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# PROSPECTUS



KLEANZA MINES LTD. (N.P.L.)

**GEOLOGICAL REPORT**

**on**

**CURRENT EXPLORATION**

**by**

**KLEANZA MINES LTD. (N.P.L.)**

**on the**

**KLEANZA MT. and TALTAPIN PROPERTIES**

**in the respective vicinities of**

**TERRACE and TALTAPIN LAKE, B.C.**

**in the**

**OMINECA MINING DIVISION**

**during 1966**

**by**

**W. M. Sharp, P.Eng.**

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## SUMMARY & RECOMMENDATIONS

The Croesus block of 121 claims, situated on Kleanza Mt., contains a major composite zone of dispersed Cu-Au-Ag mineralization and several rather superficially explored Au-Ag-Pb-Zn-Cu occurrences. These separate groups of deposits are structurally and mineralogically dissimilar, but each possesses considerable geological potential for the occurrence of economically-mineable mineral deposits.

The major exploration interest is consequently divided between the Croesus-Excelsior and the Gem-Croesus zones.

The inferred gross width of the Croesus-Excelsior zone is about 2000 feet; the indicated east-west length is 4000 feet, with a probable plus-1000 foot westerly extension into an area of deep overburden between the lower trenches and the Zymoetz River road. The present geochemical survey coverage has disclosed two consecutive copper anomalies, each having a general lateral extent of 1000 x 1500 feet; the determination of the full westerly extent of the zone by geochemical methods is precluded by the increasingly greater, more variable depths of overburden in this direction.

The Croesus-Excelsior mineralization consists mainly of fracture-filling and disseminated chalcopyrite. The mineralization appears to have been structurally controlled, to a large degree, by E-W to S.W.-N.E.-trending zones of fracturing within an easterly-trending protrusion from the main granodiorite body west of the Zymoetz River. Within the lower Croesus trench area the intrusive rocks show considerable variation in composition, ranging from pegmatite, through granite and granodiorite, etc. to hornblende-rich diorite.

The intensity of the prevalent pyrite-chalcopyrite mineralization is partly controlled by the frequency of minor fracturing. This appears strongest within granites and pegmatites in the Croesus trench area, but is even more abundant within a smaller zone of sheared, altered andesitic tuffs and/or diorite within the Excelsior trenches. However, the chalcopyrite: pyrite ratio is evidently higher within the more acidic intrusive phases—excluding aplite.

The gold and silver-bearing veins of the Gem-Croesus, Silver Bow, etc. zones, as a group, trend northerly. These occur in both granitic and volcanic rocks, they vary from one to three feet, and locally more, in width.

A large grab sample of the mineralization within the Croesus No. 1 trench assaying Au, 0.05 oz/ton; Ag, 0.45 oz/ton; Cu, 0.20% (gross \$4.00) appears fairly typical of the tenor of mineralization initially exposed within this section. The sampled Excelsior mineralization grades slightly higher. However, the much larger unexplored extent of the general Croesus-Excelsior zone appears geologically favourable for the occurrence of more strongly fractured and mineralized sections. These should be readily detectable by I.P. survey methods.

The Gem-Croesus multiple-vein system is almost totally obscured by overburden; however, its gross potential is suggested by the 2500 foot N-S extent of the related geochemical anomaly, with due allowance for possible drainage influences. The relatively minor extent of exploration accomplished via two short adits on the Gem quartz-pyrite vein has disclosed a small shoot grading 0.66 oz/ton Au; 1.6 oz/ton Ag over a 1.5' average width. Elsewhere within the zone, the "Gem #2" and "Dollar" showings display an adequate amount of mineral potential to warrant more comprehensive exploration of these respective parts of the general group of quartz veins.

Moderate to high-grade silver-lead-zinc mineralization over mineable widths occurs within the Pinkut Creek vein of the Taltapin property. This and a number of parallel veins have sufficient ore potential to justify further exploration by more efficient methods than were available during the 1919-1928 exploration period.

Recommendations for additional exploration of the Kleanza Mines Ltd. properties are listed:

### A. Kleanza Mt.

1. Conduct and I.P. Survey over the full extent of the Croesus-Excelsior mineralized zone.
2. Test probable anomalies and presently-indicated mineralized zones within the general Croesus-Excelsior zone by trenching and/or diamond drilling.
3. Check and detail Gem-Croesus copper anomaly by heavy-metal geochemical procedures.
4. Investigate anomalous sections per (3) by trenching, and possibly diamond drilling.
5. Supplementary to items (3) and (4) explore local strike, and dip-extensions of the main Gem vein by detail E.M. survey, preliminary trenching and follow-up diamond drilling.

