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**Yukon 7-1962**

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**4219 Lions Avenue**  
**North Vancouver, B. C.**

**Report on**  
**Property of**  
**KETZAKEY SILVER MINES**  
**Quiet Lake Area**  
**Whitehorse M. D. , Y. T.**

**4219 Lions Avenue**  
**North Vancouver, B. C.**

**Dr. A. E. Aho**  
**Consulting Geological**  
**Engineer**

**Submitted to Edwin Case, Ketsakey Silver**  
**Mines Limited, Edmonton, Alberta.**

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**SUMMARY**

The Ketsakey property contains two or more veins subsidiary to a main fault, and work to date has exposed vein for 170 feet with three ore shoots 15 to 30 feet long, averaging 50 ounces per ton silver and 15% lead across 2.5 feet.

Good possibilities exist for finding a larger potential of similar ore along unexposed extensions and blind parallel veins near the main fault. Other prospects on the property may also prove interesting.

It is recommended that some further stripping be done and that the possibilities be probed by diamond drilling, with final evaluation to be confirmed by drifting.

A preliminary expenditure of, say \$40,000, mainly on drilling, should determine if a suggested total of \$125,000, or a portion thereof, should be spent on further work, chiefly underground.

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## INTRODUCTION

Silver has become an increasing attractive metal since the United States treasury stock pile used to make up the 100-million-ounce difference between Free World consumption (300 million ounces annually) and production (200 million ounces) will be depleted by the end of this year, and a price increase is thus virtually certain.

The Ketsa River district of Yukon, first staked extensively in 1954, and prospected to a limited extent since that time, is one of the few undeveloped silver districts that can be explored with reasonable expectations.

The Ketzakey property contains the best silver prospect presently known in the district. A new road has largely overcome previous difficulty of access and bulldozer stripping has exposed the vein well so that the possibilities of the property can be judged better than before.

## GENERAL CONDITIONS

The property lies at the headwaters of Ketsa River, latitude  $61^{\circ}34'N$  and longitude  $132^{\circ}13'W$ , in the Pelly Mountains of south central Yukon 110 miles northeast of Whitehorse in the Whitehorse mining district. It can be reached best by driving 79 miles from Whitehorse to Johnson's Crossing, 133 miles up the Canal Road, about 14 miles to Ketsa River, and then by tractor 20 miles up the Ketsa River road to the property.

The Ketsa River road mainly follows the east side of the river on good terrain but crosses the river 20 times, for expedience mainly (see enclosed map 105F). Except for crossings in high water in June, only a few thousand dollars would make the road serviceable for motor vehicles, preferably with 4-wheel drive. Work that should be done to make the road more permanently serviceable would be:

1. Improve first section up to mountains.
2. Consider re-routing to east side at bend of river.
3. Re-route 3 miles of repeated crossings to east side around Cloutier Creek.
4. Re-route deep crossing 4 miles above Cloutier Creek and crossing 6 miles above.
5. Improve muddy stretch in first half mile up hill.

The government should be urged to help in every way to make this a permanent access road as a major step in development of this promising district. Cost of this would be of the order of \$20,000.

Timber suitable for exploration and mining purposes exists in adequate quantity down Ketsa River and nearby Tintina Valley.

Water for drilling and underground use can be obtained in summer from a stream about a thousand feet northwest of the main showing; a limited amount of water trickles from a flat drill hole at the showing. Ketsa River a mile and a half directly below the showings would supply good water year-around for a main camp and mill.

Climate is typical of mountainous areas of Yukon, with short cool summers and long cold winters, but presents no unusual difficulties to year-around operation. The field season for surface work extends from about May 30 to September 30 as a maximum; prospecting and mapping can be done only in the snow-free period between June 15 and September 15, depending on elevation and weather.

The main showing lies at 5650 feet elevation on the steep talus-covered northeast side of Silver Ridge, about 1700 feet in elevation above Ketsa River. The slopes are occasionally subject to snow and rock slides which would have to be taken into consideration in any permanent construction.

No facilities whatever except cabins exist in the area.

Costs of operation would be comparable to that of United Keno Hill Mines in the equally distant Mayo area, except that ground conditions and a few other factors may differ. For preliminary purposes a cut-off grade of 30 ounces or so a ton is assumed although this may be too low in the final analysis.

