

HISTORY, GEOLOGY, AND PRODUCTION OF THE TINTIC MINING DISTRICT, JUAB, UTAH, AND TOOELE COUNTIES



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ABSTRACT

The Tintic mining district, located roughly 60 miles south of Salt Lake City, is the second most productive district in Utah. The initial discovery in the Tintic district occurred in 1869. With the arrival of the railroad in 1878, the mining operations expanded rapidly making Tintic the most productive district in Utah by 1899. Although district production peaked during the first half of the twentieth century, exploration activities from 1940 to 1970 continued to make significant discoveries under volcanic cover in areas peripheral to the Main Tintic subdistrict. Production declined significantly with the closure of the Burgin mine in 1978, sputtered in the 1990s, and finally came to an end in March 2002 with the closure of the Trixie mine. The district is currently idle except for sporadic exploration activities.

Geologically, the Tintic district is underlain by a thick section of Paleozoic strata that have been strongly folded into north-south trending, asymmetrical anticlines and synclines that have been cut by northeast-trending, right-lateral strike-slip faults. These sedimentary rocks were uplifted, eroded, and covered by early Oligocene calc-alkaline volcanics emanating from a large caldera just to the south of the district. Continuing magmatism resulted in the intrusion of monzonite stocks, plugs, dikes, and sills with associated hydrothermal alteration and mineralization. The area was uplifted on the west during the Basin and Range orogeny, resulting in slight eastward rotation and continuing erosion of the East Tintic Mountains.

The Tintic mining district can be broken down into four subdistricts based on geology, location, and ore occurrence: Main Tintic, East Tintic, Southwest Tintic, and North Tintic. The majority of the production has been derived from sub-vertical copper-gold-silver chimneys and sub-horizontal, carbonate-hosted, lead-zinc-silver ore runs (replacement deposits) of the Main Tintic subdistrict (Morris, 1968). The bulk of the remaining metal production has been derived from the structurally complex ore bodies of the East Tintic subdistrict. The Southwest Tintic subdistrict hosts a large, subeconomic porphyry copper system, which has seen minor production from peripheral high-sulfidation, copper-silver-lead veins. In the North Tintic subdistrict, limited production of zinc-rich replacement ores have been derived from the Scranton and other small mines.

Total district production is nearly 20 million tons, which at current metal prices would translate to well over three billion dollars. Roughly 90 percent of this production has come from irregular, precious metal-rich polymetallic base metal replacement ores. Silver (42 percent at modern metal prices) has been the most valuable product in the district followed by significant gold (29 percent) and lead values (17 percent) with lesser contributions by copper (6 percent) and zinc (6 percent). Not included in these figures, is the production of well over one million tons of halloysite clay, mainly from the Dragon mine.

INTRODUCTION

The Tintic district is located in west-central Utah, about 60 miles south of Salt Lake City (figure 1). It was one of the most prominent early mining districts

in Utah with over a century of continuous production. In addition to the town of Eureka, once flourishing mining camps of Mammoth, Silver City, Knightsville, Dividend, Robinson, and Diamond once dotted the surrounding hillsides during the

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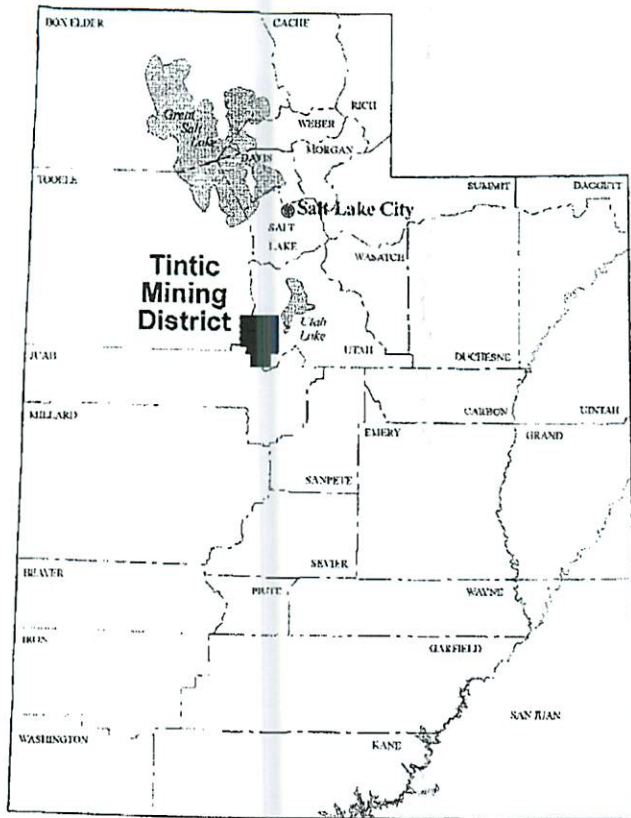


