061620

REPORT ON GEOLOGY, RADIOMETRICS AND GEOCHEMISTRY

GNUCKLE CLAIMS 1-8

Mayo Mining Division
Claim Sheet 106D-16
October 30, 1976

Lat. 64°56'N Long. 134°18'W

Colin J. Riley Geologist

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GNUCKLE REPORT

INTRODUCTION

The Gnuckle uranium occurrence was located in July, 1976 through follow-up of an anomalous geochemical soil sample which was taken by Wernecke Joint Venture (Standard Oil of B.C., Limited, Acquitaine Company of Canada, Ltd., Messrs. L. and H. Clay) in 1975. The 1976 programme was carried out by Eldorado Nuclear Limited under an option agreement with Wernecke Joint Venture; the programme was managed by Archer, Cathro and Associates, Ltd. Eight claims were staked over an occurrence of radioactive float. Geological mapping, grid soil sampling and radiometric surveys were carried out.

Personnel involved with this programme were James Griffin, geologist on 30 July, 1 and 2 August and field man Jack Dennet on August 2. Work was under the direct supervision of Colin J. Riley who was on the property 30 July and 1 August.

This work was carried out under Atomic Energy Control Board Exploration Permit #MX18/76, issued to Eldorado Nuclear Limited for exploration in the Yukon Territory.

PROPERTY LOCATION AND ACCESS

The Gnuckle property consists of eight contiguous mineral claims recorded in the Mayo Mining Division as follows:

Claim Name	Grant Numbers	Expiry Date
Gnuckles 1-8	YA5935-YA5942	20 July, 1977

The property is located at latitude $64^{\circ}56'$N and longitude $134^{\circ}18'$W on NTS Claim Sheet 106D/16. The property was worked from the Wernecke Joint Venture base camp at Fairchild Lake, 18 miles to the east. Support was by Bell 47G3B helicopter. Access to Fairchild Lake is by float equipped aircraft from a charter base at Mayo, 120 miles to the southwest.

ROCK TYPES

Unit 1 - Argillite; black, thin phyllitic cleavage, may be siliceous in places, locally contorted, may contain up to 5% pyrite giving rise to gossanous areas.

Unit 2 - Quartzite; argillaceous, slaty, black to grey, not as fissile as 1, may contain up to 5% pyrite and gossans.

Note: Units 1 and 2 are probably part of the same Unit with varying amounts of quartz and argillitic material. In this area, it is possible to separate them into two mappable units.

Unit 3 - Diorite; medium green in colour, fine to medium grained, of a diorite to gabbroic composition. May have green epidote alteration, contains fragments of Units 1 and 2, up to 2 metres in size forming an intrusive breccia.

Unit 4 - Breccia; explosive gas vent breccia associated with Unit 3 vent material. Contains varying clasts of rhyolite, chert, volcanic and argillite. The fragments may range from 1 to 2 cm. to 10's of metres. Highly pyritic in places forming large gossans (up to 25% pyrite). May have a silicic, rhyolitic phase at margins.

Unit 5 - Dolomite; cream coloured, medium grained, weathers a deep orange brown. Lies along margins of an explosive breccia.

GEOLOGY AND MINERALIZATION

The area surrounding the Gnuckle Claim is composed of an argillitic sequence containing more or less silica. The portion exposed can be classified as siliceous argillite grading upwards into slaty quartzite. The whole has been intruded and fractured by an explosive gas vent event. A central core of epidotized diorite or diogabbro is surrounded by an explosive gas driven breccia. The breccia is discordant and contains numerous fragments of the country rock as well as foreign fragments, either brought up from below or fallen back from above after the explosion. The dolomite is an alteration effect associated with the explosive breccia and is located along around the margins of it. It is a massive medium grained alteration product containing small disseminated specks of magnetite. A fault cuts across the strike of the beds towards the centre of the claim group. This fault is marked by bleaching, silicification and injection of quartz. Occurrences of brannerite, both as particles on fractures and as large crystals growing in the rock, are located along this fault. Close to the central vent, the rhyolitic border phase again contains large crystals of brannerite. Specimens submitted to the Geological Survey of Canada have been identified as brannerite in museium sized and shaped crystals. Some intergrown multiple crystals were also located. All of this mineralization was contained in float. No occurrences were located in bedrock.

A dating on one of these large crystals of brannerite by Teledyne Isotopes, Ltd., of Westwood, N.J. using uranium lead methods gave an indicated age of 742 million years. This would place the mineralization in the mid Hadrynian.