## HISTORY

Low grade silver-lead showings were originally discovered around the head of Ketsa River in 1949 by Hudson Bay Exploration Company. In 1954 showings of the present Ketzakey property were discovered and staked by George Fairclough, Erik Erikson, Jim Shorty, Roddy Blackjack and associates. These discoveries were optioned to Conwest Exploration who trenched several of the showings, drove three short adits, then relinquished the option. During this period numerous other discoveries were made in the district, including a gold deposit that was drilled by Conwest and is still held.

After the option was dropped, Conwest offered a final cash settlement of \$36,000 payable in two years, which was turned down, and R. R. Kirwin and H. H. Regehr took up the option. Further work was done on the property, largely ineffective in changing the overall picture, and the property was then optioned to Ketzakey Silver Mines Limited of 10029-148th Street, Edmonton, which is controlled by Edwin and Stanley Case. Case and an associate, Smith, constructed the Ketsa road in 1960 and 1961, stripped the main showing, and hand-sorted about 20 tons of shipping ore.

The property has been examined by Conwest in detail, and briefly by James W. MacLeod, Cooper and Hook, and others. Reports by Conwest and MacLeod were available to the writer.

I examined the property for Edwin Case on September 3, 4, and 5, 1961, in the company of Edwin Case and Stanley Case.

## GEOLOGY AND MINERALIZATION

REGIONAL (see Geological Survey of Canada map 7-1960)

The Ketsa River District lies along a mineral belt paralleling the Tintina Valley fault trench some 15 miles to its southwest. Silver-lead prospects occur in or adjacent to Lower Cambrian rocks in this belt, and promising new discoveries made recently by Conwest 40 miles to the southeast along this belt also occur with these rocks.

The district structure in the Ketsa River area consists of a half-dome uplift of Lower Cambrian rocks cut by northwest faults which have dropped down the northeast side of the dome so that overlying Paleozoic rocks lie on this side. The Ketsakey showings occur as veins of siderite and quartz with argentiferous galena and tetrahedrite, localized in and subsidiary to, northeast faults in this section of Paleozoic rocks. Other showings occurring around the half-dome structure consist of similar veins and breccia replacements in limestone with a silver-lead ratio of about 0.7 and quartz veins with copper are also common.

#### KETZAKEY PROPERTY (See Figure 1)

I examined the main showing, Key No. 3A, in detail and scouted some adjoining parts of the property. At the time of my visit a bulldozer was used to clean off and expose the main vein.

#### KEY 3A Showing (see Figure 2)

This showing originally consisted of two veins exposed only in short adits driven by Conwest Exploration in 1955. The lower of those two veins has now been stripped and well exposed for a continuous length of 170 feet which was mapped and sampled.

The exposed veins lie on the southwest side of a major fault, called the main fault, which strikes northwest, apparently dips steeply, and brings a section of buff slate and thin-bedded quartzite on the southwest side in contact with black slate on the northeast. The buff slate-quartzite section forms the relatively competent host rock for the veins. This section is several hundred feet in thickness, strikes east-west, and dips about 20° south.

The veins, consisting of siderite and quartz mineralized with galena, tetrahedrite and pyrite, are emplaced along subsidiary faults. Often with galena in the faults themselves, in later offsetting cross-faults, and in stringers and seams in the intensely fractured wall rocks. The veins strike northerly and dip about 35 to 50 degrees west. Widths vary from a few inches up to about 4 feet, averaging 2.5 to 3 feet with individual sections or sheets of ore (A, B, C, and D) being 15 to 30 feet in length. The shoots appear to be localized at concavities and intersections in the vein and may also have some spatial relationship to the main fault.

The main north- to northwest-trending veins are intersected by, and locally terminated against, north-striking fractures or faults which also carry galena and dip about 50 to 65 degrees west.

Left-hand offsets up to 10 feet occur along NNE cross-faults which dip flatly southeast and also carry minor galena. A former impressive showing of 9.5 feet of galena may have resulted from simultaneous exposure of the two faulted segments of shoot "C", the upper lens of galena now having been removed.

Assuming a cut-off grade of say 30 ounces of silver per ton, present exposures of shoots A., C, and D would give a rough average of about 25 tons per vertical foot with 2.5 feet width averaging about 50 ounces per ton silver and 15% lead. If they extend 100 feet down along the veins, this would give a potential of some 2500 tons of ore with a gross value of about \$200,000.

The present exposures are not impressive, but the structural setup is such that considerable more ore may be expected to occur in the following situations:

- (a) Along possible extensions of the veins down dip.
- (b) Along strike where the veins lie under minor black slate to the southeast, and where they are not exposed against the main fault to the northwest.
- (c) In other blind veins which may occur under the present ones in the competent section that is unexposed on the southwest side of the main fault.
- (d) At vein intersections.