Figure 1. Location map for the Tintic mining district, Juab, Utah, and Tooele Counties.

camps' heyday. Only the town of Eureka and a few scattered houses at Mammoth remain today (James, 1984).

The mineral deposits of the Tintic district are scattered across an astonishing 80 square miles of the East Tintic Mountains. The four combined Tintic subdistricts constitute the second largest metal producing district in the state (nearly 20 million tons of ore) with Bingham as the largest producer and Park City a close third. Historic production from the Tintic district has been largely derived from precious metal-rich, polymetallic chimneys and irregular, gently plunging rod-shaped replacement deposits hosted by Paleozoic sedimentary rocks. These deposits have also been called carbonate replacement deposits (CRD) and mantos. Because Tintic's ore bodies are not manto (blanket) shaped, this usage will be avoided here.

Valuing the district's past production at current metal prices, Tintic's metals are more valuable than the production of the Intermountain West's other famous polymetallic vein and replacement camps at Leadville, Colorado; Telluride, Colorado; Superior,

Arizona; Gilman, Colorado; Eureka, Nevada; Globe, Arizona; Aspen, Colorado; and Pioche, Nevada (in order of decreasing value). The West Tintic district, located sixteen miles to the southwest in the West Tintic Mountains, is a distinct and separate district and is not considered here.

HISTORY

Pioneer Era

Mineralization in the Tintic mining district was discovered in December 1869 by George Rust and a party of prospectors returning from an expedition to Utah's West Desert (Tower and Smith, 1900). Located in the Southwest Tintic subdistrict, the Sunbeam was the first claim recorded in December of that year, while the Black Dragon property of the Main Tintic subdistrict was staked in January 1870 (table 1). The Mammoth and Eureka Hill deposits, also in the Main Tintic subdistrict, were discovered in February 1870. The Tintic mining district was organized in early 1870, and named in honor of Chief Tintic of the local Goshute tribe (Morris, 1968). Although little work was done on these discoveries until the fall of 1870, productive mining camps were established at Eureka, Silver City, and Diamond by 1871. Early production was hampered by the remote location, which resulted in high shipping costs for the ores. During this period, only the richest ores could be shipped to processing facilities, some as far away as Swansea, Wales. In an attempt to alleviate the high costs of transporting ores to distant treatment facilities, primitive amalgamation plants and smelters were constructed at Homansville, Diamond, Roseville, and elsewhere during the early 1870s. However, these early facilities were seldom profitable in dealing with the numerous complex ore types encountered as the mines were extended to greater depths. Leaching plants were erected in an attempt to recover values from the oxide ores, but were generally ineffective (Tower and Smith, 1900). Despite these early difficulties, the mines at Mammoth had become the principal copper producers in Utah by 1873 (Lindgren et al., 1919).

The Utah Southern Railroad was completed to Ironton, five miles southwest of Eureka in 1878. In response to the arrival of the railroad, district production nearly doubled in 1879. During the early

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Table 1. Significant developments in the history of the Tintic Mining District.