GEOCHEMISTRY AND RADIOMETRIC SURVEY

A 1600 m. long baseline was established by topofill and compass along the central line of the claims. Stations were marked along the base line at 100 m. intervals with 1 m. high lathe pickets. Soil samples and radiometric readings were taken on pace and compass cross lines extending 180 m. on either side of the base line stations.

Soil samples were obtained from a C horizon by digging a shallow pit with a grub hoe and were analysed at Chemex Labs Limited, North Vancouver, B.C. for copper, molybdenum and uranium. The uranium analyses was obtained by a standard fluormetric method on an ashed and double acidified minus 80 mesh fraction. Copper and molydenum were determined using atomic absorbtion spectrometry of a nitric perchloric extraction of a minus 80 mesh fraction. All three minerals show a correlation of high values. These values are concentrated along the margin of the explosive gas breccia in an acidic or rhyolitic border phase. Molybdenum does not show as distinct a pattern as does copper and uranium but still follows the same trends. It is in the area of the highest uranium concentrations that the breccia is extremely gossanous and pyritic. The sulphides might indicate a reducing environment suitable for the deposition of uranium. The diorite vent is low in values for all of the metals tested. This would indicate that the mineralization was one of the last features.

The radiometric survey was carried out at the soil sampling stations with a McPhar TV1-A spectrometer used in the total count mode. Values were generally in the background range from 5,000 cpm. to 7,000 cpm. At a few isolated localities, off-scale or very high readings were located. These would seem to indicate point highs and do not delineate trends. For this reason radiometrics have not been contoured.

CONCLUSIONS AND RECOMMENDATIONS

No mineralization was located in outcrop. Mineralizations tended to be concentrated in large crystals or accumulations of brannerite widely spaced through the rock. The uranium would appear to be associated with fractures or shears and as no major porocity was located during the mapping, there would not appear to be a potential for tonnage on this property. The crystals of brannerite have been identified by the Geological Survey of Canada as mineralogical curiosities. A number of these crystals were found weathered out and loose in the soil cover. Closer examination of the property might locate other pockets of these crystals such as those found in the region of 600 metres north along the base line. It is not considered that this property has potential for commercial tonnage or grade.

It is recommended that no further work be carried out on this property.

APPENDIX "A"

Energy, Mines and Resources Canada

Énergie, Mines et Ressources Canada

Science and Technology

Science et Technologie

A I R M A I L

Your file Votre référence

Our file Notre référence

July 13, 1976

Dr. Richard T. Bell
Geological Survey of Canada
General Delivery
Mayo, Y.T.

Dear Dick:

The specimen submitted with your letter of July 1st is a multiple crystal of brannerite.

The mineral is metamict but on ignition it yields an x-ray diffraction pattern typical for brannerite. Also, titanium and uranium were confirmed as the major elements by a qualitative x-ray fluorescence scan on a pulverized portion of the specimen. A copy of the XRF chart is enclosed.

Brannerite crystals of the size and quality you submitted are of rare occurrence, and would be highly desirable accessions for our mineral collection and for exchange. Would you please collect what you can for us? Also, from your knowledge of the occurrence do the crystals occur in sufficient abundance and quality that we should consider making a trip to the property to collect a quantity for the National Mineral Collection, if permission to collect were to be granted by the propery owners?

Best regards,

Yours sincerely,

Hal

H. R. Steacy

HRS/jc

Attachment

Geological Survey of Canada
601 Booth Street
Ottawa Canada
K1A 0E8

Commission géologique du Canada
601, rue Booth
Ottawa Canada
K1A 0E8

Specimen Description

Specimen A - Brannerite in weakly fractured light coloured Unit 3 metavolcanics from the Main Showing at the north end of Quartet Mountain on the Wernecke claims. A K-Ar date of 1.03 billion years was obtained from a specimen of Unit 3 in the same area but slightly higher (100' ±) in the section.

* Specimen B - Brannerite crystal in weakly quartz veined Unit 5 argillite from the locality now staked as the Gnuckles claims.

Specimen C - Brannerite crystal from the east striking vein on the Otis claims.

Specimen D - Brannerite crystal from the north striking vein on the Otis claims.

Specimen E - Small pocket of pitchblende from a barite vein cutting hematite on the Igor claims.

Specimen F - Pitchblende in carbonate-Unit 3 breccia from headwall of Pterd cirque. The original specimen assayed 7.67% U_3O_8 and is described on page 52 of the 1975 WJV report.

