

### Bentonite

Continued from A1

...figures. "Before the recession we were mining at around 500,000 to 700,000 tons a year," Miller said. "In 2008, we dropped off to around 250,000 tons. At the present moment, the way things are going right now, we should be back at around 750,000 to 780,000 tons."

#### Bentonite means business

The life of a bentonite mine depends on market conditions, and it's seldom easier to get American coal to ensure that a steady flow of clay is available to keep pace with customer demands, including the oil industry, General Motors and Caterpillar.

Bucher, who works in American Lithium's permitting and regulatory department, said that like all mining operations, clay is subject to boom and bust. Business lately has been good.

"Bentonite is considered an industrial mineral, and so it goes into a number of different products," Bucher said. "You could say we're something of a bellwether for the national economy for the most part, as the economy goes, so goes the bentonite industry."

Wyoming's annual bentonite production has risen from 1,400 tons in 1977 to more than 4.5 million tons. Five companies are engaged in 10 active mining plants across several counties in Montana and Wyoming, according to the BLM.

"It's supposed to maintain at least five years of potential uses in industry grade bentonite," Bucher said. "So it's like the equivalent of drilling to locate and grade the product. Once the exploration is done, we know where we need to permit."

This area of the basin, which extends down the western front of the Pryor and Big Horn mountains in Montana and Wyoming, is considered one of the world's key producers of high-quality, sodium-type bentonite clay representing nearly 50 percent of the world's known supply.

According to the Wyoming Mining Association, the industry employs about 600 workers in the Big Horn Basin, including mine operators, machine operators, packagers, operators and laborers/technicians. For every acre provided by the industry, an estimated 250,000 additional jobs are created



A truck hauls a load of bentonite from a mine near M.J. Swain road of Geopoll to a smelter processing plant.

along the eastern rim of the basin. "This whole horizon of gray shale that's in front of us — we're looking at a long strike, or a trend, and there are bentonite beds all along that profile," Hurley said. "It's a big, big area."

Hurley said an initial use once covered this region while mountain-building volcanoes to the west spewed ash. The ash settled into the area, where it was ultimately worked over time.

Turned by wind, processed and compressed, it became the product used by the two main bentonite plants. There, it's dried, processed and packaged in powder and granular forms to meet customer needs.

"There are several different beds, and each bed has its own unique properties," said Loren Schrader, the mining operations manager with American Lithium. "We're trying to select different beds to meet the demands for the final products."

Standing at a corner of the Franconia mine on the state line, Schrader notes the striated layers of shale and the bed of bentonite below. Even here in this small pit, far more than an acre in size, the bentonite comes in pieces and sizes.

Schrader said each bed of clay is given to a different set of qualities suited for a variety of industrial uses. It's up to the companies to extract and process the right clay for the job.

"For this location, it's a lot of drilling and sand," Schrader said. "We're the only one in North Dakota, in the Big Horn, that increases the demand for drilling mud. Industry work can be real strong as well — the auto market. Those things are coming back, and when the economy starts to pick up, you see it flourish."

Estimates vary on how much accessible bentonite remains here in the ground. A 1960 report by the American Institute of Mining Engineers suggests that around 1.1 billion tons have yet to be mined.

A 1980 study by the U.S. Bureau of Mines, Montana, Facts and Figures for the bentonite reserves of around 2.8 billion tons. Either way, it's enough to keep the bentonite industry supplied for years to come.

"If it's not in the ground, we'll get a specific clay for that, and if it's not that, we'll target another clay for that," Bucher said. "We have many different customers, and we try to meet the market demand by mining in these different areas and getting the right quality of clay into the plant."

in the community. In Wyoming, where most of the activity takes place, the industry contributes more than \$1.1 billion in taxes and royalties. The annual payroll with benefits comes to roughly \$44.3 million, with nearly 70 percent of that paid to employees in the Big Horn Basin.

"Without the bentonite industry, you could fold up Horn County and send it to the moon," said county Commissioner Keith Gault. "At our top assessed valuations, four are bentonite companies. The top two are oil and gas, and the railroad is in there, too."

#### Remaining reserves

It wasn't until 1985 that the first commercial deposit of bentonite was made. The clay earned its name from this province in Montana's first commercial deposit. It's been sought after ever since.

Large-scale bentonite mining and processing in this region began near Geopoll in the early 1960s. More than 22,000 acres have been mined in the Big Horn Basin to date, according to the BLM.

On the hood of her truck, Hurley lays out a map with the mine designated in red. The bentonite sought by companies lies in a north-south band



Earl Hurley, mine operator, says the mine is in the Big Horn Basin, and Hurley, environmental supervisor with American Lithium, is standing in the Big Horn Basin, Wyoming. Photo by MATT WOODMAN for the Billings Gazette.

# Bentonite Production Spurs Wyoming Economy (continued)

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