ARCHER, CATHRO
AND ASSOCIATES LTD.
CONSULTING GEOLOGICAL ENGINEERS

WHITEHORSE, Y.T. 667-4415 — 6TH FLOOR, TWO BENTALL CENTRE, VANCOUVER, B.C. 688-2568

POST OFFICE BOX 4127
WHITEHORSE, Y.T.

RECEIVED
5 SEP 1972
MINING
RECORDERS OFFICE
WHITEHORSE, Y.T.

TUNG GROUP ASSESSMENT REPORT

Geology and Geochemistry

TUNG 1-34, Y64066-Y64099 inclusive

60°37'N, 130°33'W

105-B/10

Watson Lake Mining District

Wolf Lake Joint Venture

RECEIVED
SEP 7 1972
MINING
INSPECTORS OFFICE
WHITEHORSE, Y.T.

This report has been examined by the Geological Evaluation Unit and is recommended to the Commissioner to be considered as representation work in the amount of

$ 3609.90

D.B. Craig
Resident Geologist or
Resident Mining Engineer

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

Commissioner of Yukon Territory
Administrator

R.J. Cathro, P.Eng.

August 18, 1972

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ILLUSTRATIONS

Figure 1 - Regional Geology, 1"= 1 mile..... in text
Figure 2 - Geology - 1"= 1000 feet ..... in pocket
Figure 3 - Cu, Mo, W Geochemistry 1"=1000 feet ..... in pocket
Figure 4 - Zn, Pb, Ag Geochemistry 1"= 1000 feet .... in pocket

CONCLUSIONS AND RECOMMENDATIONS

The Tung claims cover a tungsten-bearing skarn zone developed in thin carbonate horizons within Cambrian or older schists and gneisses. The best mineralization has been found only as float in talus and felsenmeer, occurring in two parallel zones about 2700 feet apart at the contact of the Allan Batholith, at an elevation of about 6000 feet. Because of the overburden cover and because the best zone trends almost directly down the slope, the mineralized dimensions can only be approximately estimated. The two zones each appear to be 10 to 20 feet thick and 500 to 1000 feet long. The grade is probably below 0.75 per cent WO_3, based on grab sampling of float. The showing can only be evaluated by bulldozer trenching. The cost of moving a bulldozer to this property would be quite high at present and it is recommended that further work be deferred until access improves.

INTRODUCTION

This report covers geological and geochemical surveys carried out during August, 1971 and July, 1972 on the Tung 1-34 claims by the Wolf Lake Joint Venture (Caltor Syndicate, Rayrock Mines Ltd., and Ashland Oil Inc.) Field work was performed by Archer, Cathro & Associates Ltd.