DONALD F. SCHUTZ, President

TELEDYNE ISOTOPES
50 VAN BUREN AVENUE
WESTWOOD, NEW JERSEY 07675
(201) 664-7070 TELEX: 13-4474

28 July 1976

Mr. A. R. Archer
Archer, Cathro and Assoc. Ltd.
1016 Standard Building
510 West Hastings Street
Vancouver, B.C. V6B 1LB

Dear Mr. Archer: Re: W. O. 3-4589-142

We have analyzed the six uranium bearing minerals submitted to us for U/Pb age determinations with the following results:

			Isotopic Abundance (Atom %)				Isotopic Ratios		
Sample	% U	% Pb	Pb^{204}	Pb^{206}	Pb^{207}	Pb^{208}	$\frac{Pb^{206}}{U^{238}}$	$\frac{Pb^{207}}{U^{235}}$	$\frac{Pb^{207}}{Pb^{206}}$
A	34.69	1.286	.012	90.634	5.764	3.590	.03930	.3374	.0636
B	34.84	0.442	.020	88.495	5.619	5.866	.01317	.1112	.0635
C	22.24	0.438	.010	87.899	5.286	6.805	.02022	.1645	.0601
D	25.97	0.641	.052	88.388	6.132	5.428	.02593	.2275	.0694
E	4.986	0.886	.0090	91.937	7.469	.585	.1908	2.113	.0812
F	14.86	0.675	.035	92.590	5.840	1.535	.04965	.4068	.0631

The ages of the minerals were calculated as follows:

Sample	Pb^{208}/U^{238}(m.y.)	Pb^{207}/U^{235}(m.y.)	Pb^{207}/Pb^{206}
A	249	295	745
B	84	107	742
C	129	155	623
D	165	208	929
E	1126	1153	1249
F	312	346	728

The pattern of these ages is in all cases typical of that which develops when lead is lost or uranium is gained in the system. Detailed interpretation of discordant ages is beyond the scope of our routine analytical services inasmuch as a knowledge of the geological relationships of the minerals is required. I have, however, enclosed a discussion of discordant ages from Lead Isotopes in Geology (Russell-Farquhar, 1960) to provide you with some basic information on interpretation of the data.

If I can be of help to you in pursuing further study of the data presented, please let me know.

