The Situation

Orica Mining Services approached a large Queensland mining operation to assist them in reducing their costs in comparison to their traditional ANFO and Fortan™ products. This truck and shovel operation has been blasting in weathered material for many years and they believed there must be a more efficient and cost effective approach.

Technical Solution

Considering the type of rock in the zone of interest, an analysis was performed using a variable density explosive under the same parameters of design used with ANFO and Fortan™ Coal. The analysis results demonstrated that Flexigel™ Coal 60 was the most appropriate product for this application.

For the initial blast, 310 holes were loaded with Flexigel™ Coal 60 (0.6g/cc density) in a pattern of 10m burden, 11m spacing, 270mm hole diameter, 24m bench height, and a powder factor of 0.22kg/cum. Timing was designed to maximize the performance of Flexigel™ Coal 60.

The Result

The blast produced outstanding fragmentation. Based on the typical excavator operated in this area with budgeted standard digging production rates of approx 1,600bcm/hr, the digging production rate obtained was 20% higher than what was obtained with ANFO and Fortan™ Coal for the same area. The average production rate in this blast was 1,914 BCM/hr.

Due to the construction of a ramp in the trial area blast comparisons were not fully representative, however after these excellent results, further Flexigel™ Coal 60 blasts took place in the same area and productivity peaked at 2400 BCM/hr. These results demonstrated to the customer that Flexigel™ Coal 60 offers a solution in higher productivity at a lower cost.

Figure: 1 Avg. dig rate comparisons for trial blasts.