GEOLOGICAL, GEOCHEMICAL and GEOPHYSICAL REPORT INK, LIN and FLIP GROUPS SUTLAHINE RIVER AREA (104 K) 58° 34' N ; 132° 45' W by: N.H. Sanguinetti, B.Sc. 易 Endorsed by: A.F. Reeve, P. Eng. 104 K/10E, W. American Uranium Ltd. (N.P.L.) and Hontana Mines Ltd. (N.P.L.) Work done May 1969 -- November 1969



#### CORDILLERAN ENGINEERING LIMITED

1418-355 BURRARD STREET

VANCOUVER 1, B.C.

TELEPHONE: 681-8381

MINERAL EXPLORATION MANAGEMENT AND ENGINEERING CONSULTANTS - EASTERN OFFICE -364 MCINTYRE STREET WEST NORTH BAY, ONTARIO 705-474-3710

## WRITER'S CERTIFICATE

I, Albert F. Reeve, of West Vancouver, B. C. hereby certify that:

- I am a geological engineer residing at 101-2150 Bellevue Avenue.
- 2. I am employed by Cordilleran Engineering Limited with offices at 1418 - 355 Burrard Street, Vancouver, B. C.
- 3. I am a graduate of the Provincial Institute of Mining at Haileybury, Ontario, 1958, and received a Bachelor of Science degree from Michigan College of Mining & Technology at Houghton, Michigan in 1961.
- 4. I am a certified member of the Associations of Professional Engineers in the provinces of Ontario and British Columbia.
- 5. I supervised the compilation of this report and the work described therein.
- 6. I have no beneficial interest in Montana Mines Ltd. (N.P.L.) or the fineral flyims described in this report, nor do I expect to receive any.



CORDILLERAN ENGINEERING LIMITED

A. F. Reeve, P.Eng.

AFR/ifs June, 1970. Vancouver, B. C. ١

# Canada

Province of British Columbia

# In the Matter of

Un 翔it: | A geological, geochemical and geophysical report on behalf of Montana Mines Ltd. (N.P.L.)

# J. Michael H. Sanguinetti for<br/>Cordilleran Engineering Limited, of<br/>1418 - 355 Burrard Street

Vancouver

in the Province of British Columbia.

Bo Solemnly Berlare that trenching, geological mapping, geochemical stream sediment and soil sampling and magnetometer surveys were conducted on the INK, LIN and FLIP mineral claims (INK 1-44; LIN 1-8; FLIP 1-3,5,7, 9-12,16,18-20,22-28) in the Atlin M.D., located in the Sutlahine River area, 80 miles south of Atlin, B.C., during the period June 28 to August 29, 1969. Compilation and interpretation were completed by November 24, 1969.

The following are details of personnel costs only: Professional Services:

A.F.Reeve				
P.Eng. Geol.Eng.	5	days @ \$125/day	\$ 625.00	May-Nov.
J.W.Stollery				
P.Eng. Geol.Eng.	5 1/3	2 days @ \$125/day	687.50	May-Nov.
M.H.Sanguinetti				
Geol.	31	days @ \$ 85/day	2,635.00	May-Aug.(field)
	19 3/-	4 days @ \$ 85/day	1,678.75	SeptNov.
			\$5,626.25	(Off.Comp.)
Field Crew (at cost)	:			
C.E.O'Donnell				June 28-
Prospector	18	days @ \$600/mo	\$ 412.27	July 15
M.A.McNeice			•	June 28-
Sr.Ass't.	65	davs @ \$500/mo	1,282.61	Aug. 31
R.L.Sterrett				June 28-
Jr.Ass't.	65	days @ \$400/mo	1,019.67	Aug. 31
A.W.Randall		-	•	July 30-
Crew Chief	33	days @ \$625/mo	725.82	Aug.31(field)
	15	days @ \$625/mo	431.11	Sept. 1-15
		-		(Off.Comp.)
A.D.Zackodnick				July 30-
Jr.Ass't.	33	days @ \$400/mo	526.19	Aug. 31
R.Miller		-		July 30-
Ass't.Geol.	33	days @ \$600/mo	831.66	Aug. 31
D.J.McDonald		-		July 30-
Jr.Ass't.	33	days @ \$400/mo	549.08	Aug. 31
J.Hutton		-		July 30-
Cook	33	days @ \$550/mo	653.02	Aug.31
		-	\$6,431.43	-
		WCB on Salaries	235.46	\$12,293.14

And I make this solemn Declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath, and by virtue of the Canada Evidence Act.

Beclared before me	
at City of Vancouver	in and i de
in the Province of British Columbia.	Michael & Karguenetto
this 18th day of	
JUNE A.D. 1970	
<u> IPhillips</u>	
A Notary Public in and for the Province of British Columbia A Commissioner for taking affidavits for British Columbia Sub-Mining R	ecorder

# REPORT

## ON THE

INK & LIN CLAIM GROUPS SUTLAHINE RIVER AREA (NTS 104 K)

ATLIN MINING DIVISION BRITISH COLUMBIA

#### FOR

## AMERICAN URANIUM LIMITED (N.P.L.)

1250 - 505 Burrard Street Vancouver 1, B. C.