1869	Sunbeam claim was staked by George Rust and a party of prospectors
1870	important discoveries were made at Black Dragon, Mammoth and Eureka Hill
1877	Ore production began at Eureka Hill
1878	Utah Southern Railroad completed to Ironton, located five miles west of Eureka
1882	Bullion Beck mine commenced operations
1886	Ore shipments began at the Centennial-Eureka mine
1891	Rio Grande Western Railroad completed to Eureka and later extended to Silver City
1893	Mammoth Mining Company constructed 20-mile water pipeline from Cherry Creek, resulting in the commissioning of pan-amalgamation mills at Mammoth, Bullion Beck, Eureka Hill and Sioux
1896	Humbug ore body discovered by Jesse Knight
1899	First ore shipment from East Tintic subdistrict made from the Lilley of West mine
1900	United States Mining Company purchased the Centennial Eureka mine
1905	Iron Blossom mine discovered by Jesse Knight
1906	initial zinc production from the Tintic mining district occurred at the Scranton mine
1907	Tintic Standard Mining Company organized by Emil Raddatz and Ira Travis
1908	U. S. Smelting, Refining and Mining Company acquired the Bullion Beck and Champion mines Tintic Smelting Company commissioned a new lead smelter at Silver City
1909	Chief ore body discovered by Walter Finch and J. R. Finley Iron Blossom and Eureka Lilly mines commissioned
1916	Tintic Milling Company commissioned a 200-stpd chloridizing, roasting and leaching facility at Silver City Silver-rich Pothole ore body discovered at Tintic Standard mine
1917	High grade Central ore body discovered at Tintic Standard mine
1920	Goshen Valley Railroad completed an 11 mile standard gauge line from Iron Spur to Dividend
1921	Tintic Standard Mining Company commissioned the 200-stpd Harold mill at Goshen
1923	Plutus ore body discovered by Plutus Mining Company
1925	Tintic Standard Mining Company ceased operations at the Harold mill facility
1927	Significant discoveries were made on the North Lily and Eureka Lilly properties
1928	Gold ores were discovered at Eureka Standard
1929	U. S. Smelting, Refining and Mining Company acquired the Victoria and Eagle & Bluebell mines
1940	Commercial operations ceased at Eureka Standard
1943	U. S. Smelting, Refining and Mining Company ceased commercial operations at its Eagle & Bluebell, Centennial Eureka, Bullion Beck and Victoria mines
1949	Commercial operations ceased at Eureka Lilly, North Lily and Tintic Standard Filtrol Corporation commenced halloysite mining operations at the Dragon mine
1957	Chief Consolidated Mining Company ceased operations at the Chief mine
1958	Burgin ore body was discovered by the Bear Creek Mining Company
1966	Kennecott achieved commercial operations at the Burgin mine
1969	Bear Creek Mining Company discovered gold-silver-copper ores at Trixie
1974	Kennecott achieved commercial operations at Trixie
1976	Filtrol Corporation ceased operations at the Dragon halloysite mine
1978	Kennecott suspended operations at Burgin and returned the property to the Chief Consolidated Mining Company
1980	Sunshine Mining Company leased Burgin mine from the Chief Consolidated Mining Company
1982	Kennecott suspended mining operations at Trixie
1983	Sunshine Mining Company acquired the Trixie lease and resumed operations
1988	North Lily Mining Company commissioned the Silver City heap leach facility
1992	Sunshine Mining Company ceased mining operations at Trixie
1993	North Lily Mining Company closed the Silver City heap leach facility
1996	Chief Consolidated Mining Co. acquired the Trixie property through a merger with the South Standard Mining Co.
2001	Chief Consolidated Mining Company resumed operations at Trixie
2002	Unstable ground conditions resulted in the suspension of mining operations at Trixie

1880s, the Salt Lake and Western Railroad connected Silver City, Mammoth, and Eureka with the Utah Southern Railroad at Ironton, further enhancing the profitability of the mining operations. The

Eureka Hill mine was added to the list of major producers in 1877, and was followed by the Bullion Beck mine in 1882. The Bullion Beck was discovered by John Beck under a thin veneer of volcanic