Thus the potential of the veins in this locality might prove to be substantially more than is suggested by present exposures but may be expected to be similar in character.

Short X-ray diamond drill holes under shoot "C" are said to have intersected 8 feet of vein (almost certainly not true width), but no records were kept of the holes. One hole drilled by Case at minus 45 degrees penetrated buff slate for 60 feet under the vein. This drilling, however, is of insufficient extent to contribute much additional information.

#### Other Showings and Possibilities (see Figure 1)

Several other silver-lead showings and areas of float have been found on the Ketzakey property and have had limited work done on them. Of these I visited only the Key 6A and Key 11A prospects, but the others are adequately described for present purposes by Conwest and MacLeod.

Key 6A showing is comprised of several small sub-parallel veins or stringers up to a few inches wide, a few feet apart, striking about N20-35° W, dipping 70-85° W and mineralized with galena, siderite, and minor tetrahedrite. These appear to be associated with faults which strike northwest and dip about 45° southwest. A sample of the best mineralization gave 101.8 oz. per ton silver and 61.3% lead. These stringers do not appear to have any economic possibilities but could indicate other nearby veins that might be revealed by further investigation.

Galena float reported on the Jan claims farther downhill suggest another vein in that vicinity, which might be discovered by further prospecting and stripping.

Key 11A showing consists of a zone of shearing about 2 feet wide, striking N10°W, dipping nearly vertically, and containing a few inches (up to 6 inches judging by float) of mineralization of galena, an unidentified antimony mineral (jamesonite?), sphalerite, and minor pyrite and tetrahedrite. This vein cuts and alters a section of competent greenstone and andesitic tuff. A selected sample contained 30.8 oz. per ton silver and 44.2% lead. The relative weakness of the vein and the low silver-lead ratio do not encourage further work, but the competent greenstones in the area should be excellent host rocks if better veins can be found. Typical rusty alteration in the greenstones is a good guide to vein proximity.

Key 13A showing is reported by MacLeod to consist of an 8-foot zone of massive pyrite assaying .05 oz. per ton gold and 0.40 oz. per ton silver, with a 14-foot adit driven on it. Several tons of quartz boulders with sparse chalcopyrite and galena, and boulders of pyrite and galena with chalcopyrite are reported on the pack-trail above this showing.

Key 16A showing is reported by MacLeod to consist of massive pyrite assaying .04 oz. per ton gold and 0.60 oz. per ton silver across a width of 8 feet in an anticlinal fold. 50 feet west of this a quartz-carbonate zone with pyrite and arsenopyrite exposed by digging is reported to carry the same values.

Key 16B showing is reported by MacLeod to be a shear zone striking N-S and dipping 68°W, with a width of 16 feet and still unexposed on the east wall. A 6-foot sample across grey-green gouge with small pieces of quartz assayed 0.18 oz. per ton gold and 6.5 oz. per ton silver. A drill hole bearing S50°E at minus 40 reportedly encountered quartz-carbonate vein matter and pyrite and ended at about 85 feet.

Key 13A, 16A, and 16B showings are typical of several other such occurrences in the district, with and without accompanying galena and low silver values. Except for possibilities of interesting gold values or nearby high grade silver, they appear to have little or no economic potential but do warrant further prospecting in their vicinity.

Descriptions of Key 7A and 9A showings as well as the other showings already described are being obtained from Conwest. At the time of writing these have not yet been received but they will be forwarded and can be appended to this report.

## CONCLUSIONS

Bulldozer stripping of main key 3A showing has exposed enough information to indicate good additional possibilities of encountering high grade silver-lead ore of economic potential (a) down dip, (b) along strike, (c) in parallel unexposed veins, and (d) at vein intersections.

Well guided work on other showings, areas of float, and favorable prospecting terrain may well uncover additional sections of ore.

Recent completion of an access road has greatly enhanced capability of exploration which was formerly costly and largely ineffective due to the limited extent of work feasible by hand trenching and tunnelling and light drilling.

The property definitely warrants considerable careful exploration under the best possible geologic guidance.

### RECOMMENDATIONS

Further exploration work should include the following:

1. Some improvement of access road for vehicles.
2. Some additional stripping of extensions of the Key 3A showing and possibly others with a bulldozer.
3. Diamond drilling.
4. Underground exploration (drifting).
5. Additional prospecting.