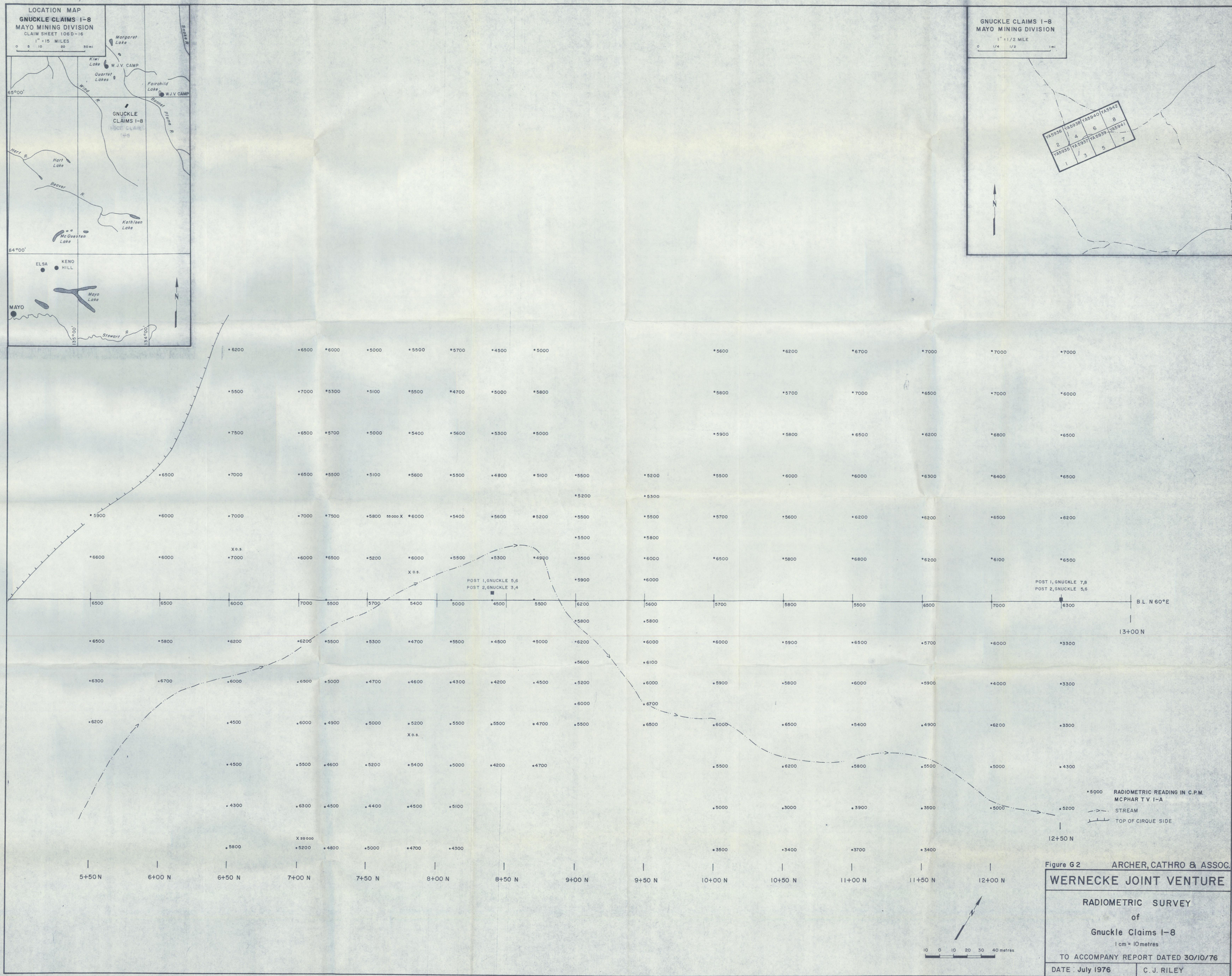
Yours truly,

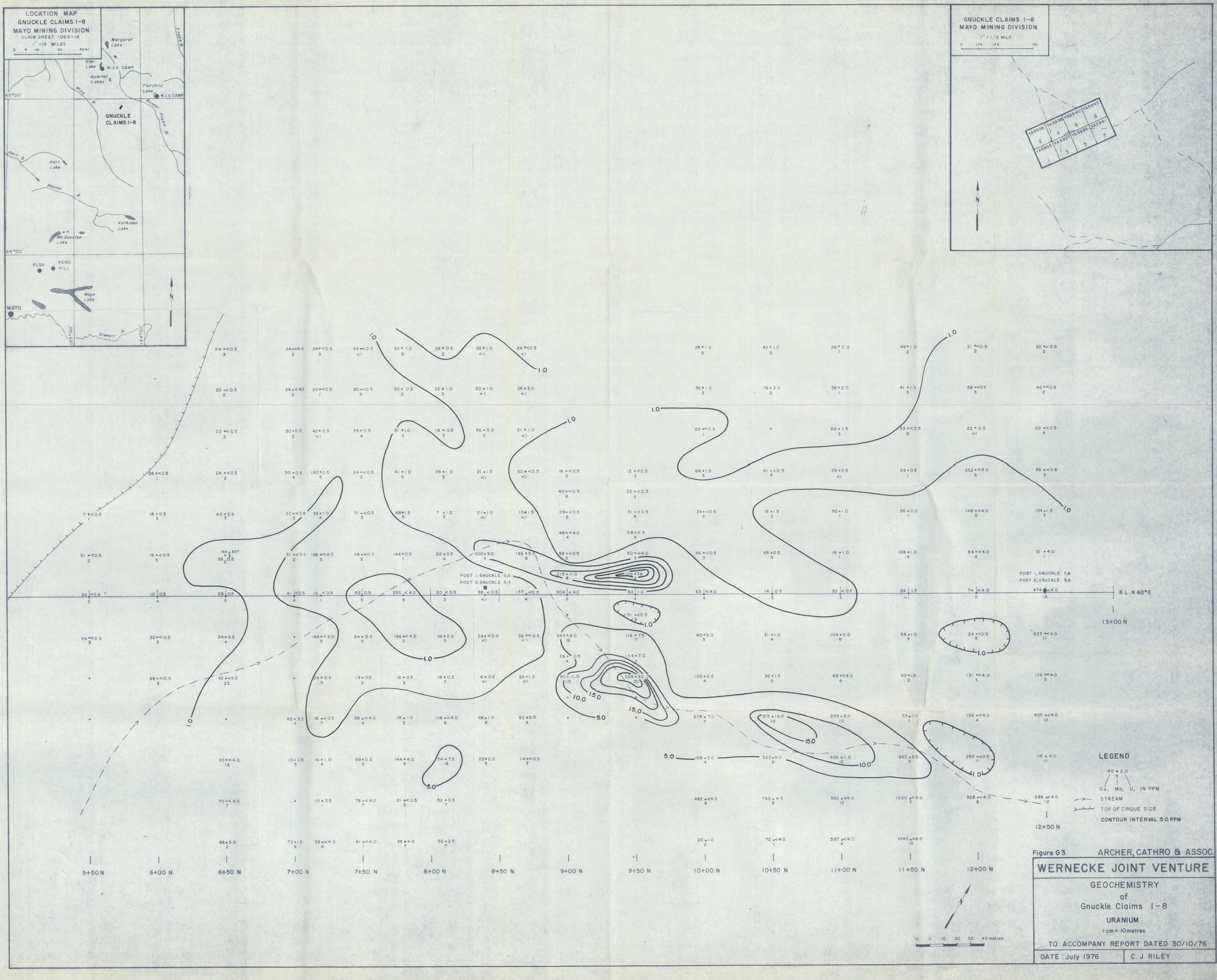
Donald F. Schutz

