

GEOLOGICAL AND GEOPHYSICAL REPORT  
on the  
SANDY GROUP  
TOOTSEE RIDGE AREA  
YUKON TERRITORY AND BRITISH COLUMBIA

1° QUADRILATERALS  
59°, 130°, N.W.  
60°, 130°, S.W.

104 0 / 15 E

WORK DONE BY

N.D. McKECHNIE, P. ENG.  
GLEN E. WHITE

WORK DONE FOR

YUCOL MINES LTD.  
510 W. HASTINGS  
VANCOUVER 1, B.C.

WORK DONE IN PERIOD OCT. 2 - OCT. 5, 1971

REPORT DATED OCT. 18, 1971

MAGNETIC DECLINATION ASSUMED 32° E.

Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT

NO. 3844 MAP

3844

FIG. 1  
YUCAL MINES LTD. (N.P.L.)

SANDY CLAIM GROUP

LOCATION AND CLAIM MAP

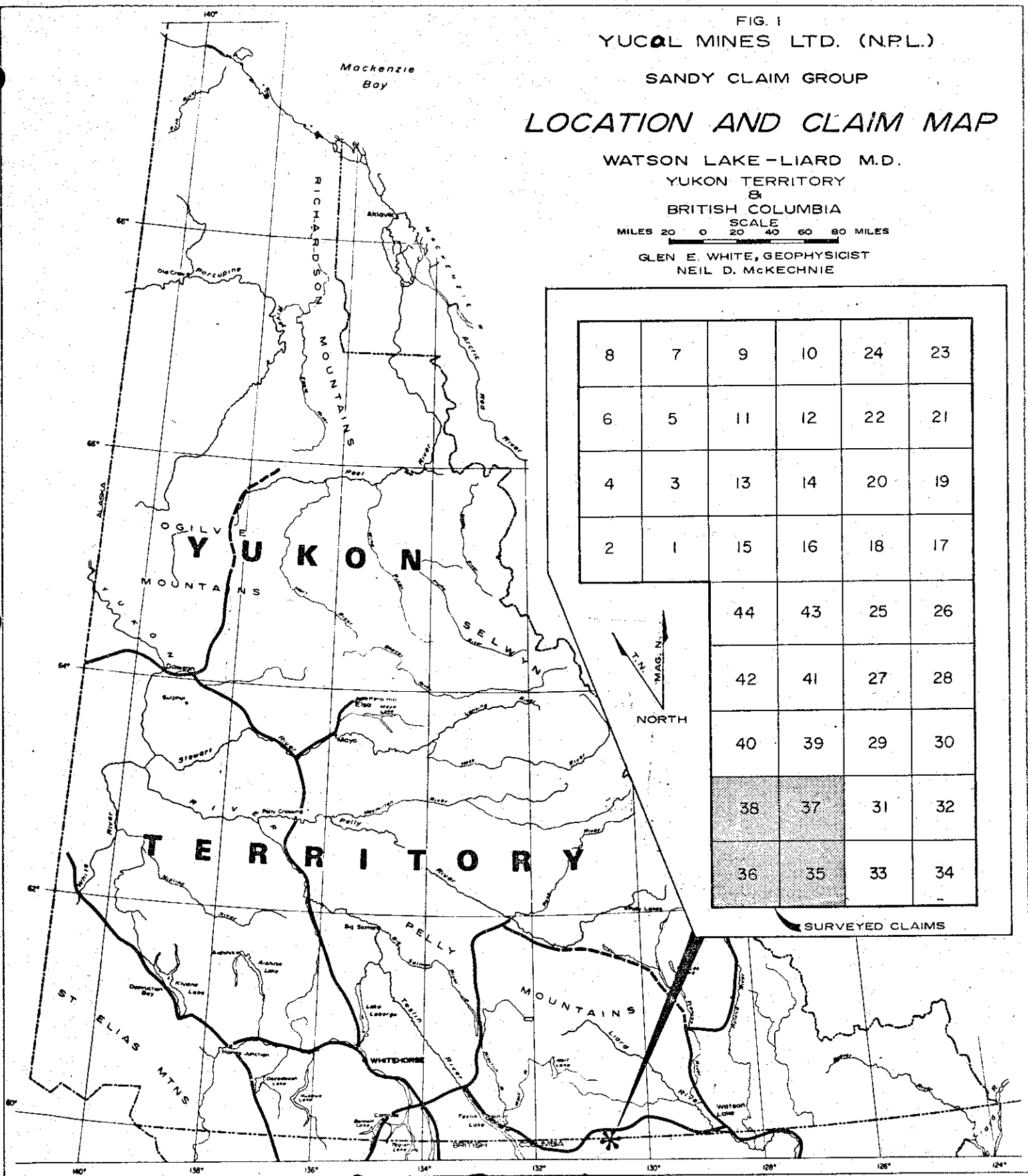
WATSON LAKE-LIARD M.D.