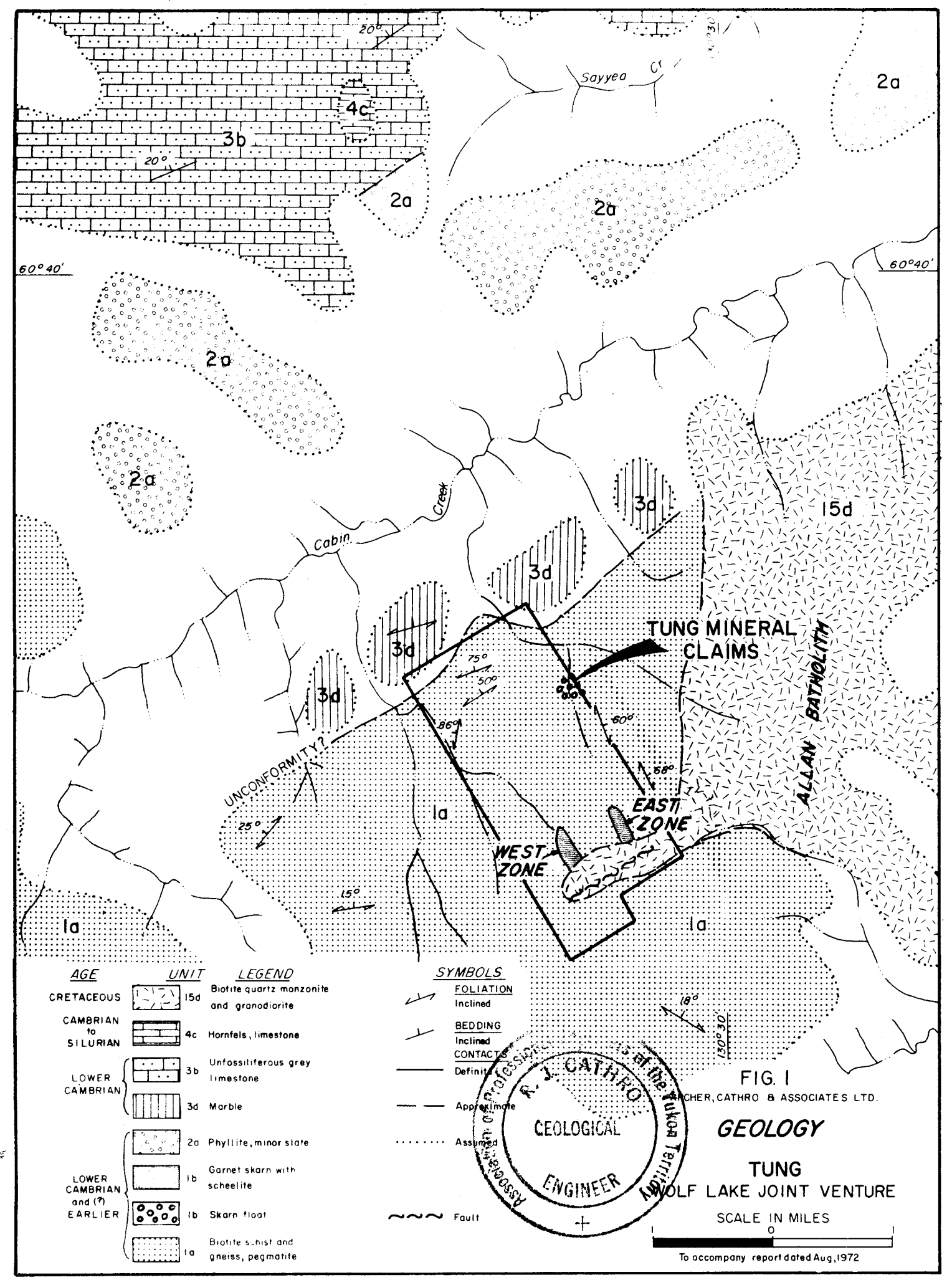


FIG. 1

CATHRO, CATHRO & ASSOCIATES LTD.

GEOLOGY

TUNG

WOLF LAKE JOINT VENTURE

SCALE IN MILES

0

To accompany report dated Aug, 1972

LOCATION AND ACCESS

The Tung claim group is situated on the height of land between Cabin and Allan Creeks, about seventeen miles southeast of Stoneaxe Lake, at 60°37'N and 130°33'W. The nearest important settlement is Watson Lake, approximately seventy-five miles southeast of the claim group. The claim group is accessible only by helicopter.

CLAIM DATA

The Tung 1-34 claims, record numbers Y64066-Y64099 inclusive, form a rectangular, contiguous block and are recorded in the Watson Lake Mining District. The claims are owned by the Wolf Lake Joint Venture (Caltor Syndicate, Rayrock Mines Ltd. and Ashland Oil Inc.).

HISTORY

The claims were recorded on August 18, 1971 by the Wolf Lake Joint Venture to cover a mineralized skarn zone discovered during reconnaissance exploration. No records or field evidence have been found to suggest any previous work.

The Wolf Lake Joint Venture, managed by Archer, Cathro & Associates Ltd., carried out geological mapping, rock and geochemical sampling on the Tung group during August, 1971 and July, 1972. This was accomplished from camps on Northwind and Caribou Lakes in late August, 1971 and by a two man fly camp in the period July 15 to 20, 1972.

