PRES SEZ
Reap the benefits of July Geosynthetics Week

BENEFACOCTORs OF THE MONTH
Knight Piesold
Spilo

INTERVIEW
10 Questions for
Jonathan Shamrock

UPCOMING EVENTS
Educate the Educator
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GCYP
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SOCIETIES
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CALENDAR

BENEFACOCTORs
Dear GIGSA Members

This year is a very exciting year for geosynthetics in South Africa as we are going to reap the benefits of many years of effort and long hours into a one-of-a-kind week from 2 to 6 July 2018. The week will kick off with the two-day Educate the Educator programme (EtE), hosted in Africa for the first time. EtE is one of the best recognised initiatives of the International Geosynthetics Society (IGS) with multiple successes worldwide. Following the EtE, we will hold two one-day highly technical workshops in parallel: The Stability of Geosynthetic Lined Sites by Professor D. Timothy Stark, and The Fundamentals of Soil Reinforcement by Professor Martin Ziegler, both recognised international experts. The week will culminate with the two-day Geosynthetics Conference for Young Professionals (GCYP). It is the most important week for geosynthetics in South Africa, as well as Africa, as the IGS has extended invitations to professors and lecturers from throughout Africa.

It is the last year of the current committee’s term of office and we are not going to hold back! We have already hosted a GSI webinar with a great turnout in Johannesburg, but unfortunately turnouts in Durban and Cape Town were low. We will keep up our efforts to ensure our members outside the Gauteng area receive the support they deserve.

During our first committee meeting we awarded the GIGSA bursary. Already in its 4th year with more than R200,000 awarded, the 2018 bursary has been awarded to Nash Dookhi for his PhD Thesis at the University of KwaZulu Natal (UKZN) on “the effects on durability characteristics and stability of geosynthetics due to thermal ageing” and Charles Sikwanda for his Master Thesis in Geotechnical Engineering at the University of Cape Town (UCT) on “Effects of Geosynthetic Gripping Systems in Interface Testing”. I wish them all the best and we look forward to increasing our research in geosynthetics in South Africa in the years ahead.

We are going through a period of instability worldwide, and are all feeling the repercussions. Many of us are using this as an opportunity to seek further business and look at the positive side, and I am of the opinion that it is in these periods that our engineering ingenuity gets a boost as we are forced to think out of the box, come out from our comfort zone, and look out for innovation and a spark! Surely geosynthetics are themselves innovative, with huge potential for our society in terms of safer infrastructure, cost effective solutions and, most importantly, raising the bar of advancement of our society.

Thank you to our newsletter editors, Tyrone and Ricardo, for their perseverance in chasing materials for the newsletter and keeping us up to date.

Yours Sincerely

Edoardo Zannoni Pr Eng CEng
GIGSA President
DESIGN, CONSTRUCTION AND QA/QC OF A ZINC TAILINGS STORAGE FACILITY (TSF)

The project site is situated in the Northern Cape, South Africa. The tailings storage facility embankments were constructed with the in-situ material consisting mainly of nodular calcrete. The cyclone deposition TSF covers an approximate area of 110 ha with a starter wall and toe wall surrounding the entire perimeter constructed with side slopes of 1:2.5. The maximum height of the TSF will be 44m with a centralized decant tower decanting supernatant water from the pool. An intermediate decant is situated on the decant pipeline at a lower elevation to decant water within the earlier life of the TSF. As the TSF increases in height, an impermeable rock armour will be constructed on the outer crust to ensure clean run-off into the storm water drains on the outer perimeter of the TSF.

Initially the geomembrane was intended to be placed underneath the starter wall. This could not happen because of time and logistical issues. Thus, it was required to place the geomembrane over the starter wall, which caused difficulties originally not planned for. Because the walls were constructed out of the in-situ material, achieving the specified surface finish was difficult and time consuming. It was concluded that a nonwoven needle punched geotextile (300 g/sqm) was required underneath the double textured geomembrane on the slopes for further protection. The design called for a road to be constructed on the starter wall crest. The same geotextile was placed on top of the geomembrane before an approved mixture of ±13mm stone and sieved sand was used to construct the road.

