

Bureau of Mines



4720 0002

MACKAY SCHOOL OF MINES
RENO, NEVADASORENSEN FLUORITE CLAIMS

The Sorensen fluorite claims are situated in southern Esmeralda County, about 11 miles southwest of Lide and 1 1/2 miles northeast of the Nevada and California boundary. They are probably in section 4, T 7 S, R 39 E, M D M.

The property, comprising 5 unpatented claims, was visited on July 10 and 11, 1945, at the request of Jay A. Carpenter, director of the Nevada State Bureau of Mines. It is owned by Mr. R. S. Sorensen of Tonopah, Nevada. There is a good dirt road crossing the edge of the property about 1200 feet from the exposed fluorite. Cucomungo Spring, with a large flow of water, is about one mile farther west on this road.

The claims are on the top of a divide overlooking the northern extremities of Death Valley, at an elevation of about 7200 feet. To the north and east the slopes are gradual, but to the south are precipitous with spectacular "bad lands" topography. The erosion from Death Valley has cut steep "box canyons", into the ridge rapidly robbing the headwaters of the north flowing streams, and moving the divide northward.

The country rock is dominantly granite and porphyritic granite, with a small roof pendant of metamorphosed calcareous rock, within which the fluorite has formed. The lense of metamorphics, approximately 300 to 500 feet in width, trends about northwest, and is exposed for about 1000 feet, although it may actually be longer as it is covered by

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alluvium to the northwest, and by andesite to the southeast. The area was undoubtedly covered by tertiary andesite, which is now mostly eroded with scattered "islands" of andesite remaining.

The metamorphics have been prospected for scheelite, with several trenches and one 10 foot pit. Most of the work has been done along the northeast side of the lense where the metasomatic replacement by garnet and epidote has been much more intense. Near the contact garnet and epidote comprise almost the entire rock, grading laterally into coarse grained recrystallized limestone.

The U. S. Bureau of Mines examined the property for scheelite, but apparently found it to be too low grade for economic consideration. Later, in January 1945 Mr. Redelius of Reno brought a sample of the rock in the 10 foot pit to the Nevada State Analytical Laboratory, and it was found to contain fluorite. The State Laboratory reported, "Fluorite, garnet, and small amount of scheelite, with manganese and iron oxide. The two specimen pieces run about 60% fluorite". Mr. Sorensen then sent two samples from the pit to the Denver Assay Company and received returns of 53% and 61% fluorite. The rock is so similar in appearance and texture to a medium grained granite, or quartzose metamorphic rock that the occurrence of fluorite could be easily overlooked; however, it is dominantly white fluorite and garnet.

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The fluorite has been deposited along a narrow, steep fracture zone between a completely garnetized rock and a partially replaced limestone. The fractures strike about N 55 W, dipping steeply to the northeast, and the fluorite can be recognized to extend along them for a distance of about 50 feet. The 10 foot pit has been sunk at the northwest end of the fluorite which is about 4 feet wide. A sample cut across the 4 feet analyzed 39.4% fluorite. To the southeast

Wm. I. Smyth, Analyst, Nevada State Analytical Laboratory

the rock with discernable fluorite narrows to about $1\frac{1}{2}$ feet at a trench 50 feet from the pit and a cut sample analyzed 33.0% fluorite. However, a cut sample of 6 feet of the partially replaced limestone in the foot-wall with no discernable fluorite surprisingly analyzed 25.8% fluorite, with 22.0% calcite, and the rest mostly garnet and epidote. To the southeast of the trench cutting the fractures no more fluorite could be distinguished. In fact a cut sample only 3 feet farther to the southeast from the two samples in the trench analyzed only 15.4% fluorite, so that the fluorite content apparently cuts off very sharply. Consequently the only rock that was found to contain discernable fluorite is confined to an area about 50 feet long, with the better grade material ranging from $1\frac{1}{2}$ to 4 feet in width, but some lower grade material ex-

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tending in places as much as 6 feet into the footwall of the fractures. The garnet rock in the hanging wall of the fractures analyzed only a trace of fluorite.

Samples were taken over a distance of about 800 feet, with no other area showing any fluorite except in a small pit about 300 feet to the southeast of the 50 foot strip. A 3 foot cut sample from here in garnetized rock analyzed 8.0% fluorite, but none could be recognized megascopically in the rock.

A qualitative procedure for discerning fluorite in the field, either chemically or by a petrographic microscope, would be of considerable aid in sampling this deposit. The fluorite can be easily overlooked, and of course my experience showed fluorite to be present in some rock when none could be recognized.

Why the deposit does not have any greater longitudinal extent is not clear, and further work might possibly show some connection between the main body and the area from which the 8.0% sample was taken.

This fluorite deposit is an interesting and unusual one, but offers difficulties for satisfactory gravity separation of the fluorite from the garnet. Due to the remoteness, along with the fact that the grade of the ore is such as to require concentration, a large tonnage must be developed to substantiate the outlay for necessary equipment.

Fred L. Humphrey
Mining Engineer for the Nevada

State Bureau of Mines