### B. Taltapin Property

1. Prospect vein systems by "heavy-metal" geochem. and E.M. Survey methods.
2. Investigate anomalous zones per (1) by bulldozer trenching.
3. Provisionally, diamond drill principal targets indicated by (2).

**Estimated Costs:**

A-1:	Grid preparation, estimate .....	2,500.00	
	I.P. Survey, estimate .....	7,500.00	10,000.00
		<hr/>	
A-2:	Trenching, D8 Cat, 15 days .....	4,000.00	
	Diamond Drilling, 3000 l.f. ....	30,000.00	34,000.00
		<hr/>	
A-3:	Fill-in grid preparation .....	1,000.00	
	Soil-sampling and testing .....	1,500.00	2,500.00
		<hr/>	
A-4:	Trenching, D7 Cat, 7 days .....	2,000.00	
	Provisional diamond drill, 1500' .....	15,000.00	17,000.00
		<hr/>	
A-5:	E.M. Survey, including grid preparation .....	500.00	
	Bulldozer trenching and clean-up .....	1,000.00	
	Provisional, diamond drilling, 1500' .....	15,000.00	16,500.00
		<hr/>	
	Provision, assaying, miscellaneous technical, travel .....		5,000.00
	Provision for omissions and contingencies .....		15,000.00
			<hr/>
	Sub-total (A) .....		\$100,000.00
			<hr/>
B-1:	Geochemical survey, 1 month .....	1,500.00	
	E.M. Survey .....	1,000.00	2,500.00
		<hr/>	
B-2:	D8 Ripper-Cat, 15 days .....		5,000.00
B-3:	Provision, diamond drilling 1500 l.f. ....		15,000.00
	Provision, general technical expense .....		2,500.00
			<hr/>
	Sub-total (B) .....		\$ 25,000.00
			<hr/>
	Total, Kleanza Mt. and Taltapin .....		\$125,000.00
			<hr/>

Respectfully submitted,  
W. M. SHARP, P.Eng.

## INTRODUCTION

This report derives from progress data provided by Kleanza Mines Ltd. field crew during the 1966 season and the writer's mapping and observations resulting from his periodic visits to the property—these occurring on June 12-13; August 6-7 and 11; September 10; October 31-November 2, 1966. Preliminary and interim reports, dated June 24, September 2, and September 16, 1966 resulted from the above visits. Following his most recent visit the writer was formally instructed, in his capacity as geological consultant, to prepare a report which would summarize the results of the season's exploration, and which would present detailed recommendations, with estimated costs, for subsequent exploratory work.

The extensive and diversified 1966 program of exploration on the Company's Kleanza Mt. property has been very ably supervised and undertaken by Mr. R. H. Bates, Terrace, B.C., and accomplished with the assistance of crews and equipment obtained locally. A field engineering office and geochemical laboratory has been established at Mr. Bates' Terrace residence; this has substantially expedited progress in field exploration, and also in the compilation of the ensuing data. In addition, field camps have been established at lower and higher elevations within the claim group to reduce crew travel-time, thus expediting field progress and increasing the scope of the field investigations.

The writer thankfully acknowledges the field guidance, assistance, and detailed information pertaining to the various mineral showing and working on the property provided him by Mr. R. H. Bates. The writer has supplemented the above background information with relevant details contained in Provincial and Dominion Government mining and geological reports; these listed under "References".

Part A of this report deals with the Company's Kleanza Mt. property, and Part B with the Taltapin group. As the writer has not yet visited the latter property, his information is derived from data furnished by Company principals and from government publications.

## PART A - KLEANZA MT. PROPERTY

### CLAIMS

The "Croesus" group, according to a sketch and verbal information recently provided by the Company, consists of 121 claims including one fractional claim. These have been located mainly by Mr. R. H. Bates, Mr. D. W. Small and by prospectors on behalf of the Company.

The present group includes a number of old gold-silver-lead-zinc prospects—the controlling claims having lapsed prior to Mr. Bates' general consolidation of the ground. The more prominent of these comprise the old Black Bull-Gem, Silver Bow, Silver Cliff, Beanstock, Excelsior, and Zymoetz groups.