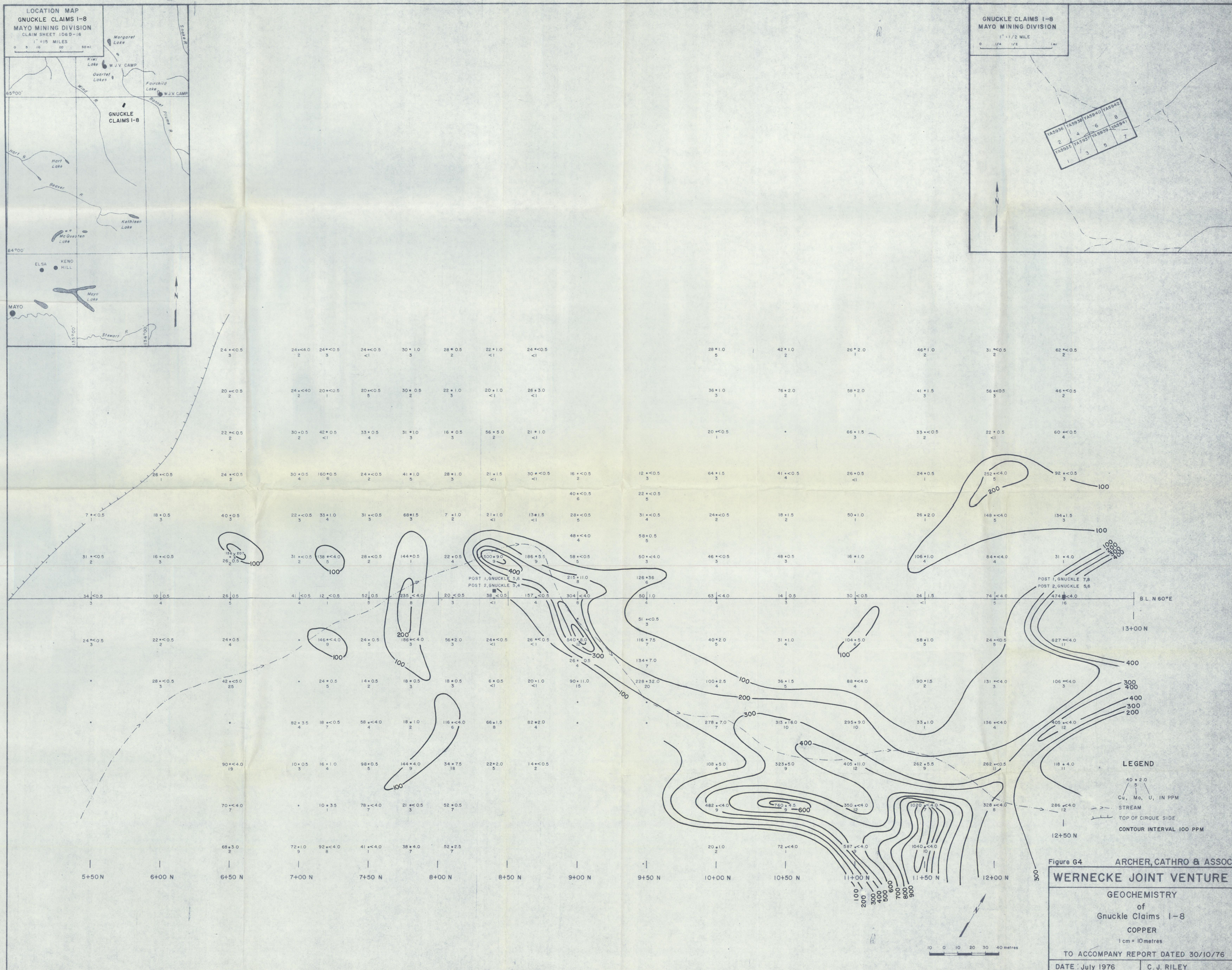
Donald F. Schutz
President

DFS:mm
enclosure: Pages 104-107, Lead Isotopes in Geology,
Russell-Farquhar, 1960


