BULLETIN 55 *(Preliminary Map Issue)*

The Pelican Area, Palomas (Hermosa) District, Sierra County, New Mexico

BY RICHARD H. JAHNS

1957

STATE BUREAU OF MINES AND MINERAL RESOURCES
NEW MEXICO INSTITUTE OF MINING & TECHNOLOGY
CAMPUS STATION SOCORRO, NEW MEXICO

Introduction

The Palomas (Hermosa) mining district, in northwestern Sierra County, New Mexico, is 27 airline miles west of the Rio Grande and 63 airline miles north of Deming. It lies immediately east of the Black Range, and is traversed from west to east by the steep-walled canyon of Palomas Creek.

Deposits of silver, gold, lead, zinc, and copper are present in the Palomas Camp area, which is less than a square mile in extent but includes the principal mines in the district. The commercial output from this area has consisted almost wholly of precious metals, and its total value since about 1875 is estimated at approximately $1.5 million. A substantial fraction of this production came from the Pelican mine, on the north side of Palomas Creek.

The geologic relations and possibilities for discovery of additional ore in the Palomas Camp area have been discussed in a short preliminary report, published in 1955 as Circular 33 of the New Mexico Bureau of Mines and Mineral Resources. Supplementary information concerning the stratigraphic and structural relationships within a part of this area is offered in the form of the present map. This map will appear later in a comprehensive report on the entire district, but is released separately at this time in order to make representative geologic data available as promptly as possible.

Stratigraphy

Exposed on the canyon wall is a thick section of sedimentary strata, all Paleozoic in age. The units, as they appear on the slopes south of the Mooney tunnel and in the main gully northward from the Day tunnel, can be summarized and compared with the map explanation as follows:

Unit	Thickness (feet)	Generalized lithology
Sandia formation	150	Variegated sandy siltstone and dense gray limestone, interbedded; 0-12 feet of conglomerate with chert fragments at base.
Kelly(?) formation	90	Light-gray crinoidal limestone, coarsely crystalline, in part very thick-bedded, in part very cherty.
Lake Valley formation		
Tierra Blanca member	22	Light-gray crinoidal limestone, thin- to medium-bedded, very cherty throughout.
Nunn member	26	Gray silty limestone and marl, thin-bedded, very fossiliferous, locally cherty.
Alamogordo member	40	Dark-gray limestone, finely crystalline, medium- to very thick-bedded, in part very cherty.
Andrecito member	20	Gray silty limestone, thin-bedded, very fossiliferous, middle part cherty.
Percha shale	140+	Dark-gray calcareous siltstone, weathering to thin chips; 14 inches of dark-gray dolomitic sandstone at base.

Unit	Thickness (feet)	Generalized lithology
Onate formation		
Upper member	59	Gray calcareous siltstone and silty dolomite, thinly interbedded, fossiliferous; weathers into chips and plates.
Lower member	10	Bluish- to greenish-gray silty dolomite, thin- to thick-bedded; 2 inches of black shale at base.
Fusselman formation	7	Grayish-blue dolomite, finely crystalline, thick-bedded, locally veined with calcite.
Cutter (Valmont) formation		
Upper member	47	Light-gray to bluish-gray dolomite, very fine-grained, medium- to thick-bedded, locally silty, locally cherty; 8 feet of thick-bedded locally cherty dolomite at base.
Lower member	36	Light to medium bluish-gray dolomite, finely crystalline, thin- to medium-bedded, cherty, locally silty.
Aleman formation		
Upper member	10	Light-gray dolomite, medium crystalline, very thick-bedded.
Lower member	109	Medium bluish-gray dolomite, medium- to finely crystalline, medium-bedded and locally thick-bedded, cherty, locally silty.
Upham dolomite	25	Light to medium bluish-gray dolomite, medium-crystalline, thick-bedded, locally cherty.
Total	791+	

Structure

The prevailing dip of stratification in all the rocks is northerly at low angles, generally less than 15 degrees. Two major faults are present within the map area. The Pelican fault, which trends north-northwest and dips very steeply west-southwest, is one element in a zone, 20 to 100 feet wide, of several subparallel breaks. The rocks west of this zone are downthrown about 200 feet with respect to the rocks east of it. The Kendall fault trends east-northeast and dips steeply north-northwest. The rocks on the north side of this relatively simple break are downthrown 50 to 80 feet.

Numerous near-vertical faults and narrow shear zones trend north to north-northwest and have displacements of 5 feet or less. Many of them are marked by discontinuous concentrations of ore minerals.

An unusual zone of deformation, 75 to 250 feet in outcrop breadth, extends up the canyon wall from creek level to the base of the Onate formation. As traced inward from the irregular margins of this zone, the pre-Onate rocks are progressively more warped, broken, and dislocated. In its central parts there are several bodies of breccia which contain fragments of more than one formation. The zone also is marked by considerable thickening of the Fusselman formation.

The deformation is ascribed to slumping of soft sediments along a fault zone on the Paleozoic sea floor; it probably occurred prior to lithification of the formations involved. It plainly took place before deposition of the Onate formation. The undeformed strata on the east side of the zone are about 25 feet lower than the corresponding strata on the west side, but no more direct evidence of the ancient fault is preserved.

Ore Mineralization

Concentrations of ore minerals occur mainly in two forms: (1) small tabular shoots and podlike masses along the minor faults and shear zones, and (2) stringers, pods, and irregular disseminations in parts of the Fusselman formation immediately beneath the Onate formation.

Ore bodies of the first type are essentially vertical, with steep plunges, and many of them have been worked downward from their outcrops to points below the level of Palomas Creek. Those of the second type are horizontal or gently inclined, and have been worked northward from their outcrops to points beneath the higher parts of the canyon wall. A little ore occurs along the Pelican fault, but most of the movement along this break postdated the general period of mineralization. The Kendall fault is essentially barren, and all its movement appears to have been postore.

The chief primary ore minerals are galena, sphalerite, chalcopyrite, argentite, and pyrite. Polybasite, pyrargyrite, and tetrahedrite also are present. Secondary minerals include argentite, chalcocite, covellite, cuprite, native silver, silver halides, and carbonates and sulfates of copper, lead, and zinc. Talc is the most abundant gangue mineral; calcite, barite, quartz, and clay minerals also are widespread. Most of the ore bodies are thin and discontinuous, but many are very high in grade.

The wall-rock dolomite has been converted to talc and calcite in the immediate vicinity of the ore bodies, and chert has been replaced preferentially by coarsely crystalline calcite for considerable distances from some of them. Surface oxidation and leaching have impoverished some ore bodies near their outcrops, and have led to development of small caverns along several of the mineralized faults. Some secondary enrichment has been reported from parts of the mine.

Most of the production of precious metals from the Pelican area can be correlated with extensive stopes along the Roberts, Foster-Nourse, Mooney, and Adams faults, and to a lesser extent with workings developed along faults and fractures that flank the Pelican fault on the east.