

MEXICO

MINING REVIEW



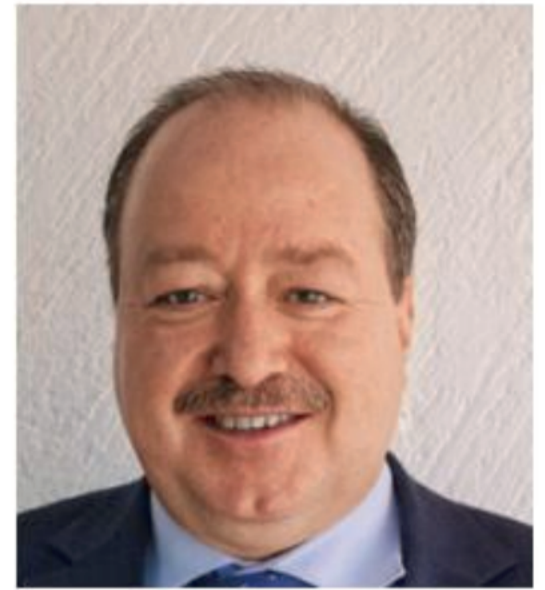
2018



UNDERSECRETARY OFFERS RANGE OF OPPORTUNITIES FOR SERVICE PROVIDERS

JESÚS HERRERA

Director General of Detector Exploraciones



Q: How have changes in commodity prices in 2016 and the early part of 2017 impacted service suppliers like Detector Exploraciones?

A: For service providers like ourselves, the rise in prices has been a great boost because operators and explorers alike are starting to ramp up drilling programs to increase reserves. We are seeing a lot more contracts on the table and more jobs on offer for workers across the value chain. For the past three years we have been working mainly with operators such as McEwen Mining at the El Gallo complex in Sinaloa.

Major mining companies will not consider developing a deposit smaller than 1 million gold ounces and they must constantly work to increase the reserves and mine life of their operations. Our technology can provide accurate 3D models and other geological data that mine operators use to explore around a producing asset so we have been delighted to see confidence return to the sector.

Between 2015 and 2016, the company managed to increase the total meters drilled by 30 percent. With more and more exploration projects being launched on a consistent basis, we hope to further increase this number by 20 percent to 200,000m in 2017.

Q: What changes do you expect to see following the creation of the Undersecretariat of Mining?

A: The change was made with the best interests of the Mexican mining sector at heart. The new Undersecretary for Mining should open a whole range of opportunities to service providers but the whole community has a duty to work together to resolve the issues that affect us all. The public sector of course influences the industry and plays an important role in attracting investment and facilitating the operational business environment but the responsibility for solving the problems of mining companies is on the shoulders of the companies themselves. It is fantastic that the federal government is placing more importance on the mining sector but it does not mean that all of the industry's issues will disappear overnight.

Q: Given the wide range of services that Detector Exploraciones provides, which does your Mexican client base demand most?

A: We have particular expertise in exploration. The company makes considerable investments in drone technology as well as training for geologists, engineers and mechanics. Our drone technology was used by Goldcorp at the Peñasquito mine in Zacatecas. We managed to complete an exploration program, which would usually take one year, in just four months. We completed a 70km flight, scanning all the local terrain, borders and infrastructure, in just three days. This enabled the client to gain accurate geo-referential information about the surrounding area and to make the necessary payment arrangements immediately.

We are also proud of the extensive training we offer our workers to ensure that we are using state-of-the-art technology. Otherwise we will not be able to compete with other mining jurisdictions.

Q: As a service provider, what are the most pertinent challenges facing your business at the moment?

A: Aside from security, which is a huge issue for the entire country, the most pertinent challenge we face is the delay in receiving drilling permits in certain parts of the country. There have been many cases where we have identified a strong deposit, we have the equipment and the contract to commence work but it can take months or sometimes years to obtain all the necessary legal and environmental permits required to start operating. Then, once the permits have been obtained, often the external circumstances have changed and the project is no longer viable. Another area that can be improved is land ownership. Since the Energy Reform, electricity companies and other power generators have clear guidelines on how to use land and work with *ejidos* but the mining sector is still stuck in the past.

Detector Exploraciones is a Mexican company, founded in 1997, providing geology, geomatics and other exploration services to both mining companies and the public sector throughout the country

HOW ARE MODERN DRILLING AND MODELING TECHNIQUES HELPING MAKE NEW PROJECTS MORE VIABLE?

With a history dating back over 500 years, mining is one of the oldest industrial activities in Mexico. Many of the country's largest mineral deposits have already been discovered and exploited, making the challenge of finding the next mine more challenging with every passing year. Thankfully, technological developments in drilling techniques, geological mapping and core analysis are helping to give Mexico's community of exploration geologists an edge over their predecessors. Mexico Mining Review spoke to leading executives to find out which specific techniques are being used in Mexico to help both greenfield and brownfield exploration projects get off the ground.



