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092555

GEOLOGICAL MAPPING AND
GEOCHEMICAL SOIL SURVEY.

MACMILLAN PASS TUNGSTEN DEPOSIT

SELWYN MOUNTAINS, N.W.T.

AMAX EXPLORATION, INC.

R.J. Cathro, P. Eng.

October 5, 1967.

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SUMMARY

A field program of geological mapping and geochemical sampling between August 8 and 29 has shown that six limestone horizons occur on Mt. Allan in addition to the Main Zone sampled in 1963 by J.F. Allan. Skarn can be seen in most of these and was sampled in one place 1500 feet from the intrusive. This suggests that the tonnage potential estimated by Allan could prove to be conservative if mineable grade and width is found in the upper limestone horizons, or the mineralization extends more than 750 feet away from the intrusive. Approximately 50,000 feet of drilling will be required to adequately sample this deposit for production. Detailed sampling of the granodiorite has proven that no open-pit tonnage potential is present although one small zone is present in the intrusive that deserves more careful study. The mineral deposit is bisected by the Yukon-Northwest Territories border and the ramifications of this should be investigated fully. Geochemical prospecting has produced strong anomalies but appears to have a limited application because the soil profile that has developed since glaciation is so young and thin.

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INTRODUCTION

The Macmillan Pass Tungsten deposit was discovered by J.F. Allan in 1962 and ownership was subsequently transferred to Amax Explorations, Inc. The precipitous cliff face in which the showing outcrops was mapped and sampled in a preliminary fashion during 1963 and 1964. This work indicated a potential for 2.1 million tons of underground ore grading 0.90% WO_3 over a 45 foot mining width. This tonnage was all within the lowest skarn horizon and not enough information was available to estimate the potential in other narrower skarn horizons. A single sample taken from a trench blasted in the granodiorite intrusive in 1964 (Trench 12), returned an assay of 0.17% WO_3 over an 80 foot length, suggesting a potential for a large tonnage of low grade open-pit ore.

The 1967 survey was planned to provide the basic information necessary to guide the diamond drilling program which will be needed to sample and outline the deposit. This drilling will likely be deferred until the Canol Road is reopened to provide better access and for lower exploration costs. The specific objectives of the program were:

- (a) To map the stratigraphy on Mt. Allan in detail.

This was essential because the deposit is stratigraphically controlled, occurring in

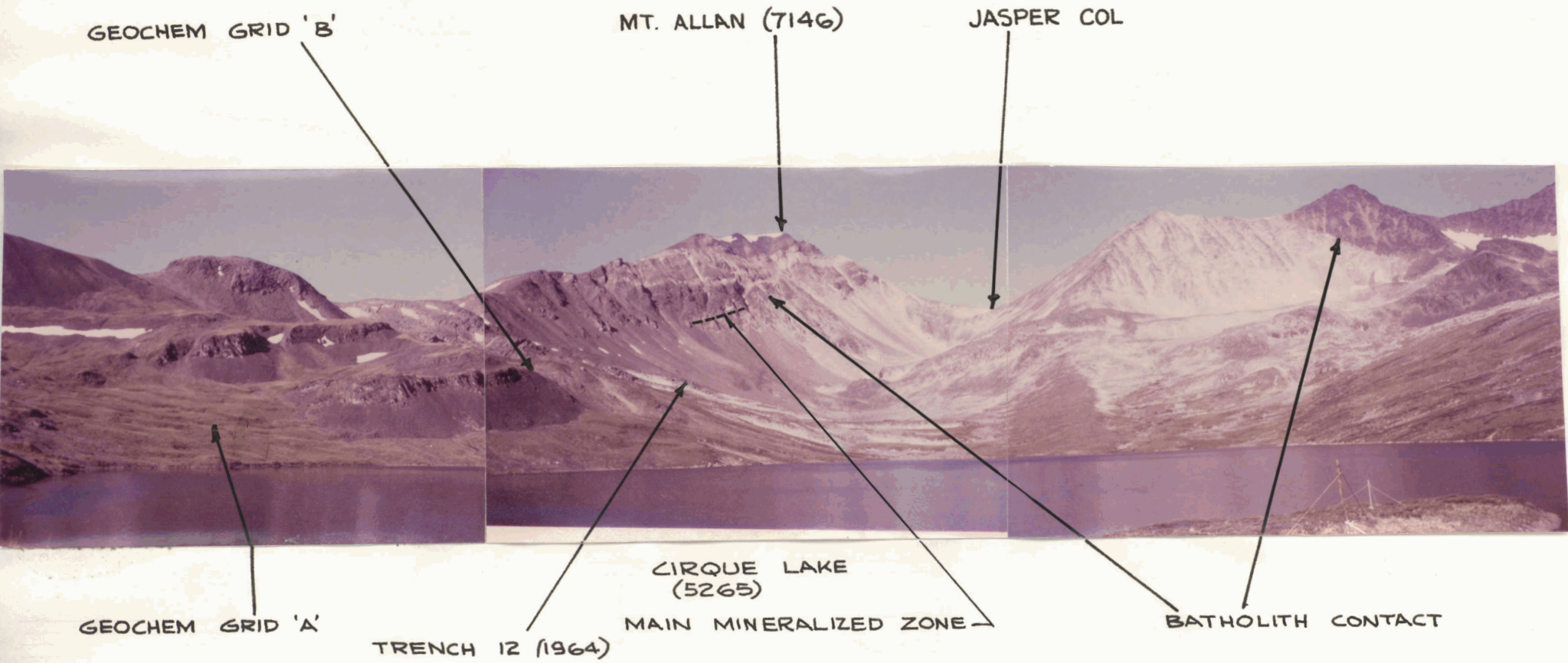


PHOTO 1 - PANORAMIC VIEW FROM EAST END OF CIRQUE LAKE, LOOKING WEST
AUGUST 17, 1967

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2.

skarn alteration zones in limy horizons within a thick sequence of fine grained clastics and chemical precipitates which alternate between shaly, cherty and limy composition.

- (b) To investigate the occurrence of the scheelite in the granodiorite and explore the open-pit mining potential.
- (c) To conduct an experimental reconnaissance tungsten geochemical soil sampling survey over the whole property and an orientation survey around the known showings. It was hoped that this would aid in tracing the skarn zones across the south slope of Mt. Allan and at the same time provide useful data in searching for other tungsten deposits.

The field work extended from August 8 to 29. The writer spent the period August 8 to 18 at the property. J.F. Allan of Amax visited the project from August 15-18 to coordinate the 1967 program with previous work. The weather was poor except for a 4 day period. Strong winds and rainstorms between August 8 and 14 made the move to the property difficult. Snow fell almost daily between Aug. 21 and 29, a total fall of about 6 inches, and the snowline fluctuated for most of this period between the 6400 and 6800 foot elevations. At the end of the survey the new snow had almost disappeared.

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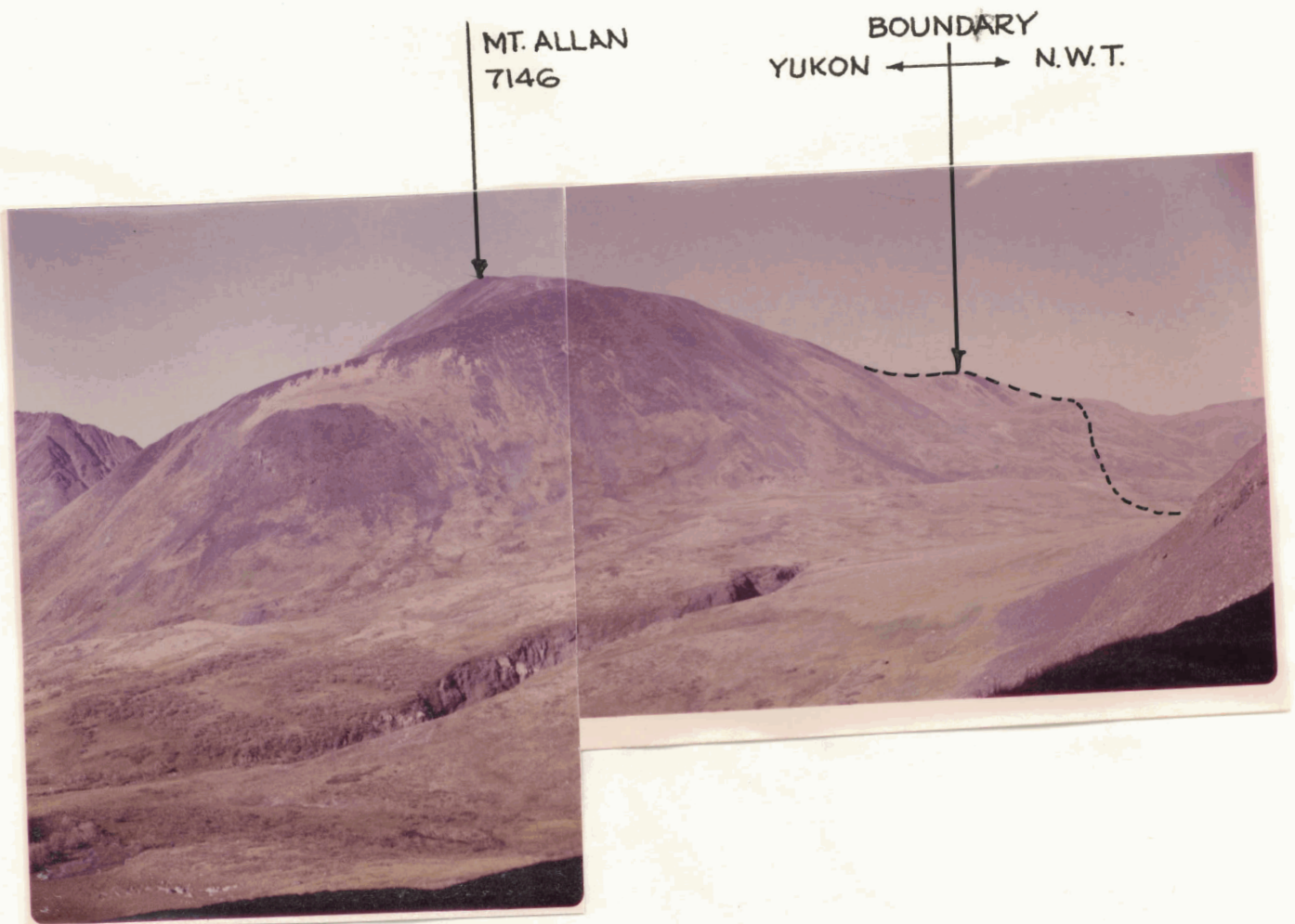


