

REPORT ON
LEAD-SILVER PROPERTY
CASINO SILVER MINES LTD. (N. P. L.)

CASINO CREEK AREA
YUKON TERRITORY

This report has been examined by
the Geological Evaluation Board
Approved as to technical work

D. C. Bradley
RESIDENT GEOLOGIST

Approved as to cost in the amount
of \$

REGISTERED ENGINEER

Accepted as representation work
under Section 53(4) Yukon Quartz
Mining Act.

COMMISSIONER OF YUKON

019157

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Location Map

Certificate

The President and Directors
Casino Silver Mines Ltd. (N. P. L.)
1st Avenue and Strickland Street
Whitehorse, Yukon Territory

Gentlemen:

This report describes your property located in the Casino Creek area, Yukon Territory. The exploration and development work carried out up-to-date on the property has been reviewed. Further exploration and a program of diamond drilling are recommended.

PROPERTY -

Your property is now comprised of 222 contiguous mining claims, which include the original sixty-two claims located at approximately the central north part of the property. The additional claims were staked to cover aeromagnetic indications and inferred structures which are similar to that indicated at the known showings and may have some bearing on the mineral occurrences.

The claims are all in good standing and registered with the Mining Recorder in Whitehorse, Y. T., as follows:

<u>Name of Claim or Group</u>	<u>Registration Numbers</u>
Helicopter Mineral Claim	4252
Bomber Group Nos. 1, 3, 5 and 7	56979 to 56982 inclusive
Airport Group Nos. 1, 3, 5, and 7	56983 to 56986 inclusive
Bomber Group Nos. 2, 6 and 8	56987 to 56989 inclusive

<u>Name of Claim or Group</u>	<u>Registration Numbers</u>
Airport Group Nos. 2, 4, 6 and 8	56990 to 56993 inclusive
Cat Group Nos. 1 to 22 inclusive	92201 to 92222 inclusive
Cat Group Nos. 23 to 46 inclusive	92764 to 92787 inclusive
Cat Group Nos. 47 to 70 inclusive	95724 to 95747 inclusive
Vic Group Nos. 9 to 56 inclusive	95676 to 95723 inclusive
Joe Group Nos. 1 to 8 inclusive	98380 to 98387 inclusive
Joe Group Nos. 9 to 16 inclusive	98372 to 98379 inclusive
Joe Group Nos. 17 to 40 inclusive	Y615 to Y638 inclusive
Joe Group Nos. 41 to 88 inclusive	Y639 to Y686 inclusive

LOCATION AND ACCESS -

The property is located between Casino Creek and Canadian Creek, with its center and main silver-lead showing (the Bomber showing) on the south facing slope of the mountain which separates the two creeks in the Yukon Territory. The showing is at an elevation of approximately 4,000 feet above sea level at latitude 62° 40' and longitude 138° 50'.

The location is south of the Yukon River at about 175 air miles to the northwest of Whitehorse. Prior to 1964, the only access to the property was by the Yukon River, up Britannia Creek to an elevation

of about 5,000', and a distance of 12 miles to Canadian Creek divide, thence 4 miles down Casino Creek by a tractor trail to the property.

In 1964, an aircraft landing strip was built on the Airport claims, adjacent to the Bomber showing, and last fall a winter road was built from Burwash landing on the Alaska Highway to the property, a distance of about 140 miles. The winter road has brought your property to within 300 miles trucking distance to the railhead of Whitehorse.

TOPOGRAPHY, TIMBER AND WATER -

The topography is rugged with Casino Creek at an elevation of 3,000', and Canadian Creek at 4,300'. There are many steep hills with slopes estimated at over 30°. There are a few sharp escarpments at the higher elevations. The depth of overburden stripped at the Bomber and Helicopter showings are from 6' to more than 20'. Permafrost conditions extend from just below the moss to an unknown depth.

The showings are located below timberline where there is a thin stand of scrubby spruce. Timbers suitable for mining purposes are located at elevations below about 3,000'.

The small tributaries of Casino Creek on the property are considered adequate for mining and domestic use.