GNUCKLE CLAIMS 1-8
MAYO MINING DIVISION
1" = 1/2 MILE
0 1/4 1/2 1 mi
YA5936 YA5938 YA5940 YA5942
YA5935 YA5937 YA5939 YA5941
1 2 3 4 5 6 7 8
N
LOCATION MAP
GNUCKLE CLAIMS 1-8
MAYO MINING DIVISION
CLAIM SHEET 106 D-16
1" = 15 MILES
0 5 10 20 30 mi
Margaret Lake
Kiwi Lake
W.J.V. CAMP
Quartet Lakes
Fairchild Lake
65°00'
GNUCKLE CLAIMS 1-8
Wind R.
Bonnet Plume R.
Hart R.
Hart Lake
Beaver R.
Kathleen Lake
McQuesten Lake
64°00'
ELSA
KENO HILL
Mayo Lake
MAYO
Stewart R.
135°00'
134°00'
Snake R.
TALUS AREA
GRASS AREA
Boulders slatey quartzite
Pyritic slatey quartzite
Slatey quartzite
R 76-84
Chert boulder with brannerite
Pyritic cherty quartzite
Area of large brannerite crystals
Rhyolite
Pyritic rhyolite
POST 1 GNUCKLE 1
POST 1 GNUCKLE 2
POST 1 GNUCKLE 3
POST 1 GNUCKLE 4
POST 1 GNUCKLE 5
POST 1 GNUCKLE 6
POST 1 GNUCKLE 7
POST 1 GNUCKLE 8
POST 2 GNUCKLE 7
POST 2 GNUCKLE 8
R 76-83
Epidotized diorite or dio-gabbro core to intrusive neck. Contains bands of breccia with slatey quartzite fragments.
R 76-82
R 76-86
Highly pyritic rhyolite (25%)
Breccia
Explosive breccia
Dolomite
Highly pyritic slatey quartzite
R 76-85
Rhyolite breccia
Black siliceous argillite
Argillite
Quartzitic argillite black, pyritic
R 76-80
R 76-81
Brown weathering dolomite
LEGEND
1 Argillite, siliceous, black, thin phyllitic cleavage
2 Quartzite, argillaceous, slatey black to grey. Not as fissile as 1.
3 Diorite to dio-gabbro, vent material, assimilating 1 and 2 to form a breccia with fragments to 2 metres.
4 Explosive breccia associated with 3. Clasts of varying materials, may have a rhyolitic phase at edges. Highly pyritic in places.
5 Dolomite, cream, weathers deep orange brown.
Fault
Bedding, strike and dip.
Outcrop
Geologic contact
Talus line
Base line and claim line
Creek
Specimen station
X Radioactive boulders and crystals greater than 30,000. McPhar TV 1-A
Figure G1
ARCHER, CATHRO & ASSOC.
WERNECKE JOINT VENTURE
GEOLOGY of Gnuckle Claims 1-8
1 cm = 20 metres
TO ACCOMPANY REPORT DATED 30/10/76
DATE July, 1976
C.J. RILEY
20 0 20 40 60 80 metres


LOCATION MAP
GNUCKLE CLAIMS 1-8
MAYO MINING DIVISION
CLAIM SHEET 106D-16
1" = 15 MILES
Margaret Lake
Kiwi Lake
W.J.V. CAMP
Quartet Lakes
Fairchild Lake
W.J.V. CAMP
65°00'
Wind R.
Bonnet Plume R.
GNUCKLE CLAIMS 1-8
Hart R.
Hart Lake
Beaver R.
Kathleen Lake
McQuesten Lake
64°00'
ELSA
KENO HILL
Mayo Lake
MAYO
135°00'
Stewart R.
134°00'
N
GNUCKLE CLAIMS 1-8
MAYO MINING DIVISION
1" = 1/2 MILE
YA5936
YA5938
YA5940
YA5942
YA5935
YA5937
YA5939
YA5941
1
2
3
4
5
6
7
8
N
POST 1, GNUCKLE 5,6
POST 2, GNUCKLE 3,4
POST 1, GNUCKLE 7,8
POST 2, GNUCKLE 5,6
B.L. N 60°E
13+00 N
12+50 N
5+50 N
6+00 N
6+50 N
7+00 N
7+50 N
8+00 N
8+50 N
9+00 N
9+50 N
10+00 N
10+50 N
11+00 N
11+50 N
12+00 N
•5000 RADIOMETRIC READING IN C.P.M. MCPHAR T V I-A
STREAM
TOP OF CIRQUE SIDE
10 0 10 20 30 40 metres
Figure G 2
ARCHER, CATHRO & ASSOC.
WERNECKE JOINT VENTURE
RADIOMETRIC SURVEY
of
Gnuckle Claims 1-8
1 cm = 10 metres
TO ACCOMPANY REPORT DATED 30/10/76
DATE : July 1976
C.J. RILEY