The TSF basin is covered by a herringbone drain system to extract water from the tailings deposited via cyclones and lower the hydrostatic head on the geomembrane. There are three perimeter drains, two between the starter wall and toe wall and one on the upstream toe of the starter wall. All the perimeter drains are lined with the 1.5mm HDPE double textured geomembrane and all the herringbone drains in the basin are lined with the 1.5mm HDPE smooth geomembrane.

A combination of 1.5mm HDPE smooth and 1.5mm HDPE double textured geomembrane was employed throughout the TSF. The 1.5mm HDPE smooth geomembrane was used on the basin inside the starter wall (inner perimeter of the TSF). The 1.5mm HDPE double textured geomembrane was used from the upstream side of the starter wall up until the anchor trench on the toe wall.

Freshly prepared surface
The drains are all sunken into the in-situ base of the TSF footprint which caused challenges for the surface preparation to meet the design specification. Before any geomembrane could be placed in the drains, the workforce was required to remove oversized material from the base and sides. Thereafter screened sand was placed in a layer throughout the drain. It was concluded that a nonwoven needle punched geotextile (300g/sqm) was required to be added in the drains as a protection layer because the screened sand contained particles larger than the required 3mm.

There were a few concrete structures within the TSF (anchor blocks and decant tower) that required a secure (water tight) connection to the geomembrane. The design employed battens to sandwich the geomembrane against the concrete. The RWD is the final stop for the water before returning to the plant. In the original design the lining system comprised a lower 1.5mm HDPE smooth geomembrane covered with a geonet to act as a waterway should a leak occur in the upper 1.5mm HDPE smooth geomembrane. The water will flow towards the leak detection sump at the lowest point of the shaped RWD base within the geonet, sandwiched between the geomembranes. It was concluded that the same nonwoven needle punched geotextile (300 g/sqm) should be used underneath the lower layer of geomembrane over the entire area because surface preparation could not give satisfactory results. The RWD also includes a concrete spillway and concrete pipe support for the outflow pipe. Secured connections between geomembranes and concrete surfaces were achieved in the same manner as within the TSF.

The lining system was secured on the outer edges with an anchor trench.

The construction of the TSF started early 2017 with the lining only commencing in July 2017. Strict quality assurance and quality control (QA/QC) was enforced on site by the liner contractor, earthworks contractor and two resident engineers. The liner contractor implemented an online system of data capturing where every piece of geomembrane deployed, extrusion welding and wedge welding was recorded and checked by the engineer. Trial welds, destructive testing and non-destructive testing (air pressure testing of seams and spark testing of patches) were done and captured on the system which was checked by the engineer to ensure the work is done according to the approved method statement. This system works well to keep everyone informed on progress and forces everyone involved to be more proactive towards the quality.
INTRODUCTION

Spilo Technical Textiles produces - ZebraTube Geotextile Dewatering Bags ideal for large dewatering or sludge removal projects. Our tubes are designed with significantly larger dimensions and a higher strength fabric. This allows them to handle the removal of large amounts of sludge, sediment or silt without having to constantly change out or replace bags.

These bags are pumped with or without flocculants and we have supplied numerous bags that have been pumped without flocculants due to our unique bag design, saving companies a significant amount of costs.

Due to their high strength and large capacity, dewatering tubes are used extensively in Waste Water Treatment Projects (WWTP’s), agricultural ponds, aquaculture facilities, Acid Mine Drainage (AMD) projects, pulp and paper mills and numerous industrial lagoons.

SIZES & DIMENSIONS

We are able to manufacture bags varying from 1m x 1m x 1m all the way through to 30m circumference and 90m in length (tubular). With this said, we highly recommend that our team work closely with the civil team to ensure that the correct size bag is used in relation to the ground layout.

Tubular bags are not to be pumped higher than instructed from the ground and the flow rate of the material entering the bags should not exceed 40 cubic liters per hour. It is recommended that, should the flow rate be higher than 40 cubes per hour, diverter valves should be used and more than one bag should be pumped.

GEOTEXTILE SPECIFICATIONS

We are able to offer a vast array of geotextile tubes that all perform differently. With the help of our soil lab, we prefer to analyse the fill before hand to assist our clients in delivering the correct geotextile for the various projects. Our bags are capable of handling up to 4 years in sun. For a cheaper option, we are able to supply the same performing bags, however, they are only able to withstand 6 months direct sun exposure before the integrity of the product becomes compromised.