PHYSIOGRAPHY

The claims cover a moderate north-facing slope between elevations of 4500 and 6500 feet and are almost completely free of vegetation and glacial till. Overburden consists entirely of thin,locally derived talus and felsenmeer. Outcrop occurs on less than five per cent of the claims.

GEOLOGY

Geologically, the showing is situated at the margin of the Allan Batholith and is south of the Cabin Creek Lineament. The immediate area is underlain by northerly trending, lower Cambrian or earlier, quartz-mica schists and gneisses (G.S.C. Unit 1a) containing minor carbonate horizons (Unit 1b), which are in unconformable or fault contact with lower Cambrian marble (Unit 3d). The regional geology is shown on Figure 1.

Near the intrusive contact, intense skarn alteration has developed in two impure limy horizons, designated the East and West Zones. The skarn consists of finely to coarsely crystalline, cinnamon brown to salmon red garnet, dark green diopside, pale green tremolite, calcite and quartz, with weakly disseminated pyrrhotite and local scheelite. Neither zone outcrops, both occurring as trains of float which trend down felsenmeer and talus covered slopes. Consequently, the true mineralized dimensions can only be surmised until a thorough trenching program is performed. The maximum dimensions of the two zones are probably about 10 to 20 feet in thickness and 500 to 1000 feet in length.

Figure 2 shows the areas of outcrop, felsenmeer and talus superimposed on the geology. The claims were carefully prospected for outcrops in an attempt to map the structure of the Cambrian rocks in detail. The structural pattern consists of a complex open fold pattern but insufficient outcrop exists to trace the folds accurately. Areas shown as felsenmeer are underlain primarily by the map units in nearby outcrops although leucogranite, graphic granite and pegmatite fragments are sometimes abundant, suggesting that intrusive dikes are locally present. The contact of the batholith near the showings could not be closely positioned, either because of downhill slumping and frost mixing, or perhaps because the contact is not simple, and the contact as shown on Figure 2 is very generalized.

Abundant scheelite was only seen in talus in the East and West Zones near the contact. The mineralization in the two zones is similar, although the East Zone is somewhat darker in colour and contains a little more sulfides. The East Zone is almost completely covered by talus, even near the crest of the ridge, whereas the West Zone is slightly better defined near the upper end, where it strikes almost straight down the hill. Both zones disappear under talus and felsenmeer to the north.

Without trenching, it is only possible to grab sample the scattered float from the two zones, which does little more than indicate the possible grade range which can be expected.

Results of geochemical analyses and assays of various rock samples from the tungsten-bearing skarns are as follows:

No.	Description	W(ppm)
4127	garnet skarn (East Zone)	25
4128	garnet skarn (East Zone)	100
4129	garnet skarn (East Zone)	2400
4133	garnet skarn (West Zone)	2400
4134	garnet skanr (West Zone)	3200
4138	garnet skarn (West Zone)	3000
239	scheelite-pyrrhotite-diopside garnet skarn (boulder from East Zone tributary)	1500
1573	pyrrhotite-scheelite-garnet skarn	400
4095	scheelite-bearing garnet skarn(boulder from West Zone)	10000
4096	scheelite-bearing garnet skarn(West Zone)average type	2800
1576	)	0.09%WO_3
1577	)grab samples from East	0.11%WO_3
1578	)Zone	0.15%WO_3
1579	)	0.43%WO_3
1580	)grab samples from West	0.93%WO_3
1581	)Zone	0.50%WO_3
1582	)	0.05%WO_3
1583	)grab samples from East Zone	0.01%WO_3

GEOCHEMISTRY

Soil samples were collected with a mattock and stored in pre-numbered Kraft envelopes. The sampling followed a close-spaced reconnaissance pattern with ground control provided by an uncontrolled airphoto enlargement. Soil is poorly developed in the felsenmeer and talus areas and consists of a thin, patchy B + C horizon containing many bedrock fragments. Samples were shipped air express to Acme Analytical

Labs, Burnaby, B.C. where they were analyzed for copper, molybdenum, lead, zinc and silver by atomic absorption spectrometry of a nitric-perchloric extraction of a minus 80 mesh fraction. In addition, tungsten was analyzed colorimetrically from a similar extraction.