HISTORY AND DEVELOPMENT -

Early history of silver-lead showings on the property was described fully by Mr. C. D. N. Taylor, Mining Engineer, in a report to you dated November 15, 1965. In short, the mineralization was discovered in 1936, but prior to 1965, there was very little work done to explore its possibilities, mostly due to difficulties in access. In 1965, Mr. L. I. Proctor developed the Bomber vein showings with three longitudinal bulldozer trenches along the strike of the veins, and obtained 47.374 dry tons of hand-cobbed silver-lead (galena) ore which was shipped to the smelter at Trail, B. C., at a profit. The ore assayed 161.1 ounces of silver per ton and 68.0% lead.

On completion of the winter road last fall, mining equipment was moved to the property and a crew of up to 16 men was employed, during the period between January and mid-April this year, to carry out an underground program of exploration at the Bomber showing. In addition, an extensive bulldozer trenching was conducted at the Helicopter showing located at about 3,000' to the west.

In late 1965, an aeromagnetic survey was conducted to cover the general Casino Creek area. Ground geophysical and geochemical surveys commenced in mid-May this year are still in progress.

As noted before, additional claims were staked to cover interesting aeromagnetic indications. These new claims also covered the area at the Canadian Creek, where a known placer gold-tungston prospect is located. This prospect was drilled by Yuba Consolidated Goldfields in 1942. Some testing and bulldozer work was carried out in 1964.

The writer, accompanied by Mr. C. D. N. Taylor, P. Eng., visited the property in early July, 1966, and examined the surface and underground workings, and up-to-date ground geophysical indications. Access to various parts of the property was assisted by helicopter.

GENERAL GEOLOGY -

Geology of the area is largely unknown, mainly due to the scarcity of outcrop. At the vicinities of the known showings, the rocks exposed by trenches consist mainly of medium grained granite-granodiorite that have been weathered and decomposed near the surface. Hornblende granite was observed by government geologists on the mountains to the north (Paper 64-36, G. S. C.). The area was generally described as all underlain by granitic rocks.

However, during the visit of the writer to the property, he observed an ultrabasic intrusive (amphibolite-pyroxenite) cutting

granite at the southwest part of the property, and a formation of slate at the southeast part of the property. At about four air miles to the north, at Sunshine Creek, there is a large mountain of slate separated from the granitic intrusives to the south by a strong east-westerly fault. At the head of Casino Creek, there is a young flat-lying formation of impure limonite. Furthermore, Mr. Taylor observed an outcrop of limestone to the southeast of the property, near Casino Creek. It follows that the geology is apparently more complicated than previously expected.

There are three known mineral occurrences on the property: the Bomber galena veins, the Helicopter galena veins, and the Canadian Creek placer gold. These occurrences are described more fully below.

The Bomber Showing:

At the Bomber showing, surface trenches exposed four silver-lead veins. No. 1 vein has an apparent width of 12 feet, and was stripped for a distance of about 280 feet. The other three veins have some wider portions, but are generally 4 feet or less in width, and were stripped for lengths from 40 feet to 250 feet.

The veins occur in a highly altered, manganese-stained fault and fractured zone of about 150 feet wide. They strike N 40° W and dip 75° south-westerly. Much of the vein material exposed consists of brown to rusty-stained, punky material containing limonite, quartz, and lenses of galena with associated barite up to several feet wide and 20 feet in length within the veins. The galena is frequently altered to cerussite, and some secondary native silver was noted by previous writers.

According to company records, the exploration adit was collared in the hillside with the portal at an elevation of about 3,940 feet, which is 110 feet to 165 feet beneath the lowest and highest surface showings. It consists of about 1,200 feet of drifting and cross-cutting. The No. 1 vein was intersected by the adit, cross-cut at 450 feet from the portal, and was followed by drifting for a strike length of 375 feet. This vein, as exposed underground, consists of a wide fault zone containing lenses of vein quartz and barite, with sulphide minerals including galena, dark brown sphalerite, pyrite and chalcopyrite.