A formal claim schedule, providing details of claim names, locator, location-dates, record-dates, and place of record is to be furnished by the Company to supplement the above general information.

A more than adequate amount of geophysical, geochemical, and physical exploration has been accomplished during the current field season, as assessment credit, to maintain the group in good standing.

### LOCATION, ACCESS & GENERAL FEATURES

The claim group is situated on the westerly nose, or ridge of Kleanza Mt., closely above the junction of the Zymoetz and Skeena Rivers; the group lies within and close to the west boundary of the Omineca Mining Division.

The property is reached via one mile of well-graded wide gravel road following the east bank of the Zymoetz River, and departing south-eastward from Provincial Highway 16 at about 8 miles east of Terrace. Access to the higher parts of the property is provided by a few old mining and logging roads and trails—these being generally passable only to 4-wheel drive vehicles.

The topographic relief is approximately 3500 feet—elevations ranging from about 500 feet at the main road to 4000 feet on the central ridge. Topographic characteristics, and consequently the relative ease or difficulty of access, vary considerably over the group. Forest growth is similarly variable, thus also contributing to conditions of access. The upper ridge areas are generally characterized by moderate to gentle slopes and relatively "open" forest growth. The main southerly-facing area includes moderate to steep-bluffy, to locally-precipitous slopes—the latter particularly occurring along the Zymoetz River and tributary stream courses. In general, and particularly within the latter-noted sections, ground exploration of the property is somewhat impeded by thick growths of typical "coastal" underbrush and/or old logging slash. In spite of these attendant difficulties the exploration personnel managed to establish a systematic exploration grid, and accomplished a considerable amount of general prospecting, and geophysical and geochemical exploration.

The climate is typically "inland-coastal", with a large annual precipitation in the form of rain during the spring-to-fall months, and as heavy wet snow during the winter months—the latter season being normally from mid-November to mid-April.

With respect to transportation, the Terrace area is well provided for by daily C.N. Railway service between Prince George and Prince Rupert, by daily C.P. Airline service between Vancouver and Prince Rupert, and by daily stage and truck services operating on Highway 16.

Personnel and supplies for normal mining exploration are generally available in Terrace and Prince Rupert.

## HISTORY

Several occurrences of moderate, to high-grade gold-silver-lead-zinc mineralization, in generally narrow veins or vein-lodes, have been made within the general Kleanza Mt. area. Several of these, as noted previously, occur within the present Croesus claim group. The Provincial Government sampling and metallurgical testing plant at Prince Rupert provided a pre-production type of service for the several developing properties of the district during the 1920's-1930's.

Columnario Gold Mines, which ground is presently adjoined on the south by the Croesus group, was developed sufficiently for a short period of sustained production. Underground development consisted of about 8000 feet of tunneling on seven (distinct) veins over eleven levels. This vein system strikes northwesterly, and dips northeasterly. The 100-tons per day flotation mill produced concentrates from the gold-bearing pyritic quartz-vein material for nine months during 1934-35.

The very limited amount of surface-underground exploration and development accomplished within the boundaries of the present Croesus group, principally upon the Silver Cliff-Silver Bow, Black Bull-Gem, Adeline and Zymoetz gold and silver-bearing quartz-sulphide veins, has not adequately defined the full potential of the individual mineral occurrences. In general, local exploration during this period of the 1920's-30's was restricted by inadequate financing, organization, and inefficient exploratory equipment and methods.

Of the earlier discoveries within the area, the Excelsior gold, pyrite and chalcopyrite-bearing shear lode showed the most geological potential for the possible occurrence of the type of large, low-grade disseminated-type of deposit which is of more general interest to present-day mining exploration organizations. For this reason, a considerable part of the Kleanza Mines Ltd. exploratory effort has been directed towards the investigation of rather similarly-mineralized occurrences within the lower southerly parts of the property.

## GENERAL GEOLOGY

The greater part of the Croesus group is underlain by a complex association of granitic to dioritic rocks. G.S.C. map 1136A indicates that these are contained within a major, easterly-trending aphyres emanating from the parent "grandiorite" batholith, which extends south and west of the lower reaches of the Zymoetz River. Locally, the plutonic rocks intrude and enclose Hazelton group and older sedimentary and volcanic rocks. As a result of intrusion and assimilation, extensive zones of complex mixed, deformed rocks occur at the border areas of the granitic rocks, and within enclosures and embayments of the older rocks. Rocks so affected are generally classified as "migmatites"; these range from pegmatite to amphibolite. Migmatite zones occur frequently within the general lower Croesus-Excelsior section of the claim group.