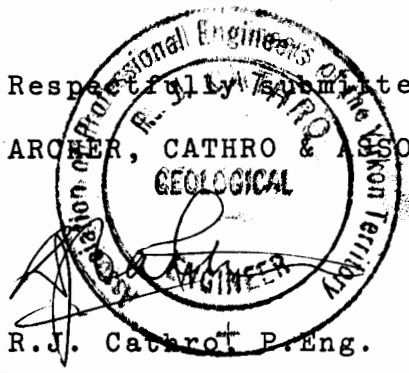
Geochemical assays in ppm are plotted on Figure 3 (copper, molybdenum and tungsten) and Figure 4 (zinc, lead and silver). Background levels are about 30 ppm Cu, 1 ppm Mo, 5 ppm W, 75 ppm Zn, 25 ppm Pb and 0.1 ppm Ag. The only interesting geochemical response is in tungsten but surprisingly, the best assays do not coincide with the areas of best mineralized float. As well, the soil assays are lower than expected from such strong mineralization in a rapidly eroding, alkaline environment. At the West Zone, assays range between 15 and 40 ppm for 2000 feet along strike to the north, in an area where no skarn was seen. This is assumed to indicate a low tungsten content in a weakly altered calc-silicate extension. At the East Zone, similar assays occur in soil uphill from the mineralized float train, suggesting relatively weak mobilization of metal into ground water.

The geochemical response of soil and silt samples from the area is surprisingly low, considering the excellent

tungsten assays obtained in rock samples and the fact that abundant scheelite was found in panning creeks. Samples from creeks draining the showing and the creek immediately south give the occasional erratic, low-order tungsten anomaly and only several samples have the anomalous zinc response common in tungsten-bearing skarns elsewhere in this district.

Respectfully submitted,

ARCHER, CATHRO & ASSOCIATES LTD.



R.J. Cathro P.Eng.

RJC:st

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CONSULTING GEOLOGICAL ENGINEERS

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POST OFFICE BOX 4127
WHITEHORSE, Y.T.

August 22, 1972

CERTIFICATE

I, Robert J. Cathro, with business address in Whitehorse, Yukon Territory, and residential address in West Vancouver, B.C., do hereby declare that:

1. I am a consulting engineer.

2. I am a 1959 graduate of the University of British Columbia in geological engineering.

3. I am a registered professional engineer in B.C. and Yukon Territory.

4. From 1959 to 1965 I was engaged in mining and exploration geology and held positions of responsibility with United Keno Hill Mines Ltd., Giant Yellowknife Mines Ltd., and Eldorado Mining and Refining Ltd. I entered private practice in January, 1966.

5. I have personally supervised the work program referred to in this report.

Respectfully submitted,

R.J. Cathro, B.A.Sc., P.Eng.

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AND ASSOCIATES LTD.
CONSULTING GEOLOGICAL ENGINEERS

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POST OFFICE BOX 4127
WHITEHORSE, Y.T.

AFFIDAVIT

I, Sharon Thompson , of Whitehorse, Y.T., hereby declare that, to the best of my knowledge and belief, the attached statement of expenditures is a fair and accurate representation of exploration expenditures on the Tung 1-32 claims located on claim sheet 105B/10.

S.A. Thompson

ARCHER, CATHRO & ASSOCIATES LTD.

S.A. Thompson

Signed before me at
Whitehorse this 22nd
day of August, 1972

Notary for Yukon

Dept. of Indian Affairs & Northern Development
Northern Affairs
Canada
AUG 24 1972
Mining Recorder & Land Agent

ARCHER, CATHRO
AND ASSOCIATES LTD.
CONSULTING GEOLOGICAL ENGINEERS

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POST OFFICE BOX 4127
WHITEHORSE, Y.T.

