

# MODERN QUARRYING

QUARTER 3 – 2020

## AFRIMAT'S NORTH CLUSTER DEMONSTRATING AN INTERCONNECTED SUPPORT SYSTEM



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# PLANNING FOR POST-COVID-19

**L**ike any other sector of the economy, the quarrying industry is facing crippling challenges due to the COVID-19 pandemic.

The COVID-19 influenced hard lockdown, dubbed Alert Level 5 of South Africa's tiered approach to fighting the pandemic, saw the complete shutdown of quarries and the construction industry at large, leaving producers with absolutely no revenue during April.

While Alert Level 4 regulations allowed quarries to operate at 50% capacity levels, the construction industry was still completely shut, leaving the quarrying industry in a precarious position. The start of Alert Level 3 in June offered some reprieve for the industry, with operations allowed to operate at 100%, while construction companies were also allowed back on sites.

It is also important to note that the crisis came at a time when the industry was already suffering from decreased demand for construction materials, thus worsening an already

complicated business environment.

While COVID-19 has had a devastating impact on the economy, I believe it has served as a wake-up call for the authorities. The government understands that there is an urgent need for targeted infrastructure investment.

Minister of Public Works and Infrastructure Patricia de Lille recently reiterated the need to address a history of massive infrastructure underspending by all spheres of government and state-owned enterprises. She also noted that the COVID-19 pandemic and the downgrading of the economy had worsened the crisis and increased the urgent need for infrastructure investment. There has been a 14,2% contraction in the construction sector, which has been severely impacted by the pandemic and records some of the biggest job losses.

To this end, the Department of Public Works and Infrastructure has developed and will be applying a new methodology known as the Sustainable Infrastructure

Development System (SIDS) to guide the country's infrastructure development agenda. A total of 276 projects with an investment value of more than R2,3-trillion have been submitted as of June 2020.

At the SIDS conference held in June, President Cyril Ramaphosa made promising commitments to prioritise infrastructure development post COVID-19 to support structural transformation, creation of jobs and economic recovery. The symposium notably reflected on a number of projects that have been identified by the National Infrastructure Fund.

If this anything to go by, it is important that quarries start planning for a possible surge in demand post-COVID-19. When this pandemic is defeated – not sure when – opportunity might overflow as the government strives to meet its lofty infrastructure goals.

I believe that one of the pressing concerns quarries will face at the time will be the increased pressure to rapidly ramp up production, in an effort to recoup lost output. We will be back to basics, and the emphasis will be fixed firmly on output.

As you will see in this edition of *Modern Quarrying*, industry players unanimously believe that the 'next normal' technology will have an important role to play in improving productivity and enabling high levels of health and safety.

I am of the view that focus, post-COVID-19, should be on the use of technology to improve efficiencies and optimise returns, while making operations more adaptable to market demands. As an industry in South Africa, the quarrying sector has over the years been slow to embrace technology and this has to change.

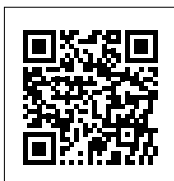
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## Infrastructure spend key to reviving sector – ACI

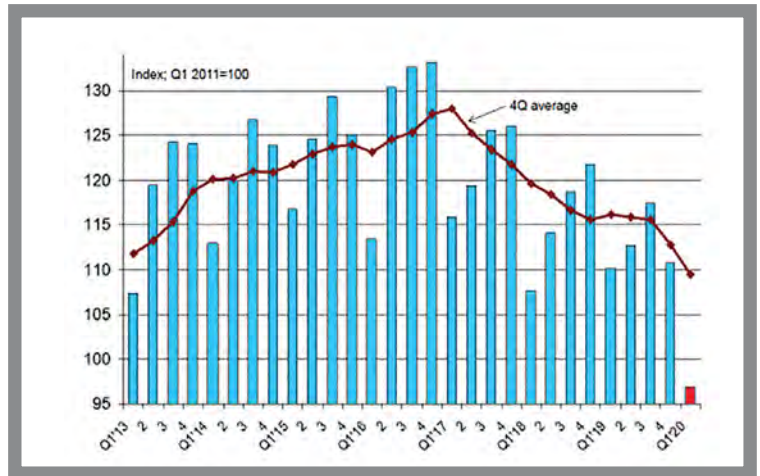
Afrimat, the JSE-listed open pit mining company providing industrial minerals, bulk commodities and construction materials, has released the findings of its Afrimat Construction Index (ACI) for the first quarter of 2020. The ACI is a composite index of the level of activity within the building and construction sectors, compiled by economist Dr Roelof Botha on behalf of Afrimat.

While the results of the ACI for the first quarter of 2020 are considerably down, hope for recovery for the construction sector lies in government’s infrastructure-led economic growth recovery plan post COVID-19, according to Dr Botha. “The results of the Index prove just how important the recovery plan is and, given the current low levels, we should see an immediate effect if activity is increased.”

Botha adds that in addition to the strong likelihood of a resurgence in infrastructure spending, another key driver of recovery is the lower interest rate environment. “If lending rates remain at their current levels for several years, the imminent post-pandemic recovery should gain considerable momentum in 2021.”

Although the sector represents the third smallest key sector of economic activity, with a contribution of 3,3% to the country’s total output, construction activity nevertheless possesses a multitude of forward and backward linkages with most other sectors. It also plays a pivotal role in the development of new infrastructure, with a dominant contribution to total capital formation of close to 50%.

The trend of the ACI, as measured by the four-quarter moving average, has declined by 14,5% from its peak, recorded in the first quarter



**The trend of the ACI, as measured by the four-quarter moving average, has declined by 14,5% from its peak, recorded in the first quarter of 2017.**

of 2017. The Index itself declined more than 27% from its highest level, recorded in the fourth quarter of 2016.

According to Dr Botha, the quarter-on-quarter decline of more than 25% in the real value of building plans passed by the country’s metros and larger municipalities is a point of particular concern.

Afrimat CEO, Andries van Heerden, says although the Index results are down, he is heartened by the steps being taken by government in terms of the proposed infrastructure spend, adding that the assurance given by Dr Kgosisentsho Ramokgopa, head of the South African Presidency’s Investment and Infrastructure Office, that commitments of tens of billions of rands have already been received, is good news.

“This bodes well for companies involved in infrastructure development and throughout the supply chain, particularly the construction sector, and our hope is that this can bring about some recovery and help reduce unemployment levels.”

## No excuses for damaging the environment

While the construction industry remains in the grips of a long-lasting downturn, worsened by COVID-19 in recent months, there remains no excuse for construction contractors or building material suppliers to excavate sand and aggregates illegally.

Surface mining industry association, Aspasa, has asked the public to be vigilant and to report suspicious excavation of sand and stone that is either being sold or used for construction purposes. Damage caused to land in this manner can render it unusable for future generations and may lead to erosion or contamination of waterways or other surrounding areas.

“While the economic outlook for the industry is severely strained at present,

there is no excuse for environmental negligence and adds that court rulings against directors of mining companies found to be responsible for polluting the environment in recent years should act as a warning to others to get their environmental-affairs in order,” says Aspasa director, Nico Pienaar.

In certain instances, individuals and directors of companies have been found guilty of damaging the environment and faced substantial fines and in some instances prison sentences. The same applies to public sector employees, municipalities and state-owned enterprises who are not above the law.

“Aspasa serves on a number of environmental boards and is an important member of the Mineral

Council South Africa (MCSA), as well as enjoying a healthy relationship with the Department of Mineral Resources and Energy. Needless to say, we will not hesitate to escalate any violations through these authorities in addition to reporting such incidents to the South African Police Service.”



## AfriSam reiterates commitment to the environment

AfriSam is synonymous with environmentally conscious manufacturing processes, honouring its values of 'People, Planet and Performance'. As a leading supplier of construction materials, AfriSam has over many years pioneered and sustained numerous initiatives towards a greener planet across all its business units, for the benefit of all stakeholders and at all touchpoints.

As one of the top 10 carbon emitters globally when measured per capita, the cement manufacturing industry is often singled out as the culprit in the greenhouse gas debate and comes under fire regularly to reduce its carbon footprint.

"AfriSam was at the forefront to introduce proactive measures in the southern African cement manufacturing sector," according to Nivashni Govender, environmental specialist at AfriSam. "To put actions to our concerns, we established our own environmental department as early as 1992 and developed an environmental policy just two years later."

"Continuous investment in research and development has enabled AfriSam to improve processes, technology and products with the ultimate goal of energy optimisation and emission reduction encompassing the complete range of our products: aggregate, cement and concrete," says Govender.

"It is in our cement manufacturing business where the most notable impact on the lowering of carbon emissions is achieved. Our ongoing focus on alternative fuels and resources (AFRs) has allowed us to steadily reduce the amount of coal burnt in our cement kilns, which in turn contributes to lower carbon emissions," Govender says. "One example is at our Dudfield plant where we developed and implemented process modifications to allow us to co-process scrap tyres – a strategy that also contributes significantly to addressing the environmental hazards posed by tyres when they are disposed of in a landfill."

Govender continues: "Cement kiln emission improvement has been the AfriSam way for a long time, setting the benchmark for others."

"The introduction of our green cement product range in 2000 added to our goal of becoming one of the lowest CO<sub>2</sub> generators per ton of cement in Africa," she expands. "The use of extenders in our cement has resulted in a substantial reduction in our clinker factor without compromising the quality of our products."

Energy and water conservation are ongoing programmes, featuring high on AfriSam's environmental agenda, according to Govender. Energy efficient lighting has been installed across the company's cement, readymix and aggregate quarry facilities, and water conservation has become a priority in all its operations.



As far back as 2000, AfriSam introduced Project Green Cement to actively reduce its carbon emissions.

"Our programmes focus on reducing the amount of water per ton of cement and aggregate produced, or per ton of readymix prepared," she says. "Our readymix plants, for instance, have strict re-use and recycling processes, and must recycle at least 50% of their grey water generated, on-site."

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Afrimat's Qwa Qwa Quarry in the Free State has won numerous ASPASA Show Place awards, and produces some of the highest specification road and asphalt stone in the country.



## AFRIMAT'S NORTH CLUSTER DEMONSTRATING AN INTERCONNECTED SUPPORT SYSTEM

A huge part of Afrimat's success over the years has hinged on its diversification strategy. Not only does this apply to its product line, but also to its geographical footprint. Its North Cluster – a combination of operations across South Africa's key regions of Gauteng, KwaZulu-Natal and the Free State – is a case in point of an interconnected support system, which demonstrates how the construction materials giant places immense value on its geographical footprint and proximity to the market and customers. **By Munesu Shoko.**

**M**ost business professionals agree that, although it does not guarantee against loss, diversification is the most important component of achieving long-term financial goals while minimising risk. Diversification is a business strategy aimed at maximising returns by investing in different areas that would each react differently to the same event. Afrimat is one such company that has truly and successfully pioneered diversification.

With its roots in construction materials, the company has in recent years spread its wings to include Industrial Minerals and Bulk Commodities. Afrimat's diversification strategy has not only applied to its product range, but also to its geographical footprint across the country. This enables the company to service projects of any scale, from major infrastructure and construction projects for state-owned enterprises and parastatals through to small private sector contracts.