YUKON TERRITORY

BRITISH COLUMBIA

SCALE  
MILES 20 0 20 40 60 80 MILES

GLEN E. WHITE, GEOPHYSICIST  
NEIL D. McKECHNIE



8	7	9	10	24	23
6	5	11	12	22	21
4	3	13	14	20	19
2	1	15	16	18	17
NORTH					
T.M. MAG. N.					
		44	43	25	26
		42	41	27	28
		40	39	29	30
		38	37	31	32
		36	35	33	34

— SURVEYED CLAIMS

3844 M-1

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" 4	Certification, Neil D. McKechnie

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#2 Fig. 2	Vertical Magnetic Intensities
#3 Fig. 3	Electromagnetometer, Filtered Dip Angles

Summary and Recommendations: The Sandy Group of 44 claims is underlain by biotite-quartz-monzonite of the mid-Cretaceous Cassiar batholith.

The biotite-quartz-monzonite is cut by weakly magnetic gabbroic dykes having in general, a northward trend. The dykes occur beyond the boundaries of the property and indicate major development of dilatant fractures.

Five sites of silver-lead mineralizations have been found on the property. They strike in a general east-west direction and have a spatial relationship to the gabbroic dykes which could also be a structural relationship.

The mineralization occurs as veins the maximum known width of which is 6 feet. Exploration of the occurrences must therefore be directed toward the possibility of developing a small-tonnage, high grade deposit.

Magnetic and electromagnetic surveys conducted on claims Sandy Nos. 35-38 show good continuities from a site of mineralizations and a gabbroic dyke occurrence. Because of weather conditions, these surveys could not be carried beyond the area shown.

Geological information on the occurrences is at present inadequate.

The following work is recommended, to start in 1972

*JM*

as soon as snow conditions allow:

- (a) The clearing and systematic sampling of existing trenches and open cuts for data on what assays and grades can be expected.
- (b) Present trenches and cuts should be extended to the limits of visible mineralization, where depth of overburden permits.
- (c) A grid system on the basis of 400 - foot intervals and 100 - foot stations should be established to form the basis for detailed surveys.
- (d) Soil sampling, with tests for silver, lead, and zinc should be done in areas marked by overburden.
- (e) A geological survey on a scale of not less than 1 inch = 400 feet should be done both as a study of visible relationships and to aid in the interpretation of geophysical data.
- (f) The present geophysical survey on claims Sandy Nos. 35 - 38 should be extended over the remainder of the property, save where bedrock exposures are virtually continuous.
- (g) Bulldozer stripping should be done as indicated by the results of the surveys.
- (h) Diamond drilling should be done accordingly as progressive surface results justify subsurface exploration.

*W.D.M.*

Estimate of Costs

Geological survey ...	\$3,150.00
Geophysical survey...	5,850.00
Geochemical survey and analyses...	3,600.00
Reports and Interpretation...	1,700.00
Assaying...	1,000.00
Instrument rental...	600.00
Materials...	100.00
Bulldozer	7,000.00
Rock trenching	2,000.00
Diamond drilling	16,000.00
Air Fares	500.00
Hotels, taxis, etc.	50.00
Meals and accomodation	1,900.00
Administration and overhead	5,000.00
Contingencies	<u>1,550.00</u>
	\$50,000.00

*J. M. M.*

SANDY GROUP  
TOOTSIE RIDGE AREA  
YUKON AND BRITISH COLUMBIA

Introduction: On October 2-5, 1971, inclusive, I made an examination of exposures on mineral claims Sandy Nos. 35-38 inclusive of the Sandy Group. I was accompanied by Messrs. Robt. K. Bailey, Prospector, Douglas Parent, Mining Engineer, and Glen White, Geophysicist. Mr. White conducted the geophysical surveys over these claims as described below.