Statement of Expenditures
Tung Claims

1971

44 geochem samples- soils, silts & rock @ $3.40 per		$149.60
Karvinen -geologist-2 days @ $50.00 per	$100.00	
Bremner - geologist & sampler 2 days @ $35.00 per	70.00	
Fairbank - geologist & sampler 2 days & $25.00 per	50.00	
Room and Board @ $15.00 per	90.00	
		310.00
Helicopter- on contract to WLJV from T.N.T.A. from Northwind Lake base camp		
August 19 - 3.2 hours August 20 - 2.9 hours 6.1 hours @ $129.00	$786.90	
Fuel - 6.1 hours @ $ 15.00	91.50	
		878.40
Office - report preparation		50.00
Sub-total -----		1388.00

1972

248 geochem samples & soils @ $3.75		$930.00
Jensen - 7 days @ $25.00 per ...	$175.00	
McManus- 7 days @ $20.00 per ...	140.00	
R.J. Cathro-3 days @ $150.00 per	450.00	
		$765.00

1972(con'd)

Fixed Wing Aircraft- B.C. Yukon Air Services Ltd.
July 3 - Otter - flight ticket No.2779 ..... $104.00

Helicopter - Frontier Helicopters - July 15 -
Flight ticket #04913 ..... $322.90
August 1 - flight ticket # 04999 . 100.00

$422.90

Total ---- $3609.90

T
N
-1

TRANS NORTH TURBO AIR LTD.

BOX ~~1977~~ 4338 PHONE 668-2177
WHITEHORSE, YUKON

TO:

Archer Cathro & Associates
P.O. Box 4127
Whitehorse, Yukon

Date: September 30, 1971 Invoice No. 721-71

RE:	Wolf Lake Joint Venture Four month contract beginning June 1, 1971	
	Bell 47G-3B-1 Helicopter CF-VUB Crew: Brown & Miller	
FLYING:	September 1 - 18, 1971 Daily Flight Report Nos. 6540 - 6557	
	72.2 hours at $129.00 per hour (Rate per hour - first 80 hours per month when charterer supplies fuel)	$ 9,313.80
PLUS:	Fuel purchased by T.N.T.A. at Watson Lake	
	26.6 gallons at $.70 per gallon	18.62
PLUS:	Bell 47G-3B-1 Helicopter CF-UFC Crew: Brown & Miller	
FLYING:	September 19 - 30, 1971 Daily Flight Report Nos. 8027 - 8038	
	7.8 hours at $129.00 per hour (Rate per hour - first 80 hours per month when charterer supplies fuel)	1,006.20
	21.8 hours at $114.00 per hour (Rate per hour - hours over 80 per month when charterer supplies fuel)	2,485.20
PLUS:	Oil supplied by T.N.T.A. for September flying	
	4 cases at $18.00 per case	72.00
	INVOICE TOTAL	$12,895.82

TERMS: One per cent interest per month will be charged on all invoices not paid within 30 days of date issued.

Paid Nov 10/71
WLJV-#192
$ 12,895.82

Acme Analytical Laboratories Ltd.

Assaying & Trace Analysis
6455 LAUREL STREET
BURNABY 2, B. C. PHONE 299-5242

OUR NUMBER 14852
DATE Sept. 21/71
CUSTOMER'S ORDER 203
SALESMAN
TERMS 2 weeks
F.O.B.

SOLD TO Archer, Cathro & Associates Ltd.,
Box 4127, Whitehorse, Y. T.

SHIPPED TO

ADDRESS VIA

INVOICE

18	Analyzed for Mo, Cu, Ni, Fe, Mn, Pb,				
	W, Zn, & Ag @ $3.40 each	$61.20			
	Please pay			$61.20	

Wolf Nitz

Paid 391.80
Oct 12/71
WL JV-177

Rediform 7M32

ORIGINAL

B.C.-YUKON AIR SERVICE LTD.

CHARTER FLYING

WATSON LAKE, YUKON

STATEMENT OF FLYING SERVICES RENDERED

STATION Watson Lake, Y.T. AIRCRAFT Otter REGISTRATION CF-XUX PILOT D. Ball

IN ACCOUNT WITH Archer Cathro Ltd,

ADDRESS Box 4127,

Whitehorse, Y.T.