Within the more extensive exposures of grandiorite-migmatite underlying the central-southerly parts of the property, the predominant trend of fracturing, minor intrusion, and quartz and pegmatite veining is east-northeasterly. The more significant occurrences of associated stockwork, and disseminated pyrite-chalcopyrite, bornite, with minor molybdenite mineralization appear to be localized to these ENE-trending structural zones.

The trend of the gold and silver-bearing quartz veins occurring within the mixed assemblages of granitic and volcanic rocks underlying the upper prospect zones of the group, is northerly to northwesterly. This is approximately conformable with the general bedding attitude in the locality.

The above group of typically narrow quartz veins has a distinctive mineralogy, consisting of banded fillings of pyrite, with variable amounts of associated galena, sphalerite, chalcopyrite, tetrahedrite, etc. The richer parts of these veins frequently carry an important precious metal content, with gold and silver often amounting to 1 oz., and 100 oz. per ton, respectively. In general the dispersed pyrite-chalcopyrite type of mineralization within the extensive Croesus-Excelsior zones carries above-average amounts of gold and silver—thus providing considerable incentive for intensive exploration of these, and similar occurrences.

## GENERAL EXPLORATION

### (A) Geochemical Survey

Soil-sampling over the principal prospect areas has been done on N-S, E-W grids on general 100' x 100' to 200' x 100' spacings. Locally, more closely-spaced sampling has been done to trace known zones of mineralization. To date, laboratory-testing of the resulting samples has employed the rubenic-spot method for detection of "soluble copper"; eventually a large proportion of the samples, particularly those from zones of mixed lead-zinc-copper mineralization, will be tested by the "heavy-metals" method, employing dithizone as the indicator.

To date a number of significantly large "copper anomalies" have been delimited by the survey. Other anomalous areas have been indicated by general reconnaissance soil-sampling beyond the main large "copper anomalies".

The apparent relationships of geochemical anomalies to known mineralization will be discussed in the next section of this report.

## **(B) Geophysical Surveys**

This has employed the electromagnetic (E.M.) method for the detection of concealed (sulphide) conductors, and has been carried out on selected portions of the general exploration grid. The surveys have detected a number of apparent conductors—the more significant being coincident with, or adjacent to known sulphide-bearing quartz veins within the upper mineralized prospect areas.

In doing this work, Mr. Bates has employed a Sharpe S.E. 200 unit, an in-line configuration, and 100-foot transmitter-receiver separation. An anomalous condition has been recorded only when 4 (each-way) readings are consistent. Tilt-angles of 0.5 degrees or more are considered significant.

## **(C) Trenching**

\*In addition to numerous trenches excavated to the date of the writer's November 1st visit, trenching has been done within the "Gem"-“Dollar” area.

A D8 cat accomplishes the preliminary overburden and loose rock removal. Following this, trench bottoms are cleaned up by pick and shovel. Next, the trench bottom is drilled off by Cobra drill and blasted to obtain fresh exposures of bedrock and mineralization. After this, the blasted trench rock is wholly or partly removed to allow detailed inspection, geological mapping, and sampling—if warranted. A considerable amount of direct hand-trenching, with Cobra drilling and blasting, has also been carried out to prospect the narrower vein-type mineral occurrences.

To date, some 4000 lineal feet of trench-exploration has been accomplished—most of this having been done on the Croesus-Excelsior zones to investigate these more extensive occurrences of dispersed Fe-Cu-Mo sulphide mineralization.

## **(D) Geological Mapping and Sampling**

This was considerably expedited by the general control grid established over the property—primarily as a control for the soil-sample and E.M. Survey investigations.

Detailed geological mapping was done by Brunton-type methods, with frequent closures on grid stations.

The rather minor amount of sampling required to date has been divided between the general Croesus-Excelsior dispersed sulphide zones and the Gem-Silver Bow, etc. vein deposits.

The dispersed-sulphide material is most readily and adequately assessed by random-grab and/or random-chip sampling of excavated mineralized trench rock and/or trench walls and bottoms.

Sampling of the usual 1 to 3-foot sections across the mineralized quartz vein, or quartz-sheeted shear occurrences is done by chipping the material at close intervals. This is thought to give fairly representative results. This method is also more convenient than the more accurate channel-sampling method, as the latter entails carrying a considerable weight of equipment to often rather distant sections of the property, and which is not really warranted as only approximate determinations of metal content are all that are necessary for the preliminary mineral evaluations.

