

DESCRIPTION OF MAP UNITS

Qa ALLUVIUM (QUATERNARY)—Poorly sorted unconsolidated gravel, sand, and silt. Includes alluvial fans and terraces. Includes older and younger stream deposits and alluvial fans. Includes older and younger stream deposits and alluvial fans.

Pq UPPER PERMIAN (UPPER PERMIAN; OKMAN)—Nonstratified, thin laminated, brownish-gray weathering limestone. In extreme southeast corner of mapped area.

Pp LOWER PERMIAN (LOWER PERMIAN; BELL CANYON FORMATION)—Irregularly bedded, dark-gray, finely siliceous, shaly limestone. Gradually thickens laterally and southward into breccia member of Goat Steep Dolomite. Includes thin beds of dolomite and a few very thin beds of sandstone. Includes thin beds of dolomite and a few very thin beds of sandstone.

Pn UPPER PERMIAN (UPPER PERMIAN; QUER FORMATION)—Light gray to yellowish-gray, fine-grained, shaly limestone. Includes thin beds of dolomite and a few very thin beds of sandstone.

Pm LOWER PERMIAN (LOWER PERMIAN; SEVEN RIVERS FORMATION)—Orange, finely textured dolomite in 1- to 5-ft-thick beds and subordinate, having about 30 ft of sandstone at base. Includes thin beds of dolomite and a few very thin beds of sandstone.