#### BY

M. H. Sanguinetti, B.Sc. Geologist

CORDILLERAN ENGINEERING LIMITED 1418 - 355 Burrard St. Vancouver 1, B. C.

NOVEMBER 24, 1969.

F

BRITIS

# TABLE OF CONTENTS

		r Au
INTRODUCTION		1
PROPERTY		3
HISTORY		4
LOCATION AND ACCESS		5
PHYSIOGRAPHY AND CLIMATE		б
REGIONAL GEOLOGY		7
INK GROUP		8
Local Geology Economic Geology Geochemistry Geophysics	• • • • • • • • • • • • • • • • • • • •	8 10 12 14
LIN GROUP		15
Local Geology Economic Geology Geochemistry Geophysics	• • • • • • • • • • • • • • • • • • • •	15 16 18 20
SUMMARY AND CONCLUSIONS	• • • • • • • • • • • • • • • •	22
RECOMMENDATIONS	*******	27

# APPENDICES

APPENDIX "A"	Bibliography	
APPENDIX "B"	Writer's Certificate	
APPENDIX "C"	Maps:	
#1 Fig. 1 #2 Fig. 2 #3 Fig. 3	Location Map (frontispiece) Claim Map Ink Group, Geology	l" = 125 mi l" = 3,000' l" = 800'



# TABLE OF CONTENTS

APPENDIX "C" Maps (Continued)

#4	Fig.	4	Ink	Group, Locatic	Geology	& Trench	1."	-	200
#5	Fig.	5	Ink	Group,	Geochem	ical			
				Stream	Survey		1"	-	800
#6	Fig.	6	Ink	Group,	Geochem	ical			
				SOLL SI	irvey		1	-	200
#7	Fig.	7	Ink	Group,	Magnetor	meter			
				Survey			2.11		200
#8	Fig.	8	Lin	Group,	Geology	and			
				Trench	Location	ns	1.00	-552	40.01
Ha	Fig.	9	Tin	Group	Geochem	i et en	-		
#1	+ + 9 .	-	14.4.44	- Coppe	- GCOGUEIIC	r s Çr Y	6.11		5661
HID	-			- coppe	21		+	-	200
#10	r1d.1	10	bin	Group,	Geochem	istry			
				- Molyk	odenum		1."		200'
#11	Fig.]	1	Lin	Group,	Magnetor	neter			
				Survey	La construction de la constructi		7.10	-200	2001
#12	Fig. 1	2	Tin	Group	Geocham	ical and			
			dar of a dire	Geophys	sical And	omalies	1 "	100	40.0
APPENDT	x "T	, ir	p	hotoura	anhs				
The second of the		·	-		-Person				
APPENDI	X "E	șu.	D	rill Lo	ogs, Ink	Group			
APPENDI	X "F		D	rill Lo	ogs, Lin	Group			



· •••

# INTRODUCTION

This report has been prepared for American Uraniam Limited (N.P.L.) at the request of Mr. G. A. Armstrong, president. It is based on research of mining records, geological reports and on work performed on the properties during the period June 28th to August 29th, 1969 by crews of Cordilleran Engineering Limited.

The purpose of this report is to summarize and evaluate the results of prospecting, sampling, geochemical and geophysical surveys and to determine if further work is warranted.

The properties are located in the Atlin Mining Division of British Columbia approximately 100 miles west of Dease Lake and 70 miles north of Telegraph Creek. Access was by float-equipped fixed-wing aircraft and helicopter troa Dease Lake and Telegraph Creek.

Two separate claim groups, the Ink and the first comprising 44 and 28 full-sized claims respectively, and controlled by American Uranium Limited (N.P.T.). Encode commucover two separate showings discovered and worked by set a Mining Co. Ltd. (Anaconda) from 1963 to 1965. (Thorn)

# INTRODUCTION (CONT'D)

Mineralization on the Ink group consists of chalcopyrite, tetrahedrite and pyrite in structurally controlled silicified alteration zones in a quartz-feldspar porphyry. Chalcopyrite, molybdenite, tetrahedrite and enargite occur as disseminations and in tight quartz veins in an altered intrusive on the Lin group.

Sufficient surface trenching and sampling was performed to complete annual assessment work on the key area of each group.

The writer's certificate of qualifications, map:, photographs and drill logs of the core remaining on the property are appended.

## PROPERTY

#### (FIGURE 2)

The company controls the Ink and the Lin claim groups totalling 72 full-sized claims in the Atlin Mining Division of British Columbia. The showings are 3 miles apart and approximately 1½ miles of open ground separates the claim groups. Two camps were established, one on each property due to rugged terrain. Assessment work was performed and recorded on Ink #1-10 and Lin #1-8 in July.

