All clear: Hazell Bros' secondary and tertiary crushing and screening circuit at its Leslie Vale plant initially filled the shed with volumes of dust.

# FOAM SOLUTION PROVES A GODSEND

When Hazell Bros began operating an enclosed crushing and screening circuit, it did not account for the sheer volume of dust it would generate. As **Damian Christie** reports, it sent an SOS to a dust suppression supplier whose foam agent has worked wonders.

In an application like quarrying, dust is an unavoidable yet pestilent side effect of aggregate processing. There are many occupational health and safety and environmental factors that come into play.

When Hazell Bros began operating an enclosed secondary and tertiary crushing and screening circuit at its Leslie Vale plant in Tasmania a few years ago, it sorely underestimated the sheer volume of dust that the circuit would generate from inside a shed. The dust was so prolific that it reduced visibility in the shed to less than a metre while the circuit was operating and accumulated in all reaches and corners of the shed once the circuit was wound down.

Concerned at the impact that the dust would have on health, safety and productivity, Hazells principal Michael Hazell turned to Polo Citrus, a key supplier to the extractive and mining industries in the prevention of airborne dust emissions from a large variety of extractive processes.

## BIODEGRADABLE DUST SUPPRESSION

Polo Citrus specialises in natural orange oil technology and has developed a range of products over the years that have reduced dust emissions in most extractive industry applications, in particular, where respiratory dust has been a concern. The key "weapon" in its arsenal was Polo BDS, a biodegradable dust suppression (BDS) agent.

Unlike traditional dust control agents like water, dust collectors and fans, Polo BDS employs foam micro-bubbles at the application point and downstream prior to crushing and screening. "The dust particles adhere to the foam and go through the crushing and screening process," explained Polo Citrus business development manager Adam Gelly. "The airborne dust particles that would go airborne stick to the foam. The foam dries as it goes through the rest of the process and the dust falls off. In most cases, the foam will last right through to the stackers, so you're likely to get dust suppression right

through to the stockpiles, up to about 90 per cent better in most cases."

In turn, the foam when mixed with a single litre of water expands up to 100 times to capture the airborne particles. This means the plant only has to provide six litres of water per minute, resulting in potentially high water savings. Adam added that the foam also dries more quickly, reducing material build up on belts and in the plant, leaving a better quality product at the end of the process, ie no "dripping" stockpiles.

## TIGHT TIMELINE

When Polo Citrus is contracted for a job, the average time between the initial quote and installation can vary from four to six weeks. Normally, this would include a site inspection of the plant to prepare for the installation. In contrast, the installation of the Polo BDS system at Hazell's Leslie Vale plant had a turnaround of just a week, due to the urgency of Hazell's work at the time.

Nevertheless, Polo Citrus met this challenge, thanks to the assistance of Michael Hazell who provided multiple photos of the site. "We can get things done in a short time frame," said Adam, "but the normal procedure would be a site visit to determine if there may be any issues with the site at all, ie ensuring the customer has in place power, water, air, etc. The installation can take between six and eight hours, again depending on specific site requirements."

During installation, the customer will provide water of up to six litres per minute, a minimum 35 cubic feet per minute air per unit and for fixed plant and equipment, a 240 volt power source (for mobile plant, the power source varies between 12 and 24 volts).

Polo Citrus fulfilled all of Hazell's needs at the Leslie Vale plant, which is virtually dust-free since the BDS was implemented. Hazells has subsequently retained Polo Citrus for other jobs, including providing BDS for three units operating at its site at Cotter Dam, near Canberra. Indeed, in the tender for the dam project, Hazell Bros nominated Polo Citrus as its preferred dust suppression provider.

"We provided information to Hazell Bros about the environmental application and biodegradable nature of the product, and also the estimated cost per tonne for that plant," recalled Adam. "We were able to assist Hazell Bros with satisfying the criteria for the tender. Being a brand new plant too, we had schematics on our desks early. We were able to plan the installation right down to every nut and bolt."

Polo BDS employs foam micro-bubbles at the application point and downstream.

## COMBATTING THE ELEMENTS

Adam said the Cotter Dam plant had its own unique challenges. The crushing and screening circuit was not sheltered to the same degree that the Leslie Vale circuit was but as Adam said, "the issue at Cotter Dam was that some of the dust came in from the outside of the shed due to the elements and machinery". He added that being "right up on top of a hill too, there was lots of wind generated, so we had to keep the dust emissions low. It was also different from the Leslie Vale site because they had an impact crusher involved as well as two gyratory cones which were good for us because our system works really well through an impact crusher. We put the BDS in and it cut down dust emissions to 90 per cent."

In addition to cone and impact crushers, BDS is also proven on screens. "Again, it depends on the size of the screen," Adam explained, "but we have BDS in limestone mines where they're crushing down to virtually nothing. It is pretty much designed to work in any crushing or screening situation."

BDS can also be utilised on mobile plant and equipment, although Adam said that each mobile job may differ from the last, even with the same set of machines. "The mobile market is different from a fixed plant because they move from site to site; sometimes the material differs and customers will find that the traditional suppression method, if they are using any, is just not cutting the dust down as well as our system would." Adam said that Polo Citrus is already meeting the demands of many mobile plant customers and predicts that this market will only increase over time.

## "BETTER THAN WATER"

Michael Hazell said he was very impressed with the BDS agent. "For the amount of water we would use, it is an incredible saving of water. You don't have to flood the product, you don't have to get the product wet to be able to use it. It doesn't affect after-screening processes. It has tremendous advantages over water." He added that he would recommend BDS to other members of the quarrying industry, "especially where dust emissions are a problem. Polo Citrus gives a better result than water".

Adam Gelly was equally complimentary about Hazell Bros as a customer. "Feedback from Hazell Bros has been exceptional. They are building another plant in Tasmania and have asked Polo Citrus to quote. We have enjoyed positive feedback from all of our customers. Also, after running the system for a period, a customer will refer us to another of their sites for an installation or if they utilise a mobile plant, they refer us to the contractor."

Adam concluded that when it came to using water or foam to suppress dust emissions, the BDS was a "no brainer".

"You can get rid of dust with water," he said, "but water is a natural resource and Australia is one of the driest continents on earth. So water is a precious resource and if you throw a precious resource into stopping dust, you are using up a valuable commodity and, considering how much water costs every time we turn the tap on, you'll end using up more money than you'll save." •