

(276)
C4 cv

Mines and Mineral Resources of
SHASTA COUNTY
California

By PHILIP A. LYDON, Formerly Geologist, Division
of Mines and Geology; currently Associate Professor
of Geology, California State University—Chico
and J. C. O'BRIEN, Mining Engineer, Division of
Mines and Geology; retired 1959

COUNTY REPORT 6

1974



Manuscript submitted May 1964; revisions and additions January 1967.

12 to 14 feet deep. Asbestos seams in one trench strike N. 85° W. and dip steeply south. Some fiber is $\frac{3}{8}$ inch long, but most of it is $\frac{1}{20}$ to $\frac{1}{4}$ inch in length. The Johns-Manville Corporation drilled 2,000 feet of exploratory holes in 1950, but the amount of fiber in the cores was not enough to encourage further development at that time. The Blas Asbestos Corporation processed a few tons of the material in a small pilot plant located on the highway at Eagle Roost Point, but no commercial production is recorded.

Stock Asbestos (Loma Blanca Mines, Inc., Powhatan Mining Company). Location: Sec. 33, T. 38 N., R. 5 W., and Secs. 1, 2, 4, and 12, T. 37 N., R. 5 W., M.D., about three miles northwest of Sims. Ownership: Ida M. Bryant *et al.*, 17308 N. Ardmore Avenue, Bellflower, California, owns 17 claims and 1023 acres of patented land; leased to Powhatan Mining Company, Baltimore, Maryland.

Extensive outcrops of serpentine on these claims contain both anthophyllite and chrysotile asbestos. Anthophyllite, the only type produced thus far, occurs in numerous slip-fiber veins on the property, and also in the form of mass-fiber bodies resulting from contact metamorphism of the serpentine by intrusive granitic rocks. This mineral previously had been identified as tremolite, but X-ray studies show that it is anthophyllite (Salem Rice, Jan. 1964, pers. comm.). Slip-fiber veins are typically only a few inches wide, but some contain lenticular pockets of fiber 10 or more feet wide and up to 50 feet long. Such fiber is characteristically white, weak, and somewhat brittle. A noteworthy feature, however, is its acid resistance—about 1 percent—which is significantly lower than the resistance of fiber from other West Coast properties (J. C. KempvanEe, Jan. 1964, pers. comm.). This characteristic is tested by weighing the fiber, soaking it in acid of given strength for a standard length of time, and then reweighing to determine the amount that was dissolved in the acid. Thus, fiber rated at 1 percent is so resistant as to be almost chemically inert.

Two adits about 150 feet apart are on the property, and one of these penetrated fiber for 60 feet; the orientation of this body of fiber is not known (J. C. KempvanEe, pers. comm., 1964).

Although chrysotile deposits have not been seriously prospected on this large property, Brown (1916, pp. 752-755) illustrates and discusses promising outcrops of chrysotile-bearing serpentine.

The first production from this property amounted to 47 tons in 1913. The material was mostly anthophyllite and was valued at \$25.00 per ton at the property. The fiber was shipped to an experimental plant in Oakland and used in the manufacture of a variety of products such as pipe covering, composition flooring, and plaster for stucco. In 1916, 145 tons of anthophyllite asbestos were shipped, and there was additional production during the period 1920 to 1924. In 1929, a carload containing more than 44 tons was shipped (J. C. KempvanEe, Jan. 1964, pers. comm.). The property was idle from 1929 until 1942, when the Powhatan Mining Company of Baltimore, Maryland, secured a five-year lease.

In 1948, the property was leased to the Loma Blanca Mines, Incorporated, Homer E. Fenn of Salinas, President. During the succeeding five years, this company mined about 200 tons of anthophyllite, but shipments probably amounted to only some 30 tons. The material was sacked and shipped to the Powhatan Mining Company in Baltimore, Maryland. Fenn stated that the sacked No. 1 grade material, containing as much as 30 percent moisture, was worth \$250 per ton f.o.b. Dunsmuir; the No. 2 grade sold for \$55 per ton at the highway.