#### Status of the groups is as follows:

#### INK GROUP

and the second

<u>C1</u>	.aim	Record No's	Expiry Date	Title	Bill of Sale Number and/or date
Ink	1-10	9162 - 9171	16 July,1970	Montana Mine Ltd. (N.P.L.)	s 23/8/68
Ink	11-44	12059D-12092D	8 April,1970	American Uranium Mine Ltd.	27/5/69 s #M22/69

#### LIN GROUP

ć

				DITI OF DUIC
<u>Claim</u>	Record No's	Expiry Date	Title	Number and/or Dat
Lin 1-8	9154 - 9161	16 July,1970	Montana Mine Ltd.(N.P.L.)	s 23/8/68
Flip 1-3, 5,7,9-12, 16,18-20, 22-28	12093D-12112D	8 April,1970	American Uranium Mine Ltd.	27/5/69 s #M23/69

з.

Nill of Calo

# HISTORY

The showings were discovered by the Julian Mining Co. Ltd. during the course of a regional exploration programme in 1963. At that time what is now known as the [Ink group was called the Thorn group] and the [Lin group was then called the Kay group]. Previous work on the Ink group consisted of trenching and sampling, geological mapping, geochemical sampling, magnetic surveys, an induced polarization survey and limited diamond drilling. On the Lin group previous work consisted of trenching and sampling, geological mapping, geochemical sampling, magnetic surveys, a seismic survey, an induced polarization survey and diamond drilling.

In 1968 ten claims, Ink 1-10, were staked to cover the Thorn showing and 8 claims, Lin 1-8, were staked to cover the Kay showing. These claims were sold by Mr. G. B. Watson to Montana Mines Ltd. (N.P.L.) who in turn optioned them to American Uranium Limited (N.P.L.). Additional claims were staked for protection around both groups in 1969.

Sale Ale

#### LOCATION AND ACCESS

(FIGURE 1)

The properties are located 7 miles northwest of Trapper Lake and 13 miles southeast of King Salmon Lake at approximately 58° 34' north latitude and 132° 45' west longitude. Nearby settlements are Tulsequah, 30 miles to the west, Atlin, 80 miles to the north, Dease Lake, 100 miles to the east and Telegraph Creek, 70 miles to the south.

The Lin group is situated in a north facing cirque, 7 miles north-northwest of Trapper Lake while the Ink group is about 3½ miles to the west on a westerly flowing tributary of the Sutlahine River.

Access to the property was by float-equipped Beaver and Otter aircraft out of Watson Lake to Trapper Lake. From there a helicopter ferried men and supplies to the camps. A 1,500 foot airstrip, located 2 miles north of the Lin camp, was unserviceable. Weekly and bi-monthly service trips were generally by Jet Ranger helicopter based at Dease Lake. An important consideration when working in an isolated area such as this is that transportation costs are exceptionally high. Charters were shared with other parties operating in the same general area to reduce costs and coordinate expediting.

# PHYSIOGRAPHY AND CLIMATE

(APPENDIX "D")

The claim groups are located near the edge of the Taku Plateau and the Boundary Ranges of the Coast Mountains. Topography is typically rugged, hanging valleys, steep-sided ravines and alpine glaciers being the more common landforms present. Elevations range from 2,500 feet above sea level in the vicinity of the Ink group to 5,000 feet at the site of the Lin camp. Local peaks rise to 6,800 feet above sea level.

In the vicinity of the Ink group the steep slopes above the creeks are covered with spruce, balsam and birch with dense underbrush of devil's club, alder, huckleberry and other bushes. The Lin group is mainly above treeline, about one-third of the claim group being covered with glacial moraine, one-third with grass, heather and mountain hemlock and onethird covered with dense balsam, hemlock, devil's club, alder and small bushes.

Weather during the 1969 field season was unusually wet, with rain or snow at least three days out of four.

No reliable information is available for the climatic conditions of this specific area, however, persons

## PHYSIOGRAPHY AND CLIMATE (CONT'D)

familiar with the region report that under normal conditions precipitation averages about 35 inches per year. July and August are usually the warmest and dryest months. Temperatures in summer may average a high of  $60^{\circ}$ F while in winter a low of  $-40^{\circ}$  is common.

### REGIONAL GEOLOGY

The eastern flank of the Coast Range batholith is in contact with Lower Triassic clastic sediments and Upper Triassic volcanics to the south and west of the claim groups. To the north a series of Tertiary volcanics, felsite and rhyolite, overlie mixed Lower Jurassic sediments. Several stocks of granitic to dioritic composition were observed to have intruded volcanics and sediments in a belt subparallel to the edge of the batholith.

Minor fault patterns are established both parallel and perpendicular to the Sutlahine River. Since large portions of the region are unmapped and obscured by vegetation, no conclusions as to tectonic history can be drawn at this time.

### INK GROUP

LOCAL GEOLOGY (FIGURES 3 & 4) (APPENDIX "D")

The northern and western portions of the Ink group are overlain by volcanic rocks of Upper Triassic age, primarily andesites and tuffs. Rhyolite flows of Tertiary age occur on the northeastern portion of the claims. The southern half is underlain by mixed sedimentary rocks of Triassic and earlier age. A probable disconformity exists along the contact between volcanics and sediments in the vicinity of Ink #30 mineral claim. The sediments are composed of thinly bedded shale, argillite and sandstone grading over short distances into metasediments in the form of greenstone.