PHOTO 2 - PANORAMIC VIEW OF SOUTH SLOPE OF MT. ALLAN, FROM THE SSW.
AUGUST 17, 1967

PROPERTY

The property comprises 24 contiguous, unpatented mineral claims. Ownership was transferred from Southwest Potash Corp. to Amax Exploration, Inc. on March 6, 1967. The claims are situated in the Mackenzie Mining District and are registered in Yellowknife, N.W.T. The claim sketch following shows that the west side of the property lies along the Yukon-N.W.T. boundary as located on the government claim map. A detailed base map of the property, prepared for this survey from aerial photographs by McElhenney Surveying and Engineering Ltd., Vancouver, indicates that the true position of the boundary may be shifted several thousand feet northeast and could bisect the mineral deposit (see Figure 2). This can only be confirmed by a government border survey. The details of the claims are as follows:

<u>CLAIM NAME</u>	<u>TAG. NO.</u>
Judy 1-13	N41417-N41429
" 14-15	N34186-N34187
Jill 16-17	N34182-N34183
" 18	N41434
Jill 8-9	N41442-N41443
" 12	N41446
" 13	N34184
" 14-15	N41451-N41452

Circle Lake

Jo 9	Jo 1	Judy 15	Judy 14	Judy 17	Judy 18	Jill 14	Jill 15	Jill 16
Jo 10	Jo 2	Judy 14	Judy 13	Judy 12	Judy 11	Jill 13	Jill 12	Jill 11
Jo 11	Jo 3	Judy 6	Judy 7	Judy 8	Judy 9	Judy 10	Jill 9	Jill 10
Jo 12	Jo 4	Judy 5	Judy 4	Judy 3	Judy 2	Judy 1	Jill 8	Jill 7
Jo 13	Jo 5	Jo 8	Jill 6	Jill 5	Jill 4	Jill 3	Jill 2	Jill 1
Jo 14	Jo 6	Jo 7						

N.W.T.
YUKON

——— GROUP 1
- - - - GROUP 2

Note:-

- 2 post staking - Recorded Mayo Mining District, YUKON.
- 4 post staking - Recorded Yellowknife Mining District, N.W.T.

FIG. 10

SOUTHWEST POTASH CORPORATION

Mac MILLAN PASS TUNGSTEN

Yukon - N.W.T.

CLAIM SKETCH

Scale 1" = 1/2 Mile Approx

LOCATION & ACCESS

The property straddles the Yukon-Northwest Territories border at 63°17'N and 130°30'W (see Figure 1). The border follows the Continental Divide so that the southwest side of the property drains west into the Yukon River while the remainder drains east into the Mackenzie River. The property is situated in the Selwyn Mountains above the 5200 foot elevation, within NTS mapsheet 105-0-8.

At present the property can only be reached safely by helicopter. Although Beaver and Super Cub aircraft have used Cirque Lake in the past, it is regarded as hazardous except under ideal weather conditions. The nearest suitable lakes for float-equipped aircraft are Fish Lake, 15 miles northeast, which was used for mobilization to the property in the 1967 survey, and Jeff Lake, 21 miles southwest, the site of Hudson Bay Mining's Tom property base camp. The nearest aircraft charter point is Ross River, 125 miles southwest of the property. The 1967 survey was fortunately able to use a helicopter chartered by Hudson Bay Mining and based at Jeff Lake.

The logical access route to the property is by way of the Canol Road. A 5 mile tote road will be required to connect the property with the Canol Road at a point 285 road miles from Johnston's Crossing on the Alaska

*9750
KEELE PK.

W.00°01'

YUKON
N.W.T.

CANOL ROAD
Mileages from Johnsons Crossing

Fish L.

Tisichu R.

AMAX

Cirque L.

Macmillan Pass

290

280

HUDSON BAY
(Tom)

270

260

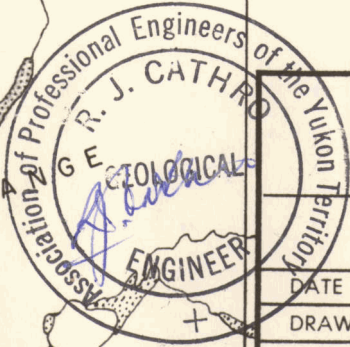
Jeff L.
camp

S. MACMILLAN R.

ITSI MTN
X 8500

ITSI

0 1 2 3 4 5 mi.



Location Plan
Macmillan Pass Tungsten
AMAX EXPLORATION, INC.

ARCHER & CATHRO
Consulting Geological Engineers

DATE	31 Aug. 1967
DRAWN	<i>W. Tommes</i>
SCALE	1" = 250,000'

DWG. No. 1.

5.

Highway and 145 and 180 miles respectively from Ross River and the new townsite planned for the Anvil-Vangorda lead-zinc camp. Johnston's Crossing is 82 road miles from Whitehorse, northern terminus of the 110 miles of White Pass Railway from Skagway, Alaska, and is 340 road miles from Haines, Alaska. The total road distance from the property to ocean ports is, thus between 480 and 630 miles depending on the route chosen. Final selection of the transportation route for concentrates from the Anvil operation, expected to be announced soon, will be of great importance for the Amax deposit.

The Canol Road is presently abandoned and impassible between Ross River and Norman Wells. However the road can be reopened for a relatively small cost, at least as far as Macmillan Pass, and this scheme is reported to have high priority in government planning.

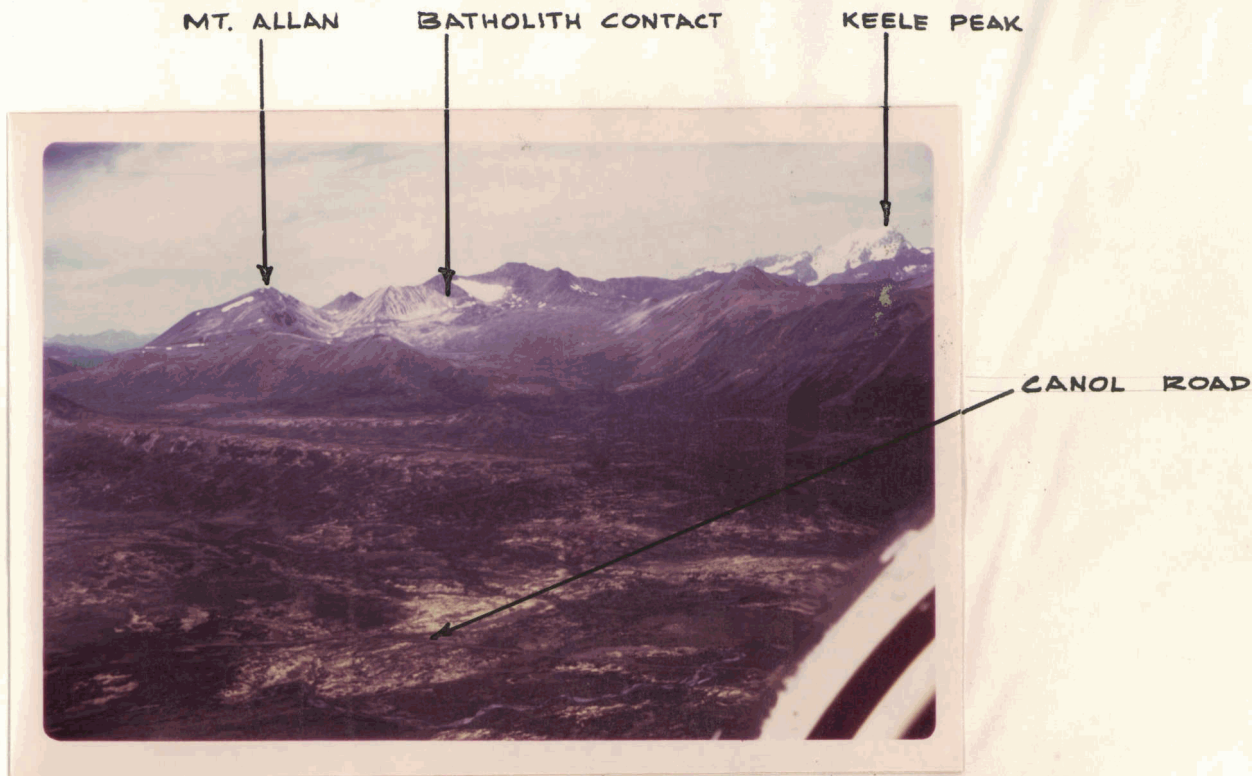


PHOTO 3 - MT. ALLAN & AMAX PROPERTY, VIEWED FROM THE EAST.
THE YUKON - N.W.T. BOUNDARY FOLLOWS THE SKYLINE.

