

# DynoMiner™ Advance Streamlines Blasting Efficiency at Cosmos Operations



## Project Summary

### SUPERIOR PERFORMANCE AND SOLID SAVINGS

The Xstrata Nickel Cosmos mining operation (formerly Jubilee Mines) in the North Eastern Goldfields of Western Australia is experiencing the benefits of the Dynominer™ Advance first hand.

Dyno Nobel provided a Dynominer Advance bulk emulsion development charging system for Byrnegut Mining to improve the ease and efficiency of loading explosives underground at the site.

Using TITAN® 7000 gassed emulsion technology, the rugged and compact Dynominer Advance system significantly increased performance and dramatically reduced costs.

Developed over a number of years, the Dynominer Advance system achieves the lowest total cost of advance compared with ANFO-based charging systems.

## Background

### RAPID DEVELOPMENT RATES ACHIEVED

The Helene Decline is part of the Cosmos operations, an advanced underground mining operation in the heart of Australia's most productive nickel region.

Jubilee Mines required rapid tunnel development to access the Prospero and Tapinos ore bodies before ore supply from the Cosmos mine ran out.

Byrnegut Mining, the mining contractor, chose Sandvik TCAD computer aided drilling and Dyno Nobel's TITAN 7000 bulk emulsion to achieve rapid development rates in a single heading at the lowest total cost.



## Project Goals

### MAXIMIZING DELIVERY PERFORMANCE AND COST BENEFITS

Dyno Nobel's charging system meets a wide range of objectives.

**Productivity** – The unit was employed to achieve single heading advance rates greater than current industry benchmarks. What's more, it improves face advance per round.

**Cost benefits** – The efficient delivery of the emulsion helped to maximize cost benefits. The reduced use of explosives and reduced drilling and charge times all added up to significant cost savings. Overall, the Dynominer Advance achieved a greater advance per face, which delivered substantial value to the operation.

**Safety** – By reducing noxious blast fume volumes, the system improved re-entry times adding to cost efficiencies as well as worker comfort and safety.



**Groundbreaking Performance**

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## Technology Applied

**THE DYNOMINER ADVANCE UNIT IS A RELIABLE, SIMPLE TO OPERATE, AND LOW PRESSURE PUMPING SYSTEM THAT DELIVERS A SAFER, MORE EFFICIENT AND COST-EFFECTIVE WAY OF TUNNELING**

The IT and work basket based system provides flexibility in a single heading operation.

The air powered, PLC controlled bulk emulsion system delivers a gas-sensitized emulsion to the blasthole, delivering a fully coupled emulsion charge to the main body of the face.

The variable density emulsion system allows product density changes through the round. The PLC controlled String Loading system allows perimeter holes to be charged at rates as low as 0.70kg/m.



This is, of course, in addition to the health benefits of a safe and quiet operation with a less demanding routine for operators at the site.

Improved lifter performance reduced the number of lifters and knee holes by four and a further three easier holes were removed from the standard ANFO pattern.

The unit also recorded perimeter performance with string loading equivalent to that of packaged tube-type perimeter products.

In addition, the unit provided accurate metering of product for string and fully charged holes.

The use of superior emulsion product delivery in the tunneling application greatly increased productivity and efficiency. Utilizing a tunneling jumbo, the site was able to take 5.8m rounds in a single heading decline. The TITAN 7000 emulsion was an integral part of the cycle. The site is reporting reduced charging times, improved fragmentation and a reduction in the number of boreholes needed. With faster access to the ore body, the long-term benefits for the site are a higher NPV and the recovery of significant upfront capital expenditure.

## Value Added

### THE BENEFITS OF USING DYNOMINER ADVANCE

Dynominer Advance outperforms ANFO-based charging systems. The advance was improved by 7 percent to achieve full advance per round.

Manual handling is greatly reduced as the bulk emulsion is pumped from a storage tank to the Dynominer unit, improving efficiency through quicker handling and charging times. The system achieves instantaneous loading rates of over 90kg per minute.

The main problems being experienced at the mine were pulling large rounds and re-entry times. By using the Dynominer Advance, the site was able to reduce charge times by up to 30 per cent and reduce explosive costs by around 25 per cent. The emulsion produces four times less after firing, which reduces the re-entry time to a development face and speeds up the mining cycle.

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