairment loss is recognized immediately in profit or loss.

If an impairment loss subsequently reverses, the carrying amount of the asset (or group of related assets) is increased to the revised estimate of its recoverable amount, but not in excess of the amount that would have been determined had no impairment loss been recognized for the asset (or group of assets) in prior years. A reversal of impairment is recognized immediately in profit or loss.

1.4 Revenue

Revenue is recognized to the extent that the Branch has transferred the significant risks and rewards of ownership of goods to the buyer, or has rendered services under an agreement provided the amount of revenue can be measured reliably and it is probable that economic benefits associated with the transaction will flow to the Branch. Revenue is measured at the fair value of the consideration received or receivable, excluding sales taxes and discounts.

Interest is recognized, in profit or loss, using the effective interest rate method.

Notes to the Annual Financial Statements

| | 2018 R | 2017 R |
|--|----------------|----------------|
| 2. Other financial assets | | |
| At fair value | | |
| Listed shares | 596 936 | 596 936 |
| Non-current assets | | |
| At fair value | 596 936 | 596 936 |
| 3. Trade and other receivables | | |
| Trade receivables | 18 463 | – |
| UCT Fund | – | 4 165 |
| | 18 463 | 4 165 |
| 4. Cash and cash equivalents | | |
| Cash and cash equivalent consist of: | | |
| Bank balances | 25 132 | 3 355 |
| Short-term deposits | 533 181 | 511 567 |
| | 588 313 | 514 922 |
| 5. Other financial liabilities | | |
| At fair value | | |
| The Southern African Institute of Mining and Metallurgy This loan is unsecured, interest free, and has no specified terms of repayment. | 223 351 | 223 351 |
| Non-current liabilities | | |
| At fair value | 223 351 | 223 351 |
| 6. Trade and other payables | | |
| Trade debtors in credit | 84 701 | – |
| UCT fund | 6 171 | – |
| Accruals | 8 451 | 33 740 |
| Accrued audit fees | 5 000 | 5 000 |
| | 104 323 | 38 740 |
| 7. Revenue | | |
| Rendering of services | 178 700 | – |

Notes to the Annual Financial Statements

| | 2018 R | 2017 R |
|-------------------------------------|--------------|----------------|
| 8. Investment revenue | | |
| Interest revenue | | |
| Bank | 21 729 | 28 673 |
| <hr/> | | |
| 9. Auditor's remuneration | | |
| Fees | - | 5 000 |
| <hr/> | | |
| 10. Trade and other payables | | |
| Loss before taxation | (7 894) | (4 265) |
| Adjustment for: | | |
| Interest received | (21 729) | (28 673) |
| Changes in working capital | | |
| Trade and other receivables | (14 298) | (4 165) |
| Trade and other payables | 65 583 | 1 652 |
| | <hr/> 21 662 | <hr/> (35 451) |

Detailed Income Statement

| | <i>Note(s)</i> | 2018 R | 2017 R |
|---------------------------------------|----------------|-----------------|----------------|
| Revenue | | | |
| Conference fees | | 178 7000 | - |
| Cost of sales | | | |
| Conference costs | | (190 390) | - |
| Gross loss | | | |
| | | (11 690) | - |
| Other income | | | |
| Reversal of/ (Adjustments/write offs) | | - | 41 585 |
| Fair value adjustments | | - | 37 743 |
| Interest received | 8 | 21 729 | 28 673 |
| | | 21 729 | 108 001 |
| Operating expenses | | | |
| AGM expenses | | 850 | - |
| Accounting fees | | - | 45 314 |
| Auditor's remuneration | 9 | - | 5 000 |
| Bank charges | | 2 475 | 2 345 |
| Book Prize | | - | 6 000 |
| Catering - Meetings | | - | 262 |
| Committee dinner | | 5 781 | 4 281 |
| Computer expenses | | 699 | - |
| Employee costs | | - | 32 385 |
| Printing and stationery | | 250 | 1 000 |
| Student evenings | | 6 180 | 10 324 |
| Telephone and fax | | 1 698 | 5 355 |
| | | 17 933 | 112 266 |
| Loss for the year | | (7 894) | (4 265) |