The type of weave/geotextile that is selected is determined by a few aspects:

- Fill make-up
- Flow rate
- Bag size (smaller bags require less strength)
- The use of flocculent or not
Spilo Technical Textiles - ZebraTube have been manufacturing geotextile dewatering bags for many years and are here to assist you with any shape and/or design that you require. Our trained staff will join you at your project site and assist where ever possible to ensure you get the optimum performance from our Spilo Technical Textiles - ZebraTube bags.

Site Preparation

Filled Bags

Numerous Bags Filled Simultaneously

60m Long Zebra Tubes
In this interview, we catch up with Jonathan Shamrock, who left South Africa for New Zealand in December 2017. While not a GIGSA committee member, Jonathan served GIGSA well by working collaboratively on a number of events organised or co-hosted by the Institute of Waste Management of Southern Africa, actively supported colleagues serving on the GIGSA committee, and showed a keen interest and shared his expertise in geosynthetics. Jonathan is certainly not the first esteemed GIGSA member to head for Australasia, and while we wish him well in settling in, this article is not meant as encouragement for others to move on!

Jonathan Shamrock

**1. How did you get into the geosynthetics field?**

Shortly after starting at Jones & Wagener, in early 1998, I received a call from Danie Brink to come meet him on site for an inspection at a hazardous waste disposal site. The rest, as they say, is history. The site made extensive use of geomembranes, geotextiles and GCLs to contain waste, so I was on a steep learning curve that has still not flattened out. Geosynthetic materials, functions and properties are all constantly changing, which really keeps you on your toes if you work in this industry.

**2. Who were your mentors in the geosynthetics industry in South Africa?**

Firstly Danie Brink, who through his patience, and understanding of the products, was able to get me up to speed with designs incorporating geosynthetics. Secondly GIGSA, who enabled designers in South Africa to get exposure to the international leaders in the field like Rick Thiel, Prof Kerry Rowe, Dr George Koerner and others who brought all who attended their seminars up to speed on the most recent international developments. Thirdly the suppliers, both local and international, who educated me on technical product development and testing aspects. And lastly the installers, who I learned the onsite practical application aspects from, specifically Falk Hedrich in the early years.

**3. What would you consider the highlights of your career in South Africa?**

Working with an amazing bunch of people at Jones & Wagener and at our clients, and what we achieved on various projects through the years. Many projects stand out but I think establishing the first hazardous waste landfill in Uganda, working with the client and contracting team to get the project designed and delivered in a very short time, has a special place. On the landfill gas side taking the opportunity presented by The UNFCC Clean Development Mechanism projects (Kyoto Protocol) to design and install landfill gas extraction projects on five landfills in Gauteng stands out. One disappointment on these projects is how few we managed to take to energy recovery, for various frustrating non-technical reasons.

**4. Advice for engineers starting out in the waste/geosynthetics industry in South Africa?**

In short trust no-one, question everything and do your own tests! As one of my clients once quoted “People don’t do what is expected, they do what is inspected”.

**5. Why New Zealand? Hardest part of leaving? Best part of being there?**

Why NZ? My wife has family here, which is a big help, and when visiting here in April last year we were blown away by the people we met, the beauty of the countryside and beaches and the general relaxed and friendly vibe we found. In the first few months the hardest part has been losing a professional network that was built up over 20 years. You do really feel lost at times and keeping contact with the people in your network becomes a lifeline. The next really difficult part is having to learn new standards, processes and terminology that are all very unfamiliar at first, you do a lot of reading. The best part of being here is being able to explore a new country and go on an adventure with your family.
6 How different are landfill design/lining standards in NZ?

The NZ general waste standards are very similar to ours, composite compacted clay liner and HDPE geomembranes. There are some differences, the way they monitor compaction of clay by air voids and shear vane tests, but other than that standards are pretty much based on GRI standards which was a great relief.

7 We know that you haven’t been in NZ for long, but do you have any comments on differences in the way designs including geosynthetics are approached in NZ?