A good example of this strong focus on its footprint is



The Glen Douglas Dolomite Mine is strategically positioned to supply customers in the southern parts of Johannesburg and northern Free State.

## KEY TAKEAWAYS



Afrimat's diversification strategy not only applies to its product range, but also to its geographical footprint across the country



A good example of the strong focus on its footprint is the reinforcement of its North Cluster region in recent years



The North Cluster includes operations across Gauteng, KwaZulu-Natal and the Free State, with a focus on Construction Materials (Aggregates and Concrete Based Products) and Industrial Minerals



Through carefully considered acquisitions and subsequent turnaround strategies, Afrimat has over the years grown the footprint of its Construction Materials operations in this region to 32: three in Gauteng, nine in Free State and 20 in KwaZulu-Natal

and 20 in KwaZulu-Natal. This is complemented by the flagship Gauteng-based Glen Douglas Dolomite Mine, the only industrial mineral operation in the region.

The region contributes a significant portion of the company's overall Construction Materials business. "During the past financial year, the North Cluster contributed 38% of the Construction Materials business's profit and 12% of Afrimat's profit," explains Davin Giles, MD North Cluster.

### Operations in detail

Under the Construction Materials division are several clusters of the business. The Concrete Based Products Division manufactures concrete blocks and bricks for small and large-scale commercial and residential projects.

The Readymix Concrete operations supply quality concrete to small, medium and large-scale civil engineering and infrastructure projects through fixed and mobile readymix plants where concrete is batched on demand and transported to the site by concrete mixer trucks. While the mobile concrete batching plants can be set up in any part of the region, the fixed plants are based in KwaZulu-Natal and the Free State.

"Close to 90% of our readymix's raw material needs (excluding cement) are sourced from our own

the reinforcement of its North Cluster region in recent years. The North Cluster includes operations across Gauteng, KwaZulu-Natal and the Free State, with a focus on Construction Materials (Aggregates and Concrete Based Products) and Industrial Minerals.

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Clinker Supplies produces aggregates through recycling and reclamation of old ash dumps.

quarries,” says Giles. “One of our premium products from our Glen Douglas mine is super sand. The product’s low-water demand offers a raw material cost-benefit to the readymix industry.”

The Aggregates Division produces aggregates of a wide variety of sizes and technical specifications, which are primarily used for large-scale civil engineering and infrastructure projects.

Clinker Supplies produces aggregates through recycling and reclamation of old ash dumps. “This is an interesting aggregate deposit with high alumina contents (that react well with cement) and a low loose bulk density (LBD) of 1 100 kg/m<sup>3</sup>,” says Giles.

SA Block, situated in Redan in the Sedibeng District Municipality of Gauteng, has a daily production capacity of 700 000 S7 equivalents, and regular daily sales in excess of 1-million S7 (stock brick) equivalents.

Glen Douglas Dolomite Mine, located in Henley on Klip supplies the steel industry with metallurgical dolomite; the construction industry with a variety of aggregate products; and the agricultural industry with agricultural lime. The Glen Douglas Dolomite Mine is strategically positioned to supply customers in the southern parts of Johannesburg and northern Free State. This is the only dolomitic source in the Vaal area.

Unique to Glen Douglas is also the immediate access to a railway siding equipped with a mechanical loading

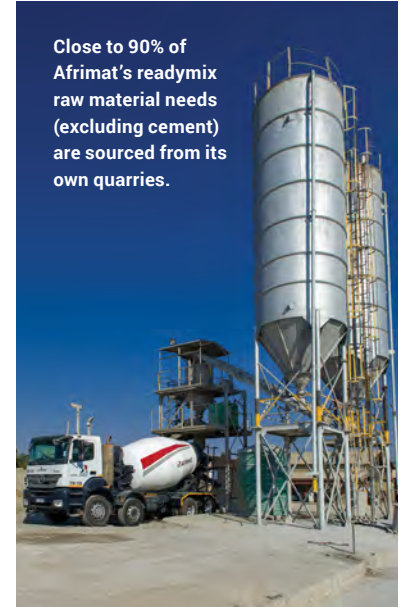
facility to facilitate more cost-effective transport solutions for Afrimat customers.

### Beating the odds

Commenting on the business performance of the region, Giles says the past three years have been tough, especially for the operations in the south of Gauteng. “We have seen a steady decline in both government and private projects, impacting Clinker Supplies, SA Block and Glen Douglas. In 2018, we restructured our KwaZulu-Natal and Free State businesses, resulting in a strong improvement in 2019, which has continued well into 2020,” says Giles.

All the businesses in the North Cluster, adds Giles, are well positioned to take advantage of any opportunities that arise within the markets the company serves. “Our target market includes infrastructure development projects (both civil and building); government projects (including road and rail); traders and merchants that operate in the residential and other markets. We have in recent years seen annual increases in the demand for our agricultural lime, despite this being seasonal. Steel manufactures also continue to buy products from us.”

All operations in the region are flagships, but Giles makes special mention of a few. SA Block’s brick-making factory, for example, comprises eight brick-making machines with a total capacity of 700 000 bricks a day. Over the years



Close to 90% of Afrimat’s readymix raw material needs (excluding cement) are sourced from its own quarries.

SA Block has refined its brick-making operations and techniques with the implementation of a highly efficient, semi-automatic and continuous process. The bricks from the operation are SABS approved and enjoy great market acceptance in Gauteng and surrounding areas.

Clinker Supplies reclaims ash from old Eskom Power Stations. A 100% of this “waste” product is converted into aggregates. Clinker Supplies has over the years cleared in excess of 50-million tonnes (t) of ash. The Vaal plant with a 750 tph capacity has recorded daily sales in excess of 8 000 t. Afrimat recently installed a 300 tph fixed plant at its Vierfontein operation to improve efficiencies, supply and quality of the products based on a growing market.

Glen Douglas, with a 160 000 t monthly capacity, supplies some of the highest quality lump and sinter products to the steel manufacturing industry.

“Our Qwa Qwa Quarry in the Free State has won numerous ASPASA Show Place awards, and produces some of the highest specification road and asphalt stone in the country. It is a benchmark of how any quarry operation should look like and is well worth a visit,” says Giles.

### Continuously evolving

Like all other Afrimat quarries, operations within the North Cluster are continuously evolving in many ways, with more focus being placed on improvement rather than “turn-around”. This is achieved through



**SA Block, situated in Redan in the Sedibeng District Municipality of Gauteng, has a daily production capacity of 700 000 S7 equivalents.**

the “Afrimat Way”, which encompasses many facets.

Some of the pillars of the “Afrimat Way” include growing the Afrimat culture throughout the business with a strong people focus; developing and training staff, and deploying them in positions where they can use their talents and grow further; streamlining the operations to reach required operational efficiencies through maintenance programmes and the correct plant balance.

Other facets include a low tolerance of poor performance, or “fit” into the organisation; a lean and flat structure where all work towards a common goal; creating a place of employment where all can work hard, have the freedom to explore opportunities, take some risk, and be accountable for their actions; as well as creating an entrepreneurial culture where all seek out opportunities. “It is not uncommon for a financial or HR manager to identify a sales opportunity at Afrimat,” says Giles.

Expanding on the need to continuously develop and train staff, Giles says development and growth of its people is very important to Afrimat. “We have a number of internal and external programmes that we offer to our people. The programmes are freely available to all employees at all relevant levels of employment and education,” says Giles.

Some of the external programmes that are offered include Adult Education Training and Portable Skills training such as computer skills and Code 10 and Code 14 licenses. The company also offers Trackless Mobile Machine training to its employees and its direct community. Young individuals get the opportunity to train as multi-skilled operators to assist them in their current workplace or to improve their chances when applying for employment elsewhere.

“The North Cluster is very proud of its learnership, internship and apprenticeship programme, where young graduates get afforded the opportunity to gain experience and to be mentored by our best artisans, engineers and managers. The programme has proven valuable to both the individual and Afrimat as a number of interns, learners and apprentices have built a successful career at Afrimat,” says Giles.

Afrimat’s internal training modules consist of the Afrimat Management Development Programme, which is offered from junior management level; Introduction to Afri-lead; as well as Afri-lead, which is Afrimat’s leadership programme focused on its talent pool and future leaders.

“Once the upcoming leaders complete our internal programmes, we also encourage and assist them with Management Development and Senior Management Development Programmes through external tertiary institutions,” adds Giles.

### **COVID-19 response and outlook**

Commenting on the response to COVID-19, Giles says the North Cluster, and Afrimat at large, is adhering to, and implementing all regulations as legally

required by government. At all operations, all employees are required to go for medical screening and attend inductions on safety protocols.

“We issued masks (which are compulsory to wear) and sanitisers to our staff, and also ensured that social distancing is enforced by way of signage on the floors, on posters and via email, indicating how many staff members may be allowed in an office/kitchen/restroom at a time,” he says.

“We are continually sharing information with employees on staying safe and healthy and are actively monitoring the wearing of masks, washing of hands, keeping offices and workstations clean and practicing social distancing,” he adds.

Commenting on the outlook of the market, Giles believes that “we are in for an interesting year that will buck conventional trends”.

“We have seen a sharp increase in demand for our concrete products in most areas, with supply to mostly rural markets and traders. The aggregate sales remain slow, mostly going to concrete product manufacturers and readymix concrete producers,” he says.

“We are waiting in anticipation for government to release funds for infrastructure development. This will give our economy the kick start it needs while addressing the unemployment struggles of the country. We remain confident that the remainder of 2020 will provide us with the growth opportunities we seek,” concludes Giles. ●

**ON PHOTO:** CHECKING AGGREGATE QUALITY

Tighter requirements from building and construction professionals are driving ever tighter tolerances and aggregate suppliers need to be ready to meet future specifications.

# QUALITY STANDARDS TO THE FORE

With its industry-wide survey currently under way across member operations, surface mining industry association, Aspasa, seeks to gauge the extent of laboratory facilities at each of the member operations to assist with the planning of the implementation of its newly-introduced technical quality audits, writes **Munesu Shoko**.

Increasing requirements for certified quality aggregates have led surface mining industry association, Aspasa, to introduce its own guidelines and auditing systems to ensure testing of aggregates and crushed granular materials is done in accordance to South African National Standards (SANS) 3001 AG and GR series test methods.

In future quarries belonging to Aspasa will have an option to participate in an annual audit designed to measure compliance of testing facilities including their apparatus calibration and personnel competence against an abridged ISO 17025 format, to ensure the correct classification of products.

Over time, as their systems improve, they can opt to obtain accreditation through South African National Accreditation System (SANAS) for ISO/IEC 17025 – general requirements for the competence of testing and calibration laboratories.