THE SAIMM SCHOLARSHIP FUND
(REGISTRATION NUMBER IT 6837/02)
ANNUAL FINANCIAL STATEMENTS
FOR THE YEAR ENDED 30 JUNE 2018

The SAIMM Scholarship Fund

(Registration number: IT 6837/02)

Annual Financial Statements for the year ended 30 June 2018

General Information

| | |
|--|--|
| Country of incorporation and domicile | South Africa |
| Trustees | J.R. Dixon R.P. Mohring (deceased 14/03/2016) M.H. Rogers W.H. van Niekerk |
| Business Address | 5 Hollard Street Marshalltown 2001 |
| Postal address | PO Box 61127 Marshalltown 2107 |
| Bankers | First National Bank |
| Auditors | Genesis Chartered Accountants Chartered Accountants (SA) Registered Auditors |
| Trus registration number | IT 6837/02 |
| Level of assurance | These annual financial statements have been audited in compliance with the applicable requirements of the Trust Property Control Act 57 of 1988. |
| Preparer | The annual financial statements were independently compiled by: J. Den Drijver CA(SA) |

The SAIMM Scholarship Fund

(Registration number: IT 6837/02)

Annual Financial Statements for the year ended 30 June 2018

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| Accounting Policies | 1006 |
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Trustees' Responsibilities and Approval

The Trustees are required to maintain adequate accounting records and are responsible for the content and integrity of the annual financial statements and related financial information included in this report. It is their responsibility to ensure that the annual financial statements fairly present the state of affairs of the Trust as at the end of the financial year and the results of its operations and cash flows for the period then ended, in conformity with the International Financial Reporting Standard for Small and Medium-sized Entities. The external auditors are engaged to express an independent opinion on the annual financial statements.

The annual financial statements are prepared in accordance with the International Financial Reporting Standard for Small and Medium-sized Entities and are based upon appropriate accounting policies consistently applied and supported by reasonable and prudent judgments and estimates.

The Trustees acknowledge that they are ultimately responsible for the system of internal financial control established by the trust and place considerable importance on maintaining a strong control environment. To enable the trustees to meet these responsibilities, the Trustees sets standards for internal control aimed at reducing the risk of error or loss in a cost-effective manner. The standards include the proper delegation of responsibilities within a clearly defined framework, effective accounting procedures and adequate segregation of duties to ensure an acceptable level of risk. These controls are monitored throughout the Trust and all employees are required to maintain the highest ethical standards in ensuring the Trust's business is conducted in a manner that in all reasonable circumstances is above reproach. The focus of risk management in the trust is on identifying, assessing, managing and monitoring all known forms of risk across the Trust. While operating risk cannot be fully eliminated, the Trust endeavours to minimize it by ensuring that appropriate infrastructure, controls, systems and ethical behaviour are applied and managed within predetermined procedures and constraints.

The Trustees are of the opinion, based on the information and explanations given by management, that the system of internal control provides reasonable assurance that the financial records may be relied on for the preparation of the annual financial statements. However, any system of internal financial control can provide only reasonable, and not absolute, assurance against material misstatement or loss.

The Trustees have reviewed the Trust's cash flow forecast for the year to 30 June 2019 and, in the light of this review and the current financial position, They are satisfied that the Trust has or has access to adequate resources to continue in operational existence for the foreseeable future.

The external auditors are responsible for independently auditing and reporting on the Trust's annual financial statements. The annual financial statements have been examined by the Trust's external auditors and their report is presented on pages 1002 to 1003.

The annual financial statements set out on pages 1001 to 1007, which have been prepared on the going concern basis, were approved by the Trustees on 03 August 2018 and were signed by:



Chairperson: J.R. Dixon

The SAIMM Scholarship Fund

(Registration number: IT 6837/02)

Annual Financial Statements for the year ended 30 June 2018

Trustees' Report

The Trustees have pleasure in submitting their report on the annual financial statements of The SAIMM Scholarship Fund for the year ended 30 June 2018.

