

Goldfield-Short but sweet!

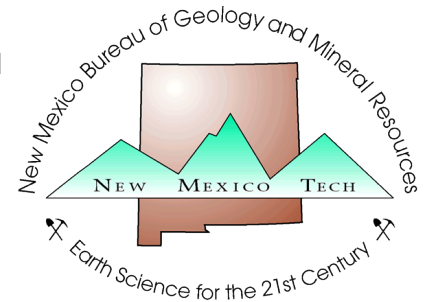
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The annual [New Mexico Mineral Symposium](#) provides a forum for both professionals and amateurs interested in mineralogy. The meeting allows all to share their cumulative knowledge of mineral occurrences and provides stimulus for mineralogical studies and new mineral discoveries. In addition, the informal atmosphere encourages intimate discussions among all interested in mineralogy and associated fields.

The symposium is organized each year by the [Mineral Museum](#) at the [New Mexico Bureau of Geology & Mineral Resources](#).



Abstracts from all prior symposiums are also available: <https://geoinfo.nmt.edu/museum/minsymp/abstracts>

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—Nathalie N. Brandes and Paul T. Brandes

Discovered in 1902, Goldfield quickly grew into Nevada's largest city. Peak production from the rich but confusing epithermal ore occurred in 1910. By 1912, both the population and production were declining. In those few short years, Goldfield rose to prominence and faded into obscurity but remains a fascinating locality for those interested in geology and mining history.



Overview of Goldfield from 1908, just before the crash.

Goldfield is located in the Goldfield Hills about 45 km (28 mi) south of Tonopah, Nevada. The mining district sits at an elevation of ~1740 m (~5700 ft.), although the surrounding hills rise as high as 2100 m (6900 ft.). The climate is arid, resulting in little vegetation. US Highway 95 runs through Goldfield today, but early in the 20th Century three standard gauge railways also served the city.

The Goldfield Mining District sits at the western margin of a Tertiary volcanic center. Typical rocks of the district include volcanic breccia, rhyolite, quartz latite, trachyandesite, and rhyodacite overlying Ordovician metasediments and granitic rocks. The oldest of these volcanic rocks are Oligocene (30-31 Ma). During this eruptive episode, a caldera and associated ring fracture system formed. After a period of quiescence, volcanism resumed around 22 Ma with the eruption of trachyandesite and rhyodacite.

Goldfield is the largest known high sulphidation gold deposit in North America. These types of epithermal deposits tend to form adjacent to volcanic centers where magmatic volatiles, such as HCl and SO₂, rise and are absorbed by meteoric water, resulting in an acidic fluid that leaches rock. In the case of Goldfield, this mineralization occurred about 20-21 Ma with the shallow emplacement of a pluton. Ore fluids followed fractures and faults associated with the prior volcanic activity of the region, including the Oligocene ring fracture system. Rock closest to

the fractures was silicified whereas rock farther from the fractures was argillized. Supergene mineralization occurred between 9 and 12 Ma based on alunite formation.

The Goldfield Mining District occupies an area of about 39 km² (15 mi²) of hydrothermally altered rock, however, the richest ores were concentrated in an area of only 1.3 km² (0.5 mi²). Gold occurred within the silicified zones of the altered Tertiary volcanic rocks. Changes in grade, even within the silicified zone, were abrupt, often going from rich ore to barren rock within a meter (3.3 feet). Typically the highest grade ore occurred in brecciated parts of unoxidized ore zones. Often the brecciated pieces would be covered with quartz, pyrite, farnatinitite, tetrahedrite-tennantite, bismuthinite, goldfieldite, native gold, and sometimes tellurides and sphalerite. This ore commonly produced 440-580 oz./ton gold. The richest carload of ore, however, was extracted from the Mohawk Mine in 1906 and produced 609.6 oz./ton gold and 75.4 oz./ton silver.

The first claims at Goldfield were staked on December 4, 1902 by Harry Stimler and William Marsh, a pair of prospectors who had been grubstaked by Jim Butler of Tonopah. The prospectors named their site "Grandpa." Soon more gold strikes were made, more claims were staked, and a rush to the new district began. By 1903, a town was organized



A modern (March, 2019) view of Florence Mine and its remaining headframe.

and given the name Goldfield. Mines in the district operated under a leasing system in which a company was granted a lease along a vein and paid the claim owner a percentage of the production after operating costs. This led to the development of many mining companies until most were consolidated by George Nixon and George Wingfield as the Goldfield Consolidated Mines Company.

Just five years after the initial discovery of ore, Goldfield became the largest city in Nevada with a population near 20,000. The glory days of rich ore in Goldfield were short-lived. Labor tensions rose with the arrival of the Western Federation of Miners union and strikes broke out in 1906 and 1907. Fearing violence, as had occurred in Leadville, Colorado and other mining towns, federal troops were dispatched to maintain order. The strike ended with no major episodes of violence and mining companies refusing to employ Western Federation of Miners members. Peak production from the mines occurred in 1910 with 539,000 oz. gold and 118,000 oz. silver produced. Following that year, large numbers of the population began leaving. By 1912, a local mining engineer reported to a friend that all who were able had left that spring. Mining continued for a few more years, but in 1919 the Goldfield Consolidated Mill shut down and with it, large-scale mining ended.

The town seen today is but a small part of what once existed. A major flash flood destroyed part of the town in 1913. Ten years later, a bootlegger's still ignited a fire that swept through many of the remaining buildings. If one visits Goldfield today, one can still see the hotel, the courthouse, the school, and of course, the headframes and tailings piles of a legendary mining locality.



A high grade gold specimen from the tailings pile of the Florence Mine. This photo is courtesy of Jon Aurich.