DATE 19	FROM	TO	FLYING TIME HOURS: MINUTES	CHARGE $ PER HOUR	AMOUNT
July 3/72	Ticket # 2779	Paid July 10/72 WHTE #245 $416.00			$416.00 208.00-Mid 104.00-Lampoon 104.00-Tung
				TOTAL ▶	$416.00

THE WHITEHORSE STAR

nalytical Laboratories Ltd.
saying & Trace Analysis
6455 LAUREL STREET
Y 2, B. C. PHONE 299-5242

2 6 0 2 2 1
2 9 8 0
1,6 1 5.0 0
1,6 4 4.8 0 T

OUR NUMBER 14770
DATE Aug. 2/72
CUSTOMER'S ORDER 1360
SALESMAN
TERMS 2 weeks
F.O.B.

hro & Assoc. Ltd.,
P. O. Box 127, Whitehorse, Y. T.
SHIPPED TO
ADDRESS VIA

INVOICE

527	Soils analyzed for Mo, Cu, Pb, Zn Ag, &				
	W with sample preparation and 5 years				
	storage @ $3.75	$1976.	25		
	Less 20% discount	395.	25		
		$1581.	00		
8	Rocks assayed for Cu with sample				
	preparation and 5 years storage @ $4.25				
	each 930.00 Tung	34.	00		
	685.00 Lampoon	$1615.	00		
	Please pay			$1615.	00

Paid Aug 9/72
WLATU #262
$1644.80

Wolf

Rediform 7M32

930.00 - Tung
685.00 - Lampoon

FRONTIER HELICOPTERS LTD.



CHARTER FLYING

PHONE 536-7305
BOX 10, WATSON LAKE, Y.T

CHARTER AND CONTRACT TICKET

DATE July 20 1972 A/C TYPE 206A CF. QLP

PILOT Ron Phillips BASE Watson

CHARGE TO Archer - Cathro

ADDRESS

JOURNEY Watson - Caribou Lake Area + Local - Watson

Rate 240.00/hr - $440.00

PURPOSE Groceries from Watson + Move 2 Fly Camps to Main Camp

FUEL & OIL SUPPLIED BY	
FHL	CHARTERER
✓	

TOTAL HOURS 1:50

This ticket is expressly subject to the conditions printed on the reverse side of ticket and which are hereby accepted.

PILOTS SIGNATURE [signature]

AUTHORIZED BY

No. 04999

Paid August 3/72
WLIV #257
$440.00

ACCOUNT DUE WHEN RENDERED
OVERDUE ACCOUNT SERVICE CHARGE AT RATE OF 1% PER MONTH COMPOUNDED MONTHLY WILL BE CHARGED ON ALL ACCOUNTS 30 DAYS OR MORE IN ARREARS.

TERS LTD.

PHONE 536-7305 TELEX 049-866

August 1, 1972 19

DEBIT	CREDIT	BALANCE
440.00		
		$440.00

100.00 - Lampoon
100.00 - Tung
240.00 - Mid
440.00

'NC

FRONTIER HELICOPTERS LTD.

BOX 10 WATSON LAKE Y. T. **CHARTER FLYING** PHONE 536-7305 TELEX 049-866

July 15, 1972 19

Archer Cathro Assocaites Ltd
Box 4127
Whtehorse, Y.t.

DATE		DEBIT	CREDIT	BALANCE
	TO COVER CHARTER FLYING SERVICES			
uly 13/72	Charter Ticket No. 04910	270.83	MID.	
uly 15/72	Charter Ticket No. 04913	645.81	½ T ½	
	Total this invoice			$916.64

$270.83 - Mid
322.90 - Tung
322.91 - Lampoon
916.64

Paid July 21/72
WLTV #248
$916.64

ACCOUNT DUE WHEN RENDERED
OVERDUE ACCOUNT SERVICE CHARGE AT RATE OF 1% PER MONTH COMPOUNDED MONTHLY WILL BE CHARGED ON ALL ACCOUNTS 30 DAYS OR MORE IN ARREARS.

...R HELICOPTERS LTD.

