

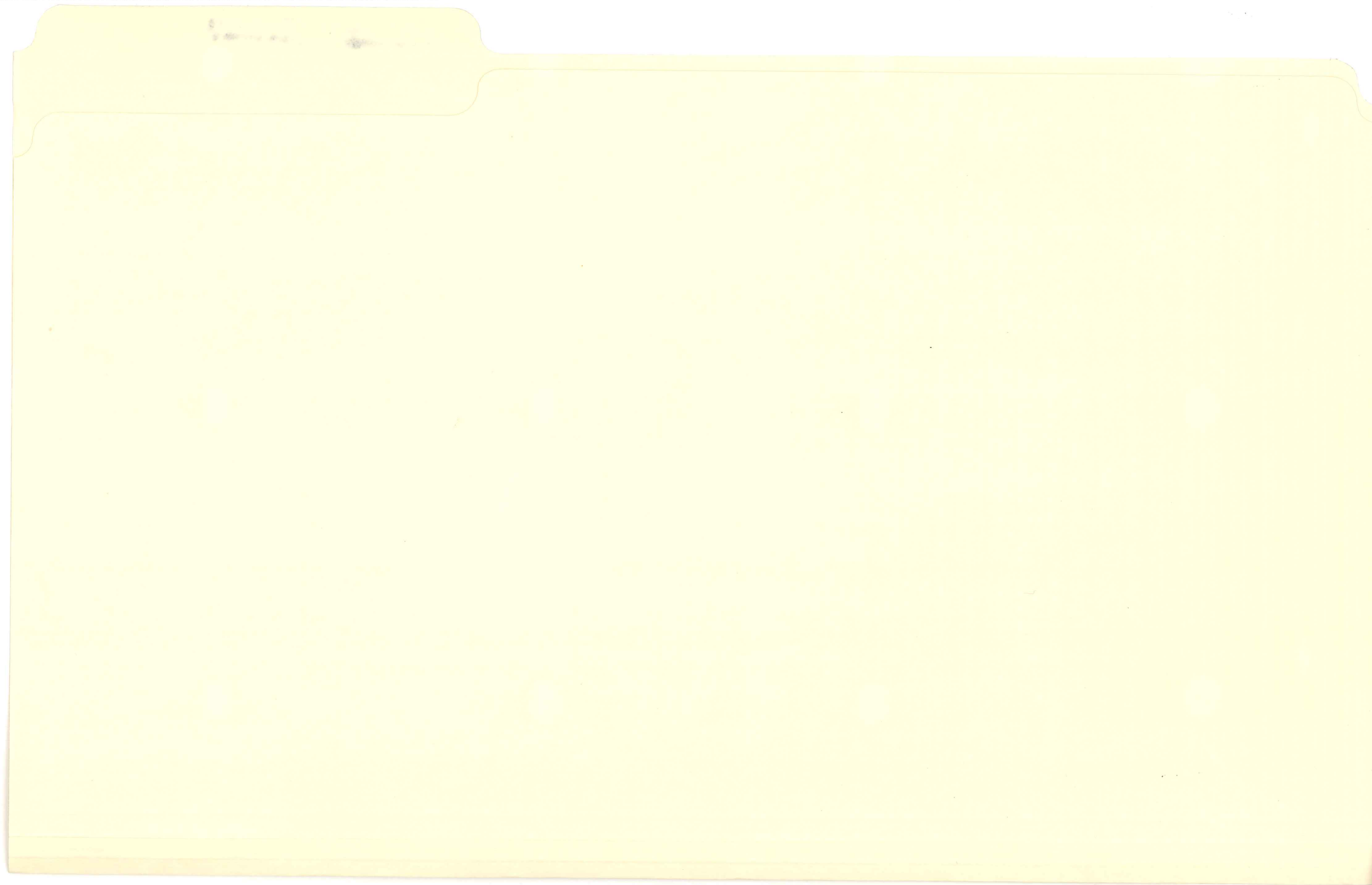
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Keep docs at about 250 pages if no oversized maps attached
(for every 1 oversized page (>11x17) with text reduce
the amount of pages by ~25)

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Discovery and Geology of Gold Mineralization at the Rosebud Project, Pershing County, Nevada.