In the centre of the claim group, exposed along major creeks and minor gullies, is an irregularly shaped intrusive body of quartz-feldspar porphyry. Sections of this rock have been subjected to intense deuteric alteration as well as severe surface weathering. Samples of fresh rock were difficult to obtain here except in hand trenches. The colour of the altered rock is pale cream to white except where weathered to light brown due to oxidation of pyrite. It is composed of about 10% medium-grained anhedral to subhedral

# INK GROUP - LOCAL GEOLOGY (CONT'D)

glassy quartz phenocrysts (1/8" - 1/4") and coarse (1/4" -1/2") white sericitized feldspars, generally subhedral. Mafic minerals have been completely altered. The unaltered porphyry has not weathered as intensely and may contain up to 10% euhedral biotite in 1/8" books. These have partially altered to chlorite giving the rocks a pale green cast.

Pyrite occurs as fine disseminations in both fresh and altered porphyry. It may also occur in massive veins (up to 4" wide) in thinly layered siliceous zones, and is sometimes accompanied by tetrahedrite.

Some suggestions of structural control of the alteration in the form of slickensides and silicification were observed. Several minor faults and fault zones occur in the porphyritic rock. It is suggested that these were large tension features and thus more susceptable to alteration and later injection of quartz, pyrite and tetrahedrite. The spacings between the siliceous areas or veins is from 50 feet to 200 feet but the veins themselves average about 20 feet in width. Two general directions of veining were noted, northeast and northwest. These are subparallel to the larger creeks in the area.

### INK GROUP - LOCAL GEOLOGY (CONT'D)

Several dykes were observed which cut the porphyritic as well as the sedimentary and volcanic rocks. These are generally of andesitic composition but aplitic and lamprophyric dykes are also present. Width varies from 2 feet to 80 feet and no consistent direction was noted.

### ECONOMIC GEOLOGY (FIGURE 4, APPENDIX "E")

Mineralization occurs in two rock types on the Ink group. Chalcopyrite, pyrite and pyrrhotite occur as massive blebs and stringers in andesites which are altered in a halo about 100 feet out from the contact with the porphyry. Abundant epidote and some magnetite are associated with this alteration. Diamond drill core from work performed by Julian Mining Co. Ltd. was relogged. Several sections of chalcopyrite mineralization were noted in this core, however, none exceeded 15 feet and grade was estimated at less than 0.5% Cu. Drill logs of the core remaining on the property are appended. North of the slide area directly west of camp two channel samples were taken of andesite mineralized with

## INK GROUP - ECONOMIC GEOLOGY (CONT'D)

chalcopyrite stringers. These assayed at 0.1% copper.

The most extensive mineralization is in the quartz-feldspar porphyry. Twenty-two trenches were excavated and sampled in the porphyry while several other sections were chip sampled at surface. The averaged assay values of copper, silver and gold are noted on Figure 4. Pyrite and tetrahedrite occur as fine disseminations throughout the porphyry and in narrow siliceous veins.

The intensely altered porphyry is directly associated with mineralization and silicification. The silicified areas average 20 feet in width but may be as wide as 80 feet and are composed of parallel 2 to 4 inch white quartz veins. Sulphides occur as fillings between quartz veins and both are slickensided indicating a probable structural control. A 6 inch tetrahedrite vein near the top of the slide area west of camp assayed at 33.71% Cu, 25.32 oz/ton Ag and 0.220 oz/ton Au. This vein was discontinuous along strike and varied in width from 1 inch to 12 inches. Copper values were generally less than 0.1% and silver was greater than 0.1 oz/ton in the altered porphyry. The best silver assay was 9.10 oz/ton across 12 feet of a faulted silicified zone on trench 12. This sample also contained 0.250 oz/ton in gold, the highest on the property.

## INK GROUP - ECONOMIC GEOLOGY (CONT'D)

Gold assays for the majority of the samples were low. In the fresh and altered porphyry only trace values were received, however, some significant assays were returned from the silicified zones where sulphide concentrations were higher than average.

The porphyry, both fresh and altered, is exposed over a length of 11,000 feet along the northwest-trending creek and over 5,000 feet along the northeast-trending creek, however, less than a quarter of this is altered or mineralized to any extent. Channel samples in the unaltered porphyry generally assayed trace copper and 0.1 oz/ton or less silver.

### GEOCHEMISTRY (FIGURES 5 & 6)

Reconnaissance stream sediment sampling was conducted on all drainages on the Ink group with the exception of those creeks which were physically impossible to ascend. A total of 68 samples were collected of which 6 were considered to be definitely anomalous and a further 18 were

#### INK GROUP - GEOCHEMISTRY (CONT'D)

above threshold level. The majority of these above-threshold samples were gathered on creeks draining the western side of the claim group where chalcopyrite is known to occur in andesites and "greenstone" along the contact with the porphyry.