The examination was hampered by snow which, increasing, eventually ended the work. The geological section of this report, therefore, is a summation of information available from the owners records and from publications, supplemented by such observations as I was able to make.

Location: The Sandy Group is comprised of 44 mineral claims situated in the Tootsie Ridge area, five miles south of Mile 708 on the Alaska Highway. (Fig. 1) The claims lie approximately between latitudes N 59° 59' and N 60° 01' and between longitudes W 130° 32' and W 130° 35', between elevations of about 4,000 to 6,000 feet above sea level.

Claims Sandy Nos. 1-24 are in Yukon Territory, Watson Lake Mining Division; claims Sandy 25-44 are in British Columbia, Liard Mining Division.

<u>Claim Name</u>	<u>Location</u>	<u>Staked</u>	<u>Record No.</u>
Sandy 1 - 8	Yukon	27/8/70	Y2948-55
" 9 - 16	"	29/8/70	Y42957-64
" 17 - 24	"	28/8/70	Y42965-72
" 25 - 34	B. C.		48571-80
" 35 - 44	B. C.		48581-90

*J. S. M.*

They are registered in the name of Robt. K. Bailey, P.O. Box 264, Watson Lake, Y.T..

Access to the claims is by the service road to a Canadian National Telecommunications microwave tower which crosses the Hancheria River southward on a bridge near Mile 706 on the Alaska Highway. From this road, a branch road follows the east side of Freer Creek to a crossing at 3.5 miles. From just beyond the crossing the road forks westward over the ridge to the valley of Alan Creek, and southward along Freer Creek valley. The westward fork leads to showings on claims Sandy No. 3 and Sandy No. 25; the southward fork terminates about two miles north of the showing on Sandy No. 35.

General Geology: The claim group lies wholly within the Cassiar Batholith, an elongate body of granitic rocks which extends from Wolfe Lake, in the Yukon Territory some 200 miles southeastward to Lamarque Pass in British Columbia. Widths of the exposed batholith, as mapped by the Geological Survey of Canada, vary from four to twenty miles. The predominant rock types are described as biotite-quartz-monzonite and granodiorite. The Cassiar Batholith is considered, on the basis of age-dating, to be of mid-Cretaceous age.

A shear zone of up to two miles in width marks the westward contact of the batholith for some ninety miles, from fifty miles southeast of the B.C. - Yukon boundary to forty miles northwest of it.

*JRM*



Mineral occurrences of silver-lead-zinc, copper and molybdenum are known in the area in the batholithic rocks and in the intruded sediments. Surface and in one instance, limited underground development has been done, chiefly since the mid nineteen sixties.

Geology of the Property: Rock exposures in the property area are confined, even in the creek valleys, to elevations above 4,500 - 5,000 feet. The area is one of serrated ridges and numerous cirques, indicating strong glaciation; the valleys and lower slopes are filled and covered with glacial outwash characterized by rounded to sub-angular granitic boulders in a matrix of coarse, ill-sorted gravel with occasional crudely bedded lenses of finer material. Depths of bedrock are not known.

The rock exposed on claims Sandy Nos 35 - 38 are medium to coarse grained biotite - quartz - monzonite. Marked porphyritic textures were seen on lines 7 North and 11 North (see Figs. 2 and 3) lying in a roughly northward strike, one to the other, but any contacts there may be were covered by snow so the relationship of the porphyry to the biotite-quartz-monzonite is not known. A dyke of gabbroic composition, showing occasional phenocrysts of biotite, is exposed in a northward strike about 100 feet west of the base line (Figs. 2 and 3). Again contacts were obscured but the width of this dyke is of the order of ten feet and the dip is near-vertical.