The No. 1 vein, for the most part, is much wider than the 8 foot drift heading. Only the last section of the foot-wall side was checked at regular intervals by stud cross-cuts or by test holes. Neither the assumed hanging-wall side nor at the section directly under the surface cut of the same vein were tested by test hole.

Two lenses of massive sulphides were found beyond the northwest end of the downward projection of the No. 1 vein.

The assays of daily chip samples from these lenses are as follows:

<u>Massive Sulphide Lense</u>	<u>Length Explored</u>	<u>Average Width</u>	<u>Silver Oz/T</u>	<u>Lead %</u>	<u>Zinc %</u>	<u>Copper %</u>
No. 1 at hanging-wall side	40'	1.4'	48.4	31.3	8.8	
No. 2 at foot-wall side	over 80'	1.6'	37.1	18.2	9.3	2.2

Sludge samples from the vein material on the foot-wall side of No. 1 lense assayed 4.7 ounces silver per ton, 1.0% lead, 0.3% zinc, and 1.3% copper over an average width of 8.6 feet.

Six sludge samples from vein material on both sides of No. 2 lense had an average assay value of 8.5 ounces silver per ton, 3.0% lead, 2.5% zinc, and 1.3% copper over a width of 8.5 feet.

Two cross-cuts were designed to test the 2, 3 and 4 veins. The first cut encountered a zone of minor faulting with some thin veins of sulphide minerals, and the second cross-cut intersected a mineralized shear zone 60 feet south-west of the No. 1 vein and, also, two sub-parallel veins located 130 feet and 150 feet south-west of the No. 1 vein. The first vein assayed 8.7 ounces silver per ton, 2.0% lead, 1.1% zinc, and 0.7% copper over a 7 foot width, and the second vein assayed 9.0 ounces silver per ton, 6.8% lead, 3.6% zinc, and 0.3% copper over a 1.5 foot width.

The location and attitude of the mineralized shear zone and the veins do not readily correspond with the downward projections of the Nos. 2, 3 and 4 veins as expressed on surface. In an interim report dated May 15, 1966,

Mr. C. D. N. Taylor has proposed a program of short hole lateral diamond drilling to assist in proving up the potential commercial value of all these veins for a strike length of some 400 feet. It may be advisable to have a few longer holes drilled across the vein system to further evaluate the occurrence. It should be noted here that preliminary ground geophysical survey data indicated that the vein system extends much further than tested by the adit. Some surface drilling may be required to test the possibilities of these geophysical indications.

The Helicopter Showing:

The Helicopter showing is located at about 3,000 feet to the west, and at about the same level of the Bomber showing. A total of eight bulldozer trenches were used to trace two sub-parallel galena veins for a length of over 500 feet. The veins are apparently striking N 40° W within a 60 foot wide zone of sheared and fractured granite. The mineralization is narrow. Samples with widths from 0.25 feet to 3.0 feet assayed 2.44 to 42.52 ounces silver per ton, and 5.6% to 79.8% lead. Two trenches located at the south part of showing area encountered no mineralization.

Placer Gold and Tungsten:

At the north part of the property along Canadian Creek, there is a placer gold deposit. The black sand from here also contains a tungsten mineral, ferberite. During our visit to the deposit, gold was readily obtained by panning of soil immediately under moss. Submetallic brownish-black pebbles left behind by gold prospectors who previously worked on the deposit are magnetic. One of these pebbles is an aggregate of tabular ferberite crystals with some quartz.

There are long rows of stacked boulders along the valley bottom as evidence of hand mining. Previous records as described by Mr. C. D. N. Taylor, P. Eng., in a report dated October 1964, indicate that the high grade zone here has largely been mined out in previous years. He calculated that there remains approximately 180,000 cubic yards of comparatively low grade gravels estimated to average 51¢ per cubic yard in gold.

The reserve is outlined along a section of the valley of the Canadian Creek and has a short southeasterly branch near its upper reach. This picture indicates a stream placer and is mainly based on the results from 63 holes drilled by Yuba Consolidated Goldfields. The values from these holes are in general decreasing toward depth.