Soil samples were collected along grid lines in three areas as noted on Figure 6. A total of 142 samples were taken of which 8 were considered definitely anomalous. Two areas of above-threshold copper values were determined, both of which appear to be associated with intense alteration in the quartz-feldspar porphyry where quartz veining and tetrahedrite mineralization are known to occur.

Stream sediment samples were collected in the active portion of the creeks and care was taken to avoid selecting organic material. Soil samples were taken from the enriched "B" horizon, generally about 6 inches deep. Samples were placed in kraft bags and the sites marked with fluorescent flagging tape. Care was taken to avoid contamination in sampling, packing and shipping. All samples were sent to the North Vancouver laboratory of Bondar-Clegg & Company Ltd. to be analyzed for copper.

## INK GROUP (CONT'D)

#### GEOPHYSICS (FIGURE 7)

A magnetometer survey, using a Sharpe MF-1 fluxgate magnetometer, was conducted along grid lines over two portions of the Ink group. The results show two relative highs and one relative low. It is suggested that the areas of higher readings may be underlain by sections of more magnetic volcanic rock. The area of relatively low magnetic readings is probably a reflection of the intense alteration of the porphyry. This is associated with the faulting which trends subparallel to the creeks.

The results of the magnetometer survey, while not specifically indicative of mineralization, may possibly serve as guides to structure and alteration with which the mineralization is associated. The extent of the grid lines of the present survey was limited by topography and vegetation.

# LIN GROUP

#### LOCAL GEOLOGY (FIGURE 8)

The area of the claims is underlain by a series of cream to buff coloured rhyolite flows, grey felsite and a pinkish syenitic (monzonitic ?) intrusion with a relatively wide chill margin. Andesitic and basaltic dykes have cut all rocks of this group. Detailed surface mapping and examination of drill core on the property suggest that an igneous body of dioritic composition has intruded and altered overlying rhyolite flows. These have been altered and welded to grey felsite and resulted in a localized mixture of syenitic composition on the "nose" of the intrusion.

The felsite is microcrystalline with small (1/8") phenocrysts of glassy anhedral quartz and occasional 1/4 - 1/2" relic feldspars set in a dense grey matrix. The intrusive is a medium to fine grained pink rock frequently containing phenocrysts up to 1/4" diameter of rounded glassy quartz and euhedral to anhedral 1/8 - 1/4" phenocrysts of both orthoclase and plagioclase feldspar. These phenocrysts are set in a pink matrix whose grain size, crystalline habit and composition vary immensely from one area to the next.

## LIN GROUP - LOCAL GEOLOGY (CONT'D)

Mineral compositions are such that the rock may grade from diorite to syenite over a hundred feet. Finely disseminated euhedral pyrite is relatively consistent throughout the intrusive, and is also found in the felsite, rhyolite and andesite. Minor brecciation was noted near contacts with felsite where coarse pieces of syenite had been included and welded into flows. Some suggestions of more than one stage of intrusion were observed but could not be verified.

Several wide faults were observed which cross the property in two general strike directions, east-west and northeast-southwest. Secondary quartz, orthoclase and sulphides have mineralized faults trending in both directions as well as minor faults and shears which lie parallel and perpendicular.

### ECONOMIC GEOLOGY (FIGURE 8, APPENDIX "F")

Chalcopyrite and molybdenite mineralization occur as disseminations, fracture fillings and in secondary quartz-orthoclase veinlets in symmitic intrusive rock.

#### LIN GROUP - ECONOMIC GEOLOGY (CONT'D)

Minor amounts of enargite and tetrahedrite also occur in quartz veinlets and as fracture fillings. The intrusive rock is only exposed in the central creek, its tributaries and on the ridge southeast of camp. However, from past drilling results it was determined that minimum dimensions of the intrusion are 5,000 feet by 5,000 feet to a depth of 500 feet. Examination of the remaining drill core revealed only minor amounts of mineralization. Although alteration and pyritization were extensive in some sections, there was little accompanying chalcopyrite. Sampling of surface trenches along the creeks north and east of camp returned exceptionally low assays for copper and molybdenum. The values noted on Figure 8 indicate averages of the trenches which were channel sampled in 10 foot sections. The grab samples are averages of 20 foot continuous chip samples taken along the mineralized outcrop in order to determine the grade of the exposed section. The highest individual assay returned .29% copper over 20 feet.

Diamond drilling by the Julian Mining Co. Ltd. on the Lin group consisted of 3 EX holes totalling 210 feet and 5 BX holes totalling over 2,640 feet. Only short sections of the core had been split for assay and at no place did copper mineralization appear to be more than 0.3%; generally it was less than 0.1%. Molybdenite occured in trace amounts associated

# LIN GROUP - ECONOMIC GEOLOGY (CONT'D)

with widely spaced quartz stringers.

Minor chalcopyrite and pyrite occur as disseminations in andesite and felsite; assays of these materials returned values of 0.01% copper and less.