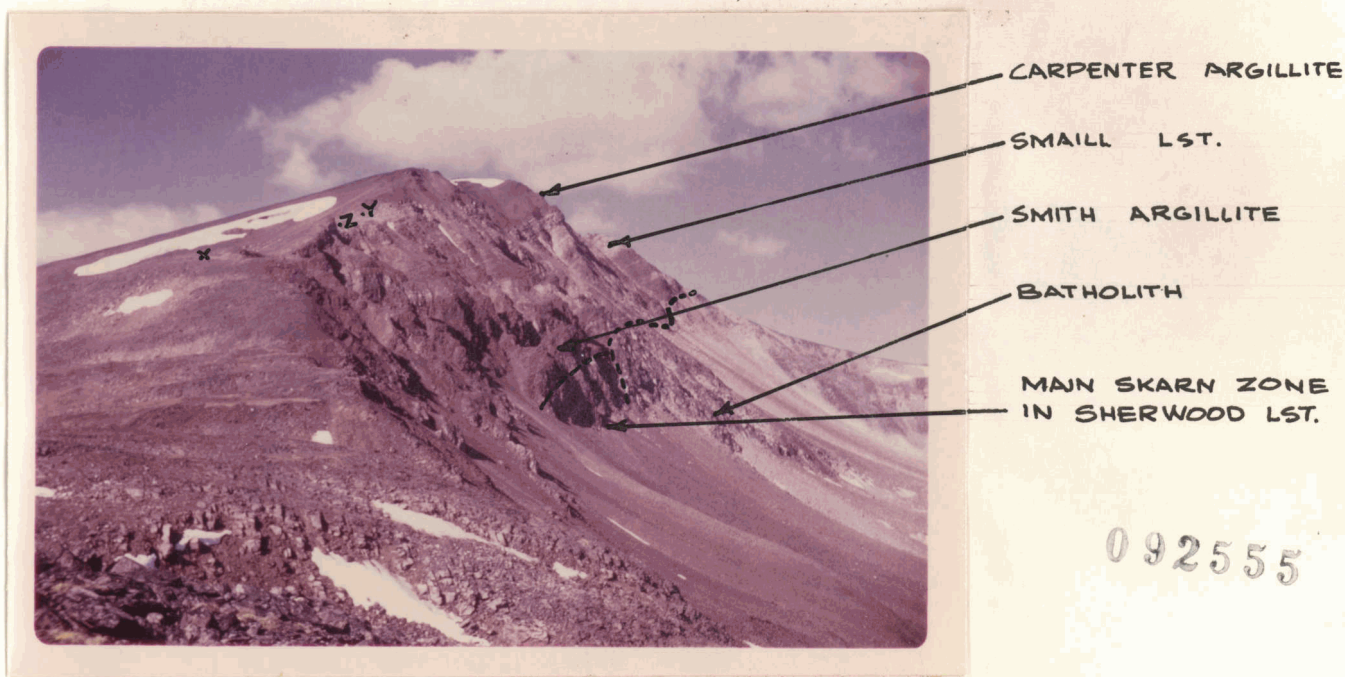


PHOTO 4 - NORTH FACE OF MT. ALLAN LOOKING WEST.

X - SKARN OUTCROP ON BACK SLOPE
 SAMPLES 3252 & 3253

Y - CAMERA POSITION FOR PHOTO 5

Z - CAMERA POSITION FOR PHOTO 6

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GENERAL GEOLOGY

The geology has been well described in a 1963 report by J.F. Allan of Amax. Briefly, scheelite is associated with pyrrhotite, chalcopyrite and minor molybdenite in a skarn alteration halo associated with an intrusive contact. The skarn is developed in one main horizon and several smaller ones and is partially exposed in the steep north face of Mt. Allan.

The intrusive is a circular granodiorite stock two miles in diameter. It is exceptionally rich in tourmaline, which is generally associated with trace amounts of scheelite, molybdenite, and muscovite alteration along quartz veinlets. The stock intrudes a gently south-dipping sequence of deep-water sediments, probably of Ordovician-Silurian age. These rocks are underlain, perhaps unconformably, by a metamorphic unit consisting of contorted phyllite. The phyllite is tentatively correlated with similar Cambrian rocks to the southeast near Cantung. A set of north striking faults crosses the property, generally displaying offsets of a few tens of feet. One stronger fault block has lifted phyllite several hundred feet vertically into the sedimentary horizon.

The geological mapping is shown in plan and section in Figures 2, 3 and 4.

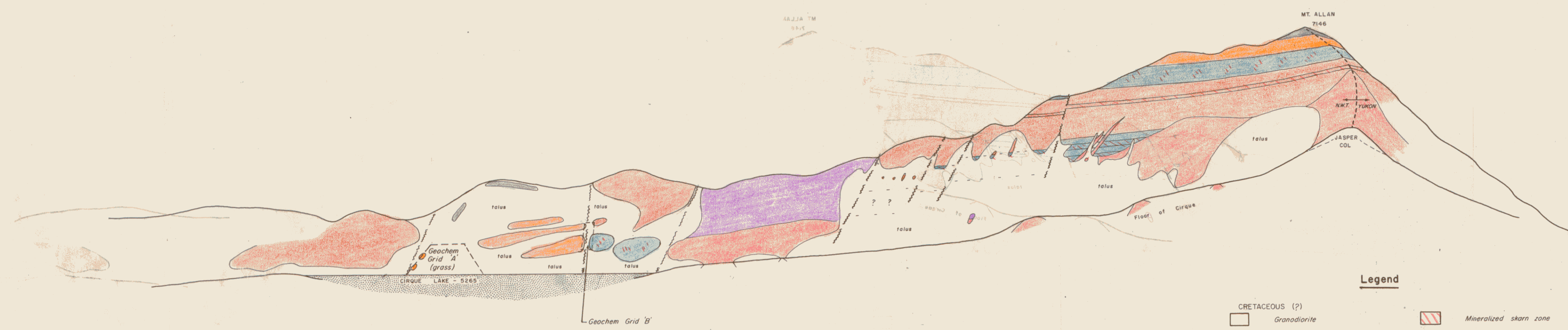
B
EAST

VIEW LOOKING SOUTH

A
WEST

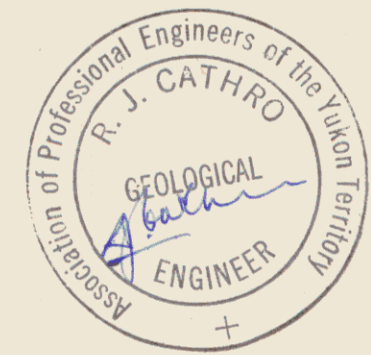
7000'
6500'
6000'
5500'
5000'

7000'
6500'
6000'
5500'
5000'



Legend

- CRETACEOUS (?)
 - Granodiorite
- ORDOVICIAN & SILURIAN - ALLAN GROUP
 - Hommes shale
 - Carpenter argillite
 - Small limestone
 - Smith argillite
 - Sherwood limestone
- CAMBRIAN
 - Phyllite
- Mineralized skarn zone
- Assumed fault



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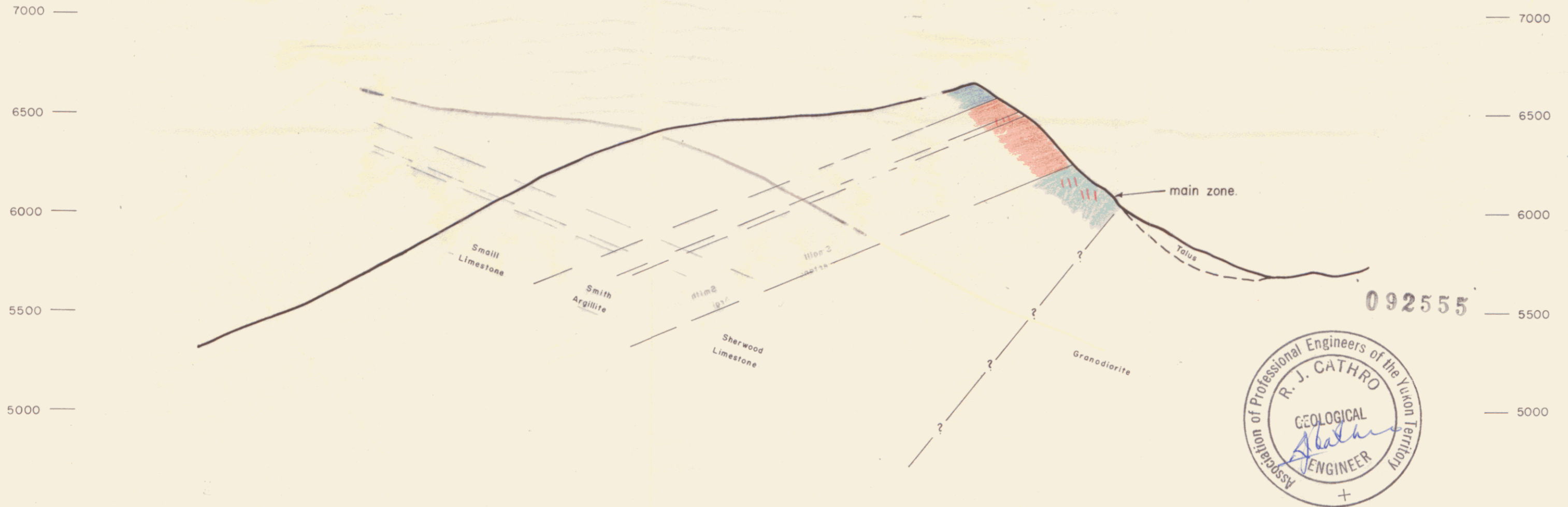
Vertical Projection of a Longitudinal Section in the approximate plane of the north face of Mt. Allan.