Bulldozer stripping on Key 3A showing, alternated with limited road improvement and work on other prospects while waiting for frost to thaw, should be begun in early June when long daylight produces maximum rate of thaw. A bulldozer will be necessary in any case for transportation during high water.

Drilling with a large machine and B core should be started by July, with steeply inclined holes on the southwest side of the main fault to test for lateral and depth continuity and possible parallel veins. Because of irregularity of the mineralization and probably of the coring results, this drilling should be used to confirm the presence of promising veins, which would determine the extent and location of adit and drifts to be driven to evaluate these veins.

Because of complex structure, careful geologic work must be done throughout this program.

By mid-August an expenditure of say \$40,000 in this work should determine roughly the extent to which an underground program and continued surface work would be justified. With reasonable planning, the underground work can be started before freeze-up and continued in winter, although lack of water will be a difficulty.

Provided a reasonable agreement can be negotiated on price of property and work done to date, \$125,000 should be tentatively allotted to exploration roughly as follows:

Stripping and road	\$20,000
Drilling say 1500' @ \$15	25,000
Drifting say 1000' @ \$25	25,000
Equipment	25,000
Geology, supervision, etc.	10,000
Camp, labour, etc.	20,000
Total	<u>\$125,000</u>

Respectfully Submitted,

September 20, 1961

Dr. A. E. Aho

## APPENDIX

### **ADDITIONAL DATA FROM REPORT BY R. WOODCOCK CONWEST EXPLORATION CO., LTD.**

On Key 3A showing, drag on fractures indicates that the hanging wall moved down and to the north, thus the veins would be in tensional fractures.

Key 1A showing, on Key 1 claim near a supposed fault, consists of a few pieces of galena float up to 4 inches wide which assayed 75 oz. per ton silver and 70% lead.

At Key 6A showing, a massive lens of galena is mentioned as replacing argillite with a channel sample across it assaying 91.40 oz. per ton silver and 75.0% lead.

Key 7A showing is described as a 15-foot width of arsenopyrite with minor carbonate, pyrite, and sphalerite assaying 0.18 oz. per ton gold and 0.42 oz. per ton silver.

Key 9A showing consists of an irregular galena coating, formerly about 5 inches thick, on a fault surface striking N45W and dipping 35 SW; from which galena assayed 135.0 oz. per ton silver and 75.8% lead.

Key 11A, 16A, and 16B showings were described by MacLeod and myself after more work had been done, but values have remained about the same as when Woodcock examined them.

Key 13A showing is described as lying between two diverging faults striking N52 W/80 NE and N25 W/vertical, with small lenses of galena and sphalerite, from which grab samples assayed 9.08 oz. per ton silver and 24.0% lead.

On Strike No. 4 claim, just off the southwest boundary of the Ketzakey property, a 4-inch vein of galena striking N50 W and dipping 10 SW assayed 135.4 oz. per ton silver and 70.0% lead.

A number of other minor occurrences of galena are mentioned, including galena fragments in breccia along the main fault.

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**KSM****KETZAKEY SILVER MINES LIMITED**

**10029 - 148 Street, Edmonton, Alberta  
 MU 8-5777**

**COPY OF ASSAY CERTIFICATE from Whitehorse Assay Office**

**Samples taken by Dr. A. E. Aho for KETZAKEY SILVER MINES  
 LIMITED**

Sample No.	SILVER oz. Per Ton	LEAD	Sample No.	SILVER	LEAD
3791	24.7	6.6	3871	85.8	12.2
3792	17.6	1.8	3872	17.1	3.1
3793	131.1	16.7	3873	49.7	1.9
3794	43.7	7.9	3874	9.0	3.4
3795	34.1	6.1	3875	19.8	6.9
3796	1.14	0.3	3876	31.0	9.0
3797	16.4	4.1	3877	16.0	6.8
3798	1.24	1.2	4791	130.8	44.2
3799	24.3	17.8	4792	574.0	63.6
3800	10.4	8.8			
3801	3.9	Nil			
3866	101.8	61.3			
3867	129.6	23.8			
3868	56.8	25.2			
3869	48.0	18.5			
3870	61.3	17.6			

4791 - Taken from one of the exposures on the South East end of Key claims.

4792 - Grab sample taken from Key 3A showing, as indicated on plan.

Signed/ Norman Case  
 Secretary Treas. Ketzakey Silver Mines Ltd.