CHARTER FLYING

PHONE 536-7305
BOX 10, WATSON LAKE, Y.T

CHARTER AND CONTRACT TICKET

DATE 6.13.19.72. A/C TYPE 206B CF-T.K.V.

PILOT BAIRD BASE WATSON LAKE

CHARGE TO ARCHER CATHRO

ADDRESS

JOURNEY WATSON LAKE - CANOL WATSON LAKE

WATSON LAKE

Rate 250.00/hr #27283

PURPOSE TAKE IN CAMP MAN AND SUPPLIES

ST82

FUEL & OIL SUPPLIED BY	
FHL	CHARTERER
✓	

TOTAL HOURS 1.5

This ticket is expressly subject to the conditions printed on the reverse side of ticket and which are hereby accepted.

PILOTS SIGNATURE

AUTHORIZED BY

No 04910

CHARTER FLYING

PHONE 536-7305
BOX 10, WATSON LAKE, Y.T

CHARTER AND CONTRACT TICKET

DATE July 15 1972 A/C TYPE 206B CF T.K.Y.

PILOT BAIRD BASE WATSON LAKE

CHARGE TO ARCHER CATHRO

ADDRESS

JOURNEY WATSON - CARIBOU LAKE

WATSON

5782 Rate 250.00/hr - $645.81

PURPOSE TAKE IN SUPPLIES

MOVE 2 FLY CAMPS

FUEL & OIL SUPPLIED BY	
FHL	CHARTERER

TOTAL HOURS 2:35

This ticket is expressly subject to the conditions printed on the reverse side of ticket and which are hereby accepted.

PILOTS SIGNATURE [signature]

AUTHORIZED BY [signature]

Nº 04913

TERS LTD.

PHONE 536-7305 TELEX 049-866

July 15, 1972 19

DEBIT		CREDIT		BALANCE	
270.	83	MID.			
645.	81	1/2 T	1/2	L	
				$916	.64

CABIN CREEK

felsenmere

A11449-394

CAMP

TUNG CLAIMS

EAST ZONE

WEST ZONE

felsenmere

felsenmere

felsenmere

GEOLOGY

JURA-CRET	15d	ALLAN BATHOLITH Biotite quartz monzonite, graphic granite, pegmatite.
LOWER CAMBRIAN	3d	Marble
CAMBRIAN or EARLIER		Garnet-diopside skarn with local scheelite, pyrrhotite, grades into siliceous calc-silicate away from unit 15a.
	1a	Biotite - quartz schist and gneiss.

LEGEND

- Schistosity
- Bedding (?)
- Fold axis plunge
- Talus
- Outcrop
- Inferred contacts

Topographic control from uncontrolled enlargement of airphoto A11449-394

Field mapping by E. Jensen, July 15-20, 1972.

To accompany report by R.J. Cathro dated Aug. 1972

Association of Professional Engineers of the Province of British Columbia
J. CATHRO
GEOLOGICAL
ENGINEER

FIG. 2

ARCHER, CATHRO & ASSOCIATES LTD.

GEOLOGY

TUNG CLAIMS

WOLF LAKE JOINT VENTURE

SCALE IN FEET

1000 0 1000 2000

CREEK

CABIN

CAMP

A11449-394

LEGEND

- Soil
- X Silt } Cu, Mo, W
- ▲ Rock

All assays in ppm by Acme Analytical Labs Ltd.

Topographic control from uncontrolled enlargement of airphoto A11449-394

FIG. 3

ARCHER, CATHRO & ASSOCIATES LTD.