I have been very impressed with the thorough design approach in New Zealand, driven mainly by the fact that most designs are taken through a peer review process as part of its consenting. I think this is a very good way to raise the overall standard of designs in a country as everyone learns from everyone else over time.

8 Parting words?

It was a very tough decision to leave Jones & Wagener and South Africa. Starting again has been a very humbling experience, but on the positive side I am learning many new things every day. I guess the lesson in that is to never stagnate, always keep on learning, especially in the dynamic field of geosynthetics.

From the GIGSA committee, we’d like to say thank you to Jonathan for all his inputs and encouragement over the years and wish him all the best.
Upcoming Events

SAVE THE DATE

Education Week including

Educate the Educator
Irene Country Lodge, Centurion

Two Workshops presented by International Experts
Bytes Conference Centre, Midrand

Geosynthetic Conference for Young Professionals
Irene Country Lodge, Centurion

Educate the Educator (Monday, 2 and Tuesday, 3 July 2018)

Parallel One-Day Workshops (Wednesday 4 July 2018)

Stability of Geosynthetic Lined Sites by Professor Timothy D. Stark

Fundamentals of Soil Reinforcement by Professor Martin Ziegler

GCYP 2018 Conference (Thursday, 5 and Friday, 6 July 2018)

For more information, send an email to the organisers:
info@selahproductions.co.za

Creating Awareness of GIGSA and the appropriate use of Geosynthetics
The Institute of Waste Management of Southern Africa herewith proudly announces our 24th WasteCon™ flagship Conference and Exhibition.

This premier showcase of best practice African waste management solutions will take place at Emperor’s Palace in Johannesburg, South Africa.

Waste management in South Africa is guided by the internationally accepted waste management hierarchy, which is implemented through the National Environmental Management: Waste Act, 2008.

The waste management hierarchy indicates an order of preference for action to reduce and manage waste, and is usually presented diagrammatically in the form of a pyramid and captures the progression of a material or product through successive stages of waste management, and represents the latter part of the life-cycle for each product. All products and services have environmental impacts, from the extraction of raw materials for production to manufacture, distribution, use and disposal.

The aim of the waste management hierarchy is to extract the maximum practical benefits from products and to generate the minimum amount of waste. The proper application of the waste hierarchy can have several benefits, it can help prevent emissions of greenhouse gases, reduces pollutants, save energy, conserves resources, create jobs and stimulate the development of green technologies.

In supporting South African Government, we are calling for abstracts to be submitted in line with the theme “Implementing the Waste Hierarchy”.

Pre-Registration Deadline: June 15, 2018

Extended versions of selected papers from the 11ICG will be published in Special Issues of official IGS journals, Geotextiles & Geomembranes and Geosynthetics International, and in a Special Issue of Soil & Foundation.
The SAICE Geotechnical Division’s Tailings Sub-Committee are pleased to present:

6th International Mining and Industrial Waste Management Conference

29 – 31 October 2018

Legend Golf & Safari Resort, Haakdoring Road, Sterkrivier District, Limpopo

// About the Conference

The South African Institution of Civil Engineering (SAICE) Geotechnical Division’s Tailings Sub-Committee is pleased to announce the 6th International Mining and Industrial Waste Management Conference to be held from 29 – 31 October 2018 at Legend Golf and Safari Resort, Haakdoring Road, Sterkrivier District, Limpopo.

The conference will be structured to cover the full life cycle of a typical residue disposal facility, within the broad categories of Site Selection, Investigation, Design, Construction, Operation and Closure.

// Who Should Attend?

It is anticipated that the conference will provide a comprehensive overview of the latest developments and trends in the design, operation and closure of disposal facilities for mining and industrial waste, both locally and internationally. The conference is likely to attract a significant number of papers dealing with new mining developments on the African continent and should provide invaluable information in this regard.

The Organising Committee is currently in discussion with a number of international experts in the field of mine and industrial waste management with the view of bringing out at least one international guest speaker to the conference. Details of the guest speaker will be communicated once arrangements have been finalised.

As in the past, it is anticipated that the conference will provide a good balance between theory and practical aspects, and will benefit a wide spectrum of those involved in waste management, including regulators, facility owners, metallurgists, environmental scientists, engineers and operators.

