

# Consulting on change

**The role may not have changed, but the expectations placed on mining consultants certainly has, Dan Gleeson discovers**

Consultants are expected to provide expert advice on a specific topic or process.

There is a perception from mining investors that these specialists are only called in for regulatory purposes to sign off a 43-101- or JORC-compliant document for Canada- or Australia-listed companies, respectively, or when a specific problem or challenge occurs that requires a 'fresh' pair of eyes.

That view does not reflect reality, as Dr Vasilis Roubos, Director of International Mining Consultants at **DMT Group**, explains: "The role of a consultant remains rooted in objectivity and independence, which means today's consultants can add value at each stage of the mining process by optimising, innovating and finding new solutions."

This potential value generation, plus the lack of in-house expertise present across the wider mining sector, means consultants have become a bigger part of day-to-day operations at mines, all of which has led to a change in service delivery, according to Philippe Baudry, **RPMGlobal's** Executive General Manager – Advisory Services.

"While I don't believe the basic services requested of consultants has changed dramatically in the last decade, the approach we take in delivering these services in terms of service level and integration of technology continues to evolve," Baudry told **IM**.

Baudry has his own thoughts on the reasons behind this evolution, but it is hard to look past the swathe of layoffs in the mining consulting and contracting sector after the global financial crisis for an explanation.

Simplistically, a cooling of Chinese demand for metals and minerals, post-2011, saw thousands of individuals laid off. Many of the job cuts were employees of mining companies, but contractors and consultants were also hit, with this industry rationalisation still being felt acutely today.

Christopher Catania, General Manager of engineering-focused consultancy **MEC Mining**, explains: "During the last boom-bust cycle, the industry saw a large number of the workforce depart the industry – taking with them valuable

inherited operational knowledge.

"Unfortunately, the cyclic uplift did not see a return of this workforce or university enrolment numbers, and so the industry is currently faced with a short-term skill gap."

This gap, plus memories of the layoffs, led to a change in mindset from the consultancy field.

Instead of coming back in smaller numbers in the same guise when commodity prices started to rise, mining consultants committed to making themselves invaluable to the clients they served.

They have been helped along the way by an evolving industry backdrop that they are taking advantage of.

## Same role, different expectations

While the bulk of contributors **IM** heard from agreed with Baudry that the tasks being asked of mining consultants had not changed in the last decade, they did acknowledge that mining clients' expectations had altered.

**Stantec's** Senior Vice President for Mining, Jon Treen, said the industry is demanding that the focus of projects is more "holistic", taking into account costs, sustainability, the environment and impacts on communities.

"The demand for a holistic approach means there is a lot of focus on environmental, social and governance (ESG) and sustainability as a means to manage both risk and change," he told **IM**.

The application of new technology also comes into this 'holistic' focus.

Terry Braun, Practice Leader at **SRK Consulting** in the US, acknowledges that most mining consultancies were not equipped to handle big data sets 10 years ago.

"We relied on specialty software to interrogate and interpret resource models and mine plans," he told **IM**. "These software packages required various, validated data inputs and produced massive data sets as outputs."

Today, clients present mining consultants with a much wider array of data sets, along with new questions, according to Braun.

"Advances in sensor technology offer new technical insights for virtually all aspects of an

*Today's mining consultants have a lot to consider in their day-to-day work including new technology, evolving ESG requirements and the need to build a diverse and inclusive workforce (photo: Stantec)*

operating mine," he said. "This trend moved mining consultants and clients into the brave new world of big data management."

SRK assists clients with data capture, data quality, interpretation and/or storage, Braun explained, with data scientists becoming a part of SRK's traditional technical teams, providing critical know-how with respect to big data management.

Data analytics has also been a growth area for **AMC Consultants** alongside "business improvement" projects, according to Patrick Smith, Managing Director and CEO.

"Clients are looking for expert assistance to help them best utilise the big data being recorded at their operating mines," he told **IM**. This is seeing data scientists play a greater role in fields like geo-metallurgy, he added.

While knowledge and experience have not yet been replaced by technology, using the right technologies well is "increasingly critical to mining consultancy", Smith added.