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Abstract

The Rosebud district is located in the Kamma Mountains, southeast of the townsite of Sulphur, Nevada. Since discovery in 1989, LAC Minerals, in joint venture with Equinox Resources, has delineated a resource containing approximately 570,000 ounces of gold and 5,500,000 ounces of silver. The deposit is of the volcanic-hosted epithermal quartz-sericite type. Mineralization occurs in tabular zones in and along the hanging wall of the South Ridge fault, and in cross-cutting high-angle structures. Multiple stages of discontinuous stockwork gold- and silver-bearing quartz-calcite-clay veins cut variably clay-altered, silicified, and sericitized rhyolitic Miocene volcanic rocks.

Introduction

The Rosebud project is located in northern Pershing County, approximately 50 miles NNW of Lovelock, Nevada (Figure 1). The Rosebud district was discovered in 1906, and has a recorded production of 3,700 ounces Au and 116,000 ounces Ag between 1908 and 1947 (Johnson, 1984). Most of the production was from the Dreamland mine, located approximately 3000 feet northwest of the current resource at Dozer Hill. Modern gold exploration in the district began in the late 1970's, and several major mining companies conducted exploration programs prior to LAC's involvement in the district.

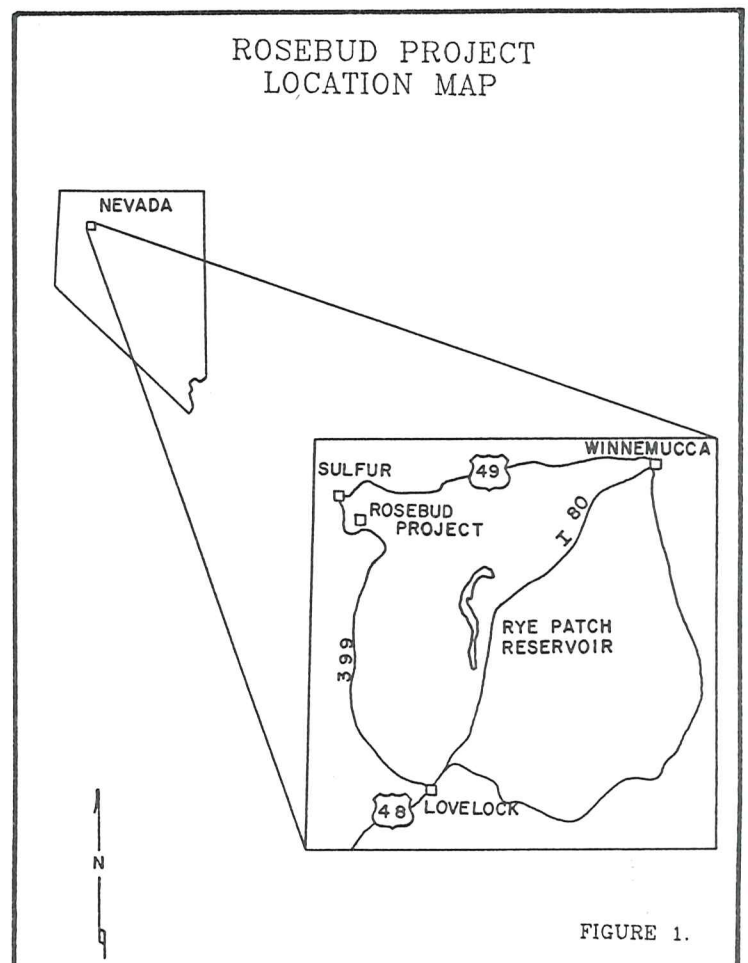
LAC's interest in the region was generated out of a regional reconnaissance program in 1987. In 1988 LAC Minerals began acquiring a land position in the district through claim staking and various property agreements, including the joint venture with Equinox Resources. Currently LAC controls approximately 10,000 acres, covering most of the northern Kamma Mountains. Evaluation of the property began in 1988 with geologic mapping, soil and rock chip geochemical sampling, and geophysical surveys, including airborne magnetics and IP. Initial drilling in 1989 was targeted on the basis of a multi-element soil anomaly in a previously untested area southwest of Dozer Hill. Ore-grade mineralization was encountered in the hanging wall of the South Ridge fault in the third hole (55 feet at 0.120 opt Au). Drilling has continued to the