Float containing massive pyrite, pyrrhotite and chalcopyrite was found in lateral and terminal moraines on the southern portion of the property. Detailed prospecting indicated a source about 3 miles south of the camp near a contact of limestone and volcanics. The mineralization occurred in the limestone as small pods and irregular veins. The area was not staked.

### GEOCHEMISTRY (FIGURES 9, 10 & 12)

Geochemical sampling was conducted on the creeks and tributaries draining the Lin group and on a soil grid spacing of 100' x 200' and 200' x 400'. More than 42,500 feet of grid line were covered. Soil horizons were generally

#### LIN GROUP - GEOCHEMISTRY (CONT'D)

well developed. Samples were collected from the enriched "B" horizon and were sent to the NOrth Vancouver laboratory of Bondar-Clegg & Company, Ltd. for analysis for copper and molybdenum.

Threshold values for copper and molybdenum soil analyses are 85 and 8 parts per million respectively. Using these values the outlines of above-threshold areas were plotted on Figure 12. Anomalies for both metals occur on the southeast portion of the claims and immediately north and west of camp. The anomaly in the southeast area is caused by chalcopyrite and molybdenite mineralization in altered dioritic rock. It extends over 2,000 feet and is open to the south. To the west it is cut off by glacial moraine and to the east by the felsite (chill margin ?) contact.

The large anomaly located north and west of the camp is possibly caused by chalcopyrite and molybdenite mineralization in volcanic rocks. Near the creek intersection by ON - OW, thin quartz stringers cutting andesite were sampled. Chalcopyrite and molybdenite occur in the quartz while only chalcopyrite occurs as disseminations in the andesite. Assays of this material graded 0.06% Cu and .001% MoS<sub>2</sub>.

# LÍN GROUP - GEOCHEMISTRY (CONT'D)

The anomalous area west of camp is underlain by light coloured pyritized felsite and rhyolite. Mineralization found in that area on the creek draining towards the west was chalcopyrite and pyrite in narrow quartz veins cutting light brown rhyolite. This was sampled at sites R-1 and R-2 and returned values of 0.1% and 0.3% copper. It is suspected that this geochemical anomaly is caused by such mineralization.

#### GEOPHYSICS

#### (FIGURES 11 & 12)

A magnetometer survey was conducted over a grid on the central area of the claims. Approximately 61,200 feet of line was run using a Sharpe MF-1 fluxgate magnetometer.

Two areas of high magnetic strength, greater than 1000 gammas, were noted. These two are possibly connected in that the larger, located immediately north of camp, is underlain by andesite which is relatively strongly magnetic. The smaller, 800 feet southeast of camp, is associated with

#### LIN GROUP - GEOPHYSICS (CONT'D)

andesite on steep cliffs which grades northward into a chilled rock containing frequent magnetic inclusions.

A large area of relatively low magnetism, less than 500 gammas, exists on the eastern edge of the grid lines. Rock outcrop along the ridge where this low is situated grades from felsite and rhyolite in the north into coarsely grained intensely altered monzonite (diorite ?) in the south.

Two other areas of relatively low magnetism exist in the southeastern area of the claims. The smaller covers over 600 feet on the southern end of the OW base line. The larger, which extends from 8S-OW to 20S-10W is overburdencovered, mostly with morainal material. Near the northern end of the larger and the southern end of the smaller are two old drill sites. These were probably drilled to test areas of intensely altered intrusive which is mineralized at both places with disseminated pyrite and chalcopyrite and thin quartz veins containing pyrite, chalcopyrite and molybdenite. It is suggested that the three areas of relatively low magnetism are caused by barren felsitic and rhyolitic rocks and some degree of alteration of the intrusive body. The felsite here may be part of the chill margin of this intrusive.

## SUMMARY AND CONCLUSIONS

- American Uranium Limited (N.P.L.) controls 72 mineral claims in two groups, the Ink and Lin, in the Atlin Mining Division of northeastern British Columbia.
- 2. The claim groups are located about 100 miles due west of Dease Lake and 70 miles north of Telegraph Creek. Access was by float-equipped aircraft out of Watson Lake, Y.T., to Trapper Lake, 7 miles east of the properties. From there a helicopter was used to ferry provisions to the camps.
  - 3. The claims, covering two separate showings, were discovered and worked by Julian Mining Co. Ltd. from 1963 to 1965.
  - 4. Mineralization on the Ink group consists of chalcopyrite, tetrahedrite, and pyrite in structurally controlled silicified alteration zones in a quartz-feldspar porphyry. Chalcopyrite, molybdenite, tetrahedrite and enargite occur as disseminations and in tight quartz veins in an altered intrusive on the Lin group.
  - 5. Exploration programmes consisting of geological mapping, geochemical soil and stream sediment sampling, a magnetometer survey, prospecting, trenching and sampling were conducted

on each claim group. Work was performed by crews of Cordilleran Engineering Limited during the period June 28th to August 29th, 1969.

