

Put to the test: new drilling solutions

North American drilling contractors are trialling Fordia's new drilling-mud pump and core bit

As part of a drilling-equipment system, the pump plays an integral role – you cannot drill without water. The pump needs to be durable and dependable, which is why drillers are so reluctant to change a reliable drill-mud pump. One popular, reliable model used by many drillers has been around for years, but has not seen any major improvements for some time.

Now Fordia, a Canadian company that offers drilling solutions for the mineral-exploration, geotechnical and environmental industries, is launching a new and improved drill-mud pump – the Elepump KF-50M.

The company states that the pump is smaller, lightweight and takes up very little space, yet surpasses old models in terms of performance and reliability. Fordia was eager to have the pump tested in the field by one of its drilling customers, Major Drilling.

Drillers also know that the choice of core bit has a huge impact on drilling performance. However, certain ground conditions can be difficult to drill regardless of the core bit chosen. As a result, drilling-equipment manufacturers are focusing on customising their core

bits and equipment to particular rock types.

An example of this kind of customisation is Fordia's newly launched Hero 11 Abrasive, which is a softer matrix that allows the diamonds in the crown to come into contact with the ground very quickly for better penetration. Its potential is unleashed in very hard and abrasive ground, specifically from 6.5 to 7.5 on the Mohs hardness scale. The new bit was recently tested on site and, according to Fordia, provided excellent results.

MUD PUMP

Major Drilling Group International is a drilling-services company serving the mining industry, with operations and offices in Canada, the US, Mexico, South America, Asia and Africa. Fordia contacted the company's office in Salt Lake City, Utah, about testing the new pump at its drilling project in Battle Mountain, Nevada.

Major Drilling was using one of its fleet of standard pumps, the same model used by many drilling customers. Fordia's tech team asked them to try the Elepump KF-50M to compare its

performance to the industry standard, but Major Drilling was initially hesitant in case it led to downtime. In the end, Major Drilling's team decided to try one pump.

The state of Nevada is notorious for its tough ground conditions. The ground was 3.5-6.5 on the Mohs hardness scale and highly fractured. The Major team was already 1,500ft (457m) deep into a hole that had a HWL diameter.

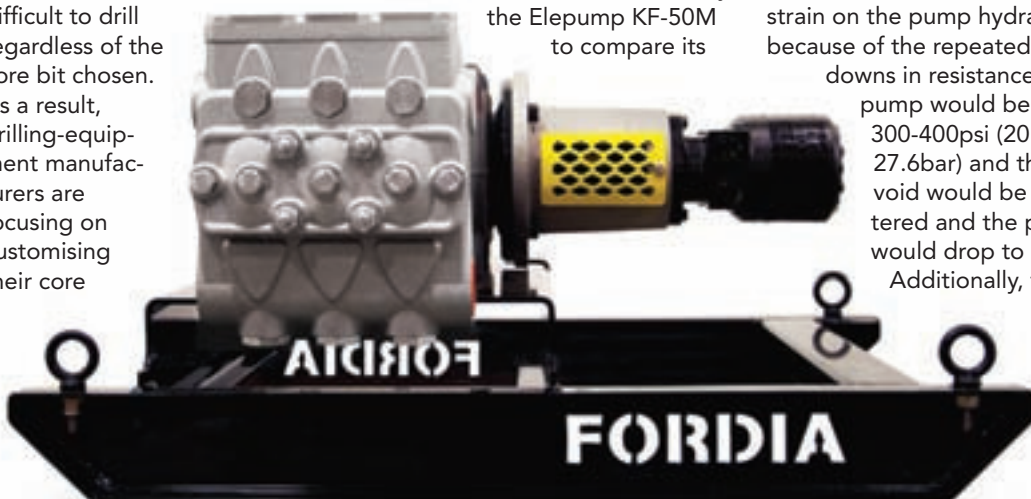
The highly fractured ground resulted in particularly challenging conditions; due to the cracks and voids in the terrain, the team would encounter dry hole conditions with no water in the rods. Then a certain amount of water would start flowing in, usually filling the hole halfway, only to be followed by more loss of water.