// Conference Secretariat

Selah Productions // Yolandé van den Berg // +27 (0)82 323 3910 // info@selahproductions.co.za
MEDIA

Social media is no longer just on the rise but a major way of staying in touch. It has now become an everyday way of life. To better keep in contact with GIGSA or find out about future events relating to the geosynthetic industry; try one of the following links below by clicking on your preferred social media platform. We may not have many followers yet but we will get there in time with your help. Invite your friends and colleagues as well. These social media platforms can be used as a forum for discussions pertaining to anything geosynthetic related.

Some tips for GIGSA's social media platforms:

Tip #1: Place your questions or thoughts on any of these platforms and you are likely to get a response be it from a supplier, consultant, contractor or someone just browsing the page.

Tip #2: Don't be afraid to ask GIGSA questions as well. If we can't answer you then we can get someone that will be able to!

Tip #3: Keep it clean! Social media was invented to keep in contact not grow apart; help maintain our level of professionalism by always being courteous!

Happy Clicking from the team at GIGSA!

As of April 2018, the figures below show the current status of the GIGSA memberships with a total of 218 members.

We currently stand at 29 Benefactors and 3 Affiliated members.

With the upcoming GCYP, we hope to increase significantly our Student Members as well as Academics and Individual Members.

<table>
<thead>
<tr>
<th>SUMMARY OF MEMBERSHIP</th>
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<tr>
<td>Individualships covered by Affiliate status</td>
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<td>Individualships covered by Benefactor status</td>
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<td>Total membership (persons)</td>
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<tr>
<td>Affiliate Members</td>
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<tr>
<td>Benefactors</td>
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Student Award Paper Spotlight: “The Effect of Reinforcement Position on Geogrid Reinforced Clay Liners”

Marx and Jacobsz presented a paper on geogrid reinforced clay liners and won the student award competition at GeoAfrica 2017. This paper presents an interesting experimental investigation to understand the effect of reinforcement position on the response of geogrid reinforced clay liners subjected to differential settlements. The differential settlements below the landfill liner can result in distortion and crack for the liners. In this study, centrifuge modeling tests were conducted for three cases including, unreinforced, bottom-reinforced, and top-reinforced clay liners, to investigate the effects of geogrid reinforcement and the optimized position of reinforcement to reduce the cracks. Innovation methods were used for measurements and interpretation of test results, including laser scanner to identify the crack locations on the clay liner surface and digital image velocimetry to calculate the strain in the clay liner. Cracks were observed for all three cases subjected to a central settlement of 1.5 m; however, the cracks for the unreinforced and bottom-reinforced liners were significantly more severe than for the top-reinforced liner. For the unreinforced liner, the crack extended from the top surface to the base, while the cracks stopped at the position of geogrid reinforcement for both the bottom-reinforced and top-reinforced liners. Results indicate that top-reinforced clay liner is more effective than bottom-reinforced liner on reducing the cracks due to differential settlements.

Geosynthetics Conferences Not Sponsored by the IGS

It has recently come to the attention of the IGS that a number of geosynthetics conferences are being promoted throughout the Internet that are not sponsored or have received auspices by the IGS. We are unsure of the events’ validity and advise that people should be very diligent before signing up for anything. As a reminder all IGS related-events throughout the world are posted on the calendar section of our website.

IGS to Host the 1st GeoReinforcement Workshop

4 – 5 June 2018  Munich Workstyle  Landwehrstraße 61  80336 München, Germany

IGS to Host the 1st GeoBarrier Workshop

6 – 7 June 2018  Munich Workstyle  Landwehrstraße 61  80336 München, Germany

The Young Members Committee of the IGS is holding its first ever photo competition in 2018. This contest intends to promote young members of the International Geosynthetics Society.

The competition seeks the best photos of geosynthetic materials or technologies taken by young members.

The contest is open to international or chapter members of the International Geosynthetics Society, who will be younger than 36 years of age on 31 December 2018. Entrants may be asked to verify their membership and age by the committee.

