THE GEOLOGICAL SURVEY OF WYOMING
Gary B. Glass, State Geologist

OPEN FILE REPORT 86-16

DIATOMITE (DIATOMACEOUS EARTH) IN WYOMING

by

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Laramie, Wyoming
1986

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Introduction

Diatomite, also known as diatomaceous earth or kieselguhr, is a siliceous sedimentary rock composed primarily of siliceous skeletal remains of diatoms, one-celled aquatic plants related to algae (Kadey, 1975; U.S. Bureau of Mines, 1968). The diatoms lived in large shallow basins with minimal sediment influx or carbonate precipitation, with clear water for maximum light transmittance, with an abundance of soluble silica, with an abundant supply of nutrients to promote their growth and with a lack of toxic substances such as found in evaporite basins. Under the above conditions, diatoms thrive, and when their remains are preserved in the geologic record, they can form deposits of economical value.

Most diatomite occurs in geologically young rocks that have not been subjected to metamorphism or diagenesis. Diatomite deposits currently mined in the United States are found principally in California where diatomite is produced from Cretaceous and younger marine sediments and in Nevada, where Oligocene and younger fresh-water (lacustrine) deposits are mined (Williamson, 1966). Other states that produce or have produced small quantities of diatomite are Arizona, Idaho, Oregon, Utah and Washington. A diatom-bearing carbonate was mined from a fresh-water deposit in western Kansas. Noncommercial deposits are known from Florida, Maine, Massachusetts and New Hampshire. In Wyoming, only occurrences have been described.

Diatomite is soft, crumbly and lightweight. It is usually variable in color, from white when pure to dark green when substantial organic impurities are present. Some diatomite may be indurated by carbonate or silica cement. Heat can destroy a diatomite deposit by crystallizing the silica and destroying the cellular nature of the diatoms. Better quality diatomite is soft and has a density of between 20 and 34 pounds per cubic foot (Kadey, 1975). It is the cellular nature of the diatom remains and their chemical inertness that account for the industrial value of diatomite.

Other characteristics of diatomite deposits that contribute to their industrial value include high purity, lack of cementation or consolidation, low loose weight, low wet density, appropriate screen size, high brightness, high resistance to abrasion, high water absorption properties, high filtration flow rate and clarity, neutral pH and low trace element content (Kadey, 1975). All of these characteristics must be balanced against mining and transportation costs. Nearness to markets is important, as with any bulk commodity.

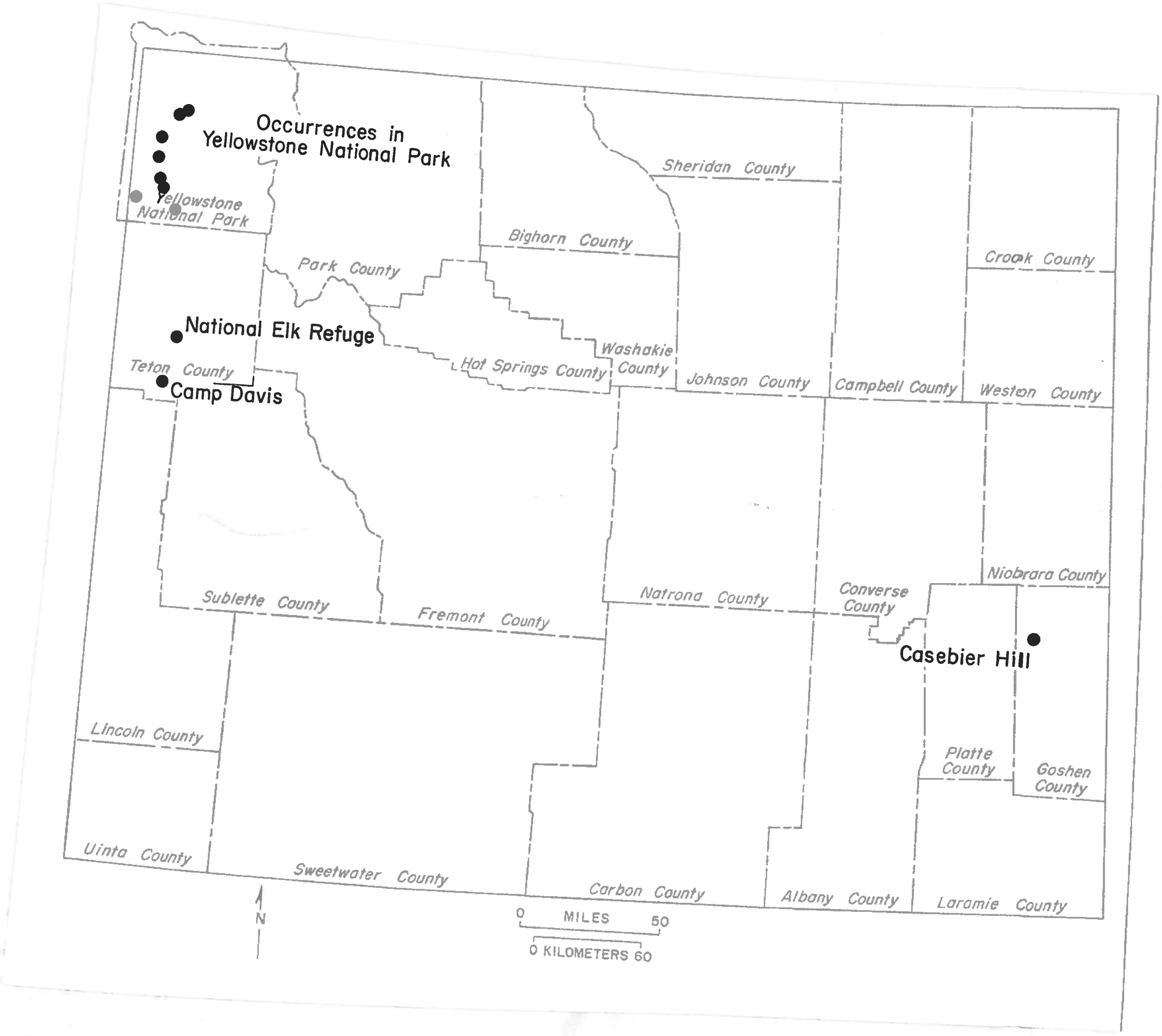
Diatomite is used primarily in filter aids (67 percent) and in fillers (22 percent). Miscellaneous other uses account for the remaining 11 percent (Meisinger, 1986). The cellular, relatively nonreactive nature of diatomite makes it ideal for use in filter aids.

