NEWMONT

Newmont's Cripple Creek & Victor Team Continues Innovative Approach to Solving Problems

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Newmont's Cripple Creek & Victor (CC&V) gold mine in Colorado operates two valley fill heap leach pads. One of which, VLF1 (Valley Leach Fill), is a 3.72 million ton leach pad that is more than 700 feet deep in some areas. Active stacking has been completed on VLF1, reaching the 10,400 ft. elevation level (from sea level). As the valley fill heap leach pad was built or "coned up," it created over 12 million square feet of side slope area, which comprises nearly 80 percent of its leachable area. While these side slopes have been leached intermittently since 1995, they will remain a significant contributor to CC&V's production for years to come.

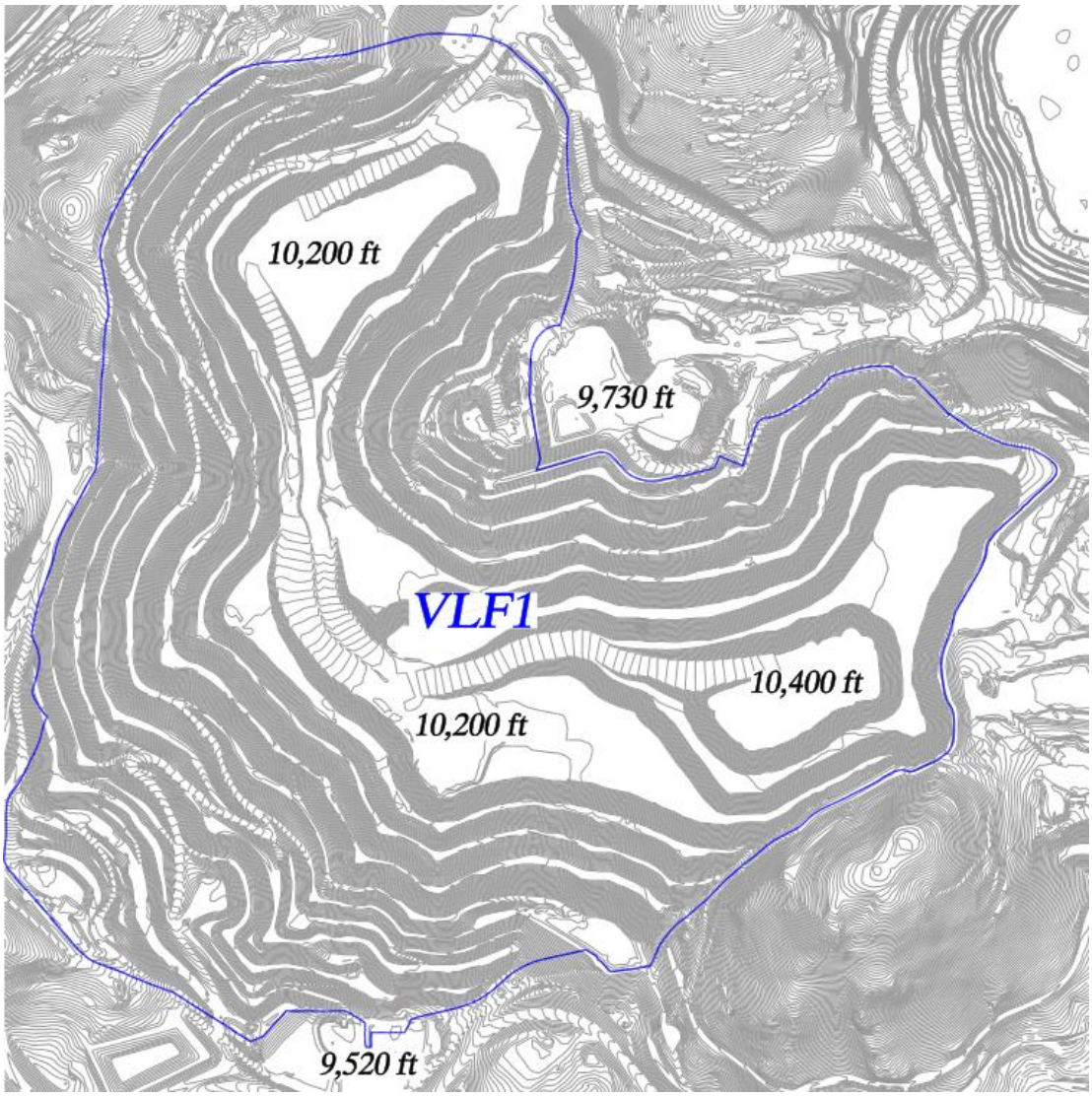


Figure 1: Plan View of VLF1

Side slope areas have limited access, with most benches just wide enough to fit a pickup truck. This makes them difficult to leach and have a high potential for washouts caused by drip lines disengaging from their adaptors. These washouts can affect multiple benches and access roads on the leach pad creating safety and environmental concerns, as well as costly remediation efforts and production loss. There are approximately 15,000 drip line adaptors in use daily on VLF1 and it only takes one of them to create a washout that can take days to remediate.

