

## **Arizona's Five C's**

### **Copper**

It seems like mining has always been big in Arizona. In 1736 the discovery of silver just below the current border with Mexico drew prospective Spanish miners northward into southern Arizona. After Arizona became a U.S. Territory, gold was found near Yuma in 1858 and in 1863 in the Bradshaw Mountains near Prescott and around Wickenburg. By that time about one of every four people in the Territory was a miner.

Tombstone's boom in the 1880s was based on silver, but Arizona's precious metals were soon exhausted and it became evident that Arizona's long-term mining prosperity depended on copper.

### **Copper History**

Copper is easily stretched, molded, and shaped, is resistant to corrosion, and conducts heat and electricity efficiently. The discovery that copper combines with tin to produce bronze marked the beginning of the Bronze Age about 3,000 BC.

Native Americans used copper in Arizona a thousand years ago for pigments, ornaments, and tools. The first Spanish explorers here in the 1500s found working copper mines.

Spaniards mined copper on a small scale at Ajo as early as 1750. After the Gadsden Purchase in 1854, the mine was reopened by Anglos.

In the 1870s and 1880s, huge copper deposits were found in Bisbee, Clifton-Morenci, Globe-Miami, and Jerome. "Big-time towns" sprung up to support serious mining operations. Copper emerged as the most important mineral to the economy of Arizona.

Other early successful copper operations included the Ray Mine (Pinal County), the Bagdad Mine (Yavapai County) and mines near Tucson at Silver Bell (23 miles northwest) and Sierrita (20 miles southwest), and forerunners of the Mission Mine (18 miles south).

By 1910 Arizona was the leading producer of copper in the U.S. and remains so today.

### **Copper Mining**

Copper mining started out as an underground operation, with access to the copper ore via vertical shafts and tunnels. Over the years, the decline of the richness of the ore (.4 to 1.0% copper today) forced miners into open-pit mining, where vastly larger bodies of ore had to be dug out and processed to achieve significant amounts of copper.

The first open-pit copper mine in Arizona was in Ajo in 1917. By the 1950s, most Arizona copper mines were open-pit operations.

Miners continued to find additional sources of copper. Since the mid-1950s, new sites included San Manuel (25 miles northeast of Tucson), Mineral Park (Mohave County), Pinto Valley (Gila County), Carlotta (Globe-Miami), and most recently at Safford (Graham County).

Some early mines closed, due to running out of profitable ore, with their supporting towns, such as Bisbee and Jerome, “rapidly shrinking to the brink of nonexistence,” but finding new life as popular artist colonies and tourist attractions.

Copper mining operations also eventually closed at Ajo and San Manuel – resulting in less successful “second lives.” Other former copper towns, in central Arizona (east of Phoenix), have formed the Copper Corridor, a movement to attract tourism to their mining history.

The other copper mining operations previously identified are still open and producing today! The top 10 largest producers (in rank order of output) in 2012 were: Morenci, Ray, Bagdad, Safford, Sierrita, Mission, Miami, Silver Bell, Mineral Park, and Carlota. (To see how a modern open-pit copper mine operates, you can tour ASARCO’s Mission Mine in Sahuarita.)

### **Copper Today**

Today, copper is used in a variety of domestic, industrial, and high-technology applications - in building construction, power generation and transmission, electronics manufacturing, and the production of industrial machinery and transportation vehicles. Familiar products include semiconductors, cell phones, computer chips, and automobiles.

Despite some mine closings, declining yields at some sites, and fluctuating copper prices, Arizona remains a major producer of copper, the largest in the U.S. According to the Arizona Mining Association, in 2012 Arizona mines produced 1.63 billion pounds of copper valued at \$6.02 billion. That was 65% of all the copper produced in the U.S. There were over 10,500 people employed in mining and refining copper!

Arizona is also the second-largest U.S. producer of molybdenum, which is extracted as a byproduct of copper, and is fifth in the nation for producing silver, mined mostly as a product of copper processing.

Plans for new mining to satisfy future copper requirements are actively underway. These include Rosemont Copper, 30 miles southeast of Tucson, now in the permitting process under the direction of the United States Forest Service, and Resolution Copper, near Superior, currently stalled pending a proposed land swap with the federal government.

Copper certainly remains a core industry of the Arizona economy today.

### **Copper Facts ...**

**Copper wiring made widespread use of electricity possible in the early 1900s.**

**Copper transformed and modernized households in the 1920s and 1930s with piping and wiring.**

**Copper was used to make Arizona automobile license plates in 1932-1934.**

**The average car today contains 0.9-mile of copper wire.**

**Since mid-1982 copper pennies contain (only) 2.5 % copper and 97.5 % zinc.**

### **If you go ...**

**What: ASARCO Mineral Discovery Center – Mission Mine Tour**

**Where: 1421 W. Pima Mine Road, Sahuarita AZ**

**Info: [info@asarco.com](mailto:info@asarco.com) or 520-625-8233**

**Selected Sources and Information:** *Arizona – A History* (Thomas E. Sheridan, 2012); Economic Impact of the Mining Industry on Arizona – 2012, Arizona Mining Association; Facts About Copper, geology.com; Five C's Supported the Arizona Economy, arizona100blogspot.com; A History of Mining in AZ, azmining.com; Mining Arizona, The Arizona Experience; Rosemont Plan – Mine Plan of Operations, WestLand Resources, Inc.; U.S. Bureau of Economic Analysis, Gross Domestic Product by State, 2013; Wikipedia: Copper Mining in Arizona, Resolution Copper, Rosemont Copper, Safford Mine, San Manuel Copper Mine, Seal of Arizona.



*The open pit of the Mission Mine south of Tucson is currently 2 ½ miles long by 2 miles wide and is 1500 feet deep. The copper mine operates 24/7, 365 days a year. (Courtesy of ASARCO)*



*Bob Ring and Pat Wood are dwarfed by one of the 11-foot-diameter tires from the huge 240-ton haul trucks that carry copper ore at the Mission Mine. (Courtesy of Bob Ring)*