The fluctuation in water put a strain on the pump hydraulics because of the repeated ups and downs in resistance. The pump would be pushing 300-400psi (20.7-27.6bar) and then a void would be encountered and the pressure would drop to zero. Additionally, these ►



Fordia's newly launched Hero 11 Abrasive core bit

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The Elepump KF-50M mud pump

Fordia's new pump was tested in the field by Major Drilling ► extremes put a lot of stress on the drill rig's hydraulic system due to the tendency of a triplex pump to pulsate violently. Many drilling companies spend several thousands of dollars installing nitrogen accumulators (pulsation dampeners) to help protect their pumps and the rig hydraulics. These were not required with the KF-50M.

Eric Moore, project manager at Major Drilling, comments: "This new pump ran so much smoother and more quietly than the existing pump we have. It seemed that the hydraulics of the drill rig liked the new pump."

It was after the Major Drilling team ran the pump for three months that the true value of the new pump shone through. Usually, a pump needs to be opened often to change valve seats and packing cups. A lot of debris can get caught in the valve seats, causing the pump to lose its prime and start acting erratically.

"This is not your grandfather's pump; this is a new pump with today's technology"

During that three-month period, the pump did not need to be opened up for maintenance at all. The Elepump KF-50M was finally checked for wear and tear after three months, and the team was pleasantly surprised to see that there was not any. They were able to send the pump to another drilling project on a nearby site, where it was used in similar ground conditions for two months. The pump performed for five months in total before any maintenance had to be performed. A typical pump has to be checked several times per month, on average.

More importantly, the KF50M was not just pumping water over the course of the five months. The KF-50M was tested while using a thick drilling-fluid mud made with bentonite. In order to try and plug up the cracks and voids, other LCM (loss control material) pills and concrete were used as well.

"This pump can handle any kind of mud we throw at it," claims Ryan Ricaporte, technical



field-support representative at Fordia. "We know customers are reluctant to try new products, especially when the old-style pumps have been around for decades. But this is not your grandfather's pump; this is a new pump with today's technology that all drillers need to try for themselves."

The KF50 offered other benefits, including a smaller footprint and lighter weight. The pump can be moved by two men, which makes it a suitable choice for underground rigs, fly rigs with small drill pads or any drill rig with limited space on deck.

CORE BIT

Dorado Drilling is a drilling operator in western Canada, providing contract diamond-drilling services to the mineral-exploration industry. The company has three diamond drills (Hydracore 2000s) currently in operation and employs over 20 employees at its drill sites. Dorado Drilling, a Fordia customer since 2007, recently worked on a drilling project in Lynn Lake in northern Manitoba, where its client had a camp.

The ground at Lynn Lake was highly fractured, hard-banded ironstone, a sedimentary rock with stripes of iron and silica. The hardness of the ground was approximately 7-8 on Mohs scale. The drilling team had been using a variety of drill bits with an NWL diameter, including a Hero 7 and 9, as well as a competitor's bits from 8 to 15. None performed

particularly well. The bit life was poor, averaging about 80m. The bits also polished too quickly.

A member of Fordia's technical crew then suggested using the Hero 11 Abrasive. Bit life almost doubled, with the new bit averaging 150m. It cut freely and sharpened itself without any dry stripping or the need to use nuts. Matt Falkins, president of Dorado Drilling, says: "The Hero 11 Abrasive is the longest-lasting and most free-cutting soft-matrix bit I have used to date."

Falkins decided to try the bit at a nearby site approximately 30km from Lynn Lake. The ground conditions at this second site were more competent and not as hard. The Dorado team had been using other Fordia bits, as well as the competitor's bits, at this location. While the Hero 11 Abrasive achieved the same bit life, its penetration rate was 20% better than the bits the team had been using.

"The Hero 11 Abrasive would keep cutting quickly even when the ground changed to a harder rock with quartz," Falkins explains.

The Hero 11 Abrasive joins a line of products developed specifically for abrasive ground conditions. The Hero 7 Abrasive is another versatile bit that is suitable for abrasive rock formations containing a wide range of hardness levels, from 5.0 and 6.5 on Mohs scale, while the Hero 9 Abrasive is a good choice for abrasive rock formations that include high iron-ore content. ♥