According to Barry Pearce, chairman of Aspasa's technical



## KEY TAKEAWAYS

Increasing requirements for certified quality aggregates have led surface mining industry association, ASPASA, to introduce its own guidelines and auditing systems to ensure testing of aggregates and crushed granular materials is done in accordance to South African National Standards 3001 AG and GR series test methods

To determine the extent of testing facilities at member operations before rolling out the technical quality audit, Aspasa is conducting an industry-wide survey, which is being led by the association's technical team

Attention to the quality of the products provided is now starting to become more of a concern for ASPASA members, especially where margins on products are so low and business is scarce

Tighter requirements from building and construction professionals are driving ever tighter tolerances and aggregate suppliers need to be ready to meet future specifications



committee, the audits complement the association's well established environmental (About Face) and health and safety (ISHE) audit systems, which have contributed to the association's recognition internationally as a leader in these fields.

"Now, the idea is to help Aspasa members to produce better quality products that are tested consistently to meet the specifications of their clients as well as national standards – where required. It entails the inspection of the laboratory including the testing apparatus and the verification of procedures," says Pearce.

"The audits will be simple but thorough and will leave the quarry in no doubt as to what is required. With this in place, producers can confidently supply their products without fear of material rejections in future, provided that the necessary procedures are followed," he adds.

To determine the extent of testing facilities at member operations before rolling out the technical quality audit, Aspasa is conducting an industry-wide survey, which is being driven by the association's technical team, under the leadership of Barry Pearce and Saartjie Duvenage.

"As part of Aspasa's drive to improve the quality of the products produced by its members and reduce the costs of out of spec materials supplied to clients, we implemented a laboratory auditing initiative on a similar basis to the ISHE and About Face audits already being offered by the association," explains Pearce.

The survey results will give the technical committee an overview of the extent of testing operations at the various facilities, including what is being tested and staff involvement. "Should the member not have a facility to test on the premises, we would look to assist



**Tighter requirements from building and construction professionals are driving ever tighter tolerances and aggregate suppliers need to be ready to meet future specifications.**



**In future, quarries belonging to Aspasa will have an option to participate in an annual audit designed to measure compliance of testing facilities including their apparatus calibration and personnel competence.**

them in establishing such a facility that would be effective in providing them with the required information to measure their own quality on site,” adds Pearce.

Explaining the driver behind this survey, Pearce tells *Modern Quarrying* that attention to the quality of the products provided is now starting to become more of a concern for Aspasa members, especially where margins on products are so low and business is scarce.

“One or two claims against a quarry in a year can seriously dent their profitability and reputation for future work. Unless they have a really good feel in the form of valid test results of the quality

of their materials produced, they will be on the back foot to try and defend themselves in such a scenario, especially if it’s based on test results from a SANAS accredited commercial testing laboratory,” he says.

According to Aspasa director Nico Pienaar, tighter requirements from building and construction professionals are driving ever tighter tolerances and aggregate suppliers need to be ready to meet future specifications.

“In the quarrying industry many methods are used to determine the grade and type of sand and aggregate supplied. However, not all of them are acceptable in the modern construction industry

and may lead to disputes or the exclusion of certain suppliers in future,” explains Pienaar.

“As a progressive industry, it is our intention to take the concerns of construction professionals seriously, measure the percentage of our members who have formalised quality standards in place and respond with practical interventions that are tailored to their specific requirements. These interventions may be in the form of training, guides or specially developed Aspasa quality standards that can be adapted to the materials supplied by individual mines,” says Pienaar.

With the Aspasa membership in excess of 100 members, Pearce is aiming for a response rate of at least 75% so as to make a reasonable evaluation of the readiness of the members to tackle this issue.

### **Importance of compliance**

Not conforming to the standards proposed, says Pearce, can have huge cost implications in capex expenditure, especially for major infrastructure contracts where the cost of road construction can be up to R10-million per km. It does not take long, he adds, for a substandard material failure to hit the R1-million mark, especially for the secondary suppliers of material like asphalt and concrete where the quarries provide the bulk of the material that make up such products.

“I believe that the implementation of an external quality audit based on ISO 17025 standards will go a long way in assisting quarries to get a better handle on the consistency of the quality of the products they produce, as well as assisting with the management and maintenance of their plants,” he says.

Staff training, calibration of equipment and, more importantly, participation in some form of Proficiency Testing Scheme (PTS) or inter laboratory comparison (ILC) so as to be able to compare one’s results to those of other facilities are all part of the ISO 17025 requirements which the Aspasa technical committee is looking to implement into these audits.



The implementation of an external quality audit based on ISO 17025 standards will go a long way in assisting quarries to get a better handle on the consistency of the quality of the products they produce.

“Although I am not suggesting that all the members’ testing facilities need to be ISO 17025 accredited, if they are partaking in a PTSÍLC that includes some of these accredited facilities and their results compare favourably with them then they can have more confidence in their test results and in the overall quality of the products they are producing,” says Pearce.

This is of course over and above the main benefit of the cost savings that will result from a reduction in the number of failures or rejected materials each year, and this should easily cover the cost of the operation’s laboratory facilities.

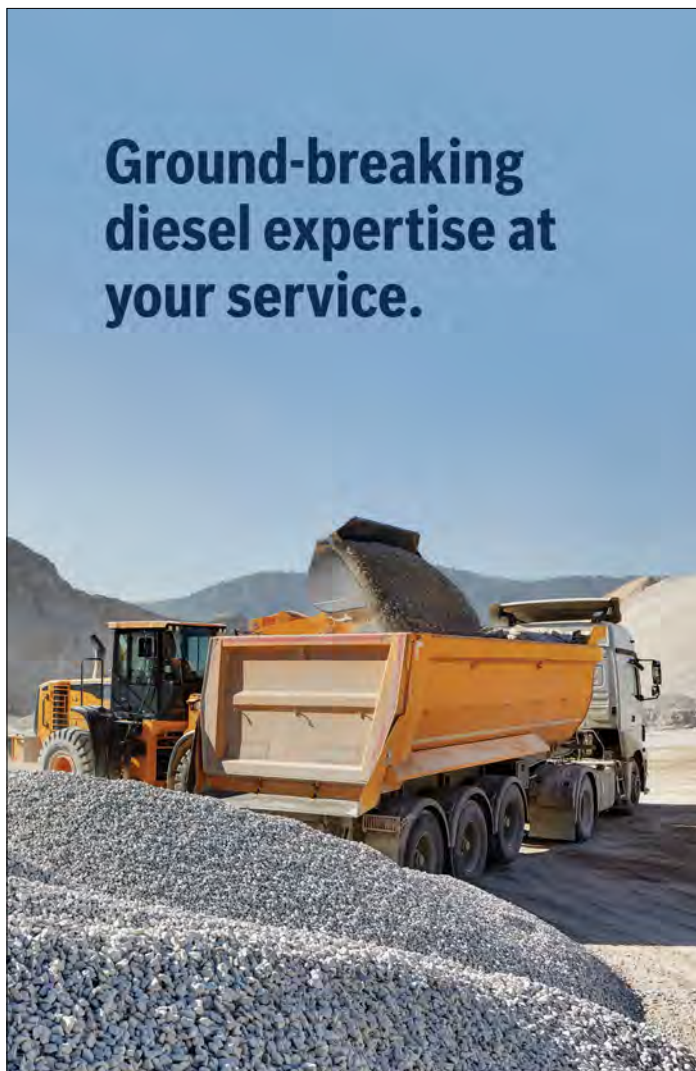
### Tailored to requirements

Pearce says the technical audits will be tailored to the requirements of individual quarries which may range in size from a small family-owned quarry to large multi-national concerns producing aggregates and crushed granular material for multiple uses in different markets.

He adds that it is a fallacy that only large quarries can afford to have in-house laboratories. At the cost of a set of sieves, a flakiness gauge plate, some scales, a drying oven and moisture containers, any quarry can set up the required tests to meet ISO 17025 requirements. Management systems can then be introduced at varying levels of detail depending on the quarry’s requirements.

Pearce says the construction and civils industry have long been working towards a more accurate system of materials procurement and the new Aspasa audits will go a long way in meeting and exceeding the industry’s requirements, as well as improving the image of Aspasa and its members.

The introduction of the technical audits is expected to reduce the rate of material rejection once delivered to site, which is expected to easily offset the cost of compliance. He adds that the association would also look at participating in the National Laboratory Association – South Africa (NLA-SA) National Proficiency Testing Scheme to assist in comparing their results against the accredited commercial facilities to further reduce the disparities in the results and material rejections once the material has been delivered to site. ●



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The more pressing concern quarries face at the moment is the increased pressure to rapidly ramp up production, in an effort to recoup output lost during the hard lockdown.



## UNPACKING THE **'NEXT NORMAL'** FOR THE QUARRYING INDUSTRY

Like any other sector of the global economy, the quarrying industry is facing unprecedented challenges due to the coronavirus pandemic. Industry stakeholders concur that an imminent restructuring and re-thinking of the quarrying business could be the imperative of our times as the industry plans for the 'next normal'. **By Munesu Shoko.**

**T**hat the coronavirus (COVID-19) crisis is a world-changing event is no overstatement. Business experts believe that dealing with the pandemic and its aftermath could be the obligation of our times. Kevin Sneader and Shubham Singhal of McKinsey & Company maintain that the pandemic augurs the "imminent restructuring of the global economic order."

Like any other business sector, aggregates companies are looking at ways to protect their businesses during the pandemic, while finding workable solutions that will shape the 'next normal' post-pandemic.

### The impact

Commenting on how the pandemic has affected the quarrying industry in South Africa, Andries van Heerden, CEO of Afrimat, an open-pit mining company providing industrial minerals, commodities and construction materials, says the crisis came at a time when the industry was already suffering from decreased demand for construction materials, thus worsening an already complicated business environment.

"The construction industry has been impacted by a shrinking market for the past three years, which left many quarrying businesses vulnerable when the lockdown was announced unexpectedly," says



Various VEI models from Dynamic Weighing Systems can be fitted on any machine with a lifting piston – from small forklifts to the largest rigid dumpers and excavators.

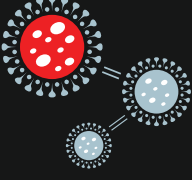
Van Heerden. “Quarries had in most cases absolutely no revenue for the month of April and a severely reduced revenue stream for May. Sales started returning slowly during June as contractors returned to work and managed to become productive again but have not yet returned to pre-COVID-19 levels in most cases.”

He adds that there has been talk of retrenchments and salary reductions among many industry players in South Africa, and it is therefore clear that the pandemic has had a devastating effect on the quarrying industry. “In our case, Afrimat has been blessed with exposure to other industries and a strong balance sheet, which has shielded us from the worst possible impact.”

The same view is expressed by Marius van Deventer, independent auditor, ISHE Audits at Aspasa, southern Africa’s surface mining industry association, who says that the quarrying industry in South Africa has been operating under very difficult business conditions for some time now due to a constrained construction sector, with the COVID-19 influenced lockdown exacerbating the situation.

