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Item 27

Drilled reserves at Gold Quarry are estimated at 144 million tons of ore averaging 0.049 opt gold (7 million oz gold), mineable by open pit methods. Milling commenced in late 1985 and 210,000 ounces were scheduled for production from the deposit in 1986. (Rota, 1987).

At the MAGGIE CREEK Mine, west of Gold Quarry, ore is hosted in thin-bedded limestone and siltstone of the upper plate transitional assemblage (Vinini Fm.(?)) along the southwest edge of the Carlin window. The deposit is characterized by extreme structural preparation, with structurally induced permeability along N 40 E faults and fault intersections being the prime control of gold mineralization. Decarbonation of limestone and strong argillic alteration are the main alteration effects; silicification is less intense than at Gold Quarry, but is still an important feature. The ore is enriched in arsenic, antimony, mercury and thallium.

Originally defined reserves were estimated at 4.5 million tons grading .089 opt gold in the main pit and .31 million tons grading .105 opt gold in the west pit. The mine was operated from 1979 until 1986 when pit-wall failures slid about 600,000 tons of waste over the remaining reserves (McFarlane, 1987). The Maggie Creek pit will eventually merge with the expanding Gold Quarry pit.

277.9 Elko County line.

279.4 EXIT 279 WEST CARLIN. We are now crossing the axis of the CARLIN TREND, one of the most prolific gold-producing belts in the world, containing over 20 million ounces of gold in at least 14 deposits (Knutsen, 1987). The Carlin Trend extends from the Rain mine on the southeast for 38 miles in a N 35 W direction to the Dee mine on the northwest, and includes, from SE to NW, the Gold Quarry/Maggie Creek, Carlin, Bluestar, Genesis, Goldstrike/Post and Bootstrap mines as well as a number of prospects and developing deposits including Gnome, Pete, Bullion-Monarch, Northstar, Bobcat, Lantern and Capstone. The Carlin gold belt lies within the broader Lynn-Railroad belt defined by Roberts (1960) based on the northwest alignment of mining districts and erosional windows of lower plate carbonate rocks below the Roberts Mountains thrust. Roberts (1986) attributes the windows to erosion of highly fractured domal uplifts developed over intrusive bodies which were emplaced along major northwest-trending fracture zones. Knutsen, et al (1987) divided the Carlin Trend into 6 geological subdistricts, each characterized by differences in host lithology, structural controls, alteration assemblage, or style of mineralization (fig. 23). The 6 subdistricts, from SE to NW are Bullion (Railroad), Rain, Maggie Creek, Lynn, Bluestar-Goldstrike and Bootstrap.

Tomorrow we will visit mines within the Bluestar-Goldstrike and Bootstrap subdistricts. The Bluestar-Goldstrike subdistrict is distinguished from the Lynn (Carlin Mine) district by the spatial distribution of deposits around the Jurassic-Cretaceous Goldstrike granodiorite stock and the occurrence of deposits in both upper-plate and lower-plate rocks. At the BLUESTAR mine low-grade (.015-.059 opt gold) leaching ore occurs in both upper plate and lower plate units associated with clay seams and argillization developed along faults, fractures and bedding planes. Higher-grade (.060 opt gold) milling ore is hosted in pervasively argillized and/or weakly silicified silty limestone of lower-plate Popovich facies equivalents. Ore distribution structurally controlled by the Roberts Mountains thrust and numerous anastomozing high-angle faults (Zimmerman, 1987). The GENESIS mine contains proven, mineable reserves of 12.68 million tons grading .091 opt gold. Gold mineralization occurs in highly fractured to brecciated, argillized Devonian-Silurian limestones beneath the Roberts Mountains thrust. The ore body is localized in the footwalls of the N 10 W

trending "Gen" fault and the N 40 E trending "K" fault zones. The GOLDSTRIKE/POST ore body is hosted within decarbonatized and argillized, silty and arenaceous limestones of the upper-plate Ordovician Vinini Formation, which provide lithologic control. Structural preparation is provided by complex faulting developed at the intersections of the north-northwest trending main feeder zone with northwest and northeast-striking faults (Knutsen et al, 1987). American Barrick has intersected thick sections of high-grade ore at depths of 800-1700 ft and is considering an underground mine to produce 300,000 oz gold per year. The Post open-pit will be operated as a joint venture between American Barrick and Newmont and will produce 120,000 oz gold in 1988 (Reno Gazette-Journal 9-15-87).