present, with a total of 235 holes in the Dozer Hill area, which have outlined a geologic resource of 570,000 ounces of gold at a 0.1 opt cut-off.

Regional Geologic Setting

The Kamma Mountains are located on the southeast side of the Black Rock Desert, in a region of Tertiary basin and range extension. The Tertiary-age Kamma volcanics were deposited in a north-trending caldera-like subsiding trough developed in a Jurassic-Triassic basement sequence of pelitic metasediments. The Kamma Mountains are bounded on the east by the Kamma fault, which juxtaposes the youngest volcanics next to the basement rocks. On the west side of the range, the Kamma Mountains are bounded by NNE trending rangefront faults.

The oldest rocks in the district are folded and faulted Jurassic-Triassic carbonaceous metasedimentary rocks of the Auld Lang Syne Formation (Johnson, 1977). Unconformably overlying the metasediments, the Kamma volcanic sequence is composed of a thick section (>7000') of flows, pyroclastic, and

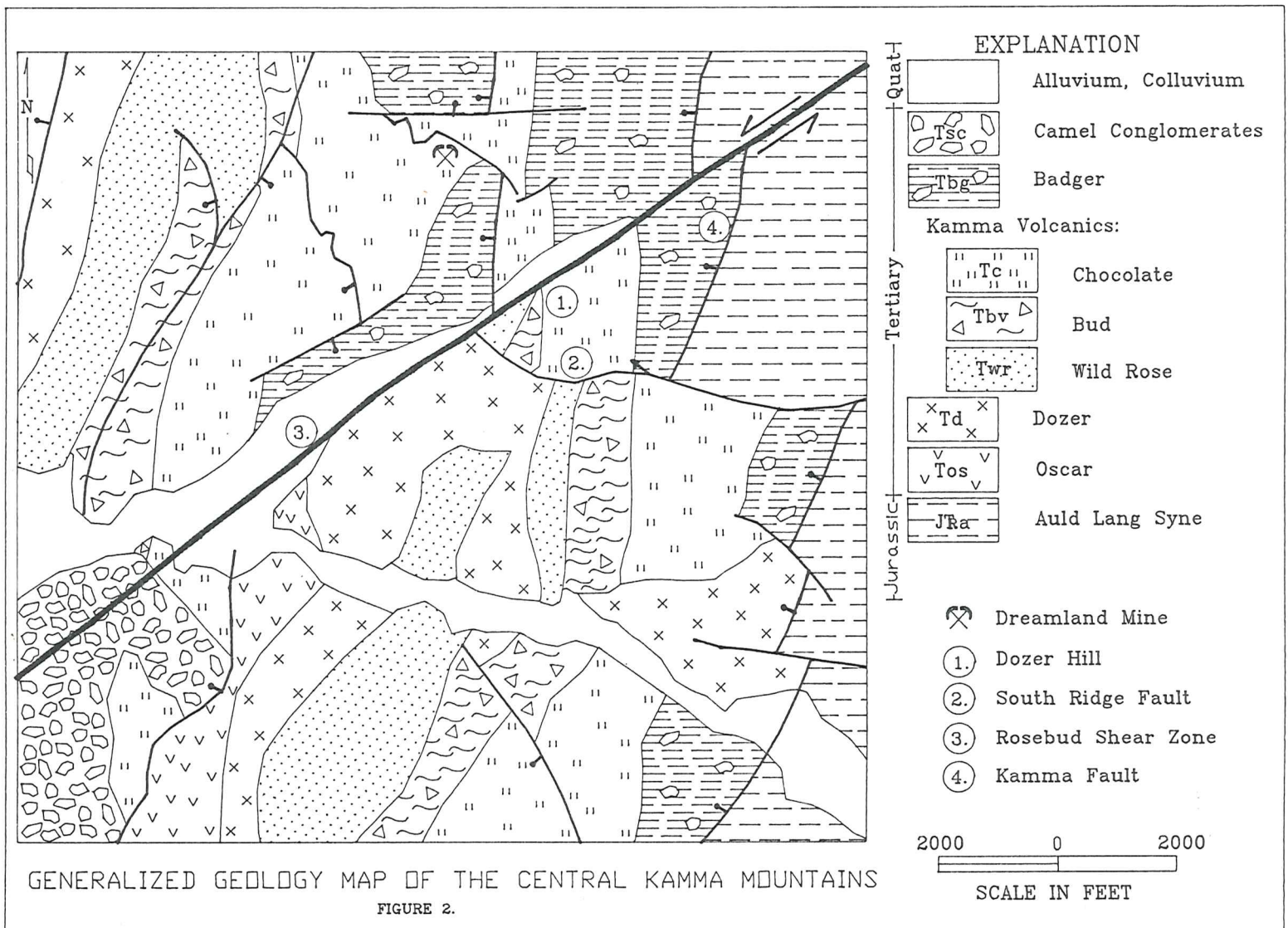


epiclastic rocks, generally of quartz-latite to rhyolite composition (Figure 2). LAC geologists have broken the undifferentiated Kamma volcanics into mappable stratigraphic units, these unit names will be described and used throughout this paper. At the bottom of the volcanic pile is the Oscar Sequence, which grades upwards from Triassic pebble conglomerates interbedded with tuffaceous sediments, into a series of andesitic flows. The Oscar Sequence thins to the north, and is overlapped by the Dozer Formation. The Dozer Formation consists of a rhyolitic fine-grained flow dome complex, and varies in