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UNSUCCESSFUL OIL AND GAS EXPLORATORY HOLE

APPROXIMATE BOUNDARY OF GUADALUPE ESCARPMENT WILDERNESS STUDY AREA—AS OF APRIL 17, 1982

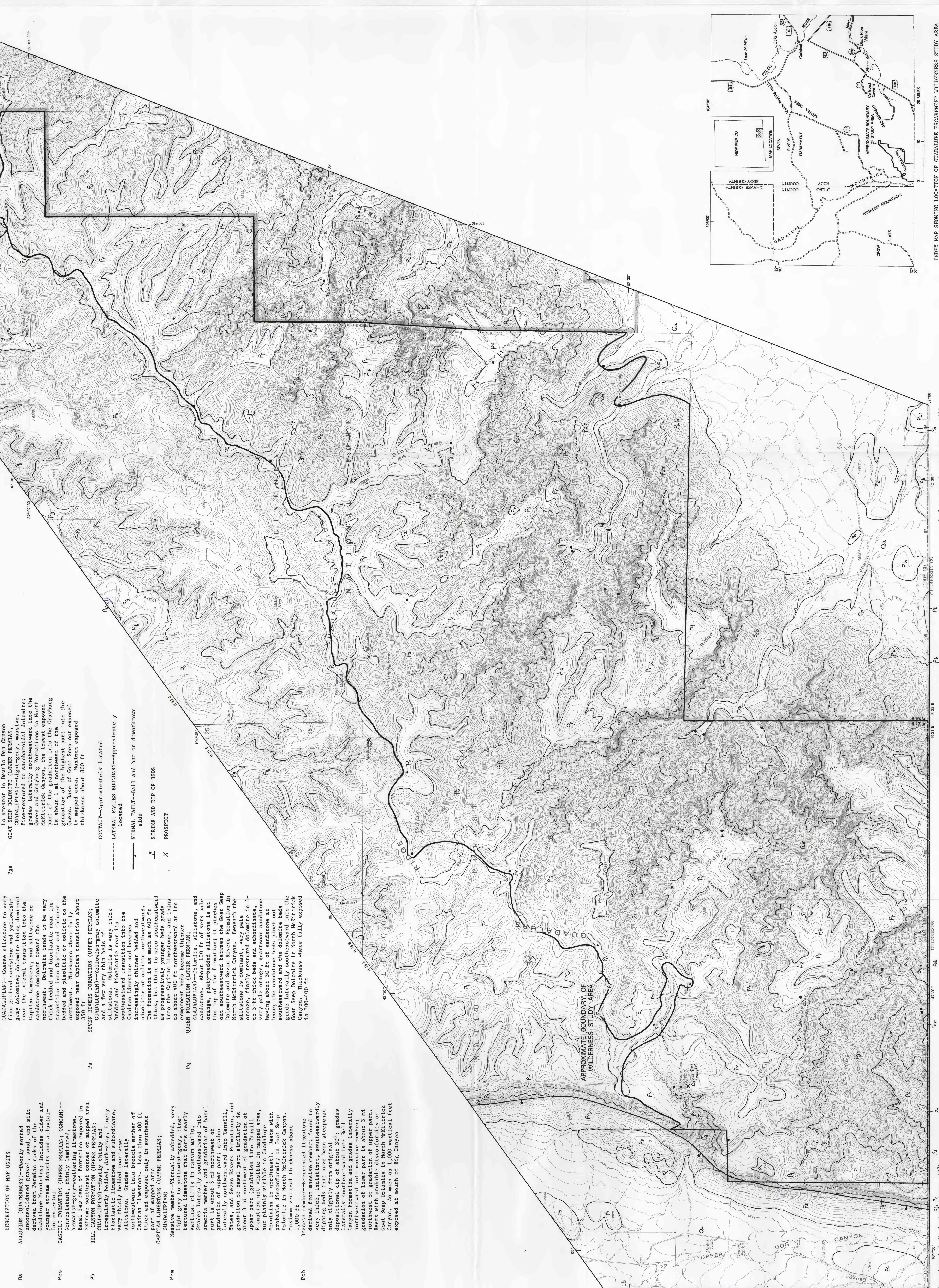
GEOCHEMICAL SAMPLE LOCALITY

STUDIES RELATED TO WILDERNESS

The Wilderness Act (Public Law 93-377, September 3, 1974) requires that the U.S. Geological Survey conduct studies to determine the mineral resource potential. Results must be made available to the public. This report presents the results of a mineral survey of the Guadalupe Escarpment Wilderness Study Area, New Mexico. The Guadalupe Escarpment Wilderness Study Area was established by Public Law 96-550, December 1980.

MINING ACTIVITY

There are no formal mining districts in the Guadalupe Escarpment Wilderness Study Area. However, about 66 tons of ore containing 6,256 lbs of copper and 3 oz of silver were mined in 1914, 1926, and 1928. The mine was located about 2 mi southwest of the southwest corner of the study area. The mine was operated by the Guadalupe Escarpment Wilderness Study Area. The mine was operated by the Guadalupe Escarpment Wilderness Study Area.



MINERAL RESOURCE POTENTIAL

Low to moderate potential exists for concealed base-metal deposits in the study area. The existence of copper minerals in the Seven Rivers Formation at the base of the Guadalupe Escarpment is well documented. Limestone is present in the Seven Rivers Formation a few miles south of the study area. The Seven Rivers Formation within the study area. Geochemical anomalies indicate that weakly mineralized chert and limestone are present in the study area. Seven Rivers and Vates Formations. The potential for silver minerals in the Seven Rivers Formation is indicated by the presence of silver-bearing minerals in the Seven Rivers Formation. The potential for lead and zinc minerals in the Seven Rivers Formation is indicated by the presence of lead and zinc-bearing minerals in the Seven Rivers Formation. The potential for uranium minerals in the Seven Rivers Formation is indicated by the presence of uranium-bearing minerals in the Seven Rivers Formation. The potential for oil and gas minerals in the Seven Rivers Formation is indicated by the presence of oil and gas-bearing minerals in the Seven Rivers Formation. The potential for coal minerals in the Seven Rivers Formation is indicated by the presence of coal-bearing minerals in the Seven Rivers Formation. The potential for other minerals in the Seven Rivers Formation is indicated by the presence of other mineral-bearing minerals in the Seven Rivers Formation.

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INTRODUCTION

The Guadalupe Escarpment Wilderness Study Area comprises about 94,000 acres (21,300 acres) in Lincoln National Forest, Eddy County, N. Mex. A rough jeep road along the northeast boundary of the study area was used to access the study area. The northeast part of the study area on U.S. Highway 69-100.

GEOLOGIC SETTING

The mapped area is known for its display of the remarkable lateral facies changes from the Capitan Limestone to the lower Permian. The Capitan Limestone is divided into the upper and lower members (Hayes, 1946) or reef facies (Newell and others, 1953), and the lower member (Hayes, 1946) or barrier reef or bank deposit; it grades northward into the Seven Rivers Formation. The lower Goat Steep Dolomite, which the Goat Steep grades northward into, is comparable to the Tusill, Vates, and Seven Rivers Formations. In details of these facies changes are preserved in the mapped area. Although other dramatic finobates and facies changes are not exposed within the mapped area, information suggest that they probably occur in the thousands of feet of Permian rocks that lie beneath the Goat Steep Dolomite. The Goat Steep Dolomite probably occur in Permian rocks as well. These could contain traps for oil and gas.