GEOCHEMISTRY
COPPER, MOLYBDENUM & TUNGSTEN

TUNG CLAIMS

WOLF LAKE JOINT VENTURE

SCALE IN FEET

1000 0 1000 2000

Field mapping by E. Jensen July, 15-20, 1972

To accompany report by R.J. Cathro dated Aug., 1972

Association of Professional Engineers of the Yukon Territory
R. J. CATHRO
GEOLOGICAL
ENGINEER

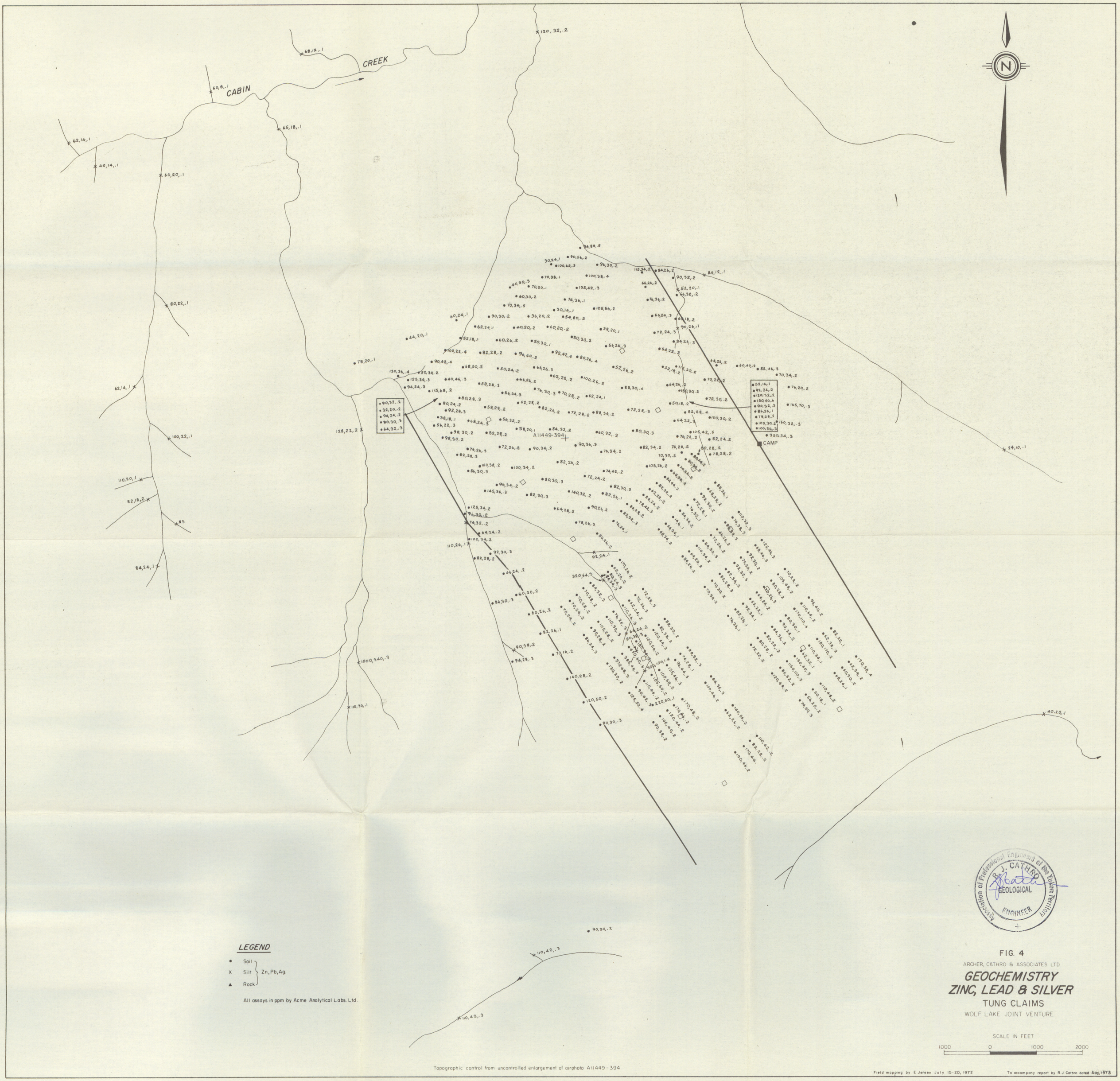

FIG. 4

ARCHER, CATHRO & ASSOCIATES LTD.

GEOCHEMISTRY
ZINC, LEAD & SILVER

TUNG CLAIMS

WOLF LAKE JOINT VENTURE