

## San Juan County

### Eureka District

The Eureka District was recognized by Henderson (1926) and by Vanderwilt (1947). The latter considered the district synonymous with the **Cement Creek, Mineral Creek and Animas Forks Districts**. Dunn (2003) noted that it has also been called the **Silverton District**. Moore (2004) provided boundaries - from "the abandoned town of Eureka north along the valley of the Animas River to the ghost town of Animas Forks, west along the valley of the West Fork of the Animas (California Gulch) and across the divide into the drainage of Cement Creek above the abandoned townsite of Gladstone, and from Gladstone easterly along Eureka Gulch to Eureka. He also notes that the reference to the district has often been expanded to include the **Mineral Point and Engineer Districts**.

The district lies entirely within the Silverton Caldera with the dominant structural feature being the Eureka Graben, in the center and northeastern parts of the district. The boundary faults (and associated fractures) of the graben helped localize the ore deposition (Moore, Ibid).

Two types of deposits are found - veins and chimneys. The vein deposits are themselves of several types, according to Varnes and Burbank (1947). Quartz-pyrite gold veins with some galena and other sulfides in white quartz with abundant pyrite and some free gold are characterized by the Gold King Mine. A second type is the tungsten-bearing quartz veins. Massive pyrite veins also exist. Another variation is pyrite veins (such as the Brooklyn Vein) with some chalcopyrite and other base metal sulfides with a bit of quartz.

Chimney deposits are similar to those in the **Red Mountain District**. A good example is the Zuni Mine, characterized by a pipe sixty feet long and fifteen feet wide with massive anglesite, guitermanite (lead-arsenic sulfide) and argentiferous enargite. Some gold occurs in the pyritic ore.

Gold was first discovered in 1860 at Eureka and lode discoveries followed, leading to the development of the district by 1874. The Eureka and Silver Wing Mines were working by 1875. The Gold King vein was discovered in 1887. The largest producer by far was the Sunnyside Mine. According to Moore (Ibid) the Sunnyside was eventually connected to other large producers - Gold King, Gold Prince, and Great Mogul - by the American Tunnel.

The Sunnyside Mine and mill was served by the town of Eureka, a now-dead town. As many as 2000 residents called Eureka home at one time (Eberhart, 1969) and the Sunnyside mill alone employed 500. The mighty Gold King Mine was served by the town of Gladstone.

George Moore, a veteran geologist of the area, points out that most of the mines have been explored to only shallow depths and considerable mineralization probably remains in the area (Moore, Ibid.)

A large volume of literature has been generated on the geology and mineralization in the Silverton area. Aspects of the geology have been discussed by Lipman (1976), Lipman et al. (1978), Luedke and Burbank (1987), Plouff and Rakiser (1972), Steven (1975), and Steven and Lipman (1976). Ore deposits and mineralization have been discussed by Prosser (1910), Bejnar (1957), Burbank (1940), Burbank and Luedke (1968), Casadevall and Ohmoto (1977), Fischer et al. (1973), Grauch et al. (1985), Sanford et al. (1987), King and Allsman (1950), Rosemeyer (1988), and Mosier et al. (1986), among others.

Mines listed in the district (mindat.org and others) include:

