



## Climate change: the impact on the mining sector



There has recently been a lot of talk about global warming and its impact on weather patterns, *i.e.* climate change. A keynote address at the recent Infacon conference in Cape Town focused on climate change. Some people believe that this is all a lot of hype. Others (myself included), like the keynote speaker, believe that there is some evidence pointing to climate change – dry seasons becoming longer and wet seasons becoming shorter. Rainfall is reported to have become more variable than before, with rain coming in more concentrated, violent bursts. The end of March, for instance, saw a lot of rain leading to floods in Gauteng. A number of roads were closed due to bridges collapsing. In Cape Town, in contrast, there are serious concerns about water shortages, with Day Zero being a common topic of conversations at events and functions.

Similarly, if you tune into the radio, you hear more often than not that the next world war will be fought, not for land or some other resource, but for water. Then I look around and see families, friends, and neighbours busy with water harvesting projects.

There is clearly growing concern about changing weather patterns and climate stability, and the effect on the consistency of future water supplies. Most research, mine design, planning, and monitoring has focused on the impact of mining activities on the environment and water resources. We are all aware of acid mine drainage, which has been a constant source of concern in the mining industry. But what about the impact of the changing weather patterns on mining activities? Research on industry perspectives suggests that climate change is an emerging concern for the mining industry. While climate data is one of the facets that are incorporated within mining projects, the changing weather conditions are not always considered, and as such, not much action has been taken to plan for or adapt to these changing conditions.

Extreme weather events such as recurring droughts and floods can pose a number of challenges to the mining industry. Mining infrastructure such as containment facilities and buildings, energy sources, storm water, wastewater collection and treatment systems, tailings and waste disposal ponds, transportation infrastructure such as bridges, roads, and pipelines can all be easily affected by extreme conditions caused by changes in weather patterns. The health and safety of site-based employees can also be affected. Mostly importantly, considering that water is a huge necessity for mining, a change in water supply levels can have an adverse effect on a large range of activities, including exploration, drilling, dust suppression, cooling and extractive metallurgy processes. The literature is filled with examples of temporary halts to plant production due to a reduction in available water supply for processes, or in some cases, power cuts due to severe storms. The lack of fresh water supplies has, for example, forced some Chilean companies to consider the use of seawater for the processing of copper ores.

What does all this mean for the future of the mining and metal extraction industry? It can be argued that the mining sector is one of the major emitters of greenhouse gases, and furthermore produces fossil energy resources that also significantly contribute to global CO<sub>2</sub> emissions. Although the mining sector does seem to be taking action and playing a part in reducing greenhouse gas emissions in certain cases, mitigation alone will not solve the problem. There is a great need for us, as engineers in the mining sector, to recognize the reality of climate change, understand how these changes will impact the sector, and develop strategies that will minimize the impact on infrastructure and operations. There is also a great need to effectively communicate the risks caused by changes in weather patterns and their potential impact on the mining sector. Although some companies are aware of these changes, they are not proactively planning for the impact on their operations. But, more specifically, as engineers it is important to start considering cost-effective technologies and measures that allow mining operations to adapt to the changing climate. We also need to look at designing and developing infrastructure that can withstand extreme weather challenges. We need to develop appropriate technologies and processes that can not only work effectively, but also efficiently, in whatever climatic environment we find ourselves in. The mining sector contributes significantly to the economies of Southern African countries, and we need to keep the wheels underground turning. We cannot afford to do otherwise on account of the weather.

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