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May 17, 1966

Mr. Otto Schneider, President, Sunrise Silver Mines Ltd. (Non-Personal Liability), 174 West Ilth Avenue, Vancouver 10, B. C.

Dear Sir:
In compliance with your request, the following is a report on the property of The Hazelton Sunrise Mines; Limited, which I examined briefly on August 3rd and again on August 29th, 1965, and which, I understand, is being acquired on a long-term lease by Sunrise Silver Mines Ltd. (NonPersonal Liability).

## Property:

The property, which is owned outright by The Hazelton Sunrise Mines, Limited (Non-Fersonal Liability), consists of a compact group of five Crown granted mineral claims and one fraction, whose total area is about 1.80 acres, as follows:

Lot 593, Cassiar District, known as the "Ethel" mineral claim
Lot 594, Cassiar District, known as the "Sunset" mineral claim
Lot 595, Cassiar District, known as the "Sunrise" mineral claim
Lot 596, Cassiar District, known as the "Noonday" mineral claim.
Lot 597, Cassiar District, known as the "Hidden Treasure". mineral claim
Iot 599, Cassiar District, known as the "Ethel Fraction" mineral claim

## Location and Access:

The property is located on the north side of Nine Mile Mountain, about eight air miles northeast of New Hazelton station, Omineca Mining Division, British Columbia. It is reached by way of Nine Mile Mountain road, 13 miles long from South Hazelton station to Silver Cup basin at elevation 3,400 feet. This road was extended last summer an additional distance of about $11 / 2$ miles and it is my understanding that it is proposed to extend it during the coming summer a further $1 / 2$ miles to an old campsite in a grassy meadow at the foot of a glacial cirque at elevation 4,075, feet. It is presently passable by four-wheel drive vehicles only. From this point a good pack horse trail leads to the vein exposures at elevations of betweer 4,800 and 5,100 feet.

The property is nearly surrounded by claims presently owned by Sunrise Silver Mines Ltd. (Non-Personal Liability).

Sources of Information:
The property is described in some detail in Geological Survey of Canada Memoir 223 (Revised Edition), Mineral Resources, Hazelton and Smithers Areas, Cassiar and Coast Districts, British Columbia, by E. O. Kindle, pp 78-82, with accompanying map (Figure 8) showing the location of the various veins mentioned in the text.

The property is also described in a report dated December 4, 1963, by J. D. Mason, P. Eng., who carried out a preliminary sampling of the main vein exposed on the claims and who recommended that further exploration and development work be done in order to ascertain the merits of the property.

My examination was confined to visual inspection of the veins described in the above-mentioned reports and indicated on the maps. No sampling was done by the writer. Both reports have been used freely in the preparation of this report.

Timber and Water:
Excellent timber for all mining purposes is available in the Shegunia Valley and on the slopes of Nine Mile Mountain.

Adequate water for milling purposes is available at lower elevations, and for preliminary exploration and development, it can probably be obtained from surface run-off and from the inclined shaft. A permanent supply of water can be obtained when warranted from a small lake near the top of the mountain at elevation 5,400 feet.

## History:

Quartz veins carrying abundant jamesonite, galena, and sphalerite, were discovered on the property in 1909. The Hazelton Sunrise Mines, Limited (Non-Personal Liability) was organized in 1911 and carried out some development work. A shipment of 74 tons of hand-sorted ore was made to the smelter in 1915, but results are not recorded. Further development was done in 1918 by J. Errington, and in 1920 by American Smelting and Refining Company. Trethewey Brothers carried on work for several years beginning in 1923, and were responsible for driving the main crosscut adit 400 feet. This work was resumed in 1927 by The Hazelton Sunrise Mines, Limited (Non-Personal Liability), the main adit being extended to a total length of 750 feet with a 60 foot raise from the face being driven up at 45 degrees to the north. Further work, chiefly surface trenching was done by this Company in 1937, which resulted in exposing several new veins. No significant work would appear to have been done on the claims since that time.

## Development:

Development consists of numerous strippings, rock trenches, and open-cuts, with a crosscut adit driven due south, 110 feet long, at elevation 4,985 feet, and a 40 foot shaft inclined at. 30 degrees on the main vein at elevation of about 5,020 feet. As noted above, the main crosscut adit, at elevation 4,800 feet, is driven in a southerly direction for 750 feet, at the end of which is a 60 foot raise inclined at 45 degrees to the north. There are two other short adits, one at elevation 4,760 feet, driven south for 32 feet, the other at elevation 4,735 feet, driven southwest for 117 feet, with a 50 foot crosscut to the southeast at a point 55 feet from its portal.

All underground operings are in good condition, but some of the surface openings are now more or less filled with rubble that has fallen from the walls.

## Plant, Equipment, Buildings:

There is presently no serviceable plant or equipment on the property, except for track and pipe in the main adit and a number of leng.ths of unused pipe along the trail leading up to it.

The only building on the property is an old cabin at the edge of the timber at elevation 4,250 feet.

## Geology:

Nine Mile Mountain is underlain chiefly by a group of sedimentary rocks of Upper Jurassic and Lower Cretaceous age, which consist of tuffaceous sandstone, greywacke, arkose, argellite etc. The most common type is a hard grey, even-grained greywacke, which only locally is wellbedded. Those rooks have been folded into broad anticlines and synclines which trend northeasterly and whose limbs usually dip at angles of less than 45 degrees. On the north side of the mountain, in the vicinity of the Sunrise Silver property, the sediments have been intruded by an elongated stock, 4 miles long by $1 / 2$ mile wide, of grey, coarsely crystalline granodiorite, whose longer axis trends in a northwesterly direction. It is of Upper Cretaceous or Tertiary age.