Visit http://www.geosyntheticssociety.org/committees/young-members-committee/.
The Infrastructure Report Card Guide

Dr Martin van Veelen, Sam Amod and Malcolm Pautz, three past presidents of SAICE combined their knowledge and experience to produce a guide on how to prepare an Infrastructure Report Card (IRC) which will be used internationally to aid engineering organisations to produce score cards. The guide has been submitted to the Independent Group of Scientists in preparation for the 2019 Global Sustainable Development Report.

Is Day Zero a Myth?

The first Civil Talk segment of the year took place on 4 April 2018 at SAICE House in Midrand. The event was well attended and centred on disaster management in South Africa and possible ideas for avoiding day zero.

The panel of experts featured Professor Mike Muller PrEng (South Africa), CEng (UK), FSAICE, SFWISA. Prof. Muller is a former Director-General of South Africa’s Department of Water Affairs and Forestry (1997-2005) and Commissioner of South Africa’s National Planning Commission (2010-2015). He advises many organisations locally and internationally on water and development issues and is currently involved in regional energy policy and strategy issues. His research interests include water governance at different levels of government to support sustainable and resilient development. Prof. Muller was accompanied by leading water management specialist and Civil Engineer, Dr Ronnie McKenzie. He has been instrumental in the team that developed the Water Resource Models used by the South African government for the planning and operation of the bulk water resource infrastructure.

The discussion entitled Disaster management within South Africa: How to avoid Day Zero was facilitated by SAICE’s Water Division committee representative, Helgard Muller. The two-hour event knocked off with Prof. Mike Muller who outlined the current landscape of Water Management in South Africa as well as the country’s readiness and resilience to deal with water shortages and other resource management related problems. Thereafter, Dr Ronnie McKenzie from the UK shared insight into the water management system models South Africa (SA) has in place, a background into their origins as well as how they’re put together. According to Dr McKenzie, SA has one of the world’s most powerful water resource management system. It was developed with input from models used in the UK and the USA.

The session ended with a Question and Answer session where members of the audience posed pertinent questions, challenged the panellists on various aspects of the discussion, including proposed ideas and/or solutions for moving forward.

SAICE President Errol Kerst visits hometown of Nelspruit

The SAICE delegation led by 2018 President Errol Kerst and CEO Manglin Pillay embarked on their third of some 23 branch visits scheduled for this year. The visit to the President’s hometown took place from 15-16 March 2018. Branch visits are an opportunity for SAICE’s top brass to interact and engage with regional constituencies regarding plans the institution has for its members as well as to touch base with concerns they might have. During the visit, the delegation made a point to meet with various stakeholders who represent the length and breadth of industry, including companies, universities and government departments.
<table>
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<th>Date</th>
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<td>Electro Mining 2018</td>
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<td>16-21 September</td>
<td>11 ICG</td>
<td>IGS</td>
<td>Seoul, South Korea</td>
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<td>16-18 October</td>
<td>WasteCon 2018</td>
<td>IWMSA</td>
<td>Emperor’s Palace, Gauteng</td>
<td>1 February 2018</td>
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<td>29-31 October</td>
<td>6th International Mining and Industrial Waste Management Conference</td>
<td>SAICE Geotech Tailings Sub-Committee</td>
<td>Legend Golf &amp; Safari Resort, Limpopo</td>
<td>30 April 2018</td>
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<td>14 November</td>
<td>GIGSA Annual General Meeting</td>
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(E): mail@golder.co.za

Total Terrain Lining Systems (Pty)
www.ttls.co.za
(T): (011) 467 0892
(E): via website
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<td><a href="http://www.aks.co.za">www.aks.co.za</a></td>
<td>(T): (021) 983 2700 (E): <a href="mailto:info@aks.co.za">info@aks.co.za</a></td>
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<td>(T): 011 412 4302 (E): <a href="mailto:shawn@heferplant.co.za">shawn@heferplant.co.za</a></td>
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<td>(T): (014) 596 5279 (E): <a href="mailto:tommie@accuplas.co.za">tommie@accuplas.co.za</a></td>
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<td>(T): 082 348 2022 (E): <a href="mailto:info@igtesting.co.za">info@igtesting.co.za</a></td>
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<td>(T): (011) 84 611 8819 (E): <a href="mailto:henrico@geokatanga.com">henrico@geokatanga.com</a></td>
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