Consulting with the consultants

How can mining companies and consultants work together to create the best results, and what types of projects are miners seeking help with? Donna Schmidt finds out

Consultancy firms have become, by far, some of the most comprehensive service providers in mining. When trends change for mines, these companies adapt, and a large percentage of them have decades of experience in one or several specific areas of service work.

The relationship between the consultant and the operator is evolving, as it has historically parallel to the movements of the industry. *MM* sought to find out what's important to mines today, what will be important in the future, and how these partnerships can get the most from their working associations.

KEYS TO SUCCESS

Gustavson mining vice president Don Hulse says that, when it comes to the working bond of the operator and the consultant, the latter can add value in three ways: by offering independent opinions or reports, providing supplemental talent for short-term projects, and offering independent operational audits to find potential efficiencies and savings.

"While the first is necessary and mandatory for some public companies, and the second provides a relief valve for lean staff, I believe that the third offers the most satisfaction for consultants and direct benefit to clients," he says.

Many companies engage a consultant for the direct, measurable benefit of savings opportunities. Others retain them for their application of analytical techniques that may not be available to them in-house – especially when that consultant has specialists in a specific area or field.

"Mines are built on limited data and estimates," Hulse points out. "The quality of the estimates and understanding of the associated risks should be an integral part of the decision process."

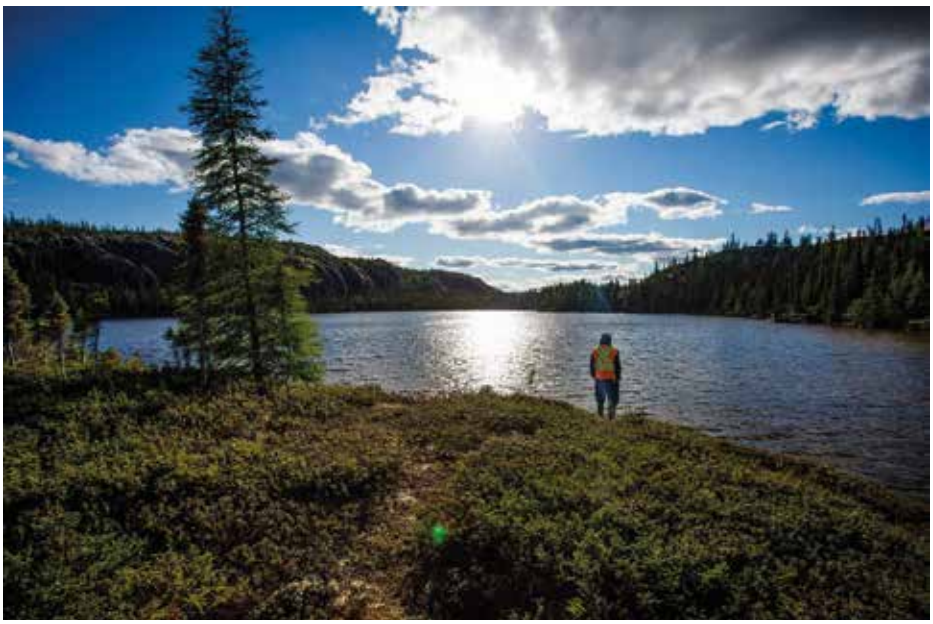
At the same time, he stresses that the basic science of estimation and model development cannot be replaced by AI or machine learning - but can both enhance and be enhanced by these techniques. Each deposit is unique, as is the training required for computer analysis. All of this functions best when it can be tuned by field observations and experienced users, he adds.

Stantec mining sector leader Jon Treen and mining vice president Andrew Watson also believe there are three items that must be addressed in the mining company-consultant connection. They include determining ways to reduce mining costs while improving safety as new ore finds become less frequent, focusing more on the social licence to operate and moving from the concept of doing no harm to the message of doing good for the world, and determining methods to safely accelerate the project execution.

"These items require a true partnership between the mining company and the consultant to make the project successful," Treen explains. "Teams that understand what drives project investment and look at global examples of projects that do these things well can apply lessons learned and be truly successful."