- Adelia Occurrence
- Adelphin
- Alabama Occurrence
- Amador Occurrence
- Animas Forks
- Animas Forks Deposits
- Auburn Group
- Aztec
- Bagley
- Barnes Tunnel
- Belcher Occurrence (Belcher Tunnel No. 1)<sup>2</sup>
- Belle Creole
- Ben Butler Occurrence<sup>2</sup>
- Ben Franklin<sup>2</sup>
- Benitoite
- Bill Young
- Bismarck
- Black Diamond Occurrence (1)
- Blacksmith Occurrence
- Blanchard Placer
- Bonanza
- Bonanza King
- Bonita Peak
- Brazillian Occurrence (Monitor)
- Broadgage Mine
- Burns Group
- Burrows Prospect (Little Ida; Burrows Group)
- Caledonian
- Cement Creek
  - Adams Mine (Adams Tunnel Mine)
  - Anglo-Saxon Mine
  - Gladstone Area occurrence
  - Golden Hub
  - Hoosier Bay occurrence (Hoosier Boy)
  - Minnesota Gulch Mine
  - Omaha Mine
- Columbia<sup>2</sup>
- Columbus
- Como Consolidated
- Custer Occurrence<sup>2</sup>
- Detroit Hollister
- Dewitt
- Eagle Mountain Occurrence
- Early Bird
- Elk
- Endless Chain
- Eureka
  - Eureka Gulch
  - Ransom Mine
- Evaline
- Evening Star
- Forest Queen Occurrence
- Fourteen Occurrence
- Free Gold Occurrence
- Frisco Tunnel (Gladstone)
- Galena Queen Mine (Silver Pitcher)
- George Washington Occurrence
- Gladstone
  - Black Hawk; Occidental
  - Bonita Peak
    - Sunnyside Mine group (American Tunnel Mine; American Tunnel; Gold King Mine; Washington Mine; Belle Creole; Gold Prince; Brenneman Mine; Mogul Mine)<sup>2</sup>
  - Galtie Boy - Hercules Mine
  - Gladstone Mine<sup>2</sup>
  - Gold King Mine (Gold King Extension)<sup>1, 2</sup>
  - Poughkeepsie Gulch
  - Sunnyside Extension Mine<sup>2</sup>
- Gold Dollar - Little Mack
- Gold Hub Occurrence (Yukon Tunnel Ariadne)
- Gold King Mill Placer
- Gold King Occurrence
- Gold Prince Mine
- Golden Fleece<sup>2</sup>
- Graham Mine (Crevice; Kansas City Adits)
- Great American Occurrence
- Great Eastern (Silver Wing; Frederica; Monitor; Sioux City)
- Grivtza; Mountain Eagle; Norman
- Hesperian
- Hidden Treasure<sup>2</sup>
- Hurricane Pass
- Independence
- Indian Chief
- Kansas City
- Kittimac Mine

- Lark Mine
- Lead Carbonate Mine<sup>1</sup>
- London Occurrence
- Maid of the Mist
- Mastodon Mine<sup>2</sup>
- Midway
- Minnehaha Mine
- Mocking Bird
- Mogul Mine
- Montezuma No. 1 and Plain Streak Occurrence
- Mountain Queen Mine<sup>2</sup>
- No Name Mine
- Oyama Occurrence
- Palmyra
- Picket
- Poughkeepsie
- Pride of Bonita
- Pride of the Rockies<sup>2</sup>
- Queen Anne Occurrence<sup>2</sup>
- Red and Bonita Occurrence<sup>2</sup>
- Red Cloud
- Red Rogers Occurrence
- Reed Tunnel
- Rollo Occurrence
- Rose
- Ross Basin (Red Rogers; Bonanza; Canandaigua; Queen Anne; Columbia; Seven Thirty)<sup>2</sup>
- San Antonio
- San Juan Chief<sup>2</sup>
- San Juan Queen<sup>2</sup>
- Sandiago (Treasure Mountain)
- Scotia Occurrence<sup>2</sup>
- Serrano
- Seven-Thirty Occurrence
- Sewell Occurrence
- Shenandoah-Dives Mine (Shenandoah Mine)
- Silver Bay Mine
- Silver Chord
- Silver Cloud Occurrence
- Silver Coin
- Silver Queen Occurrence<sup>2</sup>
- Sixteen-To-One
- Sound Democrat<sup>2</sup>
- Star of the West
- Sunnyside Mine<sup>2</sup>
- Surprise Occurrence
- Tempest Occurrence
- Terry Tunnel
- Tincup and Gypsy Occurrence
- Toltec Occurrence<sup>2</sup>
- Tom Moore Lode
- Treasure Mountain Gold; Sandiago Tunnel Occurrence
- Tyrol
- Uncompahgre Chief Occurrence<sup>2</sup>
- Union Occurrence
- Upper Uncompahgre Mines
- Vermillion
- Victory - Silver Monarch Occurrence
- Washington
- Webster
- White Crow Occurrence
- Yukon Mine (Gold Hub Mine)

Notes:

<sup>1</sup> Details in Burbank and Luedke (1969, pp. 59-60).