At 350 feet north on the base line and immediately north of it galena with quartz occurs in a northward striking

*JAM*

fracture zone in monzonite. It is poorly exposed in one open cut. The rock is sheared, brecciated and altered to light green, sericitic material which is veined by a black, fine-grained rock. The galena and quartz are distributed as stringers and discrete bunches in the sheared and brecciated rock. More work is required before this showing can be assessed.

Two other sites of mineralization are known on the property but because of the snow, I was not able to see them. The following remarks are a summary of information provided by the owners and in part confirmed by descriptions in Annual Reports of the Minister of Mines of B.C.. The sites are on the Sandy No. 25 mineral claim, immediately south of the B.C. - Yukon boundary; and on the Sandy No. 3 mineral claim, lying on the Yukon side 5,500 feet on bearing north 55° west from Sandy No. 25.

The showings on Sandy No. <sup>43?</sup>(25) are described as 1040-1  
Holliday Ransom, on pages 69 and 70 of the Annual Report of the Minister of Mines of B. C., 1949. There are described as relocations of earlier claims, Eva and Molly which are listed as having been Crown granted in the years 1912 and 1922 respectively. Apparently before 1949 the Crown grants had lapsed.

The gabbroic dyke noted above is one of a number which were noted in the course of prospecting the property as favoring north-trending fractures and varying in widths from a few inches to 10-20 feet. They were found to be spatially related to the mineral showings. The best exposure available at the time of my visit was on the adjoining Lucky Group where

*W. E. M.*

a dyke was exposed on the east side of Freer Creek, striking northeastward, for several hundred feet. These dykes are not mentioned in the relevant publications of the Geological Survey of Canada nor the B.C. Dept. of Mines, so their distribution and that of the dilatant zones they occupy are still to be learned. They are weakly magnetic and should be readily traceable with a magnetometer. Their apparent relationship to mineralization, whether fortuitous or actual, should be investigated since dilatant zones are possible loci for ore.

The mineral showings on Sandy No. 25 are described in the Annual Report 1949 under the names "Discovery Vein" and "Shipment Vein".

DISCOVERY VEIN: "The Discovery vein is the widest showing, but no work has been done on it because of its almost inaccessible location. It is on the north side of a steep slope, about 20 feet below the peak of the mountain (6,000 ft.). The outcrop is quartz with some galena, pyrite, and hematite. Both walls are composed of rusty, weathered granite. The vein is exposed for a width of 6 feet and a length of 10 feet. Both ends are covered by talus. The vein strikes north 35 degrees east and dips vertically. A sample across the 6 feet of vein material and weathered granite assayed: Gold, trace; silver 2.2 oz. per ton; lead 1.7 %."

The owners have no additional data on the Discovery vein.

SHIPMENT VEIN: "Several open-cuts have been made at about 1,500 feet east of the Discovery vein and 1,000 feet lower in elevation. The largest of these is a trench 4 feet wide, 6 feet deep and 150 feet long from which ore was sorted for the test shipment....The Shipment vein, as far as exposed by the trench, is a quartz vein striking north 65 degrees east and dipping 80 degrees south. At the upper or south end of the trench, the vein consists of 0.8 foot of quartz and 0.8 foot of altered granite. Both the quartz and the granite within the walls of the vein are mineralized with galena and some pyrite. A sample across the 1.6 feet assayed: Gold, 0.05 02/ton; silver, 9.1 02/ton; lead 29.2%. The vein widens toward the middle of the trench and narrows again at the north end. A sample across 2.1 feet in the middle section assayed: Gold, nil; silver, 0.9 02/ton; lead, 9.6% ----- This test shipment (5 tons) assayed: Gold 0.04 02/ton; silver 40.1 02/ton; lead, 65.4%; zinc 1.5%."

The owners record of this showing show a strike of north 74 degrees east, a dip of 74 degrees north, a length of trench of 124 feet at an altitude of 5,550 feet. Three chip samples taken by them yielded the following assays:

	<u>Width</u>	<u>Au.OZ ft.</u>	<u>Ag 02/t</u>	<u>Pb%</u>
No. 065 S. wall	1.3 ft.	-	0.02	-
No. 066 Vein	0.4 ft.	tr	15.68	20.9
No. 067 N wall	1.3 ft.	-	0.52	-

giving a weighted average over three feet of 2.32 oz/ton silver

*J.M.*

and 2.79 % lead.