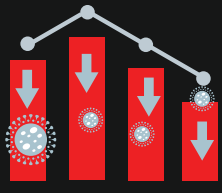
“This is something neither businesses nor individuals in the

### KEY TAKEAWAYS



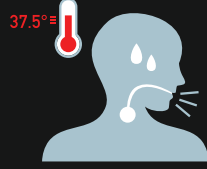
Business experts believe that dealing with the COVID-19 pandemic and its aftermath could be the obligation of our times

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The crisis came at a time when the industry was already suffering from decreased demand for construction materials, thus worsening an already complicated business environment

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If a concern around safety arises, mines and quarries are geared to respond quickly – making the industry better equipped than most to handle the new complexities around COVID-19

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Where in the past quarry operators may have looked to the flexibility of their teams to drive productivity, going forward they now have a range of new workflows enabled by technology to help them cope with the ‘next normal’



Measurement tools like LOADRITE loader scales give quarry managers real time information about the amount of materials going into or taken out of the stockpile.



Andries van Heerden, CEO of Afrimat.



JBI Industrial offers solutions to a range of industrial weighing applications, including weighing solutions and systems for mobile equipment such as front-end loaders.

sector were prepared for,” says Van Deventer. “Companies lost a lot of revenue during the period they could not fully operate, while individual employees also lost out due to steps taken by employers to save businesses.”

### Rethinking the business

The pandemic has forced quarry operators to re-think their business and do things differently. As we all know, says Van Heerden, the virus is highly contagious and looking ahead, the risk of human to human contact, direct or indirectly, should be reduced to the absolute minimum and very high hygiene standards must be maintained.

“Fortunately, the quarrying and mining industry in South Africa has a strong compliance culture and we need to build on this to maintain the discipline. The transport to and from work, the change houses and the ‘toolbox talks’ are areas where specific attention on social distancing and increased hygiene is of utmost importance,” says Van Heerden.

Van Deventer reasons that a quarry’s activities are basically drilling and blasting, loading and hauling, crushing and screening, maintenance and sales. Most of these, he says, can be safely done with limited human interactions, but in the entire process the human factor will still be included. None of these activities will be possible without employees and this is where the challenge starts in the quest to prevent possible infections.

He is, however, confident that the health and safety standards, and more specifically the compliance to these standards, are very high in the South African quarrying industry. “Employees are committed to these through their different structures and focus needs to be reinforced that existing risks still exist and need to be managed,” he says.

The same view is shared by Arjen de Bruin, MD of OIM Consulting, a Cape Town headquartered business consultancy that specialises in the mining sector, who says stringent safety processes are entrenched in the industry’s very DNA. He believes that if a concern around safety arises, mines and quarries are geared to respond quickly – making the industry better equipped than most to handle the new complexities around COVID-19.

De Bruin is of the view that the more pressing concern mines and quarries face at the moment is the increased pressure to rapidly ramp up production, in an effort to recoup output lost during the hard lockdown.

“In addition to this, they are now faced with an entirely new operating environment. Physical distancing, concerns within communities around COVID-19 infections and changes in day-to-day operations have altered existing team dynamics,” he says, adding that capex projects may have to take a backseat as the urgency to rapidly meet new production targets moves



Arjen de Bruin, MD of OIM Consulting.

to the fore. “We are back to basics, and the emphasis is fixed firmly on output.”

### The role of technology

Industry players unanimously believe that in the ‘next normal’ technology will have an important role to play in improving the much needed productivity and enabling high levels of health & safety.

“I think that technology is going to play a very important role in making the quarrying industry competitive in the ‘new normal’ after COVID-19. I think the focus will be on using technology to improve efficiencies and optimise the returns, while making operations more adaptable to market demands which could be more volatile and demanding in future. As an industry in South Africa, we have been slow in embracing technology in our operations and I think this is going to change,” says Van Heerden.

Glen Webster, sales manager at Loadtech Load Cells, the southern African distributor of LOADRITE, agrees, saying that where in the past quarry operators may have looked to the flexibility of their teams to drive productivity, going forward they now have a range of new workflows enabled by technology to help them cope with the ‘next normal’.

Now, says Webster, is a great time for quarry operators to learn more about the options available and talk with technology partners about their unique challenges, their goals and how technology can play a role in

their productivity and health & safety agendas.

“Using third-party on-board scales on an aggregates business’s loaders, excavators, haul trucks and conveyors that collect productivity data that can be easily shared with teams for better decision making can be beneficial,” says Webster. “Measurement tools like LOADRITE loader and belt scales, for example, give quarry managers real time information about the amount of materials going into or taken out of the stockpile, and loader scales can also help ensure that every truck is loaded correctly.”

From a health and safety perspective, Webster says while many operators will be isolated by the cab, and beyond regular cleaning of surfaces, technology can help to isolate them further. Electronic ticketing technology, for example, can email the loading ticket to the truck driver’s mobile phone or the office, just as a paper ticket does. By replacing the physical handover of a loading ticket, it reduces the need for proximity or any objects that may have the virus.

New load/haul monitoring systems have also replaced haul truck tally sheets. In fact, some newer systems require no haul truck operator interaction to track cycles, with remote reporting for anyone off-site.

“Before COVID-19, it was standard practice to use a paper workflow with load tickets for truck drivers. With social distancing, this may no longer be acceptable. The answer is paperless, contactless Trimble eTickets,” says Webster.

An eTicket is a paperless email of a load ticket or load summary. The load ticket details one specific truck load. The load summary totals all the loads in the last 24 hours to midday. “Limit person-to-person interactions and paper handling with digital eTickets to replace paper tickets. An eTicket-enabled worksite helps support a safer environment for visiting truck drivers as there is one less reason to exit the truck cab and potentially put themselves in an unsafe area,” adds Webster.

Ivan van Heerden, MD of Dynamic Weighing Systems, the sole distributor in southern Africa of the VEI Group’s line of on-board weighing and payload management systems, says that using intelligent products can help minimise contact between people. “If the VEI Vkiosk system is to be used, for example, apart from a security guard there would be no need for a weighbridge and the related staff, only persons on site would be the loader operators,” he says.

“The uptake of onboard weighing in the quarrying market has been progressing. It is now more important than ever that contact between individuals is minimised as much as possible and this technology can play a huge role in that regard,” adds Ivan van Heerden.

Christiaan Luttig, marketing director at JBI Industrial Solutions, believes that the COVID-19 pandemic has presented aggregate producers with valuable time to evaluate certain aspects of their respective business units. Relooking key performance indicators (KPIs) and restructuring of tasks among personnel, he says, could have an overall positive outcome in the immediate future.

“The only way to make more money is reducing inefficiencies and waste within quarrying operations and implementing and utilising technology in the production process will be beneficial,” says Luttig, adding that the aggregates sector could benefit the most from technology.

“Utilising technology such as production and productivity monitoring equipment and software will easily outline areas of improvement. The software solutions will identify bottlenecks, cycle times, equipment utilisation and lost labour hours daily, among other important parameters. Performance of operators can also be monitored and quantified per hour/shift,” says Luttig. “We are heading into an era of autonomous plant control, already successful in other parts of the world. It is going to become a reality in Africa sooner than we expect.”

Apart from technology, De Bruin sees the supervisor as being key to accelerating production within the ‘new normal’, and thus maintains that it is critical for senior leadership to understand what the frontline leaders are thinking, and how they are dealing with the new reality.

“With less on-site senior leadership representation, supervisors ultimately become the organisation’s primary culture carrier; responsible for motivating teams, instilling company values, ensuring adherence to new safety processes – and more importantly, meeting production targets,” concludes De Bruin. ●

AUTHOR: MARK BOTHA

# THE IMPORTANCE OF DUST SUPPRESSION AT QUARRIES

Dust poses one of the greatest threats to health and safety at quarries but the evolution of dust suppression systems is enabling quarries to deal with dust effectively. This feature highlights the various methods of preventing dust from escaping from its source, and explores the available methods and technologies used in dust suppression.



The DustBoss DB-60 Fusion Dust Control and Suppression Cannon from Boss-Tek.

**M**ining and industry face increased exposure to dust and other natural obstacles in their daily operations, says FlowCentric Mining Technology CEO Jacques Wessels.

“It is such a rapidly increasing problem for mines and their surrounding communities that the government included the administration and suppression of dust in the health and safety requirements for the operation of mines or industrial sites.”

He says dust is airborne dirt and other particles posing health risks including lung and other diseases. It is also the biggest cause of accidents in the industry.

“Without proper dust suppression treatment, you run the risk of occupational diseases including irritation to eyes, ears, nose, throat


## KEY TAKEAWAYS



Government has included the administration and suppression of dust in the health and safety requirements for mines and industrial sites




Using road dust palliatives on gravel haulage roads contributes to increased safety in terms of visibility

Atomised mist is recognised as an effective method of dust suppression

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Road construction material is critical and will play a major role in assisting with road maintenance and dust suppression

**“Worker health and safety is the primary reason why dust control is critical to so many operations. An environment with airborne quarry dust, which often contains silica, creates a worker safety hazard. In addition, the quarrying company could be held liable if employees develop illness or chronic disease due to long-term dust exposure.”**

MIKE LEWIS

and skin; dust explosions and fire; damage to equipment; impaired visibility and health hazards to the local communities.”

Mike Lewis, VP of sales at US-based industrial dust and odour solutions company Boss-Tek, agrees: “Worker health and safety is the primary reason why dust control is critical to so many operations. An environment with airborne quarry dust, which often contains silica, creates a worker safety hazard. In addition, the quarrying company could be held liable if employees develop illness or chronic disease due to long-term dust exposure.”

Pilot Crushtec International’s sales and marketing director Francois Marais says dust pollution has been a growing environmental concern over the past decade and expects it to “grow as a focus of concern over the coming years”.

He agrees that, in terms of health and safety, many of the “most serious” risks to on-site staff are either caused or exacerbated by dust. Dust suppression, he says, is an essential element of any effective health and safety policy.



Ken Mouritzen, MD of BLT World.



Mike Lewis, VP, Boss-Tek.



Jacques Wessels, CEO, FlowCentric Mining Technology.



The TDS 2005 tailing dam solution from I-CAT.

“In terms of plant maintenance, air filters and greased parts are some of the most frequently maintained items on any quarry. These items are extremely sensitive to high levels of dust, making dust suppression one of the best ways to decrease maintenance time and increase productivity on site.”

“Wear and tear on equipment,” says Boss-Tek’s Lewis, “increases when dust gets into every nook and cranny on machinery. This poses a housekeeping issue: having to clean up accumulated dust at some points in the facility.”

I-CAT business development manager Eugene Kleynhans agrees that dust suppression is crucial at quarries to improve the health and wellbeing for employees and surrounding communities. He says using road dust palliatives on the gravel haulage roads at quarries

also “contributes to increased safety in terms of visibility, and decreases rolling resistance and maintenance intervals, while saving water.”

#### Effective dust suppression

Kleynhans says a durable, dust-free foundation depends on the effective use of road and dust palliatives to stabilise and maintain dust-free road surfaces. I-CAT offers two such palliatives, the RDC 20 and GreenBit, which are used in different applications.

RDC 20 is a formulation of blended emulsified co-polymers and ionic modifiers, while GreenBit, a bitumen-based product which creates permanent roads by establishing a wearing course, is used primarily on permanent haulage roads. Both products maintain roads at a predetermined application ratio determined by several

factors, including average rainfall and traffic type.

RDC 20 is an environmentally friendly road dust suppression palliative providing non-permanent solutions. It is mostly used on secondary haulage roads requiring dust suppression.