The increased availability of data – and computing power to process it – has improved technical decision making within the consultancy field, according to MEC Mining's Catania.

"This has significantly improved the efficiency of our work and enabled a step change towards optimising production efficiency and improving ESG," he told **IM**.

The industry is also more readily looking forward, as opposed to back, when it comes to developing new mines or projects, according to **RPMGlobal's** Baudry.

"A decade ago, most mining studies would have planned to leverage the accepted mining methods and technology of the time," he said. "This is no longer acceptable."

"Requests for a mining study these days often come with the request to 'design the mine of five years from now' not the 'mine of today'."

This has driven **RPMGlobal's** consulting team to stay abreast of all advances in technology such as electrification of underground fleets, automation, ore sorting technology and renewable power generation, among others, Baudry said.

The industry's need to innovate, Baudry says, is primarily driven by:

- Higher community expectations around ESG and health and safety;
- Global political and economic volatility;
- Tighter margins driven by lower grades and deeper or harder to recover resources;
- Challenging sovereign risk and governance in some areas of the world;



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- Challenges and investments required for logistics, especially for bulk materials; and
- A volatile energy price environment.

DMT’s Dr Roubos added to this: “We are living through a progressive evolution across the entire sector, as much on the policy side as on operations.

“Mining companies are embracing the need to have a positive impact, initially through more cosmetic corporate social responsibility activities and, more recently, through fundamental ESG commitments.

“Consequently, the floodgates of innovation have really opened in mining over the past four to five years and technology has developed rapidly to provide safer, more efficient and more transparent processes.”

### Adding value

Factoring in these changes, where can mining consultants add the most value?

Value generation starts early in a project’s life from a consultant’s perspective, according to AMC’s Smith.

“Making the right strategic decisions across production rate, cutoff grade and mining method before these parameters get locked in can set the project up for long-term success,” he said.

Stantec’s Treen agreed with Smith’s sentiments.

“In my mind, it is having the opportunity to be involved in a project early – and throughout the project – that brings value.

“In addition, the partnership between the consultant and the mining companies offers another opportunity to add value because so much value is added in seeing projects through – a strong partnership unlocks real value.”

Collaboration and context are key value drivers in DMT’s mining work, according to Dr Roubos.

“The real specialism here is to develop a consultancy approach that has the dual ability of meeting the needs of the industry today, while also understanding wider industry changes and

helping clients develop and adapt within their transformation journey,” he said.

An understanding of the entire mining process and the ability to apply this to a project/mine in an orderly manner is a value differentiator for **CSA Global**, Karl van Olden, Manager Mining, says.

“The most important value that a consultancy can bring to our clients is the ‘big picture’ understanding of the project development pipeline and how all of the multi-disciplinary components are co-dependent on each other,” he told *IM*.

“In almost every job we do, there are interdependencies that we identify with our client that they did not have sight of. In this way, we help them do the necessary work in time and in the right order so that they have smoother running processes for technical analysis that may be overlooked (eg geo-metallurgy during exploration, rehabilitation and closure planning before start-up, stakeholder engagement, licensing board approvals, and attracting funding).

“This way we save time and money, and maintain the developer’s credibility with stakeholders.”

Baudry from RPMGlobal, which has a leading mining software arm of its own, sees the ability to leverage such technology as a key ‘value add’.

“There is no doubt that our ability to access the full suite of RPMGlobal’s integrated software products gives us the capacity to work with big data, quickly assess scenarios and provide our clients with informative answers that are grounded in their own primary data and our ingrained mining knowledge, having completed over 15,000 studies in the past 50 years,” he said.

The size of the company and stage of development has a bearing on this value generation, too, Baudry says.

“At a junior level, it would be fair to say that many organisations do not have the in-house teams to successfully move from exploration through to feasibility-study stage,” he said. “For those particular companies, engaging with a trusted supplier like RPMGlobal adds huge value as we assist them on this value journey over time.

“For others, engaging with RPMGlobal in a peer review capacity can assist in ensuring companies are not operating in a corporate thought bubble which may hold culturally driven flaws.”

MEC Mining’s Catania breaks this value question down into ‘greenfield’ and ‘brownfield’ opportunities.