1. The Trust

The Trust was registered on 11 November 2002 with a registration number IT 6837/02. The fund can sue and be sued in its own name.

The objective of the Trust is to promote, foster and advance the interest of minerals industry by providing the beneficiaries with funds to be used to support the education of student in the minerals industry.

2. Nature of business

The SAIMM Scholarship Fund was formed in South Africa with interests in the Non-profit industry. The trust operates in South Africa.

The objective of the Trust is to promote, foster and advance the interest of minerals industry by providing the beneficiaries with funds to be used to support the education of student in the minerals industry and to collect monies and accept contributions in monies or otherwise by way of donations, bequests, or otherwise and to apply the same or the income therefrom for all or any object as set out.

The fund has no full time employees and is administered by The Southern African Institute of Mining and Metallurgy.

There have been no material changes to the nature of the Trust's business from the prior year.

3. Review of financial results and activities

The annual financial statements have been prepared in accordance with International Financial Reporting Standard for Small and Medium-sized Entities. The accounting policies have been applied consistently compared to the prior year.

Full details of the financial position, results of operations and cash flows of the Trust are set out in these annual financial statements.

4. Beneficiaries

The beneficiaries of the Trust are the Minerals Education Departments of those universities and technikons in South Africa as determined by the trustees.

5. Trustees

The Trustees in office at the date of this report are as follows:

J.R. Dixon

R.P. Mohring (deceased 14/03/2016)

M.H. Rogers

W.H. van Niekerk

6. Borrowing powers

In terms of the Trust Deed, the borrowing powers of the Trust are unlimited. However all borrowings by the Trust are subject to Board approval as required by the Board delegation of authority.

7. Events after the reporting period

The Trustees are not aware of any material event which occurred after the reporting date and up to the date of this report.

8. Going concern

The Trustees believe that the Trust has adequate financial resources to continue in operation for the foreseeable future and accordingly the annual financial statements have been prepared on a going concern basis. The Trustees have satisfied themselves that the Trust is in a sound financial position and that it has access to sufficient borrowing facilities to meet its foreseeable cash requirements. The Trustees are not aware of any new material changes that may adversely impact the Trust. The Trustees are also not aware of any material non-compliance with statutory or regulatory requirements or of any pending changes to legislation which may affect the Trust.

9. Auditors

Genesis Chartered Accountants will continue in office.

The SAIMM Scholarship Fund

(Registration number: IT 6837/02)

Annual Financial Statements for the year ended 30 June 2018

Independent Auditor's Report

To the trustees of The SAIMM Scholarship Fund

Opinion

We have audited the annual financial statements of The SAIMM Scholarship Fund set out on pages 1004 to 1007, which comprise the statement of financial position as at 30 June 2018, and the statement of comprehensive income, statement of changes in equity and statement of cash flows for the year then ended, and notes to the annual financial statements, including a summary of significant accounting policies.

In our opinion, the annual financial statements present fairly, in all material respects, the financial position of The SAIMM Scholarship Fund as at 30 June 2018, and its financial performance and cash flows for the year then ended in accordance with International Financial Reporting Standard for Small and Medium-sized Entities and the requirements of the Trust Property Control Act 57 of 1988.

Basis for opinion

We conducted our audit in accordance with International Standards on Auditing. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the annual financial statements section of our report. We are independent of the Trust in accordance with the Independent Regulatory Board for Auditors Code of Professional Conduct for Registered Auditors (IRBA Code) and other independence requirements applicable to performing audits of annual financial statements in South Africa. We have fulfilled our other ethical responsibilities in accordance with the IRBA Code and in accordance with other ethical requirements applicable to performing audits in South Africa. The IRBA Code is consistent with the International Ethics Standards Board for Accountants Code of Ethics for Professional Accountants (Parts A and B). We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Other information

The Trustees are responsible for the other information. The other information comprises the Trustees' Report as required by the Trust Property Control Act 57 of 1988, which we obtained prior to the date of this report. Other information does not include the annual financial statements and our auditor's report thereon.