The Bootstrap subdistrict lies north of the Bluestar-Goldstrike subdistrict along the Bootstrap window. At the BOOTSTRAP mine a relatively narrow steeply dipping ore body was mined between 1974 and 1982. Gold mineralization occurred as disseminations within silicified Devonian Bootstrap limestone, a debris-flow unit of the Ordovician Vinini Fm and, to a minor extent, in dikes of argillized dacite porphyrhy. Ore was strongly structurally controlled along a north-northwest trending fault zone. Newmont recently announced high-grade drill intercepts on the CAPSTONE prospect, where bold jasperoid crops out a short distance north of the Bootstrap pit along the same structure. The DEE mine is the northern most producing ore body in the Carlin trend. The deposit is grossly similar to Bootstrap. Ore occurs mainly in the Bootstrap limestone as structurally controlled steeply dipping irregular tabular bodies. Silicification and argillization of originally calcareous siltstones and limestones are the dominant alteration affects. (Ellis, 1986).

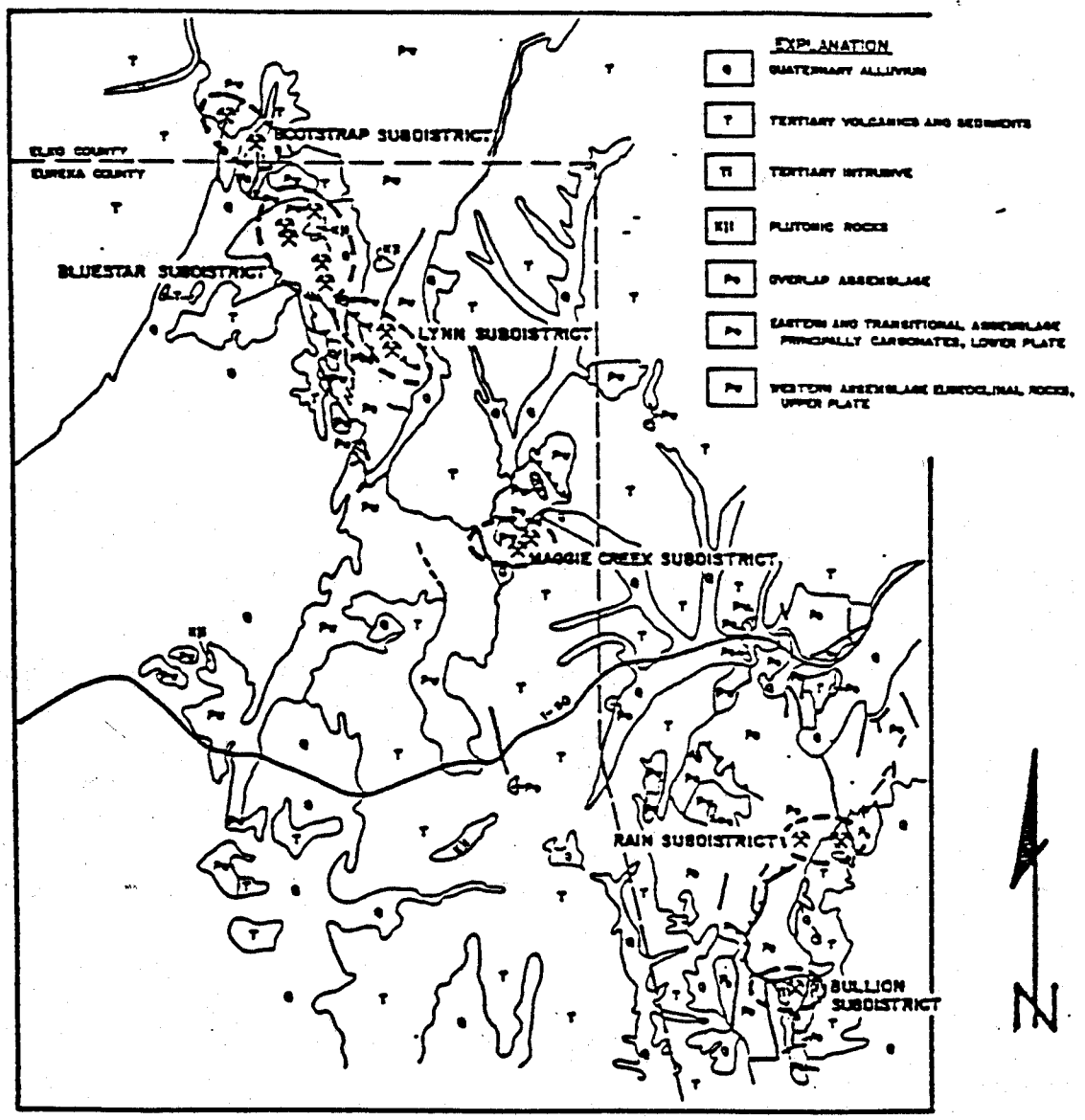
279.6 Looking back to the left at about 8:00 the Carlin No. 2 mill at Gold Quarry can be seen briefly as we ascend the hill past the West Carlin Exit. The mill was commissioned in September 1985 to treat higher grade (greater than .06 opt gold) ore from Gold Quarry and Maggie Creek. The mill was designed to handle 7,000 tpd ore but has been operating at the rate of 9,000 tpd and further expansion is planned.

