DIAMOND DRILL REPORT

Ting 1-50, 85-86, 91-94, 95F-101F; Prospecting 77-84; Noting 51-76 Claims

Office of the Supervising Mining Recorder
FEB 14 1980
WHITEHORSE
Yukon Territory

CLAIM SHEET 116 B/7

Latitude 64°23'N; Longitude 138°38'W

RECEIVED
MINING RECORDER
LAND AGENT
DAWSON, Y.T.
LA. & N.D.

Work done June 3, 1979 to September 20, 1979

090561

A.R. Archer, B.A.Sc., P.Eng.

January 15, 1980

ARCHER, CATHRO
AND ASSOCIATES LTD.
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1016 STANDARD BUILDING
510 WEST HASTINGS STREET
VANCOUVER, B. C.
V6B 1L8

DIAMOND DRILL REPORT

Ting 1-50, 85-96, Noting 51-76, Prospecting 77-84, Ting 91-94, Ting 95F-101F Claims

CLAIM SHEET 116 B/7

WORK CONDUCTED FROM

July 3, 1979 to September 20, 1979

Latitude 64°23' north; Longitude 138°38' west

A.R. Archer

Consulting Engineer

090561

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INTRODUCTION

The Tombstone property was staked in 1976 following discovery of radiometric anomalies during an airborne survey. From 1976 to 1978 ground exploration outlined 24 radiometrically anomalous zones and subsequent trenching and sampling indicated that uranium is responsible for most of the radioactivity.

During 1979, 16 holes were drilled for a total of 1774 m (5821 feet) to explore beneath the best zones of surface mineralization. In addition, limited surface mapping and radiometric surveys were continued on the central portion of the claim block, and the eastern end of the property was prospected. Some of the geochemical samples collected during the 1976 regional exploration program were reanalyzed for Cu and Mo in 1979 and the results are discussed in this report.

Drilling was conducted during the period July 3, 1979 to September 20, 1979. Supervision was provided by geologist W. Eaton under the direction of the writer.

PROPERTY, LOCATION AND ACCESS

The Tombstone property is an elongated block of 95 full and fractional claims lying in an arc along the southern margin of the Tombstone Stock. The claims are recorded in the Dawson Mining District as follows:

Claim Name	Grant Numbers	Expiry Date
Ting 1-10	YA5027-YA5036	12 Feb. 1985
Ting 11-20	YA3037-YA5046	12 Feb. 1984
Ting 21-40	YA5047-YA5066	12 Feb. 1985
Ting 41-48	*YA5163-YA5156	12 Feb. 1985
Ting 49-50	YA5140-YA5141	12 Feb. 1985
Noting 51-55	YA5174-YA5178	12 Feb. 1985
Noting 56-59	YA5182-YA5185	12 Feb. 1985
Noting 60	YA5179	12 Feb. 1985
Noting 61-64	YA5190-YA5193	12 Feb. 1985
Noting 65-68	YA5186-YA5189	12 Feb. 1985
Noting 69-70	YA5180-YA5181	12 Feb. 1985
Noting 71-76	YA9509-YA9514	12 Feb. 1985
Prospecting 77-84	YA9525-YA9532	12 Feb. 1985
Ting 91-94	YA10385-YA10388	12 Feb. 1985
Ting 95F-96F	YA10389-YA10390	12 Feb. 1985
Ting 97F-101F	YA31741-YA31745	12 Feb. 1984

* Note reverse order

The claims are centered at latitude 64°23'N and longitude 138°38'W within NTS sheet 116B/7, 51 km northeast of Dawson. The nearest roadpoint is Km 51 on the Dempster Highway, 13.5 km to the east. Access in 1979 was provided by either a contracted Bell 47 G3/B2 based at the drill camp or a Bell 206B (Jet Ranger) based in Dawson, both supplied by Trans North Turbo Air Ltd.

The claims are held in the name of Archer, Cathro and Associates Ltd. on behalf of Ukon Joint Venture (Chevron Canada Ltd. and Kerr Addison Ltd.).

GEOLOGICAL SETTING

The Tombstone Stock forms the core of the Tombstone Range, which is characterized by numerous blind valleys heading in steep cirque walls separated by knife-edge, almost vertical, ridges reaching elevations of up to 2100 m. Valleys are wide and well mantled with debris from extinct alpine glaciation while their sides are obscured by talus slopes heading on steep walled rock faces. Local relief ranges from 1000 to 1600 m. Mappable outcrop makes up only a small portion of the total. The claims lie above timberline and vegetation consists only of grasses and scattered stunted buckbrush.

The Tombstone Stock consists of a sub-circular, 11 km wide, middle Cretaceous syenite intrusion cutting lower Cretaceous quartzite with limy and argillaceous sections. Contact metamorphism has produced a hornfels halo up to 1000 m from the contact and has selectively bleached the quartzites. There was little faulting associated with emplacement of the stock or post-intrusion.

Mapping on the property has subdivided the syenite into four phases: tinguaite, a variation of nepheline syenite related to phonolite; fine to medium grained, pyritiferous, leucocratic syenite; spire forming, porphyritic syenite; and crumbly weathering, equigranular syenite grading to quartz monzonite. The regional and property geology, with brief descriptions of the geologic units, are illustrated on Figures U-TG9 and 10 in the pocket.

The tinguaites are the earliest of the syenite phases and appear to offer the greatest potential for uranium mineralization. For logging purposes, they have been divided into five sub units as follows:

Pseudoleucite tinguaite contains 5 to 30%, 3 to 20 mm, white, subhedral to euhedral pseudoleucite phenocrysts and 1 to 5%, 1 to 10 mm, white, euhedral orthoclase phenocrysts in a medium gray, aphanitic groundmass.

Sheared tinguaite is moderately to strongly foliated and/or autobrecciated tinguaite commonly exhibiting biotite alteration. The pseudoleucite phenocrysts are usually flattened and the orthoclase phenocrysts often broken.

Mixed tinguaite consists of lenses or bands of pseudoleucite tinguaite in a sheared tinguaite groundmass.

Fine grained tinguaite forms dykes and has a medium to dark grey aphanitic groundmass with minor 1 to 3 mm orthoclase phenocrysts but no pseudoleucite phenocrysts.

Intermediate tinguaite often occurs in dykes and is similar to pseudoleucite tinguaite except that the pseudoleucite phenocrysts are smaller and less abundant.

Most tinguaite is composed of the pseudoleucite and mixed phases. The sheared variety is best developed in a 200 m wide band adjacent to the northern syenite-tinguaite contact. Its foliation strikes subparallel to the contact and dips steeply. Several syenite dykes have intruded the tinguaite parallel to the foliation. The fine grained and intermediate tinguaite phases are best exposed in Ting Cirque.

Contacts between tinguaite phases are usually gradational although the pseudoleucite and fine grained varieties exhibit sharp boundaries. Biotite alteration of tinguaite appears to be primary metasomatism related to autobrecciation (brecciation of an igneous rock occurring during the intrusion event) while chlorite alteration is an overprint caused by hydrothermal fluids derived from later intrusive phases. Chloritic alteration is most intense adjacent to syenite dykes and in shear zones.

MINERALIZATION

The 1978 Final Report described five environments which host uranium concentrations, as follows: (1) in dyke-like aphanitic zones; (2) in shear zones; (3) irregular concentrations in the tinguaite; (4) along contacts; and, (5) in xenoliths. In 1979 syenite dykes intruding the tinguate were recognized as a sixth mode of occurrence.

The best surface assay obtained to date is 1.06% U_3O_8 over one metre from a trench on the T1 zone in Ting Cirque. Based on only twelve samples, Olade and Goodfellow of the Geological Survey of Canada reported that the average uranium content of the tinguaite is 76 ppm. The uranium usually occurs as disseminated uraninite and is closely associated with biotite. In a few areas, uraninite, sooty pitchblende and yellow uranium secondaries are found on fractures. Fluorescent uranium oxides are rare. Uranium to thorium ratios are usually greater than 1:1 in the tinguaite and there are no associated rare earth elements or niobium even in geochemically anomalous quantities. Minor pyrrhotite is the only sulphide seen on the surface.

DIAMOND DRILLING

General

The UJV drilling was contracted from E. Caron Diamond Drilling Ltd., Whitehorse, Yukon using a BBS-1 model drill powered by a 4 cylinder Lycoming diesel engine and equipped with hydraulic head and wireline attachments. All holes were drilled using BQ rods and water circulation. No sludges were collected because core recovery exceeded 95 percent.

Drilling proved to be relatively trouble free. Permafrost was present in some of the holes but did not require the addition of calcium chloride to the water except during radiometric probing. The core was logged in British rather than metric units to conform with the lengths of drill rod used. Field drill logs with assays, radiometric logs and sections are enclosed in the pocket and the location of the drill collars is shown on Figure U-TG10 in the pocket. The drill core is stored at the H.S. Bostock core library in Whitehorse, except Holes TH3 and TH4, which are stored by Chevron in the Marine Building, Vancouver.

Assays and Radiometric Logging

All core was split and geochemically analyzed at Chemex Labs Ltd., North Vancouver, B.C. for extractable uranium using a weak nitric-perchloric extraction. All samples from holes TH1, TH3 and TH10 and portions of TH8 were also analyzed for Th, Cu, Mo, Sn, W, Ag and Au geochemically and for total uranium and radium using neutron activation. Portions of holes TH5 and TH16 were geochemically analyzed for Mo and the bottom of Hole TH6 was analyzed for Ag. Selected sections of Holes TH1, TH3, TH8 and TH10 were spectrographically analyzed for common metals, 16 rare earth metals and niobium. Three composite samples consisting of core sample rejects from intervals in Holes TH3 and TH10 with (a) high uranium content, (b) average uranium content, and (c) high sulphide content respectively, have been sent to Lakefield Research, Lakefield, Ontario for preliminary uranium extractability studies. The results of these tests are expected in January, 1980.

Each hole was radiometrically logged using a Model 1000-C Portable Borehole Logger, manufactured by Mount Sopris Instrument Company, Delta, Colorado, on loan from Chevron Canada Ltd. The Mount Sopris logger is equipped with a 4.82 cc thallium-activated, sodium iodide crystal housed in a 3.18 cm diameter

probe 1.1 m long that is attached to a 304 m cable. It records total-count gamma radiation in counts-per-second (CPS) on metric chart paper moving at a speed of 1 cm per metre of hole probe. Available scales range from 0 to 50 cps up to 0 to 50,000 cps. Most UJV logs were run at a 1000 cps chart width. The holes were probed at a speed of approximately 2 m per minute, about twice the recommended speed, because of the permafrost hazard. Radiometric charts are attached to the right hand margin of the drill logs, which have been given a scale that converts the metric chart directly to hole footage.

DRILL RESULTS

Of the 16 holes, 12 were drilled near the valley floor on the west side of Spotted Fawn cirque where a number of high grade uranium zones were sampled in 1978. This drilling was designed to give structural data, test vertical continuity of surface mineralization, and determine the bulk tonnage potential of the area. Although the azimuths of these holes vary slightly to optimize data collection, most fall on a rough section line across the area of interest. Two holes (TH1 and TH2) were collared in Ting cirque on 1976 Zone T1, in an orientation that covered all possibilities for exploration of downdip extension of the surface showing. The remaining two holes (TH5 and TH13), explored the margins of the tinguaite body. TH5 cut the quartzite-tinguaite contact in Ting cirque while TH13 tested the syenite-tinguaite contact near the head of Spotted Fawn cirque. Drill locations are illustrated on Figure U-TG10 in the pocket and a summary of results is presented in tabular form on the following page. In summary, eleven of the sixteen drill holes contained at least one intersection exceeding 0.160 lb U_3O_8 over a width of 6 or more feet.

In Ting cirque, Holes TH1 and TH2 failed to locate a downdip extension of Zone T1, as illustrated in Figure U-TG15 in the pocket. Hole TH5 produced two

TOMBSTONE DRILLING SUMMARY

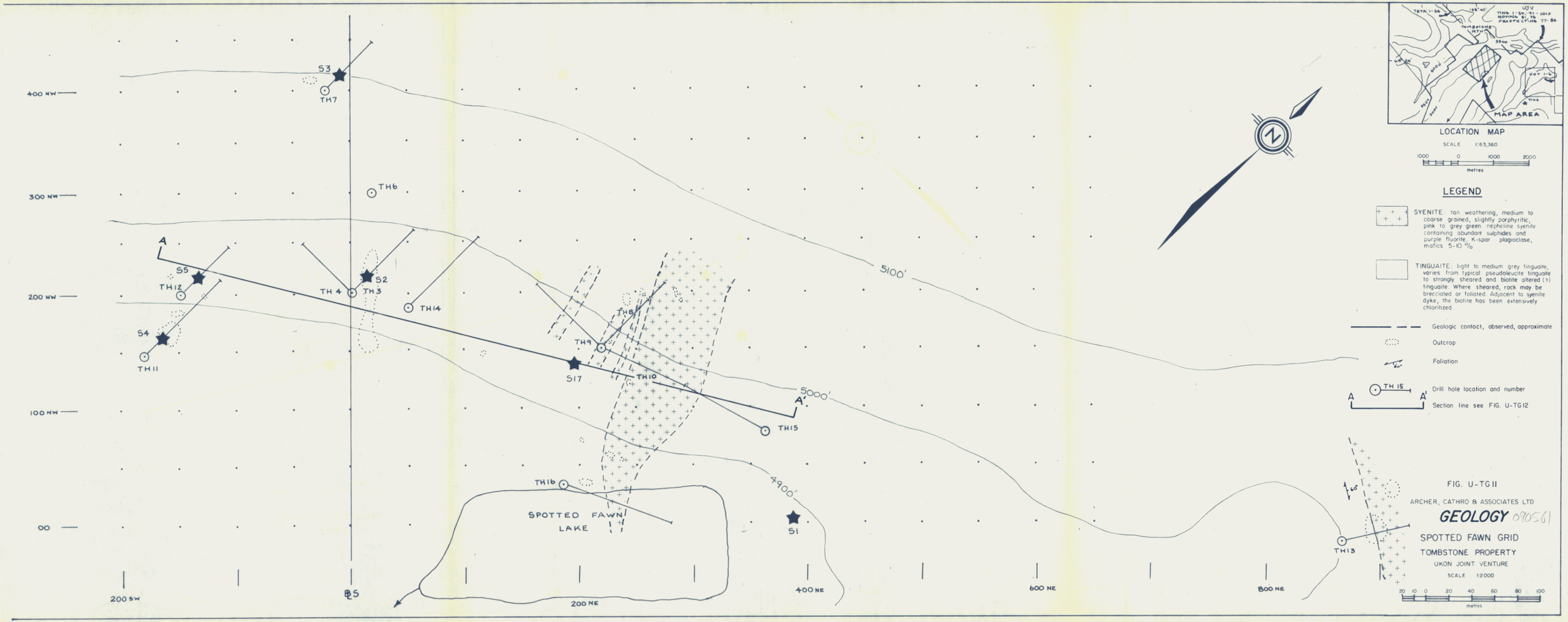
HOLE NUMBER	TARGET	LOCATION	COLLAR ELEVATION (ft)	DEPTH (ft)	DIP	AZIMUTH	ROCK TYPES	AVERAGE LBS U_3O_8	HIGHEST ASSAY IN LBS. U_3O_8	OTHER METALS	BEST URANIUM INTERSECTIONS	COMMENTS
TH 1	Zone T1	Ting cirque	5400	172	-45°	270°	Tinguaite	0.023	0.070/5'	--	--	Failed to intersect a steep dipping extension of Zone T1.
TH 2	Zone T1	Ting cirque	5393	112	-50°	020°	Tinguaite	0.030	0.053/5'	--	--	Failed to intersect a shallow to moderate dipping extension of Zone T1.
TH 3	Zone S2	B S 200 NW	4929	388	-50°	000°	99% Tinguaite 1% Syenite	0.180	1.463/2'	Mo	0.238 lb U_3O_8/250'	The highest uranium values occurred in rocks with above average biotite and pyrrhotite contents. A 32' section averaging 0.327 lb Mo was also associated with the best uranium; no Mo minerals were observed. Assay data illustrated on Fig. U-TG 17.
TH 4	Zone S2	B S 200 NW	4929	308	-50°	090°	99.5% Tinguaite 0.5% Syenite	0.083	0.294/5'	--	0.161 lb U_3O_8/45'	The best uranium section was in biotite altered pseudo-leucite tinguaite.
TH 5	Tinguaite quartzite contact	Ting cirque	5000	202	-50°	330°	33% Tinguaite 67% Quartzite	0.046	0.216/5'	--	0.191 lb U_3O_8/15' 0.165 lb U_3O_8/15'	A strong breccia, dominantly composed of quartzite fragments, and lying between the tinguaite and quartzite was unmineralized. The best uranium intersection occurred in the tinguaite adjacent to the contact.
TH 6	Extension Zone S2	17 NE 300 NW	5034	727	-90°	--	95% Tinguaite 5% Syenite	0.080	0.900/4'	Ag	0.900 lb U_3O_8/4' 0.228 lb U_3O_8/45' 0.179 lb U_3O_8/15' 0.173 lb U_3O_8/10'	The hole was drilled subparallel to the intrusive fabric. The syenite at the bottom of the hole averaged 0.1 oz Ag over 37'.
TH 7	Zone S3	20 SW 400 NW	5090	297	-50°	000°	97% Tinguaite 3% Syenite	0.037	0.227/5'	--	--	Failed to intersect subsurface extension of Zone S3.
TH 8	Zone S17	220 NE 150 NW	4985	397	-50°	000°	71% Tinguaite 29% Syenite	0.064	1.06/0.5'	Cu, Ag?	0.200 lb U_3O_8/28'	The best uranium intersection occurred in a syenite dyke near the top of the hole. Most of the hole was in tinguaite which appeared to be leached of its uranium.
TH 9	Zone S17	220 NE 150 NW	4985	387	-50°	270°	74% Tinguaite 26% Syenite	0.075	1.71/1'	Cu, Ag?	0.161 lb U_3O_8/65'	The best uranium intersection occurred in a syenite dyke and adjacent sheared tinguaite.
TH 10	Zone S17	220 NE 150 NW	4985	396	-50°	070°	10% Tinguaite 90% Syenite	0.113	1.68/0.5'	Cu, Ag	0.219 lb U_3O_8/85' 0.395 lb U_3O_8/5.5'	The best uranium values were on the margin of the syenite dyke. A portion of the dyke averaged 0.222% Cu and 0.273 oz Ag over 290'. Arsenopyrite, pyrrhotite, pyrite and sphalerite were also present. Assay data illustrated on Fig.U-Tg 25.
TH 11	Zone S4	180 SW 145 NW	4850	492	-53°	000°	Tinguaite	0.052	0.236/5'	--	0.186 lb U_3O_8/15'	The best uranium section occurred directly below Zone S4.
TH 12	Zone S5	150 SW 200 NW	4912	302	-50°	000°	Tinguaite	0.048	0.078/5'	--	--	No evidence of the surface high grade Zone S5 was seen in the hole.
TH 13	Tinguaite syenite contact	Head of Spotted Fawn cirque	5000	312	-50°	030°	40% Tinguaite 60% Syenite	0.059	0.750/1'	--	0.194 lb U_3O_8/15'	The best uranium sections occurred in sheared tinguaite and at the contact between sheared tinguaite and syenite.
TH 14	Extension Zone S2	50 NE 140 NW	4935	432	-50°	000°	Tinguaite	0.045	0.255/5'	--	0.170 lb U_3O_8/10' 0.196 lb U_3O_8/15'	These uranium intersections probably represent extensions of surface Zone S2 and subsurface intersections in Hole TH3.
TH 15	Zone S17	362 NE 70 NW	4955	392	-50°	250°	87% Tinguaite 13% Syenite	0.052	1.532/1'	Cu, Ag?	0.352 lb U_3O_8/6' 0.756 lb U_3O_8/6'	There is a pronounced leached halo adjacent to the syenite roughly corresponding to chlorite alteration. The best uranium sections were in a pegmatitic syenite dyke lying between the main syenite and the tinguaite and in a tinguaite shear zone.
TH 16	Extension Zone S17	185 NE 35 NW	4853	307	-50°	070°	84% Tinguaite 16% Syenite	0.026	0.018/5'	Mo	0.148 lb U_3O_8/10'	Most of the hole is situated in a zone of strongly leached tinguaite adjacent to the syenite.

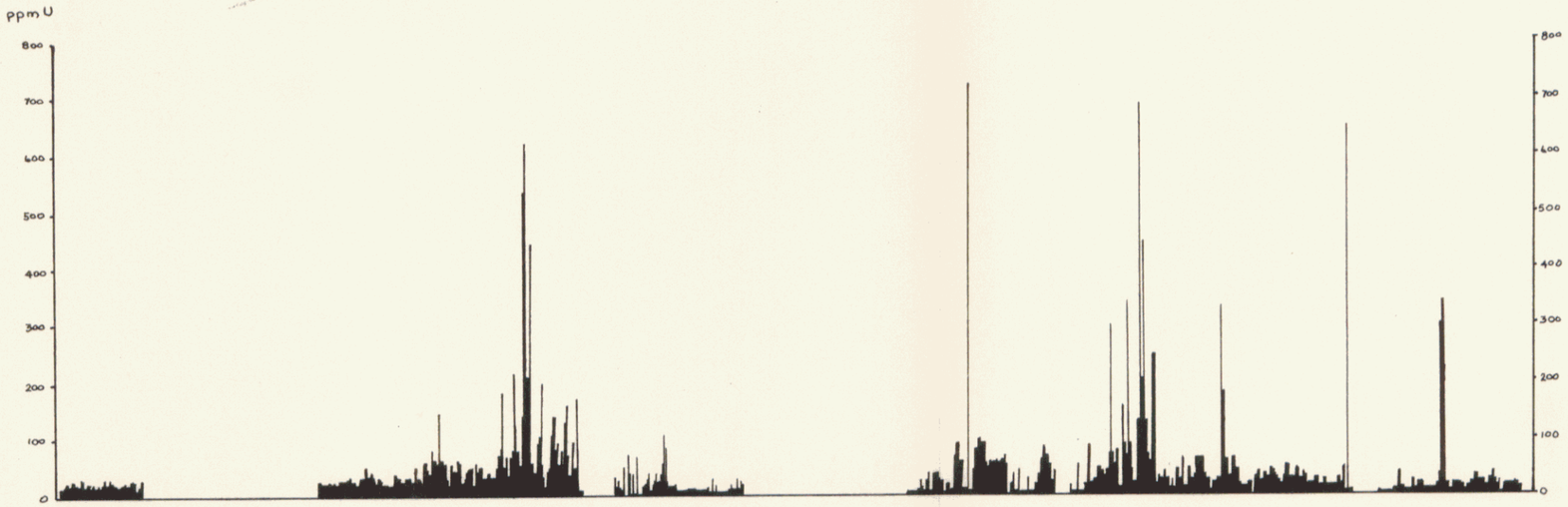
15 foot intervals in tinguaite adjacent to the syenite contact which averaged 0.191 and 0.165 lb. U_3O_8 respectively.

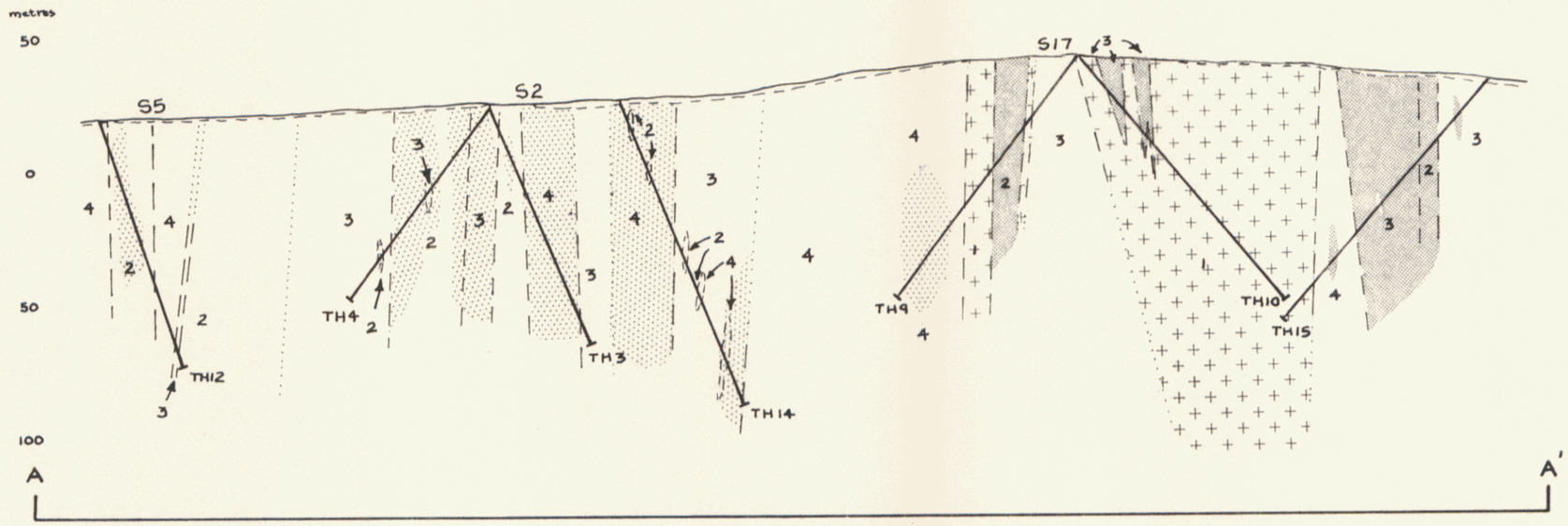
The drilling in Spotted Fawn cirque yielded 619.5 feet (11.6% of the total footage) with an average of 0.233 lb. U_3O_8 in individual zones ranging from 5.5 to 250 feet wide. The average grade of all core from Spotted Fawn cirque is 0.071 lb. U_3O_8. Figures U-TG11 and 12 on the following page illustrates surface geology, collar locations and the results of the Spotted Fawn drilling in section. No uranium mineral has been specifically identified in the core.

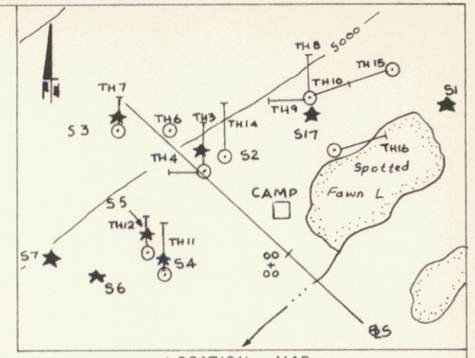
Drilling has shown that the sulphide mineralization is much more abundant than surface observation has indicated. Pyrrhotite is the most common sulphide in the tinguaite, often forming between 1/4% and 1% of the rock. Adjacent to and within the large syenite dyke northwest of Spotted Fawn Lake the rock appears to have been leached of much of its uranium, and sulphide mineralization is unusually abundant (up to 50% of the core), particularly along fractures. Minerals, in order of abundance, are pyrrhotite, pyrite, chalcopyrite, arsenopyrite and sphalerite, usually occurring with a quartz, calcite, ankerite(?) and purple fluorite gangue. A 290 foot intersection in Hole TH10 averaged 0.222% Cu and 0.273 oz Ag. As the silver assays closely follow the copper, another copper mineral, possibly tetrahedrite or bornite, may be present. Molybdenite is present in trace to minor amounts along fractures in both the tinguaite and the syenite. The best molybdenum intersection was 0.0164% Mo over 32 feet from a uraniferous section in Hole TH3.

Tin and tungsten analyses returned isolated anomalous values up to 420 ppm Sn and 85 ppm W but rarely exceeded background. Gold, niobium and rare earth elements were detected in background amounts only. Tables U-TG17 and U-TG25 in the pocket illustrate the complete assay results for Holes TH3 and TH10.


400 NW
300 NW
200 NW
100 NW
00
200 SW
0
200 NE
400 NE
600 NE
800 NE
TH7
TH6
TH12
TH4
TH3
TH14
TH11
TH8
TH9
TH10
TH15
TH16
TH13
S1
S2
S3
S4
S5
S17
A
A'
5100'
5000'
4900'
SPOTTED FAWN LAKE
MAP AREA
LOCATION MAP
SCALE 1:63,360
1000 0 1000 2000
metres
LEGEND
SYENITE: tan weathering, medium to coarse grained, slightly porphyritic, pink to grey green nepheline syenite containing abundant sulphides and purple fluorite, K-spar plagioclase, mafics 5-10 %
TINGUAITE: light to medium grey tinguaite, varies from typical pseudoleucite tinguaite to strongly sheared and biotite altered (?) tinguaite. Where sheared, rock may be brecciated or foliated. Adjacent to syenite dyke, the biotite has been extensively chloritized
Geologic contact, observed, approximate
Outcrop
Foliation
Drill hole location and number
Section line see FIG. U-TG12
FIG. U-TG11
ARCHER, CATHRO & ASSOCIATES LTD
GEOLOGY 090561
SPOTTED FAWN GRID
TOMBSTONE PROPERTY
UKON JOINT VENTURE
SCALE 1:2000
20 10 0 20 40 60 80 100
metres







LOCATION MAP

SCALE 1:10,000

100 50 0 100 200 300 400 500

metres

1 SYENITE tan weathering, medium to coarse grained nepheline syenite often with abundant sulphides and purple fluorite

2 PSEUDOLEUCITE TINGUAITE 5-30%, 3-20mm pseudoleucite phenocrysts 1-10mm orthoclase phenocrysts in a medium grey, aphanitic groundmass

3 SHEARED TINGUAITE foliated and/or auto-brecciated tinguaite often biotite altered

4 MIXED TINGUAITE lenses or bands of pseudo-leucite phenocrysts in sheared tinguaite groundmass

5 FINE GRAINED TINGUAITE medium to dark grey tinguaite without pseudoleucite phenocrysts, some 1-3 mm orthoclase phenocrysts. Usually as dykes

6 INTERMEDIATE TINGUAITE medium grey tinguaite with pseudoleucite orthoclase phenocrysts. Pseudoleucite phenocrysts smaller than usual

B,b BIOTITE ALTERATION intense, moderate

C,c CHLORITE ALTERATION intense, moderate

——— – – – geologic contact: sharp, gradational

FIG. U-TG12

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SPOTTED FAWN SECTION

TOMBSTONE PROPERTY

UKON JOINT VENTURE

SCALE 1:2000

20 10 0 20 40 60 80 100

metres

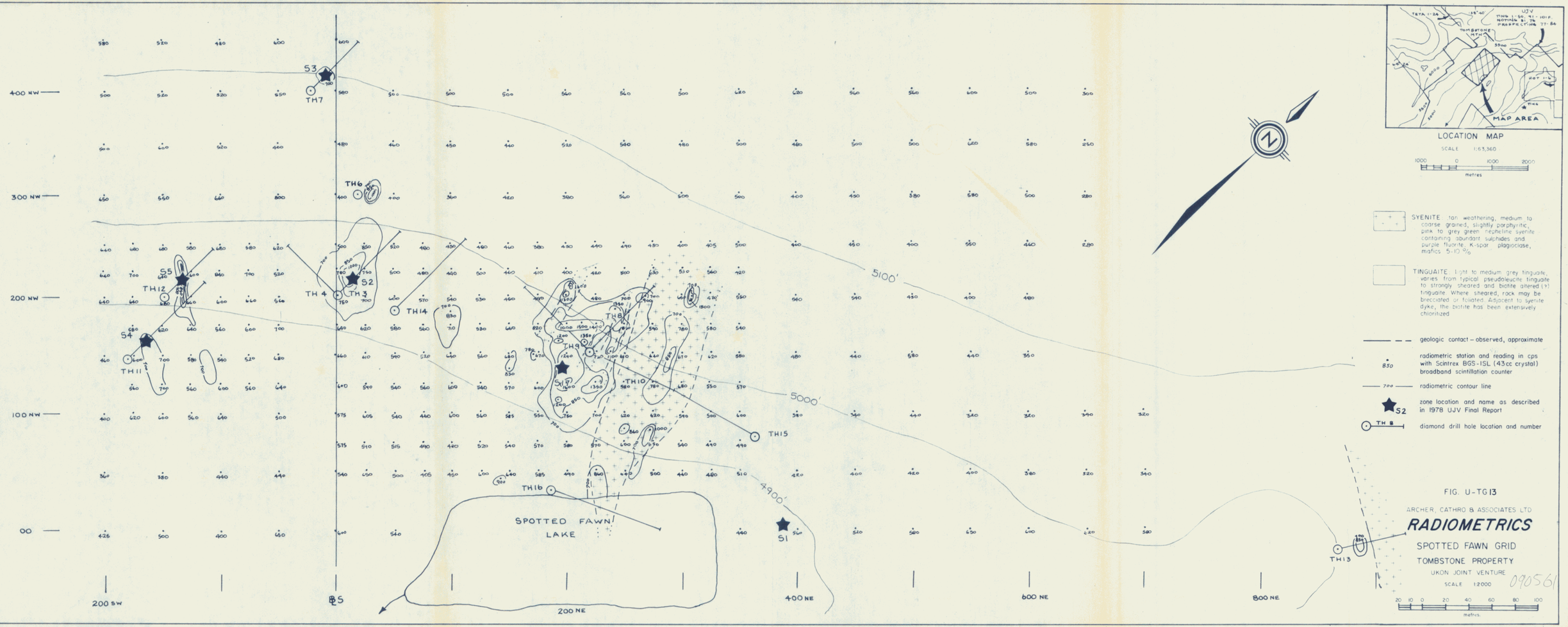
RADIOMETRIC SURVEYS

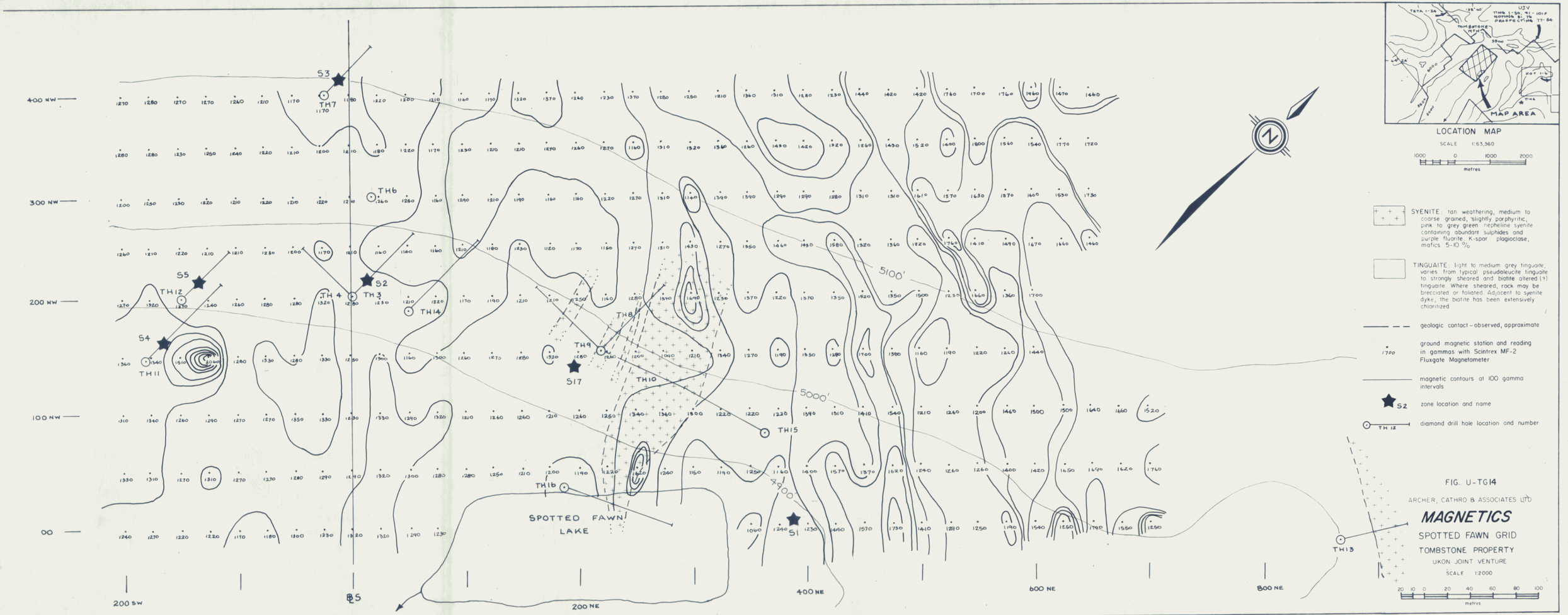
The 1979 radiometric survey was conducted to more accurately define the 1978 radiometric anomalies near the floor of Spotted Fawn cirque in the vicinity of the drilling. The survey used the grid established in 1978 and was conducted on additional lines spaced at 25 m intervals. Readings were taken at waist height with Scintrex BGS-1SL broadband scintillometers at 25 m stations along the lines, with detail filled in at 5 m intervals where necessary. Figure U-TG13, illustrating the results of the radiometric survey, and Figure U-TG14, showing the data from a 1978 magnetic survey of the area, follow this page.