<sup>2</sup> Details in Ransome (1901).

Minerals listed in the district (mindat.org) include:

Acanthite	'Apatite'	Chalcocite
Aikinite	Baryte	Chalcopyrite
Akaganeite	Bismuth	'Chlorite Group'
Alabandite	Bornite	Copper
Allanite Group	Bustamite	Digenite
Alleghanyite	Calaverite	Enargite
Altaite	Calcite	Epidote
Anhydrite	Chalcanthite	'Feldspar Group'

Fluorite	Kutnohorite	'Ruby Silver Ore'
Freibergite	Marcasite	Scheelite
Friedelite	Matildite	Silver
Galena	Molybdenite	Spessartine
var: Argentiferous Galena	Muscovite var: Sericite	Sphalerite
Gersdorffite	Petzite	Stephanite
Gold var: Electrum	Proustite	Tephroite
Gypsum var: Selenite	Pyrite	Tetrahedrite
Helvine	Pyroxmangite	Titanite
Hematite	Pyrrhotite	Uraninite
Hessite	Quartz	'Wad'
Hübnerite	var: Amethyst	'Wolframite'
Kaolinite	var: Milky Quartz	
'K Feldspar var: Adularia'	Rhodochrosite	
Krennerite	Rhodonite	

#### References:

- Bartos, P.J. 1993. Gold-rich and Gold-poor Quartz-base metal Veins, Western San Juan Mountains, Colorado: The Mineral Point Area as an Example. Society of Economic Geologists Newsletter, No. 15, 7 pp.
- Bejnar, Waldemere. 1958. Lithologic Control of Ore Deposits in the Southwestern San Juan Mountains. New Mexico Geological Society, Guidebook of Southwestern San Juan Mountains, Eighth Field Conference, p. 162-173.
- Burbank, W.S. 1941. Structural control of ore deposition in the Red Mountain, Sneffels, and Telluride districts of the San Juan Mountains, Colorado. Colorado Scientific Society, Proceedings, Vol. 14, p. 141-261.
- Burbank, W.S., and Luedke, R.G., 1968, Geology and ore deposits of the western San Juan Mountains, Colorado, in Ridge, J.D., ed., Ore deposits of the United States, 1933- 1967 (Graton-Sales Volume), v. 7: New York, American Institute of Mining, Metallurgical, and Petroleum Engineers, p. 714-733.
- Burbank, W.S. and Luedke, R.G. 1969. Geology and Ore Deposits of the Eureka and Adjoining Districts, San Juan Mountains, Colorado. U.S. Geological Survey Professional Paper 535.
- Casadevall, T. and Ohmoto, H. 1977. Sunnyside Mine, Eureka Mining District, San Juan County, Colorado Geochemistry of Gold and Base Metal Ore Deposition in a Volcanic Environment. Economic Geology, Vol. 72, pp. 1285-1320.
- Dunn, Lisa. 2003. Colorado Mining Districts: A Reference. Colorado School of Mines, Golden, Colorado.
- Eberhart, Perry. 1969. *Guide to Colorado Ghost Towns and Mining Camps*. Fourth, revised edition. Swallow Press, Athens, Ohio.