“It is not as expensive as asphalt” says Kleynhans, “and, over time, creates roads with properties similar to those of asphalt.”

Pilot Crushtec’s Marais notes that dust creation is highest at points of transfer. “Be they loaders tipping product into trucks, conveyors creating stockpiles or transferring material to other conveyors, we generally see the most dust being emitted at these transfer points.”

In cases such as those involving conveyors, the company can fit dust suppression systems close to the source of the dust.

“For stockpiling conveyors, we can fit hoses that spray the product throughout the length of the conveyor so that the material is sufficiently damp by the time it falls from the conveyor and onto the stockpile. This method is effective on static equipment like conveyors.

“However, when it comes to more dynamic points of transfer such as a loader picking up material from stockpiles and feeding it to other plants, it is far more difficult to administer dust suppression close to the point of transfer.”

FlowCentric Mining Technology’s Wessels says that, while road dust control is done by means of palliatives and binder added to water bowsers and sprayed onto the road, proper road grading and sweeping



**Eugene Kleynhans, business development manager, I-CAT.**



**Francois Marais, sales and marketing director, Pilot Crushtec.**

can reduce maintenance.

“Misting systems are installed on drop points, in plant and on conveyers to catch the dust particles effectively and ensure a dust-free environment.”

Lewis adds that atomised mist is recognised as an effective method of dust suppression.

“Water droplets are fractured into extremely small sizes similar to dust particles, which allows them to capture the dust effectively and bring it to the ground. Using misting technology reduces the amount of water necessary to control dust, while also minimising pooling and runoff, which can be a hazard on the jobsite.”

### **Dust suppression technologies**

Typically, says Pilot Crushtec’s Marais, dust suppression systems rely on wetting material before it becomes airborne to prevent dust from taking to the air. The Generac Mobile Dust Fighter, however, addresses dust once it is already in the air.

“The Generac Mobile Dust Fighter range,” he says, “is designed for where access to the point of transfer is limited or impossible. High-power fans blow atomised water particles into the air. These particles attach themselves to dust particles and weigh them down, causing them to settle to the ground.”

Kleynhans says the RDC 20 product is sprayed on to road surfaces using a water bowser at a predetermined application ratio.

“To prepare the road surface, a higher percentage of product is sprayed on the road to stabilise the surface and prepare it for the monthly maintenance schedule.”

The I-CAT GreenBit solution establishes and maintains road surfaces. To establish the surface, the road is ripped by means of graders before water bowzers wet the road, using the product.

“With this done, the road is compacted using roller compactors, and shaped with graders. The road is maintained using a water bowser with a predetermined application ratio of product to water.”

Misting is another dust suppression technique, usually involving high-pressure technology which, according to Kleynhans, “can be dangerous, costly and difficult to install”.

The misting technologies offered by I-CAT are low-pressure systems installed on conveyers, transfer points, tipping areas and crushers.

“This is unique to the market as it is a low-pressure system using a combination of water and air. This method is cost-effective, easy to install and less dangerous.”

The company’s Dust Monster solution sprays water on to stockpile areas that are difficult to reach.

“This technology can be mobile or static and requires a constant water supply and electricity. It can be automated or used manually, attached to a weather station for ease of control,” says Kleynhans.

The Retractable Stock Pile Ring, another product by I-CAT, is installed on header boxes at stockpiles.

“The patented technology creates a virtual curtain around the material that flows from the conveyor onto the stockpile.” Kleynhans says the “ring” is mounted on a banana slide to allow for easy maintenance.

Lewis says Boss-Tek’s DustBoss product line “continues to grow with the addition of the DustBoss Surge centre nozzle, a powerful cannon designed to fight dust in sub-par weather conditions”.

“We have also added our full line of Fusion units, which pair a ‘workhorse’ electric dust suppression design with a generator set. Our equipment offers a wide range of versatility depending of the facility’s specific needs, including 359° oscillation, tower mounting and remote-control capabilities.”

He says modern dust suppression technologies reduce manual labour and water consumption, providing dependable solutions for controlling airborne and ground-level particles.

“Many quarries and surface mines rely on manual spraying or water trucks, both of which require labour and can result in heavy water usage, pooling and runoff. In addition, these methods only address ground-level dust and do little or nothing to manage airborne particles.”

He says the DustBoss product line addresses these concerns and delivers more effective suppression, while freeing up employees to work on other tasks.

Wessels says FlowCentric Mining Technology’s flagship product is Roadtech, used in various industries as a dust palliative.

“This formulation of blended emulsified co-polymers and ionic modifiers offers an environmentally friendly and cost-effective solution for dust control in the mining, agricultural and construction industries.”

He says the product is biodegradable, environmentally friendly and can be applied over vegetation without harmful effects. As it is water soluble, Roadtech is added to



Dust levels on the road before treatment with Roadtech from FlowCentric Mining.



Road after treatment with FlowCentric Mining's Roadtech.

a water bowser and sprayed on to the surface of the road.

Roadtech Plus is a natural, polymer-based gravel road sealant combined with an emulsified bituminous product to create a durable sealant for gravel roads.

Wessels describes it as an “environmentally safe alternative for semi-permanent and permanent gravel roads and roads in residential areas.” He says regular use makes it ideal for water-scarce areas.

“Roadtech Plus was formulated to create a durable road surface suitable for heavy haulage vehicles in the mining industry. It is less harmful to the environment than traditional bituminous products as natural ingredients are incorporated into it. The result is a durable, smooth road capable of withstanding high volumes of traffic.”

Another of the company’s solutions is PolyTech, a natural emulsified gravel road sealant combined with a polymer to provide a sealant for gravel roads.

“It is an environmentally-safe alternative for semi-permanent and permanent gravel roads, and even for roads in residential areas,” says Wessels. This product forms a water-resistant road surface, resulting in a durable, smooth road capable of withstanding high traffic volumes.

While not designed to carry traffic but purely to seal large open areas and to keep extreme fines at bay, Tailing-Cap is an application used to bind fines on tailing dams and discard dumps, where fugitive dust becomes a hazard.

Wessels says it is polymer-based and forms a permeable cover or “skin” over the intended area, with limited flexibility to ensure longevity on the treated surface.

“Both Roadtech and Polytech use spray-on application protocols while Roadtech-Plus is built into the surface of the road to ensure stability of the wearing course. After application, the products will form a durable crossed linked matrix which binds fine soil particles to prevent dust from becoming airborne.”

Apart from these products, the company also provides locally manufactured misting canons and misting systems to the mining and construction industries.

BLT World MD Ken Mouritzen says the company’s contact-free AirScrape conveyor belt skirting system by ScrapeTec eliminates dust and spills on belts and transfers to minimise conveyor system maintenance requirements. The system can also cope with the challenges of moist and sticky materials, without the need for filter elements, as it is a water-free solution.

“This system prevents dust formation, reduces material spill, enables thorough belt-cleaning and minimises the risk of explosion at critical sections along the conveyor route and at transfer points.”

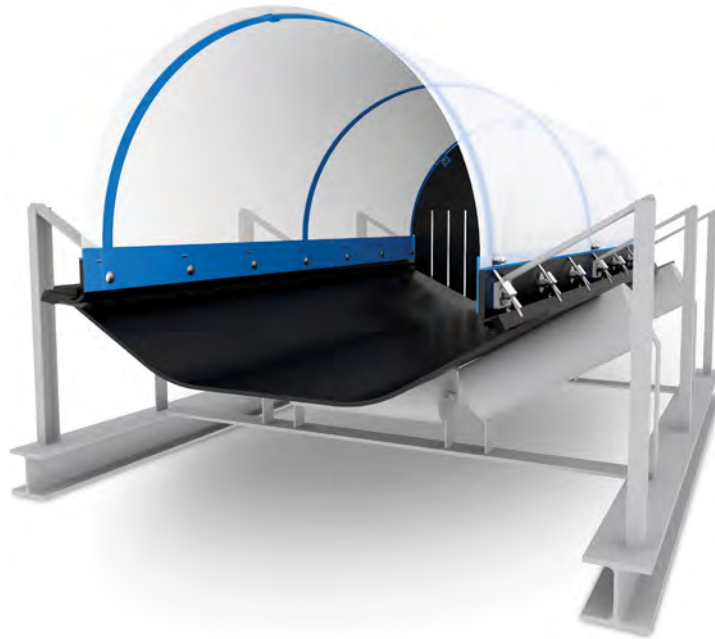
He says AirScrape is a contact-less side seal that lies over the conveyor belt to create negative pressure on the belt. The system eliminates skirt friction and belt damage, so extending the service life of “every component of the conveyor”, as it hovers freely above the conveyor belt.

“AirScrape has also solved the problem of ‘moist and sticky’ conditions in some industries, including at a plant for processing slag and ashes from waste incineration into usable raw materials.”

He says a six-week trial operation showed that, although cleaning at critical points is necessary once a week, some 90% of time previously spent cleaning is now available for productive work at the plant.

“The fact that it is possible to process ashes with a high moisture content directly from incineration using ADR technology is a real advantage for metal recovery.”

Mouritzen says the other products from ScrapeTec available from BLT World, including DustScrape, TailScrape and SpeedScrape, are virtually maintenance-free, extend the service



BLT World's DustScrape is a combination of dust filter cloth and AirScrape.

life of conveyor belts and reduce cleaning requirements of the entire conveyor system.

“Our Samson travelling Eco-Hoppers feature dust control systems to minimise the escape of dust in bulk materials handling.”

These hoppers have an upper and lower section, separated by the Flex-Flap dust retention feature. Bulk material falls through the Flex-Flap and accumulates in the inner hopper below. The hopper system closes automatically due to a pressure differential between the hopper and the atmosphere, forming a seal to contain the dust.

### Considerations before installation

Boss-Tek's Lewis says quarries should consider their water sources prior to installing dust suppression measures.

“Quarries are notorious for having limited access to water, so finding a clean water supply is paramount. Our Fusion systems can be paired with water tanks on a roadworthy trailer to deliver a self-contained solution.

“Where is the primary, secondary, and tertiary dust being generated? Crushers, screeners and stockpiling all generate dust, and there are atomised mist tools for each area that will help mitigate dust to promote a cleaner and safer environment.”

He says wind can affect the range

and performance of atomised mist systems, so positioning, aiming and oscillation should be considered when using the equipment. BossTek supplies both stationary systems for ongoing activity that creates dust and mobile systems that deliver the versatility to accommodate changing conditions.”

Prior to installing dust suppression measures, says BLT World's Mouritzen, quarries should consider factors such as ease of installation; conveyor monitoring; maintenance; labour cost; power requirements; wear of conveyor belting, and return on investment.

Pilot Crushtec's Marais adds that quarries should consider each material transfer point on the quarry and manage dust creation for those transfer points.

“For transfer points where it is possible to install spray bars close to the area, such as stockpiling and transfer conveyors, simple spray bar systems are usually sufficient to moisten the material enough to prevent dust.”

He says that, for more dynamic transfer points such as loaders and excavators, it may be necessary to implement the Dust Fighter to deal with dust already airborne.