The owners found another small rock trench "some 400 feet northeast of showing No. 2 (Shipment Vein). The vein is quartz with about 12% pyrite, and 1.5% galena and trace chalcopyrite, all very rusty and manganese stained. The wall rock is highly altered quartz monzonite with talc and sericite. The vein strikes east-west, dips vertically and is at an altitude of 5,400 feet. One chip sample was taken across the vein which assayed:

	<u>Width</u>	<u>Au OZ/t.</u>	<u>Ag OZ/t.</u>
No. 068	1.5 ft.	tr.	0.44"

Two showings on the Yukon side of the boundary are described in the owners records as follows:

"Showing No. 4: Located on the same N.E. striking low ridge and about one claim length N.W. of No. 2 showing (Shipment Vein), consists of a 92 foot wide highly altered shear zone with numerous quartz threads and stringers all highly manganese stained. Four chip samples were taken across this zone where exposed for a sum of 42 feet, the rest of the zone was covered by arkosic sand and boulders. The rock type was not easily distinguishable, it may be a lamprophyre dyke. At the far west wall of the zone, a two foot wide quartz vein with sparse galena and pyrite was seen and sampled

"Strike of Shear Zone N 35° W.  
"Dip " " " 71° S. W.  
"Width " " " 92 feet  
"Altitude " " " 5,600 feet

*W.M.*

"Strike of Vein N 45° E  
 "Dip " " 63° N. W.  
 "Width " " 2 feet

"Chip Samples:	<u>From-To</u>	<u>Width</u>	<u>Au OZ/t.</u>	<u>Ag OZ/t.</u>
"Chip No. 069	0 - 7	7	tr.	0.14
"Chip No. 070	7 - 30	23	tr.	0.04
"Chip No. 071	72 - 78	6	tr.	0.06
"Chip No. 072	86 - 92	<u>6</u>	tr.	0.30
		42		
"No. 073 (vein)	0 - 2	2	nil	tr"

"No. 1 Showing: Located on N. E. sloping rim of the basin at elevation 6,100 feet on claim Sandy No. 3 and consists of a 1.4 feet wide white quartz vein with fist size pods of medium coarse galena; some inclusions of altered wall rock as breccia was also seen in the quartz vein. The walls of the vein are biotite-quartz-monzonite, highly talcose and also containing some sericite.

"Strike of vein N 80° E  
 "Dip of vein 74° S  
 "Altitude of vein 6,150 feet approx.

"Chip samples:	<u>Width</u>	<u>Au OZ/t.</u>	<u>Ag OZ/t.</u>	<u>Pb %</u>
"No. 062 south wall	2 ft.	-	tr	
"No. 063 vein	1.4 ft.	tr.	5.32	11.3
"No. 064 north wall	1.4 ft.	-	0.22	

*JDM*

GEOPHYSICS

Introduction: A limited amount of magnetometer and electro-magnetometer surveying was conducted over a portion of the Sandy Claim Group, early in October 1971. The electromagnetometer survey was undertaken to try and locate areas of high conductivity which might reflect lenses of galena-silver sulphide mineralization. The magnetometer survey was used to try and trace the lamprophyre dikes which are thought to be associated with the above mineralization.

SURVEY SPECIFICATIONS

Survey Grid: The survey grid consisted of traverse lines turned off at right angles every 400 feet from a N40°E directed baseline. The traverse and baselines were flagged and numbered at 100 foot intervals.

The Magnetometer Survey: The magnetometer survey was conducted using a Sharpe M<sup>-</sup>1 Fluxgate magnetometer. This instrument measures the vertical component of the earth's magnetic field to an accuracy of 10 gammas. Corrections for diurnal variation were made by tying into previously established base stations at intervals not exceeding one and one half hours. Readings were taken at 100 foot intervals along the traverse lines.

The Electromagnetometer Survey: This survey was conducted using

*JRM*

a V.L.F. Electromagnetometer. This instrument acts as a receiver only. It utilizes the primary electromagnetic fields generated by VLF marine communication stations. These stations operate at a frequency between 15-25 KHZ and have a vertical antenna-current resulting in a horizontal primary field. Thus, this V.L.F. - E.M. measures the dip-angle of the secondary field induced in a conductor.