PROSPECTING

A total of eight man days were spent prospecting the eastern end of the claim block. Although several small tinguaite xenoliths were located, no strong radiometric anomalies were found. Talus from a stockwork of syenite dykes intruding quartzites and hornfels exposed on a cliff exhibited up to twice background radioactivity and commonly contained disseminated molybdenite. Most of the mineralized talus is low grade although one specimen of hornfels was visually estimated to contain greater than 1% MoS_2.

One man day was also spent off the property prospecting syenite adjacent to a large roof pendant near the northerly margin of the Tombstone Stock where weakly anomalous radioactivity and grab sample assays up to 0.063% U_3O_8 had been obtained in 1976. Four wide spaced chip samples across 100 m intervals of syenite talus averaged 55 ppm U_3O_8. Figure U-TG9 in the pocket shows the location of the samples.


400 NW
300 NW
200 NW
100 NW
00
200 SW
BL S
200 NE
400 NE
600 NE
800 NE
TH6
TH7
TH4
TH3
TH14
TH12
TH11
TH8
TH9
TH10
TH15
TH16
TH13
S1
S2
S3
S4
S5
5100'
5000'
4900'
SPOTTED FAWN LAKE
N
LOCATION MAP
SCALE 1:63,360
1000 0 1000 2000
metres
MAP AREA
SYENITE tan weathering, medium to coarse grained, slightly porphyritic, pink to grey green nepheline syenite containing abundant sulphides and purple fluorite. K-spar plagioclase, mafics 5-10 %
TINGUAITE Light to medium grey tinguaite, varies from typical pseudoleucite tinguaite to strongly sheared and biotite altered tinguaite. Where sheared, rock may be brecciated or foliated. Adjacent to syenite dyke, the biotite has been extensively chloritized
geologic contact – observed, approximate
radiometric station and reading in cps with Scintrex BGS-ISL (43cc crystal) broadband scintillation counter
radiometric contour line
zone location and name as described in 1978 UJV Final Report
diamond drill hole location and number
FIG. U-TG13
ARCHER, CATHRO & ASSOCIATES LTD
RADIOMETRICS
SPOTTED FAWN GRID
TOMBSTONE PROPERTY
UKON JOINT VENTURE
SCALE 1:2000
20 10 0 20 40 60 80 100
metres
090561


400 NW
300 NW
200 NW
100 NW
00
200 SW
B5
200 NE
400 NE
600 NE
800 NE
S1
S2
S3
S4
S5
S17
TH1
TH2
TH3
TH4
TH5
TH6
TH7
TH8
TH9
TH10
TH11
TH12
TH13
TH14
TH15
TH16
5100'
5000'
4900'
SPOTTED FAWN LAKE
LOCATION MAP
SCALE 1:63,360
1000 0 1000 2000
metres
MAP AREA
SYENITE: tan weathering, medium to coarse grained, slightly porphyritic, pink to grey green nepheline syenite containing abundant sulphides and purple fluorite, K-spar plagioclase, mafics 5-10 %
TINGUAITE: light to medium grey tinguaite, varies from typical pseudoleucite tinguaite to strongly sheared and biotite altered (?) tinguaite. Where sheared, rock may be brecciated or foliated. Adjacent to syenite dyke, the biotite has been extensively chloritized
geologic contact – observed, approximate
1700 ground magnetic station and reading in gammas with Scintrex MF-2 Fluxgate Magnetometer
magnetic contours at 100 gamma intervals
S2 zone location and name
TH 12 diamond drill hole location and number
FIG. U-TG14
ARCHER, CATHRO & ASSOCIATES LTD
MAGNETICS
SPOTTED FAWN GRID
TOMBSTONE PROPERTY
UKON JOINT VENTURE
SCALE 1:2000
20 10 0 20 40 60 80 100
metres

REANALYSIS OF 1976 SAMPLES

Ninety-six soil samples collected during the 1976 regional program were reanalyzed for copper and molybdenum after the drilling indicated that the metals are more abundant than previously suspected. The results are not strongly anomalous for either element with the highest values being 295 ppm Cu and 22 ppm Mo. The sample locations and results are plotted on Figure U-TG9 in the pocket.

DISCUSSION AND CONCLUSIONS

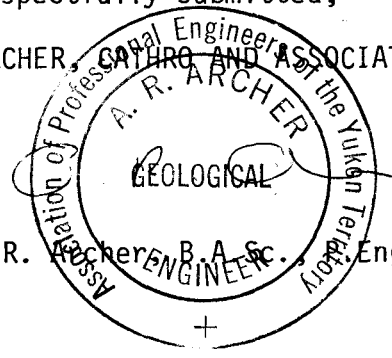
Drilling has confirmed that the tinguaite phase of the Tombstone Stock contains a large quantity of uranium metal at a very low grade. Geochemical assaying indicates that most of the uranium may be in an easily extractable form and preliminary mill tests are presently being conducted to establish if this is the case. Uranium to radium ratios suggest that uranium is weakly leached up to 170 feet below surface. The thorium content of the tinguaite is relatively constant while uranium content is highly variable. In the most uraniferous tinguaite, uranium to thorium ratios exceed 10:1 while in weathered and hydrothermally leached tinguaite, the ratio averages 1:2 or less. Limited assay data from the syenite dykes shows total uranium and thorium content to be variable but with a relatively consistent uranium to thorium ratio of between 1:2 and 1:4. Surprisingly, the uranium in the syenite appears to be in a readily extractable form and not tied up with thorium in resistate minerals.

The above data, coupled with field observations, suggests that the uranium in the tinguaite was probably introduced with primary hyrdrothermal fluids during the emplacement of the tinguaite. Subsequent hydrothermal activity related to

the intrusion of syenite dykes appears to have leached uranium from the tinguaite adjacent to the dykes and redeposited it in subparallel shear zones. Uranium mineralization is closely associated with purple fluorite. Fluorine complexes were the primary mode of transportation during the hydrothermal events. The sulphide mineralization in and around the syenites was probably deposited from the same hydrothermal activity. Surface weathering may have further remobilized uranium to provide secondary concentrations along the syenite dyke contact and subparallel shear zones.

Respectfully submitted,

ARCHER, CATHRO AND ASSOCIATES LTD.



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A.R. Archer, B.A.Sc., P.Eng.

UJV NEBULOUS CLAIMS

MT BRENNER

TOMBSTONE MT N

UJV TING, NOTING AND PROSPECTING CLAIMS

MT MONOLITH

Azure Lake

Syenite Lake

Divide Lake

Tombstone River

North Klondike River

Creek

MARN

TRIX

HOT

BETA

TEA

LOCATION MAP

SCALE 1:2,000,000

FIG U-TG9

Dawson City

Keno Hill

Indian River

Klondike River

Stewart River

White River

Tintina Trench

Dempster Hwy

Klondike Hwy

Silver Trail

Robert Campbell Hwy

Tombstone Park

LEGEND

CRETACEOUS

MIDDLE CRETACEOUS (?)

18 — Amphibole pyroxene syenite; pyroxene amphibole monzonite, hornblende quartz monzonite; medium-to coarse-grained, commonly porphyritic (orthoclase), with trachytoid texture; medium-grained biotite quartz monzonite and biotite quartz diorite near margins; minor granite; related porphyritic biotite lathe and pyroxene trachyte dykes; 18a, pseudoleucite tinguaite

LOWER CRETACEOUS (?)

16 — Brown weathering, dark green diabase, tholeiitic diabase and medium-grained gabbro; sheared and altered equivalents

13 — *'KENO HILL QUARTZITE'*: resistant, thick-bedded, massive, light, medium and dark grey, fine-grained orthoquartzite with lesser interbedded black slate

JURASSIC (?)

11 — *LOWER SCHIST*: black, graphitic slate and phyllitic slate with lesser interbedded chert-pebble conglomerate and immature feldspathic subgreywacke in lower part

PERMIAN

UPPER PERMIAN

8 — *TAHKANDIT FORMATION*: grey and white, crystalline skeletal limestone and marble

ORDOVICIAN AND SILURIAN

7 — *ROAD RIVER FORMATION*: grey, black and pale green, thick-bedded chert with interbedded black slate (lower part); greenish grey argillite and siliceous argillite with minor interbedded black crystalline limestone (upper part)

CAMBRIAN (?) - SILURIAN (?)

5 — Greenish grey weathering, massive, altered, amygdaloidal augite basalt with lesser lapilli tuff and volcanic breccia

PROTEROZOIC AND/OR CAMBRIAN

CAMBRIAN (?)

4 — Massive to thin-bedded, deep maroon and light green slate and argillite

geological boundary (defined, approximate, assumed)

fault (defined, approximate, assumed)

thrust fault (defined, approximate, assumed)

• 37, 16, 10 — sample location and geochemical analyses in ppm U, ppm Cu, ppm Mo

8o — chip sample interval and analysis in ppm U

FIGURE U-TG-9

ARCHER, CATHRO & ASSOCIATES LTD

U, Cu, Mo GEOCHEMISTRY

TOMBSTONE AREA

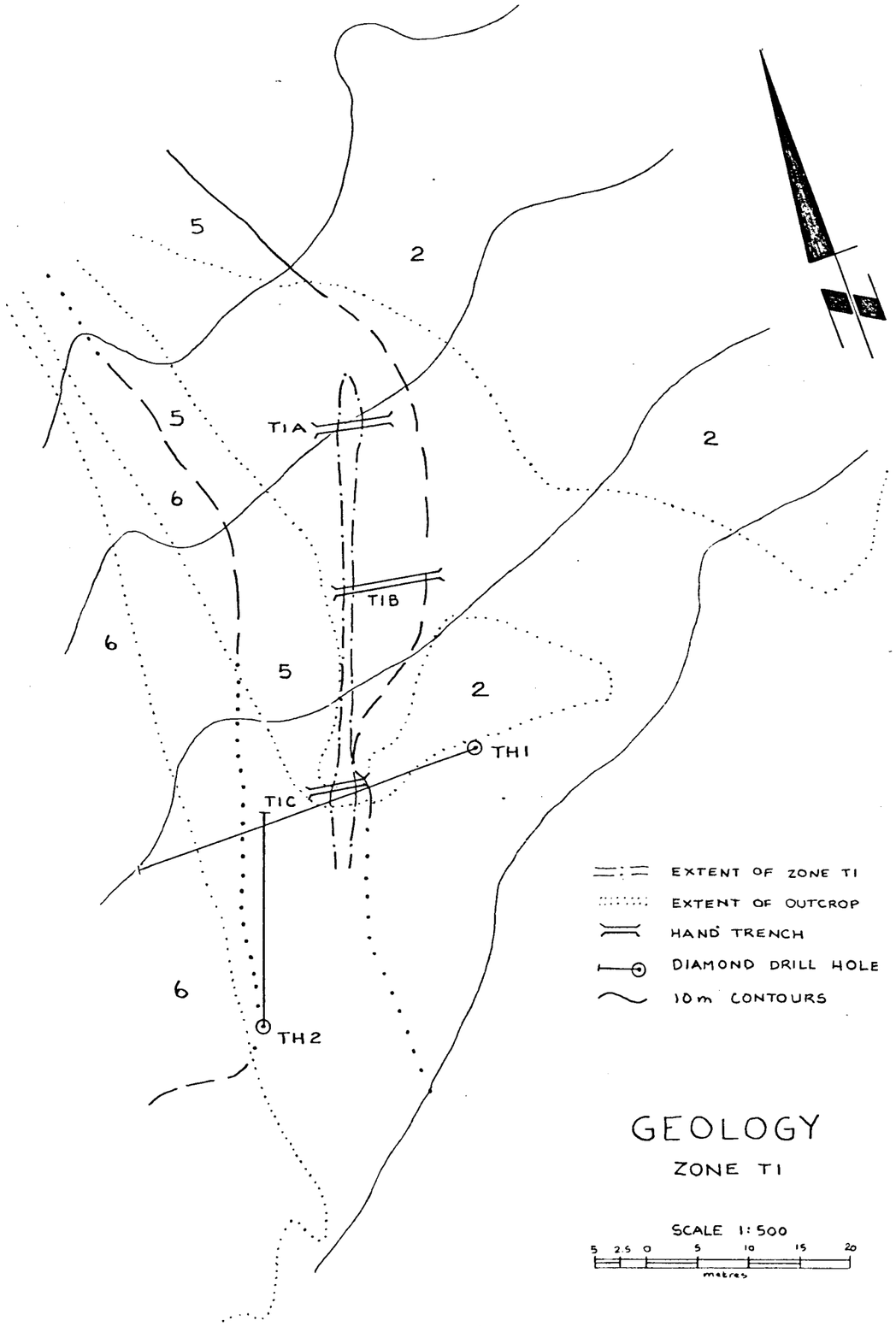
UKON JOINT VENTURE

SCALE 1:25,000

090561

Association of Professional Engineers of the Yukon Territory
R. ARCHER
LICENSED GEOLOGICAL ENGINEER

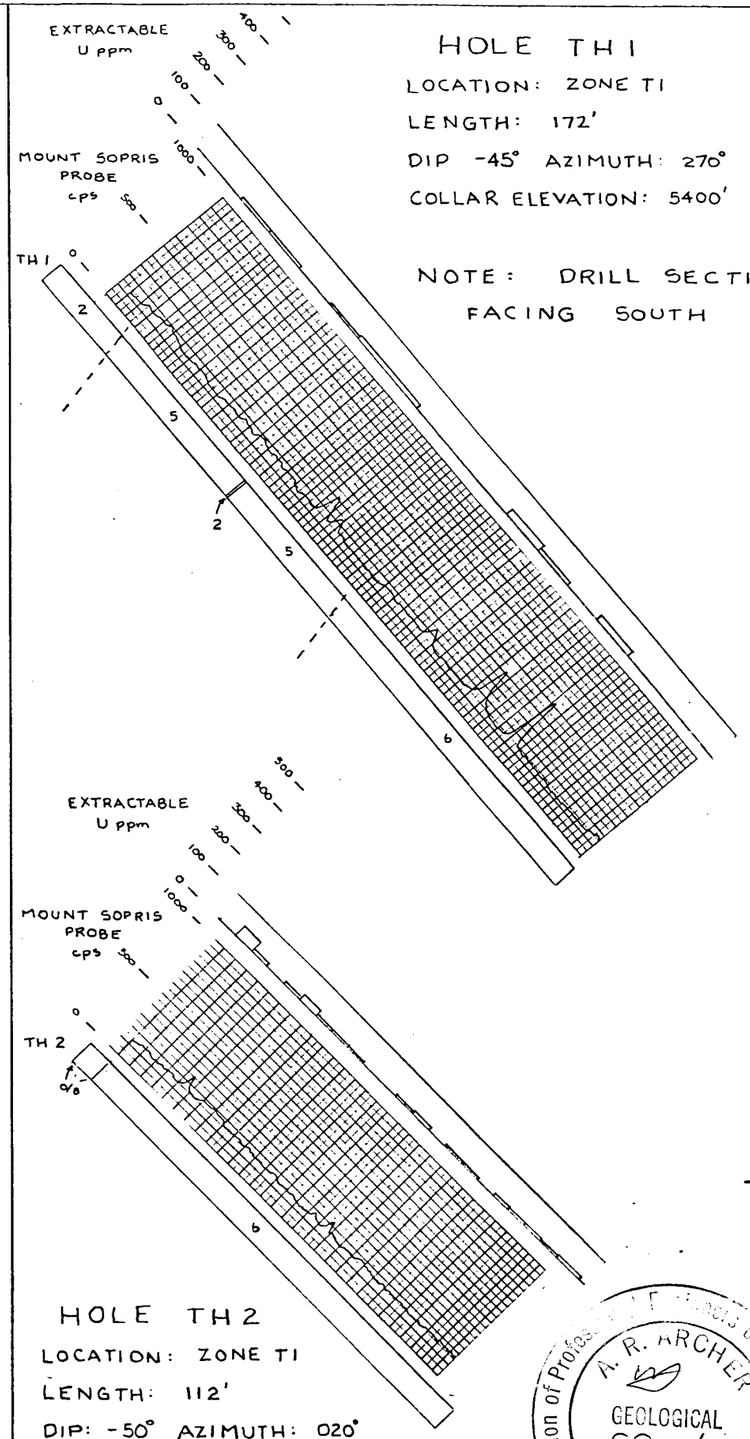
To accompany report dated January 15, 1988



EXTRACTABLE U ppm

MOUNT SOPRIS PROBE cps

TH1



EXTRACTABLE U ppm

MOUNT SOPRIS PROBE cps

TH 2

HOLE TH1

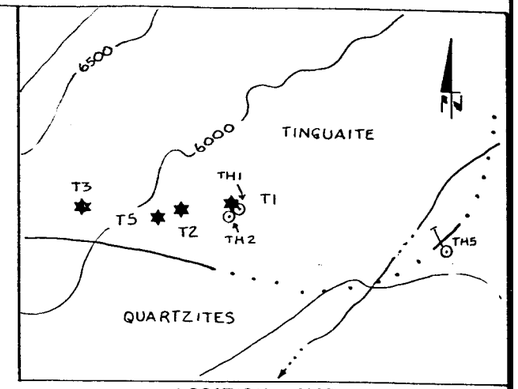
LOCATION: ZONE T1

LENGTH: 172'

DIP -45° AZIMUTH: 270°

COLLAR ELEVATION: 5400'

NOTE: DRILL SECTION FACING SOUTH



LOCATION MAP

SCALE 1:10,000

100 50 0 100 200 300 400 500

metres

1. SYENITE tan weathering, medium to coarse grained nepheline syenite often with abundant sulphides and purple fluorite
2. PSEUDOLEUCITE TINGUAITE 5-30%, 3-20mm pseudoleucite phenocrysts 1-10mm orthoclase phenocrysts in a medium grey, aphanitic groundmass
3. SHEARED TINGUAITE foliated and/or auto-brecciated tinguaite often biotite altered
4. MIXED TINGUAITE lenses or bands of pseudo-leucite phenocrysts in sheared tinguaite groundmass
5. FINE GRAINED TINGUAITE medium to dark grey tinguaite without pseudoleucite phenocrysts, some 1-3 mm orthoclase phenocrysts. Usually as dykes
6. INTERMEDIATE TINGUAITE medium grey tinguaite with pseudoleucite orthoclase phenocrysts. Pseudoleucite phenocrysts smaller than usual

B,b BIOTITE ALTERATION . intense, moderate

C,c CHLORITE ALTERATION intense, moderate

——— – – – geologic contact: sharp, gradational

EXTENT OF ZONE T1

EXTENT OF OUTCROP

HAND TRENCH

DIAMOND DRILL HOLE

10m CONTOURS

GEOLOGY

ZONE T1

SCALE 1:500

5 2.5 0 5 10 15 20

metres

HOLE TH2

LOCATION: ZONE T1

LENGTH: 112'

DIP: -50° AZIMUTH: 020°

COLLAR ELEVATION: 5393'

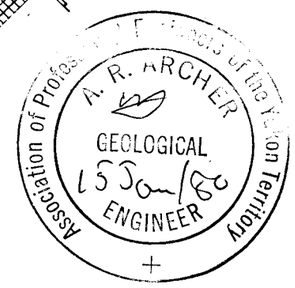


FIG. U-TG15

ARCHER, CATHRO & ASSOCIATES LTD

SECTION TH1 AND 2

TOMBSTONE PROPERTY

UKON JOINT VENTURE

SCALE 1:400

4 2 0 4 8 12 16 20

metres

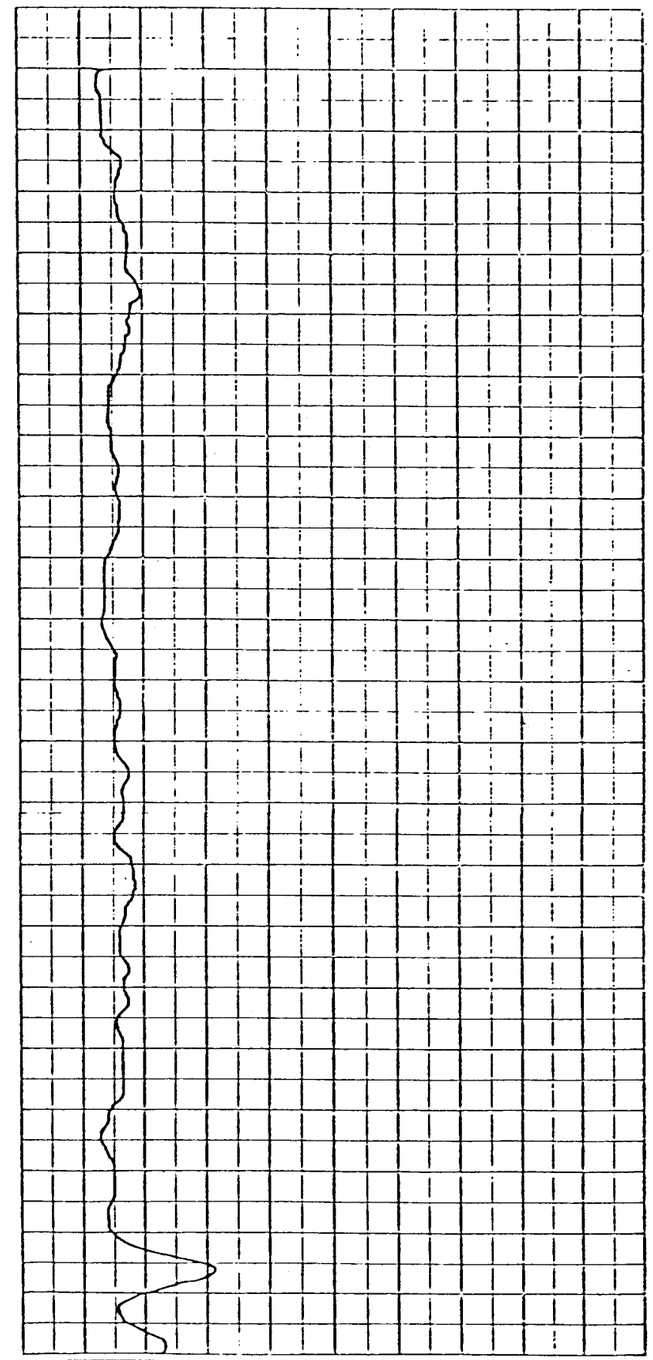
DRILL HOLE LOG

PROJECT UJV HOLE TH1 LOCATION ZONE T1 CORE SIZE BQ STARTED 11/07/79 FINISHED 13/07/79

CLAIM GROUP TOMBSTONE LENGTH 172' DIP -45° AZIMUTH 270° COLLAR ELEVATION 5400' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8 ppm U)	ppm Cu	ppm Mo	ppm Ag	% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
PSEUDOLEUCITE TINGUAITE: white, subhedral to euhedral pseudoleucite phenocrysts up to 15 mm across and white tabular orthoclase phenocrysts up to 8 mm long in a medium grey, aphanitic groundmass. Relatively massive, fracture density 2-3/ft. Fractures normally open, where closed usually filled with orthoclase and/or calcite. Fractures at high angles to the core axis are usually open, whereas shallow angle fractures tend to be closed. 8.6'-9.0': small fracture zone is weakly stained with hematite and contains minor molybdenite. An unidentified, non-magnetic black mineral is present in minor amounts surrounded by a hematite halo.	H46300	BKGD	<10	6	3	0.6			10° to 20° 70° to 90°	2-3/1'	5
9.0'-15.0': pseudoleucite tinguaite, fracture density 2-5/ft with minor hematite stains on some fractures.											10
15.0'-16.4': 1 mm wide fracture crossing pseudoleucite tinguaite at 10° is filled with orthoclase and goethite coated, euhedral pyrite.	H46301		10	6	5	0.2			10° to 20° 60° to 80°	2-5/1'	15
21.0'-22.4': gradational contact between pseudoleucite tinguaite and a finer grained tinguaite phase. FINE GRAINED TINGUAITE: orthoclase phenocrysts > pseudoleucite phenocrysts, phenocrysts rarely exceed 3 mm in length, in a dark grey to black groundmass. Fracture density 3 to 9/ ft normally. Commonly exhibits weak to moderate foliation at 60-80° to core axis. Compositional banding, notably of phenocryst rich versus phenocryst deficient bands, parallels foliation. Disseminated magnetite is locally present. 27.3': 1 mm 45° fracture filled with drusy orthoclase, purple fluorite and goethite coated pyrite.	H46302		10	14	2	0.2	100%		5° to 20° 50° to 80°	3-9/1'	20 25 30
36.6': pyrite and very black purple fluorite coating <1 mm, 60° fracture. 38.4'-39.0': orthoclase > calcite > pyrite > purple fluorite coating 1 mm closed fracture cutting tinguaite at 20°, tinguaite slightly vuggy adjacent to fracture. 41.7'-42.7': 3, 1 cm wide, hematite stained fracture zones cutting fine grained tinguaite at 50° to 60°, associated with a non-hematitic, 1 cm wide, black tinguaite (?) filled fracture zone which parallels the other 3.	H46303		<10	12	2	0.4					35 40
42.7'-49.0': a series of weakly goethite and hematite stained fractures cut the weakly foliated and banded, fine grained tinguaite at 5-20°, most are less than 1 mm in diameter. A 1 cm fracture between 46.5' and 47.5' contains minor pyrite > galena with calcite gangue. 49.0'-58.5': fractures at 20-30° and 80° are coated with minor pyrite. Between 51.6' and 55.4' a 1 mm wide closed fracture, filled with pyrite > calcite parallels the core axis.	H46304		10	20	1	1.2					45 50
58.7'-59.3': 1/2 mm, closed fracture cutting fine grained tinguaite at 10° is filled with pyrite, goethite, and calcite. 59.3'-63.0': PSEUDOLEUCITE TINGUAITE: with phenocrysts up to 1 cm in diameter. Probably a xenolith. Fracture density 3-10/ft.	H46305		20	16	1	0.8					55 60
63.0'-70.7': FINE GRAINED TINGUAITE: is cut by a fracture zone (6-50 ft). Most fractures <1/2 mm wide, cut core at 20-30°. Fractures coated with chlorite > calcite, locally pyrite, goethite and/or hematite. Some bleaching of tinguaite adjacent to fractures. Tinguaite is not foliated.	H46306		20	12	4	0.2	80% 40% 100%		10° to 30° 20° to 30°	3-10/1' 6-50/1'	65 70 75

MOUNT SOPRIS GAMMA PROBE LOG



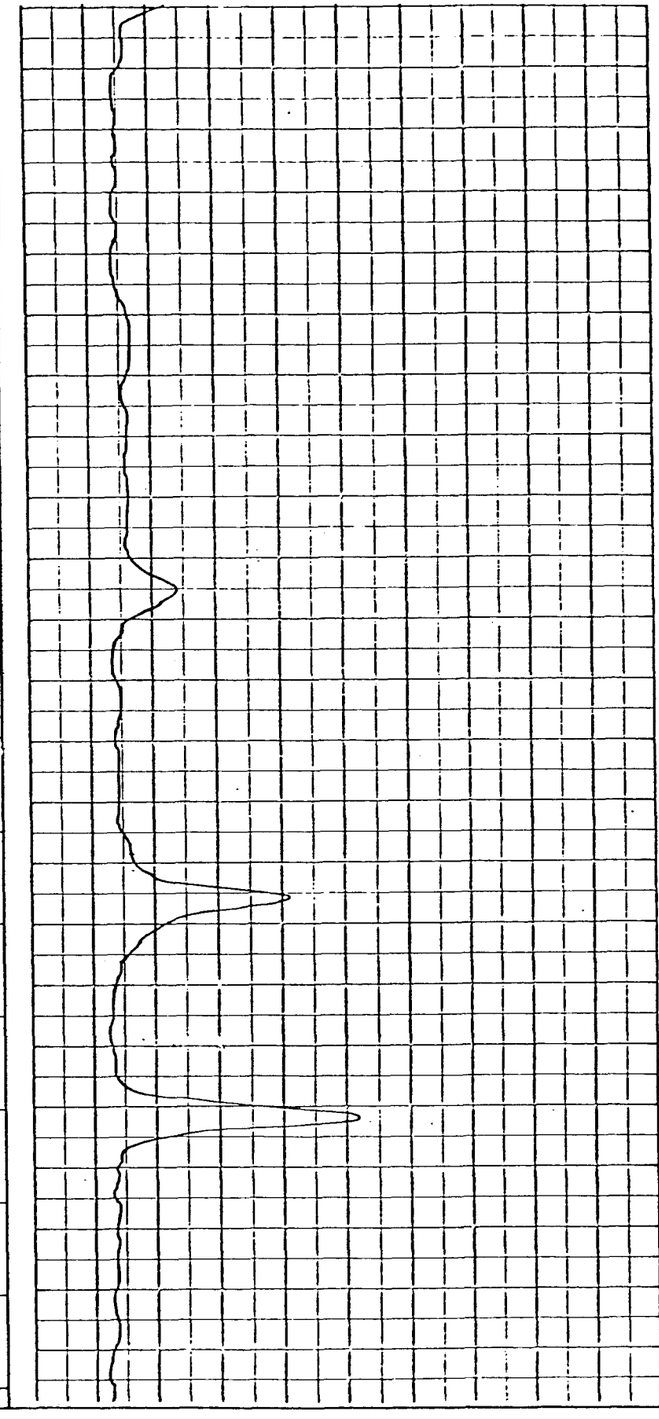
DRILL HOLE LOG

PROJECT UJV HOLE TH1 LOCATION ZONE 11 CORE SIZE BQ STARTED 11/07/79 FINISHED 13/07/79

CLAIM GROUP TOMBSTONE LENGTH 172' DIP -45° AZIMUTH 270° COLLAR ELEVATION 5400' DRILLED BY CABON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8) ppm U	ppm Cu	ppm Mo	ppm Ag	% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
74.0'-79.0': fine grained, non-foliated tinguaite, moderate fracture density 3-9/ft, most fractures 1 mm wide but one at 75° is 10 mm wide. Two fracture sets: 1 at 50°, generally open and the other at 15°-30° filled with chlorite > calcite > goethite.	H46307	BKGD	<10	12	5	0.4	100%		15° to 30° 50°	3-9/1'	80
79.0'-92.0': fine grained, relatively massive, weakly banded tinguaite; a few pseudo-leucite phenocrysts up to 7 mm in diameter but orthoclase > pseudoleucite. Orthoclase rarely exceeds 3 mm in length. 6 fractures/ft. At 86.0' pyrite in fracture; most others contain only calcite and chlorite.	H46308	20/BKGD	<10	6	4	0.2			15° to 30° 50° to 80°	6/1'	85
92.0'-96.0': fine grained tinguaite with chlorite > calcite > pyrite coating fractures. Also pyrite with biotite enclosed in pseudoleucite phenocrysts between 92.8' and 93.6'.							70%				90
INTERMEDIATE TINGUAITE: medium grey tinguaite with abundant phenocrysts in the 5-8 mm range. Pseudoleucite ≥ orthoclase. Relatively massive with a fracture density of 3/ft. Most fractures 0-30° to core axis and filled with chlorite ± orthoclase, calcite, goethite, and pyrite. Minor calcite and magnetite are disseminated in the groundmass.	H46309	BKGD	<10	8	3	0.2					95
	H46310		30	8	5	0.6	100%				100
											105
											110
	H46311	20/BKGD	20	10	6	0.2	80%		0° to 30°	3/1'	115
Still intermediate tinguaite as described above except that magnetite now comprises 1-3% of core.											120
							100%				125
133.0'-133.6': small fracture cutting core axis at 25°, contains chlorite and minor hematite. Some pitting adjacent to fracture. Surrounding intermediate tinguaite still strongly magnetic.	H46312	40/BKGD	<10	8	2	0.4					130
135.0'-135.5': 1 mm wide, 20° fracture contains strong hematite stain, an unidentified black mineral, and calcite. Surrounded by a 50 mm wide envelope of weakly hematized intermediate tinguaite.											135
	H46313	BKGD	30	12	2	0.6	60%				140
Still intermediate tinguaite with a fracture density of 3/ft. Contains 1-2% magnetite. Fractures generally 20-30° to core axis. Calcite most common fracture filling material.											145
	H48198		<10	12	5	0.2	100%				150

MOUNT SOPRIS GAMMA PROBE LOG



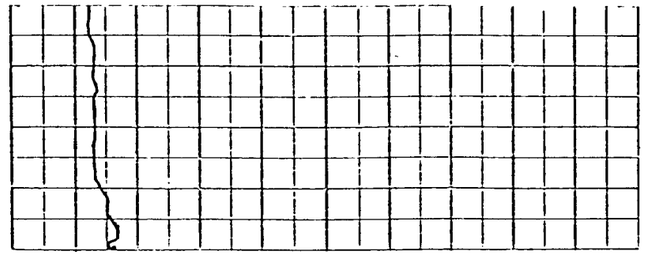
DRILL HOLE LOG

PROJECT UNV HOLE TH1 LOCATION ZONE TI CORE SIZE BQ STARTED 11/07/79 FINISHED 13/27/79

CLAIM GROUP TOMBSTONE LENGTH 172' DIP -45° AZIMUTH 270° COLLAR ELEVATION 5400' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8) ppm U	ppm Cu	ppm Mo	ppm Ag	% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
							100%	D	0° to 30°	3/1'	
154.0'-156.0': very strong fracture zone (>50/ft). In part brecciated, bleached tinguaite fragments in a chlorite matrix. True thickness ~ 30 cm. Unlike surrounding rocks, nonmagnetic with pits and goethite stains.							60%	a			155
156.0'-161.0': intermediate tinguaite with 1% magnetite disseminated in groundmass. Fracture density 5-10/ft at 30-50° to core axis. Fractures either open or closed with calcite.	H48199	BKGD.	<10	12	2	0.2	100%	p	30° to 50°	5-10/1'	160
							50%	p	15°	30/1'	
161.0'-162.0': bleached tinguaite in a chlorite matrix, approximately 30 fractures/ft. Rocks are weakly stained with goethite and nonmagnetic. True width of zone: 15 cm. Crosses core axis at 15°.								a			165
162.0'-172.0': intermediate tinguaite containing 1% magnetite. Fracture density 3/ft, most are open; where closed, filled with calcite.	H48200		10	10	1	0.2	100%	d	0° to 30°	3/1'	170
								o			172