“Once this route is selected, the availability of sufficient water and appropriate electricity input to power the Dust Fighter become important. Also bear in mind that, as the wind

changes direction, the Dust Fighter will have to be moved to allow the wind to enhance the effect rather than detract from it.”

I-CAT's Kleynhans says quarries should consider their environment, size of operation, the desired result and, most importantly, their budget.

“There are many dust suppression technologies available, however budget is the chief contributing factor to installing or applying effective dust suppression technologies in quarries.”

FlowCentric Mining Technology's Wessels says the material used in road construction is critical and will play a major role in assisting with road maintenance and dust suppression. Stabilisation of the wearing course, he says, is of “utmost importance”.

“Although grading intervals will be reduced significantly with the use of effective dust palliatives, it will still be advisable to skim the road surface once a week with a grader to reduce corrugation and potholes.”

He says proper water bowser spraying patterns are essential to ensure that the entire surface of the road is covered when applying the dust palliative.

“Regular road sweeping will help with the removal of rocks and debris which, in turn, are mayor contributors to the deterioration of the wearing course.” ●



The Combo allows Ground Breakers to produce two high-quality sands simultaneously from the raw feed including plaster sand and river sand.

## REPLACING **BUCKET WHEEL** SYSTEMS WITH CYCLONE TECHNOLOGY

Problems encountered when washing and dewatering sand include the discharge of wet product; product-sized sand sent to waste; too much time spent cleaning out settling ponds, and water usage. Wet processing equipment provider CDE has developed an alternative for construction and materials companies, in the form of cyclone-based solutions. By **Mark Botha**

**U**ntil recently, construction and materials companies had to rely on bucket wheel wet processing technology to separate materials into different grades of sand.

Although bucket wheels have been essential to the quarrying industry over the years, increasing demand for sand and aggregates products, as well as increasingly stringent regulatory requirements, mean that operators must produce a wider range of materials in larger quantities and in less time to protect their return on investment and to turn a profit.

Global wet processing equipment provider CDE has developed an alternative for construction and materials companies, in the form of cyclone-based solutions which, according to Willem du Plooy, the company's business development manager, "guarantee a strong competitive edge and fast return on investment".

### **Bucket wheel technology**

"Bucket wheel technology, in its prime when resources were abundant and the price of sand was high, is fast becoming a much less attractive proposition when compared to new systems," says Du Plooy.

He says bucket wheels accept material either directly from the aggregates screening operation, or are fed from classification tanks in applications where there is excess fine material in the -75/-63 micron range, which must be removed.

The operation of the screw pushes the sand fraction up the elevated chamber while the water and finer particles pass through the overflow weir. The overflow weir, which is closer to the feed point, then provides the mechanism for fines removal.

In bucket wheel classifiers, sand slurry is introduced near the wheel, where the coarse sand settles, and is lifted by the rotating wheel. The rotary

bucket elevator scoops the sand from the tub and drains the water from the sand during transfer. The wastewater flows over the weir at the back of the bucket wheel and the solid fraction is separated in the wastewater slurry.

“The limited capacity at the feed point of these technologies means that control over the volumes of water required for accurate material classification is difficult,” says Du Plooy. “The inability to use sufficient volumes of water means that fines are not efficiently removed and 100 – 300 micron fractions are lost to ponds or to the water treatment phase, along with the overflow, making the sand product coarser.”

He says the bucket wheel’s settings must be adjusted regularly to mitigate the risk of inaccurate material classification.

As this method of classification depends on settling time, the cut point must often be chosen above the threshold to obtain a maximum amount of allowable silt in the final product.

Diverting excess material to settling ponds requires considerably more space to accommodate them, and the classification inefficiencies increase as the proportion of fines in the feed material increases.

Clearing out settling ponds to recover lost material requires plant downtime in addition to the operating costs incurred when reprocessing waste material. High maintenance and restricted throughput aside, the sand product typically discharged contains between 23% and 25% moisture, placing stockpiles at risk of contamination if located in proximity to one another.

“As a consequence, stockpiling the final product requires double or even triple handling to move the material to separate stockpile areas. Stockpiles take long to build and to dry to saleable standards, and return on investment becomes a significant issue,” says Du Plooy.

**Cyclone technology**

He says cyclone technology is now replacing bucket wheel technology as a “natural evolution” of materials processing brought about by modern innovations. CDE has developed cyclonic materials technology to the point where it guarantees the



Switching from the bucket wheel system to the Combo has resulted in production gains for Ground Breakers.

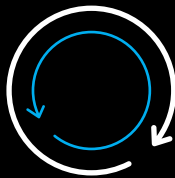
**KEY TAKEAWAYS**



Bucket wheel technology is fast becoming a much less attractive proposition when compared to new systems



The limited capacity at the feed point of bucket wheel technologies makes control over the required volumes of water difficult



Cyclone technology is now replacing bucket wheel technology as a ‘natural evolution’



Return on investment is fast thanks to a reduced spares requirement, efficient water management and longer and running time



CDE developed and built a Combo modular plant to transform 60 tph of raw feed into washed 0 – 6 mm river sand and 0 – 1,5 mm plaster sand.

removal of the undesired fraction (e.g. -74 micron) while retaining quality fines and maximising dewatering of the product to between 10% and 15% moisture.

The company has been a proponent of cyclone technology since 1992 and has delivered almost 2 000 materials washing operations projects globally.

“Cyclone technology involves the use of centrifugal force as opposed to gravity to classify materials,” says Du Plooy. “After testing to determine the proportion of silt material to be removed from the raw feed, the specification of a cyclone set-up is calculated to ensure that the client’s EvoWash hydrocyclone-based system provides control over silt cut points.”

The design of the cyclone unit allows for an increased number of parameters which, says Du Plooy, ensures improved accuracy on the material cut point. The silt exits the overflow at the top of the cyclone with the wastewater, to be sent to settling ponds or a water recycling system. The sand fraction exits the cyclone at the bottom, ready for dewatering and stockpiling.

Retaining all available quality fines in the raw feed reduces the space required for settling ponds and so benefits both the customer and the environment.

“Product yield is maximised and operational costs reduced,” says Du Plooy. “The production of sand and aggregates is guaranteed to be within specifications, in line with the requirements of the customer or their downstream processes.”

“For instance, a 70 tph machine typically loses 20% sand to the pond which equates to 14 tph of sand lost, resulting in 140 t/day and 3500 t/month. If sand is worth R100 per tonne, that is a loss of R350 000 per month. With the lost sand recovered from the silt pond, a CDE EvoWash could pay for itself anywhere between 6 to 12 months.

### High moisture content

The solution to bucket wheels’ limited ability to dewater sand products effectively lies in using a high-frequency dewatering screen to dewater the material in one pass, so removing the need for re-processing and double handling, says Du Plooy.

Once the sand slurry with the silt material is discharged from the hydrocyclones, it is delivered to a dewatering screen which is sized according to the customer’s specific capacity requirements.

“This allows for a sand product with a moisture content typically ranging from 10% to 15%,” says Du Plooy. “As a result, the product is ready for market straight from the belt, and the sand is turned into revenue in the shortest possible time.”

He says return on investment is fast thanks to a reduced spares requirement,

efficient water management and longer and more reliable running time.

“If sand is worth R100 per tonne, a 70 tph machine loses R7000 for each hour it is out of action due to maintenance or repairs. Our products are designed specifically to require minimum attention, minimal civils and a minimal number of operators so that they can be left to simply produce clean sand and aggregates at the required rate.”

### Process water recycling

He says CDE’s AquaCycle water management solution accelerates return on investment by maximising production efficiency, minimising the loss of valuable fines, and reducing water and energy costs.

“AquaCycle minimises water consumption by ensuring that up to 90% of process water is recycled for immediate recirculation.”

Once the feed material has been washed and classified, waste is sent to the AquaCycle thickener tank, where a small amount of polyelectrolyte flocculent is added to the water via an automatic dosing station forcing fine particles to settle to the bottom of the thickener tank.

“The clean water at the top overflows the weir and is stored in the AquaStore tank before being re-circulated,” says Du Plooy. “The result is an efficient water recycling system which requires only a 10% top-up water supply.”

He says waste sludge is discharged into a buffer tank where a motorised rake in constant rotation ensures the material does not settle and solidify. If further dewatering is required, a filter press or decanter is added to the wet processing solution to eliminate the need for settling ponds.

### Design

Du Plooy says all water thickeners are not “born equal” and their efficiency results from years of research, development, and refinement.

“Every aspect of its design is considered carefully so that the system is responsive to the site-specific needs of its owner.”

He says all CDE equipment is pre-wired and pre-tested before despatch, to allow for plug-and-play operation, and is designed for rapid assembly and set-up to start processing



Willem du Plooy, CDE business development manager.

material within days of arrival on site.

“These design considerations and factory acceptance tests reduce install time significantly and accelerate return on investment, a real proposition when the CDE AquaCycle thickener is introduced to a washing operation. In fact, RoI with a CDE AquaCycle is typically achieved within six to nine months.”

Settling ponds are a known source of revenue loss due to their high maintenance costs, site footprint and downtime, but also because high-value fines can be lost and trapped at the bottom of ponds.

“The requirement for settling ponds is greatly reduced by recycling up to 90% of the process water. The addition of a filter press tailings management system eliminates that need entirely. When combined with a CDE filter press custom-built fines management system, this figure increases to 95%, removing the need for settling ponds altogether.”

### Case study

South African sand and aggregates producer Ground Breakers required an upgrade of the existing bucket wheel system to address the loss of valuable materials to ponds and excess moisture in the final products.

The company’s JC Janse van Vuuren and Johan Meintjes explain: “Our quarry site in Lanseria faced a lot of challenges: we had limited water

sources and space to install a proper wash plant. Silt dams are no solution as they take up valuable mining space.”

The market required clean washed concrete sand but the company’s bucket wheel was not delivering quality product. In addition, fines were being lost to settling ponds, wasting material that could not be sold without dredging the ponds and re-processing it through the bucket wheel.

The sand product typically discharged from the Ground Breakers’ bucket wheel system contained between 23% and 25% moisture, which meant that stockpiling the final product required double or triple handling to move the material to a separate stockpile area.

### The solution

Ground Breakers’ feed material was tested at CDE’s laboratory. The resulting analysis results showed that the customer could achieve savings by adopting cyclone technology to eliminate the loss of fines to ponds.

This, says CDE’s Du Plooy, “would help retain every grain of sand available in the system, reduce the size of the settling ponds, and shorten maintenance time.”

He says CDE’s technology could also add a plaster sand product to Ground Breakers’ offering. Plaster sand has higher commercial value than the river sand originally processed.

CDE then presented its Combo all-in-one wet processing and water recycling system as a solution to the customer’s requirements.

According to Du Plooy, the Combo would allow the client to produce two high-quality sands simultaneously from the raw feed, including plaster and river sand, at a much faster return on investment.

“Incorporated water management would ensure that the final products were dewatered to an average 12% moisture content, making them ready for market straight from the belts. As an added benefit, the fully integrated CDE AquaCycle thickener would allow for up to 90% of the process water to be recycled directly into the system for near-independence from fresh water supplies.”