- 6. The claim groups are close to the eastern flank of the Coast Range batholith. To the south and west of the claims the batholith is in contact with Lower Triassic clastic sediments and Upper Triassic volcanics while to the north Tertiary volcanics overlie Lower Jurassic sediments.
- 7. The Ink group is underlain by Upper Triassic and Tertiary volcanics in the north and by Triassic and earlier sediments in the south. A body of quartz-feldspar porphyry has intruded these rocks and is exposed along the creeks and gullies in the central portion of the claim group. The porphyry is intensely altered and silicified in zones suggesting structural control. This alteration is directly related to sulphide mineralization in the form of pyrite, chalcopyrite and tetrahedrite.

Copper assays averaged less than 0.1% but silver assays were generally greater than 0.1 oz/ton. Silver and gold values were both significant but only within the limitations of the silicified veins. Chalcopyrite mineralization occurs

along the perimeter of the porphyry in altered andesites, but no significant assays were noted.

Reconnaissance stream sediment sampling was conducted on most drainages on the Ink group and 24 samples were considered to be above threshold level. The majority of these higher values were possibly the result of chalcopyrite mineralization in andesite and "greenstone" along the contact with the porphyry. A geochemical soil survey over portions of the Ink claims revealed two copper anomalies, both of which were related to intense alteration and silicification in the quartz-feldspar porphyry where sulphide mineralization is known to occur.

A magnetometer survey over portions of the Ink group indicated two areas of relatively high and one area of relatively low magnetism. It is suggested that the high areas are caused by volcanic rocks containing minor amounts of magnetite while the low area is a reflection of the intense alteration of the quartz-feldspar porphyry.

8. The Lin group is underlain by a series of volcanic flows which appears to have been intruded by a dioritic stock. This intrusion has resulted in a relatively wide chill

margin in the volcanics and subsequent alteration of the diorite to monzonite and symite. Mineralization consists of chalcopyrite and molybdenite disseminated, in quartz veinlets and along tight fractures in altered symite. Small amounts of tetrahedrite and enargite were noted. Results from previous drilling indicated that alteration and minor amounts of mineralization exist over an area 5,000 feet by 5,000 feet to a depth of at least 500 feet. Sampling of trenches and mineralized outcrops indicated an average grade of 0.1% Cu and 0.002% MOS<sub>2</sub>. Visual estimation of copper in drill core was less than 0.3%.

Soil sampling over the key area of the Lin claims indicated two Cu-Mo anomalies. The smaller anomaly in the southeastern portion of the claims is caused by minor chalcopyrite and molybdenite in altered intrusive rocks. The larger anomaly, in the central and western portion of the claim group, is caused by chalcopyrite mineralization in andesites and possibly by trace amounts of chalcopyrite and molybdenite in quartz veins intruding rhyolite flows. A magnetometer survey conducted over the central portion of the claims revealed two areas of high magnetism and three areas of low magnetism. It was suggested that the high areas reflect moderately magnetic andesitic rock while the areas of low

magnetism are caused by barren felsitic rock and some degree of alteration of the intrusive body.

- 9. Because of the low overall assays for copper, silver and gold and the restricted nature of the veins carrying higher metal values it is felt that no further work would be warranted on the Ink group of mineral claims at this time.
- 10. Similarly, examination of the existing drill core and sampling of trenches and mineralized outcrop have indicated that the grade of the mineralized zone on the Lin group is minimal thus no further work is warranted on these claims at this time.

#### RECOMMENDATIONS

#### It is recommended that:

.

- No further work be performed on the Ink group of mineral claims.
- No further work be performed on the Lin group of mineral claims.
- 3. The option agreement with Montana Mines Ltd. (N.P.L.) be dropped.

Respectfully submitted

M. H. Senguinetti

M. H. Sanguinetti, B.Sc.

MHS/s

APPENDIX "A"

# BIBLIOGRAPHY

Aitken, J.D.: 1959:

"Atlin Map-Area, British Columbia (104 N)", Geol. Surv. Can., Mem. 307.

British Columbia:

Minister of Mines and Petroleum Resources, Annual Reports, 1963, 1964, 1965.

Kerr, F.A.: 1948:

"Taku River Map-Area, British Columbia", Geol. Surv. Can., Mem. 248.

Sadlier-Brown, T.L.:

1968: "Report on the Ink & Lin Claims for Montana Mines Ltd.", Private Report.

Sanguinetti,M.H.: .

"Preliminary Results of Geochemical, Geophysical and Geological Surveys on the Ink and Lin Claim Groups", Private Report for American Uranium Limited (N.P.L.).

Souther, J.G.:

1969:

1969:

"Tulsequah", Geol. Surv. Can., Map 6-1960.



#### CORDILLERAN ENGINEERING LIMITED

1418-355 BURRARD STREET

VANCOUVER 1, B.C.

TELEPHONE: 681-8381

MINERAL EXPLORATION MANAGEMENT AND ENGINEERING CONSULTANTS

l

i

- EASTERN OFFICE -364 MCINTYRE STREET WEST North Bay, ontario 705-474-3710

#### May 5, 1970.

Mr. L. McGowan Montana Mines Ltd. Box 302 Whitehorse, Y.T.