Sharp gold and ferberite particles were observed by Mr. Taylor in surface gravel near Patton Gulch, located at about one claim to the southeast and about 400' above the Canadian Creek placer deposit. He theorized that these metals have not migrated very far from their source. Aeromagnetic data, as will be described below, indicated that there is a rather strong high anomaly located to the west and striking across the south part of the placer area. Since the ferberite is commonly magnetic, a magnetometer reconnaissance survey may obtain targets for the exploration of the source lode.

GEOPHYSICAL DATA -

In November-December, 1965, Aero Photo Inc. conducted an aeromagnetic survey covering the Casino Creek area.

The survey outlined several magnetic high anomalies which were accounted for by hornblende granite, plus effects of topography. However, one of these anomalies was later found to be outlined close to the occurrence of an amphibole-pyroxenite intrusive, outlined by ground geophysical survey. It follows that some of the aeromagnetic anomalies may be of importance. The correlation, however, was hindered by the fact that the aeromagnetic data was plotted on a base map which was from an existing large scale (1 = 250,000) topographic map, and the locations of the anomalies are far from accurate.

The aeromagnetic "lows" and depressions in the area are apparently partly due to weak dipole effects and topography, and some are apparently indicating fault or shear structures. There are two outstanding magnetic depressions which are not related to any magnetic high or located along indicated regional structures. In addition to the area of the known mineral showings, these two areas of magnetic depression were subjected to a program of ground geophysical survey now in progress on the property.

It should be noted here that up-to-date the ground survey has encountered an interesting electromagnetic conductor

to the south of one of the magnetic depressions. Due to frozen ground, a geochemical soil sample survey was unable to thoroughly check the conductor. However, some indication of base metal was obtained at a short distance down slope from the location of the conductor. This apparently will lead to a program of surface diamond drilling.

The ground geophysical survey carried out up-to-date has also traced the vein structure of the Bomber zone to more than 1200 feet from the portal. The method now in use is evidently successful in tracing the vein structure to beyond its known length and, when the survey is completed, a program of surface diamond drilling may be required to test choice indications outlined by the survey. A similar program is in progress to check the Helicopter showing area.

As mentioned before, up-to-date the ground magnetic survey outlined an anomalous area where the writer has observed an amphibolite-pyroxenite intrusive to account for the high magnetic anomaly. There is also a possibility of finding magnetic bodies with ferberite at the north part of the property. The present program

of ground geophysical survey may have to be extended to cover a portion of the high aeromagnetic zone at the north part of the property to check its possibilities.

The central and east parts of the property are well drained by the Casino Creek and its tributaries. From the up-to-date ground geophysical survey results, and the fact that it is hard to drill the frozen ground for a soil-sample geochemical survey, a program of geochemical survey to be carried out along the streams on the property appears to be an economical way of checking the possibilities of the areas not yet covered by the ground geophysical survey. The source of geochemical anomalies along the streams should be traced and the source area checked by ground geophysical survey for the possible occurrence of base metal deposits.

CONCLUSIONS AND RECOMMENDATIONS -

The property is located in an area where the geology is largely unknown but apparently much more complicated than previously expected, and has more possibilities than previously expected.

Results from previous surface work at the Bomber showing indicate the occurrence of commercial grade silver-lead

mineralization in mining widths within a wide zone of altered granite-granodiorite. The limited underground exploration has shown that the mineralization is associated with a rather pronounced wide fault zone, but the results are inconclusive for immediate mining and a program of underground drilling is required to correlate the findings and to further explore and evaluate the mineral occurrence. Preliminary ground geophysical survey conducted to check this showing has obtained electromagnetic data which indicate that the vein system extends further than tested by surface and underground workings. It is recommended to trace this system to its limit on the property. Choice indications not tested by the workings should be tested by surface diamond drilling.

Trenching at the Helicopter showing has exposed two narrow sub-parallel galena veins with values in lead and silver. The structure and mineralization are similar to but apparently weaker than the occurrence at the Bomber showing. It is advisable to test drill this showing after the geophysical check survey now in progress in this area has been completed.