Following a collaborative design process with the customer, CDE then developed and built a Combo modular plant to transform 60 tph raw feed into washed, 0 – 6 mm river sand and 0 – 1,5 mm plaster.

### The result

The Ground Breakers bucket wheel was not reducing moisture in the sand products effectively and fines were lost to ponds.

To address these limitations, the Combo high-frequency dewatering screen was provided to dewater the material in one pass, removing the need for re-processing and double handling.

Once the sand slurry with the silt material is discharged from the hydrocyclones, it is delivered to the screen which is sized according to the customer’s capacity requirements. This allows for the production of a sand product with a moisture content typically ranging from 10% to 15%.

The result was a product that is ready for market straight from the belts, in turn converting sand into revenue in the shortest possible time.

“An added benefit of the Combo system is that, although the plant packs a powerful punch, it requires a very small footprint, making it easy to relocate, even in remote areas,” says Du Plooy.

Janse van Vuuren and Meintjes agree: “Our CDE Combo is compact and highly efficient. It produces two properly washed products and our customers are happy that the moisture content is so low. This means a considerable cost saving to them, as we generally sell per tonne.”

They say the need for silt dams has been reduced because the system basically works as a full-circuit unit, retaining fines and recycling used water for immediate re-use in the system.

“The Combo on the Ground Breakers site,” says Du Plooy in conclusion, “has allowed the company to maximise yield and reduce its operational costs. The production of sand and aggregates is guaranteed to be within specifications, with no risk of cross-contamination when two products are processed simultaneously.” ●



At any mine where there is significant risk collisions, measures need to be taken to mitigate them.

## PDS COMPLIANCE UPDATE

In December 2014, the Department of Mineral Resources and Energy promulgated the use of proximity detection and collision avoidance systems at South African surface mines and quarries. After lengthy consultation, Afrimat health and safety manager Letisha van den Berg updated *Modern Quarrying* on the process in 2017. Now, three years later, she brings us up to speed once more. By Mark Botha

In December 2014, the Department of Mineral Resources and Energy (DMRE) promulgated the mandatory use by mines of collision avoidance systems (CASs) and proximity detection systems (PDSs) on trackless mobile machines (TMMs), based on their own risk assessments.

The deadline for promulgation of collision avoidance systems was provisionally set for July this year but, by the time of her initial interview with *Modern Quarrying* in 2017, Afrimat health and safety manager Letisha van den Berg said no date had yet been approved by the DMRE.

It had also been found, by 2017, that not all PDS units complied with the standards and specifications set for these and collision

avoidance systems on TMMs, and that very few suppliers provided surface-mine CAS solutions on multiple vehicles.

In the same year, the quarrying industry engaged the Minerals Council, TMM OEMs and small-scale mines through industry association Aspasa to ensure proper risk evaluation through Australian technology consulting company Mitacom. The aim was to produce a user's manual setting out industry's PDS requirements.

Afrimat is one of four industry members who volunteered to undergo the process of testing PDS units, and to guide other industry players through the testing process, which involved the Mineral Council, Aspasa, PDS suppliers and TMM OEMs. Feedback was passed on to the regulator.



Letisha van den Berg, health and safety manager, Afrimat.

“There were some uncertainties in the original published requirements,” says Van den Berg. “For instance, in terms of the mine itself, its equipment and liability, or in terms of ownership of the TMMs: the mine doesn’t necessarily own these machines as they are leased or purchased under guarantee and warranty. This implies, in turn, that mines are unable to modify their TMMs to accommodate the CAS and PDS units. Before this process, we didn’t even know what to expect from the suppliers of these units.”

### Risk evaluation

The mines who participated in the compliance process performed a risk evaluation in cooperation with Mitacom and Aspasa. This process recorded previous incidents involving TMMs between 2005 and 2017. Van den Berg says some 2 000 incidents of TMM-related collisions with structures, other vehicles and pedestrians were recorded.

“We also considered all DMRE TMM-related data, so we didn’t only record isolated problems on small-scale mines but included the DMRE’s statistics as well.”

The risks involved with about 230 incidents were evaluated and an industry outcome obtained.

“This process helped us identify the vehicles most at risk: articulated dump trucks, front-end loaders and light-duty vehicles (bakkies). That enabled us to approach PDS unit suppliers for quotes on units that would warn of possible collisions

## KEY TAKEAWAYS



In December 2014, the Department of Mineral Resources and Energy promulgated the mandatory use by mines of collision avoidance systems and proximity detection systems on trackless mobile machines, based on their own risk assessments



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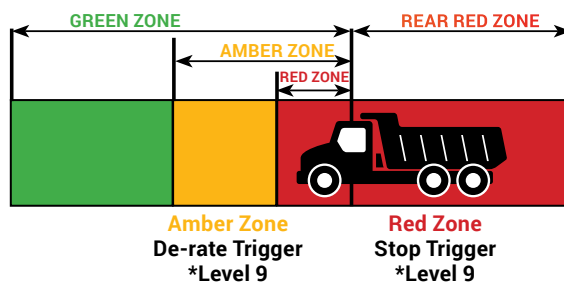


PDS suppliers were required to undergo simulation testing at the University of Pretoria, as well as a trial at the mine to demonstrate their solutions in a live environment, before submitting their technical files to the DMRE

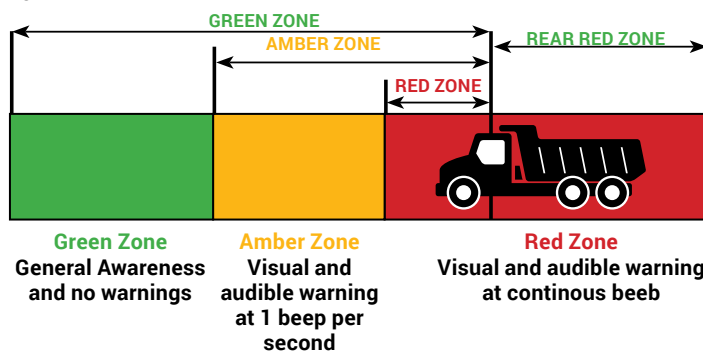


During a 2020 meeting between PDS suppliers, movable machine OEMs, the Mineral Council of South Africa and Mitacom, it was agreed to extend the December 2020 deadline for compliance, as the TMM manufacturers were not ready for the transition to CAS units

### SLOW SPEED



### HIGH SPEED



Graphics supplied by Afrimat

Traffic management planning has come under the spotlight recently as requirements for Proximity Detection Systems and effective risk management interventions become enforceable under the provisions of the Mine Health and Safety Chapter 8 MHSA Act 29 of 1996.



Afrimat is one of four industry members who volunteered to undergo the process of testing PDS units.

(level 7 collision avoidance), identify corrective paths (level 8), or implement a ‘slow-down and stop’, a level 9 intervention.”

The process also revealed the need for consultation between PDS suppliers and the trackless machine OEMs, who must approve the CAS or PDS units to be installed. The OEMs were, however, reluctant to allow alterations to their machine designs and provided “black box” units to which the CAS is connected. These units serve as an interface between the CAS and the TMM.

“The black box identifies liability when an incident happens,” says Van den Berg. “It will determine whether the unit triggered a warning and whether the trackless machine received or responded accordingly – does liability for the incident lie with the PDS unit supplier? Did the operator alter the unit, causing it not to trigger?”

The trial highlighted the “numerous external factors” that set apart the needs of surface mining from those of underground mines.

“With surface mining, vehicles move in all directions, on multiple levels. Rotating warning lights on older vehicles trigger the CAS units and you have constant false alarms in non-collision paths, not distance. Even WiFi, strong electric currents or radio frequencies on surface mines can interfere with these units.”

### Simulation testing

PDS suppliers were required to undergo simulation testing at the University of Pretoria, as well as a trial at the mine to demonstrate their solutions in a live environment, before submitting their technical files to the DMRE.

The four small-scale mines trialled PDS units to bring the best units to market at reasonable prices.

“We learnt from this that you can’t just install a PDS on any vehicle and expect the operator to accept it; change management beforehand is critical.”

She says the industry realised through this process that the unit suppliers were not ready. Some admitted that they would not have units ready for installation by the December 2020 deadline.

“Some suppliers were geared for large surface equipment, but they had no interface for small vehicles like 30 t ADTs. The act was promulgated with the date for collision avoidance systems without looking at the repercussions: it worked as a leading practise at underground mines with certain equipment and they just assumed it would be ready for the whole industry.”

The trial was hampered by the fact that the participating small-scale mines couldn’t afford to trial the PDS units’ level 9 trial functionality (“slow-down and stop”).

“The cost of the black box interface was higher than that of the PDS equipment,” says Van den Berg. “We were able to try out the black box for ADTs as we received those from the vehicle OEM at no charge, but not all OEMs had these units available yet, and still had to undergo the research and development process.

“Our needs are different to those of bigger mines. For instance, on small-scale surface mines, front-end loaders load other vehicles and the CASs register these vehicles as obstacles that may collide with the loader.”

### Deadline extended

During a 2020 meeting between PDS suppliers, movable machine OEMs, the Mineral Council of South Africa and Metacom, it was agreed to extend the December 2020 deadline for compliance, as the TMM manufacturers were not ready for the transition to CAS units. A new deadline was decided on but will only be announced at a later stage, pending approval by the legislator.

“All we really know is that the new date will be set a few years into the future,” says Van den Berg.

Meanwhile, she says, it is imperative for surface mines to manage on-site traffic by, among others, separating large and small vehicles and removing pedestrian traffic by transporting workers to and from the pit.

### Traffic management

“We cooperated with MOSH (Mining Industry Occupational Safety and Health) on reducing traffic on site. If you don’t sort out traffic management and you have congestion, the PDS systems will sound the alarm constantly. Instead of having five ADTs waiting in line to be loaded, introduce a ‘hard park’ area and load the trucks one by one. This eliminates dovetailing where they all wait in line and set off one another’s PDS alarms.

“Level 9 (slow-down and stop) is where the problem lies because the black box interfaces are not yet available from all OEMs.”

Van den Berg says in conclusion that quarry managers have “no reason for concern” despite the uncertainty this has caused in the industry.

“There will be a phase-in period and the process are now far more collaborative. Before, the big players in mining gave the input to the regulator. Now, the involvement of ASPASA ensures that the small mine or quarry is also represented. We now have a voice and we’ve been heard.” ●

## Zimbabwe export order for Osborn

Mining and quarrying equipment specialist Osborn, a subsidiary of Astec Industries Inc, has completed a significant export order for a new aggregate crushing plant in Harare, Zimbabwe. New customer Beta Holdings, Zimbabwe's largest brick and concrete roof tile supplier, has installed and commissioned six Osborn machines in the brand-new plant.

"The order was secured through our Zimbabwean dealer, Jacob Bethel Corporation," explains Osborn regional sales manager Kevin Mgiba. Beta Holdings is a well-established Zimbabwean business with its origins going back to 1953, when it was established as Alpha Bricks.

"Osborn values having secured this order from Beta Holdings based on the technical solution presented and our reputation for great product quality and aftermarket support. This has been Osborn's legacy in its 101 years of supporting the global quarrying and mining industry," Mgiba comments.