thickness from approximately 800 to 1800 feet. Flow dome breccias, probably equivalent to the Dozer Formation, occur locally. Considerable topographic relief was developed on top of the Dozer Formation before the volcanics of the Kamma Formation were deposited.

The Kamma Formation can be subdivided into three units; from base to top these are: the Wildrose, the Bud, and the Chocolate Members. These volcanic units are all similar in composition, consisting of quartz-latite to rhyolite flows and volcanic breccias with interbedded water-lain pyroclastics, often green in color. The Wildrose unit consists of an approximately 1300 foot thick sequence

of dense dark fine-grained flows and volcanic breccias, locally with interbedded green clastic units. In the Dozer Hill area, the upper part of the Wildrose unit is the main host for mineralization. The Wildrose is transitional into the overlying Bud unit. The Bud is a key marker unit in the Kamma volcanics, generally displaying a distinctive green color. Bud volcanics consist of water-lain bedded pyroclastic breccias and epiclastics (with a celadonite/ glauconite clayey matrix), interbedded with fine-grained flows. Individual beds within the Bud are often discontinuous, having been deposited in local depressions. The contact between the Bud and the overlying Chocolate Member is gradational. The Chocolate Member consists of at least 1500 feet of porphyritic quartz-latite flows and volcanic breccias, and is the uppermost unit in the Kamma Formation. Unconformably overlying the Kamma Formation is the Badger Formation, a thick pile of volcanoclastic sediments with a distinctive red silt matrix.