Our opinion on the annual financial statements does not cover the other information and we do not express an audit opinion or any form of assurance conclusion thereon.

In connection with our audit of the annual financial statements, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the annual financial statements or our knowledge obtained in the audit, or otherwise appears to be materially misstated. If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

Independent Auditor's Report

Responsibilities of the Trustees for the Annual Financial Statements

The Trustees are responsible for the preparation and fair presentation of the annual financial statements in accordance with International Financial Reporting Standard for Small and Medium-sized Entities and the requirements of the Trust Property Control Act 57 of 1988, and for such internal control as the Trustees determine is necessary to enable the preparation of annual financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the annual financial statements, the Trustees are responsible for assessing the Trust's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the Trustees either intend to liquidate the Trust or to cease operations, or have no realistic alternative but to do so.

Auditor's responsibilities for the audit of the Annual Financial Statements

Our objectives are to obtain reasonable assurance about whether the annual 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 our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with International Standards on Auditing will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these annual financial statements.

As part of an audit in accordance with International Standards on Auditing, we exercise professional judgement and maintain professional scepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the annual 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 our 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 Trust's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the Trustees.
- Conclude on the appropriateness of the Trustees' use of the going concern basis of accounting and based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Trust's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the annual financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Trust to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the annual financial statements, including the disclosures, and whether the annual financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with the Trustees regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.



Genesis Chartered Accountants
Registered Auditor
CWB White CA(SA)
Partner

3 August 2018
Johannesburg

The SAIMM Scholarship Fund

(Registration number: IT 6837/02)

Annual Financial Statements for the year ended 30 June 2018

Statement of Financial Position as at 30 June 2018

| | <i>Note(s)</i> | 2018 R | 2017 R |
|-------------------------------|----------------|---------------|------------------|
| Assets | | | |
| Current Assets | | | |
| Cash and cash equivalents | 3 | 20 492 | 20 436 |
| Total Assets | | 20 492 | 20 436 |
| Equity and Liabilities | | | |
| Equity | | | |
| Trust capital | | 1 000 | 1 000 |
| Accumulated surplus | | 19 492 | (433 482) |
| | | 20 492 | (432 482) |
| Liabilities | | | |
| Current Liabilities | | | |
| Loans from group companies | 2 | – | 452 918 |
| | | 20 492 | 20 436 |

Statement of Comprehensive Income

| | <i>Note(s)</i> | 2018 R | 2017 R |
|---------------------------------------|----------------|----------------|------------------|
| Revenue | | | |
| Donations Received - prior years | | 458 768 | – |
| Donations Received - current year | | 242 000 | 22 500 |
| | 4 | 700 768 | 22 500 |
| Cost of sales | | | |
| Donations Paid | | (242 000) | (251 091) |
| Gross surplus (deficit) | | 458 768 | (228 591) |
| Other income | | | |
| Annual Banquet Raffle | | 3 000 | – |
| Interest received | 6 | 1 171 | 2 577 |
| | | 4 171 | 2 577 |
| Operating expenses | | | |
| Bank charges | | 1 115 | – |
| Annual Banquet Raffle | | 8 850 | – |
| | | 9 965 | – |
| Surplus (deficit) for the year | | 452 974 | (226 014) |

The SAIMM Scholarship Fund

(Registration number: IT 6837/02)

Annual Financial Statements for the year ended 30 June 2018

Statement of Changes in Equity

| | Trus capital R | Accumulated surplus R | Total equity R |
|-------------------------|-------------------|--------------------------|-------------------|
| Balance at 1 July 2016 | 1 000 | (207 468) | (206 468) |
| Deficit for the year | – | (226 014) | (226 014) |
| Balance at 1 July 2017 | 1 000 | (433 482) | (432 482) |
| Surplus for the year | – | 452 974 | 452 974 |
| Balance at 30 June 2018 | 1 000 | 19 492 | 20 492 |