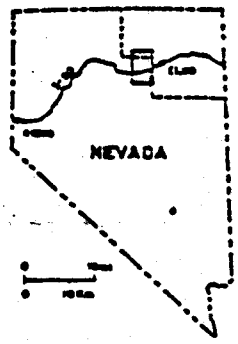
280.0 Between milepost 280 and exit 280 the newly constructed access road to Newmont's RAIN mine is visible on the right (south) in front of the pyramidal peak on the skyline (Pine Mountain). The Rain deposit contains reserves totalling one million ounces of gold in 14.2 million tons of ore averaging. .071 opt gold (Reno Gazette-Journal, 11-17-86). Mining is scheduled to commence early in 1989.

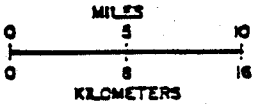
The Rain orebody (fig. 24, 25) is an epithermal disseminated gold deposit located near the base of the Mississippian Webb Fm where it unconformably overlies the Devonian Devils Gate Limestone. The Webb Fm is part of the overlap assemblage consisting of siliceous clastic material shed off the Antler Highland into the Foreland basin. Dominant lithologies are siliceous mudstones, claystones and siltstones. Gold mineralization occurs in the hanging wall of a west-northwest trending high-angle reverse fault which is the dominant ore controlling structure (fig. 25). Ore occurs within the fault and penetrates outward into the Webb Fm for up to 500 ft away from the fault. Alteration consists of oxidation, silicification, argillization and baritization. (Thoreson, 1987).

A bold northwest-trending jasperoid containing up to .48 opt gold crops out along the trace of the reverse fault for a distance of over 2,000 ft. The jasperoid is highly baritic and was originally staked as a barite prospect. Mercury and arsenic are highly anomalous within the jasperoid. The surface expression above the disseminated ore body consists of bleaching and hematite staining of the Webb Fm.

Figure 23. After Knutsen, (in press)







GENERALIZED GEOLOGY MAP
OF THE CARLIN TREND
EUREKA AND ELKO COUNTIES, NEVADA

GEOLOGICAL SOCIETY OF NEVADA

1988 FALL FIELD TRIP GUIDE BOOK

GOLD DEPOSITS OF NORTH CENTRAL NEVADA

Marigold
Cove
McCoy
Rain
~~Suprise~~
Surprise

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