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THE DISCOVERY AND GEOLOGY OF THE NIGHTHAWK RIDGE DEPOSIT AT EASY JUNIOR, WHITE PINE COUNTY, NEVADA

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The Nighthawk Ridge deposit at Easy Junior is a sediment-hosted disseminated gold deposit located at the northern end of the Railroad Valley approximately 30 miles southeast of Eureka, Nevada. The orebody lies at the southeastern end of the Cortez gold trend in T.15N., R.55E., Section 9, Mt. Diablo Base and Meridian.

At least six companies explored the property between 1979 and 1986 before Echo Bay (then Tenneco) discovered the deposit, through an extensive rock-chip and soil sampling program. The 39th hole intercepted 320 feet of 0.066 opt Au. Surface projection of the orebody measures approximately 500 feet by 2,000 feet. As of February 1989, the minable reserve of the Nighthawk Ridge deposit is estimated at over 200,000 ounces of gold. The deposit is currently being developed through a 60-40 joint venture (Alta Bay Joint Venture) with Alta Gold Company being the operator.

The stratigraphy of the property is composed of a series of Upper Devonian through Mississippian carbonate and siliclastic-shale sequences deposited east of the Antler orogenic high. Gold mineralization is primarily hosted in the Chainman Shale and Joana Limestone which are deformed by northeast-striking anticlinal folding and repeated by reverse faulting (Figure 1) related to the Antler orogeny. Some normal faulting is also evident.

Compressional faults were reactivated by Basin and Range extensional activity at which time auriferous hydrothermal fluids were introduced. Gold mineralization is thickest where the northeast striking feeder fault is offset in a left-lateral en echelon fashion. En echelon faulting was responsible for structurally disrupting the rock and imparting secondary porosity and permeability characteristics to an otherwise tight shale. The Joana Limestone acted as a porous medium and disseminated gold mineralization mimics the anticlinal fold pattern. Tertiary intrusive or volcanic rocks have not been found anywhere within the vicinity of the Nighthawk Ridge deposit.

Surface expression of the deposit is concealed by a thin veneer of Quaternary gravel. Mineralization and alteration are confined to several small outcrops (40 x 50 feet) exposed by a minor arroyo incising the gravel. The discovery outcrop is a maroon to pale gray liesegang banded silicified Chainman mudstone containing barite with admixed clay and silica on fractures. Limonite is late in the paragenetic sequence, occurring on fractures that cut the liesegang bands. The average elemental content of 32 rock-chip samples collected from the discovery outcrop is 518 ppb gold, 850 ppb mercury, 470 ppm arsenic, and 12.3 ppm thallium. Silver is not important in the system.

Supergene weathering has altered the characteristically black shale to a slightly bleached-tan or buff color at the surface to a depth of approximately 60 feet. However, extreme oxidation and silicification is increasingly present near the main feeder fault, which acted as a hydrothermal conduit. The interface between the oxidized and unoxidized rock is usually razor sharp. Alteration more-or-less conforms to the anticlinal fold of the Joana Limestone east of the feeder fault and forms a core zone that crops out near the northeast striking feeder (Figure 1). Over 50% of the deposit is oxidized; the remainder is a reduced silty limestone of the lower Chainman.

Silicification is the primary form of alteration within the deposit. Silicification and liesegang banding occur concomitantly in the Chainman Shale. Hematite is thought to be transported and related to the hydrothermal destruction of diagenetic pyrite within the rock. The Joana Limestone and associated bioclastic debris have undergone ubiquitous jasperization. The jasperoid is characterized by glassy-translucent silica replacement of the original calcium carbonate fabric and commonly displays recurring brecciation. Iron oxides associated with the jasperization process are strongly limonitic particularly near the upper contact of the Joana Limestone and grade downward to hematitic.

Argillization accounts for less than 25% of the alteration within the orebody and is confined to portions of the Chainman Shale. It is caused by the hydrothermal degradation and destruction of diagenetic clay and detrital feldspar and the formation of secondary phyllosilicates.