A major advantage of collaborating with a consultant project team is the wealth of experience gained on other similar projects. Because consultants work for diverse clients in a variety of settings, they can utilise their other experience. Doing so can, for example, keep the operation from repeating a mistake already made and subsequently remedied by someone else. A great consultant will be responsible for cross-pollination, as Watson refers to it, of ideas and innovation that can be of benefit to the mining community as a whole.

According to Stantec, there are a handful of consultancy projects that are most needed right now because of their ability to mitigate projects' risks and impacts socially as well as technically. They include waste management and optimising energy production methods while decreasing consumption rates, along with utilising virtual reality (VR) for engagement both in project execution and societal acceptance of the project. ►



Improved water efficiency could make the industry more robust, says Stantec

Among other things, consultants add value to their relationships with operators by offering independent opinions or reports

Two others are obtaining and utilising data in the digital mine of the future, and mining intensity to reduce time to production and increase production rates.

"A proper focus on these items will provide better and quicker solutions for the industry," Treen notes, adding that data is a hot topic for mines.

"We're hearing a lot about data; there is tremendous investment in [the] collection and storage of vast quantities of data," adds Watson. "What will make all mines perform better is gathering reliable data that matters, tuning out the noise, and learning to use that data to make informed and better decisions quicker."

An opportunity that the parties of an operator-consultant partnership should place focus on that can benefit from improvements is collaboration.

"Traditionally, we have seen tremendous resistance to sharing lessons learned," Watson says. "I believe this is changing fast. Following the dam failures, we saw solidarity, more open communication and adoption of practices in common. If we can do the same in other parts of our business, without waiting for some catastrophic catalyst, we'll be in good shape."

Examining what trends are shaping tomorrow's mines, Stantec believes there isn't just one issue to examine, but several.

"Managing global waste is crucial and is equally important within the mining industry," Treen points out. "In mining, this waste is both waste rock, but also the non-metal components of our ore. By reducing the excessive amounts of waste we move and the distance we move it will have a beneficial impact on costs, the environment and energy consumption."

The firm believes that one of the most significant ways to reduce energy consumption is to focus on what is being moved – not just in distance, but also through the different stages of the production cycle, he explains.

"As an industry we must determine how to optimise our energy use and create an 'energy remix' in the mines we operate; by 'remix' I mean a balance between improving the energy consumed per tonne of metal and the method in which that energy is produced."

There are also several factors that can work together to make the industry even more robust: worker health, safety and productivity; energy and water efficiency; adoption of technology; and using data to improve head grades and equipment uptime.

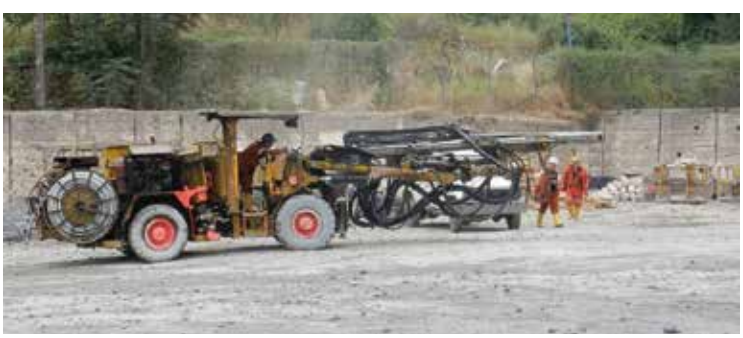
"We're investing in the 'virtual build' to make development safer and more efficient," Watson notes, adding that going electric will lower emissions and also save on ventilation costs underground.

"There is a lot of innovation going on, tempered by the very high cost of being wrong."

That certainly is true in today's mining scene.

"In the last year we've seen mining companies promise to go lean and mean to return value to shareholders (Rio, Barrick), and at the same time promise to do an extraordinary amount to improve safety and avoid failures that adversely affect performance (BHP, Newmont, Anglo)," Watson says. "It is an interesting tension that has perhaps always guided mining executives, and now it is laid bare in an interesting way. I do believe the sharing that happens in hackathons and innovation exchanges will accelerate progress."

There always will be certain differences in the way things are done from location to location and between one commodity and another. However, there is one constant: those drivers advancing social responsibility and mining's inherent technical challenges do not change and are often extremely parallel no matter the mine type, size or home country.



