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GEOLOGY OF THE BLUESTAR GOLD DEPOSIT

Charles Zimmerman
Newmont Exploration Ltd.

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Introduction

The Bluestar gold mine (Fig. 1) is located in Section 4, T35N, R50E, approximately 23 miles (37 km) northwest of Carlin, Nevada. It is situated within the northwest corner of the Lynn structural window, which contains the Carlin gold mine. Originally known as the Number 8 mine, the property was mined for gem-quality turquoise starting in 1929. Low-grade gold was recognized in 1959, and a small cyanide plant yielded low Au recoveries due to Cu-bearing clays in the ore. Newmont Mining Corporation acquired the property in 1968 and began open-pit mining in 1974 from three separate orebodies with initial mineable reserves of 1.8 million tons grading 0.12 opt gold. Reserves as of July 1986 stand at 196,000 tons at 0.106 opt Au from the south and east pits, and 573,000 tons at 0.124 opt Au from the north pit. Drilling to define ore extensions around the Bluestar mine is ongoing.

Geology and Mineralization

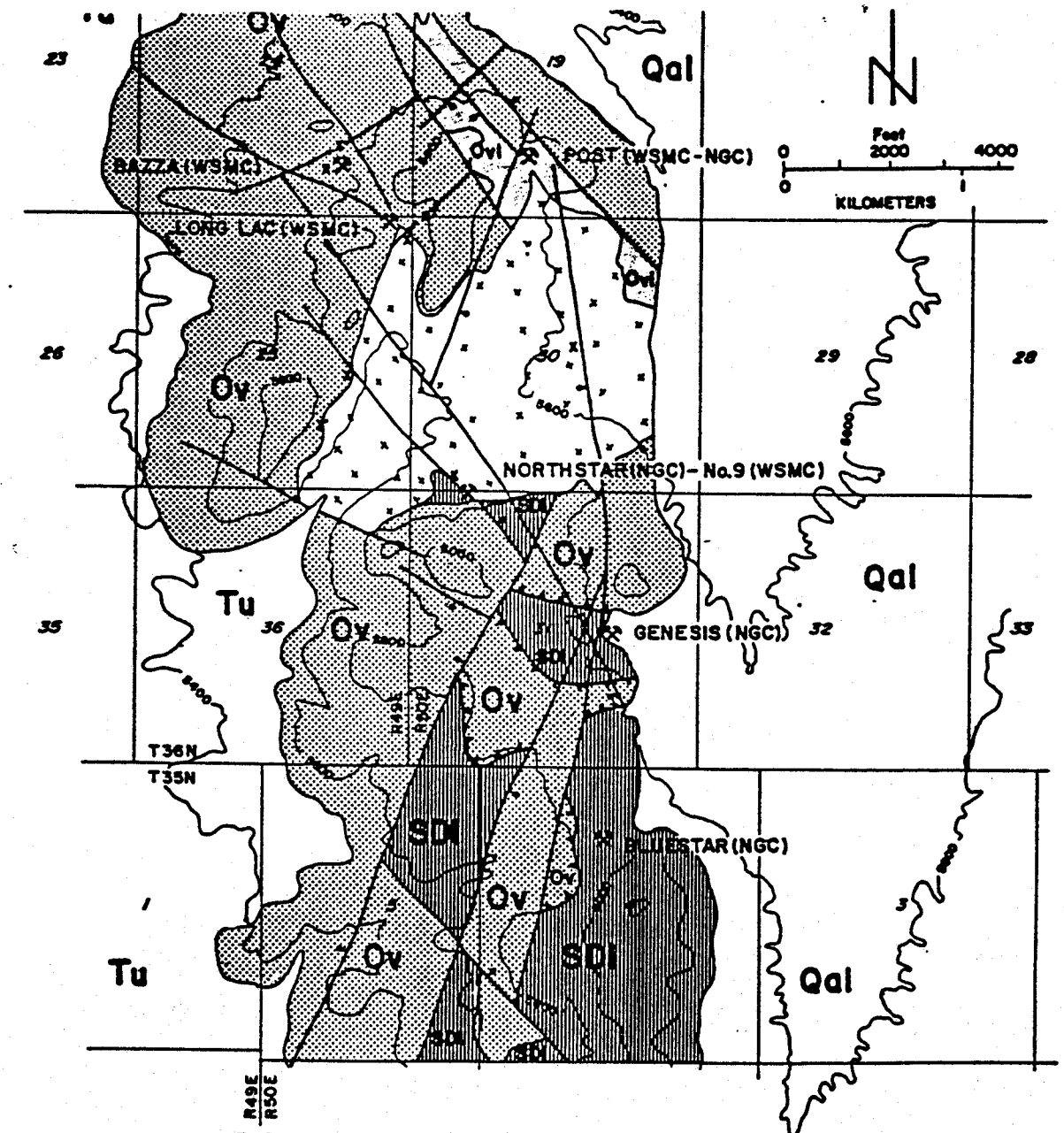
The setting for gold mineralization at Bluestar is related to the structural juxtaposition of the Roberts Mountains thrust fault and younger high-angle faults. Within the narrow northwest extension of the Lynn Window, the thrust fault has an undulatory surface with dips ranging from flat-lying to greater than 50 degrees. Within the Bluestar mine, the thrust plane exhibits structural relief of greater than 500 feet, as seen in its exposures in the south pit and island area and its trace under the north pit determined by exploration drilling (Fig. 2). South and east pit orebodies lie immediately below the thrust fault, while mineralization in the north pit resides directly above the thrust.

