

KCGM

NEWS & VIEWS

Issue 2 June 2005

OUR NEWS *Your Views*

GM Welcome

Welcome to the second edition of "News & Views". In this edition we would like to offer you an insight into blasting at KCGM. Some of you may be aware that we had an unfortunate incident in March where the wind unexpectedly turned before we could cancel the blast, resulting in some dust blowing over Boulder. Although not causing environmental harm, we didn't monitor the blast at the time, and we inconvenienced a few of our near neighbours.

In hindsight there is little we could have done to avoid the dust but we should have carried out the monitoring, even if we didn't think the dust would travel as it did. We apologise for this incident and have taken steps to ensure that we get the monitoring done correctly and will remain focussed on wind direction.

The incident is regrettable, however I would like to think that it also highlights the extraordinary number of times that KCGM does manage to get it right. To put it in perspective, last year KCGM blasted 399 times in the Super Pit, and so far this year we have blasted 120 times (no doubt more by the time you read this!). All of these blasts met our statutory requirements and the Australian Standards for vibration.

One of the ironies of Super Pit blasting is that we are often criticised by tourists for not making the blast more spectacular, or cancelling at the last minute because of unfavourable wind conditions!

This issue of "News & Views" will explore the technical aspects of blasting, and the effort that we put into ensuring that our blast practices minimise any potential impact on our very near, community. Last year, within the Chaffers cutback, special blasting techniques and tools were employed by KCGM to minimise the potential impacts from surface blasting, such as vibration, noise and flyrock.

These techniques included the introduction of electronic detonators and modified timing regimes and firing directions. They were used in conjunction with vibration modelling software that enabled KCGM to simulate vibration levels prior to blasting. As a result KCGM engineers now have more control and flexibility to limit undesirable side effects from surface blasting.

These improved techniques bring me to a very important aspect of our proposed Golden Pike



cutback (western wall) which we are currently seeking approval for. We are proposing to put forward an alternative Safety Exclusion Zone (SEZ) definition, which would in effect maintain the current SEZ outline, but reduce the distance needed between our operations and business in the industrial area. We believe our improved blasting techniques will ensure that the new cutback can proceed without inconveniencing our neighbours. Details of this are available in the Project Definition Document (PDD) available from KCGM.

In the meantime, please read on about the very serious business of blasting that KCGM undertakes in the Super Pit, and as always, your feedback is not only encouraged, but welcomed.

Cobb Johnstone, General Manager KCGM

What is the SEZ?

The idea of the Super Pit was developed in the mid '80's, and in 1987 the government formed the Golden Mile Mining Development Planning Committee (GMMDPC) to progress various aspects of the pit development. In 1991 they developed the concept of the SEZ (Safety Exclusion Zone) to address concerns of nearby residents largely with regard to fly rock and pit wall stability.

A distance of 400m from where primary blasting occurs was calculated based on mining practices at the time. 14 years later, it is acknowledged that the technology has changed and we now blast smarter, with better equipment and improved practices. KCGM is now in the technical process of assessing whether the SEZ could be safely reduced without impacting on nearby neighbours.

MORE INFORMATION ON PLANS

KCGM has produced a project definition document on the future plans of the Super Pit, and this is available from our website www.superpit.com.au, by request from our Public Inquiry Line: 9022 1100 or by visiting our Super Pit Shop at 2 Burt Street Boulder. This document further progresses the detail of the KCGM Concept Plan released in December 2004, and offers another opportunity for you to feedback into our consultation process.



Blasting at KCGM

KCGM's close proximity to the City of Kalgoorlie-Boulder means that we are very conscious of controlling the nuisance effects of drilling and blasting operations, significantly more so than a mine located in a remote area.

Considerable research and resources are put in place so that best practices can be utilised to minimise these nuisance effects that include:

- Noise from drill rigs as they drill.
- Noise emulating from a blast.
- Vibrations that may cause concern to members of the community
- Dust from the drilling and blasting process.

These effects can be more noticeable when a new area is opened up for mining and the working benches are quite shallow. Simple restrictions on work conditions, such as day light only operations work very effectively and these are employed for the first few benches.