Late Tertiary extensional tectonics have tilted the range to the east, and created a complex pattern of NE, NW, and E-W low- to high-angle faults. The most prominent regional structure is the Rosebud Shear zone, which trends N60E, appears to dip moderately to the

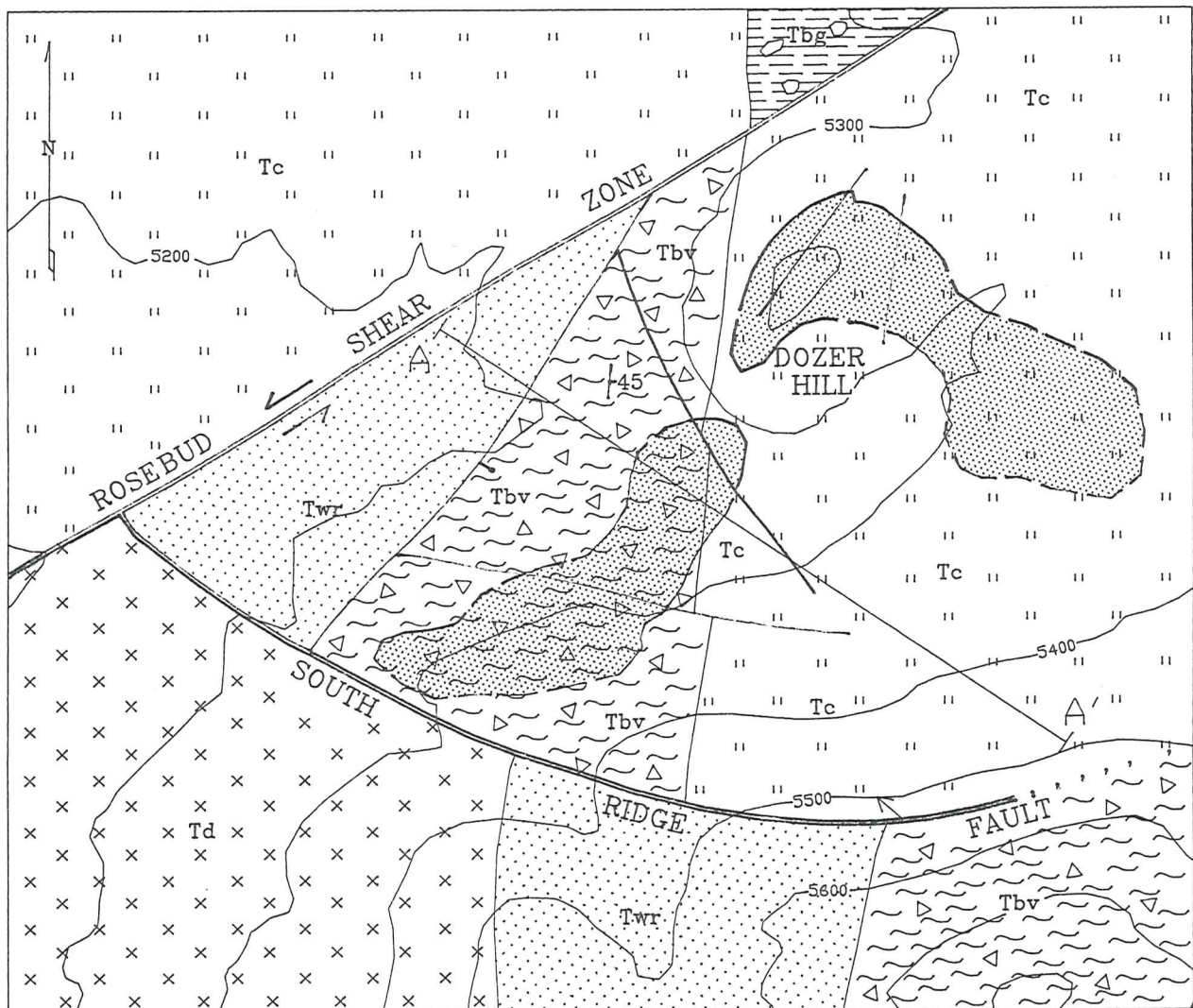



northwest, and has about 5000' of apparent left lateral displacement. Part of the left lateral movement on the eastern side of the range is taken up by the South Ridge fault, which strikes east-west and dips 25° to 45° to the north.