MOUNT. SOPRIS GAMMA PROBE LOG



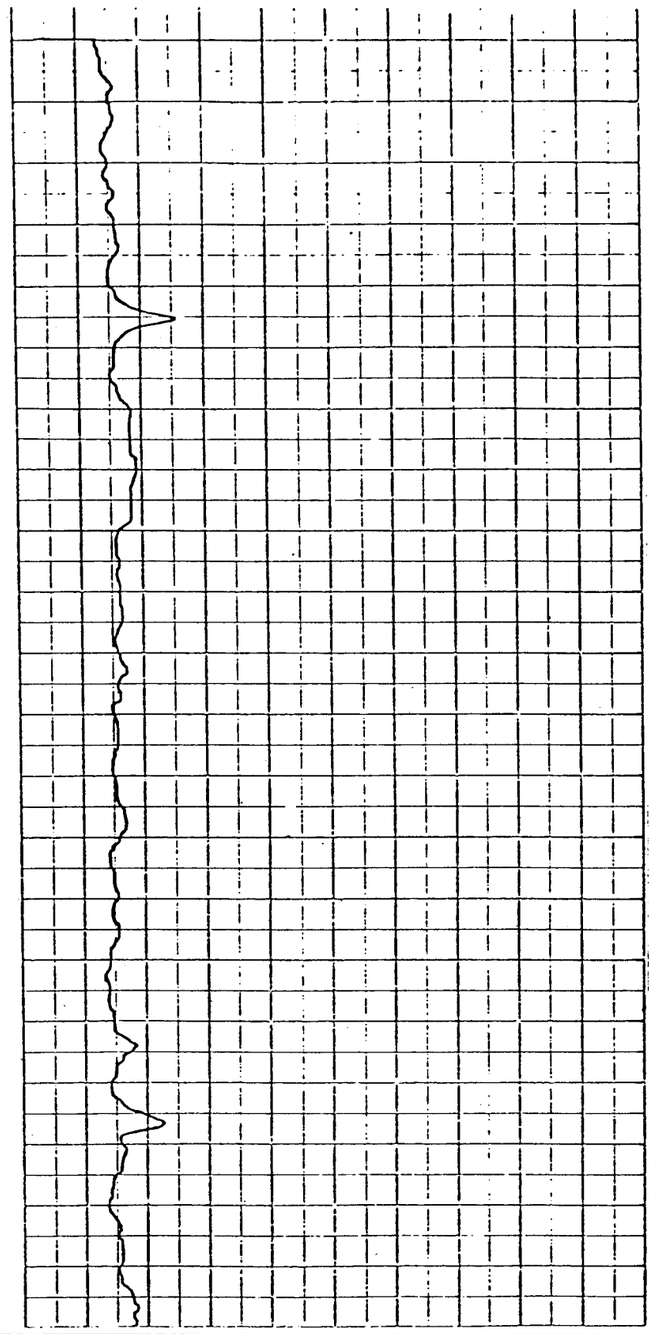
DRILL HOLE LOG

PROJECT UJV HOLE TH2 LOCATION ZONE T1 CORE SIZE BQ STARTED 15/07/79 FINISHED 16/07/79

CLAIM GROUP TOMBSTONE LENGTH 112' DIP -50° AZIMUTH 020° COLLAR ELEVATION 5393' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8) ppm U	ppm Cu	% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
OVERBURDEN: a mixture of various tinguaite phase boulders and soil in a talus chute.								
	H37378		42		30%			5
INTERMEDIATE TINGUAITE: white orthoclase and subhedral pseudoleucite phenocrysts up to 8 mm across in a medium grey groundmass. Minor magnetite associated with 1 mm long mafic phenocrysts, probably biotite but may be an amphibole. The rocks are extremely pitted for the first 30.0'; below this, leaching is confined to fractures. Relatively massive; fracture density 3-7/ft. Two fracture sets predominate, 40-50° and 0-25° to the core axis. Most fractures are open. Where closed, chlorite, calcite and goethite ± pyrite usually fill the fracture. Closed fractures are associated with the 0-25° set.	H37379		10.5		100%			10
Small fracture zones occur at 15.5'-16.0', 16.8'-17.3' and 21.0'-22.0'. These rocks are strongly leached with goethite stockworks on a few fractures.	H37380		9.5		60%			15
	H37381		11.5		100%			20
26.0'- 29.5': a series of 1 mm to 5 mm fractures run subparallel to the core axis. In addition to chlorite the fractures contain goethite and hematite coatings and stockworks. The wall rocks are pitted. 5 mm wide, bleached envelopes surround the fractures.	H37382		22.5		70%			25
30.8'-31.3': a 2 cm wide fracture zone cutting intermediate tinguaite at 20° contains chlorite, calcite, hematite stain, goethite, pyrite and molybdenite. 31.9'-33.3': a 1 cm wide fracture inclined at 20° to the core axis contains calcite, pyrite and goethite.	H37383	BKGD	12.5				40° TO 50° AND 0° TO 25° 3-7/1'	30
36.1'-36.4': a 1 mm wide fracture inclined at 20° contains chlorite, calcite, pyrite and goethite.	H37384		13.5					35
41.5'-43.7': a 1/2 mm wide fracture running subparallel to the core axis contains calcite and chlorite with minor pyrite and goethite. 44.9'-45.1': two 1 mm wide, cross-cutting fractures, one inclined at 20° and the other at 30°, are filled with chlorite, calcite, and pyrite.	H37385		11.0					40
45.3'-46.0': weak hematite stains are found adjacent to 50° fractures. 46.0'-46.8': the fracturing becomes more intense. The fractures contain chlorite and minor goethite. The adjacent wall rocks are bleached.	H37386		9.0		100%			45
52.3'-52.5': two 1/2 mm fractures cutting intermediate tinguaite at 30° contain chlorite, calcite, pyrite, and goethite.	H37387		7.5					50
56.5'-56.7': 1-2 mm wide, 25° fracture containing calcite and goethite, is surrounded by 10 mm bleached envelopes. 57.2'-57.4': 1 mm wide, 25° fracture contains calcite and pyrite.	H37388		10.0					55
59.7'-60.0': 1-3 mm wide, 25° fracture contains chlorite and pyrite. 60.3'-61.3': 1 mm fracture which is subparallel to the core axis contains chlorite, goethite and calcite and is surrounded by a 5-10 mm bleached envelope.	H37389		15.0					60
64.9'-65.1': 40 mm fracture zone composed of 30° fractures. Fractures contain chlorite and minor goethite. The wall rocks adjacent to the fractures are bleached. Similar zones are found between 66.5'-66.7' and 66.9'-67.1'.	H37390		8.0				30° 30/1' 30° 30/1'	65
INTERMEDIATE TINGUAITE: phenocrysts are slightly smaller than most intermediate tinguaite. 69.1'-69.9': 1/2 mm wide, 15° fracture containing chlorite, calcite and goethite.								70
72.3'-72.7': three 1/2 mm wide, 40° fractures contain chlorite, goethite and minor pyrite. 73.3'-73.6': a 1 mm wide, 30° fracture contains chlorite, calcite, goethite and minor pyrite.	H37391		13.5					75

MOUNT SOPRIS
GAMMA PROBE LOG



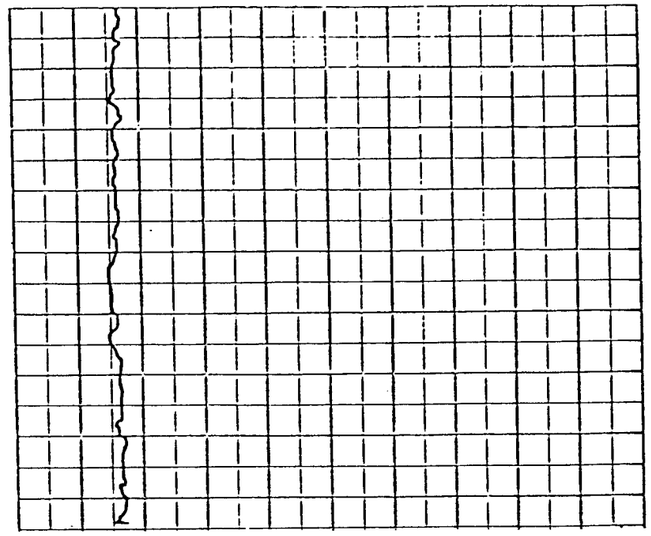
DRILL HOLE LOG

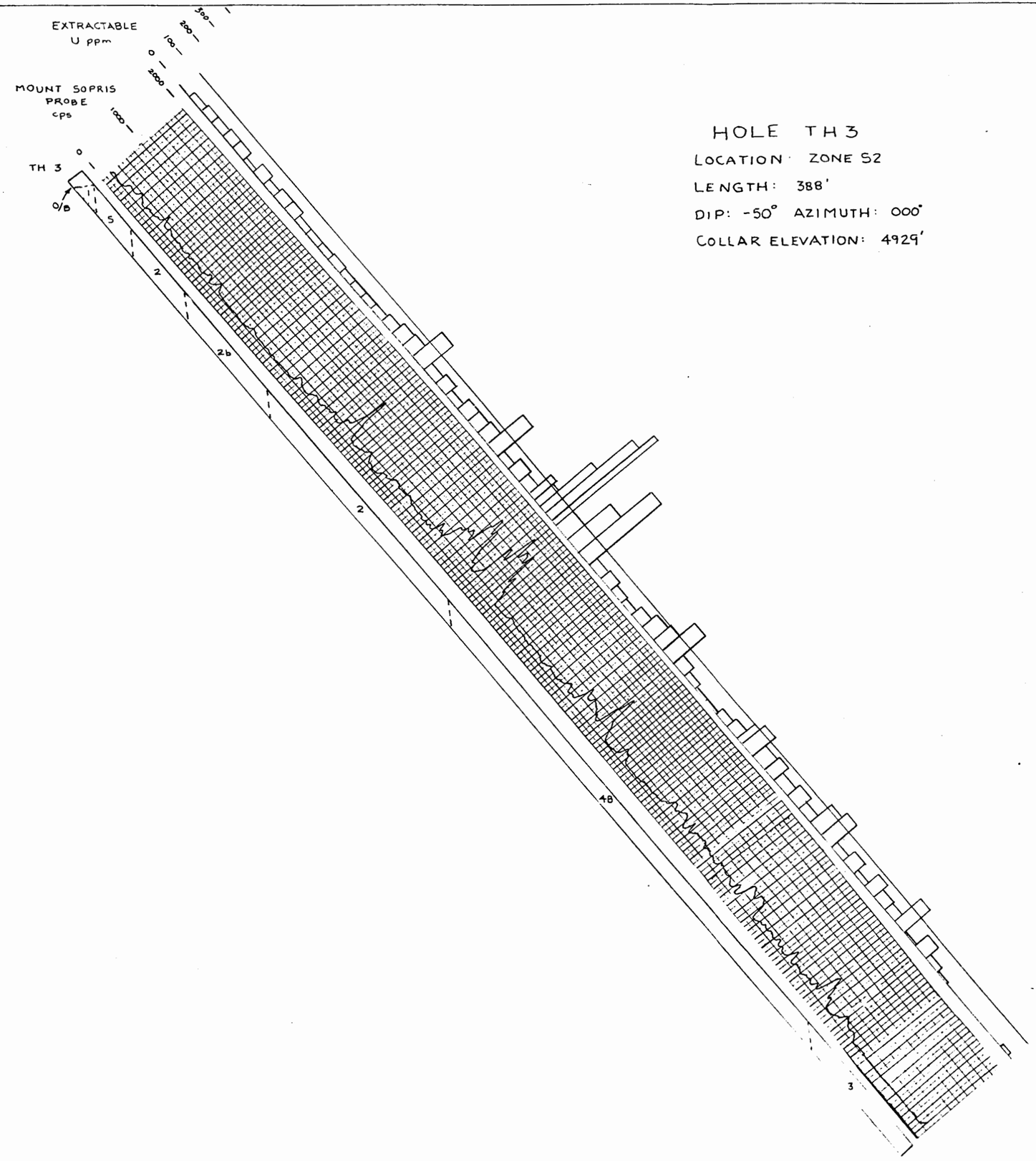
PROJECT UJV HOLE TH2 LOCATION ZONE T1 CORE SIZE BQ STARTED 15/07/79 FINISHED 17/07/79 PAGE 2 OF 2

CLAIM GROUP TOMBSTONE LENGTH 112' DIP -50° AZIMUTH 020° COLLAR ELEVATION 5393' DRILLED BY CAROL LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8 ppm U)	GEOCHEMISTRY AND ASSAY (ppm Cu)	% RECOV	GEOLOGY	STRUCTURE L to core	HOLE DEPTH (FEET)
	H37392	BKGD	11.5		100%		40° TO 50° AND 0° TO 25° 3-7/1'	80
82.0'-86.8': a series of 1 cm to 10 cm wide fine grained tinguaite dykes cut intermediate tinguaites at 45° to core axis.	H37393		8.0					85
86.8'-87.0': five 1/2 mm wide, 20-30° fractures contain chlorite, calcite and goethite.	H37394		12.0					90
90.5'-90.8': a 2 mm wide, 20° fracture contains arsenopyrite. 94.2'-94.6': a <1/2 mm wide, 25° fracture contains chlorite, calcite and pyrite.	H37395		13.0					95
	H37396		14.0					100
100.3'-100.7': a 2 mm wide, 20° fracture is filled with calcite and fresh pyrite. 102.5'-103.0': a wide, 20° fracture is filled with calcite and fresh pyrite.	H37397		14.5					105
	H37398		17.5					110
								112

MOUNT SOPRIS GAMMA PROBE LOG





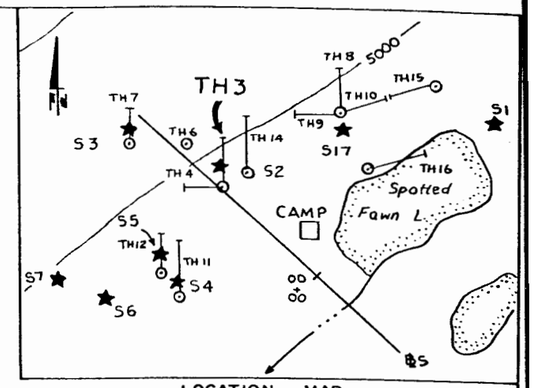
HOLE TH 3

LOCATION: ZONE 52

LENGTH: 388'

DIP: -50° AZIMUTH: 000°

COLLAR ELEVATION: 4929'



LOCATION MAP

SCALE 1:10,000

100 50 0 100 200 300 400 500

metres

1 SYENITE tan weathering, medium to coarse grained nepheline syenite often with abundant sulphides and purple fluorite

2 PSEUDOLEUCITE TINGUAITE 5-30%, 3-20mm pseudoleucite phenocrysts 1-10mm orthoclase phenocrysts in a medium grey, aphanitic groundmass

3 SHEARED TINGUAITE foliated and/or auto-brecciated tinguaite often biotite altered

4 MIXED TINGUAITE lenses or bands of pseudo-leucite phenocrysts in sheared tinguaite groundmass

5 FINE GRAINED TINGUAITE medium to dark grey tinguaite without pseudoleucite phenocrysts, some 1-3 mm orthoclase phenocrysts. Usually as dykes

6 INTERMEDIATE TINGUAITE medium grey tinguaite with pseudoleucite orthoclase phenocrysts. Pseudoleucite phenocrysts smaller than usual

B,b BIOTITE ALTERATION . intense, moderate

C,c CHLORITE ALTERATION intense, moderate

——— – – – geologic contact: sharp, gradational

Association of Professional Engineers of the Yukon Territory
A. R. ARCHER
GEOLOGICAL
ENGINEER

FIG. U-TG16

ARCHER, CATHRO & ASSOCIATES LTD

SECTION TH3

TOMBSTONE PROPERTY

UKON JOINT VENTURE

SCALE 1:400

4 2 0 4 8 12 16 20

metres

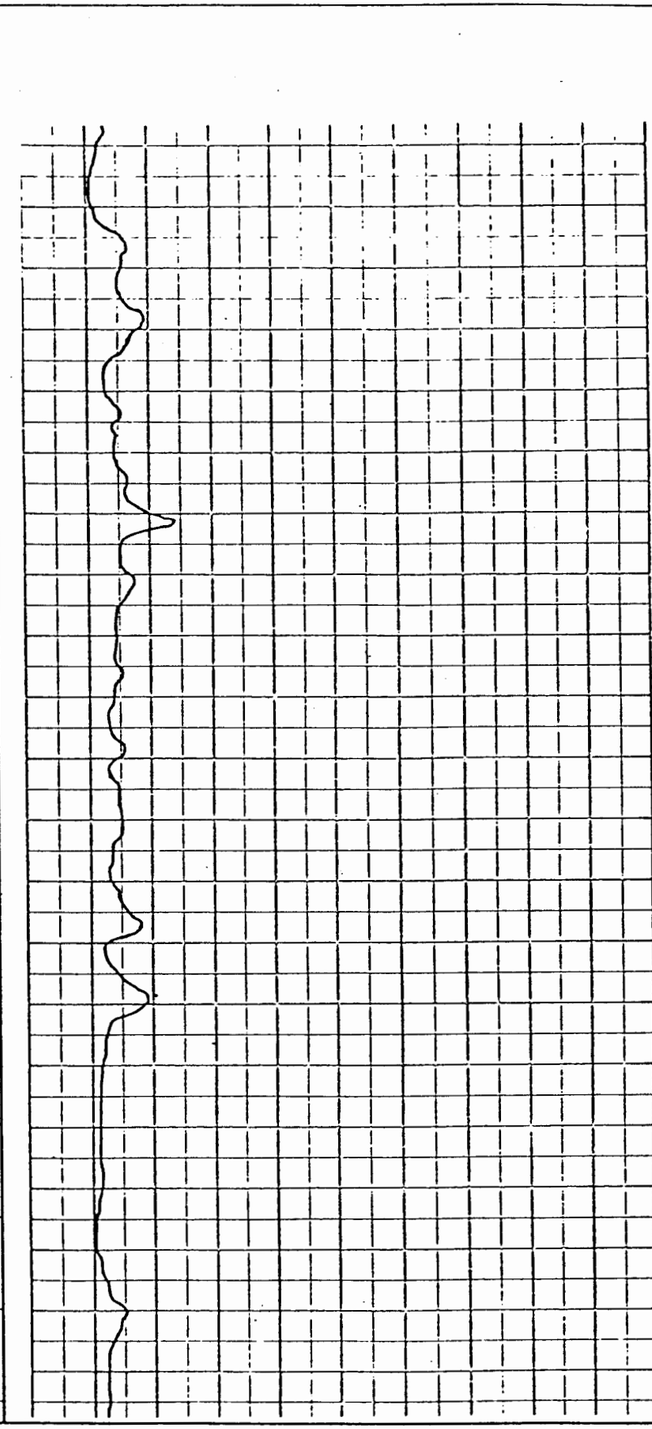
DRILL HOLE LOG

PROJECT UJV HOLE TH 3 LOCATION Zone 52 CORE SIZE BQ STARTED 18/07/79 FINISHED 21/07/79 PAGE 1 OF 6

CLAIM GROUP TOMBSTONE LENGTH 388' DIP -50° AZIMUTH 000° COLLAR ELEVATION 4929' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8 ppm U)	ppm Cu	ppm Mo	ppm Ag	% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
OVERBURDEN: syenite and tinguaite boulders mixed with soil in glacial till. Much of the material was derived at the head of the cirque.							5				5
SYENITE: fine to medium grained syenite dyke containing abundant (1/4-2%) pyrrhotite and limonite after pyrrhotite. The dyke is generally light grey however mafic minerals locally comprise up to 4-5% of the rock; where abundant the mafics occur in blebby aggregates with a vaguely plumous appearance. From 6.0-7.5', rock appears bleached. Fracture density in bleached rock 20-25/ft; in unbleached rock 7-10/ft. Fractures at 20°, 45° and 70° to core axis.	H48179		30	12	10	0.2	100		20° 45° 70°	7-25/1'	
FINE GRAINED TINGUAITE: 10.2'-14.1': fine grained tinguaite exhibiting a pervasive weak limonite stain which imparts a yellowish tint to the rock. Frequently cut by <1cm wide salt and pepper syenite dykelets composed of fine orthoclase and biotite. The tinguaite may be partially recrystallized. Fracture density 10-15/ft at 20°, 45°, 70-80° to the core axis. Goethite on all fractures. Disseminated pyrrhotite comprises 1/2% of rock.	H48180		40	16	17	0.1	50		20° 45° 70° 80°	10-15/1'	10
14.1'-26.0': fresh fine grained tinguaite; white orthoclase phenocrysts usually less than 4mm long in a medium grey aphanitic groundmass. Orthoclase phenocrysts comprise 10% of rock; there are no pseudoleucite phenocrysts. 1mm biotite phenocrysts comprise <1% of the rock. Fracture density 3-7/ft at 25°, 45°, and 70-90°; most fractures are open. Limonite coats most fracture; chlorite and calcite are less abundant. Disseminated pyrrhotite is present in trace amounts.	H48181		40	16	17	0.2			25° 45° 70° to 90°	3-7/1'	15
22.6'-25.7': a series of 1-3mm wide, closed fractures, running subparallel to the core axis, contain a mafic mineral (chlorite?) > limonite > calcite ± pyrrhotite ± chalcopyrite ± purple fluorite ± a pinkish tan mineral (orthoclase?). The fractures are surrounded by a 5-10mm wide greenish alteration envelope.	H48182		50	166	13	0.8	100				20
26.6': a 1cm wide salt and pepper syenite dykelet cuts the syenite at 45° to core axis.											25
GRADATIONAL CONTACT: fine grained tinguaite goes to pseudoleucite tinguaite in 3.0'.	H48183		50	52	14	0.4					
PSEUDOLEUCITE TINGUAITE: contains approximately equal amounts of white, subhedral to euhedral orthoclase and pseudoleucite phenocrysts in a medium grey aphanitic groundmass. The orthoclase-pseudoleucite ratio is 1:1 which is higher than is usual for pseudoleucite tinguaite. Phenocrysts compose 20-50% of the rock. Pseudoleucite phenocrysts occasionally range up to 15mm in diameter but average less than 7mm. Orthoclase phenocrysts can be as large as 15mm but are typically 5mm or less in length. Locally the pseudoleucite tinguaite grades toward an intermediate tinguaite. The fracture density is 1-4/ft at 10°, 45° and 80° to core axis. Most fractures are open. Closed fractures are usually the 10° fractures; they contain calcite > pyrrhotite > limonite > chlorite. Alteration is minor; where present usually biotite on fractures rimming or replacing part of pseudoleucite phenocrysts.	H48184		20	136	18	1.2	40				30
30.6'-32.2': leached fracture zone exhibiting pitting and strong goethite stains. Minor clay alteration of pseudoleucite phenocrysts adjacent to fractures.	H48185	BKGD	60	8	27	0.1					
32.8'-33.2': white syenite dykelet cuts tinguaite at 25°.											35
33.4': pyrrhotite and chlorite coat < 1/2mm wide, 10° fracture.											
34.7'-35.1': pyrrhotite and chlorite coat <1/2mm wide, 5° fracture.											
41.6'-44.4': biotite alteration stronger than normal; pseudoleucite phenocrysts wholly or partially replaced by biotite.	H48186		40	10	35	0.2			10° 45° 80°	1/4	40
48.0'-49.5': biotite replaces core of pseudoleucite phenocrysts; a 1/2mm fracture contains orthoclase > pyrrhotite > limonite.	H48187		50	90	40	1.4					45
ALTERED PSEUDOLEUCITE TINGUAITE: 51.0'-74.5': rocks as previously described except that 70% of the pseudoleucite phenocrysts have had their cores altered to biotite leaving only a rim of white material. Fracture density 1-3/ft. Minor greenish tint to phenocrysts locally (sericite?).	H48188		50	6	20	0.1	100				50
55.5': an 80° fracture contains yellow-orange limonite which may be a uranium mineral. Pseudoleucite phenocrysts adjacent to the fracture presumably after supergene clay alteration.	H48189		30	4	11	0.1					55
	H48190		30	6	23	0.1					60
67.8'-68.5': traces of molybdenite on a < 1/2mm, 10° fracture.											65
69.1'-70.0': a weak fracture zone contains goethite, calcite, and chlorite. Weak chlorite alteration affects parts of the wall rocks.	H48191		30	6	41	0.1	70				70
Altered pseudoleucite tinguaite grades toward pseudoleucite tinguaite: alteration affects less than 30° of pseudoleucite phenocrysts, where present usually biotite rimming phenocrysts. Fracture density <1/ft. Orthoclase pseudoleucite ratio still 1:1. Phenocrysts are slightly smaller than usual.	H48192	70/BKGD	40	6	50	0.1	100				75

MOUNT SOPRIS GAMMA PROBE LOG



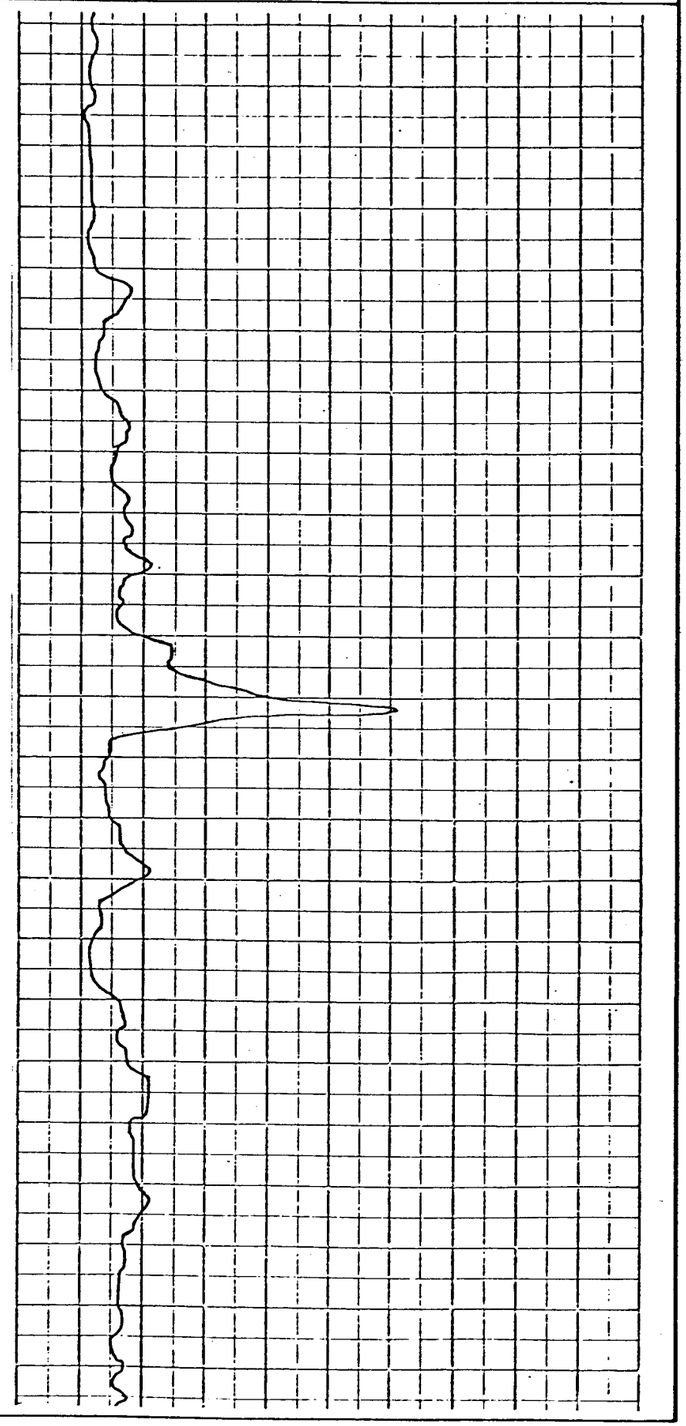
DRILL HOLE LOG

PROJECT UJV HOLE TH3 LOCATION Zone 52 CORE SIZE BQ STARTED 16/07/79 FINISHED 21/07/79

CLAIM GROUP TOMBSTONE LENGTH 388' DIP -50° AZIMUTH 000° COLLAR ELEVATION 4929' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8) ppm U	ppm Cu	ppm Mo	ppm Ag	% RECOV	GEOLOGY	STRUCTURE α to core		HOLE DEPTH (FEET)
75.5'-76.7': goethite stains and 8mm wide, weak greenish (sericite?) alteration envelopes accompany 1mm wide leached fractures.	H48193	BKGD	30	4	34	0.1			10° 15° 80°	1/4'	80
	H48194	60/BKGD	30	4	22	0.1					85
	H48195	BKGD	30	6	26	0.1					90
GRADATIONAL CONTACT: biotite altered pseudoleucite tinguaite gives way to unaltered pseudoleucite tinguaite. PSEUDOLEUCITE TINGUAITE: subhedral to euhedral, light grey pseudoleucite phenocrysts up to 1cm across and euhedral, occasionally twinned, white orthoclase phenocrysts up to 1cm long in a medium grey, aphanitic groundmass. Small amounts (trace-1%) of fresh fine grained pyrrhotite disseminated in the groundmass of the pseudoleucite tinguaite below 87.0'. The fracture density is very low-1/ft, normally at 70°. 95.1': 1mm wide, 70° fracture filled with white orthoclase and dendritic pyrolusite. 99.4'-99.7': 2mm wide, white orthoclase dykelet with a trace of molybdenite cuts tinguaite at 25°.	H48196		30	6	17	0.1					95
	H48197		50	6	41	0.2					100
	H46325	15/BKGD	70	10	57	0.2			70°	1/1'	105
105.6'-106.4': pyrrhotite is associated with whispy clusters of biotite and comprises 3% of the tinguaite.	H46326		80	10	58	0.4	100				110
	H46327	40/BKGD	180	8	58	0.6					115
Pseudoleucite tinguaite contains trace-0.5% fine grained pyrrhotite disseminated in the groundmass. Less than 20% of pseudoleucite phenocrysts are partially altered to biotite. Traces of blue feldspathoid (cancrinite?) in a pseudoleucite phenocryst. Pseudoleucite phenocrysts are often very indistinct, blending into the groundmass. Fracture density is low, 1-2/ft at high angles to the core axis.	H46328	25/BKGD	50	8	57	0.2					120
	H46329	BKGD 50/BKGD	70	6	69	0.2					125
128.1'-128.3': minor molybdenite in 1-2mm orthoclase filled fractures. Pseudoleucite phenocrysts often indistinct and smaller than usual. Orthoclase to pseudoleucite ratio is 1:1. Pyrrhotite is trace to 1/2% throughout the rock. Low fracture density at high angle to core axis; when closed filled with orthoclase.	H46330	20/BKGD 80/BKGD	40	6	74	0.4			45° to 60°	1-2/1'	130
	H46331	20/BKGD 100/BKGD	70	6	89	0.4					135
	H46332	40/BKGD	70	6	88	0.4					140
141.6'-141.9': pseudoleucite phenocrysts slightly stressed producing oblong phenocrysts with the long axis orientated at 45° to the core axis. 142.3'-144.3': a 5-10mm grey orthoclase dyke running subparallel to the core axis is surrounded by a whispy biotite envelope containing abundant pyrrhotite. 146.0'-146.5': small amount of limonite on fractures.	H46333	20/BKGD	80	6	80	0.4					145
147.1'-147.3': a 2mm wide, 45° fracture is filled with an unidentified grey mineral (possibly gouge) and calcite. The tinguaite around the fracture is foliated parallel to the fracture. 147.5': a 2mm salt and pepper dykelet cuts fresh pseudoleucite tinguaite at 40°. A similar dykelet cuts the pseudoleucite at 156.0' and another at 156.8'.	H46314	BKGD 80/BKGD BKGD	220	8	150	0.4					150