- Fischer, R.P., Luedke, R.G., Sheridan, M.J., and Raabe, R.G. 1968. Mineral Resources of the Uncompahgre Primitive Area, Colorado. U.S. Geological Survey Bulletin 1261-C.
- Fisher, F.S. and Leedy, W.P. 1973. Geochemical Characteristics of Mineralized Breccia Pipes in the Red Mountain District, San Juan Mountains, Colorado. U.S. Geological Survey Bulletin 1381.
- Grauch, R.I., Hon, K., Reynolds, R.L., Bove, D.J., and Grauch, V.J.S. 1985. Episodic Metallization in the Western San Juan Caldera Complex, Colorado [abst]. U.S. Geological Survey Circular 949, pp. 14-15.
- Henderson, C.W. 1926. Mining in Colorado, a history of discovery, development and production. U.S. Geological Survey Professional Paper 138.
- Hon, K., Bove, D.J., and Grauch, V.J. 1986. Geology and Mineral Deposits of the Region Surrounding the American Flats Wilderness Study Area, Western San Juan Mountains, Colorado. U.S. Geological Survey Open-File Report 86-431.
- Hon, Ken, 1987. Geologic, Alteration, and Vein Maps of the Redcloud Peak (Lake City Caldera) and Handies Peak Wilderness Study Areas, Hinsdale County, Colorado. U.S. Geological Survey Miscellaneous Field Studies Map 1949.
- King, W.H. and Allsman, P.T. 1950. Reconnaissance of Metal Mining in the San Juan Region, Ouray, San Juan and San Miguel Counties. Colorado Bureau of Mines Information Circular 7554.
- Lipman, P.W., 1976, Caldera-collapse Breccias in the Western San Juan Mountains, Colorado. Geological Society of America Bulletin Vol. 87, pp. 1397-1420.
- Lipman, P.W., Fisher, F.S., Mehnert, H.H., Naeser, C.W., Luedke, R.G., and Steven, T.A. 1976. Multiple Ages of Mid-Tertiary Mineralization and Alteration in the Western San Juan Mountains, Colorado. Economic Geology, vol. 71, no. 3, pp. 571-588.
- Lipman, P.W., Doe, B.R., Hedge, C.E., and Steven, T.A. 1978. Petrologic Evolution of the San Juan Volcanic Field, Southwestern Colorado Pb and Sr Isotope Evidence. Geological Society of America Bulletin, Vol. 89, pp. 59-82.
- Luedke, R.G. and Burbank, W.S. 1987. Geologic Map of the Handies Peak Quadrangle, San Juan, Hinsdale and Ouray Counties, Colorado. U.S. Geological Survey Geologic Quadrangle Map 1595.
- Moore, George E. 2004. Mines, Mountain Roads, and Rocks. Ouray County Historical Society Guidebook Series #1, Ouray, Colorado.
- Mosier, D.L., Menzie, W.D., and Kleinhampl, F.J. 1986. Geologic and Grade-tonnage Information on Tertiary Epithermal Precious- and Base-Metal Vein Districts Associated with Volcanic Rocks. U.S. Geological Survey Bulletin 1666.
- Plouff, D. and Pakiser, L.C. 1972. Gravity Study of the San Juan Mountains, Colorado. U.S. Geological Survey Professional Paper 800-B, pp. B183-190.
- Proseer, Warren C. 1910. Tungsten in San Juan County, Colorado. Engineering and Mining Journal, Vol. 90, p. 320.

Rosemeyer, Tom, 1988. The Sunnyside Mine, Eureka Mining District, San Juan County, Colorado. *Rocks and Minerals* Vol. 63, No. 5, pp. 366-384.

Sanford, R.F., Grauch, R.I., Hon, K., Bove, D.J., Grauch, V.J.S., and Korzeb, S.L. 1987. Mineral Resources of the Redcloud Peak and Handies Peak Wilderness Study Areas, Hinsdale County, Colorado. U.S. Geological Survey Bulletin 1715-B.

Steven, T.A. 1975. Middle Tertiary Volcanic Field in the Southern Rocky Mountains *in* Curtiss, B.F., ed., *Cenozoic History of the Southern Rocky Mountains*. Geological Society of America Memoir 144, pp. 75-94.

Steven, T.A. and Lipman, P.W. 1976. Calderas of the San Juan Volcanic Field, Southwestern Colorado. U.S. Geological Survey Professional Paper 958.

Steven, T.A., Luedke, R.G., and Lipman, P.W. 1974. Relation of Mineralization to Calderas in the San Juan Volcanic Field, Southwestern Colorado. U.S. Geological Survey Journal of Research, Vol. 2, No. 4, pp. 405-409.

Vanderwilt, John W. 1947. Mineral Resources of Colorado. Colorado Mineral Resources Board, Denver, Colorado.

Varnes, D.J. and Burbank, W.S. 1947. The Cement Creek and Mineral Creek Areas, Eureka District, San Juan County *in* Vanderwilt, J.W. ed. 1947. Mineral Resources of Colorado. Colorado Mineral Resources Board, Denver, Colorado.

[www.mindat.org](http://www.mindat.org), accessed January 2016.