He says that the number of Osborn machines operating successfully in the aggregate and mining space in Zimbabwe



**The scope of Osborn's contract for Beta Holdings included the manufacturing and supply of the equipment.**

is also building customer confidence in the region, together with the fact that Osborn equipment has the back-up and support of local dealer, Jacob Bethel Corporation.

The Osborn equipment supplied for Beta Holdings' new 250 tph aggregate crushing plant includes an Osborn 30 x 42 Jaw Crusher, an Osborn 44SBS Cone Crusher, a Modular VSI2500 KPI-JCI Crusher, an Osborn 6 x 16 Double Deck Vibrating Screen, an Osborn 6 x 20 Triple Deck Vibrating Screen, and a 42 x 16 Osborn Vibrating Grizzly Feeder.

The scope of Osborn's contract for Beta Holdings included the manufacturing and supply of the equipment. Osborn's Zimbabwean agent, Jacob Bethel Corporation, played a key role in the undertaking, Mgiba states, from securing the order to ensuring the optimal placement of the plant. "Our agent worked closely with the consultant assigned by Beta Holdings on the initial assessments of the site for the aggregate processing plant and recommendations on the optimal placement of the machines," he says.

## Booyco field service geared up for collaboration

Booyco Electronics' partnership approach to its field service offering ensures that mines can manage the growing complexity of proximity detection systems.

"The increased outsourcing of non-core technical services by the mines makes close collaboration with OEMs vital," says Booyco Electronics chief operations officer Pieter Wolfaardt. "Our field service offering is therefore designed in support of our business and to strengthen our relationship with the mine, so that we effectively become part of the mine's team."

The company's service structure includes area managers coordinating closely with an account manager who – together with a technical team – deals directly with the mine's engineering team.

"We empower every level of the service network, and encourage leadership and accountability at each level," says

Wolfaardt. "We then provide the tools and systems which allow services to be delivered to the highest standards."

Among the key collaboration strategies Booyco Electronics identified as a vital component are regular engagement with and regular reporting to the customer. The company intends to engage in monthly meetings with the mine's engineer where Booyco Electronics' account manager will give detailed feedback on aspects such as equipment uptime, availability, mean time to repair, services completed, and spares consumed. This information can be discussed and signed off by the customer and include a satisfaction survey that informs continuous improvement.

"An important support contribution to the service function is made by the product specialist – a highly-skilled technician who can troubleshoot on site and take recommendations back to our head office engineering team

for technical resolution and possible changes," he says. "We are steadily growing the number of product specialists from two to ten in the near future to increase this support function to our field service teams."

Wolfaardt highlights that the company's service level agreements with mines are driven by the complexity of the equipment, which demands a high level of technical expertise and competence from the OEM.

"Apart from our focused knowledge of our product, a close service relationship with customers provides the opportunity to share our experience from other sites," says Wolfaardt. "With our wide footprint of equipment around the region and experience gained over time, we have become aware of what works in differing conditions. This collaborative approach is invaluable when customers are looking for new optimal solutions." ●

# UNPACKING HEALTH AND SAFETY IN ITS BROADER TERMS

**M**y focus in this edition is understandably on the issue that we are all talking about – COVID-19. A lot has already been said about the pandemic and I would not bore you with more on that. Let me rather focus on something that we as an industry are all talking about, health and safety in its broader terms.

So, when COVID-19 hit us, we all thought it was a holiday. After a few weeks we started looking around. We saw many e-learning courses, brochures and materials showing us all how to wash our hands. This then led to a great deal of safety training on some mundane actions, like how to put your mask on.

If we look at a definition of safety – “safety is not the absence of negatives, it’s rather the presence of the capacity”. What we see in the safety “market” is that there is an endless creation of yet more safety courses, toolbox talks, posters and procedures.

So, the question is, are we building “capacity” or are we filling up employees’ heads with safety information? Maybe we have mixed the points together, perhaps the word “capacity” has not been helpful.

We need to guard against the safety e-learning courses that are only impairing rational knowledge in the hope that when it does become relevant, the employee will be able to pull it out of his/her memory and apply it.

Let’s revisit the traditional definition of safety (absence of negatives). What if “safety” does not exist as a separate objective entity? What if safety is tacitly present, until it’s not, and we notice we are unsafe? Suppose safety only acquires a separate existence when it’s lost – that is, when injury or incident occurs. This helps explain why we may see safety as the absence of negatives – and why it is only when something negative occurs that safety gets our attention. If nothing bad happens then

everything is safe, so carry on.

It is accepted that there are multiple definitions of safety, and we need to choose one that makes sense for our objectives. Our objective is to help create a safe workplace where workers go home every day better than they were when they arrived at work. Yes, a platitude of the safety professional, but if that should be our goal, then we have to look at our tactics.

We can’t achieve that objective if we push out pedantic e-learning courses and safe work procedures on how not to step on nails. I believe those who work in a safety role want to convey practical understanding of risk and risk control, but providing theoretical knowledge puts safety out there on its own, as a thing that is separate from work.

## So, what is tacit safety?

To be knowledgeable in safety you need to participate, and that means you will interact with others, in a group community or local culture, and this will in turn provide you with interpretation of how to work safely.

## So, how do you work safely?

Well, it begins with working for sure, not with e-learning. And working means you have acquired practical understanding of how to perform that work. Practical understanding is often tacit in performing skilled work. The tacit dimension is not conscious and so safety tactics that are aimed at the conscious rational mind cannot connect to the unconscious, tacit mind.

When a manager explains what he/she does for a living, they should be saying “I watch people working”. Learning is participation. Learning cannot happen if you do not participate in the workplace where work is getting done. Even if you are not performing the work, you need to be there and you need to be focussed on learning. The field of learning and development recognises learning in the workflow and you may hear about the term learning



Nico Pienaar, director of Aspasa.

at the “point-of-work”. Safety at the ‘point-of-work’ is the essence of what we need to learn in order to improve.

And this is where it really gets scary. Safety curricula teach someone how to create procedures, training courses, toolbox talks. So, if you employ safety professionals what will you get? Procedures, training courses, toolbox talks, and for example, “today we are talking about how not to step on nails”.

Safety has progressively grown into an industry which creates safety professionals who are generically skilled at creating training courses, toolbox talks and procedures.

Simple and superficial safety facts get no traction at the point-of-work. And the point-of-work is where safety is enacted, or not, by employees. The point-of-work is a space of experience, interaction and practice. If you want to improve safety, you have to find and improve element work practices, and this is why employees are the best source of safety. ●



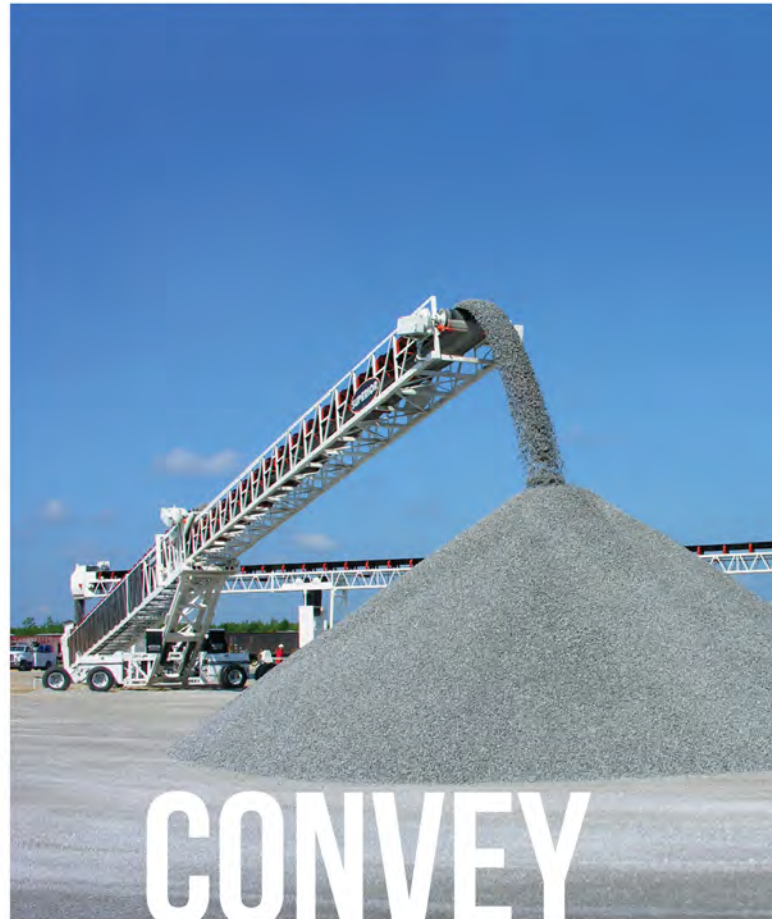
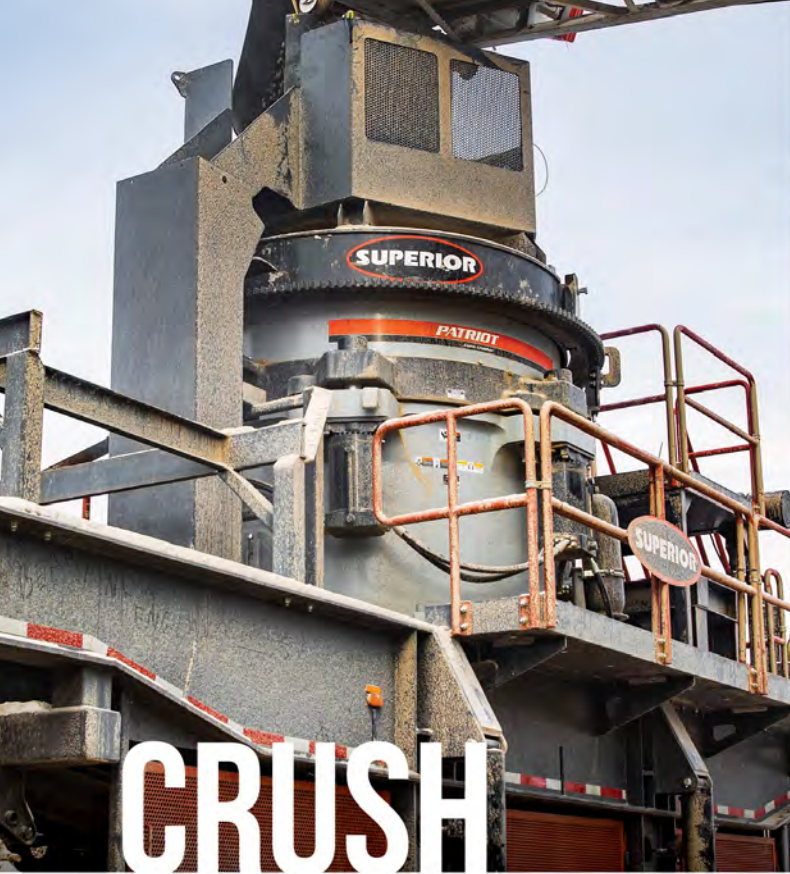
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