Blasting can only occur when the sophisticated wind monitoring program indicates that dust will not blow towards a residential area. However, there are rare occasions when a safety concern may result in needing to blast (eg. lightning).

The Process

To begin the mining cycle, the hard rock mass must be broken up into small pieces that can be easily managed by the mining plant and equipment; this is the 'drill and blast' part of the mining process.

The most convenient way to produce fragmented rock is to drill 165mm holes 11.3 metres into the rock below and fill each one approximately 2/3 full of explosives, complete with a primer, detonator and lead. A topping of crushed rock - called stemming - fills the hole to the surface and helps contain the blast energy so that it will do the maximum amount of work breaking up the rock.

All the holes in the 'pattern', which usually number about 300, are then linked together in a special way to enable the blast to follow a sequence. This is extremely important as it not only considerably aids the fragmentation process but it also enables the 'adverse' effects of blasting to be minimised. This includes noise, dust, vibration and possible fly rock.

A blast pattern consisting of 300 holes will give the mine about 220,000 tonnes of broken rock; or enough for one day's digging by all the mining machinery. Consequently, the mine is committed to drilling 300 holes and blasting on average, about one of this size pattern each day.

The Super Pit is relatively unique in the type of environment it operates in. For a start it operates in an area where there were significant old underground workings that left many dangerous open holes beneath the surface. These may collapse and fall in during the mining process so they must be found in advance. KCGM utilises a 'probe' drill to work in front of other machinery to

find and identify these voids. Once found, special drilling and blasting techniques are employed to collapse in these areas, and make them safe for pit users.

Ground vibration

As each blast hole explodes, a 'wave motion' (vibration) is initiated that travels through the ground away from the blast. So if 300 holes are being blasted, then a similar number of different waves are being created. These waves have the potential to 'add together' to make larger waves; or even partially cancel each other out. The intensity of the vibration through blasting is measured by six vibration monitors placed in strategic locations near the pit and on the perimeter of the housing areas.

KCGM works to minimise the occurrence of the ground waves that add together to make a larger vibration. Firstly we avoid allowing two holes to fire at exactly the same time. This is best achieved by using a sophisticated detonator that has an inserted electronic chip so that it will fire at the exact moment it was programmed to. Prior to firing the shot, the blast can be simulated using computer software where it can be seen which detonators are firing together. These holes are then given an alternative timing.

Secondly, we know from worldwide research that there are certain vibrational frequencies that are responsible for building damage, and these are avoided. This is achieved by controlling the timing between successive holes within the blast so that they remain outside these frequencies. Faster timings are better than slower timings.

Monitoring

Permanent blast monitoring for the Fimiston open pit was established in 1993 as part of the noise and vibration monitoring program developed by KCGM. Ground vibration and airblast overpressure are monitored using Blastronics μ MX Remote Blast Monitors. There are six monitors permanently installed at sites between the Open Pit and the City of Kalgoorlie-Boulder.

The trigger level for the Fimiston blast monitors is set at 0.2 mm/sec for vibration and if this level is reached then a result is recorded for the blast event. Ministerial conditions for blast overpressure are set at 125 dB(L) for any one blast, and 120 dB(L) for not more than one in any ten consecutive blasts when measured at the approved monitoring site.

KCGM is also committed to ensure that vibration levels from open pit blasting will be no greater than Australian Standard of 10mm/s and no more than one in ten consecutive blasts will exceed 5mm/s.

Blast monitoring results for the Fimiston Open Pit show that we meet these standards and limits for vibration and overpressure.

HOW DO YOU MEASURE VIBRATION?

Vibration is categorised in a unit called 'peak particle velocity', or PPV. KCGM has its own stringent standards set for PPV which are well below Australian or American standards.

HOW IS THE NOISE CREATED?

Noise from a blast is known as "overpressure", and is controlled by limiting the time between holes firing, not overloading the blast holes and carefully selecting blasting products.

Pre-splitting is a special blast that is used to limit wall damage. However these blasts can be noisier because of the open nature of the blast holes, however we can reduce this nuisance noise by covering the holes in more sensitive areas.