# **PRINCIPAL MINERAL OCCURRENCES**

## **CROESUS ZONE**

The current exploration trenches are situated in the mid-southerly part of the claim group at some 400-500 feet above Zymoetz River level, and are reached by about ½ mile of the main access road. To date exploration has been rather generally confined to a variably-irregular bench section situated between steeper, bluffier hill slopes on the north and the more heavily-overburdened slope down to road and river-level.

The zone was discovered through preliminary soil sampling investigations, and the resulting disclosure of an extensive, pronounced Cu-anomalous area.

Pyrite-chalcopyrite, and locally, molybdenite occur within an “inner”, or relatively less-complex phase of the major granodiorite prong described earlier in the report. The host rock (principal igneous phase, locally) is white to greenish granodiorite. This contains a variety of related igneous types—occurring as apparently-gradational segregations, irregular intrusive or injected bodies, and variably-assimilated masses of the invaded andesitic volcanic rocks and/or earlier basic, marginal differentiates. Within the Croesus zone the complexity of the intrusion is illustrated by the co-occurrence of both sparsely and highly siliceous biotite granite; granodiorite, hornblende-rich “diorite”, quartz-orthoclase/albite pegmatites, “granitic” aplites, and coarsely-textured veins and irregular masses of white quartz. On the basis of observations made to date, the writer infers that the siliceous “granitic” and pegmatitic phases of the intrusive comprise the most favourable hosts for mineralization.

The surface mineralization typically consists of generally small, to locally appreciable amounts of fracture-filling and disseminated chalcopyrite and/or copper carbonates. The “Veining”-type is best developed within zones of closely-spaced joints or seams, with quartz, or with appreciable silification outward of these fissures. Within these zones iron and copper sulphides occur as fracture-fillings and dispersions within the siliceous selvages. Within locally-brecciated and silicified sections the Cu-Fe sulphides frequently occur in more massive form.



Detailed structural mapping so far accomplished suggests that the optimum controlling fracture sets lie within a general easterly, to east-northeasterly zone; however, significant amounts of mineralization occur within a lesser-developed complementary, northerly, to northwesterly-trending fracture-vein set.

Diagnostic gangue minerals, developed by corollary hydrothermal alteration of the igneous host rocks, consists of quartz, sericite, Kaolin, chlorite, and minor pink orthoclase.

A large grab sample, taken by the writer, of mineralized fractured granite excavated from trench No. 1 assayed:

Au, 0.05 oz/ton; Ag, 0.45 oz/ton; Cu, 0.20%.

Restricted, more strongly fractured and mineralized sections range to 0.60% copper (gold-silver not determined.)

To date the rather minor part of the inferred total extent of the zone so far exposed has outlined a large area containing minor copper, but with significant amounts of associated gold and silver. Appreciable MoS<sub>2</sub> mineralization occurs very erratically—to a degree where it has not been possible to obtain representative samples of the gross mineral content.

The indicated gross value of sampled Croesus mineralization is approximately \$4.00 per ton, with the Au-Ag content contributing about one half the total value. Also, as fracturing and mineralization apparently increase in a westerly direction within the area of the present exposures, additional exploration in this direction is required. Further, the extensive geochemical anomaly continuing for some 800 feet southward, and 3000 feet eastward of the currently-delimited mineralized area indicates the presence of a mineralized zone of considerable over-all magnitude. Geologically, the Croesus and adjoining mineral zones appear to have considerable potential for the occurrence of more intensely-fractured and mineralized sections laterally, or at depth. Further exploration, which will efficiently assess the above potential, will require a combination of appropriate physical and geophysical methods.

## **EXCELSIOR ZONE**

The principal exposures are situated some 3000 feet E.S.E. of the Croesus trenches; they are reached via the main access road.

The showings are situated within a section of migmatized intrusives and volcanics marginally-outward of the Croesus intrusive complex.

The exposed mineralized section is apparently delimited, in cross-section, by two (?) roughly parallel N.E.-striking, steeply-dipping shears. These have an apparent normal separation of about 100 feet. Between them, the mineralized host rock consists of rather intensely-sheared and crenulated, soft-chloritized dark green andesitic tuff or amphibolite-diorite. This is strongly mineralized by pyrite—by replacement of matrix minerals and occurring within the swarm of minor quartz (and calcite) veins injected along the general schistosity. The notable feature of the structure is the considerable difference in strike of the limiting shear-zones and of the internal schistosity and related quartz veining. This acute relationship of major and minor fractures suggests that the quartz lode structure developed by fracturing and injection in a strong “shear-environment”.