Statement of Cash Flows

| | Note(s) | 2018 R | 2017 R |
|---|---------|------------------|------------------|
| Cash flows from operating activities | | | |
| Cash generated from (used in) operations | 7 | 451 803 | (228 591) |
| Interest income | | 1 171 | 2 577 |
| | | 452 974 | (226 014) |
| Cash flows from investing activities | | | |
| Net movement in loans to group companies | | (452 918) | (246 450) |
| Net cash from investing activities | | (452 918) | (246 450) |
| Total cash movement for the year | | 56 | 20 436 |
| Cash at the beginning of the year | | 20 436 | – |
| Total cash at end of the year | 3 | 20 492 | 20 436 |

Accounting Policies

1. Basis of preparation and summary of significant accounting policies

The annual financial statements have been prepared on a going concern basis in accordance with the International Financial Reporting Standard for Small and Medium-sized Entities. The annual financial statements have been prepared on the historical cost basis, and incorporate the principal accounting policies set out below. They are presented in South African rands.

These accounting policies are consistent with the previous period.

1.1 Significant judgements and sources of estimation uncertainty

Critical judgements in applying accounting policies

Management did not make critical judgements in the application of accounting policies, apart from those involving estimations, which would significantly affect the annual financial statements.

Key sources of estimation uncertainty

The financial statements do not include assets or liabilities whose carrying amounts were determined based on estimations for which there is a significant risk of material adjustments in the following financial year as a result of the key estimation assumptions.

1.2 Financial instruments

Initial measurement

Financial instruments are initially measured at the transaction price (including transaction costs except in the initial measurement of financial assets and liabilities that are measured at fair value through surplus or deficit) unless the arrangement constitutes, in effect, a financing transaction in which case it is measured at the present value of the future payments discounted at a market rate of interest for a similar debt instrument.

Financial instruments at amortized cost

These include loans, trade receivables and trade payables. Those debt instruments which meet the criteria in section 11.8(b) of the standard, are subsequently measured at amortized cost using the effective interest method. Debt instruments which are classified as current assets or current liabilities are measured at the undiscounted amount of the cash expected to be received or paid, unless the arrangement effectively constitutes a financing transaction.

At each reporting date, the carrying amounts of assets held in this category are reviewed to determine whether there is any objective evidence of impairment. If there is objective evidence, the recoverable amount is estimated and compared with the carrying amount. If the estimated recoverable amount is lower, the carrying amount is reduced to its estimated recoverable amount, and an impairment loss is recognized immediately in surplus or deficit.

Financial instruments at cost

Commitments to receive a loan are measured at cost less impairment.

Equity instruments that are not publicly traded and whose fair value cannot otherwise be measured reliably without undue cost or effort are measured at cost less impairment.

Financial instruments at fair value

All other financial instruments, including equity instruments that are publicly traded or whose fair value can otherwise be measured reliably, without undue cost or effort, are measured at fair value through surplus and deficit.

If a reliable measure of fair value is no longer available without undue cost or effort, then the fair value at the last date that such a reliable measure was available is treated as the cost of the instrument. The instrument is then measured at cost less impairment until management are able to measure fair value without undue cost or effort.

1.3 Tax

Current tax assets and liabilities

The Fund is exempt from taxation in terms of Section 18A of the Income Tax Act.

1.4 Revenue

Revenue comprises contribution received from donors and is recognised on receipt.

Interest is recognized, in surplus or deficit, using the effective interest rate method.

1.5 Borrowing costs

Borrowing costs are recognized as an expense in the period in which they are incurred.

