



Discovery of Pima-Mission Copper Mine, Pima County, Arizona

by David F. Briggs

Events leading to the discovery of what would ultimately become the Pima-Mission copper mine we know today began in early 1949 in the mining town of Jerome, Arizona. It was there, where two Colorado School of Mines alumni, Walter E. Heinrichs, Jr., and Robert E. Thurmond had been temporarily working at Phelps Dodge's United Verde mine after being permanently laid off by Newmont Mining Corporation. Anxious to find more permanent employment, they prepared an innovative mineral exploration proposal in which applied geophysics would be fully integrated with the more conventional geological and geochemical methods of the day.

They submitted this proposal to United Geophysical Company, Inc. of Pasadena, California, which had a successful history of providing geophysical services to the petroleum industry. Herbert Hoover, Jr., the son of a former President of the United States, was the founder and principal owner of United Geophysical. He recognized the merits of this proposal and agreed to fund and provide material support for this project.

With funding for the proposal in place, it was decided to base the project out of Tucson, because of its central location and excellent geological library at the University of Arizona. Over the next several months, all available literature on more than thirty historical mining districts in southeastern Arizona and southwestern New Mexico were reviewed. Each of these districts were also examined in the field and ranked based on its of geologic, economic and exploration potential. Based on these considerations, the Pima mining district, located immediately south of Tucson, was chosen as the site to test the methodologies outlined in their proposal.

The geophysical exploration field program began in early 1950 with magnetic surveys, which were designed to detect magnetite-bearing zones that were concealed beneath unmineralized alluvial sediments in the Santa Cruz valley along the eastern flank of the Sierrita Mountains. Two significant anomalies were identified by this study. The southern anomaly was located immediately east of the historic Twin Buttes mining camp (future site of the Twin Buttes pit), while the northern anomaly was located east of Mineral Hill (future site of the Pima-Mission pit).

Banner Mining Company's acquisition of a property position in the Twin Buttes area in July 1950 resulted in United Geophysical's decision to concentrate their initial exploration efforts on the northern anomaly. United Geophysical successfully acquired a property position covering this target in July 1950. Following additional geophysical studies, they collared the first drill hole at the site in February 1951. This discovery hole encountered oxidized bedrock at a depth of 209 feet and ore grade sulfide mineralization at 255 feet.

The Pima Mining Company was incorporated in November 1951 to develop this discovery. This project included the sinking of the 600-foot Alpha shaft, which began in January 1952. Production of high grade copper ores was achieved in May 1952. This underground project ultimately shipped 69,000 short tons of direct smelting ore, averaging 6% copper, to ASARCO's El Paso smelter by June 1955.

The Union Oil Company of California, who had acquired United Geophysical in May 1950, granted the Cyprus Mines Corporation an option to purchase an interest in the Pima property in August 1954. After evaluating the area, Cyprus purchased a 75% interest in the project. The Utah Construction Company, a predecessor to Utah International, Inc. subsequently acquired a 25% interest in the project from Cyprus. Union Oil Company of California retained a 25% in this venture. Stripping of approximately 200 feet of overburden from the Pima ore body began in November 1955, and the first copper concentrates were produced in December 1956.



Looking North at the Pima-Mission Pit (Photo taken by David Briggs June 2002)

ASARCO, Inc. acquired its initial land position in the Pima mining district in December 1953. Much of this property was located between Pima Mining's holdings to the south and the San Xavier Indian Reservation to the north. Surface drilling on these holdings commenced in February 1954, discovering the northern portion of the Pima ore body, which extended north onto their property. This discovery would ultimately become the Mission mine. In May 1957, ASARCO expanded its

property position at Mission, acquiring a leasehold interest in six sections on the San Xavier Indian Reservation that were contiguous with their land position. ASARCO's board of directors approved the Mission project in July 1959 and stripping of overburden began in August 1959. The 15,000-stpd Mission concentrator was commissioned in July 1961 and achieved commercial operations in September 1961.

Initially operated as two separate pits, known as Pima and Mission, these operations were gradually merged to form a single large open pit, now known as the Pima-Mission mine. ASARCO consolidated its land position in the Pima district through its purchase of Pima Mining Company's holdings in September 1985. Grupo Mexico subsequently acquired the Pima-Mission property in November 1999, through its merger with ASARCO.

The Pima-Mission mine has produced approximately 4.5 million short tons of copper since 1952 and continues to operate today. For those who wish to learn more about the Pima-Mission mining operation and copper mining in Arizona, I encourage you to visit ASARCO's Mineral Discovery Center, located at 1421 West Pima Mine Road in Sahuarita, Arizona.

Epilogue

Walter E. Heinrichs, Jr., one of the co-discoverers of the Pima-Mission mine passed away in Tucson on October 10, 2013. This article is dedicated to Walt and his partner, Robert E. Thurmond, whose early work in the Pima mining district significantly contributed to our knowledge of the area and pioneered the way exploration geologists would search for ore deposits in years to come.

Disclaimer: David F. Briggs is a resident of Pima county and a geologist, who has worked in the mining industry for more than 35 years.

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