Minor chalcopyrite occurs with pyrite throughout the zone; however, relatively greater amounts are found adjacent to the walls of the zone.

Like the Croesus zone, the Excelsior pyrite-chalcopyrite mineralization carries quite significant amounts of gold and silver—probably in proportion to the amount of chalcopyrite present; hence apparently sub-marginal copper mineralization may actually be mineable due to the additional value accruing from associated precious metals.

The structure is obviously strong; therefore it can be expected to persist for considerably greater distances along its strike and dip. The possibility that it will somewhere intersect a section of more competent or brittle rocks within this general locality, with an attendant increase in fracturing, silification, and copper mineralization provides it with a considerable degree of ore potential.

## **GEM ZONE**

The Gem adits and open cuts are situated some 2500 feet northeast of the main Croesus trenches. They are reached by way of the main access road and about ½ mile of trail which could be rather economically widened and graded to provide a passable “jeep” road.

The main Gem structure is a quartz-filled shear fracture, closely conformable in attitude with the enclosing andesitic wallrocks; its general trend is N 10° E, with an average dip of 70° east. The quartz filling has been later fractured and mineralized by pyrite and minor amounts of associated Pb-Zn-Cu sulphides. Material sampled by the writer within the upper drift, and at the lower portal, essentially consisted of banded quartz-pyrite containing trace, to scant amounts of tetrahedrite (and/or reported gold, silver-bearing telluride). The existing exposures vary from 10 inches to 2 feet in width, although a short section within the upper adit has been mined across widths of 3-4 feet. In addition to the tunnels shown, a third adit, 90 feet vertically below the 2250 adit, was driven for some 30 feet only.

A well-mineralized narrow (ore?) shoot is partly exposed over the inner 50 feet of the 2250 adit and within the final 10 feet of the 2140 adit. The average of this partly-stopped section is computed as 50' x 1.5' @ 0.66 oz/ton Au; 1.6 oz/ton Ag; 0.2% Cu for a gross value of \$29.00 per ton. At an assumed minimum mining width of 2.5', the diluted gross value is computed at \$17.40 per ton, assuming no precious-metal content in the over-break. Further, with an appreciably larger developed tonnage of this grade of material, and simple gravity-concentration at the property, it would constitute a potentially-mineable deposit.

The vein in the 2250' adit does not correlate on dip with the portal section of the 2140' adit; hence some exploration is required to determine if the separate exposures are part of one faulted vein, or of two closely parallel veins.

A recent open cut 250' west of the 2140' adit has exposed an appreciably, but differently-mineralized vein or lode section. The rather low assays shown result from a chip sample across a 4-foot true width of rather strongly-weathered sulphides in sheeted quartz and andesite. Sulphide minerals occurring here consist of a mixture of rather coarse-grained galena and sphalerite, with lesser amounts of chalcopyrite occurring with the latter mineral. Only a very local amount of exploration on its strike extensions has been accomplished to this date.

## OTHER SHOWINGS

The two vein segments recently opened in the "Dollar" zone are 3'-4' wide structures on widely divergent trends. The presently exposed surface mineralization consists of predominant limonite or gossan with scattered residual fragments of galena, associated with sphalerite and minor chalcopyrite. This mineral assemblage is very similar to that occurring in the much less weathered Gem #2 exposure. It is possible that the separate exposures are in some way structurally connected.

The Silver Bow zone consists of two or more sub-parallel, sinuous veins. The wider, better-mineralized sections appear preferentially localized to specific sections of bends or warps in strike and dip. On the basis of the metal content of small shipments made about 40 years ago, the zone merits further exploration. These shipments are listed, as follows:

	<u>Au, oz/ton</u>	<u>Ag, oz/ton</u>	<u>Cu%</u>	<u>Pb%</u>	<u>Zn%</u>
7.4 tons	0.173	41.6	1.1	21.2	13.0
5.2 tons	0.15	15.0	1.6	15.0	14.0

The above were obviously derived from shallow trenches and small near-surface underhand stopes.