Sometimes, atmospheric conditions can affect the effect of the "overpressure". For example on a rainy day with thick low lying cloud, there is the possibility that the overpressure will essentially 'bounce' off the clouds, and produce a louder noise.



PERCEPTION

An important ingredient in the mix of blasting effects is our local community, and in particular, what they are doing when blasting occurs! If you are at a different location to normal, or are perhaps doing something different (ie. having a nap as opposed to watering the garden), the perceived effects of the blast can be magnified. This can happen because the blast may occur when either you or your family are out of a normal routine.

Of course this may not always be the case as some blasts are larger than others. However if you do feel the next one, take note of when and where it happens, and what you were doing at the time – if you are at all concerned, please call our Public Inquiry Line on 9022 1100 for more information.



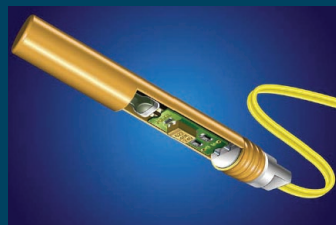
Seismic Monitoring

Seismicity is a form of vibration or movement of ground. Typically it is due to movement of major rock structures deep underground along fault lines. The Kalgoorlie-Boulder region has a long history of seismic vibrations with anecdotal experiences of some large seismic events, which can feel like earth-tremor vibrations.

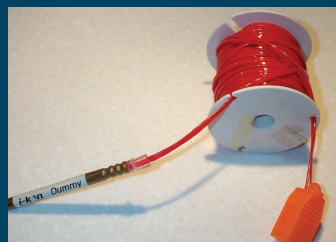
Seismic vibrations often feel similar to blast vibrations to people at the ground surface. The two have significant differences however, as they usually come from different areas, are of different frequencies, and generally do not occur at the same time. Vibration monitors are designed to detect the differences, and identify the source locations of both kinds of vibrations.

Although seismic events occur naturally in our region, some of these events may also be related to mining activity. Mining causes changes in the pressure on underground rock structures. Mining is designed with due consideration of how rock extraction will affect pressures, so that readjustments from mining are less likely to cause seismic vibrations.

I-kon Electronic Detonator



KCGM has been trialling I-kon detonators to even further improve blasting techniques. I-kon or Electronic detonators achieve delay electronically and not pyrotechnically (powder), offering much better control.



Here, a pre-programmed computer chip tells the detonator exactly when to explode and set off the charge in the blast hole. This enables a

large range of exact detonation delays from 0 milliseconds to 15000 milliseconds in 1 millisecond increments.

Benefits notes for this method of blasting include;

- Generating shock waves that interact to assist in fragmentation of the rock
- Guaranteed that one hole at a time explodes
- Firing blasts in unconventional sequences
- Multiple initiation points
- Timing designed to minimise wall damage

The blasting engineers now have better control and flexibility to limit the undesirable side effects from blasting, and at the same time blast effectively for optimising the fragmentation of the rock.

WHEN DO WE BLAST?



Open Pit Blasting is restricted to daylight hours. However, KCGM aims to fire at regular times so that the community is used to a regular firing time, our open pit has a relatively consistent schedule, and tourists have a good chance of catching the blast! The usual blast time is either 1PM or 5PM, but if unfavourable winds, or a safety issue arises, KCGM can fire anytime during daylight hours.

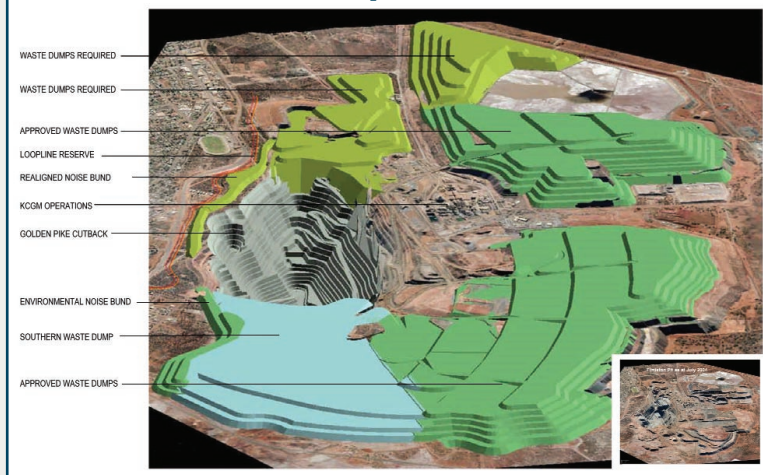


The KCGM Concept Plan

KCGM's current approvals will only take our operations up to 2012, however in October 2004 General Manager Cobb Johnstone revealed what KCGM believes will be the final Super Pit outline in 2017.