SECTION A-B		
MACMILLAN PASS TUNGSTEN PROPERTY AMAX EXPLORATION INC. SELWYN MOUNTAINS, N.W.T.		
ARCHER & CATHRO Consulting Geological Engineers		
DATE	3 Sept. 1967	DWG. NO. 3.
DRAWN	<i>Archers</i>	
SCALE	1" = 500'	

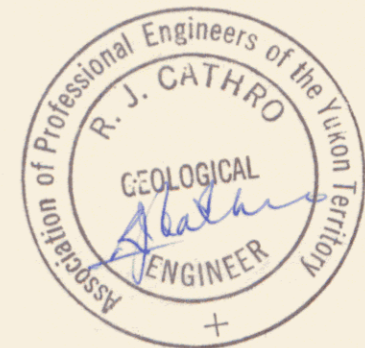
VIEW LOOKING WEST VIEW LOOKING WEST

C
South

D
North



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VERTICAL SECTION THROUGH MAIN MINERALIZED ZONE.

SECTION C-D MACMILLAN PASS TUNGSTEN PROPERTY AMAX EXPLORATION, INC., SELWYN MOUNTAINS N.W.T.		
ARCHER & CATHRO <i>Consulting Geological Engineers</i>		
DATE	13 Sept. 1967	DWG. 4.
DRAWN	<i>Tommes</i>	
SCALE	1" = 500'	

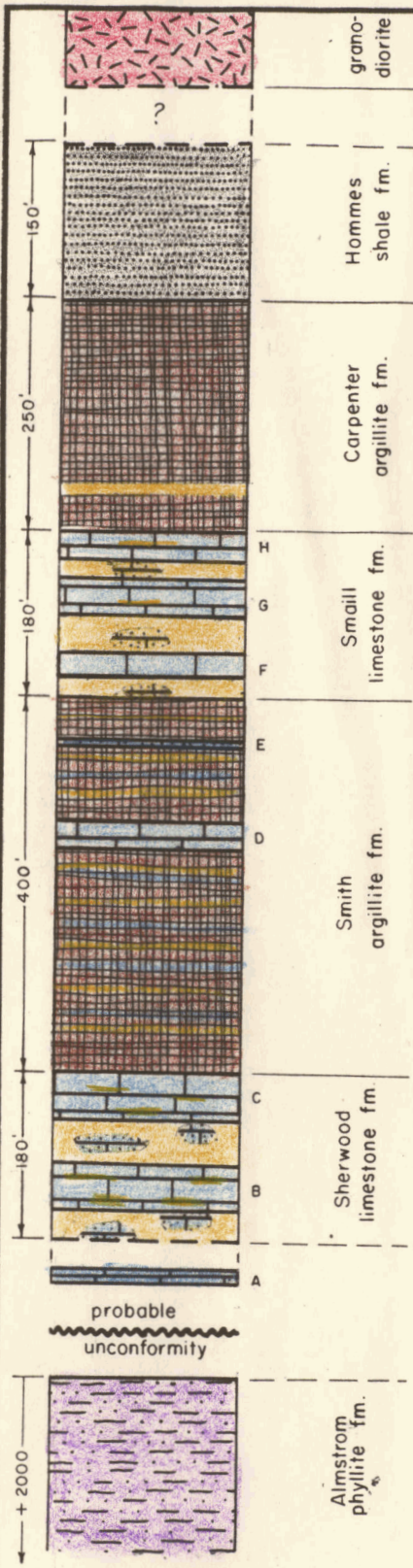
STRATIGRAPHY

The sedimentary sequence has been named the Allan Group for its type locality on the north face of Mt. Allan. It is characterized by uniform very fine grain size and rapid fluctuation in composition between three principal end components- silica (chert), lime and clay (argillite). Pure horizons are rare and the subdivision of the sequence into formations is based on the predominant composition within very impure groupings.

The group is over 1000 feet thick where measured on Mt. Allan. It was probably laid down in a stable shelf environment. Although no fossils were seen and the regional geology has not yet been mapped by the Geological Survey, these rocks have been tentatively correlated with similar Ordovician-Silurian rocks nearby.

Preliminary mapping in 1963 divided the group into two limestone and two shale units. This classification has been modified by the subdivision of the upper shale into two formations. The main features recognized by detailed study are:

- (a) Seven distinct limestone horizons are present, two in the Sherwood limestone formation, two in the Smith argillite formation and three in the Smaill limestone formation. In addition, an eighth



grano-
diorite

Hommes
shale fm.

Carpenter
argillite fm.

H
G
F
E
D
Smail
limestone fm.

Smith
argillite fm.

C
B
A
Sherwood
limestone fm.

Almsrom
phyllite fm.

Black, fissile shale

Slaty argillite; cherty throughout, decreasing towards top; slightly limy at base and becoming a platy shale at top; colour grades from white at base through green and red to black on top.

Coarsely xln. cherty limestone and limy chert with thin dense limestone bands - three important limy horizons - F, G, & H.

Red cherty argillite with cherty horizons and limestone lentils; two main limestone horizons - D & E

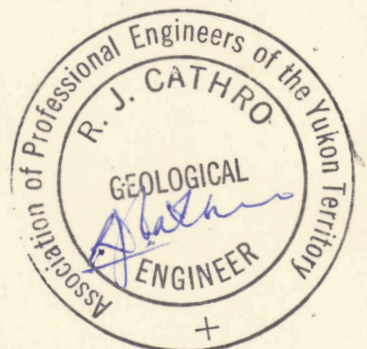
Interbedded limestone and chert member; B and C limestone contain chert and argillite bands and lentils; dense chert members contain limy lentils.

Possible limestone unit

probable
unconformity

Legend

- Limestone
- Chert
- Argillite
- Shale
- Phyllite
- Granodiorite



Section measured on north face of Mt. Allan.

STRATIGRAPHIC SECTION		
ALLAN GROUP		
MACMILLAN PASS TUNGSTEN		
ARCHER & CATHRO		
Consulting Geological Engineers		
DATE	4 Sept. 1967	DWG. No. 5.
DRAWN	<i>AA Hommes</i>	
SCALE	1" = 200'	

limestone formation is possibly present below the exposed section.

- (b) The section is much richer in chert than was previously recognized. Chert horizons and lentils are common throughout the lower 2/3 of the group. Chert is particularly common in the limy formations.
- (c) Lensing and/or facies change occurs over relatively short east-west distances. The main change is a decrease in limestone and increase in shale to the east.

The stratigraphic section is shown diagrammatically in Figure 5. The detailed description of the group is as follows:

Sherwood Limestone Formation- The base of the formation is not exposed. Two chert and two limestone members are present. Both chert horizons are banded, greenish gray and dense with numerous small limestone lentils. Near the intrusive contact, the silica becomes dark and glassy and the chert is altered to a chloritic rock with gneissic texture. The two limestone horizons are similar to one another in that they are strongly altered and are coarser grained near the intrusive. Skarn minerals are strongly developed in the B limestone and moderately developed in the C limestone. Chert bands and argillite lenses and lentils are present as well.

Smith Argillite Formation- The predominant rock is a red, dense cherty argillite to shaly chert. The formation is quite complex and narrow limestone and chert lentils are common. Two important limestone units are present, both characteristically blocky, white and clean, and evenly fine-grained. The D horizon is thin-bedded and varies in width from 15 to 40 feet and averages 25 feet. The E horizon is usually 6 feet wide. To the east, this horizon appears to merge with the Smaill limestone. Chert is most common near the limestone horizons.

Smaill Limestone Formation- This formation is very cherty, particularly towards the top. The limestone horizons also become cherty towards the east. The limestone units F, G, and H are characterized by variable thickness of bedding and grain size, white, dense appearance and lack of blocky fracture. Skarn is developed in the purer parts of the lime horizons. The cherts are very dense and locally quite pure.

Carpenter Argillite Formation- Above the Smaill formation, lime is rare and the rocks become increasingly fissile towards the top of the section. The Carpenter is somewhat cherty at the base and changes in colour from grey to greenish to reddish going upwards. A prominent narrow chert bed occurs above near the top.

KEELE PEAK

JASPER COL

YUKON - N.W.T. BOUNDARY



PHYLLITE

BATHOLITH

PHOTO 5 - VIEW NORTHWEST FROM MT. ALLAN
SMALL LST. LEFT FOREGROUND

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BLOCKY CHERT

THIN-BEDDED LST.

INTERBEDDED CHERT &
SKARNY LIMESTONE

FOLDED OR SLUMPED CHERTY,
SKARNY LIMESTONE

TOP OF SMITH ARGILLITE

SMALL
LST.

PHOTO 6 - VIEW NORTHEAST OVER CIRQUE LAKE FROM MT. ALLAN.