MOUNT SOPRIS GAMMA PROBE LOG



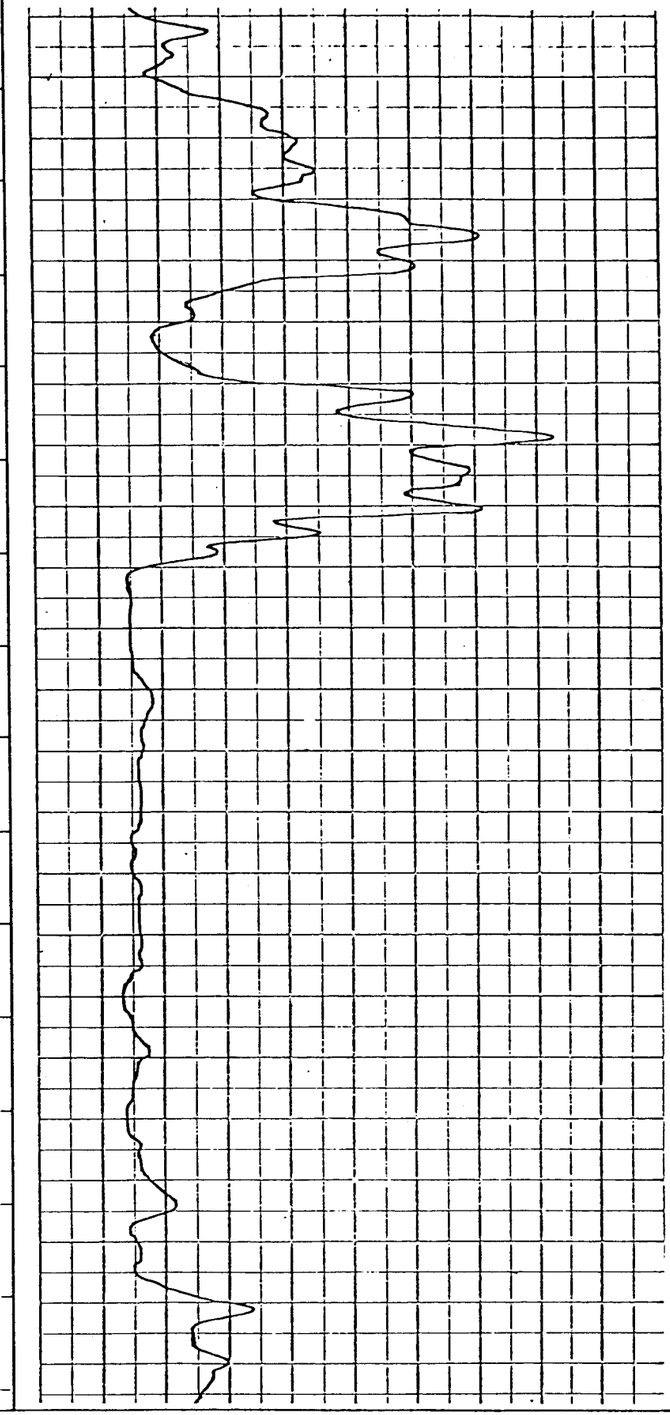
DRILL HOLE LOG

PROJECT UJV HOLE TH3 LOCATION Zone 52 CORE SIZE BQ STARTED 18/07/79 FINISHED 21/09/79 PAGE 3 OF 6

CLAIM GROUP TOMBSTONE LENGTH 388' DIP -50° AZIMUTH 000° COLLAR ELEVATION 4929' DRILLED BY CARDI LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8) ppm U	ppm Cu	ppm Mo	ppm Ag	% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
Pseudoleucite tinguaite: the pseudoleucite phenocrysts are larger and more distinct than in previous 50'. The fracture density is still 1/2-3/ft. Most fractures are open but a few are filled with white or pink orthoclase ± jarosite.	H46315	20/BKGD	40	4	25	0.2	100				155
		70/BKGD									
	H46316	BKGD	80	6	13	0.4					160
		90/BKGD									
	H46317	60/BKGD	60	4	96	0.2			45° to 60°	1-2/ft	
		135/BKGD									165
165.1'-166.8': 5-10mm wide, whispy bands composed of dark minerals (biotite) and abundant fine grained pyrrhotite are moderately radioactive. The dark bands run subparallel to the core axis but have an irregular shape suggesting convective movement within the rock during their emplacement. The pseudoleucite tinguaite groundmass adjacent to these sulphide rich patches is slightly bleached and the pseudoleucite phenocrysts are very indistinct. The rock has a low fracture density similar to ths surrounding pseudoleucite tinguaite, which contains only minor amounts of pyrrhotite.	A01084	95/BKGD	140	12	250	0.2					
	A01085		120	4	100	0.1					170
	A01086		320	4	170	0.1					
	A01087		530	4	310	0.2					
175.8'-176.1': a 1mm, 30° fracture is filled with a non-radioactive dark mineral and minor pyrrhotite is surrounded by a poorly defined green tinted alteration envelope and goethite stains.	A01088	80/BKGD	620	10	340	0.6					175
ALTERED AND STRESSED TINGUAITE MIXED WITH PSEUDOLEUCITE TINGUAITE: from this point the pseudoleucite tinguaite appears to have undergone stress and alteration so that foliated and altered tinguaite surrounds what appears to be lenses of altered tinguaite. The contacts between the altered and unaltered tinguaite may be sharp or gradational. The pseudoleucite phenocrysts are very sharp in the fresh pseudoleucite tinguaite and become indistinct or are replaced by biotite in the altered and/or foliated tinguaites. Pyrrhotite is present in minor amounts in the fresh rock and is slightly more abundant (1/4-1%) in the altered rocks. The foliation generally cuts the core axis between 30 and 40°. Where the rock is highly stressed the orthoclase phenocrysts often appear to have been broken into angular fragments. The fracture density is still low at 1/2-2/ft. The fractures are also 30-40° and are often filled with white orthoclase.	H46318		110	4	88	0.2					
	H46319	50/BKGD	260	4	140	0.2					180
180.0': LAST LIMONITE IN HOLE: very weak coat on fracture.											
181.5'-181.7': a 2mm wide biotite-pyrrhotite band is surrounded by a 5mm wide bleached envelope.	H46320	20/BKGD	440	4	170	0.4					
	H46334	BKGD	50	8	4	0.4					185
	H46335		60	8	3	0.6			30° to 40°	1-2/ft	
	H46336		40	8	3	0.4					
Predominantly pseudoleucite tinguaite, however many of the pseudoleucite phenocrysts are barely visible, imparting a fine grained appearance to the rock. This effect is in part due to biotite alteration of the phenocrysts and possibly recrystallization of the phenocrysts. The pseudoleucite is massive with <1 fracture/ft. Minor (1/4%) fresh pyrrhotite is disseminated in the groundmass of the rock.	H46337	15/BKGD	30	6	8	0.1					190
	H46338		60	8	4	0.2					
Biotite altered pseudoleucite tinguaite encloses "lenses" of fresh pseudoleucite tinguaite. Rocks are not foliated or only weakly foliated.	H46339	20/BKGD	90	12	9	0.4					195
	H46340		110	16	4	0.1					
											200
											205
											210
											215
											220
											225

MOUNT SOPRIS
GAMMA PROBE LOG



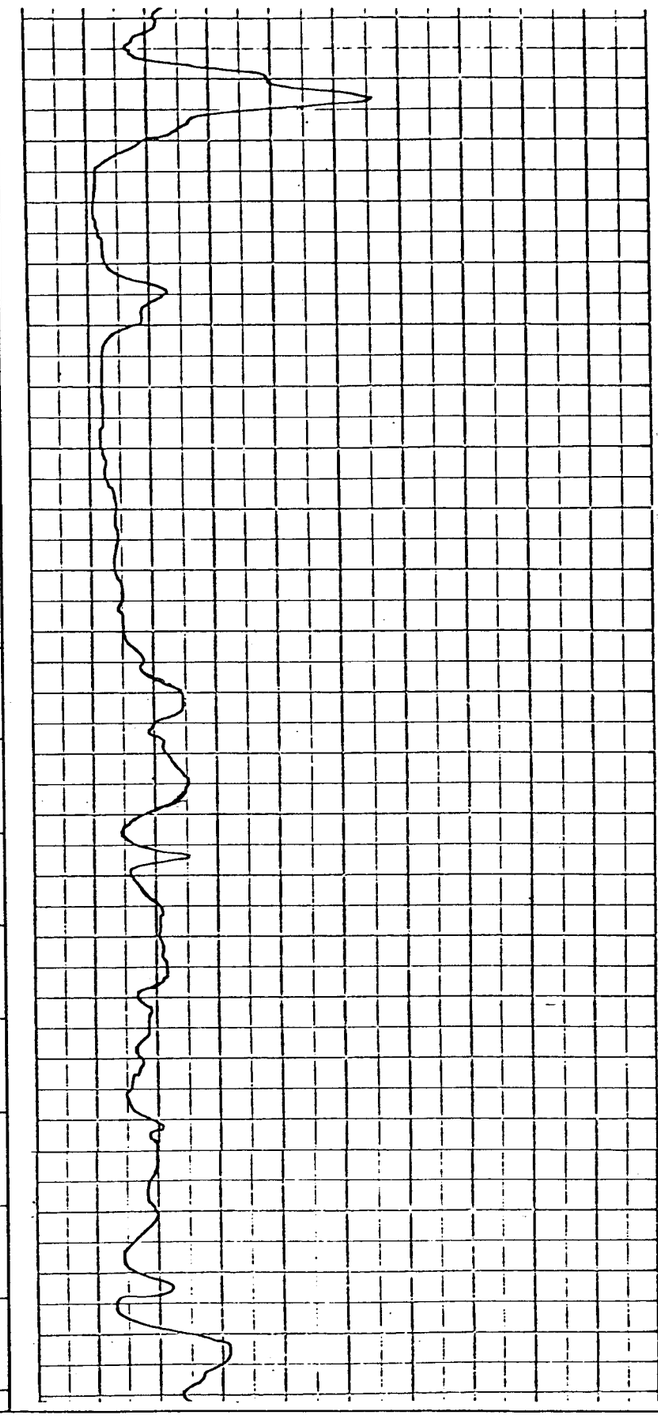
DRILL HOLE LOG

PROJECT UJV HOLE JH3 LOCATION Zone 52 CORE SIZE BQ STARTED 18/07/79 FINISHED 21/07/79

CLAIM GROUP TOMBSTONE LENGTH 388' DIP -50° AZIMUTH 000° COLLAR ELEVATION 4929' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY ppm U	ppm Cu	ppm Mo	ppm Ag	% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
		20/BKGD								
Biotite altered pseudoleucite tinguaite continues to appear with lenses of fresh pseudoleucite tinguaite. The altered rock is only weakly foliated, however the pseudoleucite and orthoclase phenocrysts have been brecciated, producing 2-4mm angular fragments. The groundmass is darker grey than if found in most of the altered tinguaite. Pyrrhotite is commonly 1/4-1% of the rock. The fracture density is <1/ft.	H46341	50/BKGD	200	8	2	0.4				230
	H46342	30/BKGD	60	8	1	0.4				235
236.5': a 2mm salt and pepper syenite dyke parallels foliation which is perpendicular to the core axis.										
239.7'-240.0': stressed pseudoleucite phenocrysts have produced oblong phenocrysts with a swirly irregular foliation.	H46343	20/BKGD	30	10	3	0.2				240
	H46344	BKGD	20	8	1	0.4				245
Biotite altered pseudoleucite tinguaite breccia predominates over unaltered lenses. Fracture density still low. Minor disseminated fine grained pyrrhotite, however less abundant than in radioactive zones.									30° to 40°	
		40/BKGD								
251.6'-252.3': 3mm wide orthoclase-biotite syenite dykelet runs subparallel to the core axis.	H46345		20	16	3	0.6				250
Altered pseudoleucite tinguaite still predominates over unaltered pseudoleucite tinguaite. In all cases the groundmass is medium grey. Pyrrhotite rarely exceeds 1/4%. As before the alteration is defined by the presence of biotite apparently after nepheline in the pseudoleucite phenocrysts and to a lesser extent in the groundmass. Weak foliation of biotite and phenocrysts is common, however the attitudes are inconsistent. Fracture density 1/ft. Orthoclase phenocrysts are frequently brecciated but are unaffected by alteration. Where the pseudoleucite phenocrysts are not altered to biotite they are frequently very pale. The pseudoleucite phenocrysts in the unaltered lenses are subhedral to euhedral, white and very prominent.	H46346		40	12	3	0.6				255
	H46347		50	10	2	0.2	100			260
	H46210		110	6	2	0.4				
264.5'-265.5': strongly foliated tinguaite cuts the core axis at 70°; paralleling this foliation are 2, 3mm salt and pepper syenite dykelets. Pyrrhotite is again common, comprising 1/4-1/2% of the rock between 265.0' and 270.0'.	H46321	40/BKGD	140	4	4	0.2				265
272.1'-272.3': 1cm, 5mm and 1mm fine grained, tan orthoclase and biotite dykelets cut altered tinguaite at 60° to the core axis.	H46322	30/BKGD	80	4	8	0.1				270
277.0'-286.5': a number of <1/2mm fractures cut the altered tinguaite at a wide variety of angles. Most are coated with white orthoclase although a few are coated with clay and in places pseudoleucite phenocrysts adjacent to the fractures have been altered to clay. The fracture density is 1-3/ft. A few fractures contain the same grey material observed in a fracture higher in the hole; this appears to be a gouge, and the fractures (usually cutting the core axis at about 30°) are probably small faults.	H46323	20/BKGD	90	12	3	0.4				275
	H46324	35/BKGD	60	12	1	0.2			30°	280
	H46348		80	10	4	0.4				285
286.7'-287.0': a 3mm wide salt and pepper syenite dykelet cuts the tinguaite at 30°. Fresh tinguaite is more abundant below this point than it has been in the previous 40'. The ratio of unaltered to altered rock is approximately 3:2. The fresh tinguaite is as previously described. The altered rocks are commonly brecciated; as before biotite replacement of the pseudoleucite fragments is the most common alteration. The fracture density is 1-3/ft. Most are filled with a hard, white mineral, probably orthoclase. Minor amounts of pyrrhotite are disseminated throughout the groundmass of both altered and unaltered tinguaites. Foliation is rare.		BKGD								290
	H46349	40/BKGD	50	4	5	0.4				
		BKGD								295
295.7': a 1cm wide medium grained syenite dykelet containing 5% pyrrhotite cuts the core axis at 45°. Altered and brecciated tinguaite again predominates over unaltered pseudoleucite tinguaite at a ratio of 2:1. Pyrrhotite is present in trace amounts. Fracture density <1/ft.	H46350	40/BKGD	130	6	3	0.4			30° to 45°	
										300

MOUNT SOPRIS
GAMMA PROBE LOG



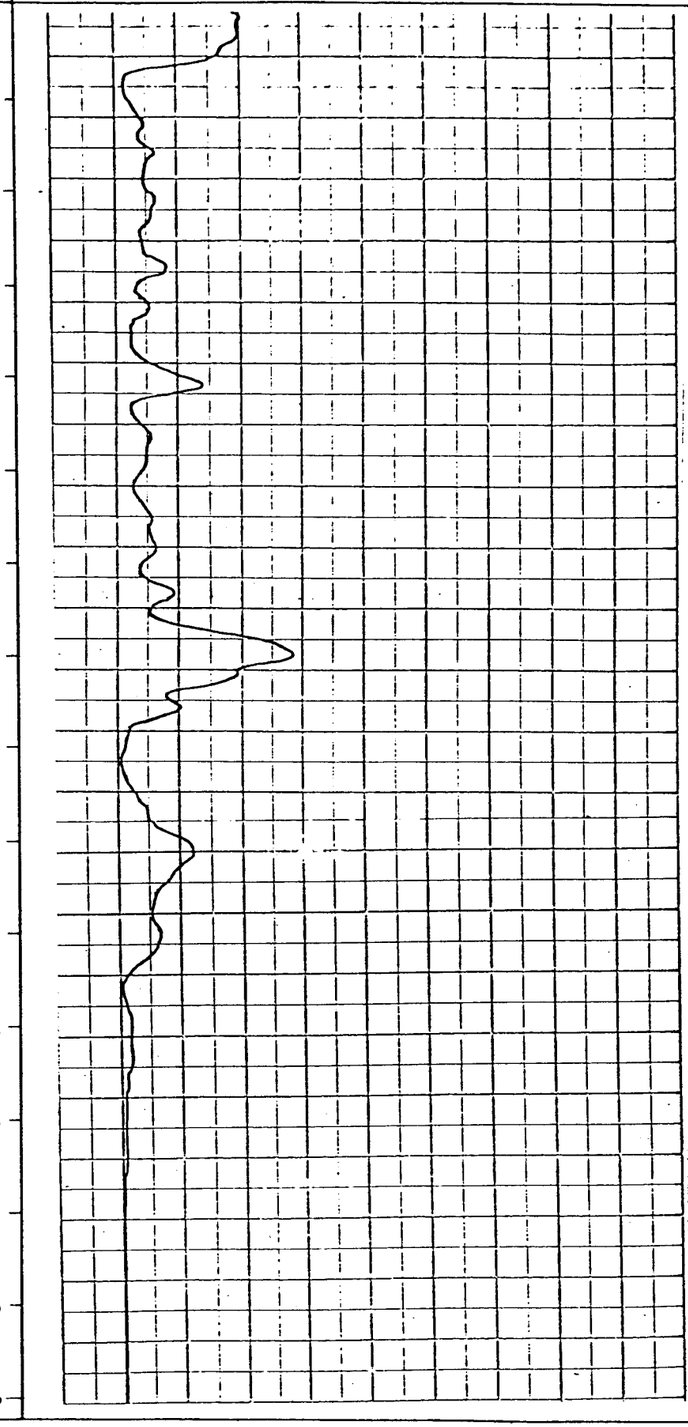
DRILL HOLE LOG

PROJECT VJV HOLE JH3 LOCATION Zone 52 CORE SIZE BQ STARTED 18/07/79 FINISHED 21/07/79

CLAIM GROUP JOMBJONG LENGTH 328' DIP -50° AZIMUTH 002° COLLAR ELEVATION 4329' DRILLED BY CAPON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8 ppm U)	ppm Cu	ppm Mo	ppm Ag	% RECOV	GEOLOGY	STRUCTURE (to core)	HOLE DEPTH (FEET)
	H46351		160	12	4	0.6				
	H46352	20/BKGD	40	12	3	0.4				305
309.7'-309.9': a 1cm wide, medium grained tan orthoclase and biotite syenite dykelet containing 5% pyrrhotite and a trace of purple fluorite cuts the tinguaite at 25° to the core axis.										
312.3': a 1/2mm wide, closed, 85° fracture is filled with orthoclase and pyrrhotite.	H46353		70	8	3	0.4			30° 85° 1/2'	310
	H46354	BKGD	30	8	3	0.4				315
										320
Biotite alteration not as extensive as above however brecciation is still common. Ratio of brecciated to fresh pseudoleucite tinguaite 3:2. Fracture density 2-3/ft. Pyrrhotite rarely exceeds trace. 324.4'-324.9': a 12cm wide dark grey-green mafic rich dyke cuts core axis at 45°. Alternatively, may be undigested xenolith of diabase.	H46355	30/BKGD	90	14	6	0.2				
326.0'-326.7': a 2mm wide syenite dykelet cuts core axis at 15°. A similar dykelet cuts across at 327.5'-327.9'.	H46356	BKGD	60	12	2	0.1				325
330.0'-330.5': tinguaite is strongly foliated and biotite altered. 332.6': 6mm wide light grey, orthoclase dykelet cuts syenite at 35°. Still traces of pyrrhotite in tinguaite.	H46357	20/BKGD	50	6	4	0.1				
335.0'-341.5': strongly brecciated and biotite altered tinguaite. Phenocryst fragments rarely exceed 3mm. Rock is moderately but erratically foliated. Fracture density 2-4/ft. Traces of disseminated pyrrhotite. Groundmass lighter than usual in tinguaite.	H46358		170	6	6	0.1	100		30° to 40° 70° to 85° 2-3/1'	330
										335
STRONGLY FOLIATED AND ALTERED TINGUAITE: the strongly foliated and altered tinguaite encloses fragments or lenses of unaltered tinguaite at a ratio of 10:1. Groundmass is much lighter than is normal for tinguaite exept in the unaltered portion of the rock. Fracture density is <1/ft. Foliation is somewhat erratic but cuts the core axis at 35° on the average. The pseudoleucite phenocrysts and fragments are almost completely altered to biotite while the orthoclase phenocrysts are unaltered. Pyrrhotite is virtually absent.	H46359		10	4	4	0.1				340
	H46360		80	4	5	0.2			35° to 45° 1/2'	345
352.6'-353.0': a 4mm wide medium grained orthoclase biotite syenite dykelet containing a trace of cancrinite or sodalite cuts the core axis at 10°.	H46361	BKGD.	30	6	18	0.1				350
354.5'-End of Hole: strongly foliated and biotite altered tinguaite exceeds unaltered tinguaite at a ratio of >50:1. The foliated rocks are as previously described with a light grey groundmass and a slightly sugary texture. The remaining fragments of pseudoleucite tinguaite are fainter than normal suggesting that they are slightly altered. Both mafic and phenocrysts are completely destroyed by biotite. Pyrrhotite is absent. The fracture density is <1/2/ft. Fractures where present cut the core axis at a high angle.	H46362		10	4	2	0.1				355
	H46363		<10	4	2	0.1				360
	H46364		<10	4	3	0.1			35° to 45° 1/4'	365
	H46365		<10	4	3	0.1				370
										375

MOUNT SOPRIS GAMMA PROBE LOG

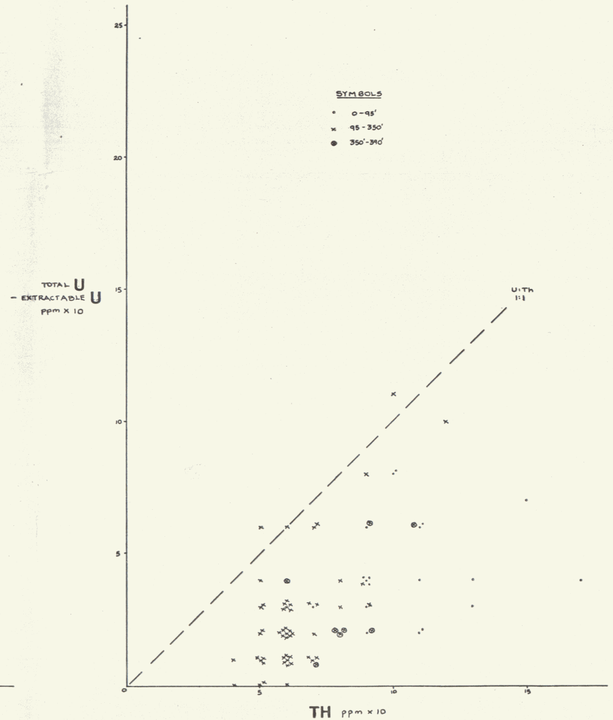


DRILL HOLE LOG

PROJECT UJV HOLE TH3 LOCATION Zone 52 CORE SIZE BQ STARTED 18/07/79 FINISHED 21/07/79

CLAIM GROUP TOMBSTONE LENGTH 388' DIP -50° AZIMUTH 000° COLLAR ELEVATION 4929' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY: %U_3O_8 ppm U	ppm Cu	ppm Mo	ppm Ag	% RECOV	GEOLOGY	STRUCTURE: L to core		HOLE DEPTH (FEET)	MOUNT SOPRIS GAMMA PROBE LOG
	H46366	BKGD	< 10	4	2	0.4	100		35° to 45°	1/4"	380	
	H46367		< 10	4	5	0.1					385	
	H46368		20	2	5	0.1					388	



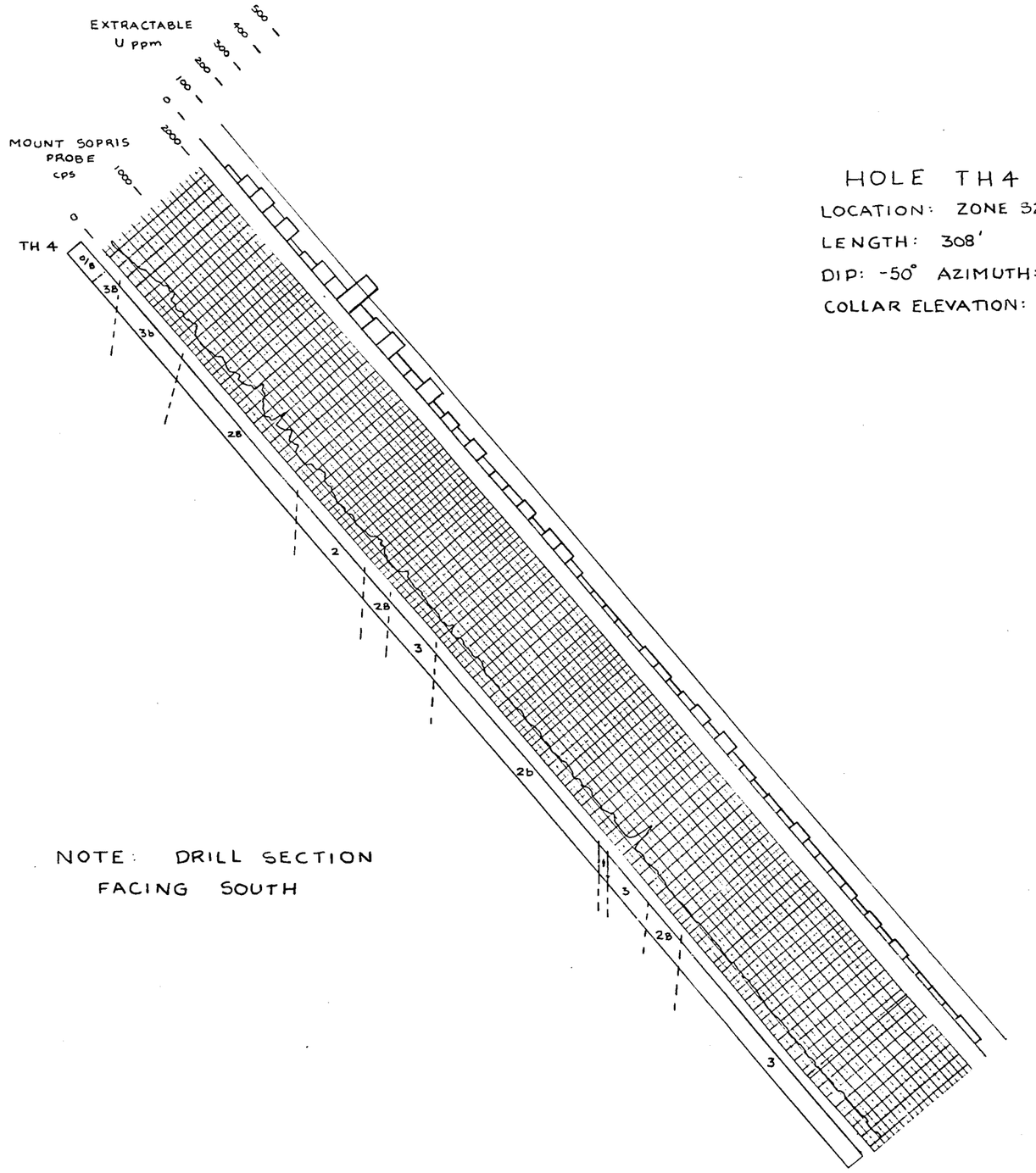
Association of Professional Engineers of the Yukon Territory
A. R. ARCHER
GEOLOGICAL
15 Jan/82
ENGINEER

TABLE U-TG17

ASSAY DATA HOLE TH3

TOMBSTONE PROPERTY

UKON JOINT VENTURE



NOTE: DRILL SECTION
FACING SOUTH

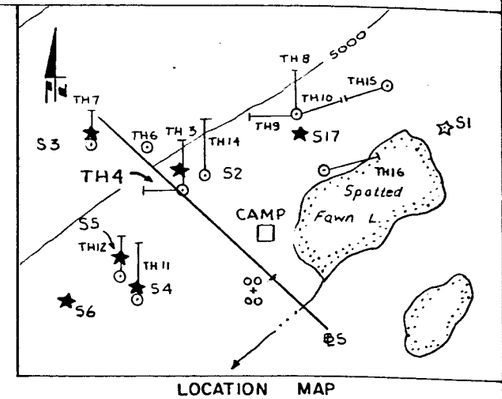
HOLE TH4

LOCATION: ZONE 32

LENGTH: 308'

DIP: -50° AZIMUTH: 270°

COLLAR ELEVATION: 4929'



LOCATION MAP

SCALE 1:10,000

100 50 0 100 200 300 400 500

metres

1 SYENITE tan weathering, medium to coarse grained nepheline syenite often with abundant sulphides and purple fluorite

2 PSEUDOLEUCITE TINGUAITE 5-30%, 3-20mm pseudoleucite phenocrysts 1-10mm orthoclase phenocrysts in a medium grey, aphanitic groundmass

3 SHEARED TINGUAITE foliated and/or auto-brecciated tinguaite often biotite altered

4 MIXED TINGUAITE lenses or bands of pseudo-leucite phenocrysts in sheared tinguaite groundmass

5 FINE GRAINED TINGUAITE medium to dark grey tinguaite without pseudoleucite phenocrysts, some 1-3 mm orthoclase phenocrysts. Usually as dykes

6 INTERMEDIATE TINGUAITE medium grey tinguaite with pseudoleucite orthoclase phenocrysts. Pseudoleucite phenocrysts smaller than usual

B,b BIOTITE ALTERATION . intense, moderate

C,c CHLORITE ALTERATION intense, moderate

——— – – – geologic contact: sharp, gradational

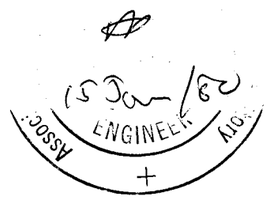


FIG. U-TG 18

ARCHER, CATHRO & ASSOCIATES LTD

SECTION TH4

TOMBSTONE PROPERTY

UKON JOINT VENTURE

SCALE 1:400

4 2 0 4 8 12 16 20

metres

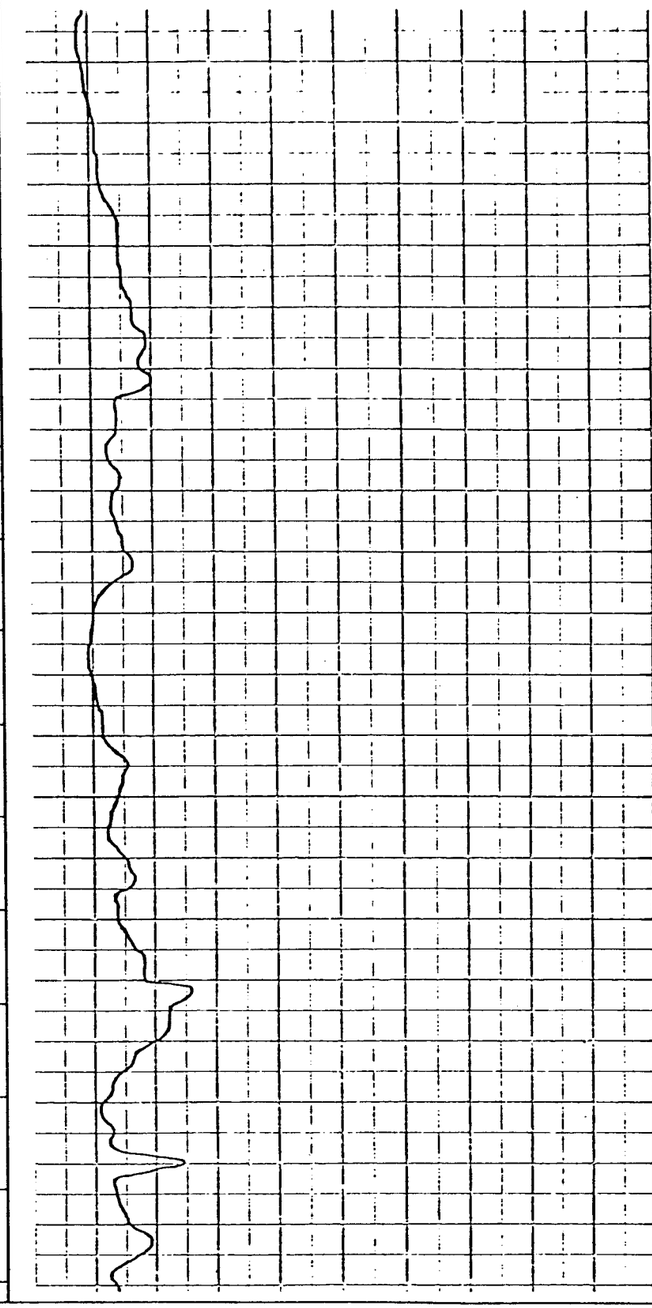
DRILL HOLE LOG

PROJECT DJV HOLE TH4 LOCATION - CORE SIZE BQ STARTED 22/07/79 FINISHED 24/07/79 PAGE 1 OF 5

CLAIM GROUP TOMBSTONE LENGTH 308' DIP -50° AZIMUTH 270° COLLAR ELEVATION 4929' DRILLED BY CABON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8) ppm U	ppm Cu	% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
OVERBURDEN: syenite and tinguaite boulders in soil; mixture of glacial talus and in situ material.					13%		70° 0°	10/1' 15/1'	5
SHEARED AND ALTERED PSEUDOLEUCITE TINGUAITE: the rock originated as normal plt but has been affected by stresses and hydrothermal solutions. 9.0'-18.0': moderate to strong biotite alteration of pl phenocrysts. Where moderate, alteration rims the phenocrysts or partially replaces the core; where strong, the pl phenocrysts are wholly altered to biotite. The groundmass of the altered plt is lighter than usual and has a weak pinkish tint. Limonite stains most fractures and floods the wall rocks adjacent to the stronger fractures; flooding is 2 mm to 10 mm wide. Between 9.5' and 20.0' a number of 1-4mm, dark green to black, amphibole (?) filled, 5-20° fractures cut the tinguaite. The strongest of these fractures are accompanied by 8 mm to 15 mm bleached alteration envelopes. These amphibole filled fractures are weakly radioactive (10 over background). Traces of pyrite and chalcopyrite occur with the amphiboles. 18.0'-43.0': MIXED TINGUAITE: the tinguaite has been strongly foliated and brecciated with narrow bands or lenses of normal plt up to 5 cm thick occurring at approximately 0.5 m intervals. The foliation cuts the core axis at 30-40°. In the foliated rock only the orthoclase phenocrysts survive as the pl phenocrysts have been flattened out and moderately altered to biotite. The brecciated rocks are weakly foliated. Limonite staining is weak. Most fractures are filled with a hard white mineral, probably orthoclase. 24.8'-25.3': a whispy, medium grained, leucocratic syenite dyke with 25%, 1/2 to 1 mm, black pyroxene crystals and a distinct compositional banding cuts the tinguaite at 30°, which is parallel to the foliation. 35.0'-36.0': at this point the foliation within the tinguaite is subparallel to the core axis.	H46211		22		95%		70° 65° 20° TO 30°	10/1' 3/1' 1/1'	10
	H46212		53						15
	H46213		62				60° 30°	1-3/1' 1/1'	20
	H46214		47						25
	H46215		57						30
39.0': foliation once again cuts the core axis at 30°.	H46216	BKGD	21				50° TO 70°	1/1-3'	35
43.0'-90.0': ALTERED TINGUAITE: strong biotite alteration of the pl phenocrysts is the most noteworthy aspect of the tinguaite. The rock is only weakly sheared. A trace of blue feldspathoid, probably sodalite, but possibly blue cancrinite, occurs in a few pl phenocrysts. Minor amount of this mineral can be observed over the next 100 ft. The rock is massive with only a very weak limonite staining on the open fractures.	H46217		26		100%		20°	1/5-10'	40
	H46218		58						45
	H46219		63						50
	H46220		147						55
60.1'-60.7': a 4 mm wide, 20° fracture is filled with calcite, limonite, pyrite, chalcopyrite, almost black purple fluorite and a trace of molybdenite. 61.7'-61.8': a 1 mm, 20° fracture is filled with calcite, silvery pyrite(?) or arsenopyrite(?), chlorite, and very dark purple fluorite. 62.4'-62.7': a 1 mm, 20° fracture is filled with pyrite, chalcopyrite, purple fluorite and limonite.	H46221		55				60° TO 70° 30°	1/1-2' 1/5'	60
	H46222		65						65
The tinguaite is as previously described with calcite and/or weak limonite coating most fractures. A few fractures are weakly chloritized. Biotite alteration is still the dominant characteristic of this altered plt, although there is also minor white to cream clay(?) alteration.	H46223		81						70
									75