“With the optionality of greenfield mining, there is an inherently large value that can be added or destroyed during the early stages of the mining life cycle,” he said. “So, there must be a particularly high level of expertise applied when determining the most appropriate mining methodology.”

Constant changes in technology, commodity prices and cost variables may justify a change in operating mentality or methodology, though,



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resulting in opportunities to realise significant value in the brownfield productivity and expansion stages of the life cycle, he said.

And, when it comes to economic studies, sourcing the best geological and engineering expertise with regional understanding is the “most critical way to extract value and also mitigate risk in investments”, Catania says.

SRK’s Braun took an even wider perspective when assessing this value generation question: “Major mining companies tend to lead the industry in terms of defining and applying best practices for project development, operations and closure in a manner that generates value for shareholders. This includes aligning with rising investor and lender expectations for ESG principles.”

Major miners have the size and financial power to commit the resources needed to implement these practices, he says. Junior and mid-tier miners also contribute leadership in these areas; however, their capacity to fund such initiatives is limited in comparison, according to Braun.

“This, in turn, leads to lost value with respect to the investment community,” he added.

“Consultants who help the industry define best practice and who understand rising investor expectations can create significant value in the mining life and investment cycle by helping all sectors of the industry with implementing essential elements of these initiatives and scaling up the effort as greenfield projects develop and/or brownfield operations expand.”

### ESG on the up

While much of the mining community embarks on extracting minerals and metals that contribute towards global growth and the acceleration of electrification and decarbonisation, it should not be forgotten that these companies are governed by their stakeholders.

Just as mining company boards and executives should factor in all stakeholder opinions in their decision-making process, mining consultants, too,

should contend with investment potential, community relations, sustainability and other elements when coming up with solutions.

This focus is helped by the fact consultants often service such stakeholders independently, as CSA Global's van Olden explained.

"In the last decade, there have been phases of increased M&A where we (CSA Global) have been on either side of deals, supporting vendors with technical work and supporting buyers with due diligence reviews. We have also done a lot of work representing the interests of lenders such as private equity funds and banks."

During this due diligence work, van Olden has noted an increased need to integrate ESG requirements into transaction support work.

"It is important for our clients to be able to demonstrate to investors that their project meets increasing global requirements for responsible and sustainable mining," he said. "A lot of people understand that nowadays you cannot obtain bank finance without showing your ESG credentials; you need more than just a good NPV and payback period."

Such requirements are coming much earlier in the mining process, according to RPMGlobal's Baudry.

"The other key change is the need for clients to be investor-ready much earlier in the development cycle; not just from a technical perspective, but also from a social licence to operate standpoint," he said.

These ESG requirements have led to pretty much all the consultants **IM** spoke with bolstering their in-house ESG teams.

It has also seen environmental specialists enter the fray, building relationships with mining consultants as a way to give miners that 'holistic' offering Treen spoke of.

A great example is **ERM's** 2019 acquisition of CSA Global, which created a "cradle-to-grave team with specialists in each of these important technical and ESG related skill sets", CSA Global's van Olden said.

He explained: "ERM's business is really strong at the front end of mining around the environmental and social impact assessment and permitting phase. They also carry out a lot of work around safety in mining operations, as well as around the closure, rehabilitation and reclamation side of the business.

"Prior to the acquisition, they effectively had a CSA-sized hole in their pipeline covering exploration – all that front end geology and understanding, resource estimation work – mine design and engineering, through to the hydrogeology and operations to support and optimise mines.

"There was no duplication between ERM and CSA – we (CSA) basically slotted in and filled out that whole value chain of work."



*"The floodgates of innovation have really opened in mining over the past four to five years and technology has developed rapidly to provide safer, more efficient and more transparent processes," DMT Group's Dr Vasilis Roubos says*

As a global provider of sustainability advisory services, ERM has witnessed a significant change in the mining industry's ESG requirements over the last decade, according to ERM Partner, Toby Whincup.

"ESG and sustainability has evolved from being a niche technical team and corporate responsibility discussion, into a fully-fledged board-level focus on risk and opportunities," he told **IM**. "It now represents a key lever of business transformation, business resilience and value creation for companies."