Dear Mr. McGowan:

We certify that between June 28th and August 29th, 1969 we carried out geological mapping, rock sampling, trenching, geochemical sampling and magnetic surveys on the Ink and Lin mineral claims located near Trapper Lake in the Atlin Mining Division, for American Uranium Mines Ltd. (N.P.L.).

In summary the costs of this work were as follows: (a copy of our work sheet is attached)

Professional Fees	\$6,133.75
Salaries (Field Crew)	6,507.43
Air Support	5,315.26
Geochemical Analysis	
and Assays	2,094.48
Equipment and Supplies	1,768.49
Travel Expenses	617.27
Secretarial Services	523.50
Radio Licence, Mining	
Certificate and Insurance	33.46
Miscellaneous Expenses	
Printing, Office supplies,	
Expense accounts, Postage,	
Telephone, Freight	1,267.34
W.C.B. (on salaries)	235.46
Food	1,331.20

Total Expenditures

SSION

C.

E

OF

GINE

F. REEVE

Yours very truly,

\$25,827.64

CORDILLERAN ENGINEERING LIMITED

F. Reeve, P.Eng. Α

AFR/s

78		the second second	ANTEN AND AND AND AND AND AND AND AND AND AN			and the second	Act o water class	Here and The second	Not Child - which we also		· • · · · · · · · · · · · · · · · · · ·	196 4		and the second second
		·		Ser !	ternisie	and lie.	america	. L.K	1 him	claim	George	Ginean	detures	1 3 3 4 2 1 1 3 4 5 7 1 2 3 4 5 7 1
		51		-	14 1 1 K	1.25			*	his Tree	ket.		Print ladi Sup.	
10.000 (1000000 (1 20.000) (10.000) (10.000)	nan man na magar matalagi yaki makeo	and a construction of the second s	and and the second second		eneti un combre					- Watel	tolo 3	Free	- King often	
Alate	Inv.	Carriery	Stal ant	A.2.	Prof. Frank	Salerica (Juied Crea)	Lipport	amelition	e infil	Theseil	Lee. Lee -	Radis hiel	might	w.c.B. Jond
May 5/69	6348	tepril / 4.9	476.04		1400	1111			11111		HU I	9701		11110
			and the second										11.5	
Thay 29	0358	May 169	1,302.44		69250	.7600		6106	30900	14580	5250 119	2444	1281	
June 12	0375	June (Part)	1. 12,4.18						73172	16201			13330	55.00
		1		1										
July 4	0385	June 169 .	905.70	1	196250	15340			11585	3385	1 8550	P.	1 1 3a	Pate
July 31	0399	July 169	3.070.22	-	49500	143417	146 00	572	1/3275	12284	120-0 im	1 80 P	19788	11 Mile
								4754						
Sept 1	0416	hug 169	7. 422.85	- 1	17.82.50	353731	69375	103277	750		5550		- 762	
Sept. 10	0421	Sept 1-10	4.124.21				120791	3/8/9	20500	729			6438	11 1/1
,		1 . 1.	10										2499	
		- Acpt 169	1, 100-21	-i	33750	80.5 16	(7/250)	65714	6394	21481	- the o	++++-	6232	20760 (7.30
Oct. 16	0439	0.1 1-16	. 2. 42283				242010		273					
	110					1131 4							346	
nov 17	6447	1 to nov 17/69	. 5.92.39	- 1	4250	5-139		19.60		239	12:00		905	
alie 8	0457	to ale : 5/69	72556		700 00	-					1500	Pa Pa	3.15	
Jan 8	0472	+ part	1970 51	il i	111100							1. 2	And !	
	- 110	corner support	1,1 10.01		1.66 43						3200		67226	
				1			-1.11							
*	-	To Tails :	25,8:764		610075	6507 +3	521526	209448	176849	617 27	523.50	3346	126734	23546 1331.2



BY M H. SANGUINETTI, B Sc. NOVEMBER 24, 1969

GLACIER 2512 URANIUM LIMITED (N.P.L 1250-505 BURRARD ST VAN COUVER 1, 8 C PROFESSI. PROVINC INK & LIN CLAIM GROUPS OF CLAIM MAP A. F. REEVE SCALE 1"= 3000' BRITISH CLUMB! BY GINEE CORDILLERAN ENGINEERING LIMITED 200000 1418-365 BURRARD ST VANCOUVER, BC. FIGURE 2













![](_page_42_Figure_0.jpeg)

![](_page_43_Figure_0.jpeg)

![](_page_44_Figure_0.jpeg)

![](_page_44_Picture_1.jpeg)

T.

CORDILLERAN ENGINEERING LIMITED

SCALE : 1"= 200'

![](_page_44_Picture_3.jpeg)

![](_page_45_Picture_0.jpeg)

![](_page_45_Picture_1.jpeg)

and the seal of the seal of the

a set of the set of the set of the

and and

the state of the s

and the second se CORDILLERAN ENGINEERING LIMITED

BY

![](_page_45_Picture_3.jpeg)

![](_page_46_Picture_0.jpeg)

![](_page_47_Figure_0.jpeg)