Disseminated gold ore is hosted within two different lithologic types at Bluestar. Rocks exposed in the south and east pits consist predominantly of massive Devonian limestones, part of the lower plate of the Roberts Mountains thrust fault. These rocks are variably carbonaceous, laminated, metamorphically recrystallized, and locally fossiliferous. Progressive decarbonitization and recrystallization occurs from west to east in the limestones, with the development of tremolite, chlorite, diopside, and calcite. A series of WNW to NW anastomozing high-angle faults have produced a zone of intense hydrothermal argillic alteration in the limestone host associated with gold mineralization. Submicron size gold is found within the lattices of montmorillonite and kaolinite clays. This clay alteration exhibits localized weak to strong limonite with lesser amounts of copper and iron-arsenic oxides. Clays along fractures and joints in relatively unaltered limestones also contain gold. The intersection in the south pit of the above-mentioned fault zone, the Roberts Mountain thrust fault, and NNE trending normal faults that continue into the north pit, was the focus of very high gold concentrations (up to 80 opt in 20-foot blast hole composites) with visible mm-size gold.

Several lithologies belonging to the upper-plate Ordovician Vinini Formation occur in the Bluestar north pit: quartzites (silicified arenites), cherty argillites, and variably silicified and argillized siltstones. The quartzite unit acts as a marker bed, indicating the sole of the Roberts Mountains thrust. All of these rocks exhibit textural gradations between each other and may be in stratigraphic or disconformable structural thrust contact with one another. Bedding characteristics in these units range from very thin-bedded to massive and blocky. Gold mineralization primarily is associated with: limonitic clays in NW to NE trending fractures, faults, and joints in the silicified and well-indurated rocks; argillization along bedding in the siltstones and argillites; and, to a lesser degree, pervasive silicification and quartz veins in all lithologies. The long dimension of the north pit, the major dike-filled structures observed therein, and the variography of its orebody trend in a NNE direction.

The Bluestar mine contains a relatively large volume of igneous rocks, predominantly exposed as dikes, that have been hydrothermally altered to some extent. These rocks are compositionally intermediate diorites to possibly quartz latites, are of probably Juro-Cretaceous age, and may be related to the large intrusive exposed in the Goldstrike deposit to the north. The most common textural variety is a porphyry with sericitized and kaolinitized plagioclase and biotite phenocrysts set in an argillized very fine-grained, variably resilicified, groundmass. Gold mineralization occurs sporadically within these dikes, especially where they are cut by faults and shear zones.

In summary, disseminated gold mineralization and related hydrothermal events at Bluestar were structurally controlled processes that occurred within two very different host lithologies. Gold-bearing fluids utilized preexisting high-angle faults to deposit argillic ores and clay alteration assemblages within ore zones above and below the Roberts Mountains thrust fault. Siliceous ores and silica alteration were volumetrically less important.



EXPLANATION

- DEPOSITS > 3 TONNES GOLD
- DEPOSITS .3 TO 3 TONNES GOLD

QUATERNARY		Qal	ALLUVIUM
TERTIARY		Tu	UNDIFFERENTIATED
JURASSIC-CRETACEOUS		JKgd	GRANODIORITE
ORDOVICIAN		Ov	VININI FORMATION SILICEOUS ROCKS (Ovcs)
ORDOVICIAN		Ovl	VININI FORMATION CALCAREOUS ROCKS (Ovss/Ovl)
			ROBERTS MOUNTAINS THRUST
SILURIAN-DEVONIAN		SDI	MIOGEOCLINE LIMESTONE

GENERALIZED GEOLOGIC MAP OF THE BLUESTAR-GOLDSTRIKE SUBDISTRICT EUREKA COUNTY, NEVADA

GEOLOGICAL SOCIETY OF NEVADA

1987 FIELD TRIP GUIDE BOOK

— NORTHERN CARLIN TREND
Bluestar, Genesis, Goldstrike/Post,
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