MOUNT SOPRIS
GAMMA PROBE LOG



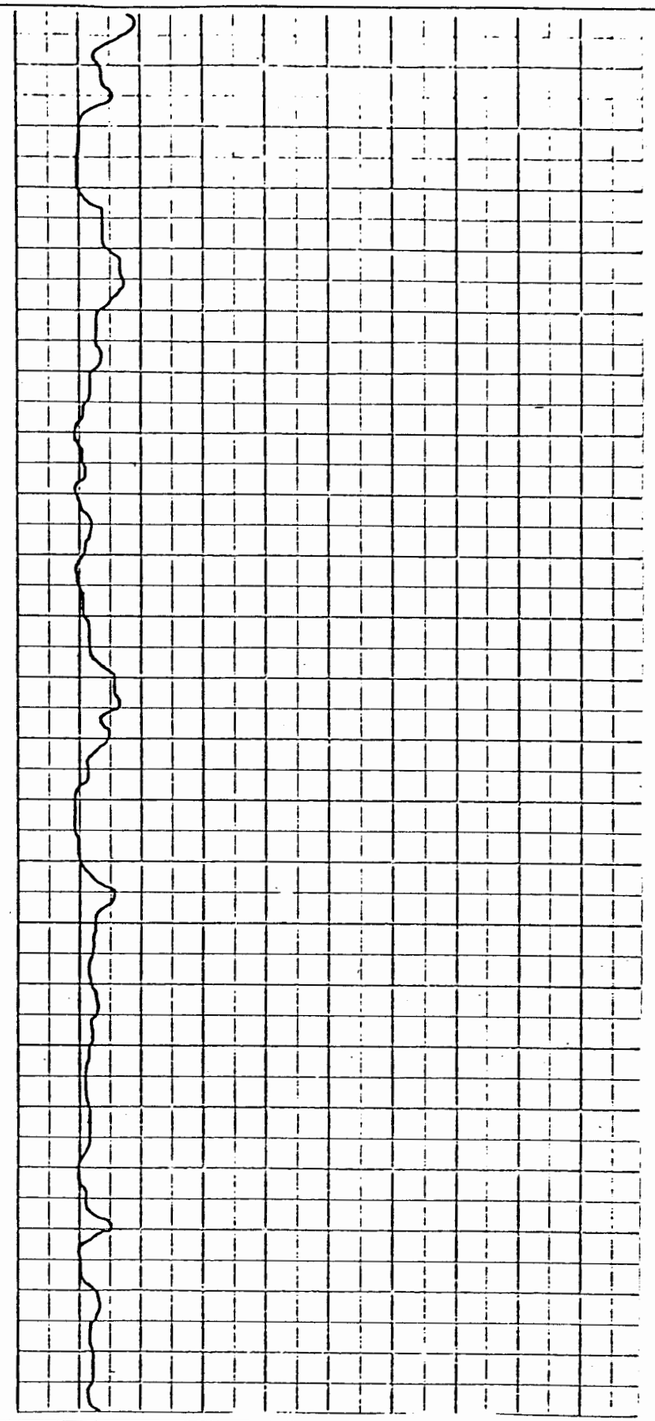
DRILL HOLE LOG

PROJECT UJV HOLE TH4 LOCATION - CORE SIZE BQ STARTED 22/07/79 FINISHED 24/07/79

CLAIM GROUP TOMBSTONE LENGTH 308' DIP -50° AZIMUTH 270° COLLAR ELEVATION 4929' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS–ISL	GEOCHEMISTRY AND ASSAY (%U3O8 ppm U)	GEOCHEMISTRY AND ASSAY (ppm Cu)	% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
	H46224		37					80
	H46225		42					
	H46226	BKGD Rare small patches 10-20/BxGD	67				30° 1/5-10'	85
88.2'-88.3': a <1/2 mm wide, 20° chloritized fracture contains arsenopyrite.							50° to 60° 1/1-3'	
GRADATIONAL CONTACT: PSEUDOLEUCITE TINGUAITE: the rocks are predominantly plt, often exhibiting weak biotite ? clay alteration with narrow bands of more strongly altered rock. The plt consists of 3-12 mm, anhedral to subhedral, white to light grey pl phenocrysts comprising 15-25% of the rock, and 2-15 mm, white, prismatic to stubby orthoclase phenocrysts, comprising 5-20% of the rock, in a medium grey aphanitic groundmass. The plt is locally slightly stressed in intermittent < 5 cm bands. The rocks are massive with only faint limonite stains on fractures.	H46227		23					90
	H46228		36					95
	H46229		27					100
	H46230		49					105
	H46231		25		100%		50° to 60° 1/3-5'	110
	H46232		32					115
	H46233		32					120
GRADATIONAL CONTACT: ALTERED PSEUDOLEUCITE TINGUAITE: 117.0'-125.0': the pl phenocrysts start to become very indistinct, taking on a medium grey color similar to the groundmass; this may be due to some form of alteration (sericite?). Some biotite alteration has also occurred. The net effect is that of a nearly aphanitic rock. The orthoclase phenocrysts are unaffected but generally comprise < 5% of the rock. A few bands of plt are surrounded by the altered rock. The rock is still massive with only faint yellow limonite stains and an unidentified white mineral coating the fractures. Weak foliation is often present at ~30° to the core axis. 122.3': another < 1/2 mm, 20° chloritized fracture contains arsenopyrite. GRADATIONAL CONTACT: MIXED TINGUAITE: 125.0'-144.5': 5-20 cm wide lenses of relatively unaltered or weakly biotite altered plt is surrounded by foliated and/or brecciated tinguaite. The shear sense is generally 30-45° to core axis, however locally it can be quite erratic such as at 136.0' where it bends 60° over a one foot interval. Biotite alteration of the pl phenocrysts in the sheared rocks is weak to moderate. The groundmass of the most intensely foliated rocks is commonly much lighter grey than is usual. Limonite is slightly stronger in these rocks than in the previous interval, but is still quite weak.	H46234		35					125
	H46235		23				50° to 60° 1/3'	130
	H46236	BKGD	36				30° to 40° 1/10'	135
140.5': a 3 mm wide, 35° fracture is filled with white orthoclase selvage and a weakly chloritized, mafic core containing minor pyrite.								140
	H46237		39					
144.5': GRADATIONAL CONTACT: ALTERED TINGUAITE: the plt is generally unaffected by shearing, however the pl phenocrysts are moderately altered to biotite. The biotite appears to have selectively replaced parts of the phenocrysts. The alteration is most intense in the smaller phenocrysts and on the rims of larger phenocrysts. In addition to the biotite alteration, many of the phenocrysts have gone to the medium grey color and a few exhibit a pink tint. Orthoclase phenocrysts in this section are somewhat larger and more abundant than usual. Orthoclase phenocrysts up to 2 cm long are not uncommon. Locally the ratio of orthoclase to pl phenocrysts is as high as 1:1 however 3: 1 is more typical.	H37399		33					145
								150

MOUNT SOPRIS GAMMA PROBE LOG



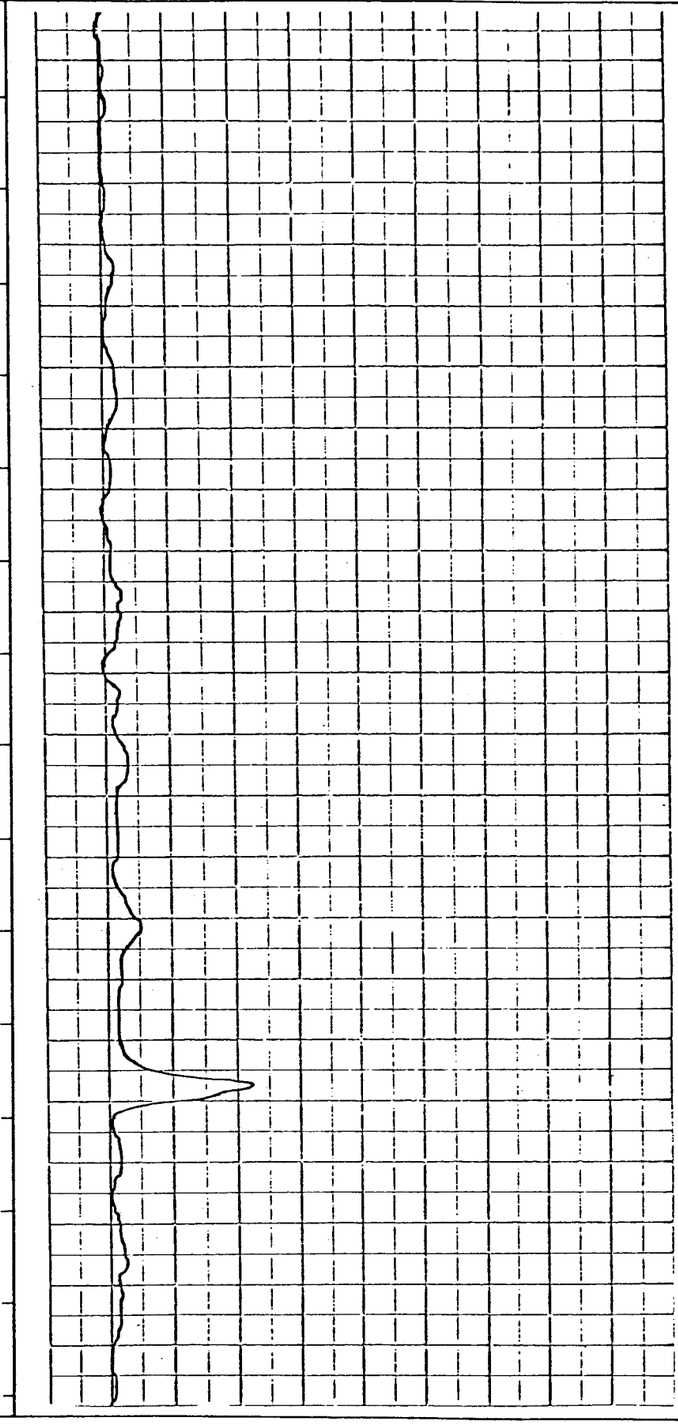
DRILL HOLE LOG

PROJECT JJV HOLE TH4 LOCATION - CORE SIZE BQ STARTED 22/07/79 FINISHED 24/07/79

CLAIM GROUP TOMBSTONE LENGTH 322' DIP -50° AZIMUTH 270° COLLAR ELEVATION 4929' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8) ppm U	ppm Cu			% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
	H37400		20.5								
	H37401		17.0						40°	1/5'	155
	H37402		22.0						70°	1-2/5'	160
167.5'-170.7': Foliated, weakly altered plt: foliation and alteration are not severe enough to completely eradicate the pl phenocrysts. Foliation is at 45° to the core axis. Traces of pyrrhotite and limonite at 170.0'.	H37403		24.5								165
170.7'-207.0': weak to moderate alteration of plt. Partial destruction of pl phenocrysts by biotite is the most common alteration, but medium grey, indistinct alteration and the pinkish tint are still present. Minor <5 cm brecciated bands exhibit weak foliation. Such a band at 87.4' is inclined at 65° to the core axis. Calcite and chlorite are the most common minerals on fractures. Very weak limonite stains coat a few fractures. Where chlorite is most prevalent the biotite in altered pl phenocrysts adjacent to the fractures is occasionally altered to chlorite. The rock is massive.	H37404		22.5								170
	H37405		28.0						30°	1-2/5'	175
	H37406	BKGD	31				100%		30° to 70°	1-2/5'	180
	H37407		23.5								185
	H37408		31								190
195.0': Biotite alteration is slightly stronger than usual at this point.	H46238		41								195
199.5': Narrow, <3 cm wide, band of moderately foliated rock cuts the core axis at 35°.	H46239		34						60°	1/5'	200
									30°	1-2/5-6'	205
207.0'-208.9': SYENITE DYKE: a highly sericitized, pale green, fine to medium grained, 35 cm wide syenite dyke cuts the core axis at 45°. The lower 10 cm of the dyke is yellow brown due to pervasive limonite staining. Minor residual pyrite is still present in parts of the dyke; most of it is highly pitted. Although the rock looks weathered, given the depth and the state of the surrounding tinguaites, the alteration is probably hypogene. Adjacent to the dyke are 10 cm wide, dark green envelopes of altered and foliated plt. The foliation parallels the dyke at 45° to core axis. The alteration appears to be sericitization and has affected the entire rock including the orthoclase phenocrysts. The alteration envelope contains minor amounts of pyrite. The dyke is moderately radioactive (100 over background).	H46240	100/BKGD	53								210
	H46241		31								215
208.9'-226.5': This plt has undergone proportionally less alteration and greater stress, producing a fresh to weakly altered and weak to moderately foliated rock. The stress has flattened the plt phenocrysts to produce a foliation which cuts the core axis at 35°. The most intense foliation (at 30°) and alteration lies between 219.1' and 222.2'. From 222.2' to 226.5' the plt is almost fresh and only slightly foliated. The open fractures are usually coated with minor calcite, while the closed fractures are filled with white orthoclase.	H37409	BKGD	30								220
	H37410		17.0								225

MOUNT SOPRIS
GAMMA PROBE LOG



DRILL HOLE LOG

PROJECT UJV HOLE IH4 LOCATION - CORE SIZE BQ STARTED 22/03/79 FINISHED 23/03/79

CLAIM GROUP TOMBSTONE LENGTH 308' DIP -50° AZIMUTH 270° COLLAR ELEVATION 4929' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8) ppm U	ppm Cu	% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
226.5'-229.0': the plt is essentially unstressed but the pl phenocrysts are strongly altered to biotite.	H37411		26		100%		30° 1-2½'	230
229.0'-231.9': this plt is stressed, however over this interval, foliation is weak. Many of the orthoclase phenocrysts are broken, producing a breccia with fragmental orthoclase and moderate to strongly altered pl phenocrysts at a ratio of 1:2. The pl phenocrysts appear to have behaved in a relatively plastic manner to the stress. 231.9'-243.0': the matrix of the plt becomes darker possibly due to higher biotite content. Orthoclase phenocrysts > pl phenocrysts. Pl phenocrysts are still strongly altered to biotite. 234.2'-235.4': a band of moderately foliated plt cuts the core axis at 70°.	H37412		25.0		10%		60° 1'5'	235
	H37413		35					240
243.0': GRADATIONAL CONTACT: altered plt to MIXED TINGUAITE: 243.0'-262.0': Narrow bands or lenses, 5-10 cm wide of normal plt are surrounded by weakly foliated and/or brecciated plt at a ratio of 1:3. The normal plt contains 3-12 cm, white to light grey, zoned, anhedral pl phenocrysts, comprising 15-20% of the rock, and white, 2 mm -11mm, subhedral to euhedral, generally prismatic orthoclase phenocrysts comprising 10-15% of the rock, in a medium grey, aphanitic groundmass. The pl phenocrysts are frequently cracked with biotite in the cracks. The sheared tinguaite is composed of 1 to 6 mm orthoclase and pl phenocrysts and phenocryst fragments in a medium grey, aphanitic goundmass. The pl phenocrysts in the sheared rock are often weakly altered to biotite. The sheared rock is rarely well foliated. At 250.0' the foliation cuts the core axis at 35° while at 261.0' it is at 30°. The rock is massive with white orthoclase and calcite as the major fracture fillers.	H37414		29					245
	H37415		25					250
	H37416		28				30° 1'5'	
	H37417	BKGD	27				60° to 70° 1-2½'	255
262.0': the rock is still mixed tinguaite, however below this point normal plt is more prominent; it occurs at a plt to sheared tinguaite ratio of 1:1. The plt is as described above except that locally the pl to orthoclase ratio approaches 1:1 and the pl phenocrysts are generally better formed. In the sheared rock, weakly foliated, brecciated plt is still much more abundant than well foliated tinguaite. Biotite alteration of the sheared rock varies from weak to very strong. Where alteration is strongest the matrix appears darker than usual, mainly due to the biotite rich pl phenocryst ghosts.	H37418		18.0					260
	H37419		27		100%			265
271.6': a fine grained, 5-10mm, white to pink orthoclase and minor pyroxene syenite dykelet cuts the sheared tinguaite at 45° to the core axis. This parallels the foliation of the rock.	H37420		20.0				30° to 40° 1/5-10'	270
	H37421		26				60° 1/15'	275
	H37422		20.5					280
288.8': clay coating open fracture has a tan coloration due to limonite(?).	H37423		19.5					285
	H37424		23.5				30° 1/10'	290
	H37425		22.5				60° 1/3-5'	295
298.7': moderate foliation or brecciated plt at 45° to core axis.								300

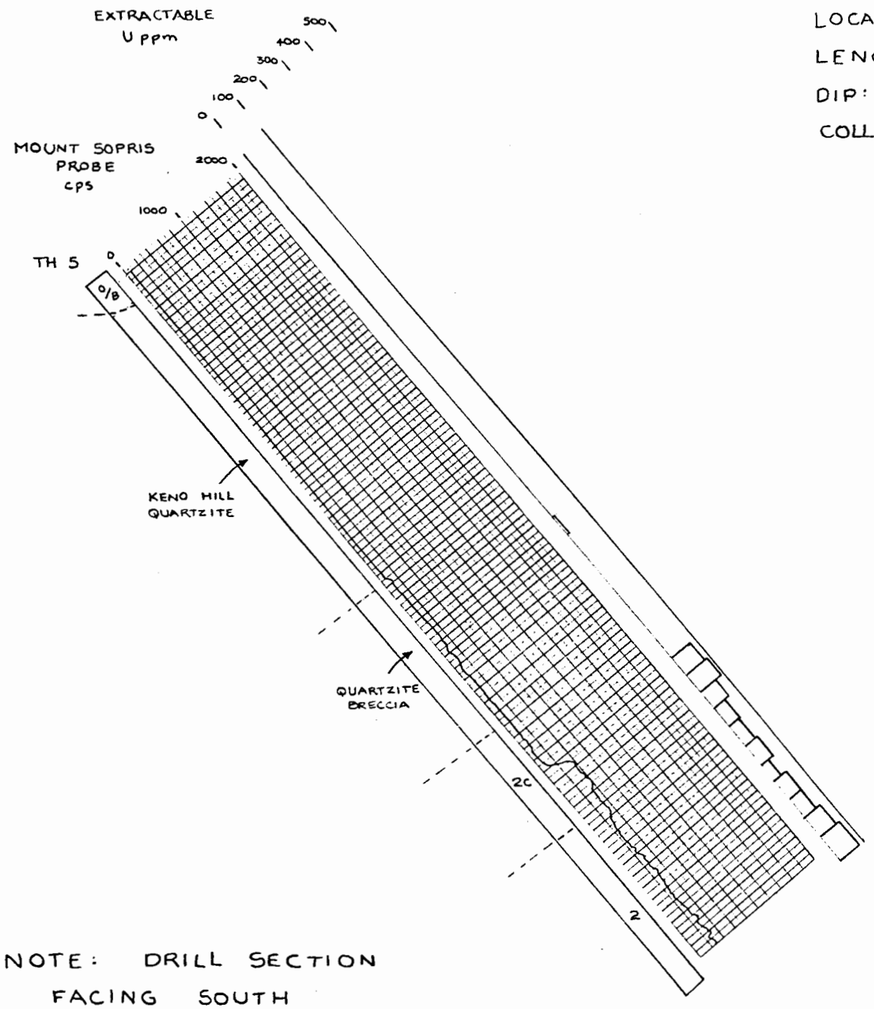
MOUNT SOPRIS GAMMA PROBE LOG

DRILL HOLE LOG

PROJECT UIV HOLE IH4 LOCATION — CORE SIZE BQ STARTED 22/07/79 FINISHED 24/07/79

CLAIM GROUP TOMBSTONE LENGTH 306' DIP -50° AZIMUTH 270° COLLAR ELEVATION 4929' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8) ppm U	ppm Cu			% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)	MOUNT SOPRIS GAMMA PROBE LOG
	H37426	BKGD	26				100%			305	
306.6': weak foliation of brecciated and biotite altered plt suggests shearing at 30° to core axis. A 1-3 mm wide breccia band is rich in biotite and pyrite.										308	



NOTE: DRILL SECTION
FACING SOUTH

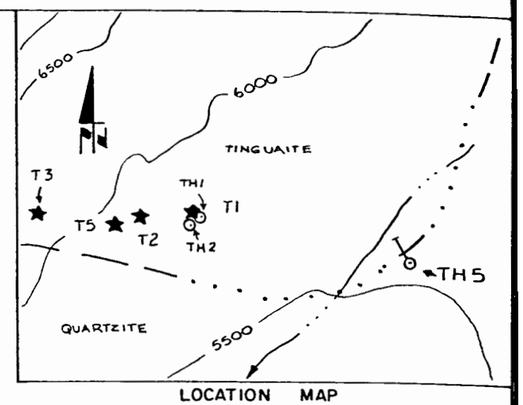
HOLE TH5

LOCATION: CONTACT

LENGTH: 202'

DIP: -50° AZIMUTH: 330°

COLLAR ELEVATION: 5000'



LOCATION MAP

SCALE 1:10,000

100 50 0 100 200 300 400 500

metres

[1] SYENITE tan weathering, medium to coarse grained nepheline syenite often with abundant sulphides and purple fluorite

[2] PSEUDOLEUCITE TINGUAITE 5-30%, 3-20mm pseudoleucite phenocrysts 1-10mm orthoclase phenocrysts in a medium grey, aphanitic groundmass

[3] SHEARED TINGUAITE foliated and/or auto-brecciated tinguaite often biotite altered

[4] MIXED TINGUAITE lenses or bands of pseudo-leucite phenocrysts in sheared tinguaite groundmass

[5] FINE GRAINED TINGUAITE medium to dark grey tinguaite without pseudoleucite phenocrysts, some 1-3 mm orthoclase phenocrysts. Usually as dykes

[6] INTERMEDIATE TINGUAITE medium grey tinguaite with pseudoleucite orthoclase phenocrysts. Pseudoleucite phenocrysts smaller than usual

B,b BIOTITE ALTERATION . intense, moderate

C,c CHLORITE ALTERATION intense, moderate

——— – – – geologic contact: sharp, gradational

15 Jan/80

FIG. U-TG19

ARCHER, CATHRO & ASSOCIATES LTD

SECTION TH5

TOMBSTONE PROPERTY

UKON JOINT VENTURE

SCALE 1:400

4 2 0 4 8 12 16 20

metres

DRILL HOLE LOG

PROJECT UJV HOLE TH 5 LOCATION CONTACT CORE SIZE BQ STARTED 26/07/79 FINISHED 28/07/79 PAGE 1 OF 3

CLAIM GROUP TOMBSTONE LENGTH 202' DIP -50° AZIMUTH 330° COLLAR ELEVATION 5000' DRILLED BY CABON LOGGED BY PHILLIPS EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8) ppm U	ppm Cu	ppm Mo	% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)	MOUNT SOPRIS GAMMA PROBE LOG
OVERBURDEN: mixed quartzite, syenite and tinguaite boulders, in part glacially transported.	H37427		0.5		1	31				5	
ORTHOQUARTZITE: light grey to white (bleached?), massive, fine grained, often with massive light greenish patches and irregular limonite staining, usually associated with fractures. Very fine disseminated pyrite estimated at 1/4%. Pyrite on fractures generally gone to limonite (goethite≈jarosite). Weak calcite and cream colored dolomite filling hairlike cracks and along stronger 70° and 30° fractures. Residual bedding is poorly preserved and cuts the core axis at 60°.	H37428		0.5		1	88				10	
	H37429		0.5		2	83				15	
						80		30°	1/2'		
						100				20	
	H37430		0.5		1	95		60° TO 70°	1/1-2'		
	H37431		0.5		1					25	
Mottled, light grey, blue grey and in part greenish grey due to thermal metamorphism. Dusting of calcite along fractures, rarely with limonite. Cash fractures up to 2mm, average 1mm, filled with white to cream dolomite.	H37432	BKGD	0.5		1					30	
	H37433		0.5		1			60° TO 70°	1/1-2'	35	
42.3': a 1 cm wide, light grey syenite dykelet cuts quartzite at 50°.	H37434		0.5		1	100		30° TO 40°	2/1'	40	
	H37435		0.5		1					45	
	H37436		0.5		2					50	
58.5': 30° fracture with weak dusting of calcite and irregular 1-4mm dark green alteration envelope.	H37437		0.5		1					55	
	H37438		0.5		2			30°	1-2/5'	60	
	H37439		0.5		1			50° TO 60°	1/1'	65	
69.0': increasing fine crack fracturing; rock becomes mottled, light reddish color due to weak limonite flooding border of fractures. Stronger limonite and calcite on fractures.	H37440		0.5		1					70	
										75	

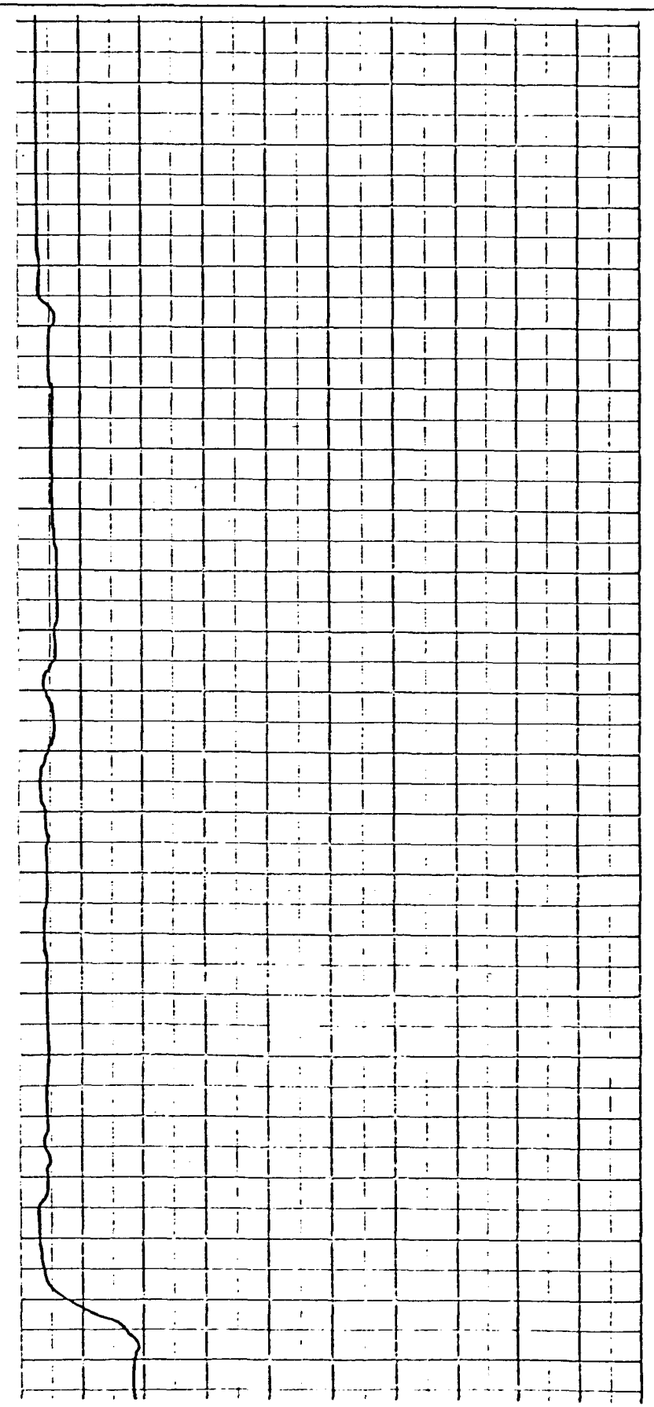
DRILL HOLE LOG

PROJECT UJV HOLE TH 5 LOCATION CONTACT CORE SIZE BQ STARTED 26/07/79 FINISHED 28/07/79

CLAIM GROUP TOMBSTONE LENGTH 202' DIP -50° AZIMUTH 330° COLLAR ELEVATION 5000' DRILLED BY CARON LOGGED BY PHILLIPS EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8 ppm U)	ppm Cu	ppm Mo		% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
ORTHOQUARTZITE: as previously described: weak limonite coats many fractures, occasionally fills strong fractures, little or no residual sulphides. After 75' calcite is the main fracture filling mineral; dolomite is rare.	H37441		0.5		1				30° 1-3/1'	80
	H37442		0.5		1				60° 1/1-2'	
	H37443		0.5		1				ABUNDANT FINE FRACTURES 0° TO 30°	85
91.0': SHARP 30° CONTACT: between orthoquartzite and breccia. MIXED BRECCIA: very tight breccia with subrounded fragments mainly composed of dark grey to white quartzite and black, massive to banded slate exhibiting plastic deformation. Less common are fragments of light colored, fine grained intrusive, which looks like syenite but may be altered diabase, and grey-green hornfels fragments probably after siltstone. The matrix appears to be tinguaite although radiometrics suggest it is not. It is medium grey with abundant stubby orthoclase phenocrysts, 2-5mm across, in an aphanitic groundmass. Pseudoleucite phenocrysts are absent or blend into the groundmass. The fragments in the breccia range in size from a few mm up to 20 mm in diameter. The fragments are generally well packed and comprise between 30-75% of the rock. Generally the more competent the rock, the smaller the fragments.	H37444		4.0		4					90
98.7': a 2mm, 10-20° fracture is filled with calcite and weak limonite. 105.0': below this point the dominant mineral on fractures is black to dark green chlorite; however several fractures are heavily coated with limonite and minor residual pyrite (<1/4%). A few blebs of pyrite are disseminated through the groundmass. 110.0': Fragments are mainly grey blue quartzite and fine grained pyroxene (diabase?)-syenite with occasional pyritic slate fragments. The diabase-syenite is altered. Chlorite and a pink mineral (zoesite?) have replaced most of the pyroxene. 110.6': dark green, very fine grained fragments become common. Although they look like altered volcanic, their hardness suggests that they are hornfels after dirty quartzite. 114.0': a 1 cm bleb of pyrrhotite > chalcopyrite. 117.1': a transition occurs in the size and composition of the fragments. While all types are still present, large altered diabase fragments dominate the breccia. They are composed of dark green pyroxene and chlorite after pyroxene and cloudy sericitized (?) feldspars. These rocks vary from relatively fine grained to coarse grained. They are cut by a few veinlets and bands up to 20 cm wide of the groundmass.	H37445		7.0		6				60° 4/1'	95
	H37446		7.5		8				30° 1/2-3'	100
	H37447	BKGD	12.5		12		100			105
	H37448		5.0		4				30° 1-3/1'	
	H37449		2.0		2				60° 1/1'	110
	H37450		4.0		4					115
127.0': altered dark and lighter grey quartzite looks stressed (foliated) but this may be original compositional banding.	H37451		2.5		2					120
	H37452		2.5		2				30° 2/3-5'	125
134.0': up to 20mm fractured and brecciated fragments of dark gery quartzite and dark grey-green intrusive. Minor white quartzite.	H37453		35		4				60° 1/3-5'	130
140.0': diabase fragments dominate breccia.										135
144.5': SHARP CONTACT: breccia to altered pseudoleucite tinguaite. Strong, 1 cm wide, gash calcite veining just past contact. ALTERED PSEUDOLEUCITE TINGUAITE: pervasive epidote alteration has produced a pale green streaked with dark green, aphanitic groundmass which is locally flooded with light brown limonite stains adjacent to fractures and slightly darker green, weakly calcareous, anhedral, 2-4mm pseudoleucite phenocrysts. Orthoclase phenocrysts are small, rare, and only weakly altered. Traces of fresh pyrite are disseminated in the groundmass. 147.0': a 1mm, 40° fracture contains minor purple fluorite. Away from the contact alteration decreases so that small patches of relatively unaltered pseudoleucite tinguaite are preserved. In this area milky white clay(?) and biotite alteration affect most of the phenocrysts.	H37454		2.0		2					140
	H46242		79		16					145
										150

MOUNT SOPRIS GAMMA PROBE LOG



DRILL HOLE LOG

PROJECT UJV HOLE TH5 LOCATION CONTACT CORE SIZE BQ STARTED 26/07/79 FINISHED 28/07/79

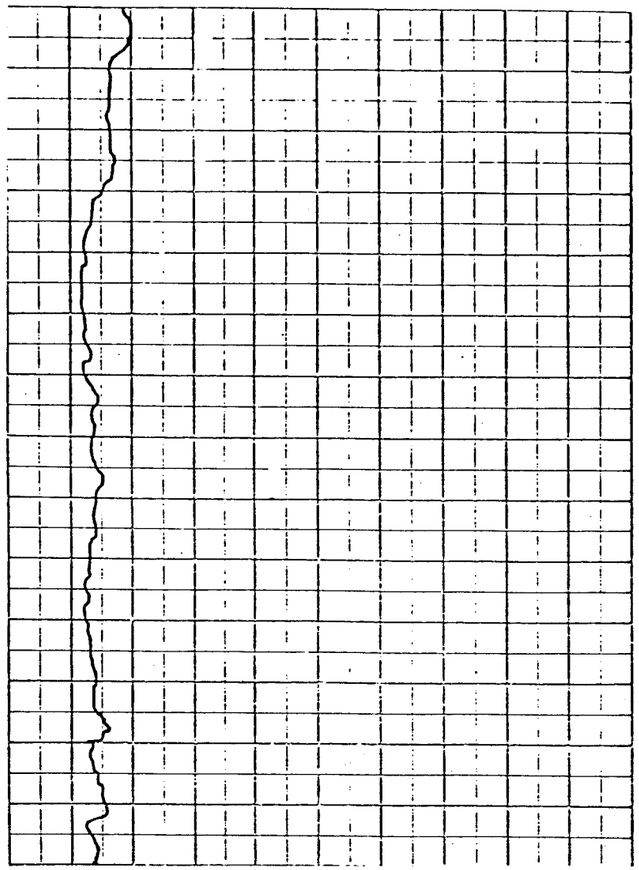
CLAIM GROUP TOMBSTONE LENGTH 202' DIP -50° AZIMUTH 330° COLLAR ELEVATION 5000' DRILLED BY CAPON LOGGED BY PHILLIPS EATON

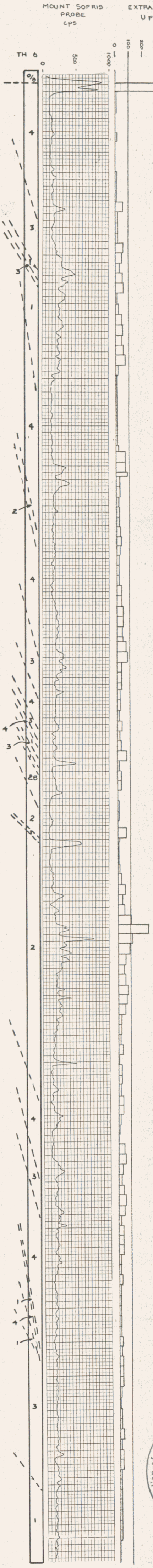
157.4': GRADATIONAL CONTACT: altered pseudoleucite gives way to UNALTERED PSEUDOLEUCITE TINGUAITE as described below.
161.4': GRADATIONAL CONTACT: rock becomes WEAKLY ALTERED PLT: pervasive pale green to slightly pinkish alteration is mixed with tan limonite flooding adjacent to fractures. The pseudoleucite phenocrysts are weakly calcareous and cloudy (due to sericitization?). The biotite in the groundmass appears to be weakly chloritized.
170.0' IRREGULAR CONTACT: UNALTERED PSEUDOLEUCITE TINGUAITE: 3-10mm, white pseudoleucite phenocrysts compose from 20-30% of the rock. They are euhedral to subhedral. 1-3mm, white, subhedral, stubby orthoclase phenocrysts comprise <5% of the rock. The groundmass is medium to dark grey, aphanitic orthoclase, nepheline and biotite. Pyrrhotite is minor, <1/4% disseminated in groundmass, and coating a few <1mm fractures. Calcite coats many small fractures. Numerous black mafic rich "shears" cut the core. They are narrow, <1mm to 3mm and commonly 1/0.5-1'.

Pseudoleucite phenocrysts are euhedral with a somewhat zoned appearance; waxy mottled pinkish white material is mixed with milky white sericitized (?) zones and minor calcite.
The larger phenocrysts show palisade texture mixing grey waxy nepheline and white orthoclase.

SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8) ppm U	ppm Cu	ppm Mo	% RECOV	GEOLOGY	STRUCTURE α to core		HOLE DEPTH (FEET)
H46243		92		10			60°	1/2'	
							30° To 40°	1/1-2'	
							50° To 60°	3-4/1'	155
H46244		73		6			30° To 40°	1/1'	
							40°	1/1-2'	160
H37455		49		8			50° To 70°	3/1'	
							30°	1/3'	165
H37456		35		4			60°	7-9/1'	
							0° To 20°		
H37457	BKGD PATCHY 20/ BKGD 150' TO 202' SLIGHTLY > BKGD.	47		6			30°	1-2/1'	170
							60°	1/1'	
H37458		34		2					175
									180
H37459		50		4			30°	1/5'	
							60°	1/5'	185
H37460		54		1					
									190
H37461		71		4					
									195
H37462		81		4					
									200
									202

MOUNT SOPRIS GAMMA PROBE LOG





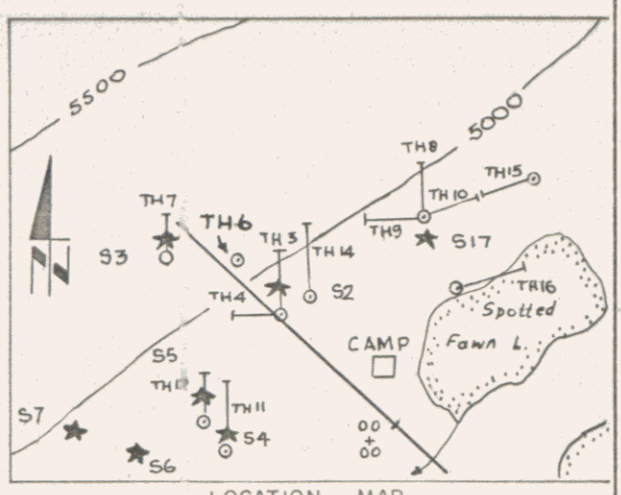
HOLE TH 6

LOCATION: ZONE 517

LENGTH: 727'

DIP: -90° AZIMUTH: —

COLLAR ELEVATION: 5034'



LOCATION MAP

SCALE 1:10,000

100 50 0 100 200 300 400 500

metres

1 SYENITE tan weathering, medium to coarse grained nepheline syenite often with abundant sulphides and purple fluorite

2 PSEUDOLEUCITE TINGUAITE 5-30%, 3-20mm pseudoleucite phenocrysts 1-10mm orthoclase phenocrysts in a medium grey, aphanitic groundmass

3 SHEARED TINGUAITE foliated and/or auto-brecciated tinguaite often biotite altered

4 MIXED TINGUAITE lenses or bands of pseudo-leucite phenocrysts in sheared tinguaite groundmass

5 FINE GRAINED TINGUAITE medium to dark grey tinguaite without pseudoleucite phenocrysts, some 1-3 mm orthoclase phenocrysts. Usually as dykes

6 INTERMEDIATE TINGUAITE medium grey tinguaite with pseudoleucite orthoclase phenocrysts. Pseudoleucite phenocrysts smaller than usual

B,b BIOTITE ALTERATION intense, moderate

C,c CHLORITE ALTERATION intense, moderate

geologic contact: sharp, gradational

Association of Professional Engineers of the Yukon Territory
A. R. ARCHER
GEOLOGICAL
15 Jan/80
ENGINEER

FIG. U-TG 20

ARCHER, CATHRO & ASSOCIATES LTD

SECTION TH 6

TOMBSTONE PROPERTY

UKON JOINT VENTURE

SCALE 1:400

4 2 0 4 8 12 16 20

metres

DRILL HOLE LOG

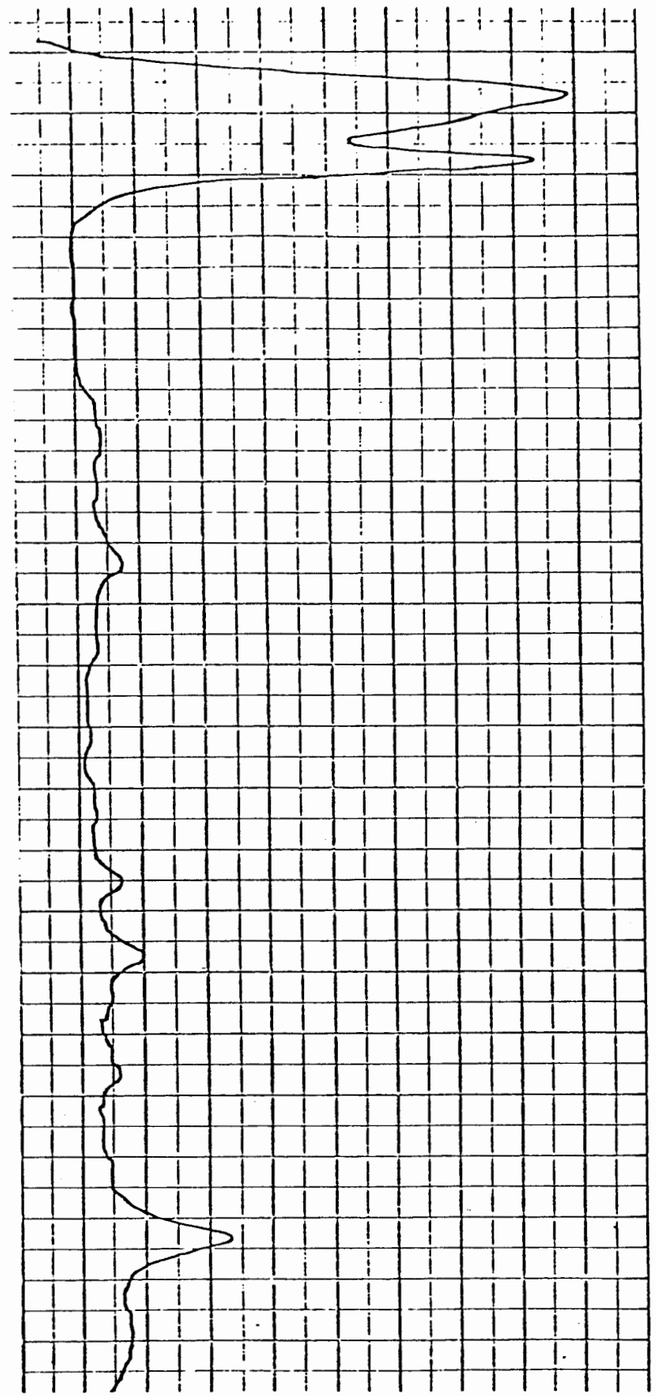
PROJECT UJV HOLE IH6 LOCATION - CORE SIZE BQ STARTED 31/07/79 FINISHED 9.08.79 PAGE 1 OF 10

CLAIM GROUP TOMBSTONE LENGTH 325' DIP -90° AZIMUTH - COLLAR ELEVATION 5034' DRILLED BY CAPON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8 / ppm U)	GEOCHEMISTRY AND ASSAY (ppm Cu)	% RECOV
0-6.0': OVERBURDEN: glacial till composed of syenite and tinguaite boulders plus soil.		BKGD			0
6.0'-28.0': MIXED TINGUAITE: 5-20 cm bands of normal plt are surrounded by sheared plt. The normal plt consists of 3-15 mm, anhedral to euhedral light grey to white, often zoned and generally cracked pseudoleucite phenocrysts comprising 15-30% of the rock; white, 1-10 mm, stubby to prismatic, subhedral to euhedral, orthoclase phenocrysts comprising less than 5% of the rock, and 1-3 mm, dark green to black, anhedral, mafic phenocrysts comprising 2% of the rock in a medium grey, anhedral groundmass. The mafic phenocrysts are usually chlorite although it is uncertain where the chlorite is after biotite aggregates or pyroxene. The mafic phenocrysts are very distinctive and are rarely as abundant or large as in this plt. The sheared tinguaite is well brecciated; the effects are most prominent on the orthoclase phenocrysts. Foliation is usually most pronounced in the mafics but also flattens the pl phenocrysts. The foliation is moderate and usually runs subparallel to the core axis. The sheared tinguaite is often highly altered with biotite and possibly sericite replacing the pl phenocrysts. The content of the chloritized mafics appears to be much higher in the sheared rocks, 5-7% of the whole rock, however this is probably in part due to chloritization of biotite altered pl phenocrysts. The ratio of sheared to normal plt is 2:1. Very fine grained, disseminated pyrrhotite comprises 1/4-1/2% of the rock from 6.0'-17.0'. Below this point it becomes a relatively minor accessory mineral. Both normal and sheared plt are weakly calcareous. White orthoclase, clay minerals, weak limonite and traces of pyrrhotite coat or fill the fractures.	H46254	80/BKGD	379		90
	H37463		11.0		100
	H37464		14.0		90
	H37465		8.5		56
	H37466		6.5		
28.0'-42.3': mixed tinguaite, however the sheared and altered plt far exceeds the normal plt, yielding a ratio of at least 5:1. The normal plt is as previously described except that blue feldspathoids are common in the pl phenocrysts. The pl phenocrysts in the sheared and altered rock have almost completely disappeared. They appear to have behaved plastically so that they compose the matrix for much of the sheared rock, often enclosing darker fragments of plt groundmass. The net effect is a mottled, weakly foliated rock.	H37467	BKGD	12.5		
	H37468		3.5		
42.3'-49.0': a 2 cm wide, mafic rich band exhibits good trachytic texture. The dyke? arcs through the core, first having a 30° attitude to core axis then paralleling the axis and finally curving to 30° in the opposite direction. This wavy orientation is common to the surrounding tinguaites as well. In this interval are a few 3-5 cm wide xenoliths(?) of mafic rich rock, possibly representing fragments of undigested 1K diabase.	H37469		5.5		100
	H37470		8.0		
47.3'-63.0': mixed tinguaite with a normal plt to sheared plt ratio of 3:1. The shearing cuts the core axis at between 0 and 20°. The biotite alteration over this interval is somewhat unusual in that it attacks the small pl phenocrysts while hardly affecting the larger phenocrysts. A few 1 mm, 20° fractures are filled with white orthoclase and blue feldspathoid (sodalite) ± minor pyroxene and pyrrhotite. Between 54.5' and 57.0' the sodalite comprises up to ~10% of most of the larger phenocrysts.	H37471		11.5		
	H37472		11.0		
	H37473		14.5		
63.0'-79.0': SHEARED TINGUAITE: although there are a few 3-5 cm wide fragments of normal plt (sheared to normal ratio 10:1), the rock is predominantly a well foliated, medium grey tinguaite containing relatively few 1-3 mm orthoclase fragments and rarely indistinct pl ghosts. Any alteration which attacked the pl phenocrysts is unidentifiable as the phenocrysts are generally indistinguishable from the groundmass. The foliation is best illustrated by the mafics and runs between 0 and 20° to the core axis. 1/4 to 1/2% pyrite is scattered throughout the rock. The open fractures are usually coated with minor clay minerals and weak limonite. The closed fractures are filled with white orthoclase. The 20° fractures are generally closed and higher angle fractures are open.	H37474	20/BKGD	55		
	H37475	BKGD Small patches 10/BKGD	20.5		

STRUCTURE ∠ to core		HOLE DEPTH (FEET)
30° to 40°	1/0.5'	5
		10
30°	1/1'	
70°	1-2/1'	15
30°	5/1'	
30°	4/1'	20
60° to 70°	2/1'	
		25
80°	1/1'	
30° to 80°	4/1'	30
30° to 70°	1/1'	
		35
		40
60°	1/2'	
		45
20°	1/4'	50
		55
		60
		65
		70
		75

MOUNT SOPRIS
GAMMA PROBE LOG



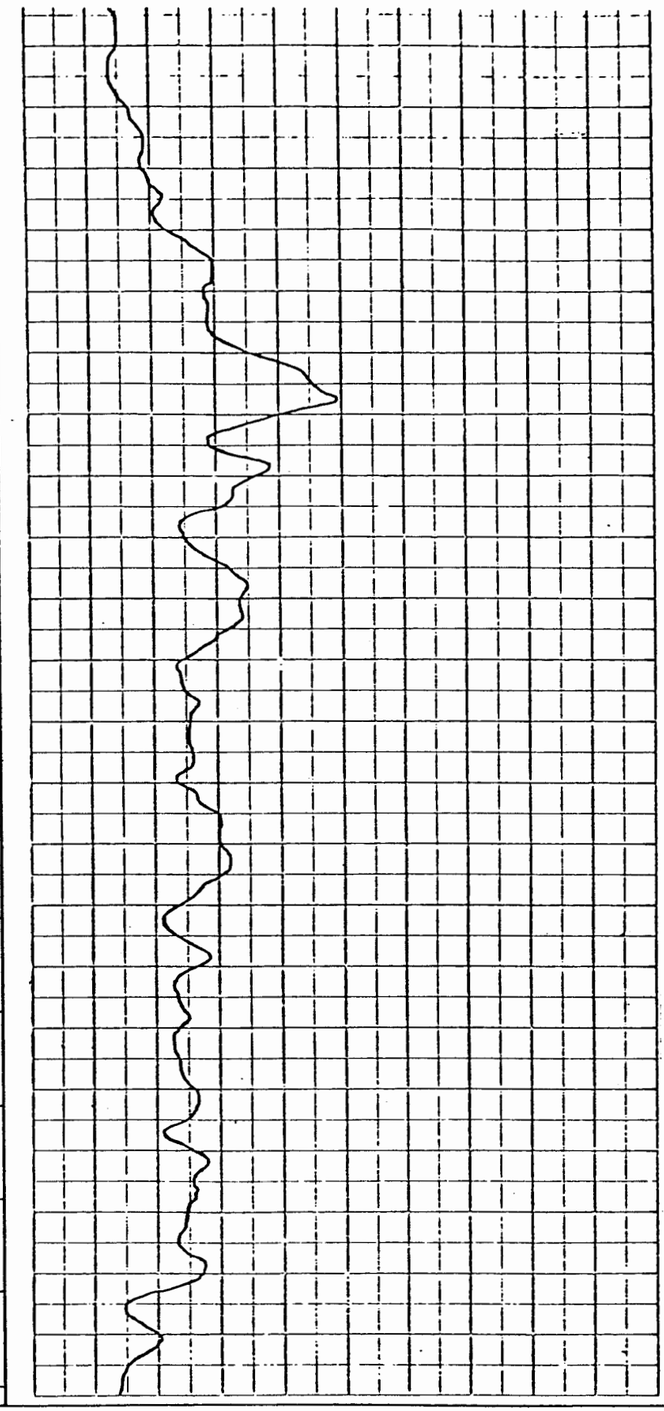
DRILL HOLE LOG

PROJECT UJV HOLE JH-6 LOCATION - CORE SIZE BQ STARTED 21/07/77 FINISHED 4/08/77

CLAIM GROUP TOMBSTONE LENGTH 725' DIP -90° AZIMUTH - COLLAR ELEVATION 5034' DRILLED BY LABOU LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8) ppm U	ppm Cu	% RECOV	GEOLOGY	STRUCTURE α to core	HOLE DEPTH (FEET)
79.0'-92.2': sheared tinguaite as before except that normal plt bands are slightly larger, up to 10 cm, and the plt to sheared tinguaite ratio is 1:6. The pl phenocrysts are often flattened enhancing the foliation which ranges from 0-30° to core axis, with the higher angles near the bottom of the interval. Pyrite content increases from 1% to 2-4% toward the bottom of the interval.	H37476	BKGD	16.5					
	H37477		20.5				45° to 60° 1/1-2'	80
	H37478		59					85
92.2'-95.7': LEUCOCRATIC SYENITE DYKE(?): or strongly bleached tinguaite. It is light grey, slightly mottled, fine grained to aplitic, highly pyrrhotitic (2-4%) and has a slight green tint suggesting sericitization. The contacts are conformable with the foliation in the surrounding tinguaites: 30° at the upper contact and 0° on the lower contact. There are weak limonite stains on fractures. 95.7'-100': MIXED TINGUAITE: normal plt to sheared (foliated) tinguaite ratio of 5:1. The rock contains 1-2% pyrite. At 97.8' a 3 cm long slice of leucocraitc syenite on one side of the core suggests that the dyke is running parallel to the core axis.	H46255		53					90
	H46256		32		100			95
100.0'-134.2': LEUCOCRATIC SYENITE: similar to earlier dyke. Weak foliation, as expressed by 1% mafics and bands of pyrrhotite, is generally sub-parallel to the core axis. Rock is still aplitic with faint greenish tint. Pyrrhotite comprises 2-5% of the rock with traces of purple fluorite. The mafics appear to be a mixture of biotite and pyroxene, often chloritized. The rock exhibits weak compositional banding of mafics and larger, up to 4 mm, orthoclase phenocrysts. Most fractures are coated with calcite or clay minerals.	H46257	20/BKGD	53					100
	H46258	BKGD	64				20° to 30° 1/4-5'	105
		20/BKGD					60° to 80° 1/2-4'	110
	H46259	BKGD	13					
		20/BKGD						115
117.7'-134.2': a broad fracture zone, possibly a fault zone, cuts the syenite. Most fractures are coated with talc, ± clay, chlorite and carbonates. Slickensides, often curved, are abundant on the 30° fractures. Adjacent to the fractures, olive to pale green, seritic alteration is common. Pyrrhotite is rare in the fracture zone, probably having been leached.	H46260	PATCHY 0-10/BKGD	22		90		70° 1/66-1'	
							30° 4/1'	120
	H46261		45				70° 3/1' 30° 3/1'	
							10°-30° Extreme	125
	H46262		60				70° 6/1'	
		BKGD PATCHY 20/BKGD					0-10°	130
134.2'-211.8': MIXED TINGUAITE: normal plt lenses and bands are separated by brecciated and weakly foliated, sheared tinguaite. The plt to sheared tinguaite ratio ranges from more than 5:1 between 134.0'-154.0', to 1:1 below 154.0'. The normal plt consists of 20-40% anhedral, dull light grey to white 3-15 mm pl phenocrysts, in places containing blue feldspathoids or limonite. The closed fractures are shallow and are filled with white orthoclase. Sulphides are a minor constituent of the rock. The sheared tinguaite contains fragments up to 4 mm across but most are less than 1 mm. The groundmass of the sheared tinguaite is dull grey and lighter in color than the plt groundmass. The foliation is illustrated best by flattening of the pl phenocrysts and alignment of the mafics. Biotite alteration of the sheared tinguaite is weak to moderate.	H46263		48				10° TO 20° 4/1'	
	H46264		55		100			135
	H37479		68				70° 1-2/1'	140
142.2'-142.4' and 142.9'-143.1': 2, 3 cm fine to medium grained syenite dykes composed of 90% white orthoclase and 10% black mafics cut the core axis at 25°. Between the 2 dykes is a 1 mm chloritized, 20° fracture containing pyrrhotite, chlorite and purple fluorite.	H37480	BKGD	23.5					145
							60° 1/3'	150

MOUNT SOPRIS GAMMA PROBE LOG



DRILL HOLE LOG

PROJECT UJV HOLE JH6 LOCATION - CORE SIZE BQ STARTED 31/07/79 FINISHED 9/08/79 PAGE 3 OF 10

CLAIM GROUP JOHNSTONE LENGTH 725' DIP -90° AZIMUTH - COLLAR ELEVATION 5034' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8) ppm U	ppm Cu			% RECOV	GEOLOGY	STRUCTURE α to core	HOLE DEPTH (FEET)
	H37481		9.5							155
	H37482		12.5						60° TO 70° 1/2'	160
	H37483		12.0						30° 1/10'	
166.0'-166.8': hairline 0-20° fractures contain calcite and pyrite.	H37484		11.5							165
	H37485	BKGD	10.5							170
177.2'-178.9': hairline, subparallel to the core axis fracture with calcite, pyrrhotite and wolframite? sphalerite?	H37486		12.5						60° TO 70° 1/3.5' 30° 1/10'	175
	H37487		12.5							180
	H37488		24.0				100			185
189.1'-189.8': a 5 cm wide leucocratic syenite dyke cuts the core axis at 25° which is parallel to the tinguaite foliation. It contains weak limonite stains associated with hairline pyrrhotite filled cracks, a trace of chalcopyrite and an unidentified soft, black mineral with black streak. 190.0'-193.5': strongly sheared tinguaite, exhibiting strong foliation at 20° to core axis, contains minor to 1/4% disseminated pyrrhotite > arsenopyrite as do the surrounding rocks. Plt to sheared tinguaite ratio 1:3. 194.4': an open, 40° fracture is coated with green tinted clays. 195.0'-196.7': a hairline, 5° fracture contains white orthoclase and pyrrhotite.	H46265		67							190
	H46266	30-40/BKGD	67						45° 1/2-1'	195
	H37489		94						60° TO 70° 1/5-10'	200
	H37490		31							205
211.8'-214.7': mottled brecciated tinguaite containing only a few small fragments of normal plt. 214.7'-222.4': PSEUDOLEUCITE TINGUAITE: normal plt such as is found in the plt portion of the mixed tinguaite. A few narrow bands with moderate biotite alteration pl phenocrysts.	H37491	BKGD	29							210
	H37492		19							215
222.4'-287.7': MIXED TINGUAITE: normal plt and brecciated, sheared tinguaite occur in alternating "bands" approximately 5-10 cm wide. The ratio of normal plt to sheared plt is 1:1. The normal plt consists of 10-20% dull grey, poorly zoned, anhedral, 2-12 mm pl phenocrysts, 5-10%, subhedral, white, 1-8 mm orthoclase phenocrysts and <1/2-2 mm black mafic phenocrysts in a medium grey aphanitic groundmass. The brecciated tinguaite is mottled rock with a light grey groundmass principally composed of pl phenocryst material	H37493		23.5							220
	H37494		22.5						0°	225

MOUNT SOPRIS GAMMA PROBE LOG

DRILL HOLE LOG

PROJECT UJV HOLE TH6 LOCATION - CORE SIZE BQ STARTED 31/07/79 FINISHED 4/08/79

CLAIM GROUP TOMBSTONE LENGTH 725' DIP -90° AZIMUTH - COLLAR ELEVATION 5034' DRILLED BY CAMON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8 / ppm U)	GEOCHEMISTRY AND ASSAY (ppm Cu)	% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
and containing fragments of orthoclase phenocryst and plt groundmass. The fragments are up to 8 mm across. Fractures are usually coated with carbonate and clay minerals if open and filled with white orthoclase, dolomite or pyrrhotite if closed.	H37495		28				0°	
222.0'-222.6': a 2-3 mm thick white dolomite filled fracture runs subparallel to the core axis. Parts of the fracture are weakly stained with limonite. Similar but narrower fractures occur between 216.5-218.4', 226.8-227.6', 230.2-231.0', and 235.0-237.5'. Between 230.5-231.0' a similar 20° fracture is orientated at 90° to the others and is filled with chlorite. 232.6'-232.7': a 35° fracture contains minor pyrrhotite.	H37496		35				10° TO 30°	230
237.0'-238.5': white clay-carbonate? alteration of pl phenocrysts in 5 mm- 20 mm envelopes around 0-10° fractures.	H37497		25		100		0° TO 10°	235
	H37498	BKGD	22.5				WEAK CRACKLE FRACTURES 1/2'	240
245.0'-259.0': numerous clay and carbonate filled shallow (0-20°) angle fractures with intermittent weak limonite stains. Between 252.0-254.0' the tinguaite is totally fragmented and highly weathered suggesting a groundwater course. The drillers report sand at this point. The rock is still mixed tinguaite as previously described except that the normal plt to brecciated plt ratio is 1:5.	H37499		19.5					245
	H37500		22.5					250
	H37501		37		30		0° TO 30°	255
260.0'-260.3': a 2mm, 20° fracture is filled with white orthoclase and a dark mafic rather than clay. Below this point the tinguaite is less fractured.	H37502		35				60° 1/5'	260
	H37503		48				30° 1/10'	
270.0'-273.0': a 1-3 mm wide, orthoclase and calcite filled fracture runs parallel to the core axis.	H37504	BKGD Narrow bands 10-20/BKGD	47				60° 1/3-5'	265
275.7'-280.0': a 1-2 mm fracture running subparallel to the core axis is filled with grey orthoclase, pyrrhotite, calcite and a trace of molybdenite or galena.	H37505		37				0° TO 10°	270
	H37506		47		100			275
	H46267		70				270° TO 280°	280
287.7'-303.2': SHEARED TINGUAITE: foliation again supplants brecciation as the dominant texture in the sheared tinguaite. The normal plt to sheared plt ratio is less than 1: 10. In the foliated tinguaite the pl phenocrysts have been completely destroyed leaving a relatively uniform medium grey groundmass with 1-4 mm white orthoclase and 1/4 to 1 mm mafic phenocrysts. The orthoclase and mafics together comprise <5% of the rock. In places the transition of normal plt into sheared plt is highly visible. This rock is massive.	H46268		76					285
	H46269	BKGD	36				30° 1/10-15'	290
	H46270		37				60° 1/10-15'	295
								300

MOUNT SOPRIS GAMMA PROBE LOG

DRILL HOLE LOG

PROJECT UJV HOLE JH6 LOCATION - CORE SIZE BQ STARTED 31/07/79 FINISHED 9/08/79

CLAIM GROUP JOHNSTONE LENGTH 725' DIP -90° AZIMUTH - COLLAR ELEVATION 5024' DRILLED BY CAZON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8) ppm U	ppm Cu	% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
301.4'-301.8': 2 narrow (7 mm and 1 mm) fine to medium grained tan syenite dykelets have undergone convolute folding. It appears that they initially cut the core axis at 60°, but have been deformed by the shearing which runs subparallel to the core axis at this point. 302.7': 2,2-3 mm, tan syenite dykelets cut the core axis at 60° which is parallel to the foliation. The foliation is highly erratic however as it changes abruptly from 0° to 60° to core axis in only 10 cm. 303.2': sharp contact between foliated and brecciated rock. 303.2'- 16.0': MIXED TINGUAITE: foliation in tinguaite is weak or absent but brecciation is very significant. The normal plt to sheared tinguaite ratio is 1:3. Moderate biotite alteration is common in the brecciated plt.	H37507	BKGD	39					305
	H37508		32					
	H37509		32					310
316.0'-321.5': SHEARED TINGUAITE: generally as described for 287.7-303.2'. Where foliation is most intense the pl phenocrysts are completely obliterated. Where it is less intense the pl phenocrysts are flattened, further enhancing the foliation. The orientation of the foliation to the core axis is variable between 0° and 45°. 321.5'-326.5': MIXED TINGUAITE: brecciation >> foliation. Normal plt to sheared plt ratio is 1:2. Toward the bottom of the interval, biotite alteration is quite strong, principally affecting the pl phenocrysts.	H37510		21.0				30° 1/25'	315
	H37511		38					320
326.5'-330.7': LEUCOCRATIC SYENITE DYKES: 4 barely discernible, fine grained syenite dykes are composed 95% of light grey orthoclase, 3% mafics and 1-2% pyrite replacing mafics. These dykes are separated by bands of slightly darker, foliated tinguaite. The dykes vary in size from 15 cm down to 4 cm wide and have irregular, whispy contacts with the adjacent tinguaite. The contacts range from 20° to 60° to core axis.	H37512		23.5					325
330.7'-336.0': SHEARED TINGUAITE: this interval has the appearance of a very fine grained rock. Over the bulk of the interval evidence of brecciation and of foliation is evident, however between 332.0' and 332.8' the groundmass takes on a uniform dark grey color with the exception of irregular to rounded light grey orthoclase fragments. The distinctive aphanitic appearance may be due to alteration or to intense milling. The foliation where visible is at 10° to the core axis. This tinguaite is further distinguished from normal tinguaite by the presence of 2 to 5% disseminated pyrite.	H37513		27.5		100			330
336.0': INDISTINCT GRADATIONAL (?) CONTACT 336.0'-339.0': APLITE DYKE: sugary leucocratic syenite dyke composed of 95% light grey orthoclase, 2% biotite, 2% pyrite replacing biotite, 1% sericite and trace amounts of molybdenite? or galena? 339.0' IRREGULAR 10-20° CONTACT	H46271		67					335
339.0'-355.5': INTENSELY ALTERED TINGUAITE: a very significant interval as it clearly illustrates relative intensities of alteration. Adjacent to the dyke the altered tinguaite exhibits a striking pink coloration due to pervasive pink mica (most too fine to be recognized but locally coarser) alteration of the groundmass and secondary (after pl phenocryst) biotite. A cloudy white mineral forms indistinct rounded masses: this is probably secondary orthoclase. Locally the rock is greenish due to green sericite alteration. Approximately 2 m from the contact the pink tint gives way to an unidentified white mineral, possibly a clay. The pink rock is deficient in sulphides while the white altered rock contains 1-3% pyrite. This pyrite appears to be derived from iron released from the destruction of the biotite. The white alteration gives way to a zone in which the pl phenocrysts are extremely indistinct and are partially altered to the white mineral and partially to biotite. In the pink, white and upper part of this mixed zone the orthoclase phenocrysts are destroyed. Beyond the mixed zone is a zone of strong biotite alteration in which the pl phenocrysts are easily recognized but have been replaced wholly or partially by biotite. Pyrite is again rare. Outside of the biotite zone (below 355.5') the pl phenocrysts are distinct, however their light grey color suggests a still lower grade alteration has affected them. In the lower mixed, biotite and lower alteration zones the orthoclase phenocrysts look fresh and pyrite is rare. Small pockets of higher or lower grade alteration can occur within any given zone. For example, at 249.4 an irregular pod of pink-green muscovite alteration occurs in the mixed zone.	H37514		12.0				45° TO 50° 1/10'	340
	H37515		29					345
	H37516		26					350
	H37517		6.0					355
355.5'-373.9': PSEUDOLEUCITE TINGUAITE: light grey, weakly altered (sericite, clays?) anhedral, 3-14 mm pl phenocrysts comprising 20-30% of the rock; white, subhedral, 1-7 mm orthoclase phenocrysts comprising 5-10% of the rock and irregular whisps of biotite in a medium grey, aphanitic groundmass. Fractures are generally coated with weak clay or limonite if open and filled with white orthoclase if closed. Disseminated pyrrhotite is about 0.1% of the rock. Blue feldspathoid is common in the pl phenocrysts. 362.3'-362.5': a 2 mm, 25° fracture is filled with white orthoclase > pyrrhotite > mafics.	H37518		10.0				60° 1/5-7'	360
	H37519		9.0				30° TO 45° 1/10'	365
373.9': SHARP, 45° CONTACT: with a 5 cm band of foliated tinguaite (flattened pl phenocrysts) paralleling the contact. 373.9'-377.0': SYENITE DYKE: a medium to coarse grained, tan syenite composed 90% of orthoclase and 10% of black mafics with 3 cm margins exhibiting good compositional banding. The chilled margins are the only part of the dyke with pyrrhotite; the lower contact also has a 5 mm band containing 1% molybdenite.	H37520		4.0					370
	H46272		69					375

MOUNT SOPRIS GAMMA PROBE LOG

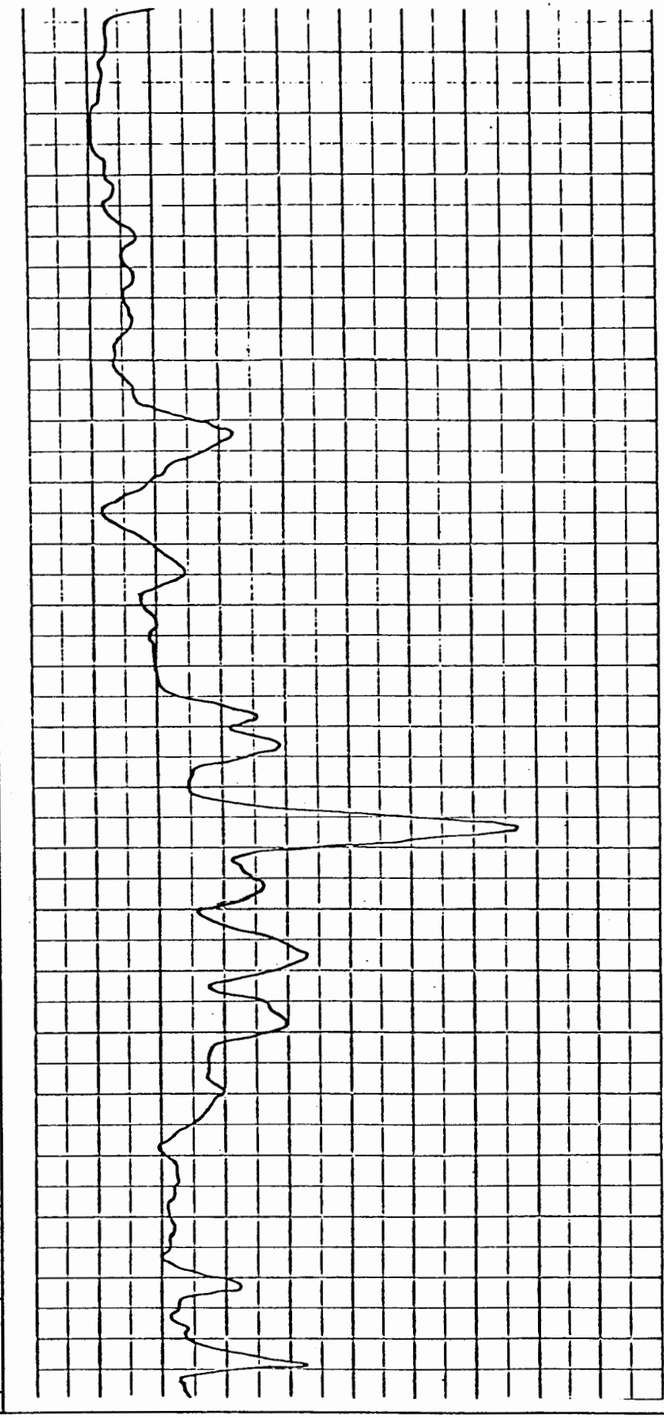
DRILL HOLE LOG

PROJECT UNV HOLE IH6 LOCATION - CORE SIZE BQ STARTED 29/07/79 FINISHED 3/08/79

CLAIM GROUP TOMBSTONE LENGTH 325' DIP -90° AZIMUTH - COLLAR ELEVATION 5024' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY ($\%U_3O_8$) ppm U	ppm Cu	% RECOV	GEOLOGY	STRUCTURE α to core		HOLE DEPTH (FEET)
377.0': SHARP 50° CONTACT: again with a 5 cm band of flattened pl phenocrysts. 377.0'-461.0': PSEUDOLEUCITE TINGUAITE: as described above except the orthoclase phenocrysts are larger, up to 1 cm long and are highly fractured. The pl phenocrysts often exhibit fuzzy reaction rims. Sulphides are minor (0.1%).						+ +			
	H37521	BKGD	15.0						380
378.9'-379.0': 2 mm syenite dyke as between 373.9-377.0' cuts core axis at 45°. 379.7'-379.8': 1 cm syenite dyke as above. 383.5': 1 cm, tan pegmatitic syenite dyke as above.	H37522		9.0						
									385
388.0'-393.0': a number of hairline to 2 mm fractures filled with orthoclase > mafics > pyrrhotite. They cut the core axis at 30°-50°.	H37523		14.0						
							60°	1/5'	390
	H37524		21.0						
									395
	H37525		32						
									400
402.8': a hairline, 70° fracture is coated with limonite.	H46273		55						
									405
406.3'-406.4': orthoclase > mafics > pyrrhotite in a closed 30°, 2 mm fracture. 407.0'-424.0': PSEUDOLEUCITE TINGUAITE: as before except that very finely disseminated sulphides (pyrrhotite) comprise 1/4 - 1/2% of the rock. Fracture density is much higher; especially significant are the shallow angle fractures which are heavily coated with calcite, clay, orthoclase and/or weak limonite stains. These fractures often have a yellow-orange or greenish coloration which could be a weak uranium staining. The 30-40° fractures are generally closed with orthoclase, mafics and pyrrhotite. The high angle fractures are usually open and coated with weak limonite and clays.	H46274	40/BKGD	38		100		0° TO 10°	1-2/1'	
									410
	H46275	50/BKGD	47				30° TO 40°	1/6'	
									415
	H46276	80/BKGD	102				80° TO 90°	1-2/1'	
421.7'-424.0': a pinkish tan, shallow angle, hairline fracture is surrounded by an alteration envelope up to 2 cm wide in which the pl phenocrysts have apparently been altered yielding a similar pinkish color.	H46277	110/BKGD	229						420
426.8'-427.4': hairline 30-40° fractures are filled with the same tan mineral described above plus a green mineral, sericite. These fractures have alteration halos as previously described.	H46278	70/BKGD	110						425
	H46279	20/BKGD	93				0° TO 10°	1/3'	430
	H46280	30/BKGD	69				30° TO 40°	1/6'	435
	H46281		53				60° TO 70°	1/4'	440
445.8'-446.0': fine to medium grained, buff, 7 cm syenite dyke composed of 90% orthoclase, 8% mafics and 2% smoky quartz cuts the core axis at 70°. 446.0'-448.2': a hairline fracture running subparallel to the core axis is filled with clay minerals and calcite. Some pl phenocrysts within 1 cm of this fracture have been altered to clays?	H46282	BKGD	63						445
									450