The last three years, in particular, have seen fundamental shifts driven mainly by the investment community, according to Whincup.

One only need look at the letter BlackRock CEO, Larry Fink, issued to clients at the start of the year as an example of this change.

In short, Fink, who heads up one of the biggest asset management companies in the world, said BlackRock would place sustainability at "the centre" of its investment approach and would exit investments that "present a high sustainability-related risk".

It is not just BlackRock making such demands of the companies it invests in, according to Whincup.

"Equity investors are now asking: 'what are the community risks or reputational risks associated with these deals?' They do not want people with placards marching down the street and protesting out the front of their buildings because of what they are investing in," he said.

"Even the financial exposure around things like TCFD (The Task Force on Climate-related Financial Disclosures) is coming into the due diligence process."

Recently, the 'S' of 'ESG' has become more of a focus in the mining sector, he explained.

"This was initially driven by economic exposure to mine-dependent communities at closure, but, since COVID-19 has emerged, it's becoming prevalent in the role the mining sector is playing in

the economic response to COVID for camp communities, FIFO workforces, etc," he said. "That need to keep workforces healthy and keep the business resilient through such challenges is being acknowledged more widely."

He concluded: "ESG now forms a critical part of business success and resilience across the mining spectrum – from juniors, through to majors, and across the supply chain."

### **In-built expertise**

MEC Mining's Catania argues his company is already equipped to deal with this increased ESG focus.

"ESG and sustainability form part of the normal operations at MEC Mining," he said.

"A lot of the work we undertake relates to minimising the operational footprint of a mine through efficient mining practices. This may be seen through a change in mining sequence, mine design or operating methodology – all of which improve the ESG credentials of the project."

MEC Mining has been able to embed this into the company's culture through internal and external training, in addition to strategic partnerships with specialists in health, safety and environmental management, he added.

Similarly, Treen sees ESG in every aspect of the work Stantec carries out for mining clients.

"Stantec is focused on having a sustainability mindset in all of our design and consulting work," he said. "ESG and sustainability are relevant across all disciplines, which means every individual (the engineers, environmental scientists, etc) working on a project must contribute to fulfilling the requirements.

"The cross-discipline participation and partnership means that everyone – not just the sustainability group – has a role to play in helping an operation achieve the company's ESG goals and sustainability standards."

RPMGlobal's in-house environmental and sustainability teams are helping miners hit their ESG goals by carrying out audits aligned with the International Finance Corp's and Equator Principles' latest ESG-related standards ahead of project financings, while helping prepare junior and mid-tier miners on "investor preparedness reviews" and "mitigation planning", according to Baudry.

He said of the subject: "There is now a broader understanding in the market that if a project doesn't meet community and government expectations, it will not succeed."

DMT's Dr Roubos is all too aware of this opinion, and can point to one of the company's sustainability initiatives as an example of how it is helping the wider mining industry meet ESG expectations.

Last year, DMT introduced CERA, the first global certification scheme to guarantee a consistent





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standard of environmental, social and economic impact throughout the entire raw materials value chain.

CERA uses blockchain technology to enable the traceability of raw materials along the value chain. It comes with the first definition of sustainability valid for all materials and manufacturing processes, meaning the standard will be applicable from mineral exploration to the final product, and covering every raw material, across every country, under a single scheme, according to the company.

Dr Roubos explained: “CERA includes not only exploration, operations, processing and the product as such – it is also transforming traceability and recycling possibilities for raw materials and is part of DMT’s wider commitment to building a more sustainable mining sector globally.”

### The role of technology

Just as blockchain is facilitating comparable sustainability standards in the case of CERA, the use of technology is helping deliver on the ESG requirements mining companies are being judged on.

MEC’s Catania says new technology, in many cases, is allowing consultants to offer solutions that fulfil both ESG and profitability requirements for miners.

“Over the years, there has been an obvious shift towards reducing operating costs and minimising the environmental footprints of operations,” he said. “With improved technology, we are starting to see both goals achieved and remain economically viable.”

With unexpected challenges like COVID-19 continually being thrown at the mining sector, Stantec’s Treen sees miners having to rely more heavily on technology to solve problems in the future.