LOCATION MAP
GNUCKLE CLAIMS 1-8
MAYO MINING DIVISION
CLAIM SHEET 106 D-16
1" = 15 MILES
GNUCKLE CLAIMS 1-8
W.J.V. CAMP
Margaret Lake
Kiwi Lake
Quartet Lakes
Fairchild Lake
Hart Lake
Beaver R.
Kathleen Lake
McQuesten Lake
ELSA
KENO HILL
Mayo Lake
MAYO
Stewart R.
Wind R.
Bonnet Plume R.
Hart R.
Snake R.
65°00'
64°00'
135°00'
134°00'
GNUCKLE CLAIMS 1-8
MAYO MINING DIVISION
1" = 1/2 MILE
YA5936
YA5938
YA5940
YA5942
YA5935
YA5937
YA5939
YA5941
POST 1, GNUCKLE 5,6
POST 2, GNUCKLE 3,4
POST 1, GNUCKLE 7,8
POST 2, GNUCKLE 5,6
B.L. N 60°E
13+00 N
12+50 N
5+50 N
6+00 N
6+50 N
7+00 N
7+50 N
8+00 N
8+50 N
9+00 N
9+50 N
10+00 N
10+50 N
11+00 N
11+50 N
12+00 N
LEGEND
40 • 2.0
5
Cu, Mo, U, IN PPM
STREAM
TOP OF CIRQUE SIDE
CONTOUR INTERVAL 5.0 PPM
Figure G3
ARCHER, CATHRO & ASSOC.
WERNECKE JOINT VENTURE
GEOCHEMISTRY
of
Gnuckle Claims 1-8
URANIUM
1 cm = 10 metres
10 0 10 20 30 40 metres
TO ACCOMPANY REPORT DATED 30/10/76
DATE: July 1976
C.J. RILEY


