

QUARRY CASE STUDY

Reducing Costs of Retrieving Low Alkali Aggregates in NY Quarry

PROJECT SUMMARY

HIGH ALKALI BENCH CREATES CHALLENGE FOR NY CEMENT PRODUCER

The chemistry on the upper 5 to 12 metres of the aggregates bench contains a high alkali material that is not desirable to send to the plant.

This high alkali affects the cement quality.

The project scope was to segregate\remove this area, post one bench blast event, leaving good quality aggregate material for cement production.

Previously, the customer blasted and removed the top 6 metres of the bench with small diameter short holes and scalped off the high alkali material.

They then drilled and blasted the low alkali material as normal production blast.

This proved to be costly as well as time consuming with additional ramps and the mucking of a split bench.

PROJECT GOALS

IMPROVE THE EFFICIENCY OF THE MINE

The customer's desire was to easily dig approximately 30% of the low alkali located in the lower 20m of the bench.

The goal was to cast the bottom 20m of aggregate low alkali bench out into the pit while, in same event, blast the top 6m of high alkali material into a manageable size with the majority staying in the power trough of low alkali blast.

Basically, allow the high alkali material to be blasted in place and simply fall.



Aggregate quarry.

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TECHNOLOGY APPLIED

ELECTRONIC TECHNOLOGY ALLOWS ACCURATE DECK TIMING TO SEGREGATE HIGH AND LOW ALKALI AGGREGATE

The initial trial blast consisted of two decks with the bottom 15m of the deck initiated first and the top 6m of the deck initiated second, having a 200ms later delay time.

The blast event took weeks of deliberation and planning and included decking the aggregates bench in order to allow segregation of the top 6m of a 25m bench which contained too high of alkali to blend in cement mix.

Digishot Plus® electronic detonators initiated the bottom deck of low alkali with a down the face delay timing of 16 ms, 165 ms between rows and initiated the top 200ms later.

This resulted in slower delay time down face in order to keep minimum forward movement.

This delay sequence proved successful as the upper portion of the bench remained in place while the lower portion was fragmented and displaced into the quarry pit.



Quarry seams.

VALUE ADDED

SAVINGS OF \$0.15 PER TON WITHOUT INCREASING AMOUNT OF EXPLOSIVES REQUIRED

DynoConsult saved the customer \$0.15 per tonne compared to the traditional drilling, blasting and scalping of the top 6m.

The success of the blast allowed easy digging of the low alkali material needed for cement production.

The remaining 500,000 tonnes on this bench was removed utilising the best blasting practice developed as part of DynoConsult customer focus and long-term commitment.

There is a possibility of drilling and blasting up to 1.5 million tonnes per year using this method. This would result in significant savings for both production of cement stone and aggregate material.



Quarry blast.

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