“We must create a culture of innovation within the industry to recognise areas where

implementation of technology can have a significant impact,” he said. “Even though implementing a new technology in an operating mine is more difficult – due to the potentially disruptive change or the cost of downtime to install the new technology – the addition of technology can be transformative!

“The key is to ensure that the solution is driving the technology and not the technology driving the solution.”

Dr Roubos said DMT – which has an Innovation Cluster incubating and accelerating as many as 40 individual mining R&D projects at any one time – factors in similar considerations when applying new technology.

“Working hand-in-hand with clients here is very important because our role is to provide optimal solutions for every single client to achieve quantifiably better performance, not to push sales,” he explained.

“From big data or automation to artificial intelligence, even the most cutting-edge technology offering is only relevant if it solves problems for clients, optimises processes or improves efficiency.

“So, our approach to innovation is always rooted in finding the right solution to the right problem.”

### Diversity of thought

Just as the mining sector is trying to escape the perception that it is ultra-conservative when it comes to adopting new technology, it is also attempting to leave behind the impression that it is an industry only suitable for men.

Those mining leaders have come out in support of creating workplaces that both encourage and value diversity in the workplace, setting targets at both the executive and global employee level.

These targets have been underpinned by internal studies, such as one from BHP, published earlier this year, which showed that its most inclusive and diverse teams have 67% fewer recordable injuries, their sense of pride is 21% higher, they have 28% lower unplanned absence rates, and have up to 11% higher planned and scheduled work delivery.

Like BHP, DMT has been advocating for increased sector-wide diversity through research.

Dr Roubos explained: “We at DMT have conducted studies that show that a highly diversified team achieves significantly better performance. We regularly convey this message to our clients and develop concepts for transforming diversification from paper into practice.”

The sector’s diversity and inclusion leaders will understandably look to align with consultants that have similar aims – a point which some respondents acknowledged.

Stantec’s Treen was one of them: “The industry as a whole understands the benefits of a more diverse workforce and our clients want their



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consultants to demonstrate – in words and action – a commitment to diversify and to share the successes that result from having a diverse workforce.”

Some of the initiatives Stantec is pursuing to keep a focus on inclusion and diversity include providing “unconscious bias training” to all staff, identifying opportunities to diversify its leadership teams, and assisting the industry as a whole to build a more inclusive workplace, Treen said.

It is also forging partnerships with universities to ensure there is a diverse pipeline of incoming graduates into the company, as well as sponsoring the International Women in Resources Mentoring program to mentor female leaders of the future.

“Having a diverse workforce that is inclusive is no longer just ‘nice to have’, it’s a business imperative,” Treen said.

SRK’s Braun said the company had recently reviewed and updated its nomination process for management and director-level positions, with a specific aim of expanding the resource pool and encouraging a diverse range of nominations.

“During this review process, we discovered inclusion and diversity success stories in our regional practices that could be shared globally,” he said.

Braun said SRK had not experienced pressure from its clients to build a diverse workplace, but it has seen an increasing number of “requests” from larger clients regarding workforce diversity.

Alongside the wider mining industry commitment to create an inclusive and diverse environment, RPMGlobal has dedicated programs in place to encourage the growth of workplace diversity across all divisions, Baudry says.

“As you may expect, with 23 offices located in 12 different countries, our advisory team is very culturally diverse,” he added. “Furthermore, over 20% of our workforce in the Advisory division are female, including two of our senior country/regional managers.”

Catania says MEC Mining has been proactive in



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addressing the industry’s diversity void, having “pivoted” from a “talent attraction” to “talent generation” model after the last boom cycle ended.

“This was a natural step towards enabling inclusion and diversity within the workforce as it removed some of the challenges faced by being downstream of the tertiary education system,” he said.

“MEC value diversity in all forms – the cultural and experience mix we have built in the team has and continues to enable us to provide solutions to clients globally that consider the unique modifying factors of the deposits and the economic environments where they are situated.

“This focus has served us well, as clients are now increasingly sourcing consulting firms that meet their diversity targets also.”