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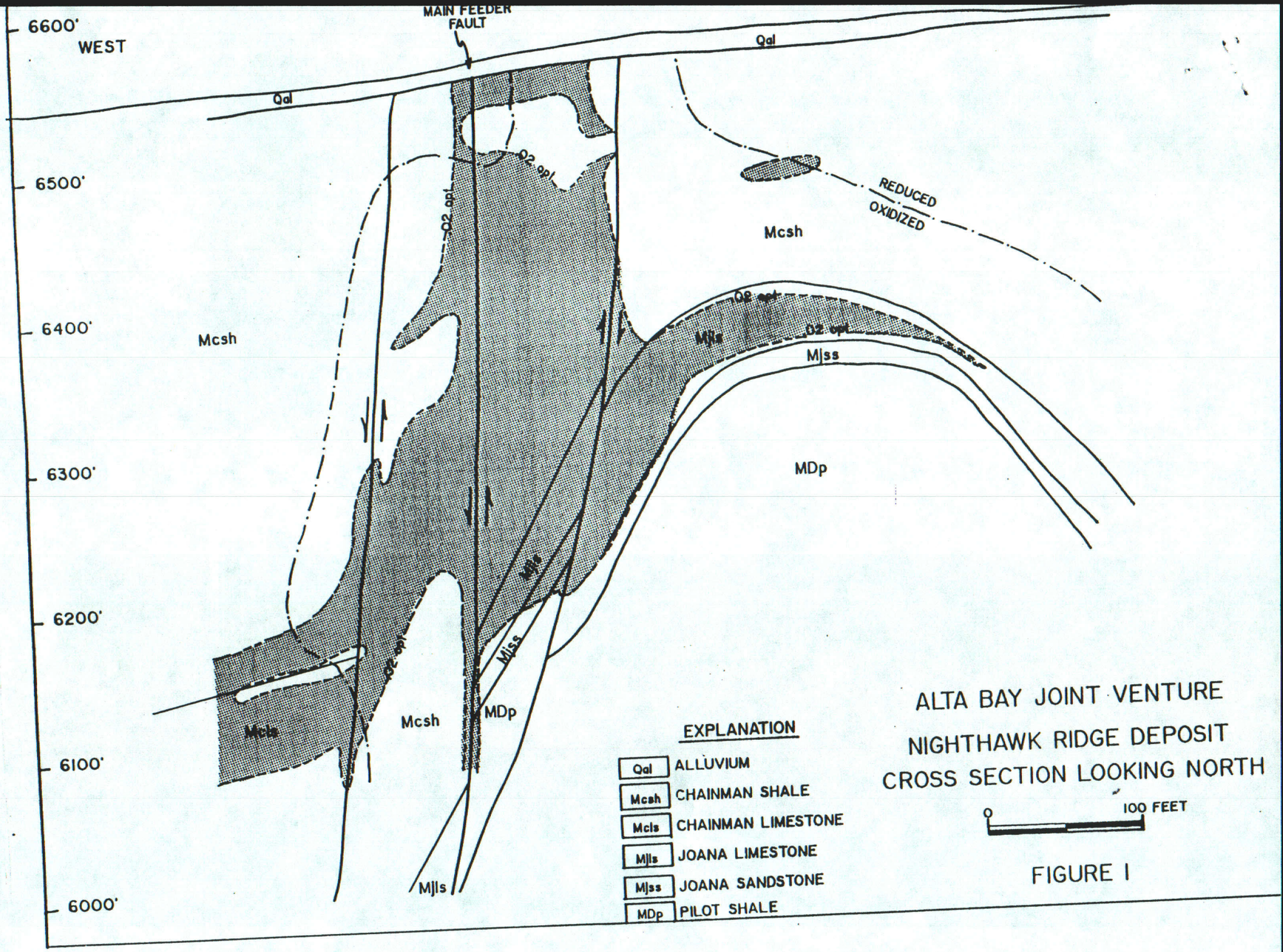
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MDp PILOT SHALE
ALTA BAY JOINT VENTURE
NIGHTHAWK RIDGE DEPOSIT
CROSS SECTION LOOKING NORTH
0
100 FEET

FIGURE 1