Geology and Mineralization of the Dozer Hill Area

The Dozer Hill area is bounded on the north by the Rosebud Shear zone and on the south by the South Ridge fault (Figure 3). Mineralization is hosted by the Wildrose Member of the Kamma Formation, and is localized in structural zones associated with the South Ridge fault. The South Ridge fault is expressed at the surface by a series of intensely silicified ribs; at depth the fault varies from calcite-rich to clay-rich to strongly silicified breccias. Mineralization occurs near the intersection of the South Ridge fault with high angle NE and NW structures, in favorable stratigraphy.

Dozer Hill mineralization can be divided into two areas: the Main zone and the East zone. Mineralization in the Main zone occurs in the hanging wall of the South Ridge fault, and is confined to the upper Wildrose unit, 10 to 200 feet below the contact with the overlying Bud unit (Figure 4). The Main zone is 1800 to 2000 feet long, and averages 250 to 300 feet wide and 25 to 45 feet thick. The orebody plunges 20° to 25° N35E (the orebody is 200 feet below the surface at the SW end, and 900 feet deep at the NE end). The NNE trend of the Main zone is defined by the intersection of the favorable hanging-wall wedge of the Wildrose unit (N15E, 42°E) with the north-dipping low-angle South Ridge fault. The Wildrose is a hard, dense unit, and fractures brittly, creating open spaces for ore deposition. Mineralization is localized within tabular, shallow to moderately dipping bodies, probably in tensional fractures antithetic to the South Ridge fault. The overlying Bud unit is relatively soft with a green clayey matrix, which deforms ductilely. Possibly the Bud has acted as



 SURFACE PROJECTION OF ZONE OF ≥ 0.05 Au

NOTE: For explanation of rock types see Figure 2.

500 0 500
SCALE IN FEET

DOZER HILL GEOLOGIC MAP

FIGURE 3.

an aquiclude to confine and concentrate mineralizing fluids in the Wildrose. Dense, weakly altered fine-grained flows of the Dozer Formation occupy the footwall of the South Ridge fault in the main zone.

The East zone ore body is tabular, approximately 400 feet by 600 feet in plan, and 15 to 45 feet thick. The zone dips slightly to the north, and is elongate in a northwest direction. Mineralization is localized within, and in the footwall of the South Ridge fault. In the East zone, the footwall is the Wildrose unit, and it is often mineralized for up to 100 feet below the fault, generally along low-angle fractures sub-parallel to the South Ridge fault. Chocolate volcanics occupy the hanging wall in this area, and contain only narrow mineralized fractures.

Alteration in the Dozer Hill area is characterized by widespread bleaching and sericitization. Local areas are variably clay-altered, silicified, and brecciated. The ore is characterized by a crude stockwork and micro-veining of quartz, calcite, clay, pyrite, and marcasite. Gold and silver minerals include electrum, auriferous silver, and silver-bearing selenides and sulfosalts, which are generally contained in narrow discontinuous veinlets (less than 1 cm. thick) or in strongly clay altered rocks. Silver to gold ratios are highly variable, but average 10:1 overall. Elevated levels of Hg, Se, As, and Sb have been correlated with mineralization.

Currently, a total of 155,613 feet has been drilled in 235 holes in the Dozer Hill area. Fifty percent of the drilling has been core (78 holes totalling 54,173 feet), the rest were reverse-circulation. Using a cut-off of 0.1 opt gold, the drill-indicated geologic resource as of January 1992 is 1,746,000 tons containing 570,000 ounces of gold with an average grade of .326 opt Au, and 5,500,000 ounces of silver, at 3.15 opt Ag. Exploration activities are continuing on the Rosebud project, and permitting is currently in progress.

Acknowledgements

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