While ERM has seen pressure from clients to diversify its workforce – particular its major clients – the company’s inclusion and diversity journey has not been driven by these expectations, Whincup stated.

“We see it as a critical part of our ongoing success as a leading global provider of sustainability advisory services,” he explained.

Some of the areas the company has been pursuing as part of this journey include a women in leadership program – reinforced by the fact its CEO and many senior ERM leaders are women – and the establishment of a global diversity and inclusion council led by the executive committee.

Within this council are three employee resource groups looking at women, LGBT+ and disability within the workplace.

“They provide employee-led communities that inform our company agenda on diversity and inclusion,” Whincup explained.

When asked about whether or not these initiatives and aims were being appreciated by its mining clients, Whincup said: “I don’t know if it is being appreciated or acknowledged by clients, but we feel people are going to give their best and do

their best when they are in an environment where they feel comfortable in being who they are, while being supported, acknowledged and recognised for their work.

“If you foster an environment of inclusion and diversity you, as a business, are going to be more successful in attracting the best people, getting the best out of them and, through that, better servicing your clients.”

### **The next 10 years**

There was much diversity of thought when asking consultants how their roles and the sector may change in the next decade.

AMC’s Smith said consumers of strategic metals would be looking to localise their supply chains following COVID-19-disruptions over the next 10 years.

“Post COVID-19, there will be great demand for locally-sourced strategic minerals,” he said. “So there will be a lot more studies of smaller, potentially sub-economic projects that may require national government intervention to support prices.”

And, hard-rock mining could also become more mechanised, according to Smith.

“At some stage, continuous hard-rock mining machines will become practical and mining will be re-engineered, requiring a high level of intellectual capacity and innovation,” he said. “And, being able to combine sophisticated analysis with mining smarts is only going to become more important.”

SRK’s Braun saw the big data trend escalating further into 2030.

“From exploration to operation, to reclamation, we will see new possibilities when we aggregate and interpret new data sets,” he said. “The role of the mining consultant will expand to explore, address and test these possibilities in the real world.”

CSA Global’s van Olden saw demand for various minerals changing as global energy-generation and energy-storage market developments take hold. He also expected a continual focus on productivity and the benefits of automation, with the advances made by major miners filtering down to smaller companies as the technology and systems become more accessible.

ESG considerations will grow too.

“Increasing social awareness and access to information means that mining companies will be held more accountable for their impact on their environment,” he added. Miners will then require increasing specialist support in “addressing these demands in a way that enables profitable and sustainable mining to continue”.

RPMGlobal’s Baudry took a similar line when projecting forwards a decade: “The communities in which we live and operate in guide the behaviour and standards they expect from



*In the next 10 years, the role of the mining consultant will expand to “explore, address and test” new possibilities that come with the aggregation and interpretation of new data sets, SRK’s Terry Braun says*

leaders. The communication speed with which this occurs has accelerated and will continue to do so. As such, we need to get used to the speed cycle of how this occurs and that will challenge boards and leadership teams.”

Catania, from MEC Mining, said advancing technology is already automating much of the iterative work being completed by the industry, which was turning consulting towards “value engineering decision making”.

The skill gap emerged in Whincup’s final remarks.

“I think ESG’s ties to finance, the climate emergency and the low carbon economy transition are the three key factors, not to forget the last four months where racial inequality has come to the fore,” he said. “Collectively these are going to make it a very interesting period for the mining sector.

“This will also impact on the war for talent that the mining industry faces, in attracting the best in the face of competition from more ‘glamorous’ sectors.”

Both Stantec’s Treen and DMT’s Dr Roubos echoed similar thoughts on how the relationship between mining clients and consultants would evolve.

“I believe we will see continued growth in the partnerships between clients and consultants because there is an inherent understanding that a strong consultant team brings solutions – engineering and technical – from different projects, operations, industries and geographies,” Treen said.

Dr Roubos added: “The role of the mining consultant is not going to change, but there will be an evolution in the tools, methodology and knowledge over the next 10 years.”

He concluded: “The changes we are already seeing in digitalisation, automation and technology will make the scope of our role more complex and more dynamic, evolving to offer expertise on the day-to-day processes as well as playing a role shaping the broader growth path of our clients. 