Hombres Shale Formation- This unit is closely related to the Carpenter but is a true shale- platy and shiny black. It has few impurities and at the summit of Mt. Allan approaches a slate.

The outcrops south and southeast of Cirque Lake can only be correlated with the section on Mt. Allan by assuming a facies change. The units south of the lake contain very little lime but are rich in chert and argillite. The chert units are presumed to be the Smaill formation while the cherty argillites are assigned to the Smith formation.

The outcrops immediately east of Hole Lake and south of Cirque Lake contain chert and limestone and have been assigned to the Sherwood formation. The argillite uphill towards the ridge is thought to belong to the Smith formation because of its thickness, reddish colour, and abundant chert and lime lentils. The upper limestone outcrop and the chert immediately downhill resemble the Sherwood formation in composition but the chert is thicker than any exposed on Mt. Allan. The lower limestone is also thicker than any units measured within the Sherwood on Mt. Allan. For those reasons the lower limestone is tentatively classified as the A horizon although it is quite possible that it is really the B or C horizon and has merely thickened towards the east. Reddish phyllite occurs in the talus slope below this outcrop but does not outcrop.

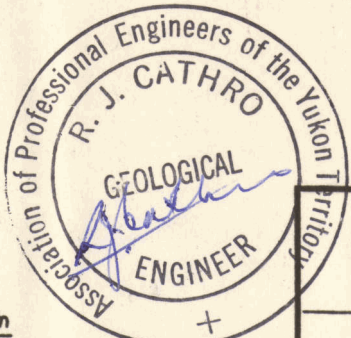
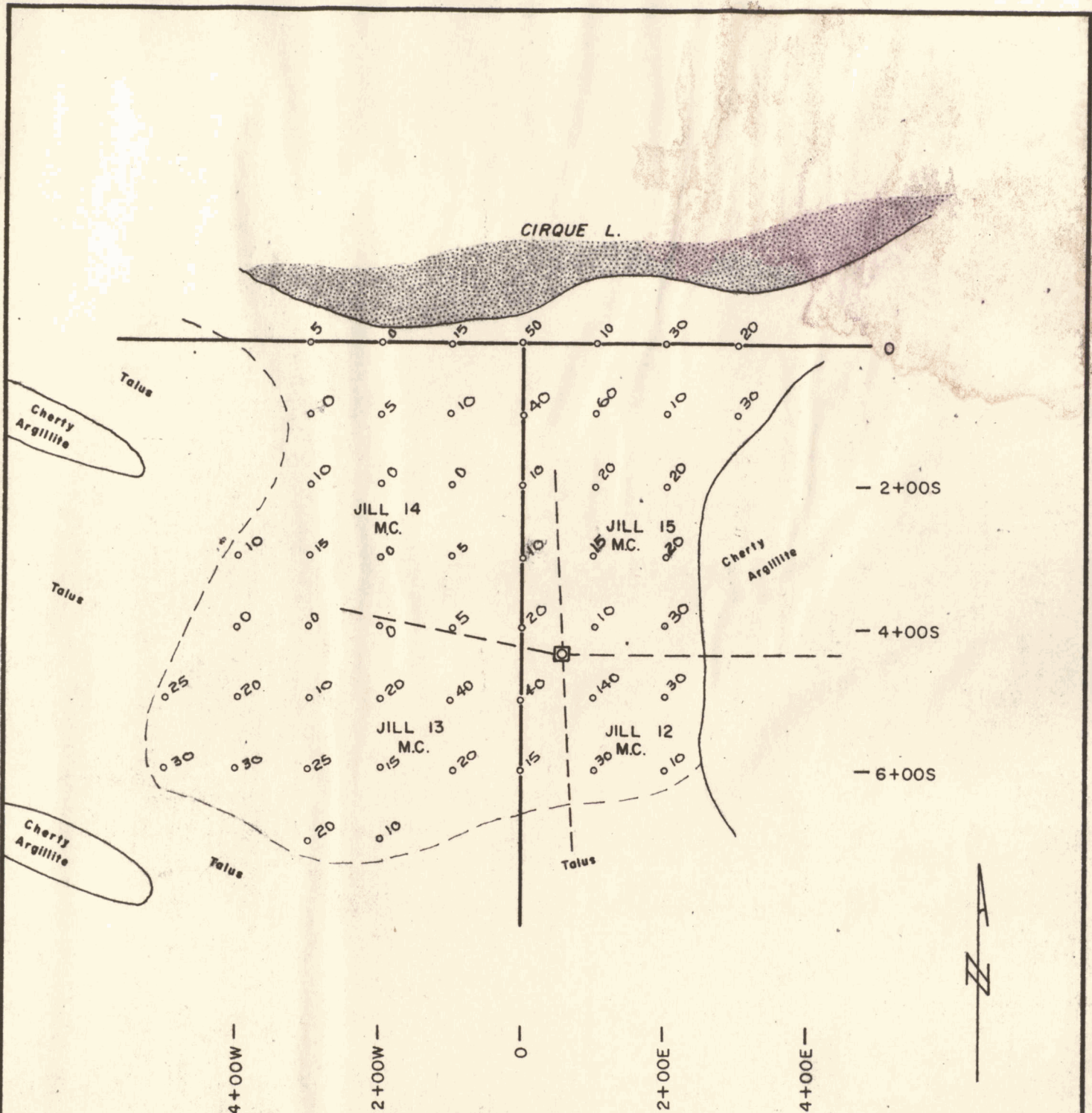
The Almstrom Phyllite- is a much older unit judging by the metamorphism it displays. It outcrops on the north side of Cirque Lake ~~the~~^{and} the batholith, at the base of the north face of Mt. Allan, and in the fault block south of Hole Lake. It appears to be arched into a gentle anticline but cleavage and bedding are often difficult to distinguish and closer study will be needed to unravel the structure of this unit. The contacts between the Almstrom phyllite and overlying Allan Group are everywhere covered by talus on the property.

GEOCHEMICAL SAMPLING

Sampling was directed towards three objectives- (1) a reconnaissance survey of the entire property to determine the background levels and possibly detect unsuspected skarn zones, (2) a detailed orientation survey of an overburden area containing skarn float (Grid B) and detailed survey of a grassy slope with no known metal content (Grid A) and (3) experimental silt sampling of the drainage system above and below Cirque Lake.

A total of 399 samples were taken and were sent to Chemex Labs., North Vancouver, B.C. for analysis by a hot Tungsten Thiocyanate extraction technique. Since geochemical prospecting for tungsten is still in the experimental stage, the extraction technique is hereby quoted from a communication from Bruce W. Brown of Chemex.

"The samples were prepared to -80 mesh consistency and exactly 1/4 gram of this material and 1.25 grams of flux mixture (5 parts Sodium Carbonate, 4 parts Sodium Chloride, 1 part Potassium Nitrate- all reagent grade) were weighed into a nickel crucible. The soil and flux were mixed thoroughly and fused at red heat with a propane torch. A



ALL VALUES IN PPM. TUNGSTEN

SOIL GEOCHEMICAL SURVEY
GRID A
 MACMILLAN TUNGSTEN

ARCHER & CATHRO
 Consulting Geological Engineers

All values in ppm Tungsten
 Extraction by Hot Tungsten Thiocyanate Technique.

Analysis by Chemex Labs, N.Vancouver.

DATE	3 Sept. 1967
DRAWN	<i>[Signature]</i>
SCALE	1" = 200'

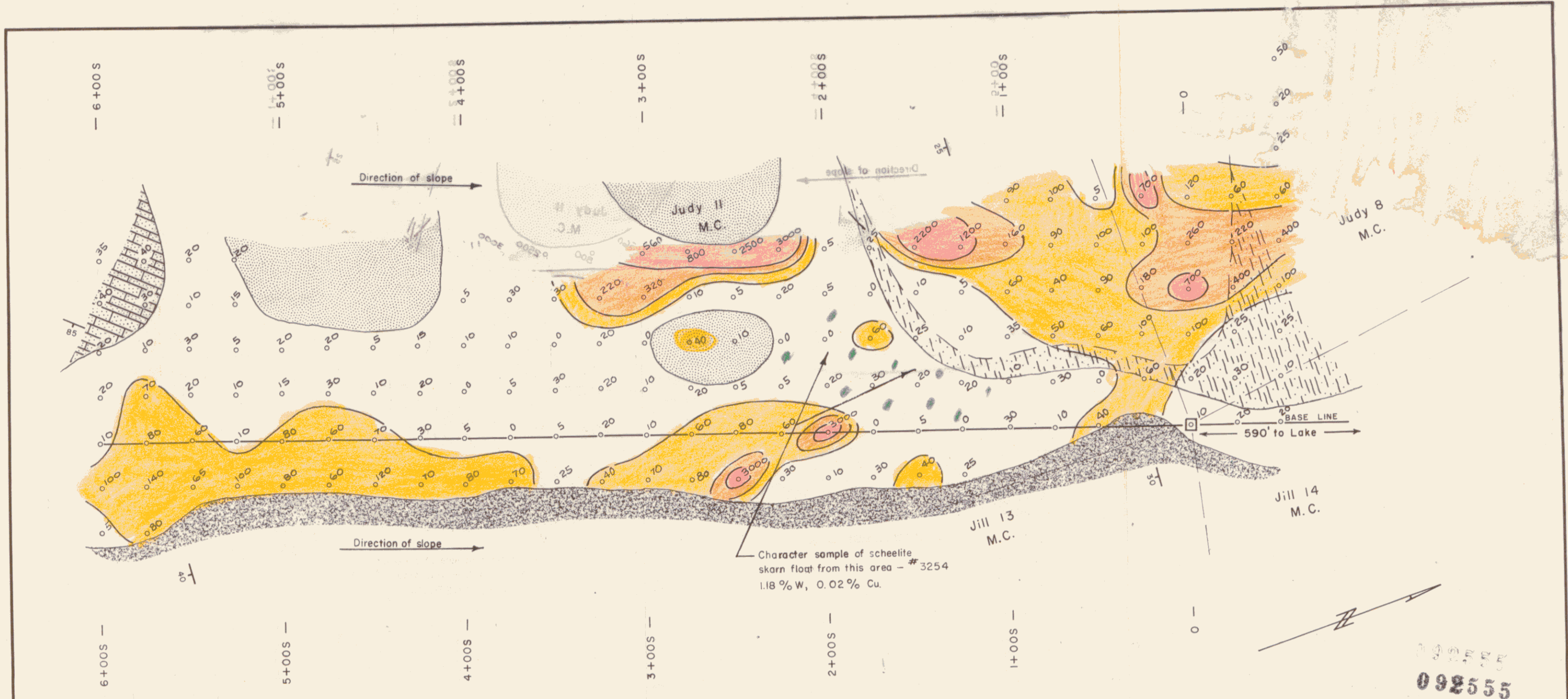
DWG. No. 7.