In March 1954 the mine was again leased, this time for 35 years, to the Powhatan Mining Company. This company was intending to build a road to the property in 1964, following which drilling was to be undertaken in order to define the shape and orientation of the mass of fiber intersected for 60 feet in the adit.

A small processing plant consisting of a hammer mill, blowers, screens, and a cyclone is located south of Mears Creek about $1\frac{1}{4}$ miles southeast of the property, but has not been used in recent years.

Sylvester (Powmears) mine. Location: Sec. 1, T. 37 N., R. 5 W., M.D., on the north side of Mears Creek about five miles northwest of Sims. Ownership: Southern Pacific Land Company, San Francisco, California, leased to John L. Serna, Dersch Road, Anderson, California.

Anthophyllite asbestos occurring in serpentine on this property has been identified as tremolite by most previous workers. However, Wiebelt and Smith (1959, p. 26) stated that the asbestos is anthophyllite, and X-ray study of material from this deposit by the Division of Mines and Geology confirms this identification (Salem Rice, Jan. 1964, pers. comm.).

The deposits have been explored by three adits. No. 1 adit, now partially caved at the portal, followed a fissure in serpentine striking N. 15° W. and dipping 78° west. A vein of white anthophyllite asbestos 12 to 14 inches wide, with fibers parallel to the strike, followed along the hanging wall of the fissure.

Ray J. Sylvester obtained a lease on this property in 1943 and drove No. 2 adit 40 feet in a N. 25° W.

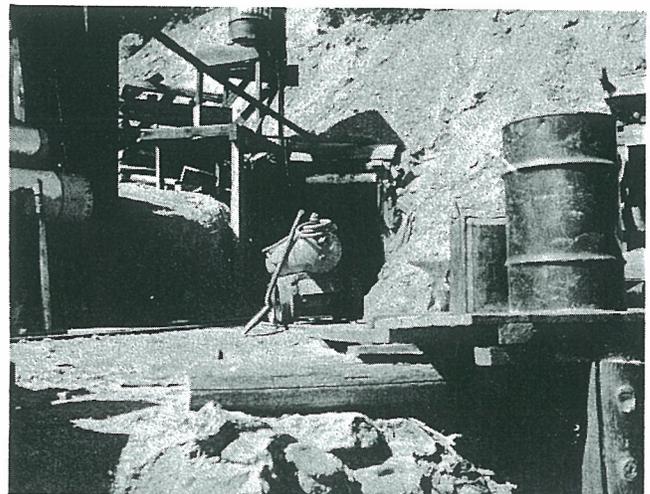


Photo 33. Adit portal at the Sylvester asbestos property, September 1947.

direction, at an elevation about 30 feet lower than No. 1 adit. A vein of tremolite asbestos 28 inches wide strikes N. 34° W. and crosses the floor of this adit about eight feet from the portal.

No. 3 adit, started about 12 feet west of No. 2 adit, was driven 88 feet in an average N. 29° W. direction. At about 35 feet from the portal, a vertical vein of tremolite asbestos 30 inches wide and striking N. 34° W. was cut and followed for 50 feet, where it narrowed to about eight inches in width. There are about six inches of hard green amphibole on both sides of the vein, between the soft fiber and the dark green serpentine walls.

The asbestos fiber was sacked as it was mined in the drift, but had to be resorted to segregate the longer fibers. In 1948, Sylvester shipped about 20 tons of fiber to the Powhatan Mining Company, Baltimore, Maryland.

In August 1951, the property was leased to this company, which drove No. 2 adit an additional 50 or 60 feet, and drove two short adits west of No. 3 adit. About 35 tons of fiber were stockpiled from this work and a few tons were shipped in 1951.

Sylvester obtained another lease on the property in 1954, and in succeeding years mined a few tons of material which were used in Redding in the manufacture of a fire-resistant paint marketed under the name "Syl-a-bestos". This paint has good durability and insulating qualities. It has been used by the U. S. Plywood and R. L. Smith Lumber Company plants in Shasta County, to reduce the obvious potential of disastrous fires.