Notes to the Annual Financial Statements

| | 2018 R | 2017 R |
|---|----------------|------------------|
| 2. Loans to (from) group companies | | |
| Subsidiaries | | |
| The Southern African Institute of Mining and Metallurgy | - | (452 918) |
| The loan is unsecured, bears no interest and has no specified terms of repayment. | | |
| <hr/> | | |
| 3. Cash and cash equivalent | | |
| Cash and cash equivalents consist of: | | |
| Bank balances | 20 492 | 20 436 |
| <hr/> | | |
| 4. Revenue | | |
| Donations received - prior year | 458 768 | - |
| Donations received - current year | 242 000 | 22 55 |
| | 700 786 | 22 500 |
| <hr/> | | |
| 5. Other income | | |
| Annual banquet raffle | 3 000 | - |
| <hr/> | | |
| 6. Investment revenue | | |
| Interest revenue | | |
| Bank | 1 171 | 2 577 |
| <hr/> | | |
| 7. Cash generated from (used in) operations | | |
| Surplus (deficit) before taxation | 452 974 | (226 014) |
| Adjustment for: | | |
| Interest received | (1 171) | (2 577) |
| | 451 803 | (228 591) |
| <hr/> | | |



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NATIONAL & INTERNATIONAL ACTIVITIES

2018

18–19 September 2018 — 4th Young Professionals Conference

'Creating a sustainable African minerals industry through applied innovation'

Focus Rooms, The Core, Sunninghill, Sandton

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Tel: +27 11 834-1273/7, Fax: +27 11 838-5923/833-8156

E-mail: camielah@saimm.co.za, Website: <http://www.saimm.co.za>

14–17 October 2018 — Furnace Tapping 2018 Conference

Nombolo Mdhuli Conference Centre, Kruger National Park, South Africa

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24 October 2018 — 15th Annual Student Colloquium

'Mining and Metallurgy in a sustainable world'

Johannesburg

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E-mail: yolanda@saimm.co.za, Website: <http://www.saimm.co.za>

25–26 October 2018 — Higher Education Development in the Extractive Industry Workshop 2018

The Wits Club, University of the Witwatersrand, Johannesburg

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E-mail: yolanda@saimm.co.za, Website: <http://www.saimm.co.za>

30 October 2018— Cobalt Processing Short Course Hydrometallurgical Processing of Cobalt

WorleyParsons, Melrose Arch, Johannesburg

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Tel: +27 11 834-1273/7, Fax: +27 11 838-5923/833-8156

E-mail: camielah@saimm.co.za, Website: <http://www.saimm.co.za>

28–30 November 2018 — The SAIMM Zimbabwe Branch are proud to host Mining in Zimbabwe

'Expectations and Opportunities'

Sango Conference Centre, Cresta Hotel, Msasa, Harare

Contact: Yolanda Ndimande

Tel: +27 11 834-1273/7, Fax: +27 11 838-5923/833-8156

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E-mail: yolanda@saimm.co.za, Website: <http://www.saimm.co.za>

11–13 December 2018 – Mauritanides 2018 5th Mauritanian Mining, Oil & Gas Conference and Exhibition

Nouakchott, Mauritania

Tel: +65 6717 6016

Fax: +65 6717 6015

Enquiry@spire-events.com

2019

11–13 March 2019— 7th Sulphur and Sulphuric Acid 2019 Conference

Swakopmund Hotel, Swakopmund, Namibia

Contact: Camielah Jardine

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E-mail: camielah@saimm.co.za, Website: <http://www.saimm.co.za>

24–27 June 2019— Ninth International Conference on Deep and High Stress Mining 2019 Conference

Misty Hills Conference Centre, Muldersdrift, Johannesburg

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E-mail: camielah@saimm.co.za, Website: <http://www.saimm.co.za>

5–7 August 2019 — The Southern African Institute of Mining and Metallurgy in collaboration with The Zululand Branch are organising The Eleventh International Heavy Minerals Conference

'Renewed focus on Process and Optimization'

Cape Winelands, Western Cape

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E-mail: yolanda@saimm.co.za, Website: <http://www.saimm.co.za>

17–18 October 2019— Tailing Storage Conference 2019

'Investing in a Sustainable Future'

Johannesburg

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E-mail: camielah@saimm.co.za, Website: <http://www.saimm.co.za>

17–18 October 2019— Tailing Storage Conference 2019

'Investing in a Sustainable Future'

Johannesburg

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E-mail: camielah@saimm.co.za, Website: <http://www.saimm.co.za>