hot aqueous leach of the fused material brought the Sodium Tungstate into solution. The Tungsten Thiocyanate complex was developed with 10% Stannous Chloride Solution and 25% Potassium Thiocyanate solution. The lemon yellow Tungsten Thiocyanate complex is clearly visible and as little as 5 ppm Tungsten in aqueous solution can be detected by this method".

The Amax property has been so recently glaciated that soil has developed only in a few small areas, one of which was covered by Grid A. Elsewhere, frost-shattering has produced active talus slopes and rock glaciers and soil can be found only in small patches between boulders or in gulleys. Silt is found only in the flat valley floor above Cirque Lake and in the outlet stream from the same lake.

The reconnaissance survey was conducted along the claim lines for simplicity. Samples were taken at 500 foot intervals on lines approximately 1400 to 1500 feet apart. Extra reconnaissance lines were laid out on the south slope of Mt. Allan to cross the drainage direction from the Smail and Smith formations.

The assay values have been plotted graphically in Cumulative Distribution Curves (see Figure 9) and in plan view (see Figures 6,7 and 8). The results of the survey can be summarized as follows:

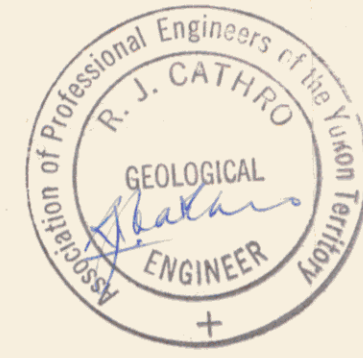


Legend

- OUTCROP
- PATCHY OR FROST-HEAVED OUTCROP
- SKARN

- CARPENTER FORMATION**
- Black Argillite, Red Chert
- SHERWOOD FORMATION**
- Coarsely Crystalline Limestone
 - Greenish White Chert
 - Thin-Bedded Limestone & Chert

- 500 + ppm
- 150 - 499 ppm
- 40 - 149 ppm

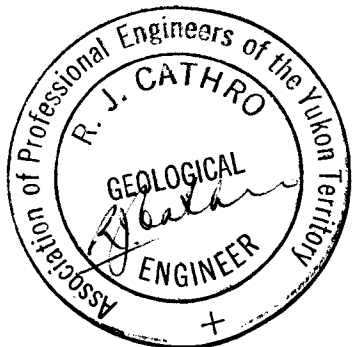
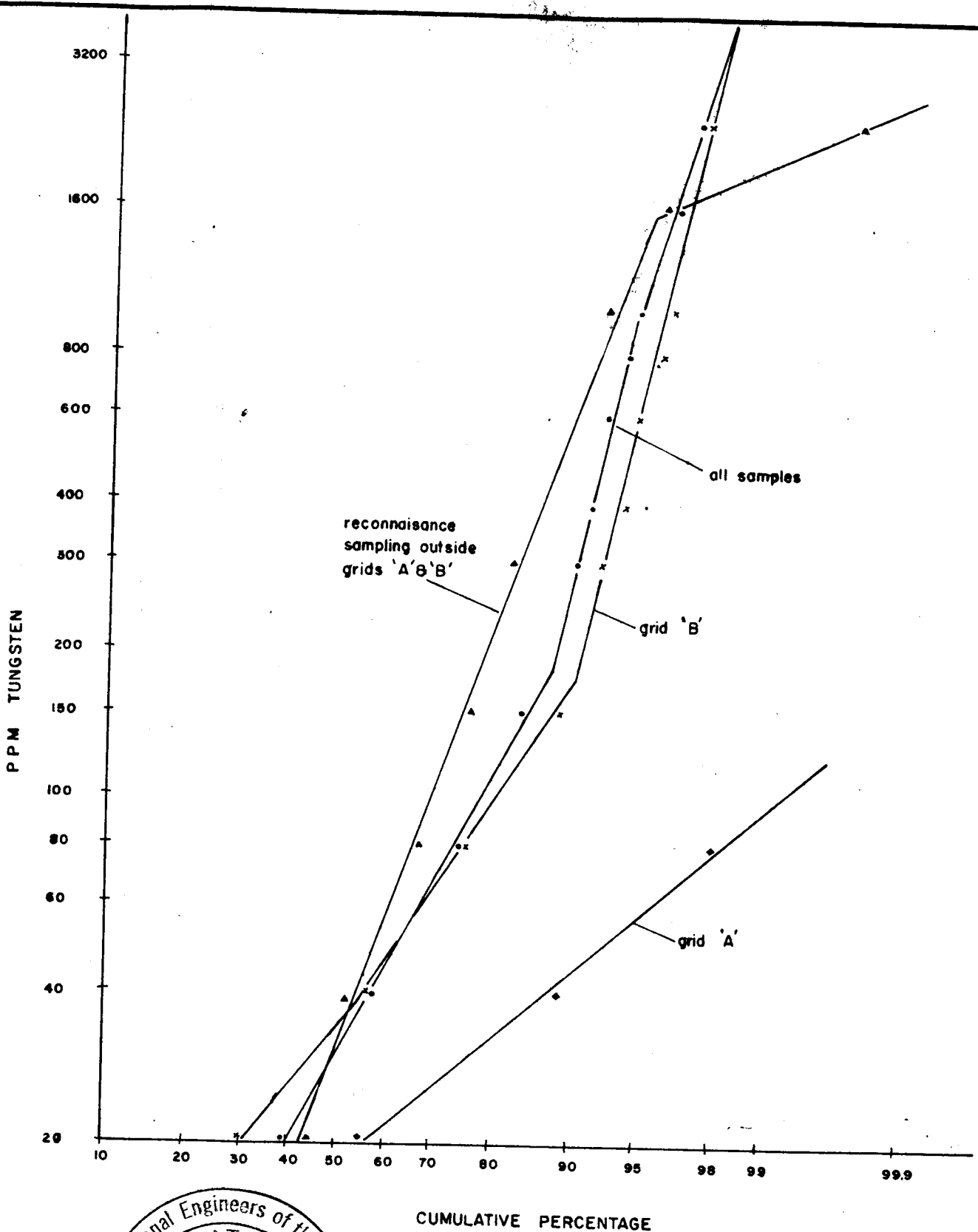


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ALL VALUES IN P.P.M. TUNGSTEN
EXTRACTION BY HOT TUNGSTEN THIOCYANATE TECHNIQUE
ANALYSIS BY CHEMEX LABS, N.VANCOUVER, B.C.

ORIENTATION GEOCHEMICAL SOIL SAMPLING GRID B		
MACMILLAN PASS TUNGSTEN		
ARCHER & CATHRO Consulting Geological Engineers		
DATE	31 Aug. 1967	DWG. 8.
DRAWN	<i>MA</i>	
SCALE	1" = 50'	

- (1) Soil sampling is very effective in locating mineralization. Strongly anomalous values, from 10 to 100 times background, are associated with scheelite outcrops or bedrock float.
- (2) Soil sampling does not give a good indication of the grade of the mineralization causing the anomaly, perhaps due to the type of weathering and young soil profile present. This is best demonstrated between Jasper Col and Cirque Lake. Two samples of decomposed bedrock downhill from the Main Zone assayed 1000 and 1700 ppm. Across the valley near fiducial point 32, two samples of decomposed granodiorite rich in muscovite alteration assayed 1000 and 1200 ppm while random reconnaissance samples of decomposed granodiorite nearby assayed from 700 to 1600 ppm. Rock samples (were taken) from this vicinity assayed trace% but none from the uphill side of the geochem soil values. Visual inspection did not indicate significant amounts of mineralization in the intrusive rocks. Silt samples nearby assayed 140 and 160 ppm. Two samples of decomposed fault gouge or vein filling from Almstrom phyllite east of Scott Glacier (near fiducial point 28) assayed 320 and 240 ppm



CUMULATIVE PERCENTAGE

CUMULATIVE DISTRIBUTION CURVES

MACMILLAN PASS TUNGSTEN
AMAX EXPLORATION INC.

ARCHER & CATHRO
Consulting Geological Engineers

DATE	SEPT. 28, 1967
DRAWN	R. J. Cathro
SCALE	AS SHOWN

DWG. No. 9.