The placer gold and tungsten at Canadian Creek is apparently a stream placer deposit, but the source lode or lodges may not be too far away. An effort to locate the source lode or

lodes by means of magnetic reconnaissance, covering, also, the aeromagnetic anomalies outlined in the vicinity, may prove worthy. Strong anomalies encountered on the ground should be examined by geological prospecting which may be followed by surface diamond drilling if required.

The ground geophysical survey carried out up-to-date has encountered an interesting electromagnetic conductor at the south part of the property and required surface test diamond drilling. A magnetic anomaly located at the southwest part of the property is outlined over an amphibolite-pyroxenite intrusive which has no indication of heavy concentration of sulphides at shallow depths.

A program of geochemical soil sample survey along the tributaries of the Casino Creek is recommended to be carried out to check the eastern part of the property. Anomalies encountered by the survey should be traced and the source area covered by geophysical surveys prior to trenching and/or surface diamond drilling.

The estimated cost for the recommended work is listed as follows:

1. Underground drilling - as recommended by Mr. C. D. N. Taylor in his report dated November 15, 1965 -	\$10,000.00
2. Surface diamond drilling, estimated 3,000 lineal feet of AXT core @ \$8.00/foot -	24,000.00
3. Ground geophysical survey, geochemical survey and geological prospecting estimated average @ \$125.00/claim, 222 claims -	27,750.00
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Total capital expenditure -	<u>\$61,750.00</u>

Respectfully submitted,

CANA EXPLORATION CONSULTANTS LIMITED

S. S. Szetu
S. S. Szetu, Ph. D.
Consulting Geologist

SSS:rk
Encl.

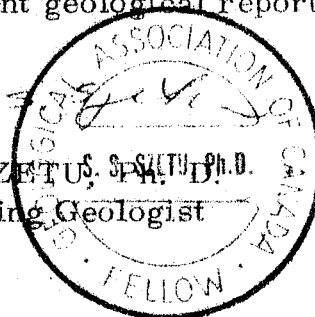
Toronto, Ontario
August 3, 1966.

CERTIFICATE

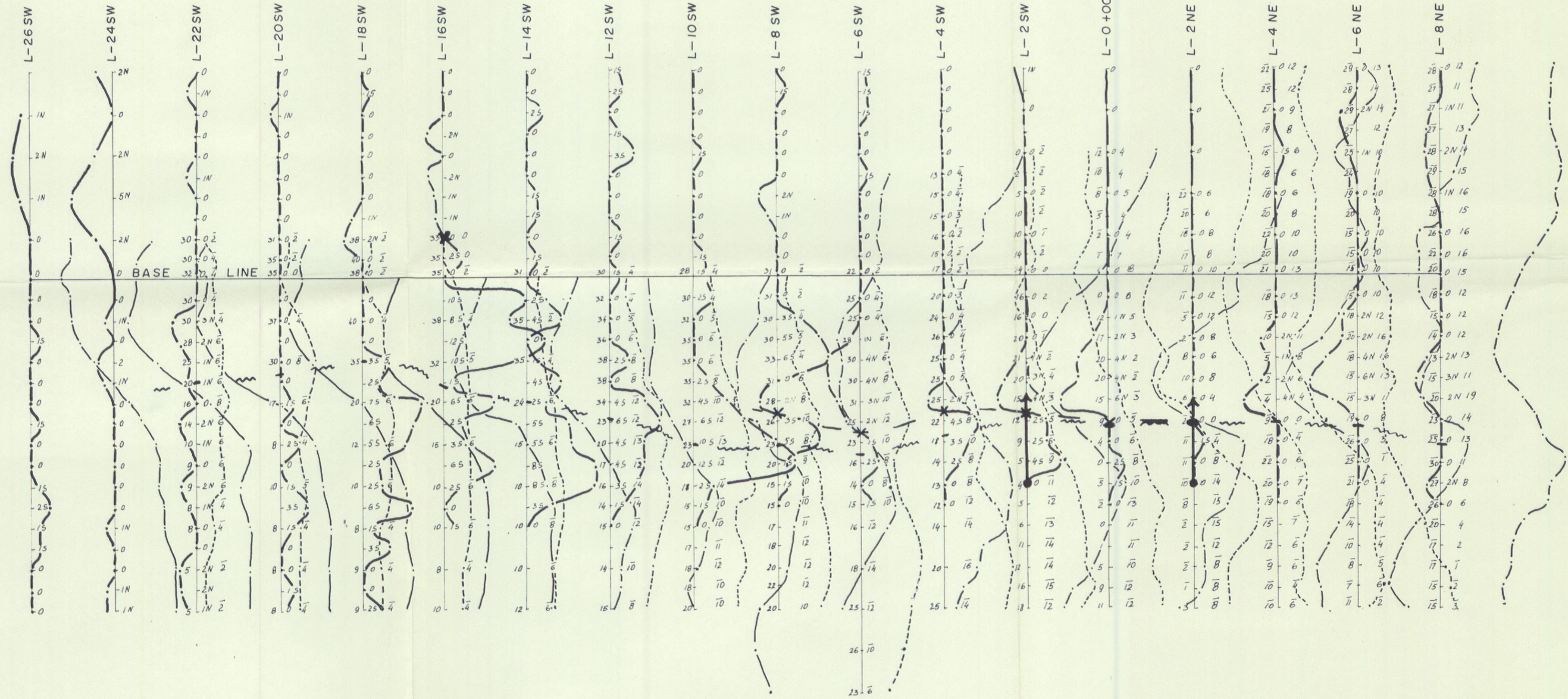
I, S. S. SZETU, of Willowdale, in the Province of Ontario,
hereby certify:

1. THAT I reside at 36 Whittaker Crescent, Willowdale, Ontario, and am a Consulting Geologist. My office is located at Suite 427, 12 Richmond Street East, Toronto 1, Ontario, and I am the President of Cana Exploration Consultants Limited of Ontario.
2. THAT I hold a Degree of B. Sc. in Geology, 1941, from National Sun Yat Sen University, China, and a Degree of Ph. D. in Geology, 1954, University of Toronto, and that I have been practising my profession in geological and geophysical explorations since graduation.
3. THAT I am a Fellow of the Geological Association of Canada, Member of the Mineralogical Association of Canada, the American Geophysical Union and The Canadian Institute of Mining and Metallurgy (Toronto Branch).
4. THAT I have no interest directly or indirectly, nor do I expect to receive any interest directly or indirectly in any securities issued by Casino Silver Mines Ltd. or in the property referred to in the accompanying report or in any other properties in which Casino Silver Mines Ltd. has, to my knowledge, any direct interest.
5. THAT the accompanying report is based on a visit to the property in the period between July 1st to 4th, 1966, and a study of all technical records and field data of the company and available government geological reports.

S. S. SZETU, Ph.D.
Consulting Geologist



Dated at Toronto, Ontario,
this 3rd day of August, 1966.



LEGEND

Picket line cut and chained.

Electromagnetic readings obtained by using a Sharpe SE-200 unit, (parallel line method).
Scale of profile: 1/10" = 1° dip angle.

Electromagnetic "Cross-Over".

Electromagnetic readings obtained by using a Ronka E.M.-16 instrument.
In-phase readings plotted at the SW, out-of-phase readings plotted at the NE side of picket line.
Transmitter station: N.A.A.
(a) In-phase profile, (b) out-of-phase profile.
Scale of profile: 1/10" = 2% of phase change.

Electromagnetic "Conductor."

Proposed diamond drill hole.

DETAIL ELECTROMAGNETIC SURVEY DATA
(ANOMALY "A" AREA)
SOUTH CENTRAL PART OF PROPERTY
CASINO SILVER MINES LIMITED
CASINO CREEK AREA
YUKON TERRITORY, CANADA
SCALE: 1" = 200' AUGUST, 1966