MOUNT SOPRIS
GAMMA PROBE LOG



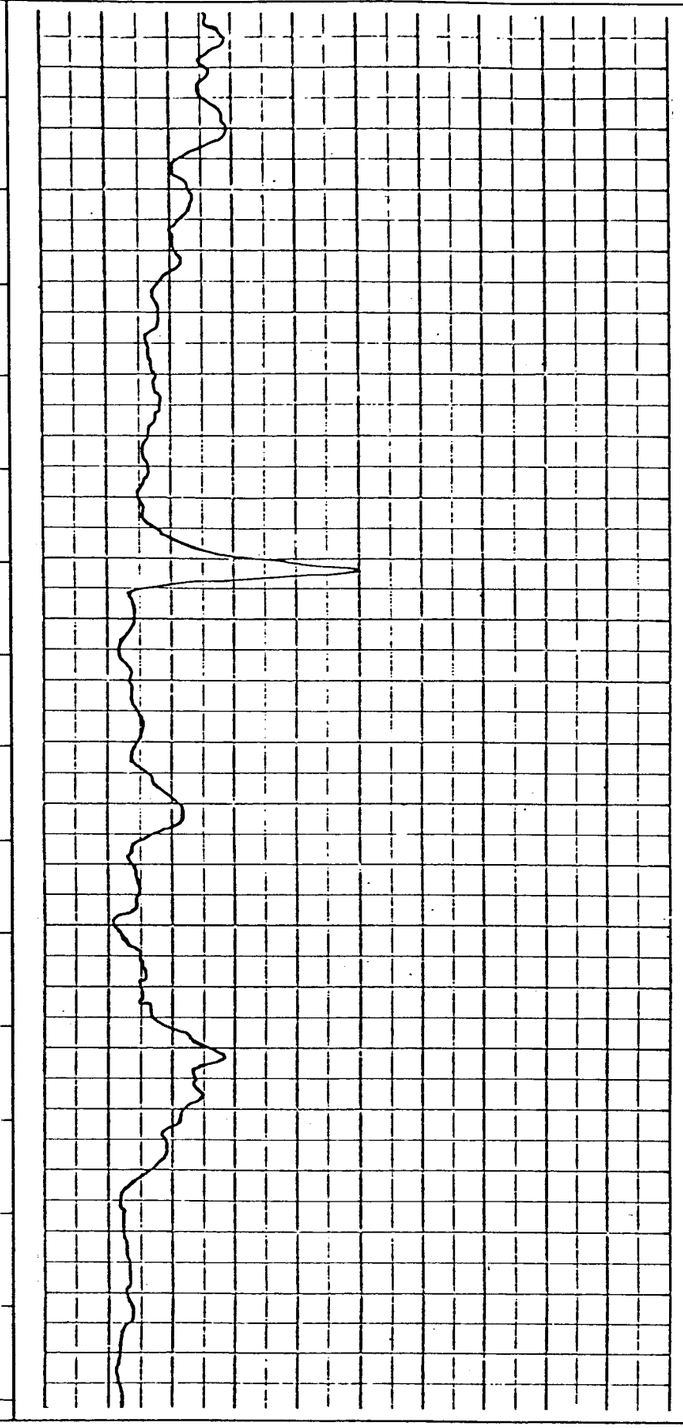
DRILL HOLE LOG

PROJECT JJV HOLE TH6 LOCATION - CORE SIZE BQ STARTED 29/07/79 FINISHED 9/08/79

CLAIM GROUP TOMBSTONE LENGTH 725' DIP -90° AZIMUTH - COLLAR ELEVATION 5224' DRILLED BY CAPCIL LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8 ppm U)	GEOCHEMISTRY AND ASSAY (ppm Cu)	% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
450.0'-450.7': 2 syenite dykes as between 445.8-446.0'; one 1 cm wide at 30° and the other 7 cm wide at 60°. 451.4'-452.0': a 2 mm, 15° syenite dykelet as before, locally flattening of pl phenocrysts is subparallel to the fracture.	H46283	20/BKGD	76					455
	H46284		74					
461.0'-495.0': PSEUDOLEUCITE TINGUAITE: rocks are essentially the same as the previous 100' except that the pl phenocrysts are usually cracked with a further pervasive system of hairline cracks filled with mafics cutting the core axis at 50°. These cracks rarely are continuous and are generally whispy. . They have a density of 100's per foot. Cross cutting these cracks are 50-60° fractures dipping in the opposite direction. The fractures may be open or closed but are usually filled with white orthoclase or clays. The sulphide content appears to be lower than in the previous interval but the extremely fine grained nature of the sulphides makes this uncertain. The rock has a faint bluish tint due to the minor blue feldspathoids in the pl phenocrysts.	H37526	10/BKGD	57					460
	H37527		29					465
470.0'-470.1': a 2 mm closed 60° fracture is filled with calcite, some of which is very dark in color.	H37528		30					470
	H37529		21.5				50° to 60° 1/2'	475
479.7'-482.0': 3 mm white orthoclase>> mafic syenite dykelet runs subparallel to core axis.								
482.2'-482.8': a 5 cm grey to tan, orthoclase>> mafic> pyrrhotite syenite dyke.	H46285		36		100			480
	H37530	BKGD	14.5					485
489.5'-492.0': a series of irregular, 1 mm orthoclase > mafic= pyrrhotite filled fractures cut the core axis at between 20-40°.	H37531		25.0					490
495.0' GRADATIONAL CONTACT 495.0'-497.0': SHEARED TINGUAITE: identical to normal plt except that the pl phenocrysts have been flattened, producing a foliation which parallels the core axis. Cutting the core axis at 20° are 3, 5 mm slightly wavy white orthoclase>> mafic > pyrrhotite dykes.	H37532		26					495
497.0'-531.0': MIXED TINGUAITE: lenses of normal plt, 5-20 cm across and surrounded by foliated, sheared tinguaite at a ratio of 1:1. In addition to the foliation, weak to moderate biotite alteration has attacked the cores of pl phenocrysts both in the normal plt and the sheared tinguaite. The general foliation of the foliated plt is 20° to core axis, however this is variable locally. The rock has very few fractures: most of them are filled or coated with white orthoclase or white clays. Sulphides are rare. 499.4'-499.7': a 2 mm, 30° fracture is filled with the orthoclase>> mafic syenite. This fracture cuts the foliation which is subparallel to the core axis at this point. 509.5'-509.7': a 2 mm syenite filled fracture as above cuts the foliation. As before the foliation is subparallel to the core axis, however this dyke has a convolute appearance with the fold axis parallel to the foliation.	H37533		16.0				15° 1/12'	500
	H37534		39					505
	H37535		41				30° 1/7'	510
	H37536		15.0				70° to 80° 1/6'	515
523.0'-523.3': an intensely sheared band is cored by a 2 mm syenite dyke. Both the dyke and the foliation cut the core axis at 50°.	H37537		10.5					520
								525

MOUNT SOPRIS GAMMA PROBE LOG



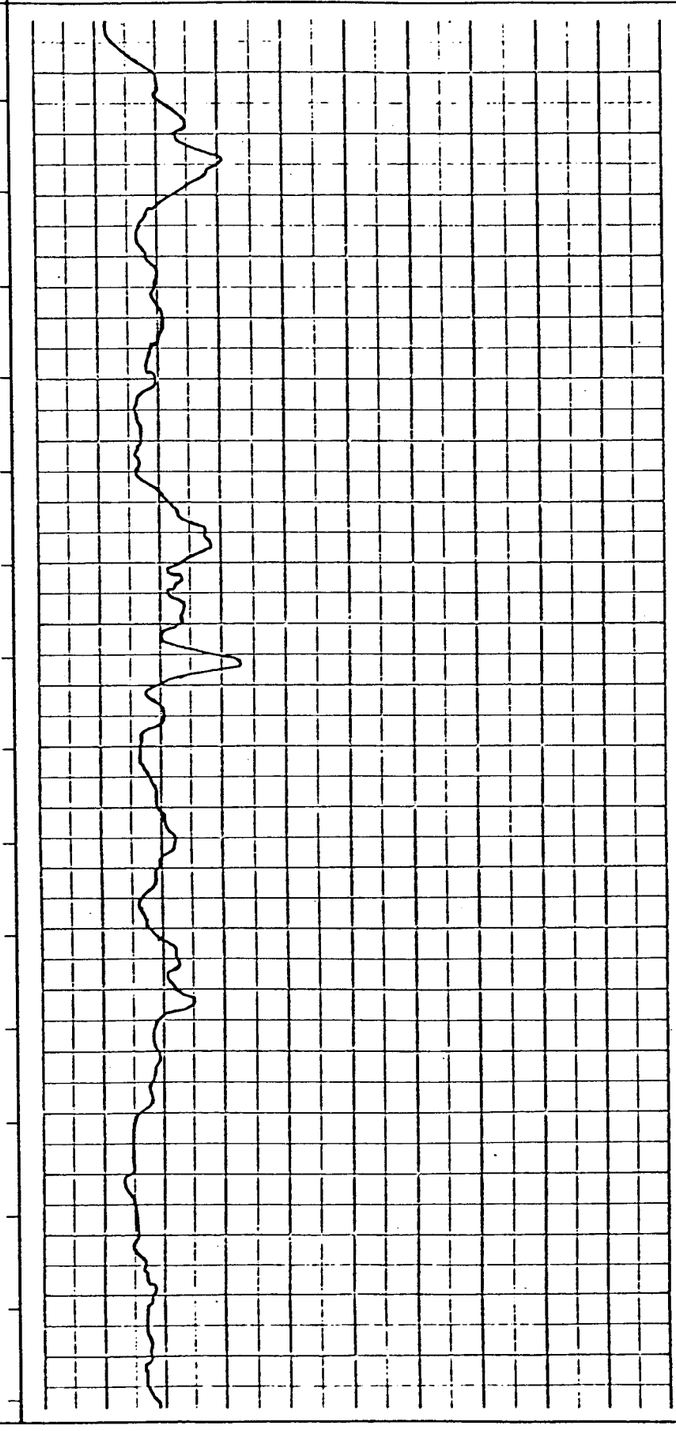
DRILL HOLE LOG

PROJECT UJV HOLE TH6 LOCATION - CORE SIZE BQ STARTED 29/07/79 FINISHED 9/08/79

CLAIM GROUP TOMBSTONE LENGTH 725' DIP -90° AZIMUTH - COLLAR ELEVATION 5034' DRILLED BY CABON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8) ppm U	ppm Cu	% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
527.0'-528.5': 3, 1 mm leucocratic syenite filled fractures cut the core axis at 20°.	H37538		8.0					
531.0'-547.6': SHEARED TINGUAITE: foliated, sheared tinguaite again has foliation generally subparallel to core axis. The groundmass to this rock is slightly darker than usual due at least in part to moderate - strong biotite alteration of most plt phenocrysts. The rock is still massive with calcite and white orthoclase being the most abundant fracture fillers. Sulphides are rare.	H46286		48					
	H46287		59				15° 1/12'	
	H46288		36					
547.6'-570.5': MIXED TINGUAITE : while foliated, sheared plt still exceeds normal plt, the foliation is now less intense and is accompanied by relatively little biotite alteration. Usually the foliation is best illustrated by the flattened pl phenocrysts and makes a 20-30° angle with the core axis. The normal plt to sheared tinguaite ratio is 1:2. The rock still has very few fractures. White orthoclase is the most abundant fracture filler.	H46289		28				30° 1/7'	
	H46290		35					
554.9'-556.5': the tinguaite is more intensely foliated than usual with the pl phenocrysts being largely obliterated. The rock has a bleached, sugary appearance. A 6 mm leucocratic syenite dykelet cutting the core axis at 25° parallels the foliation.	H46291	BKGD	64		100			
562.5'-563.4': another bleached, strongly foliated area cored by a 7 mm leucocratic syenite dyke. This dyke contains about 10% blue feldspathoid.	H46292		45				70° to 80° 1/6'	
	H37539		215					
570.0'-570.5': 2, 1-2 mm, fine grained leucocratic syenite dykelets, containing 10% pyrrhotite, parallel the foliation of the tinguaite. 570.0'-602.6': MIXED TINGUAITE : differs from the previous interval in that the sheared to normal plt ratio is now 5:1. The foliation is variable in its intensity from weak to strong. The weak foliation is little more than elongation and flattening of the pl phenocrysts, while the strong foliation usually involves strong biotite alteration. The biotite alteration of the pl phenocrysts has produced a mafic rich groundmass. The foliation is at 10-25° to core axis. In the lower part of the interval there is somewhat more tinguaite brecciation. The normal plt occurs in lenses ranging from 5-25 cm across. These lenses contain 25-30%, 2-17 mm, light grey, anhedral pl phenocrysts in a medium grey aphanitic groundmass. White clays and white orthoclase are the major fracture filler. The rock is intruded by a number of leucocratic, fine grained syenite dykelets which are sub-parallel to core axis.	H37540		43					
	H37541		35				15° to 25° 1/8'	
577.8'579.0': a 4-8 mm wide, fine grained, leucocratic syenite dykelet containing 5% pyrite runs subparallel to the core axis which is conformable with the foliation.	H37542		37					
	H37543		19.5				80° to 90° 1/5'	
590.4'-591.0': an irregular 2-3 mm leucocratic syenite dyke contains 5% pyrite and 10% blue feldspathoids. This dyke runs subparallel to the core axis. The surrounding pl phenocrysts also contain 5-10% blue feldspathoids and a trace of molybdenite. 592.0'-602.6': the sheared tinguaite in this interval is very intensely altered to biotite giving the rock a dark grey color. The foliation still ranges from 10-30° to core axis.	H37544		19.5					
	H37545		30					

MOUNT SOPRIS GAMMA PROBE LOG



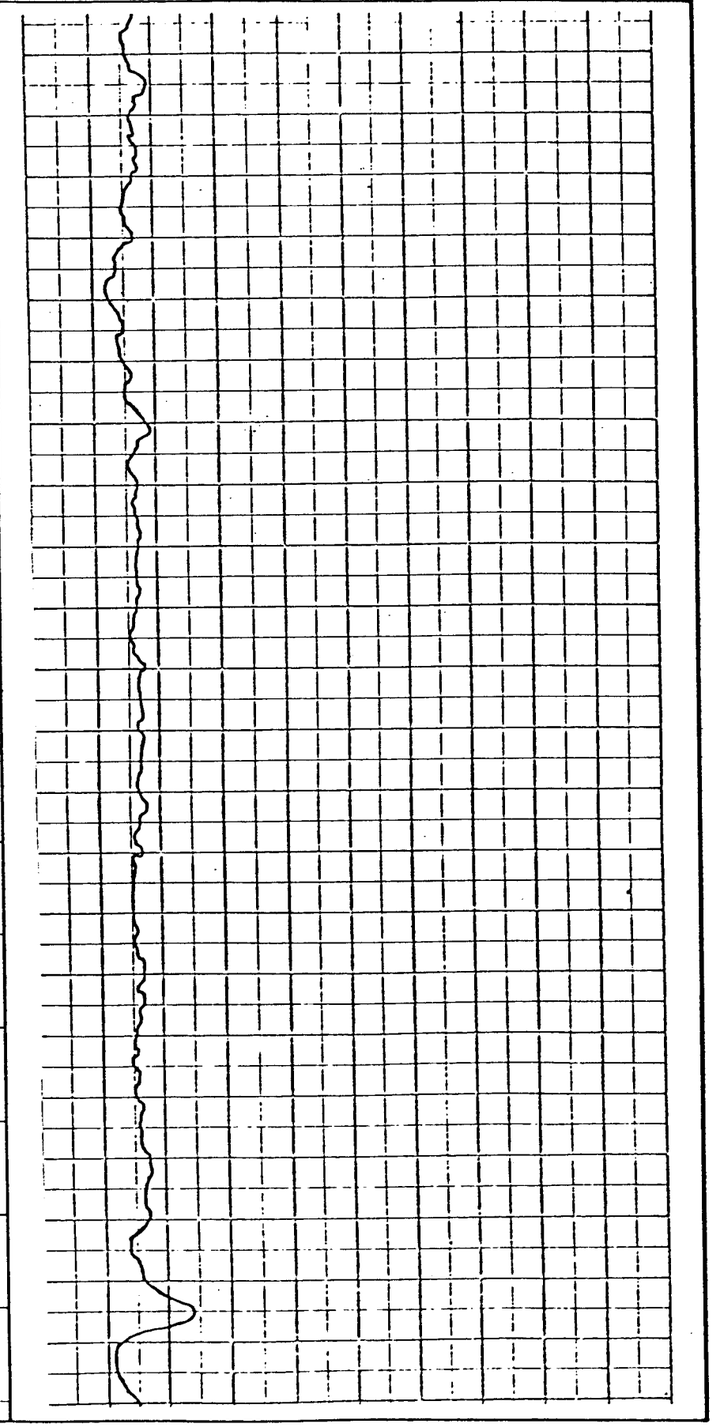
DRILL HOLE LOG

PROJECT UJV HOLE TH6 LOCATION - CORE SIZE BQ STARTED 29/07/79 FINISHED 9/08/79

CLAIM GROUP TOMBSTONE LENGTH 725' DIP -90° AZIMUTH - COLLAR ELEVATION 5034' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (U_3O_8) ppm U	ppm Cu		ppm Ag	% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
602.6': IRREGULAR 5-15° CONTACT: highlighted by an abundance of pyrite at the contact. 602.6'-607.0': SYENITE DYKE: a medium to coarse grained, grey syenite dyke composed 85% of grey orthoclase, 10% interatitial black mafics and 5% pyrite.	H37546		22.0								
607.0': SHARP 30° CONTACT 607.0'-613.5': MIXED TINGUAITE: normal plt to sheared tinguaite ratio of 2:1 with extensive biotite alteration giving way to a white clay? alteration of pl phenocrysts near the lower contact. Tinguaite has apparently been partially recrystallized to produce a lighter colored, fine grained rock but still exhibiting recognizable tinguaite characteristics near the contact.	H37547		23.5						15° to 25°	1/8'	605
613.5': GRADATIONAL 30° CONTACT: a 20 cm xenolith of partially recrystallized fine grained, altered tinguaite sits within the dyke just below the contact. 613.5'-625.5': SYENITE DYKE: a medium to coarse grained pinkish-grey syenite composed of 90% orthoclase and alteration products of orthoclase, 8-10% interstitial black mafics and 0-2% pyrite. The dyke becomes increasingly mafic rich as one goes from top to bottom culminating in a 20 cm band comprised 30% of mafics near the lower contact. The upper 2 m of the dyke contain up to 40% pale grey-green sericite after orthoclase? A number of 1 mm fractures in the upper portion of the dyke are surrounded by 5-7 mm alteration envelope of secondary feldspar. Calcite is the most common fracture filler. 620.0': a 45° hairline fracture, with 4 mm pink orthoclase alteration envelopes, contains minor galena, pyrrhotite and purple fluorite. 616.9'-617.1': a series of 1 mm wide, 45° fractures with pink orthoclase alteration envelopes contain pyrrhotite, galena, calcite and biotite. 617.7'-617.8': a portion of a 1 mm calcite filled 15° fracture widens to 6 mm and contains large blebs of pyrrhotite, galena, calcite, clear fluorite and biotite. 619.4'-619.5': a portion of a 0-5°, 1 mm wide calcite filled fracture intersects a 45° fracture. The resultant open space is filled with calcite, pyrrhotite and galena. 621.3'-621.4': a 1-3 mm, 50° fracture with pink orthoclase alteration envelopes contains pyrrhotite > galena ≤ biotite. 622.3'-622.4': a 1 mm 50° fracture is filled with pyrite. 624.1'-624.2': a 1 mm 50° fracture contains pyrite and pyrrhotite. 625.7'-626.0': a pair of 1 mm 20° and 45° fractures intersect. They are filled with biotite, pyrrhotite, calcite, purple fluorite and chalcopyrite. 626.5-: SHARP 45° CONTACT with minor recrystallization of tinguaite within 3 cm of contact. 626.5'-639.2': MIXED TINGUAITE: weak to moderate biotite and white clay? alteration of moderate to strongly foliated sheared tinguaite and normal plt. The ratio of sheared tinguaite to normal plt is 1:1. The foliation is erratic, ranging from 0-50° to core axis. The fracture is filled with white orthoclase. The rocks average 1/2-2% pyrrhotite. 627.0'-627.1': a 1-2 mm, 50° fracture filled with white orthoclase has a 15 mm alteration envelope in which the pl phenocrysts are partially altered to white clay. 639.2'-671.0': SHEARED TINGUAITE : weak to strong foliation with only rare lenses of unstressed tinguaite. Biotite alteration is generally weak. In the strongest foliated area the pl phenocrysts are indistinct or disappear. Small patches of white clay altered pl phenocrysts are common, usually associated with fractures. Fractures are very rare and are filled with white orthoclase. The foliation ranges from 0-45° to core axis.	H37548		20.0			0.4			80° to 90°	1/5'	610
	H37549		23.5			3.2			0° to 15°	1/1'	615
	H37550		24.5			1.2			25° to 30°	1/4'	620
	H37551		26			0.6			45° to 50°	1-3/1.	625
	H37552	BKGD	23.0			0.1	100		20°	1/5'	630
	H37553		25			0.1			60°	1/7'	635
	H37554		28			0.1					640
	H37555		27			0.1					645
	H37556		21.5			0.1			20° to 30°	1/10'	650
656.0': a trace of galena occurs along a hairline 20° fracture.	H37557		11.5			0.1					655
	H37558		23.0			0.1					660
	H37559		23.5			0.1					665
671.0-689.5': SHEARED TINGUAITE: extremely intense foliation of plt. The flattening and destruction of plt has produced very elongate pl lenses grading locally into compositional banding. The foliation is subject to numerous local irregularities producing a wavy effect. The attitude of the foliation ranges widely from 0-80°. Near the bottom contact and adjacent to syenite dykes the pl phenocrysts often have a pink tint. Also surrounding many fractures are 1 mm to 5 cm secondary orthoclase envelopes.	H37560		35			0.1			20° to 30°	1/10'	670
											675

MOUNT SOPRIS GAMMA PROBE LOG



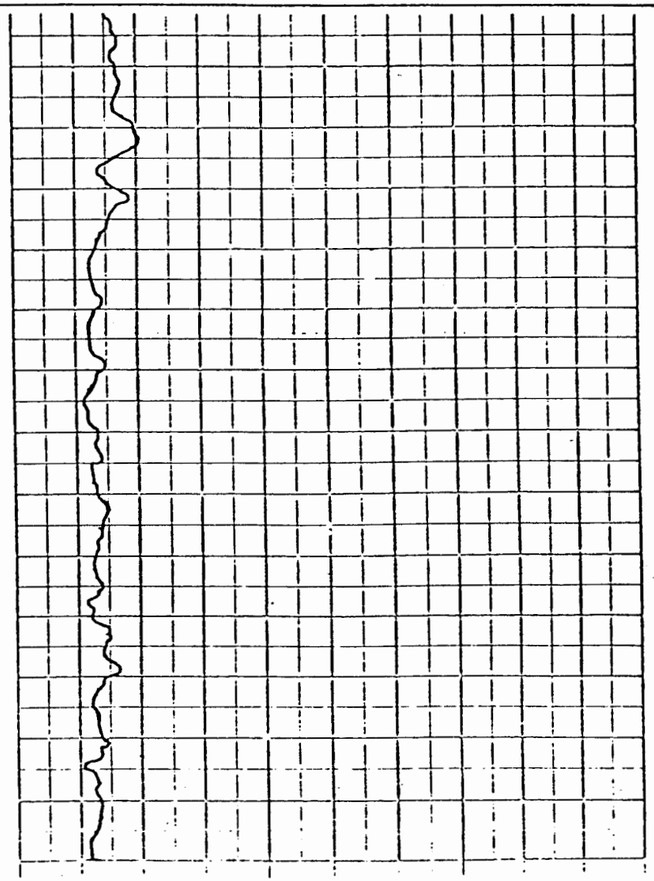
DRILL HOLE LOG

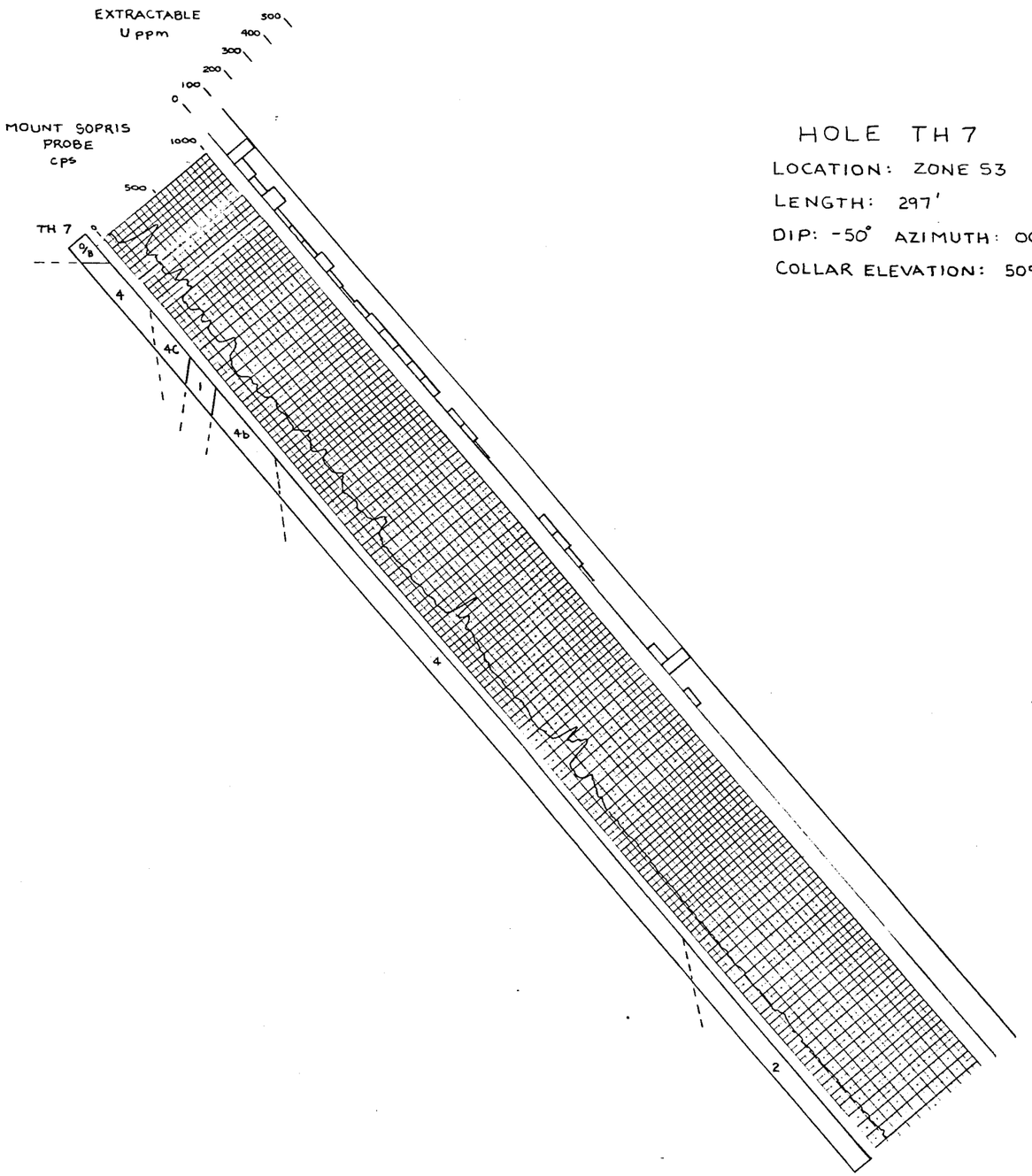
PROJECT UJV HOLE TH 6 LOCATION - CORE SIZE BQ STARTED 29/07/79 FINISHED 9/08/79

CLAIM GROUP TOMBSTONE LENGTH 725' DIP -90° AZIMUTH - COLLAR ELEVATION 5034' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8) ppm U	ppm Cu		ppm Ag	% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
674.3'-674.5': an irregular, 1 cm wide, fracture contains pegmatitic crystals of calcite, biotite, pyrrhotite, galena and a 7 mm wide wolframite or sphalerite crystal.	H37561	BKGD	15.5			0.1	100			680
678.4'-678.6': ≠ 5 mm, 30° fracture is filled with 90% white orthoclase and 10% pyrrhotite. 678.8'-679.6': a highly irregular area is flooded with secondary pink orthoclase. The core of the zone contains pegmatitic orthoclase with good crystals of calcite and pyrrhotite filling vugs.	H37562		28			1.6			20° to 30° 1/10'	
680.3'-682.5': a syenite dyke has intruded the tinguaite parallel to the 50° foliation. The uppermost 10 cm of the dyke is composed of pegmatitic pink orthoclase, calcite and biotite. The orthoclase has again flooded the adjacent tinguaite. Below this the syenite is 90% medium to coarse grained, pink to grey orthoclase and 10% chloritized interstitial mafics.	H37563		30			1.2				685
Approximately 1/2% of the mafics have been replaced by pyrrhotite. The lower contact with the tinguaite is gradational. 683.5'-683.7': a pair of 30° and 60° hairline fractures filled with biotite, pyrrhotite and calcite have 3 mm pink orthoclase envelopes. 684.6'-685.6': a medium to coarse grained, pink-grey strongly sericitized syenite dyke containing 1% pyrrhotite has a gradational 45° contact parallel to the tinguaite foliation. 685.8'-686.4': a fine grained, salt and pepper syenite dyke has sharp 60° contacts with the upper syenite and the tinguaite below it. This lower contact is conformable with the tinguaite foliation. 689.5': GRADATIONAL CONTACT conformable with the tinguaite's weak 45° foliation.	H37564		24			3.2				690
	H37565		18.0			2.0				695
689.5' - End of Hole: SYENITE: medium grained, light grey to pinkish syenite composed of 90% anhedral, light grey to pink orthoclase, 9% interstitial, black mafics and 1% pyrrhotite. Rock is locally up to 30% sericite. These areas are part of broad alteration envelopes (up to 30 cm wide) around some pink orthoclase filled fractures. The orthoclase usually floods the syenite from 5 mm - 30 mm around the fractures. Most fractures are filled with pink orthoclase ± biotite, sulphides, and calcite. 689.8'-691.3': Hairline, pink orthoclase and calcite filled, 20° and 70° fractures contain blebs of pyrrhotite >> biotite > chalcopyrite ≈ galena ≈ purple fluorite. 690.8'-691.0': a 2 cm wide, 25° pink orthoclase and calcite filled fracture. 692.1'-692.4': a 1 cm wide, 50° pink orthoclase and pyrrhotite filled fracture.	H37566		18.5			2.0			20° to 25° 1/5'	700
697.5'-697.9': irregular pegmatitic pink orthoclase dyke? 698.7'-698.9': 2 hairline, 70° and 20° fractures contain pyrrhotite, biotite, galena, and wolframite? or sphalerite?	H37567		22.5			5.6			50° to 70° 1-2/1'	705
705.0'-705.2': a 7 cm wide, 70° fracture is filled with pegmatitic pink orthoclase and calcite filled vugs. 712.8'-713.8': syenite has pinkish color due to hematite stains surrounding mafics. 714.5'-714.7': a 10 cm wide, pegmatitic, pink orthoclase dyke with irregular orthoclase flooded envelope. Dyke contains pyrrhotite >> chalcopyrite in vugs. 721.9'-722.0': a 4 mm, 70° fracture contains pyrrhotite ≈ calcite > wolframite or sphalerite >> chalcopyrite ≈ purple fluorite ≈ galena with a 5 mm pink orthoclase alteration envelope. 722.3'-724.5': 4 hairline, 60-70° fractures contain pyrrhotite and biotite. 725.0'-725.3': irregular blebs of pyrrhotite and minor purple fluorite on 1-2 mm fracture with pink orthoclase envelopes. 726.8': a 70°, hairline fracture with biotite, pyrrhotite and purple fluorite.	H37568		20.5			3.8				710
	H37569		23			2.8				715
	H37570		19.0			4.6				720
										725

MOUNT SOPRIS GAMMA PROBE LOG





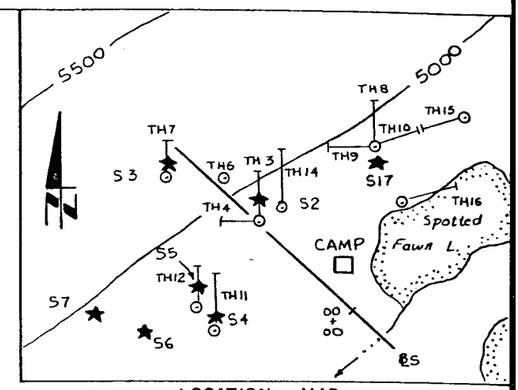
HOLE TH 7

LOCATION: ZONE 53

LENGTH: 297'

DIP: -50° AZIMUTH: 000°

COLLAR ELEVATION: 5090'



LOCATION MAP

SCALE 1:10,000

100 50 0 100 200 300 400 500

metres

1. SYENITE tan weathering, medium to coarse grained nepheline syenite often with abundant sulphides and purple fluorite

2. PSEUDOLEUCITE TINGUAITE 5-30%, 3-20mm pseudoleucite phenocrysts 1-10mm orthoclase phenocrysts in a medium grey, aphanitic groundmass

3. SHEARED TINGUAITE foliated and/or auto-brecciated tinguaite often biotite altered

4. MIXED TINGUAITE lenses or bands of pseudo-leucite phenocrysts in sheared tinguaite groundmass

5. FINE GRAINED TINGUAITE medium to dark grey tinguaite without pseudoleucite phenocrysts, some 1-3 mm orthoclase phenocrysts. Usually as dykes

6. INTERMEDIATE TINGUAITE medium grey tinguaite with pseudoleucite orthoclase phenocrysts. Pseudoleucite phenocrysts smaller than usual