- (3) Silt sampling gave values between 140 and 240 ppm in the swampy drainage above Cirque Lake contrasted with readings between 0 and 50 below the lake. This work should be supplemented in future by reconnaissance sampling of all streams draining the property over an area of 10 to 15 miles. Since many streams on the claims flow over bedrock or underground, silt sampling was of limited value.
- (4) The Cumulative Distribution Curves show sharp breaks in curve at 175 ppm for Grid B and 1600 ppm outside Grids A and B. On Grid B, strong anomalies with peaks over 2000 ppm are related to residual weathering of limestone. Coarse sheelite float was found in a part of the grid which contained only background geochem levels. This suggest that chemical dispersion is weak around fragments which are being mechanically transported and that the high values represent small fragments of primary mineral in the sample. The break in curve for the remainder of the property represents a sharp dropoff in assays above 1600 ppm and is probably a reflection of the limited amount of sampling done. rather than a geochemical feature.
- (5) On the south slope of Mt. Allan, a very strong anomaly which reaches a buildup of 800 to 2400 ppm probably reflects skarn zones in the Smaill limestone and

16.

and Smith argillite formations. Soil is very thin on this slope and most sample material is decomposed bedrock. The anomaly does not appear to reach the 3 to 4 foot wide skarn outcrop which assayed 0.92% W and 0.95% W from two channel samples. This may be a results of plotting errors however as few landmarks are available on this slope and a grid would have to be established to show the true pattern of the dispersion pattern.

- (6) Elsewhere on the property, no geochemical response was obtained.

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ROCK SAMPLING

A chip sampling program was conducted over the area of granodiorite outcrops between Hole Lake and Jasper Col, with particular emphasis on the cliff face near the main skarn zone. A total of 82 samples were taken but only 45 were assayed. All sampling was done with a sledge hammer and each sample consisted of 10 to 25 small random chips from outcrop areas ranging up to 100 feet long and 100 feet wide. Except for a resample of Trench 12, (1964) by J.F. Allan, all sampling was done by R. Carpenter, a student assistant. All samples were assayed by Coast Eldridge, Vancouver and all returns were trace with the exception of 4 consecutive samples just west of the Main Zone. These assayed 0.06%, 0.94%, 0.16% and 0.02% W respectively. The single high value is suspected to be an erratic high. This particular area contains the greatest concentration of quartz veinlets and muscovite alteration. The frequency of veining was visually estimated as follows:

large veins-	--	over 4" wide-	- - - -	-25 feet apart on average.
medium "	--	between 1" and 4" wide-	10	" " " "
small "	- -	less than 1" -	- - - -	1 " " " "
mineralized joints-	- - - -			6 inches " " "

A character sample of mineralization from the Main Zone (#3251) assayed 3.91% W and 0.13% Cu while a semi-quantitative spectrographic analysis of the same sample (see following page) showed that only bismuth, molybdenum, tin, titanium, and zinc are present in significant trace amounts and none of these metals appear to approach economic concentrations. A character sample of skarn float from Geochem grid B assayed 1.18% W and 0.02% Cu. It appears that copper values between 0.02% and 0.04% can be expected from scheelite mineralization assaying about 1.0% Tungsten.



PHONE: TRINITY 6-4111

CABLE ADDRESS "ELDRICO"

To:

Archer Cathro and Associates

P.O. Box 1708

Whitehorse, Y.T.

SEMI QUANTITATIVE SPECTROGRAPHIC ANALYSES

COAST ELDRIDGE

ENGINEERS & CHEMISTS LTD.

125 EAST 4TH AVE. VANCOUVER 10, CANADA

FILE NO. A.3-A.1-67-36084

DATE October 6, 1967

We Hereby Certify that the following are the results of semi quantitative spectrographic analyses made on ORE samples submitted.

SAMPLE IDENTIFICATION	Al	Sb	As	Ba	Be	Bi	B	Cd	Ca	Cr	Co	Cu	Ga	Au	Fe
3251	6.0	ND	ND	0.003	0.001	0.03	ND	ND	4.0	Trace	0.005	0.05	Trace	Trace	5.0
SAMPLE IDENTIFICATION	Pb	Mg	Mn	Mo	Nb	Ni	Si	Ag	Sr	Ta	Sn	Ti	W	V	Zn
092555	ND	1.0	0.5	0.001	ND	0.001	Matrix	Trace	0.003	ND	0.001	0.1	Major	0.003	0.05

All results are expressed as percent by weight

Matrix - Major Constituent

Major - Above normal spectrographic range **COAST ELDRIDGE ENGINEERS & CHEMISTS LTD.**

Trace - Detected but below normal spectrographic range

ND - Not detected

Note: Rejects retained one week.

Pulps retained three months.

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 CHIEF CHEMIST

CONCLUSIONS & RECOMMENDATIONS

Seven significant limestone horizons have been recognized on the north face of Mt. Allan. Patches of skarn can be seen in most of these but they cannot be effectively sampled on surface because of topographic reasons. Since they lie above the Main Zone they will automatically be sampled during drill sampling of the Main Zone. Scattered scheelite float and a narrow but rich outcropping bed plus a strong soil geochemistry anomaly on the south slope suggest that a good possibility exists for finding additional tonnage in these other lime horizons. This tonnage will likely be contained in thinner and shorter zones than that indicated in the Main Zone but will likely be economic if developed in conjunction with the Main Zone.

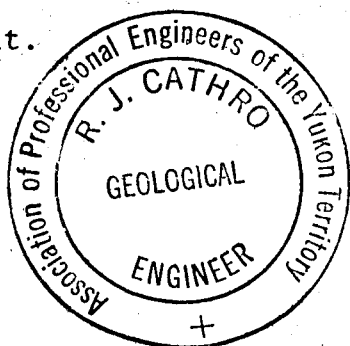
All drill holes should be drilled down to the Almstrom phyllite or the granodiorite to investigate for extra limestone horizons which could lie below the Main Zone (B limestone). To adequately sample the skarn zones on Mt. Allan for production, a 400 foot grid pattern should be drilled on the back slope over an area 4000 feet long and 2000 feet wide. Allowing for a few holes on the talus slope below the main zone, about 60 holes will be needed with a total footage of approximately 50,000.

The narrow skarn zone outcropping on the south slope is well mineralized at a point 1500 feet horizontally from the intrusive. This suggests that the tonnage potential calculated by Allan for the Main Zone, which was based on a down dip extension of only 750 feet, could be conservative.

The skarn zone on geochem grid B, between Hole Lake and Cirque Lake, should also be drilled to determine if mineable widths and grade are present. This drilling might have to be extended down to Cirque Lake. Here again, the holes should not be stopped until phyllite or granodiorite is reached.

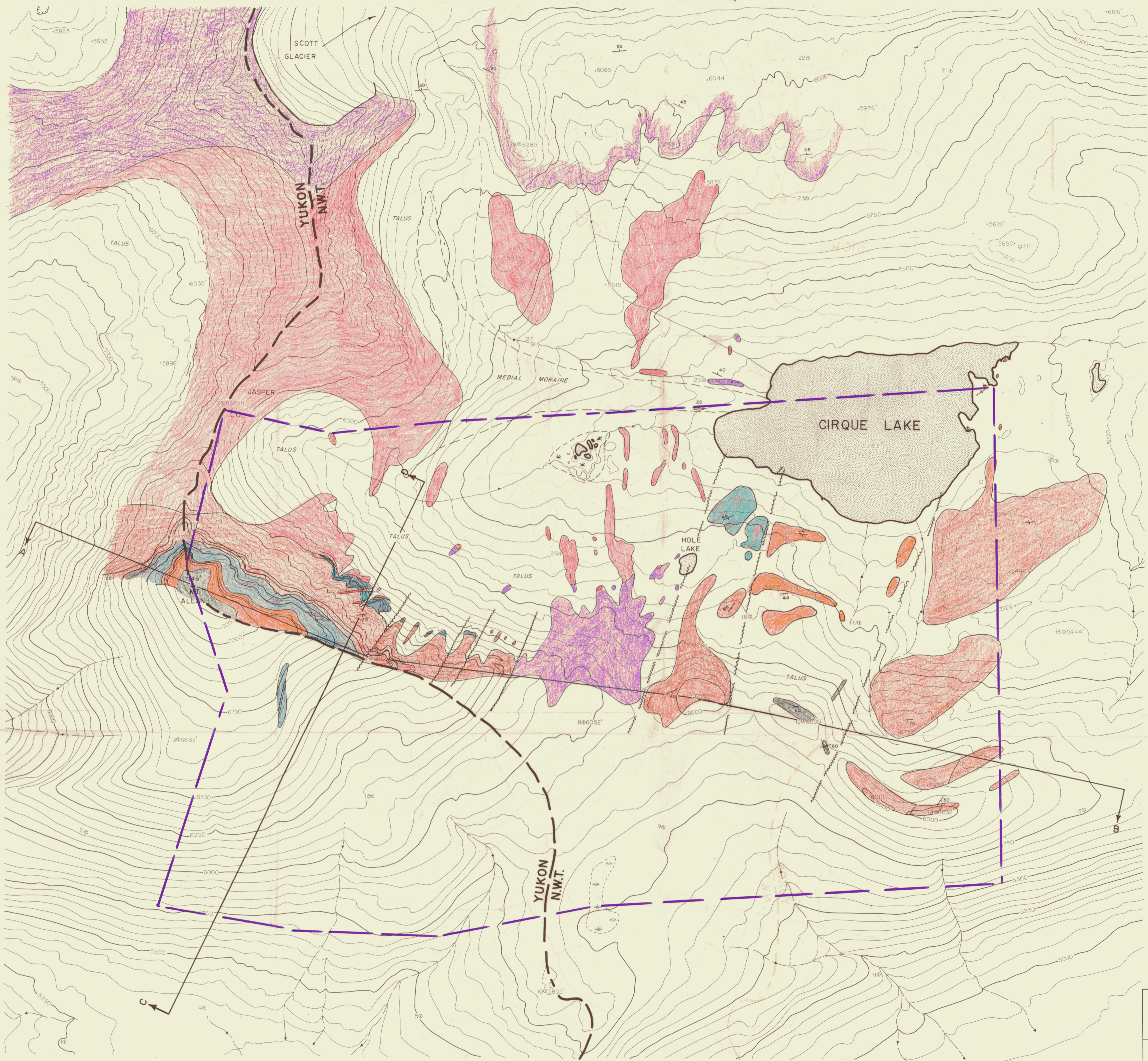
There is no potential for open-pit^{ore} in granodiorite. A small zone within the granodiorite immediately west of the Main Zone contains low tungsten values in an underground mining situation. This should be further sampled.

