**Geologist Statement on Pozzolan from Volcanic Tuff**

My expertise comes from being senior author of the geologic map of the Cedar City 30’ x 60’ quadrangle (1:100,000 scale), published in 2006 as Utah Geological Survey Open-File Report 476DM. The possible mine is in the map area. My mapping of this quadrangle was mostly done while a geologist with the U.S. Geological Survey. I retired in 2000, taught for a year at Southern Utah University, then worked for the Utah Geological Survey and others as a consulting geologist.

Pozzolan, an additive for concrete, is poorly consolidated volcanic ash. The attractive hoodos to be mined were deposited as ash-flow tuffs about 20 to 25 million years ago from a huge caldera (called a supervolcano by the media).

In 1980 I worked on the ash-flow tuffs that erupted from Mount St. Helens. The giant eruption clouds that shot miles into the air were ash-flow tuffs, and on May 18, these and other events killed 60 people. Another example of ash-flow tuffs is the destruction of Pompeii by the eruption of Vesuvius in 79AD. Although such tuffs were hot, they killed most people by asphyxiation.

Tuffs consist of shards of volcanic glass, formerly molten rock that erupted rapidly as the liquid freezes to glass, much like glass you are accustomed to. Like window glass, shards are mostly silica (SiO2). Shards have sharp points, for they are pieces of gas bubbles (water vapor) that drives the eruption by expanding and blowing apart as they undergo less confining pressure when passing up the vent to the surface. Shards destroy jet engines, the gills of fish, and lungs in animals when ingested. It is like inhaling ground glass, with death from silicosis.

Poorly consolidated tuffs, like those that may be mined, are common in Utah and elsewhere. Although hot, the shards were not hot enough to congeal to produce hard rock. They can be disaggregated with one’s hands or light strokes of a hammer, and mined by front-end loaders.

The dust is the problem. Although the tuffs in Modena Canyon have broken down over the years in part to other minerals, mining and wind acting in the pits and on spoils piles will carry dust clouds into homes or cow herds. Masks provide some protection for people.

Please consider rejecting the mine for these health reasons alone.

Sincerely,

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