For maximum coupling, a transmitter station located in the same direction as the geological strike should be selected, since the direction of the horizontal electromagnetic field is perpendicular to the direction of the transmitting station.

Readings were taken at 50 foot intervals and the data filtered in the field by the operator as described by D. C. Fraser, Geophysics Vol. 34, No. 6 (December 1969). The advantage of this method is that it removes the dc and attenuates long spatical wave lengths to increase resolution of local anomalies, and phase shifts the dip-angle data by 90 degrees so that crossovers and inflections will be transformed into peaks to yield contourable quantities.

#### DISCUSSION OF RESULTS

The electromagnetometer and magnetometer survey data is illustrated on Figures 2 and 3 respectively in contour form at a scale of 1" = 400 feet.

The electromagnetometer data (Figure 2) shows several areas of interesting electromagnetic responses. The strike of

*J. M.*



the conductors located are almost at right-angles to the direction to the transmitter station at Jim Creek, Washington, U.S.A. which will give low numerical values. The strongest electromagnetic response detected is located on line 15+00N-3+00W. The conductors in general, strike in two directions, NNE-SSW and almost east-west. The weak electromagnetic responses just west of the baseline between lines 0+00 and 7+00N may possibly be associated with lead-silver mineralization located in this area.

The magnetometer data located moderate magnetic intensities at 0 00-1+00E and 7+00N-1 00E which form a NE-SW trending magnetic ridge which may possibly reflect the lamprophyre dike associated with the mineral showing located just west of the baseline at 3 50N. The magnetic contours are also biased in NE-SW and east-west directions parallel to the electromagnetic trends.

Correlation of the magnetic and electromagnetic data indicates that the conductor on line 15 00N-3 00W is just west of a magnetic high. The electromagnetic trends may possibly reflect mineralization and/or fault zones as indicated by the electromagnetic conductor associated with a probable fault zone reflected by the creek on the eastern side of the survey grid.

Oct. 18, 1971

Glen E. White  
N. D. McKechnie, P. Eng.

*Glen E. White*  
*N. D. McKechnie*

APPENDIX 1.

Instrument Specification

MAGNETOMETER

A Instrument

- (a) Type - Fluxgate
- (b) Make - Sharpe M<sub>F</sub>-1

B Specifications

- (a) Measurement - Vertical Magnetic Field
- (b) Range -  $\pm 100$  K gammas in 5 ranges
- (c) Sensitivity - Maximum 20 gammas per scale division
- (d) Accuracy -  $\pm 10$  gammas

C Survey Procedures

- (a) Method - One and one half hour loops
- (b) Corrections - (i) Base  
(ii) Diurnal
- (c) Station relationship - each station read for intensity of vertical magnetic field.

APPENDIX 2.

Instrument Specifications

ELECTROMAGNETOMETER

A. Instrument

- (a) Type - Geonics VLF-EM
- (b) Make - Ronka EM 16

B. Specifications

Measurement (i) Utilizes primary fields generated by VLF marine communication stations, measures the vertical field components in terms of horizontal field present.

(ii) Frequency range 15-25 KHZ

(iii) Range of measurement - in phase  $\pm 150\%$  or  $\pm 90^\circ$

- quadrature  $\pm 40\%$

(iv) Method of reading - null detection by earphone, real and quadrature from mechanical dials.

(v) Accuracy -  $\pm 1\%$  resolution.

C. Survey Procedures

Method (a) Select closest VLF station perpendicular to

traverse lines.

- (b) In-phase dial measures degree of tilt from vertical position.
- (c) Quadrature dial calibrated in percent - null
- (d) Station plot - plot values read at station surveyed.
- (e) Manually filter dip-angle data

REFERENCES

Geological Survey of Canada:

Map 10 - 1960, Wolfe Lake, Yukon  
Paper 68-55, Map 18-1968, Geology of Jennings River  
Map Area, B.C.  
Paper 50-14, Potential Mineral Resources of Yukon  
Territory.