The mineral deposit appears to be bisected by the Yukon-Northwest Territories border. The government should be approached for an accurate border survey and some guarantee that production from this deposit will not be harrassed by regulations and red tape relating to the border. In view of the large amount of drilling needed to sample this deposit, it should be delayed until the Canol Road is reopened by the government.



Respectfully submitted,
ARCHER, CATHRO & ASSOC. LTD.

R. J. Cathro **092555**
R. J. Cathro



- Legend**
- CRETACEOUS (?)
 - Granodiorite
 - ORDOVICIAN & SILURIAN - ALLAN GROUP
 - Hammes shale
 - Carpenter argillite
 - Small limestone
 - Smith argillite
 - Sherwood limestone
 - CAMBRIAN
 - Phyllite
 - 25 Strike & dip of bedding
 - Assumed fault
 - Mineralized skarn zone
 - 14 Reference point from air photo's
 - Property Boundary



092555

SCALE AND ELEVATION DATUM BASED ON LIMITED GROUND CONTROL RESULTING IN GOOD RELATIVE, BUT UNCERTAIN ABSOLUTE MAP ACCURACY. COMPILED FROM AERIAL PHOTOGRAPHY AT AN APPROXIMATE SCALE OF 1 INCH EQUALS 2500 FEET FLOWN IN 1954.

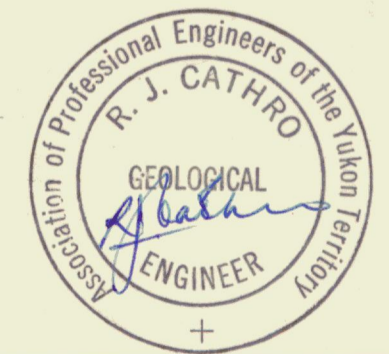
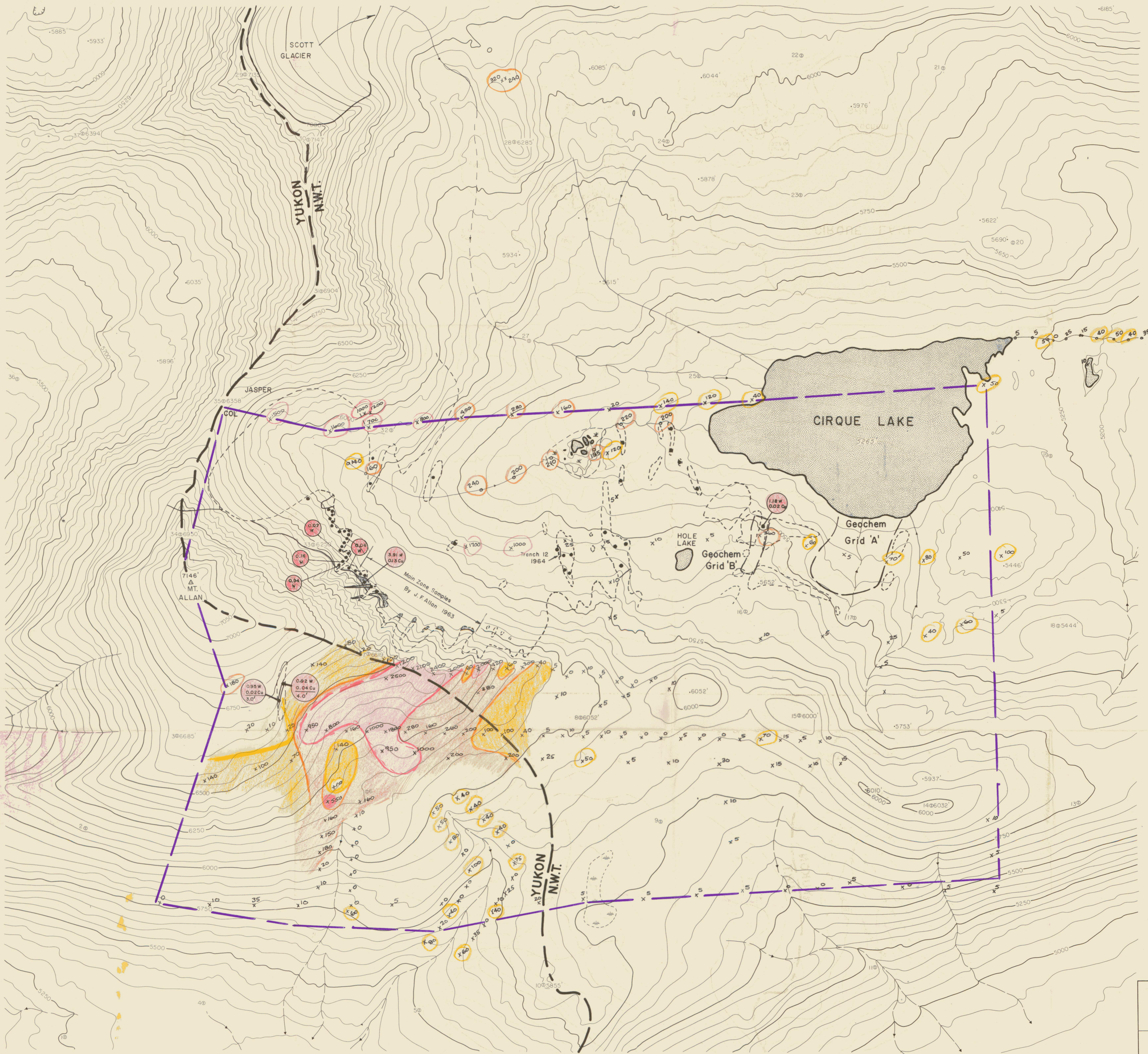


Figure 2

GEOLOGY			
MACMILLAN PASS TUNGSTEN PROPERTY			
AMAX EXPLORATION, INC SELWYN MOUNTAINS, N.W.T.			
ARCHER, CATHRO & ASSOC. LTD. CONSULTING GEOLOGICAL ENGINEERS			
BASE MAP COMPILED BY MELHANNY SURVEYING & ENGINEERING LTD. 1200 West Pender St. Vancouver, B.C.			
SCALE 1" = 500'	CONTOUR INTERVAL 50 FEET	DATE AUG., 1967	JOB NO. 5172
			SHEET NO. 2.

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Legend

GEOCHEMICAL SAMPLING

- x 80 Soil sample assay
- o 40 Silt sample assay
- All assays in ppm tungsten by Chemex Labs, North Vancouver, B.C.
- Extraction by hot tungsten thiocyanate technique.
- 500+ ppm
- 150 - 499 ppm
- 40 - 149 ppm

ROCK SAMPLING

- o 0.26% Assays in % by Coast Eldridge, Vancouver, B.C.
- All assays trace W. except where noted.
- Outcrop pattern
- Reference point from air photos
- Property Boundary



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SCALE AND ELEVATION DATUM BASED ON LIMITED GROUND CONTROL RESULTING IN GOOD RELATIVE, BUT UNCERTAIN ABSOLUTE MAP ACCURACY. COMPILED FROM AERIAL PHOTOGRAPHY AT AN APPROXIMATE SCALE OF 1 INCH EQUALS 2500 FEET FLOWN IN 1954

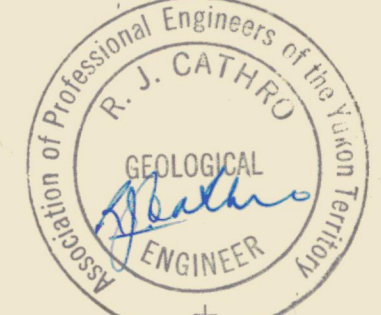


Figure 5

**GEOCHEMICAL & ROCK SAMPLING
MACMILLAN PASS TUNGSTEN PROPERTY**
AMAX EXPLORATION, INC
JELWYN MOUNTAINS, N.W.T.

ARCHER, CATHRO & ASSOC. LTD.
CONSULTING GEOLOGICAL ENGINEERS

BASE MAP COMPILED BY
McELHANNY SURVEYING & ENGINEERING LTD.
1200 West Pender St. Vancouver, B.C.

SCALE 1" = 500'	CONTOUR INTERVAL 50 FEET	DATE AUG, 1967	JOB NO. 5172	SHEET NO. 1
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