These plans have not been approved, and we are still working on the detailed environmental and engineering aspects. However, we would encourage you to consider this Concept Plan for our future and provide us with your thoughts.

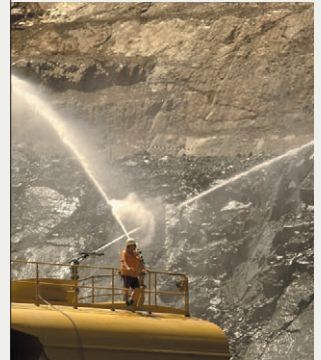
What will the final Super Pit look like in 2017?



Put simply, we would like to undertake the following major projects to ensure our mine reaches its 2017 mine life potential:

- Realign the noise bund
- Expand the pit on the western wall (the 'Golden Pike' Cutback)
- Build more waste rock dumps
- Lift the Fimiston II Tailings Storage Facility (TSF)
- Either re-commission a disused TSF (Kaltails) as a third TSF facility or build a new TSF facility.

MORE INFORMATION



This newsletter is a regular feature of KCGM's communication with our local community. If you require more information on any topic raised, or would like to simply let us know what you thought of this edition of "News & Views" please contact our Super Pit Shop on 9093 3488, or our Public Inquiry line on 9022 1100 (manned 7 days a week 24 hours a day) or email pil@kalgold.com.au

Telephone Survey

KCGM commissioned an independent telephone survey by Patterson's Market Research in December 2005 to see how we were travelling on a number of issues. KCGM was pleased to see that our results were **mostly improved**, or comparable to a similar survey that we conducted in 1999 (a comparison of results is available in the full survey).

- 502 residents
- Conducted 9-18 Dec 2004
- Sample drawn from electronic White Pages

In an unprompted response, **31% nominated KCGM as an organisation that is important to the future prosperity** of Kalgoorlie-Boulder.

A full version of the survey has been placed on our website, however here are some of the significant findings...

- **93% agree** we are "important to the economic future of Kalgoorlie".
- **78% agree** that we take care to ensure "the environmental impact of its operations are minimised" (7% disagree).
- **76% agree** we are "a good employer" (5% disagree).
- **71% agree** that we have "improved communication with the community in recent times" (11% disagree).

- **68% agree** that we are "a well managed organisation" (7% disagree).
- **67% agree** that we are "open in our dealings with the community" (15% disagree).
- **63% agree** that we "have a good environmental record" (13% disagree).
- **49% agree** that we "deal fairly with the Aboriginal community" (7% disagree).
- 72% rate out **rehabilitation efforts as good** (7% poor)
- 8 out of 10 (79%) regard **air quality** as being **acceptable**
- 83% regard **blasting** as being **hardly worth a mention**, 17% regard it as being at least a "minor irritation"
- 8 out of 10 adults living in Kalgoorlie-Boulder rate the work that KCGM has done in managing its responsibilities of operating the mine with due regard to the concerns of the people of the region as being **"well done"**.

An interesting point the survey uncovered regarding the last 'News and Views' was the low readership of the newsletter due to the distribution method. This has prompted us to have the newsletter delivered direct to your postbox via Australia Post, to give you every opportunity to learn about what we are doing and to have your say.

The Super Pit Shop is located at 2 Burt Street Boulder, and our PR staff welcome your direct inquiries.

If you missed out on the first issue of News & Views, and would like a copy, please contact our PR Office on 9093 3488 or visit the team at the Super Pit Shop, 2 Burt Street Boulder. It's also available online at www.superpit.com.au

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