13–15 November 2019 — XIX International Coal Preparation Congress & Expo 2019

New Delhi, India

Contact: Coal Preparation Society of India

Tel/Fax: +91-11-26136416, 4166 1820

E-mail: cpsidelhi.india@gmail.com, president@cpsi.org.

inrksachdev01@gmail.com, hi.sapru@monnetgroup.com

Company Affiliates

The following organizations have been admitted to the Institute as Company Affiliates

| | | |
|--|---|--|
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| AEL Mining Services Limited | Exxaro Coal (Pty) Ltd | Nalco Africa (Pty) Ltd |
| Air Liquide (Pty) Ltd | Exxaro Resources Limited | Namakwa Sands(Pty) Ltd |
| Alexander Proudfoot Africa (Pty) Ltd | Filtaquip (Pty) Ltd | Ncamiso Trading (Pty) Ltd |
| AMEC Foster Wheeler | FLSmith Minerals (Pty) Ltd | New Concept Mining (Pty) Limited |
| AMIRA International Africa (Pty) Ltd | Fluor Daniel SA (Pty) Ltd | Northam Platinum Ltd - Zondereinde |
| ANDRITZ Delkor(Pty) Ltd | Franki Africa (Pty) Ltd-JHB | OPTRON (Pty) Ltd |
| Anglo Operations Proprietary Limited | Fraser Alexander (Pty) Ltd | PANalytical (Pty) Ltd |
| Anglogold Ashanti Ltd | G H H Mining Machines (Pty) Ltd | Paterson & Cooke Consulting Engineers (Pty) Ltd |
| Arcus Gibb (Pty) Ltd | Geobrug Southern Africa (Pty) Ltd | Perkinelmer |
| Atlas Copco Holdings South Africa (Pty) Limited | Glencore | Polysius A Division Of Thyssenkrupp Industrial Sol |
| Aurecon South Africa (Pty) Ltd | Hall Core Drilling (Pty) Ltd | Precious Metals Refiners |
| Aveng Engineering | Hatch (Pty) Ltd | Rand Refinery Limited |
| Aveng Mining Shafts and Underground | Herrenknecht AG | Redpath Mining (South Africa) (Pty) Ltd |
| Axis House Pty Ltd | HPE Hydro Power Equipment (Pty) Ltd | Rocbolt Technologies |
| Bafokeng Rasimone Platinum Mine | Immersive Technologies | Rosond (Pty) Ltd |
| Barloworld Equipment -Mining | IMS Engineering (Pty) Ltd | Royal Bafokeng Platinum |
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| BCL Limited | Joy Global Inc.(Africa) | RungePincockMinarco Limited |
| Becker Mining (Pty) Ltd | Kudumane Manganese Resources | Rustenburg Platinum Mines Limited |
| BedRock Mining Support Pty Ltd | Leco Africa (Pty) Limited | Salene Mining (Pty) Ltd |
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- Modular unit and cost effective to repair
- Various foot plate sizes available
- Simple CAM and handle to activate
- Removal from a safe distance
- Available from 0.9m to 5.3m

FEATURES

- Load spreader fitted for arial support
- Easy installations
- Supplied with hooks for safety nets
- Carry handle fo ease of transporting and handling
- Lifting handle attached
- Comprehensive training provided on site as standard



RV 89

RE-USABLE & SACRIFICIAL MINE SUPPORT PROP

APPLICATIONS

- Installed as active blast on support at the work face
- Applicable in travelling ways, mono ways, winch chambers, ledging raises and stope faces
- Suitable to stoping heights of 2.3m
- Used with backfill
- Used with blast barricades

BENEFITS

- Yield load can be varied according to customer requirements
- Re-uable
- Remote installation
- Various headboards available
- Removal from a safe distance
- Lightweight and easy to use
- Cannot be over extended
- Active support on installation

FEATURES

- Diameter of 89mm
- Controlled yielding of the prop using valve technology
- Superb energy absorption
- Uses a standard pump to energise
- Can be supplied with hooks for safety nets
- Complete wth top and bottom plate