GEOCHEMISTRY

Geochemical data for stream sediments and rock samples from the Guadalupe Escarpment Wilderness Study Area are contained in a report by Light and Domenico (1982). The report indicates that the study area contains anomalous concentrations of barium, zinc, and cadmium throughout the study area. Concentrations of lead, molybdenum, copper, or boron are also elevated in some areas. Zinc to barium ratios although zinc is anomalous high, cadmium has been enriched relative to zinc.

The rock samples from iron-rich sandstone units in the study area contain anomalous amounts of zinc, arsenic, lead, cadmium, and molybdenum. Zinc, arsenic, and molybdenum were found in the study area. Copper and silver were found in the Vates Formation on Limestone Ridge. The study area is found near the Limestone-dolomite interface in light-reef rocks and is similar to the Permian basin-limestone facies (Snyder, 1968). This association may indicate the presence of stratabound epigenetic mineralization associated with the Vates Formation. The Vates Formation is a member of the Permian system, through the Vates and Seven Rivers Formations.

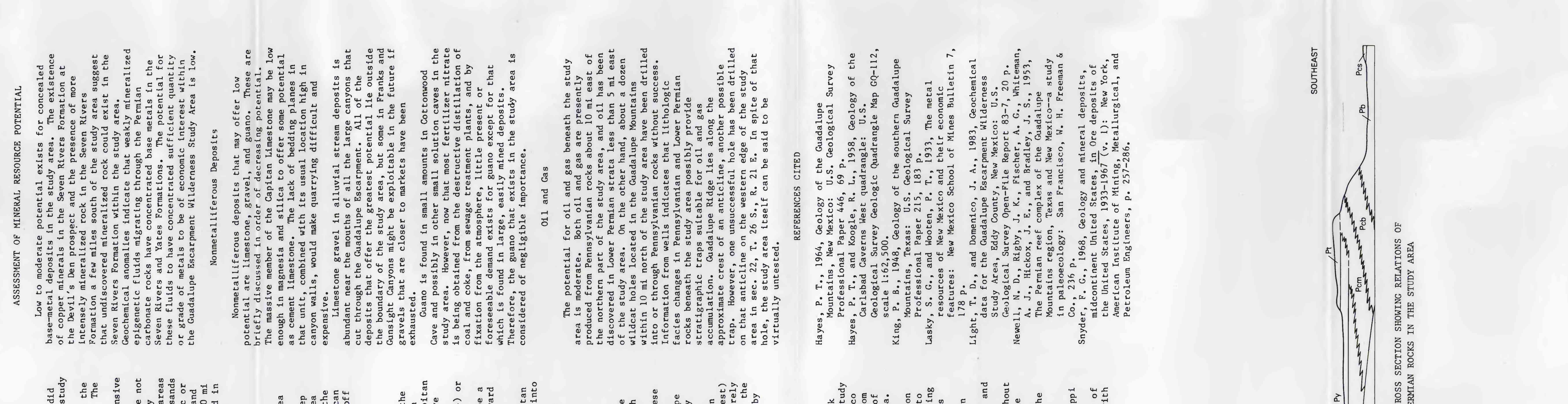
REFERENCES CITED

Hayes, D. T., 1946, Geology of the Guadalupe Mountains, New Mexico, U.S. Geological Survey Professional Paper 446, 99 p.

Light, R. C., and Domenico, J. A., 1982, Geochemistry of stream sediments and rocks from the Guadalupe Escarpment Wilderness Study Area, Eddy County, New Mexico, U.S. Geological Survey Open-File Report 82-100, 11 p.

Newell, N. D., Rigby, J. K., Fischer, A. C., Whitman, A. J., Riccio, J. E., and Bradley, J. S., 1953, Geology of the Permian rocks of the Guadalupe Mountains region, Texas and New Mexico—a study in paleogeology. San Francisco, N. H. Freeman & Co., 196 p.

Snyder, F. C., 1968, Geology and mineral deposits, Permian basin-limestone facies, in Ore deposits of the United States, 1933-1967 (C. D. New York, Geological Society of America, Bulletin, 78, 1-286).



INDEX MAP SHOWING LOCATION OF GUADALUPE ESCARPMENT WILDERNESS STUDY AREA

Geology mapped by P. T. Hayes, 1982

MINERAL RESOURCE POTENTIAL AND GEOLOGIC MAP OF GUADALUPE ESCARPMENT WILDERNESS STUDY AREA, EDDY COUNTY, NEW MEXICO

By Phillip T. Hayes and Thomas D. Light, U.S. Geological Survey

and John R. Thompson, U.S. Bureau of Mines

1983