An important feature of all of the above zones is their occurrence within extensive geochemically (Cu) anomalous zones—suggesting important extensions of mineralization beyond the presently delimited surface showings.

## PART B - TALTAPIN PROPERTY

### INTRODUCTION

The group is situated three miles south of Babine Lake, and 25 miles northeast of Burns Lake, B.C.; it is located in the Omineca Mining Division.

The writer has not visited the property; the following descriptions are from Mr. R. H. Bates' summaries, supplemented by other data from annual reports of the Minister of Mines of B.C. and G.S.C. memoirs.

Although a considerable amount of exploration was accomplished on the principal (Pinkut Creek) high grade silver-lead occurrence prior to 1919, the underground workings have since become inaccessible. In addition, bedrock is almost totally hidden by a heavy mantle of overburden; hence current knowledge of the local geology and mineralization is limited to the sparse evidence available at the collar sections of the old workings and associated dumps.

### CLAIMS

The group presently consists of two original Crown-granted claims and 58 locations staked by Mr. R. H. Bates of Terrace, B.C. A claim schedule giving the claim names, record numbers and dates, filing data, etc. will be provided by Kleanza Mines Ltd., (N.P.L.).

## GENERAL GEOLOGY

Within the vicinity altered (Cache Creek) andesite rocks are intruded by grey (Topley) granodiorite. Numerous light grey rhyolite dykes cut both greenstones and granodiorite.

Two distinct sets of quartz veins occur within the andesitic rocks. The easterly striking group is essentially barren, whereas those striking northeasterly, and generally dipping to the northwest, are mineralized. Individual veins vary in width from a few inches to 4 feet; fillings consist of galena, sphalerite, chalcopyrite, minor pyrite and tetrahedrite in a sparsely micaceous quartz gangue.

"The principal (Pinkut Creek) showings occur within Lot 4097, where the N.E.-striking veins occur on both sides, and within a 100 foot distance of a tongue of granodiorite 200 feet or more wide. East and south of the claim, less favourable showings occur in roof pendants of andesitic greenstone, more than 200 feet in diameter, in the granodiorite." (ref. G.S.C. Mem. 252, p. 175). Mr. Bates notes that mineralized veins, varying in width from 6 inches to 30 feet, occur (scattered) up to 3 miles north of the (Pinkut Cr.) canyon and for about one mile south.

## PINKUT CREEK SHOWINGS

The workings reportedly consist of 200 feet of horizontal tunnels and 200 feet of shaft from the surface. No maps of these workings, which might provide details of the vein geology and mineralization, are known to the writer.

The principal (high-grade) vein outcrops in the bed and walls of Pinkut Creek canyon. It varies in width from 6 inches to 2 feet, strikes about N30°E, and dips 60 degrees to the northwest. According to Lay (M.M. B.C., 1926) a sample from this vein assayed: gold, trace; silver, 3.6 ounces per ton; lead, 3 per cent; zinc, 27 per cent; copper, 1 per cent. Three parallel sparsely mineralized quartz veins occur 200 feet farther down the creek. They vary in width from 1-4 feet, and are from 10-20 feet apart. Two prospecting adits have been driven on these veins.

Lay reports that a —35° diamond drill hole intersected 7 feet of ore at 216 feet which assayed: gold, 0.03 oz/ton; silver, 12.6 oz/ton; lead 7 to 8%; zinc, 2.4%. Also, at 303 feet the drill went through high grade ore, appearing on Pinkut Creek, which assayed: gold, 0.03 oz/ton; silver 77.2 oz/ton; copper, 1.9%; zinc 5.1%.

## HISTORY

The original exploration-development group formed the Taltapin Mining Company on the Crown-granted Silver Fox claim and six adjoining claims. Development commenced this same year and continued intermittently over the next 10 years, and consisted of two tunnels, a shaft, and numerous surface trenches. In addition 12 miles of road and a mine plant adequate for the above work were constructed. Plans for a mill to concentrate the by-product of selected mining operations were considered.

During 1920 a three ton lot of high grade ore was shipped to the Trail smelter—no assays were given. By 1927 underground work comprised of 68 feet of crosscut, driven from Pinkut Creek, to intersect the depth extension of the "high-grade" vein exposed on the surface above the canyon; this tunnel was still short of its objective. The shaft on the high grade vein had evidently been sunk during the 1920-26 period, thereby establishing the persistence of mineralization to this depth.

