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Mr. Rutherford May
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November 16, 1970

Dear Rutherford:

This letter is in response to your request for a program of investigation of the economic feasibility of the ore deposits in the Atlanta District, Lincoln County, Nevada. The priorities are based on my direct involvement in the efforts to bring about successful operations in the district in the past decade, and on my understanding that the area which you now control through lease and option includes all of the structural trend which includes the Atlanta Mine, the Bradshaw development, and other prospects.

The Atlanta structural trend is a major basin and range type fault with an unusual configuration accompanied by extreme brecciation, locally extensive silicification, and persistant gold-silver-uranium mineralization. The fault trend is about N 20° W in the vicinity of the Atlanta Mine, N 55° W at the Hulse (Minnie) Shaft 3,800 feet to the south and east, and about N 80° W at the Bradshaw Adit, which lies an additional 3300 feet to the south and east. At the Atlanta and Bradshaw exposures, Ely Springs dolomite (Ordovician) is in contact with Tertiary porphyritic rhyolite, with the dolomite on the northeast, the volcanics to the southwest. At the Hulse shaft prospect, the Ordovician Eureka quartzite lies to the northeast in contact with altered volcanics (?) to the southwest. The attitude of the contact is about 45° westerly at the Atlanta, vertical at the Hulse Shaft, and about 45° northerly at the Bradshaw Adit. The line of the fault is offset by east-west cross faults at least twice between the Atlanta and the Bradshaw by an apparent right-lateral horizontal displacement close to the south of the Atlanta and by a vertical displacement between the Hulse and Bradshaw prospects, downward on the south side.

The volcanic rocks are of two distinct classes. One which seems to be associated with major breccia zones is a porphyritic, extremely fine grained rhyolite which, in very limited exposures, may be interpreted as pipe-like intrusives along the fault line preceeding major movement and brecciation. The other class is a nearly horizontally layered layered rhyolitic ash with a few included flow layers as at Greek Hill. More than 90 % of the volcanic rocks are on the southwest side of the fault.

Mineralization along the Atlanta Fault included intense silicification over a protracted period of time with recurrent fracturing and silicification; pyrite, which has since oxidized to iron oxides and sulfates, and gold and silver in very fine particles widely distributed. At the Hulse Shaft, green silver halides are visible in cavities, but elsewhere the precious metal content is invisible, although "flour gold" can be concentrated by panning.

The groundwater table is very deep; the rocks are drained to the depths of local valleys by the cavernous dolomite. The dolomite, particularly where it

Geologic recommendations for the Atlanta-Bradshaw District (continued)

underlies the mineralized breccia, has been extensively dissolved by the action of acidic solutions derived from the oxidation of pyrite. Unequal solution along the fottwall of the breccia zone has resulted in open caverns and reduction of solid dolomite to dolomitic sand and residual silt. Such reduction in volume has caused the overlying breccia to collapse irregularly, creating a chaotic fragmentation of the breccia with a gouge-like matrix resulting from in-washing of silt from the erosion surface. In contrast, at the Bradshaw adit where the dolomite overlies the mineralized breccia zone, acidified ground water could attack only the relatively insoluble porphyritic footwall. The breccia zone, in consequence, remains relatively unbroken.

Drill exploration of the breccia zone has been largely limited to the Atlanta ore body, where it has been beset with such troubles as "stuck-steel and lost circulation. Recent "down-the-hole hammer drilling" for the Golden Cycle Corporation appears to have largely surmounted these difficulties, penetration having continued through most of the breccia zone in most of the holes and through all of the zone in a respectable minority of attempts. Apparently the considerable mass of the hammer directly behind the bit inhibits deflection during angular entries into successive breccia blocks, preventing excessive weaving and binding of rods in the hole.

Golden Cycle's hammer drill exploration confirmed the ore reserve estimates of the Atlanta Gold and Uranium, RFC, Camp Bird and Hoover Construction investigations, extending them to nearly 1½ million tons containing 0.16 oz. per ton of gold and 1.7 oz. per ton of silver between surface and 50 feet below the 200 ft. level. At present market prices of $37.50 per ounce of gold and $1.80 per ounce of silver, the gross value is slightly more than $9.00 per ton. Past metallurgical testing of totally inadequate scope showed gold recovery in cyaniding to exceed 95%, but silver recovery to be 35% or less, due in part to reprecipitation from solution. The short milling experience by Eugene Jordan Associates in 1966 produced recoveries of 0.138 oz. of gold and 0.17 oz. of silver per ton from very poorly selected near-surface breccia in which the silver content approximated 0.75 oz. per ton.

Golden Cycle's hammer drill hole (HDH) #26 discovered a body of mineralized breccia 400 feet to the north of the Atlanta ore body containing 0.08 oz. of gold and 0.86 oz of silver per ton average in a 30 foot interval underlying 12 feet of porphyritic rhyolite and overlying a dolomite footwall. The $4.50 per ton gross value is a noteworthy increase over the values in three other hammer drill holes nearer to the Atlanta ore body. Very little of the HDH#26 breccia zone crops out at surface due to the heavy cover of slough from 1000 feet of hill slope above to the east and, perhaps, due to bedded rhyolite ash cover.

In summary, the most inviting known targets along the Atlanta fault are the Atlanta Mine, the HDH#26 area north of the Atlanta Mine and the Bradshaw Adit breccia body. The Atlanta ore body is practically developed, requiring only metallurgical research to find a process yielding a satisfactory silver recovery, and benefitting by any nearby discovery of additional reserves. The nearby HDH#26 breccia body occupies the same structure but is essentially unexplored. The Bradshaw Adit ore body, more than a mile to the southeast, contains superior but narrower ore which is partly developed, requiring additional development drilling, trenching or adits to test northwest and southeast of the now known short extent.

of the breccia zone.

From this background, I have proposed the following procedure:

1. Test the Atlanta high-silver ore to find a method of adequate silver recovery. For this the proffered study by the U. S. Bureau of Mines at Reno may be most helpful, since the experts at this facility have pioneered new cyanidation techniques for the Carlin-type gold ores.

2. Develop the Bradshaw ore body, beginning with drilling of an area above the 500 foot northwest extension of the outcrop which apparently is buried under slough. This plan envisages two lines of 10 holes each at collar intervals of 50 feet, located to intercept the breccia zone at depths of 50 to 100 feet.

3. Explore the EEH #26 area north of the Atlanta Mine, using a down-the-hole hammer drill, extending the known mineralization northward and downdip from that hole. The initial phases of this exploration should be eligible for exploration assistance through the U. S. Department of Interior, Geological Survey. The northward extent of the Atlanta fault on Atlanta Hill is at least one half mile, all of which is readily accessible. Drill roads and pads would be easy to bulldoze in the slough-covered terraine and drilling costs would not exceed $6.00 per foot in breccia or $2.50 per foot in the bedded volcanic overburden. If drilled to an average depth of 150 feet, the average cost would be about $3.70 per foot or $750.00 per hole, including site preparation, supervision, and cuttings analysis, sample assays, and mapping. An exploration drilling program to follow the fault with two lines of holes at 100 foot collar centers would comprise about 70 holes, explore 3500 feet of the fault trace, and cost about $50,000.00. Development drilling in sites off-setting ore and lean-ore discovery holes would be needed to block out ore reserves.

Very sincerely yours,

Lawrence E. Smith

Consulting Geologist