A CSA team about to head underground in Armenia

CSA principal geologist Warren Potma looking over mine plans while underground in China

"For locations that are remote and not yet developed, the issues can be more complex and involve more considerations as you create more infrastructure to support the mine," Treen notes. "Regardless of the location, this must be done not just in a consultative method but in collaboration with the local communities."

In many cases, especially among the YouTube generation and in the age of transparency, it is much easier for ideas to be shared and global adaptations seen of technology and techniques that the industry knows have worked.

"There are industry-specific or region-specific needs – like the Pilbara iron-ore mines going below the water table and having to deal with excess water and associated environmental impacts," Watson says, using the examples of Chile copper mines and South African operations that are investing in water and energy supply and adopting new mining methods to remain competitive, respectively.

"The pressure on miners to deliver dividends while protecting the environment [and] while benefitting the community that serves the mine – is only going to escalate. The industry is getting better at this every year. If past performance is anything to go by, the industry will continue to innovate and continue to supply the minerals society needs," he continues.

"Yes, commodity prices wax and wane, and miners adjust their plans accordingly. Interestingly, when times are tough, there is no money for new projects, but there is still a lot of innovation. That's where consultants add tremendous value, bringing new ideas that keep mines operating as they should."

KNOWLEDGE, RISK INSURANCE

Fundamentally, consultants and mines can work together to not only expand and extend capabilities, but also to improve or maintain processes and reduce risks, according to CSA Global principal mining geologist Ben Playford.

This can happen in a number of scenarios, including when the provision of that extra element of technical expertise that may not be present in the company's team – such as with structural geology, geometallurgy or hydrogeology.

However, he says, the consultant-operator connection is useful when providing added capacity/capability on an as-needed basis to support basic mine operational functions. This is helpful in mine planning, grade control and reconciliation, Playford notes, and can be "switched on" as needed.

Additionally, it provides continuity of technical knowhow after staff turnover, according to Playford, when technical staff expertise is in high demand. He also refers to it as a kind of operational and technical "knowledge insurance" or corporate memory for an operation.

Finally, he points out, the tie-in can aid with periodic independent audits and health checks to ensure processes are being followed, risks are being monitored and dealt with, ►

In the field in Yukon, Canada, with CSA

and there is progress against strategic targets.

Right now, there is a need for that extensive expertise to come from those with real production experience.

"There is a scarcity in the industry right now of not only technical people as a whole, but people who have significant real-world experience in the operational side of the mining industry, people who have had the exposure to different mining methods and commodities, those with the ability to look at a situation and understand the depth of the problem and provide pragmatic and timely solutions," Playford says.

There are a few things shaping tomorrow's mines, and it starts with the reactions from the top of an organisation.

"We see that boards are being more risk-averse, and an increasing shift towards using consultants as that insurance policy against risk, whether in areas of operational, technical, environmental or legislative support," he explains.

"With the trend of decreasing numbers of new discoveries not replacing projects reaching completion, there has been an ongoing and continued move towards revisiting old projects, and targeting lower-grade or harder-to-process mineralisation, trying to squeeze the maximum value and mine life out of remaining resources."

Even with those trends in play, challenges remain for the industry. Those in the 'newer' commodities like lithium or graphite, Playford says, benefit from considered advice because of the relatively smaller experience pool. Challenges are the most evident in the marketing or processing areas, though the size and quality of the resource should be evaluated, as well as how it can be mined.

Project location can help to build a cohesive team with technical, management and administration skills. Conversely, the location may make it difficult to source personnel with the level of experience required, which subsequently puts more pressure on less experienced staff.

"On international projects there are generally requirements for a majority of the workforce to comprise nationals or to be 'sourced locally'; this is a good thing for the long-term viability of an operation," Playford notes, adding it can "present challenges until there is sufficient experience and capability in the team or until there has been a period of mentoring and succession planning".

He also suggests giving careful consideration to cultural and language issues during the recruitment phase. That will increase the chances of having the right mixture of workers, while also maintaining harmony and keeping open lines of communication.

The area of mineral economics and changing environmental regulations is where the industry needs to use a crystal ball, Playford stresses.

"It's clear that every mining project must address community expectations as much as shareholder hopes. The choice of location to explore and develop new mineral deposits is always a complex balance of geological endowment, available infrastructure, distance to market and relevant legislation."