

William McDowell

Dear Arizona Department of Environmental Quality,

I'm writing to urge you to deny South32's Hermosa permit (#AZ0026387) for discharge of mine water into lower Harshaw and Alum Gulch. The proposed impacts are ecologically and socially unacceptable and fall into three main categories: 1) dewatering due to the "cone of depression" that would be created around the mine and 2) disturbances that would come from dramatically increased flow rates in nearby creeks, and 3) potential contamination of downstream water bodies.

First, pumping to drop the groundwater level to facilitate mining will change the ecology of these watersheds. In a semi-arid woodland watershed area this would be highly destructive. Drying out the shallow aquifers in these watersheds will alter the natural vegetation as native plants, including large trees, experience long-term drying of their deep root zones, potentially causing significant die-off of the native woodland tree species. This has occurred in the Tucson area over the past five decades (my lifetime).

Second, the large quantities of continuous discharge of groundwater into these two streams will alter the sediment balance of these streams, causing damaging increased sedimentation of the lower areas of these two watersheds. This will be particularly true during rainstorm runoff, since the mine discharge water will fill the absorption capacity of the stream channels, propelling much higher stormwater flows further down the watershed towards Sonoita Creek, potentially downcutting the stream channel and eventually increasing sedimentation of the lower Harshaw Creek watershed.

Third, the high levels of mine discharge water (up to 6 million gallons of water per day in lower Harshaw Creek and up to 172,000 gallons per day down Alum (Gulch) Creek) will transform lower Harshaw Creek into a perennial stream, with storm flows entering Sonoita Creek, just 5 miles away, much more frequently. As these periodic combined mine discharge/ stormflows will have higher metals concentrations than existing, water quality damage downstream could be severe. Copper is exceedingly toxic to fish, and several rare and endangered fish species exist in Sonoita Creek, a treasured local resource which feeds Patagonia Lake State Park and Natural Area. Cadmium, lead, and zinc have toxic properties for mammals, including humans. These discharges and increased sediment loads also will damage seven rheocrene seeps and springs known in Harshaw Creek and the nine rheocrene seeps and springs known in Alum Creek.

Water quality results of proposed groundwater pumping, hardrock mining, and mine waste water treatment systems are difficult to accurately predict. If actual results of water treatment do not meet the whole effluent toxicity (WET) tests or other effluent standards, it is typically quite difficult to remedy this situation by developing new treatment methods once mine operation is underway. Once money is invested and new employees are hired for new mine operation, social and political pressures on State agencies make it difficult to force modification of proposed treatment systems to meet the real world situation.

Finally, the Patagonia Mountains/Sonoita Creek area is very important to Arizona for both recreation and ecological reasons. Tens of thousands of people come to this area every year to enjoy the natural environment, wildlife, state parks, and other natural features. Opening a huge new mine

in the middle of this area is highly risky to existing economy and ecology of the area.

For all these reasons, I urge you and the Arizona Department of Environmental Quality to deny the permit for this project.

Sincerely,

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