LOCATION MAP
GNUCKLE CLAIMS 1-8
MAYO MINING DIVISION
CLAIM SHEET 106D-16
1" = 15 MILES
Margaret Lake
Kiwi Lake
W.J.V. CAMP
Quartet Lakes
Fairchild Lake
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Wind R.
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1" = 1/2 MILE
YA5936
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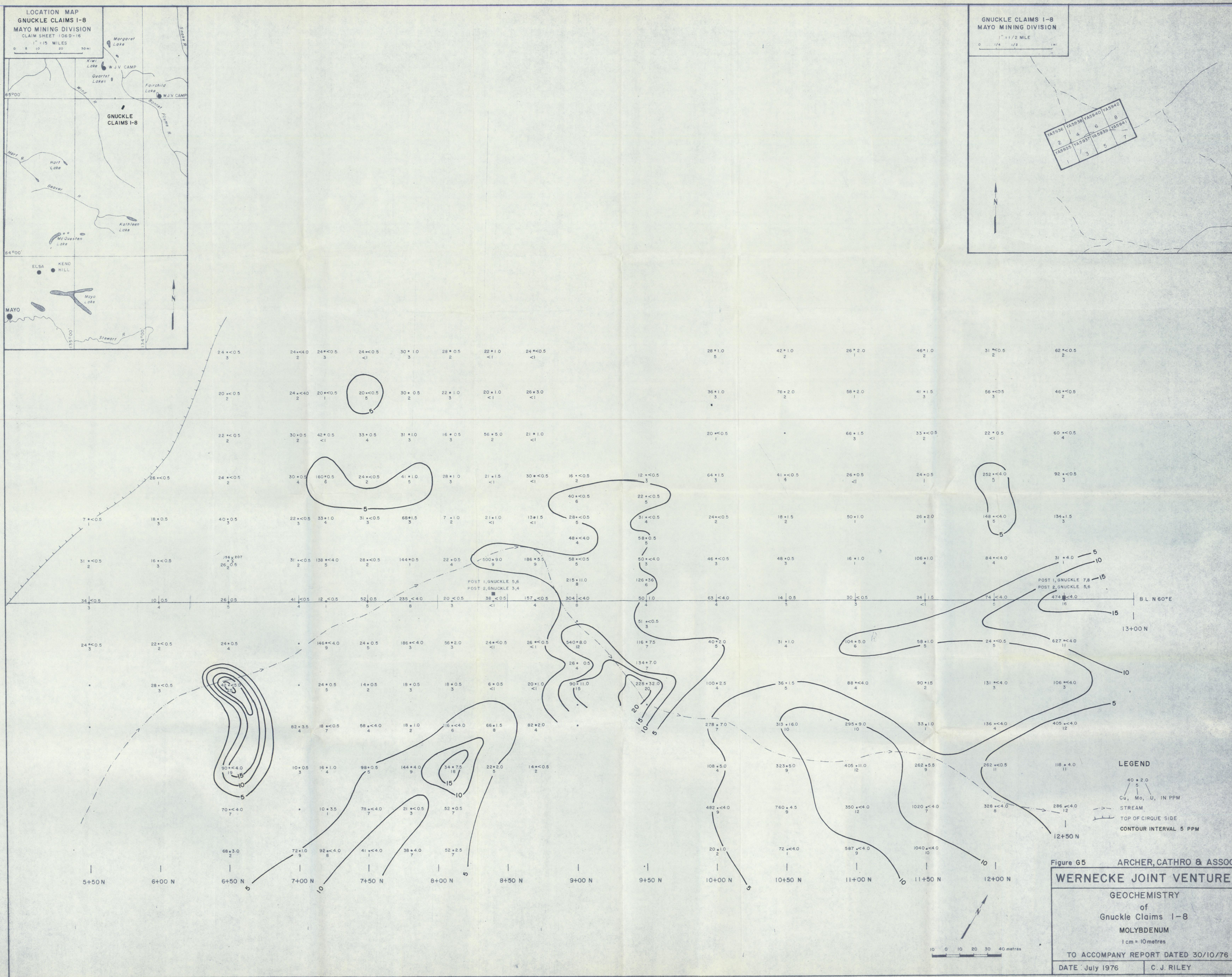
YA5937
YA5939
YA5941
POST 1, GNUCKLE 5,6
POST 2, GNUCKLE 3,4
POST 1, GNUCKLE 7,8
POST 2, GNUCKLE 5,6
B.L. N 60° E
13+00 N
12+50 N
5+50 N
6+00 N
6+50 N
7+00 N
7+50 N
8+00 N
8+50 N
9+00 N
9+50 N
10+00 N
10+50 N
11+00 N
11+50 N
12+00 N
LEGEND
40 • 2.0
5
Cu, Mo, U, IN PPM
STREAM
TOP OF CIRQUE SIDE
CONTOUR INTERVAL 100 PPM
Figure G4
ARCHER, CATHRO & ASSOC.
WERNECKE JOINT VENTURE
GEOCHEMISTRY
of
Gnuckle Claims 1-8
COPPER
1 cm = 10 metres
TO ACCOMPANY REPORT DATED 30/10/76
DATE: July 1976
C.J. RILEY



LOCATION MAP
GNUCKLE CLAIMS 1-8
MAYO MINING DIVISION
CLAIM SHEET 106 D-16
1" = 15 MILES
Margaret Lake
Kiwi Lake
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Quartet Lakes
Fairchild Lake
W.J.V. CAMP
Wind R.
Bonnet Plume R.
Snake R.
GNUCKLE CLAIMS 1-8
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Hart Lake
Beaver R.
Kathleen Lake
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65°00'
64°00'
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KENO HILL
Mayo Lake
MAYO
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135°00'
134°00'
N
GNUCKLE CLAIMS 1-8
MAYO MINING DIVISION
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YA5936
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YA5937
YA5939
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6+00 N
6+50 N
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7+50 N
8+00 N
8+50 N
9+00 N
9+50 N
10+00 N
10+50 N
11+00 N
11+50 N
12+00 N
LEGEND
40 • 2.0
5
Cu, Mo, U, IN PPM
STREAM
TOP OF CIRQUE SIDE
CONTOUR INTERVAL 5 PPM
Figure G5
ARCHER, CATHRO & ASSOC.
WERNECKE JOINT VENTURE
GEOCHEMISTRY
of
Gnuckle Claims 1-8
MOLYBDENUM
1 cm = 10 metres
10 0 10 20 30 40 metres
TO ACCOMPANY REPORT DATED 30/10/76
DATE July 1976
C. J. RILEY