



World's largest Diamond Mine enlists Javelin to do the job

Argyle Diamond Mine, the largest single producer of diamonds in the world, have purchased five Javelin Dual Grade lasers from Leica Geosystems for grading applications in their open cut mines.

Purchased through Precision Laser Systems, Leica's authorised distributor and service center for construction industry lasers and machine control in Western Australia, the instruments will be used for pit control and controlling the desired level in the open cut mine.

(Below): Argyle Mining Surveyor Andrew Payne makes adjustments to the Javelin that is mounted on a moveable laser tower



they purchased this first instrument just over a year ago and the other four in February 2004," Barry Ireland, Managing Director of Precision Laser Systems said. "Their decision was based on their requirement for a quality product with unique features that other instruments on the market don't have."

The Javelin series of lasers are the finest Grade Control lasers. They are extremely robust and waterproof in order to protect their internal components, and enabling their use in extreme environments. Additionally, the Javelins have a height of instrument alert, wind sensitivity settings, and an easy grade swap capability that further enhances their usefulness and productivity. Being dual grade, they can be tilted to measure slopes of up to 20% in either axis. Large and small increments of grade can be entered directly into the Javelin. The Javelin is particularly an excellent product for using in mining and civil works, especially due to its large working diameter of 900 metres.

Level control of mining benches

The Javelins were bought to compliment the existing laser levels for level control of mining benches, both level and on grade. They are all working simultaneously in one large pit and are attached to moveable laser towers so that they can be towed around the site. The different ore bodies are initially detected prior to excavation so that the miners know which mining routes to follow.

"We tend to use the Javelins more for grade applications (ramps, drainage etc), as we find them more accurate than our existing lasers," Andrew Payne, Mining Surveyor at Argyle Diamond Mine said. "The Javelins have the ability to adjust to grades up to 20% whilst our existing lasers are only good for 10%."

In extreme environments, they keep working and working

Andrew Payne said that one of the main reasons for choosing the Javelin to do the job was their robustness. "The conditions that we put them under are very extreme. We have from time

to time had in excess of 6 or 7 inches of rain in a day, and it doesn't seem to worry them. We also have days of over 40 degrees Celsius in heat, and they keep on working and working."

Dual axis laser makes work easier

Previously, the mine had always had at least one dual axis laser on site, with the remaining lasers being single grade lasers. The five new instruments were purchased because of their ability to turn grades up to 20%.

"Having dual axis capability has made our work a lot easier," Andrew Payne said. "We have some benches that have two grades running across them. Without a dual axis laser, these benches would have to be checked manually by a survey crew, which is time consuming and unproductive. Once the Javelins are set up, they take over all of the surveyors work."

The Javelins are based on total station technology, being easy-to-use with a large keypad and features easy switching between manual and automatic mode. They can also be combined with GPS systems to provide the ultimate in 3D control.

On-site surveying

The Argyle mine also has two TCRA1105, two TCA1100's as well as theodolites on site. Leica Geosystems' Australian Distributors, C.R. Kennedy & Company Pty Ltd are the suppliers of these surveying instruments. "The TCRA1105's certainly have measurable benefits, especially the ability for making reflectorless observations," said Andrew Payne. "I would estimate that they save us around 20% of our time compared with non-reflectorless instruments. They also give us the ability to survey where we couldn't otherwise due to safety concerns."

Argyle Diamond Mine, Western Australia

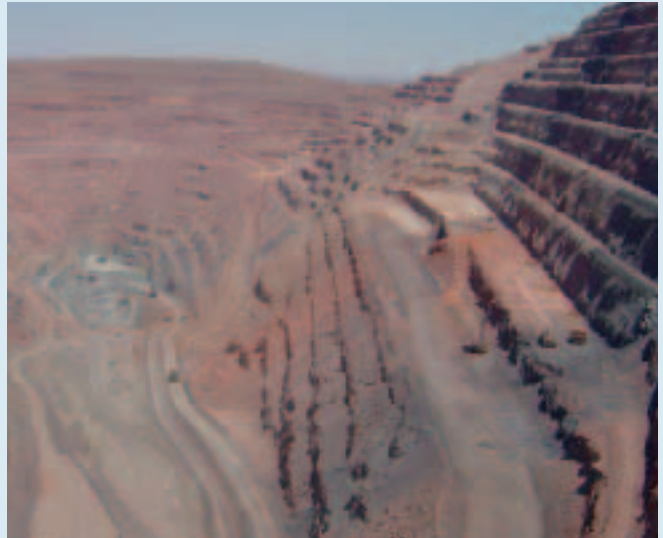
The Argyle Diamond Mine, located in the Kimberley region of Western Australia, 550 km south-west of Darwin, has been operating since 1983. Each year some 80 million tonnes of material is extracted from which approximately 30 million carats of diamonds are produced.

The mine runs as a conventional open-pit mine where both lamproite ore and waste rock are drilled and blasted before being loaded out in a shovel-and-truck operation. Ore in the pit is broken by the use of explosives with each blast hole liberating about 3000 tonnes of rock. Alluvial mining involves the mining of ancient creek beds where diamonds have been washed down over millions of years. The AK1 open pit is 2 kilometres long, 1 kilometre wide and covers an area of almost 300 hectares.

The Kimberley diamond region consists of a central core of a thick series of nearly flat-lying sedimentary and volcanic rocks that were deposited between 1.6 and 1.9 billion years ago. These rocks form the Kimberley Plateau.

When geologists discovered diamonds in the Kimberley region in 1979, the discovery was unique as it was the first time that a commercial diamond occurrence had been identified that was not hosted in the traditional diamond-bearing ore, known as kimberlite. Instead, the diamonds were found to be in olivine lamproite ore from which diamonds had been eroded to form placer deposits nearby.

Argyle is operated by the Argyle Diamond Mines Joint venture, which has been wholly owned by Rio Tinto since 2002.



"We find these instruments very easy-to-use, and I have found that, compared to other similar instruments, the TCRA1105's were very good value for money. All of the theodolites and the javelins require very little training in order to begin using them, and in fact, most new surveyors on the site have already used them so training is kept to a minimum."

"The purchase of four units shows the mine's confidence in the product," Jeff Hugo, Machine Control Manager at Precision Laser Systems said. "In addition, it is such an easy instrument to use, there is nothing complicated about it and workers are able to operate it with confidence after only 30 minutes of use."

Peace of mind

In conclusion, Andrew Payne said: "Ultimately, the thing that we like about the Javelins is peace of mind - knowing that the lasers are doing an accurate job."

Precision Lasers are currently in communication with other Rio Tinto mines regarding the use of Javelins and are also investigating opportunities with other machine control products. In addition, they are working together with CR Kennedy to promote product solutions such as the Gradestar GPS system.

"The success of the Javelins paves the way for more Leica products to be introduced not only to this mine, but also to provide a successful example for others to follow," Jeff Hugo said.

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(Below): The Javelin series of lasers are ideal for use in extreme environments