ROB FERGUSON
Director of Product Strategy
at Leapfrog

Some mathematicians at the University of Canterbury in Christchurch, New Zealand, developed a radio basis function (RBF) algorithm to create 3D objects from point data. The first application was in scans for the medical industry, wherein wounds were scanned and 3D shapes could be created. A geologist then came across the technology and adapted it for geological modeling. The main differentiator is this algorithm and the speed at which our technology works. Initially, the technology was more focused on explorers because it helped map and discover the structure of the deposit. In the last few years, we have integrated more functionality in the software and it has become more applicable to operators so we are having more success at the operational level. We now work with the majority of the mining operators in Mexico including Industrias Peñoles, Fresnillo, First Majestic Silver, Primero Mining, Coeur Mining and Alamos Gold.



PAUL LINTON
Chief Business Development
Officer at Terracore

A new science called geometallurgy, or resource engineering, is helping operators determine how a rock will react to extraction and blasts. It is no longer enough to simply discover resources and companies need to be more strategic about the costs of extraction and processing. We have found cases where processing an area with 1g/t was more viable than another with 3g/t due to the location and extraction costs. Making assumptions about the costs of a project without an accurate financial model can be dangerous to a company's budget. The industry cannot afford to make these kinds of guesses. Eventually, these systems will become normalized in the industry and we will be able to shift away from physical sampling and more toward creating databases and analyses to help mining companies grow. We hope that the segment continues to expand with more companies offering these services.



DANIEL NOFRIETTA
Director General of Tecmin

In our first year in business, one of the things that concerned us was the downtime created by the market's conventional drills. Our competitors would use well-known brands but the parts would typically be difficult to access and there could be days of downtime spent waiting for an engineer to come from another country to fix a problem with a drill. We began to explore the option of making our own drills using easily accessible parts and we were able to achieve this with the TEC series of drills. It uses standardized components which helps with stock availability; as soon as a machine breaks down, we can immediately replace it. At the Fresnillo concession on which we are working there is a neighboring concession using a high-tech drill from a major drilling supplier. But we are able to produce 10-15 percent more than that company, which speaks to the value of the simplicity of our drills.

Our drone technology was used by Goldcorp at the Peñasquito mine in Zacatecas. We managed to complete an exploration program, which would usually take one year, in just four months. We completed a 70km flight, scanning all the local terrain, borders and infrastructure, in just three days. This enabled the client to gain accurate geo-referential information about the surrounding area and to make the necessary payment arrangements immediately. The initial investment required to acquire the technology is more expensive than conventional options but the time savings more than compensate. Major mining companies will not consider developing a deposit smaller than 1 million gold ounces and they must constantly work to increase the reserves and mine life of their operations. We can help in this because our technology can provide accurate 3D models and other geological data that mine operators use to explore around a producing asset.



JESÚS HERRERA
Director General of Detector
Exploraciones

The minerals edition of Aeris is PANalytical's X-ray diffractometer (XRD) for everyone in the mining industry. The heart of the Aeris design is its simplicity - its user-friendly interface makes it accessible to everyone from experienced geologists to budding life-sciences students. It has a built-in touch screen that displays sample results quickly through a series of graphs and charts, providing accurate mineral monitoring for hydrometallurgical models. The user can then transfer the data to anywhere on the network, obtain a clear picture of the deposit and assess the economic viability of further exploratory work. The four available models - metals, cement, research and minerals - make the Aeris applicable to various industrial production control systems but it can add particular value to mineral exploration programs.



MARCELO MOTT
Regional Manager for Latin
America at PANalytical

Currently, our range of downhole instruments are gaining a lot of traction. The REFLEX EZ-TRAC is the most popular device due to its ease of use, accuracy and reliability. The geologists use the information provided to correlate the direction of the bore hole with the core samples that are extracted. One of the additional advantages is that it saves time and money by re-engineering the workflow so an on-site technician for drillhole surveying is not required. We believe the future of mining is about automation, collaboration and real-time information. Our vision is to be the leading provider of real-time subsurface intelligence solutions to the global mining industry.



PAUL ST. ONGE
Mexico Manager of REFLEX

The compact, remote-controlled Drill Rig Zinex A5 provides remote-controlled, compact track-set drill solutions to clients seeking greater versatility in the face of increasingly stringent environmental regulations. The rig, which can drill up to 1,350m when fitted with an NQ tube, is entirely unmanned when it is being transported between drill pads and rough terrains, granting the user supreme maneuverability on complicated access roads and increased safety for the operating team. Compact drills also have a more muted impact on the environment, helping mining companies scale regulatory hurdles. The drills can be shrunk to function on 5x5m drilling pads, whereas many exploration drills available on the market can only fit on 10x15m pads. This versatility helps mining companies acquire the necessary environmental permits for new projects.



RAFAEL GUTIÉRREZ
General Manager of Itzcoatl Drilling