## Economic Geology:

The veins occur in coarsely crystalline, grey granodiorite in intersecting fault fissures along which there has been minor displacement. They lie in a disturbed zone that measures 700 feet in width from north to south and l,000 feet in length from west to east across the Hazelton Sunrise property and extends an additional 1,500 feet east across the

- adjoining former Lead King property, which is now owned by Sunrise Silver Mines Ittd. (N.P.I.). The main fracture zone lies between elevations of

4,700 and 5,200 feet, and its north boundary is about 500 feet south of the sedimentary contact.

There are two intersecting sets of veins on the Hazelton Sunrise property. One set strikes northeast and dips from 30 to 50 degrees southeast. The other set strikes east and dips from 10 to 40 degrees south. The veins range from 100 to 500 feet in length and from a few inches to 4 feet in width. They commonly occur in parallel groups or may be arranged en echelon. The veins consist of variable proportions of sulfides, contained in a quartz gangue. Some of them, or portions of them, are of almost solid sulfides, but others contain considerable amounts of quartz. The metallic minerals present, in order of their abundance, are: jamesonite, sphalerite, galena, cosalite, pyrite, arsenopyrite, argentite, ana tetrahedrite. The ore contains appreciable amounts of silver, lead, zinc, antimony, and bismuth.

The location of the various veins, and other features, are shown on the attached plan, which is traced from Figure 8 in Memoir 22.3. Assay results are from samples taken by E. D. Kindle and quoted in the text of the Memoir.

Twelve veins have been partially exposed on the property, but of these the most important would appear to be that which outcrops at elevation of about 5,000 feet. It strikes east and west and dips from 10 to 30 degrees south into the mountain. It ranges in width from a few inches to nearly 4 feet, and, with its en echelon extension, has an apparent length of nearly 550 feet. Preliminary sampling by J. D. Mason, P. Eng., in 1963 over a portion of the vein 345 feet in length yielded an average grade of 25.8 ozs silver, $7.56 \%$ lead, and $9.65 \%$ zinc over an average width of 28.8 inches which would appear to be excellent ore. It is impossible, however to do a proper sampling of this vein or for that matter any of the veins exposed on the property, at the present time due to the caved condition of the trenches and to oxidation.

## Comment:

My observations confirm the location and description of the various veins mentioned in the above reports and shown on the accompanying maps. I have no reason to believe that the sampling results obtained by Mr. Mason are other than substantially correct.

Although vertical continuity of the veins has yet to be proved, there is no reason to believe that they will not extend to moderate depths, i.e. of the order of a few hundreds of feet. The fact that the main crosscut adit at elevation 4,800 feet, and the short raise from the end of it, failed to locate the downward extension of the most important vein is considered not too significant, as indications are that it was not driven

Mr. Otto Schneider

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far enough, as can be seen by inspection of the vertical section attached to this report. .

## Conclusions:

I think the veins exposed on the Hazelton Sunrise claims look sufficiently interesting to warrant the hope that further work will result in the development of a small, high grade producer of silver, lead, and zinc. However, systematic sampling of the known veins, additional development by trenching and test-pitting, and metallurgical testing of representative ore, followed probably by some diamond drilling, will be required before a final assessment of the merits of the property and the economics of an operation are possible.

## Recommendations:

In order to gain the further information required, it is recommended that a program of work be carried out in two stages, as follows:

Stage $I$ should consist of cleaning out and reblasting the existing trenches on known veins so that they can be properly sampled and representative samples of the veins - the sample rejects will suffice - made up and shipped for mill testing. Concurrently topographic and geologic mapping should be done as well as some additional exploration by trenching in an effort to extend known veins on strike and to find new ones.

Stage 2, which is contingent on favourable results being secured in stage 1, should consist of a certain amount of diamond drilling in order to establish vertical continuity of the veins.

In order to carry out the work, a temporary camp should be established at the site of the former Lead King camp (presently owned by Sunrise Silver Mines Ltd. (N.P.L.)) at elevation 4,075 feet, and the road extended to this location, a distance of about $1 \frac{1}{2}$ miles.

## Estimate of Cost:

The cost of carrying out the first stage of the above-recommended program of work, including the road and the camp, is estimated at about $\$ 30,000.00$, and of the second stage, if warranted, at an additional amount of $\$ 40,000.00$ for 3,000 feet of drilling.

Respectfully submitted
H. S. WILSON, P.Eng.

I, HAROID S. WILSON, of 179 Reynolds Street, Oakville, in the Province of Ontario, hereby certify:

1. That I am a geologist and mining engineer and reside at 179 Reynolds Street, Oakville, Ontario.
2. That I am a graduate of McGill University, B.Sc. 1924, M.Sc. 1925, with two years further post-graduate work in geology at the University of Wisconsin, and have been practicing my profession as a geologist and mining engineer for upwards of thirty-five years.
3. That I have no direct or indirect interest whatsoever in the mining claims referred to in the accompanying report or in the securities of The Hazelton Sunrise Silver Mines, Limited (Non-Personal Liability) or of Sunrise Silver Mines Itd. (Non-Personal Liability), nor do I expect to receive any such interest.
4. That the accompanying report is based on examination of the Hazelton Sunrise property and on documents and maps as listed in the body of this report.
5. That I examined the property referred to in the accompanying report on August 3rd and on August 29, 1965.

DATED at Oakville, Ontario, this 17th day of May 1966.
H. S. Wilson, P.Eng。



by H.S.Wilson. Sept, 2 S
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From G.s.c. Mem. 223, p.74. Additions by H.s.W.1son, Sept.28,146s i/fir,