U.S. production of diatomite in 1985 was 637,000 short tons. The average price of diatomite (f.o.b. plant) was $209.00 per ton in 1985. The U.S. is a net exporter of diatomite (Meisinger, 1986).

In Wyoming, diatomite is found in lacustrine deposits in units associated with volcanic ash. These deposits are restricted to sedimentary rocks of Miocene, Pliocene and Pleistocene age.

There has been no production of diatomite from Wyoming. There has also been no reported exploration for Wyoming diatomite.

The following discussion is the first summary of occurrences of diatomite in Wyoming (see Index map, below). The occurrence of diatomite in Wyoming is nearer to eastern markets than other current U.S. production. Therefore, some of these occurrences may be of interest to diatomite producers and consumers.



Index map showing diatomite occurrences in Wyoming.

Occurrences

In addition to the listed occurrences (see map, page 3) there is a potential for diatomite deposits in Pliocene lake deposits in the Teewinot, Salt Lake and Moonstone Formations in western and central Wyoming, and along the Continental fault in central Wyoming.

Goshen County

Casebier Hill	N1/2 sec. 11, NE1/4 sec. 10 and into secs. 2 and 3, T.27N., R.64W.

Love and others (1980) depict and note a Pleistocene white diatomite, ash and lacustrine clay that intertongues with sand and gravel at this locality. The unit is from zero to 50 feet thick and underlies about a 1 x 1.25 mile area.

Teton County

National Elk Refuge	Sec. 36, T.42N., R.116W.; approximately W1/2, T.42N., R.115W.

Several beds of diatomite are present in a diatomaceous claystone in the upper member of the Pliocene Teewinot Formation six miles northeast of Jackson. This is the only documented exposure of the upper member, but other members of the Teewinot Formation are also diatomaceous (Love, 1956a).

Camp Davis area	Secs. 7, 8 and 29, T.39N., R.115W; Sec. 13, T.39N., R.116W.

Diatomite is reported in the basal portion of the Miocene Camp Davis Formation at the type section (section 29) and along Horse Creek (Love, 1956b).

Yellowstone National Park (Park and Teton Counties)

Large exposures of diatomaceous sediments of Quaternary age are mapped along and near Polecat Creek, near Crawfish Creek; in the Norris, Gibbon, Shoshone, Upper and Lower Geyser Basins, along the Firehole River, near Boundary Creek; along Shoshone Creek; and near Roaring Mountain (U.S. Geological Survey, 1972). Smaller exposures are mapped at Snake River Hot Springs (Richmond, 1973a); in Bechler Meadow (Richmond, 1973b), in Little Firehole Meadows, near Three River Junction (Waldrop, 1975); in the Midway Geyser Basin (Waldrop and Pierce, 1975); and near Sulfur Creek (Pierce, 1974).

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