During 1928 the shaft was rehabilitated and deepened and the Company reported that "good ore had been struck in the continuation of the shaft." However, an excessive flow of water, together with an inadequate sinking plant culminated in cessation of work in the fall of this year. There is no record of subsequent work by the Taltapin Mining Company.

Mr. R. H. Bates, Terrace, B.C., acquired the key claims of the above group prior to 1964 and has recently expanded the group to its present size. Mr. Bates' investigations to date have consisted of staking, general prospecting, and some check sampling; a recent sample from the Silver Fox shaft dump assayed: gold, 0.04 oz/ton; silver, 15.4 oz/ton; copper, 0.94%; Mo, 0.005%. No assays of the usual Pb-Zn content of the ore were reported.

The above dump ore has an indicated gross value of approximately \$30.00 per ton. Given adequate reserves of this grade, it should be possible to mine and mill at a fair profit.

Respectfully submitted,  
W. M. SHARP, P.Eng.

## REFERENCES

- G.S.C. Memoir 205, Mineral Resources of Terrace Map Area, E. D. Kindle, 1937.
- G.S.C. Memoir 329, Geology of Terrace Map Area, S. Duffell and J. G. Souther, 1964.
- Annual Reports, Minister of Mines of British Columbia; 1919, 1920, 1925, 1927, 1928, 1937, 1938, 1940, 1946.
- R. H. Bates, Terrace, B.C.: Sketch maps, progress maps, descriptive notes, excerpts from Dominion and Provincial Govt. publications, sample reports, and general correspondence pertaining to Kleanza Mt. and Taltapin properties of Kleanza Mines Ltd., (N.P.L.).

## CERTIFICATE

I, William M. Sharp, with business address in Vancouver, British Columbia and residential address in North Vancouver, British Columbia, do hereby certify that:

1. I am a consulting geological engineer.
2. I am a graduate of the University of British Columbia with B.A.Sc. (1945) and M.A.Sc (1950) degrees in Geological Engineering.
3. I am a registered Professional Engineer in the Province of British Columbia.
4. I have practiced my profession since 1946, in both geological and managerial capacities, with Canadian mining companies until 1964, when I established my own consulting practice.
5. I have personally investigated the Kleanza Mountain mineral occurrences and have examined all available technical data, reports, and correspondence pertaining to it; in addition, I have discussed current developments with Kleanza Mines Ltd. residents and head office staff and officers.
6. I have no interest, direct or indirect, in the properties or securities of the above Company, nor do I expect to acquire any such interest.

Respectfully submitted,

W. M. SHARP, P.Eng.

Vancouver, B.C.

December 1966.

KLEANZA MINES LTD. (N.P.L.)

SCHEDULE "A"

KLEANZA MOUNTAIN (CROESUS GROUP

<u>Mineral Claim</u>	<u>Record No.</u>
Croesus #1 to #6 incl.	30813 to 30818 incl.
Croesus #7 and #8	39534 and 39535
Croesus #9 to #16 incl.	34633 to 34640 incl.
Croesus #17 to #20 incl.	39536 to 39539 incl.
Croesus #25 to #30 incl.	39540 to 39545 incl.
Croesus #31 to #52 incl.	34641 to 34662 incl.
Croesus #53 to #56 incl.	46833 to 46836 incl.
Croesus #57 and #58	34663 and 34644
Croesus #59 to #66 incl.	39546 to 39553 incl.
Croesus #67 to #72 incl.	42665 to 42670 incl.
Croesus #77 to #128 incl.	42671 to 42722 incl.
RAT No. 1 Fraction	46814

KLEANZA MINES LTD. (N.P.L.)

SCHEDULE "B"

TALTAPIN GROUP

<u>Mineral Claim</u>	<u>Record No.</u>
Taltapin #1 and #2	20121 and 20122
T #3 to #14 incl.	37128 to 37139 incl.
T #19 to #22 incl.	37140 to 37143 incl.
T #23 to #28 incl.	46815 to 46820 incl.
T #43 to #48 incl.	46821 to 46826 incl.
T #49 to #56 incl.	37144 to 37151 incl.
T #67 and #68	46827 and 46828
T #97 to #100 incl.	46829 to 46832 incl.

  

<u>Tag No.</u>	
T #57 to #66 incl.	789337 to 789346 incl.
T #75 and #76	789335 and 789336
T #91 and #92	789333 and 789334
T #81 and #82	789360 and 789361
Lecroy (Lot 4098)	Mineral Lease M-60