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Producers of versatile bentonite foresee strong demand

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CODY — Though Washington State residents may be difficult to convince, volcanic ash of the Mount St. Helens type can have some benefits. Wyoming has been dusted with volcanic ash several times during the geologic past. Between 63 million and 133 million years ago, volcanic ash from vents in Idaho fell on Wyoming; about 6,000 years ago, the region was coated with ash from as far away as Oregon's Mount Mazama, now Crater Lake.

Over time, the ash formed a substance called bentonite, and several companies now operate bentonite mines in the Big Horn basin.

BENTONITE HAS found widespread and varied uses in Wyoming, but it is used mainly as a component of the mud used for oil drilling. It helps lubricate the drill bit and lifts rock cuttings to the surface.

Bentonite is also used as a "binder" for pellets of a low-grade iron ore called taconite at the Atlantic City iron ore mine.

One bentonite processor, Wyo-Ben, ships the mineral to Minnesota, Michigan, Quebec and Australia for use with iron ore.

Bentonite also finds a tie that binds within the foundry industry, in sands used for metal casting.

Another useful characteristic of the material is its impermeability — water will not travel through bentonite, making it useful as a sealant in ditches and lagoons.

It is even used in wine-making, where vintners use it to filter impurities from the fermenting liquid.

BENTONITE IS unique in its ability to absorb water — it absorbs so much that it will swell to 20 or 30 times its original volume when wet.

That property, as many Casper homeowners know, can crack building foundations when they are constructed on soils heavy in bentonite.

The primary mineral in bentonite is a clay called montmorillonite. In Wyoming, it is largely sodium-based. Another type of montmorillonite with a calcium base is found in Texas and other parts of the south and does not have the swelling properties found in Wyoming bentonite.

Wyoming is unusual in this respect; when the volcanic ash fell here, it interacted with the ocean water which covered much of the state at the time. Calcium was exchanged with the sodium in sodium chloride found in salty sea water.

Most of the bentonite mined in Wyoming comes from the Cretaceous period's Mowry, Frontier, and Thermopolis formations with some lesser grade deposits of Tertiary age.

THE BENTONITE layers, averaging six to eight feet in thickness, are strip-mined. Overburden is removed with loaders, scrapers and other earthmoving equipment and separated into topsoils and subsoils for use later when the land is restored.

The open pits from which the bentonite is taken are several hundred feet wide and may run up to a mile in length, depending on how extensive a deposit lies below.

Drag lines remove the bentonite for field drying.

The bentonite, containing about 25 percent water, is plowed and spread out to dry in sun. The top layer is removed after drying, when it contains about 15 to 18 percent water. Each successive layer is then removed as it dries.

The field-dried material is then taken to a mill. There, the bentonite is crushed to the consistency of cement and further dried to about 12 percent moisture.

SEVERAL COMPANIES are active in bentonite mining in the Big Horn Basin. Wyo-Ben, for example, employs 325 persons at its mines and plants at Sage Creek near Lovell, the Stucco plant near Greybull and a new Lucerne plant near Thermopolis.

According to David Brown, Wyo-Ben's marketing manager in Billings, Mont., the company produces about 700,000 tons of milled bentonite annually from its three plants.

It sells another 250,000 to 300,000 tons of crude or unmilled bentonite each year, Brown added.

Work recently started on the construction of a new Baroid bentonite plant at Lovell, to be finished in 1981.

The Basics of Bentonite in Wyoming

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