

MINERAL RESOURCE SURVEY
Circular No. 5

A mineral resource survey of Texas has been started by the Works Progress Administration, the Bureau of Economic Geology of The University of Texas acting as sponsor. The purpose of the survey is to assemble information and make it available to the public. Through a separate project, sponsored by the State Planning Board, the results of the survey, as they are received in Austin, are being assembled for publication. The mineral resource survey is helping in the location of mineral products, from some of which it is reasonable to suppose industries of value to the State may be developed. The following report is based on work in Burnet County.

REPORT ON THE PAVITTE SILVER-COPPER PROSPECT IN BURNET COUNTY, TEXAS
by Virgil E. Barnes, Supervisor

The Pavitte prospect is located four and one-third miles west and three-quarters of a mile north of the Burnet County Court House. Its longitude is $98^{\circ}17.8'$, and its latitude is $30^{\circ}46.0'$. The closest rail point is at Burnet, six miles distant. To reach the prospect, one should follow the Burnet-Llano highway 5 miles, then turn south on a private road to Mr. Bailey's farm house.

The accompanying pace-compass map shows the amount of prospecting that has been done. The workings consist of an open cut along a pegmatite dike for a distance of 85 feet, two vertical shafts sunk to the same dike, inclines connecting the three, and about 100 feet of crosscuts underground. Other surface workings are one 10-foot incline and seven shallow pits. During the present work, trenching was done as indicated on the accompanying sketch.

The prospect is located in an area of Valley Spring gneiss, a reddish feldspathic rock with mineral alignment and banding well shown in some places and at others quite indistinct. A fine-grained reddish vertical granite dike striking $N. 80^{\circ}W.$ is located 200 feet north of the open cut. Other narrow granite dikes striking in the same direction were observed to the west. Several pegmatite dikes in the area follow the banding of the gneiss, another set with a vertical dip strikes about $N. 10^{\circ}W.$, and a third set dipping 30° to the north strikes about $E.-W.$ Other pegmatites were seen that do not conform to these directions.

The copper minerals present are azurite, malachite, and at depth chalcopryite. They are associated with a fluorite gangue. The copper-bearing vein is in a sheared zone mostly at the base of a pegmatite dike, which is composed almost entirely of large pink feldspar crystals and quartz. In the open cut the following section is exposed.

	Thickness	
	Feet	Inches
Large feldspar crystals, some quartz; top not exposed		6
Massive white quartz; lenses out in 45 feet each direction	4	
Large feldspars and quartz; some mica books		4
Copper-stained granular fluorite		8
Brecciated feldspar and quartz	1	
Copper-stained granular fluorite		6

(The rest of the section is under water at this point, but the footwall dips in such a manner that not more than a foot has been omitted.)

Underground, the massive quartz lense is not present. Several small ones, however, were seen. All openings have been driven in pegmatite which contains copper minerals on the footwall and in places above the footwall in the pegmatite.

In an incline to the east of the open cut, a 6-inch seam of fluorite containing copper parallels the banding of the gneiss. No pegmatite is present.

The material on the dump was carefully examined for its mineral content. Several specimens of pegmatite, some of which resemble gneiss, were found that contained chalcopryite. Some of the chalcopryite has a black film on the surface which is probably chalcocite. Pyrite is also present. The gangue is fluorite. The country rock is gneiss and pegmatite which contains reddish feldspar, quartz, and a small amount of biotite.

Some specimens, predominately quartz, were found that are coated and seamed by very thin films of azurite, malachite, limonite, and in a few places either hematite or cuprite.

The majority of the ore-bearing material has a granular appearance and consists of malachite and azurite coating grains of fluorite and quartz. In some samples, fluorite is the predominating mineral.

Water has been encountered in the lowermost part of the workings and quite probably the unaltered chalcopryite came from there. All the workings open to examination are in the zone of oxidation and carbonation where such minerals as azurite, malachite, limonite, and cuprite are developed.

A secondarily enriched zone is indicated by assays cited by Mr. Pavitte taken from hand-picked samples. A combination grab sample collected by Mr. H. D. Bevan, and assayed by Critchett and Ferguson, El Paso, gave the following values: gold, trace; silver, 0.5 ounces; and copper, 2.35%. Mr. Pavitte has obtained assays showing more than 35% copper and 50 ounces of silver.

In deposits of this type, it is usual to have a zone of oxidation and carbonation that is rather lean, beneath which a secondarily enriched zone will be found, and below this a primary zone in which the ore is again lean. The workings are apparently approaching the primary zone which is located beneath the permanent water table.

Facilities are not available for a detailed mineralogical study, or for assaying samples. Therefore, it is not possible to state the value of the ore blocked out. At present, only a small tonnage is outlined, and much barren pegmatite must be moved in order to produce that which is present. Considering the impervious nature of the formation and the small amount of penetration of the ore-bearing solution into the country rock, it is questionable whether or not a commercial block of ore will be outlined.

The geological history of this area after the development of the gneiss may be outlined as follows. Cross-folding probably took place during the time of the granitic injection. During the cross-folding some synclinal and some anticlinal areas were relieved of enough pressure to allow pegmatite dikes to be injected along the gneissic banding. The pegmatite of the Pavitte prospect occupies a synclinal area. After the pegmatite solidified, movement resumed, creating a shear zone in, and at the base of, the pegmatite. Mineralized solutions high in fluorine followed this shear zone depositing fluorite, chalcopyrite, and possibly other minerals by replacement. Whether or not granite dikes of the age of the one immediately north of the prospect were connected with these ore-bearing solutions is problematic.

This deposit is a fissure deposit and not of a pegmatitic origin as might be thought from its association with a pegmatite dike. The mineral association, while not entirely conclusive, is suggestive of veins belonging to the hypothermal zone of the deposition. The lack of structure in the ore further helps to substantiate this conclusion.

SILVER PROSPECT TEXAS

BURNET COUNTY, 98° 17.8' — Long.

Lat $30^{\circ}46.0' - \text{Long } 100^{\circ}$

Scale 1" = 100'

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