APPENDIX K-6: Examples of Existing Paste Backfill Memo

Memo

To: Bob Jacko

From: Kim Huether

cc: John Barber

Date: 01 September 2016

Re. Examples of Existing Paste Backfill

Paste fill, in this example, consists of a 62% solid and 7% cement slurry which is pumped underground to the point of use. The paste line in the main decline is 8 inch steel and the paste lines into the individual stopes are 6 inch HDPE. Paste walls or barricades are built from a fabric covered mesh and 8 inches of shotcrete.

The stopes are under geological control and can vary between flat and +/- 10% gradient. Breather pipes (4 inch HDPE) are placed two on either side of the drift, four total. One breather pipe on each side will stop mid-stope (30m from the barricade) and the remaining two will stop at the end of the stope at the highest elevation. The paste line is centered in the back of the drift. This is shown in Figure 1 below. As the stope fills, the paste material will begin to plug the breather pipes which alerts the crews that the fill cycle is nearly complete. When the air stops flowing out of the final breather pipe that alerts the crew that the paste has completely filled the stope.

If there are any voids, these can be found when mining a secondary stope next to a primary stope. Figure 2 shows the paste fill (dark material) has tight filled to the surrounding rock (light material) in a primary stope.

Figure 3 shows a paste fill void in a primary stope. It should be noted that the void is a small, tight volume, likely from an air pocket, and not a long sloping void along the length of the stope which would indicate incomplete filling. Exposing this void allows the crews to fill this void when filling the secondary stope.

Figure 4 shows the section view of a paste wall. The paste material is tight to the wall (dark material on the left). The paste walls in this example are installed slightly concave into the stope which provides a more competent wall.

The Black Butte Johnny Lee Upper Zone contains approximately 65% flat lying stopes and 35% angle stopes which follow the dip of the mineralized zone. The initial fill of the stopes would fill 93% tight to the back, leaving 21 m2 of void. Filling the secondary stopes would fill an additional 3% of that void space in the stope on either side of the secondary. The primary stopes that have

1640 S Stapley Dr Suite 241
Mesa AZ 85204
480.253.4930
amecfw.com

secondary stopes on either side would likely have 100% fill ratios. These fill ratios are benchmarked from existing drift and fill mines using paste fill. See Figure 5.

Combining this type of pattern, the flat lying stopes would have an average fill ratio of 96% and angled stopes would have an average fill ratio of 95%.

Figure 1: Paste Wall with Breather Pipes

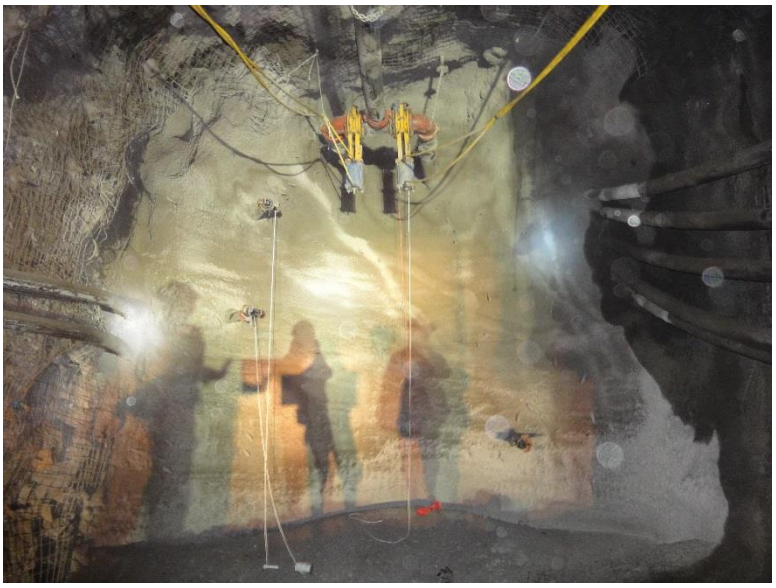

Figure 2: Tight Paste Fill

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Continued…

Figure 3: Paste Fill Void Seen From Secondary Stope

Figure 4: Paste Wall Section View

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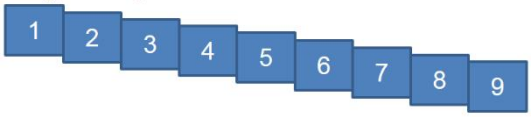
Figure 5: Paste Fill Void Ratio

Flat Lying Stopes

Primary 1 – 3 – 5 – 7 – 9
Secondary 2 – 4 – 6 – 8

Initial Fill	1	2	3	4	5	6	7	8	9	
%	93	93	93	93	93	93	93	93	93	
Final Fill	96	93	100	93	100	93	100	93	96	= Average 96%

Angled Stopes



Primary 1 – 3 – 5 – 7 – 9
Secondary 2 – 4 – 6 – 8

Initial Fill	1	2	3	4	5	6	7	8	9	
%	93	93	93	93	93	93	93	93	93	
Final Fill	93	93	96	93	96	93	96	93	96	= Average 94%

65% Flat Lying Stopes : 35% Angled Stopes = Average 95%

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amecfw.com