To address this problem, leach pad metallurgist Zach Felkey has developed two new excess flow valves (EFV). EFVs isolate flow when the flowrate through a pipe increases beyond a specified set point. The “Check” and “Eddy” excess flow valves utilize two new mechanisms to achieve flow isolation. These EFVs allow for efficient operation by delivering quick interconnections to drip line adaptors while providing a reliable and robust safeguard to reduce the potential for washouts.

The Check EFV

The first EFV developed uses a swing check valve and a modified bushing. The modified bushing is installed into the feed header in place of a typical adaptor. The bushing is tapped to accommodate a drip line adaptor. A coupling is attached to the bushing such that the drip line adaptor fits inside the coupling. The coupling is further connected to a swing check valve and the drip tube is fed into the swing check valve. The drip tube displaces the flap of the swing check valve into an open position, thus holding the flap open when the drip tube is installed onto the drip line adaptor connected to the bushing. The check valve is then threaded onto the bushing, completing installation. If the drip tube comes off the drip line adaptor due to pressure or stress, the drip tube is pushed past the flap in the swing check valve by the flow of fluid, allowing the flap in the swing check valve to close and isolate the flow. This EFV is optimal for plugging solutions since its mechanism is not affected by debris or scale.

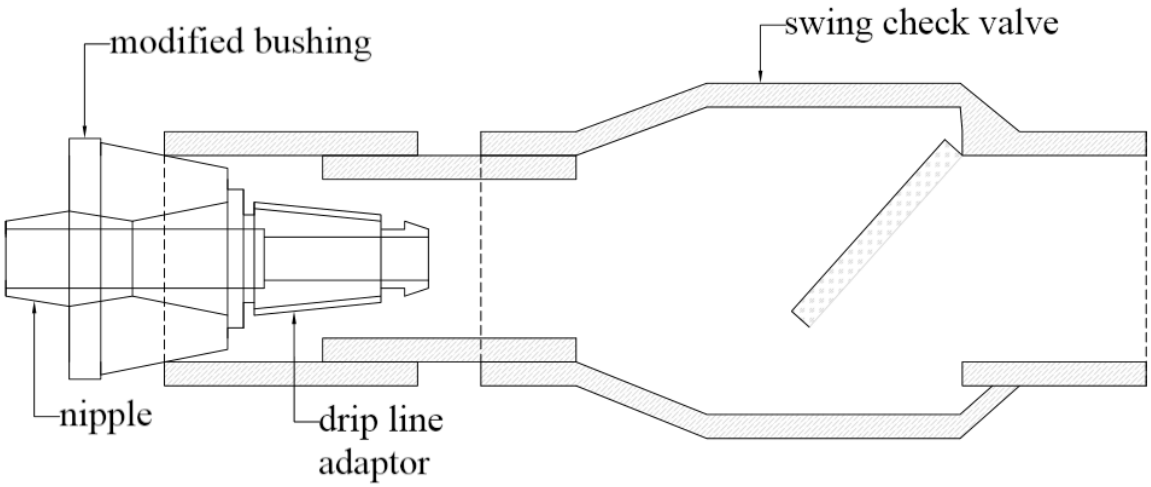
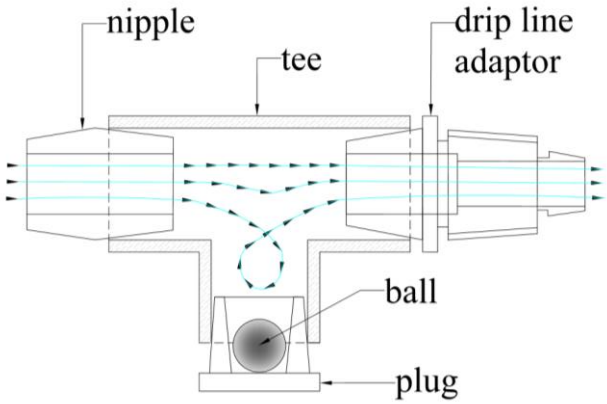


Figure 2: Design of Swing Check Valve

Figure 3: Photo of Swing Check Valve

The Eddy EFV

The second EFV developed is a tee or wye fitting with a ball in the side outlet of the tee which is plugged off. The tee is installed into the feed header using a nipple and an adaptor is threaded into the opposite end. If a the drip line disengages, the velocity increases through the tee creating an eddy current, or swirling motion, that is sufficient to lift the ball into the straight section of the tee. The ball then lodges into the inlet side of the adaptor, isolating flow. If the tee is installed above the horizontal midpoint of the feed header, the EFV will be provided at a slight angle relative to horizontal as shown in the photograph below. In turn, when the pressure in the feed header is relieved, the ball will roll back into the side outlet under the influence of gravity. The size and material of the ball can be changed for the desired maximum flow rate and fluid being used, as well as the distance of the ball from the straight section of the tee.



Figures 4 and 5: Design and Photo of EFV with Tee or Wye Fitting

Side slopes present a challenge to CC&V's operations team with their minimal access and the constant risk of wash outs. However, with these two innovations CC&V can have more confidence in their ability to safely and effectively leach side slopes.