BARITE

Barite has been mined intermittently from two deposits in Shasta County since 1919. Most of the material was mined during the early 1930's and in 1962-1965 from a deposit east of Castella owned by the Glidden Company. In the earlier phase of activity, barite was shipped to Oakland where it was blended with zinc sulfide and used in the manufacture of a white pigment called lithopone. Barite mined during the early 1960's was shipped to a mill at Sutter City for grinding and eventual use as a drilling mud in the gas fields of that area.

Prices paid for ore mined in California and delivered to northern California processing facilities ranged from \$12 to \$15 per ton during the early 1960's (Weber, 1963, p. 7). Average costs of extracting barite rock in California during this same period included royalties \$0.50 to \$1.00 per ton; mining, \$3 to \$5 per ton; and transportation, \$5 per ton for the first 100 miles and \$5 per ton for an additional 200 miles (Weber, 1963, p. 8).

Glidden (Loftus). Location: Secs. 18 and 19, T. 38 N., R. 3 W., M.D., on Girard Ridge about four miles east of Castella. Ownership: The Glidden Company, Cleveland, Ohio; leased by the Baroid Division National Lead Company, 111 Broadway, New York 6, New York.

Barite was discovered here by Charles Loftus in 1917, but for several years work on the property was limited to prospecting and shallow development. The property was sold to The Glidden Paint Company in

1926, and an eight-mile road from Castella was completed to the deposits in 1931. That same year, several thousand tons of barite rock were mined. The first 6,500 tons averaged almost 93% BaSO₄; the grade of all shipments ranged from 88% to 96% BaSO₄ (Averill, 1939, p. 115). It was used in the San Francisco Bay area for the manufacture of lithopone, a white pigment.

The property was idle subsequently until 1961, when it was leased by the Yuba Milling Division of Metals Disintegrating Company. It was sub-leased that year to a contractor from Redding, who did a small amount of work. During 1962, it was sub-leased to Al Rossi of Mt. Shasta, and several thousand tons of ore were mined from shallow open cuts by bulldozer, power shovel, and front-end loader. Ore was mined and stockpiled near Castella during the summer months; during the winter, when rain and snow renders the deposit inaccessible, the ore was trucked 170 miles to Sutter City. There it was crushed, ground, and bagged in a mill operated by Yuba Milling for use in drilling mud in the natural gas wells being drilled around Sutter Buttes. Early in 1963, the primary lease reportedly was transferred to the Baroid Division of National Lead Company, and Al Rossi for a time continued mining for this firm. The property was idle during the summer of 1963.

The barite occurs in association with metamorphosed tuff and siliceous sediments of the Kennett Formation. It is overlain by an horizon containing lenses of limestone, which is thought to be the top of the Kennett Formation (Weber 1963a).

Barite layers and interbedded sediments form a small domical structure at the crest of a southeast-trending spur of Girard Ridge. An upper barite layer is 1 to 4 feet thick and consists of nearly even proportions of thinly interlayered quartz and barite, giving the rock a banded appearance. This material has specific gravities of 2.90 to 3.98. A lower barite layer 5 to 8 feet thick consists almost entirely of barite, with only small proportions of quartz or other minerals. Except for one sample (sp. g. 2.96), specific gravities range from 3.65 to 4.44 and average 4.16 for 14 points or horizons sampled in the lower barite layer (Weber, 1963a).

Limits of barite masses in the lower layer do not appear to conform to the bedding of the host rock; their peripheries are crushed and broken, with interstices filled by a clay-like material. Two principal masses of dark gray, fetid, brittle barite have been mined from two cuts arranged in a north-south direction. Fuchite (chromium mica) occurs as crusts on bedding planes in one part of the workings. A small exposure of barite 25 feet east of the cuts was thought by the operator to be an extension of the northern mass. An exploratory cut about 500 feet west of the cuts exposed a small lens of dark barite.

Immediately northeast of the northern cut, barite and siliceous rock of the upper layer are interbedded in small bands a few millimeters to a few centimeters thick; barite in this layer appears to thin out rapidly to the northeast and east.