Annual Reports of the Minister of Mines of B.C.:

1912, p. 324, Eva Claim  
1922, p. 354, Molly Claim  
1949, pp. 69-70, Holliday Ranson Claims  
1966, p. 17, Key Claim

National Topographic Series:

Sheet 104-0/15, McNaughton Creek, B.C.  
Sheet 105-B/2, Daughney Lake, Y.T.

Claim Maps:

105 B2, Yukon Territory 1 in =  $\frac{1}{2}$  mi.  
79 M, British Columbia 1 in = 2 mi.

CERTIFICATION

TO WHOM IT MAY CONCERN:

- I, GLEN ELMO WHITE, of the City of Richmond, in the Province of British Columbia, hereby certify:
1. That I am a Geophysicist and reside at 117, 641 Gilbert Road, Richmond, B. C.;
  2. That I studied Geophysics and Geology and graduated from the University of British Columbia with the degree of Bachelor of Science.
  3. That I have been engaged in Mining Exploration for eight years.
  4. That I do not have, nor do I expect to receive, either directly or indirectly, any interest in the property, described herein or in the securities of Yucol Mines Ltd.
  5. That the Geophysics section of this report is based on information derived from a magnetometer and an electro-magnetometer survey carried out by myself.

DATED this 18th day of October, 1971.

  
G. E. White, B. Sc.  
Geophysicist

CERTIFICATION

I, NEIL DOUGLAS McKECHNIE, of 1932 St. Ann Street, in the City of Victoria, in the Province of British Columbia certify that:

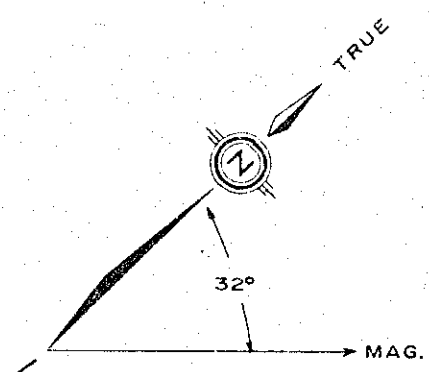
1. I am a member of the Associations of Professional Engineers of British Columbia and of Yukon Territory, and am in good standing.
2. I hold the degrees of Bachelor of Science in Geology, Queen's University, 1932 and of Master of Applied Science in Geological Engineering, University of British Columbia, 1933.
3. I am a Fellow of the Geological Association of Canada, a Member of the Canadian Institute of Mining and Metallurgy, and a Member of the Society of Economic Geologists.
4. I have practised my profession as a geological engineer for thirty-eight years.
5. I examined showings on the Sandy group, as stated in this report, on Oct. 2-5, 1971.
6. I have no interest, direct or indirect in the Sandy group of mineral claims, nor in the shares or other assets of Yucol Mines Ltd. nor do I expect to receive any.

DATED this 18th day of October, 1971.

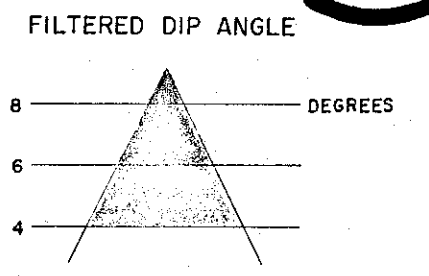
  
N.D. McKechnie, P. Eng.



3844 M-3



Approximate direction to  
Jim. Creek, Washington (V.L.F.-EM)



**LEGEND**

- x Mineral showing
- Claim post
- △ Cairn
- Claim lines

INSTRUMENT, RONKA V.L.F. EM 16  
CONTOUR LINE - 2,4,6,8 DEGREES

N.T.S. 104 0

YUCAL MINES LTD. (N.P.L.)	
SANDY CLAIM GROUP	
<b>ELECTROMAGNETOMETER (FILTERED DIP ANGLE)</b>	
WATSON LAKE-LIARD M.D.	
SCALE: 1" = 400'	DATE: OCT. 1971
GLEN E. WHITE GEOPHYSICIST	FIG. 3

TO ACCOMPANY REPORT BY NEIL D. McKECHNIE  
DATED *October 16, 1971.*

GLEN E. WHITE, GEOPHYSICIST  
*Glen E. White*

*MSM*