B,b BIOTITE ALTERATION . intense, moderate

C,c CHLORITE ALTERATION intense, moderate

——— – – – geologic contact: sharp, gradational

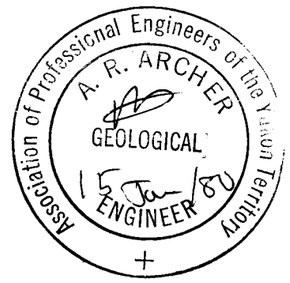


FIG. U-TG21

ARCHER, CATHRO & ASSOCIATES LTD

SECTION TH7

TOMBSTONE PROPERTY

UKON JOINT VENTURE

SCALE 1:400

4 2 0 4 8 12 16 20

metres

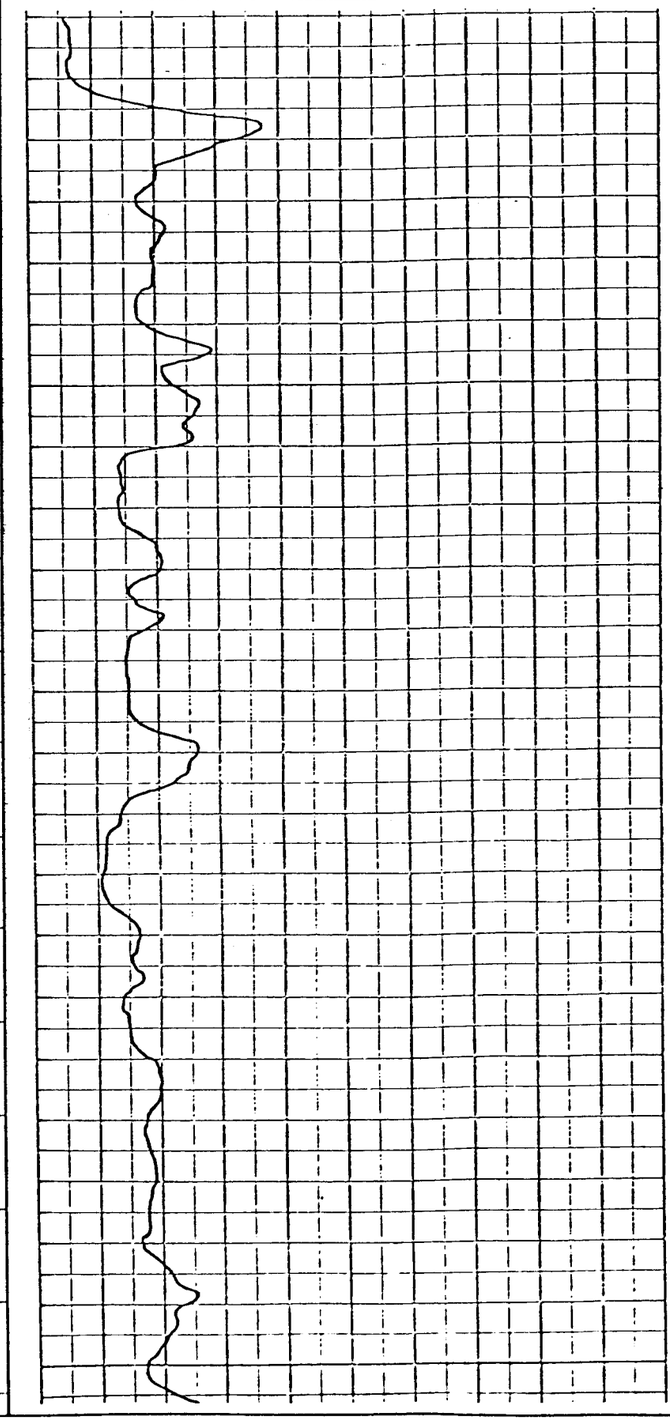
DRILL HOLE LOG

PROJECT UJV HOLE TH 7 LOCATION Zone 53 CORE SIZE BQ STARTED 10/08/79 FINISHED 11/08/79

CLAIM GROUP TOMBSTONE LENGTH 297' DIP -50° AZIMUTH 000° COLLAR ELEVATION 5090' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8) ppm U	ppm Cu	% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
OVERBURDEN: syenite and tinguaite boulders mixed with soil; both glacial and talus material present.		20/BKGD			15				5
MIXED TINGUAITE: lenses of normal pseudoleucite tinguaite are cut by sheared zones of foliated, brecciated and/or altered tinguaite, described in detail below. HIGHLY FRACTURED, ALTERED AND LIMONITE STAINED MIXED TINGUAITE: fracture density 5-30/ft, most at 5-20° to core axis. The pl phenocrysts have been more affected by alteration than the groundmass as a rule. The phenocrysts are typically tan or brown due to limonite flooding or pale green to milky white due to sericite alteration. The groundmass is medium grey except where fracture density is greatest; there it is tan to brown due to limonite and soft, suggesting clay or sericite alteration. The strongest fractures have ∠1/2 to 2mm coats of yellow brown limonite (goethite > jarosite). Traces of residual pyrite or pyrrhotite are found both in the groundmass and on fractures. Sericite is common on stronger fractures. The fractured and altered rocks are weakly radioactive. Alteration appears to be hypogene although it may be supergene in part.	H46245		97		100		20°	1/1'	
9.2'-13.0': MIXED TINGUAITE: lenses of normal plt are surrounded by sheared tinguaite. The plt to sheared tinguaite ratio is ~3:1. The shears occur at irregular intervals, average ~10 cm between shears and have ambiguous orientations to the core axis although there is a suggestion that a 30° orientation dominates. The normal plt contains white, euhedral to subhedral, 2mm-15mm (6mm average), pl phenocrysts comprising 25-45% of the rock, and white, stubby to prismatic, subhedral to euhedral, 1mm-10mm (3mm average) orthoclase phenocrysts, comprising <5% of the rock, in a medium grey, aphanitic groundmass. The large pl phenocrysts are commonly cracked. The sheared tinguaite is generally weakly foliated. It consists of 1-4mm fragments altered to biotite. Sulphides are rare in both normal and sheared tinguaites. The fracture density is low for both rock types. Most fractures are open with weak chlorite and limonite coatings; a few 20° fractures are filled with white calcite.	H46246		41		95		5° to 20°	5-30/1'	10
ALTERED MIXED TINGUAITE: starts as 3 cm wide, tan, limonite flooded and pale green sericitized alteration envelopes around chloritized open fractures (to ~31.0'). Alteration principally affects phenocrysts, then grades into pervasive pale green to olive sericite alteration affecting both the groundmass and phenocrysts. (31.0'-41.7'). Traces of pyrite disseminated through rock. Moderate to strong limonite staining and coating on closed fractures with 5mm limonite flooding of adjacent wall rock. Chlorite > sericite on open fractures. Phenocrysts still highly visible despite alteration.	H46247		25				20° and 50°	2-3/1'	15
							20° to 30° and 50° to 70°	1-2/1'	20
	H46248		62						
	H46249		17				25-50° and 50° to 70°	1-3/1'	25
	H46250		22				20°	3-9/1'	30
							50°	1-9/1'	
	H46251	BKGD	19		100		75°	1-4/1'	35
41.7' SHARP 50° CONTACT: altered mixed tinguaite to MAFIC RICH SYENITE DYKE: 41.7'-44.5': chill margin (?) fine grained, slightly porphyritic, grey-green syenite. Mafic very fine grained, mostly interstitial to coarser grained, grey feldspar crystals. Feldspar phenocrysts up to 1 cm long show greenish tint, sericite alteration. Pyrrhotite, disseminated, in blebs, and on fractures, comprises 1-2% of the rock. Sulphides closely related to biotite and calcite. Calcite estimated at 2% of whole rock and commonly fills <1mm irregular fractures running subparallel to the core axis.	H37571		43				20° to 40°	1-2/1'	40
44.5'-51.8': fine to medium grained, porphyritic, mafic rich syenite with prismatic, grey orthoclase phenocrysts 7-15mm long and chloritized dark green pyroxene phenocrysts 1-4mm long in a finer grey-green groundmass. Mafics comprise 20-30% of the rock. Fractures are commonly chloritized, limonite is rare. Calcite occurs in minor cracks and is disseminated through the groundmass, still 2-4% of the rock. No chill margin on the lower dyke contact.	H37572		16.5				20° to 30°	1-2/1'	45
51.8': SHARP 50° CONTACT: 51.8'-68.3': MIXED TINGUAITE: as before with lenses of normal plt between shear zones of brecciated, foliated and/or altered tinguaite. Shear orientation at ~30° to core axis. Ratio of normal pseudoleucite tinguaite to foliated tinguaite is 1:1. Most pseudoleucite phenocrysts in "normal" pl tinguaite have a distinctive pinkish tint, possibly signifying zoesite alteration. Biotite is the most prevalent alteration product in the sheared tinguaite. Minor green sericitic alteration occurs as an envelope around a calcite filled fracture between 52.5 and 53.0'. 5-20°, <1mm calcite filled fractures are common. Traces of pyrite occur locally in the tinguaite groundmass. Between 54.8-55.1' a dark grey, banded mylonite zone cuts through brecciated tinguaite at 30° to core axis.	H37573		14.5				75°	1/8'	50
	H37574		15.5				20°	1/2-2'	55
	H37575		31				50°	1/2'	60
	H37576		26						65
68.3'-69.3': SHARP CONTACT: MAFIC RICH DYKE: as above. 69.3'-77.2': MIXED TINGUAITE: as before; below this section biotite alteration is relatively uncommon.	H37577		34				70° to 80°	1-3/1'	70
									75

MOUNT SOPRIS
GAMMA PROBE LOG



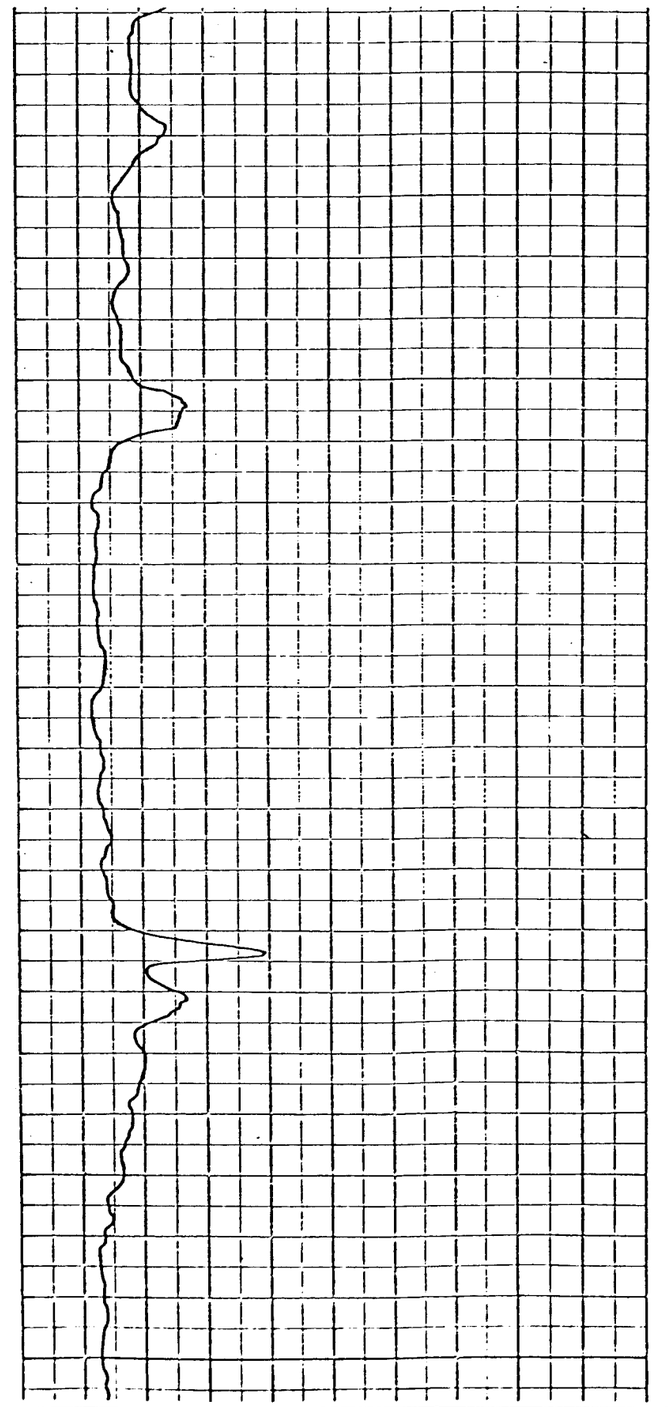
DRILL HOLE LOG

PROJECT UJV HOLE TH7 LOCATION Zone 53 CORE SIZE BQ STARTED 10/08/79 FINISHED 11/08/79

CLAIM GROUP TOMBSTONE LENGTH 297' DIP -50° AZIMUTH 000° COLLAR ELEVATION 5090' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY ($\%U_3O_8$) ppm U	ppm Cu	% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
77.2'-78.2': MAFIC RICH DYKE: a microcrystalline chill zone surrounds a coarse grained mafic rich dyke as described previously. The chill zone is 9 cm thick on either side of the coarser material. It is microcrystalliine, dark grey in color and contains several 1-3 cm in diameter coarse mafic rich fragments. The contact between the chill zone and the tinguaite is somewhat irregular but cuts the core axis at 60°. The chill margin is calcareous like the coarser part of the dyke and in this way differs from the surrounding tinguaite. MIXED TINGUAITE: similar to earlier mixed tinguaite. Shearing, although somewhat erratic, is generally at 20-40° to core axis. The dominant alteration is the pinkish alteration both in the normal and sheared plt; biotite alteration is minor. The major difference between this rock and earlier mixed tinguaite is that the plt to sheared tinguaite ratio is now 1:4. Calcite commonly coats fractures, no limonite.	H37578	BKGD	28		100		50° to 70° 1/1-2'	80
	H37579		25					85
	H37580		5.0					90
	H37581		17.0					95
98.0'-114.5': mixed tinguaite with a plt: altered tinguaite ratio of 1:4. Shearing is less important than in previous section but still ~30° to core axis. Some pink alteration and weak biotite alteration, but dominant change in pl phenocrysts in the altered and brecciated zones is their change from white to a dull, medium grey color, which nearly blends into the groundmass. Calcite common on fractures. Traces of blue cancrinite or sodalite in a few phenocrysts.	H37582		18.5					100
	H37583		14.5				50° to 75° 1/1'	105
	H37584		1.5					110
	H37585		5.0				20° 1/1' 75° 1/3'	115
114.5'-119.0': brecciation is the dominant feature of these rocks. Fragments in breccia rarely exceed 4mm in length. Rocks are weakly altered as before. Breccia like all breccia in mixed tinguaite is very tight with a mottled, slightly lighter than usual groundmass.	H37586		3.5					120
119.0'-130.0': brecciated and normal plt interspersed at approximately 15 cm intervals. In brecciated tinguaite pl phenocrysts and fragments vary from medium grey to dark grey. Biotite alteration is limited. At 126.6', a 3 cm x 1.5 cm area contains abundant 1-3mm prismatic orthoclase crystals; could be a void in the tinguaite which was filled by these crystals.	H37587		7.0				40° 1/5'	125
	H46252		31					130
130.0'-162.0': foliation dominant texture, both mafic and phenocrysts are orientated in sheared portion of rock. Plt to sheared tinguaite ratio 1:3. Little alteration of any sort. Appears to be plastic deformation. Calcite coats the few fractures which exist.	H37588		31					135
	H37589		19.5				35° 1/6' 70° 1/4'	140
	H37590		12.5					145
	H37591		4.5					150

MOUNT SOPRIS GAMMA PROBE LOG



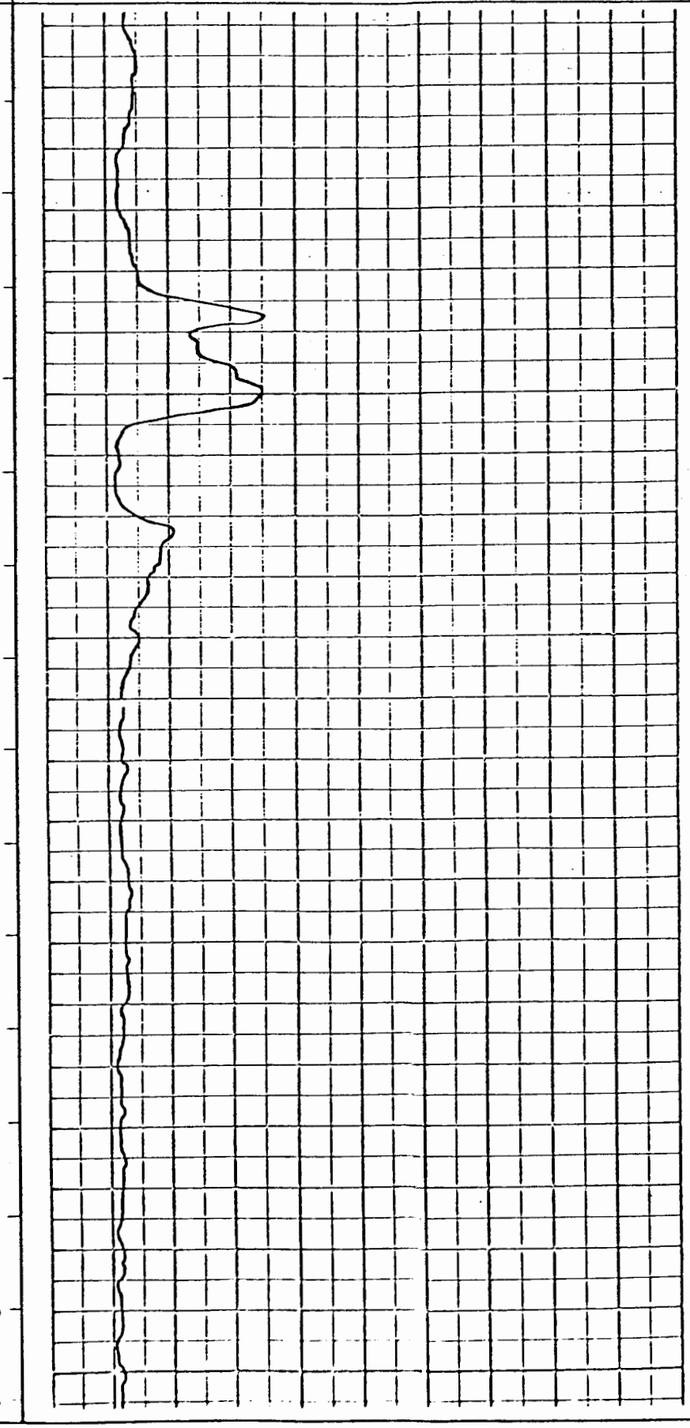
DRILL HOLE LOG

PROJECT UJV HOLE TH7 LOCATION Zone 53 CORE SIZE BQ STARTED 10/08/79 FINISHED 11/09/79

CLAIM GROUP TOMBSTONE LENGTH 297' DIP -50° AZIMUTH 000° COLLAR ELEVATION 5090' DRILLED BY CABON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (U_3O_8) ppm U	ppm Cu			% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
152.2': traces of blue feldspathoid in pl phenocrysts.	H37592		4.5						35°	1/6'	155
Shearing prevalent and consistent at 30-35°; little or no alteration.	H37593		5.0						70°	1/4'	
162.0'-165.7': brecciation again dominates over foliation although rocks are still moderately foliated. Fragments 1-4mm across. No normal plt in this interval.	H37594		4.0								160
165.7'-183.0': normal plt dominates sheared tinguaite at a ratio of 4:1! The pl:orthoclase ratio is lower than usual at 3:2. The pl phenocrysts exhibit weak, pale green, sericitic(?) alteration locally and approximately 50% of the rock is comprised of phenocrysts. The rock is massive.	H37595		5.5								165
	H46253		28								
	H37596		96						50° to 70°	1/2'	170
	H37597		7.5								175
182.6'-183.0': a small fracture zone (6/1') is coated with calcite. 183.0'-232.5': Biotite alteration and brecciation are common. Plt to sheared tinguaite ratio 1:4. The groundmass of brecciated rock is mottled often with a light grey color; locally it has a drab green-grey color. Calcite on most fractures. A 1mm fracture at 188.1' is filled with sodalite. Aside from the altered and brecciated zones the rocks are typical plt.	H37598	BKGD	17.0				100				180
	H37599		8.0								185
	H37600		3.5								190
	H37601		3.0						20°	1/5'	195
	H37602		2.0						70°	1/4'	200
Still normal plt mixed with biotite altered plt. The altered rocks are only slightly stressed in this section. Fracture density is extremely low.	H37603		1.5								205
	H37604		2.0								210
217.6'-218.5': 2mm wide, medium grained orthoclase, sodalite, biotite dykelet runs subparallel to the core axis.	H37605		2.5								215
											220
222.0': Biotite alteration gives way to foliation as the dominant characteristic of the rock, still at 30° to core axis. Plt to sheared tinguaite ratio 1:1.	H37606		1.0								
											225

MOUNT SOPRIS
GAMMA PROBE LOG



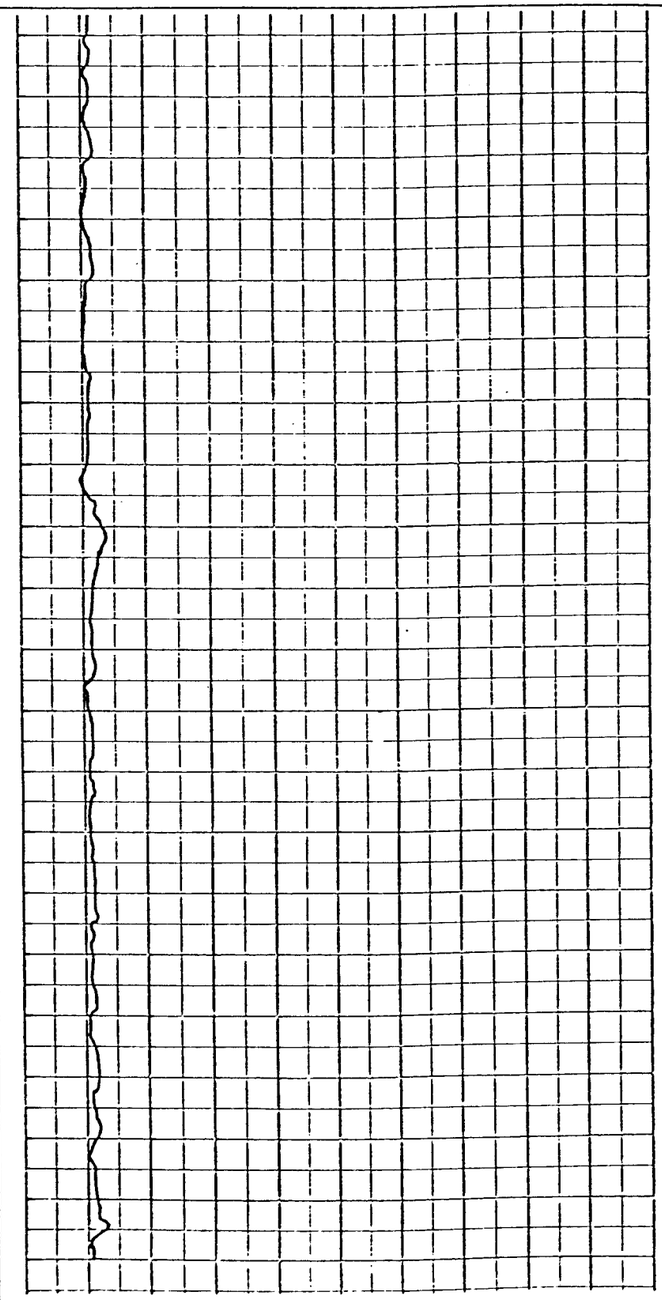
DRILL HOLE LOG

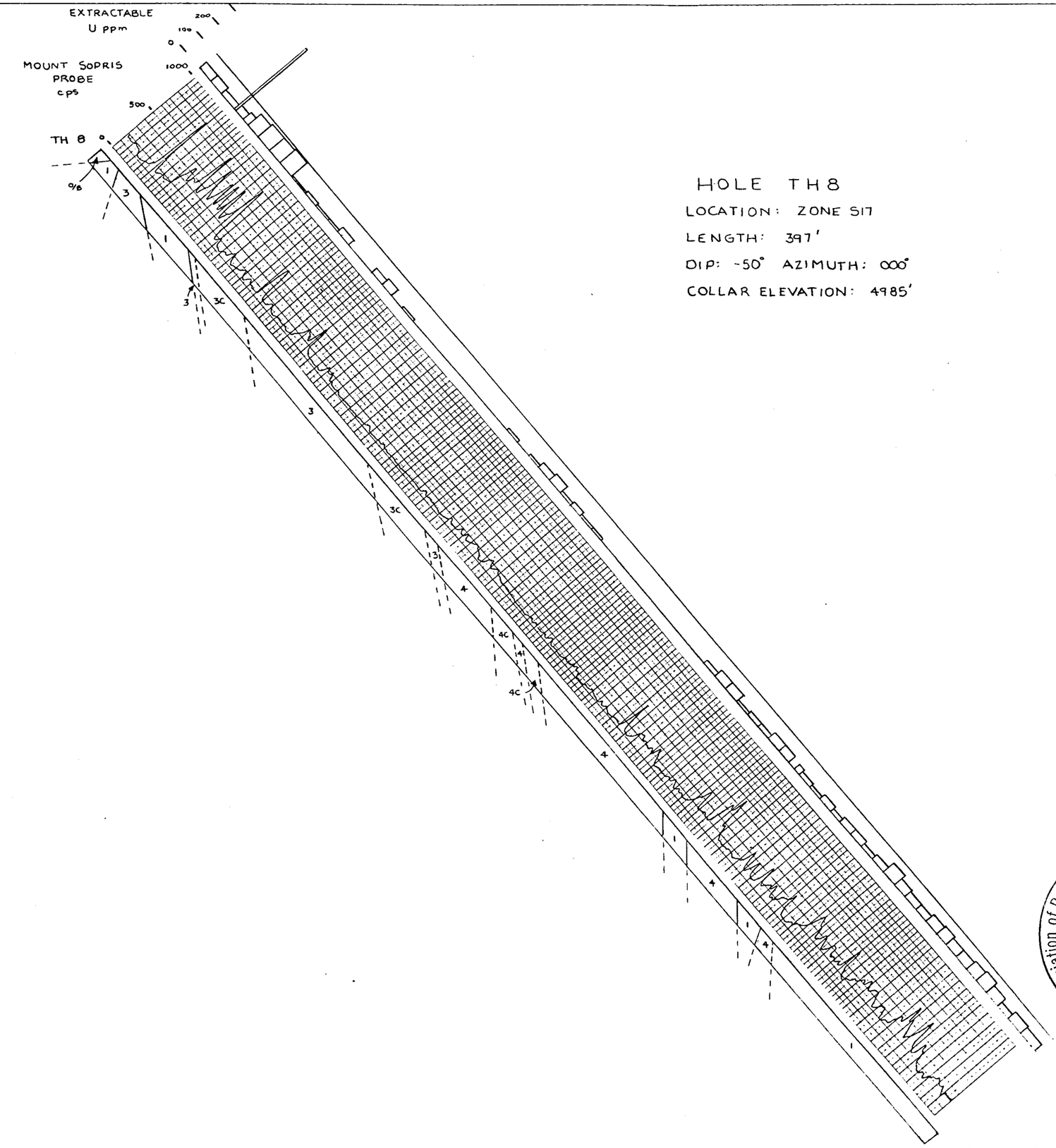
PROJECT UJV HOLE TH 7 LOCATION Zone 53 CORE SIZE BQ STARTED 10/08/79 FINISHED 11/08/79 PAGE 4 OF 4

CLAIM GROUP TOMBSTONE LENGTH 297' DIP -50° AZIMUTH 000° COLLAR ELEVATION 5090' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (U_3O_8) ppm U	ppm Cu	% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
	H37607		1.5					
232.5': GRADATIONAL CONTACT: somewhat arbitrary PSEUDOLEUCITE TINGUAITE: since the ratio of plt to sheared tinguaite exceeds 5:1, the rock is termed plt. It consists of 3-15mm white, anhedral to subhedral, pseudoleucite phenocrysts comprising 30-40% of the rock and 1-4mm, white, subhedral, stubby orthoclase phenocrysts comprising <3% of the rock, in a medium grey, aphanitic groundmass. The rock is massive. The plt is cut at irregular intervals by <10 cm wide bands of foliated, brecciated and/or altered tinguaite. Biotite destruction of the pl phenocrysts is the most common alteration however local, weak chloritization of the groundmass occurs. Most of the 50° fractures are coated with calcite.	H37608		1.0					230
	H37609		1.5					235
	H37610		1.0					240
	H37611		1.5					245
	H37612	BKGD	1.0		100			250
254.1'-254.2': a 1mm, 50° fracture is filled with sodalite. 254.7'-260.0': biotite alteration of pl phenocrysts is extensive over this interval, in all, 60% of the pl phenocrysts are wholly or partially altered to biotite.	H37613		2.0					255
							50°	1/5' 260
260.0'-278.0': normal pseudoleucite tinguaite dominant.	H37614		1.5					265
	H37615		1.5					270
	H37616		1.5					275
277.3'-277.7': a 2mm fracture filled with orthoclase, pyroxene and minor pyrrhotite. 278.0'-279.0': small band of biotite altered plt. 279.0-end of hole: normal plt with very minor <5 cm wide altered or sheared zones. Calcite fills fractures.	H37617		1.5					280
	H37618		1.5					285
	H37619		1.5				25° to 35°	1/3' 290
	H37620		3.0					295
								297

MOUNT SOPRIS GAMMA PROBE LOG





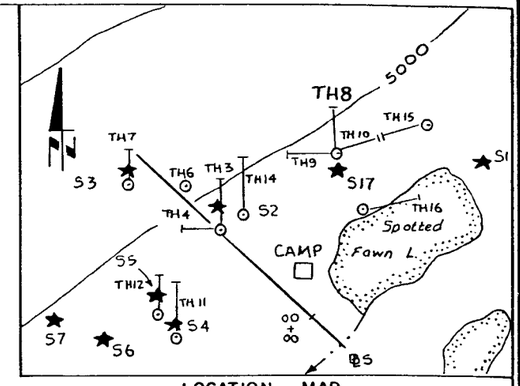
HOLE TH8

LOCATION: ZONE 517

LENGTH: 397'

DIP: -50° AZIMUTH: 000°

COLLAR ELEVATION: 4985'



1 SYENITE tan weathering, medium to coarse grained nepheline syenite often with abundant sulphides and purple fluorite

2 PSEUDOLEUCITE TINGUAITE 5-30%, 3-20mm pseudoleucite phenocrysts 1-10mm orthoclase phenocrysts in a medium grey, aphanitic groundmass

3 SHEARED TINGUAITE foliated and/or auto-brecciated tinguaite often biotite altered

4 MIXED TINGUAITE lenses or bands of pseudo-leucite phenocrysts in sheared tinguaite groundmass

5 FINE GRAINED TINGUAITE medium to dark grey tinguaite without pseudoleucite phenocrysts, some 1-3 mm orthoclase phenocrysts. Usually as dykes

6 INTERMEDIATE TINGUAITE medium grey tinguaite with pseudoleucite orthoclase phenocrysts. Pseudoleucite phenocrysts smaller than usual

B,b BIOTITE ALTERATION . intense, moderate

C,c CHLORITE ALTERATION intense, moderate

——— – – – geologic contact: sharp, gradational

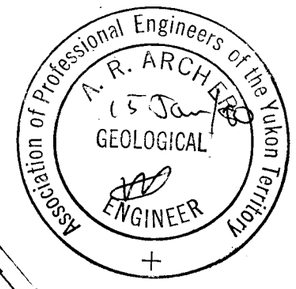


FIG. U-TG22

ARCHER, CATHRO & ASSOCIATES LTD

SECTION TH8

TOMBSTONE PROPERTY

UKON JOINT VENTURE

SCALE 1:400

4 2 0 4 8 12 16 20

metres

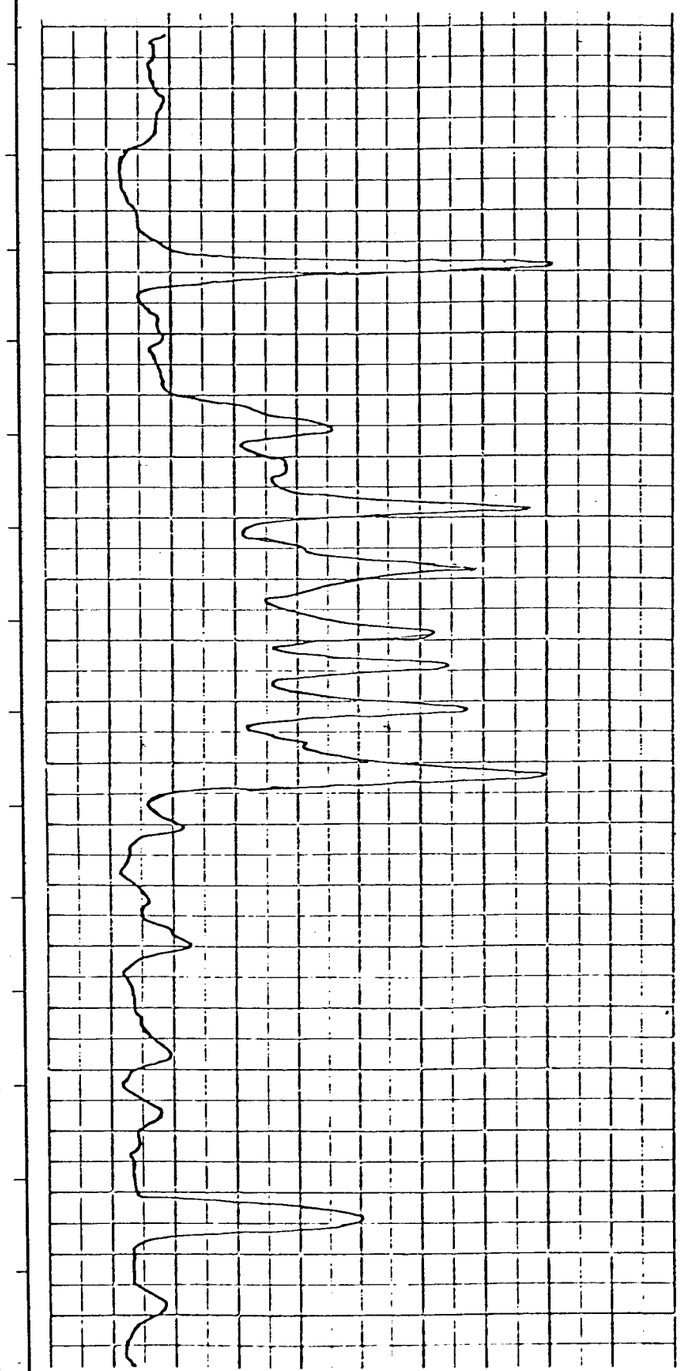
DRILL HOLE LOG

PROJECT UJV HOLE TH 8 LOCATION Zone 517 CORE SIZE BQ STARTED 13/08/79 FINISHED 16/08/79 PAGE 1 OF 6

CLAIM GROUP TOMBSTONE LENGTH 397' DIP -50° AZIMUTH 000° COLLAR ELEVATION 4985' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY ($\%U_3O_8$) ppm U	ppm Cu		ppm Ag	% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
0-3.0': OVERBURDEN: soil, talus and highly decomposed bedrock.	H46293	BKGD	35			0.8	0				
3.0'-10.0': SYENITE DYKE: rusty weathering, medium to coarse grained syenite dyke containing 80-90% tan to light grey, euhedral to subeuhedral, often twinned orthoclase and 10-20% green, interstitial, chloritized mafics. Up to 1% of these mafics have been replaced by pyrrhotite. The fractures are open with moderate to strong limonite stains. The limonite has flooded the syenite adjacent to the fractures in envelopes up to 5mm wide. Minor disseminated purple fluorite is also present.	H46294	20/BKGD	36			0.8	90		70° to 90°	10-2⅞ 1'	5
10.0': SHARP 60° CONTACT 10.0'-22.4': SHEARED TINGUAITE: the tinguaite has been highly brecciated and weakly to moderately foliated (predominantly the mafics). It contains 1-4mm orthoclase phenocryst fragments in a medium grey groundmass however the color of the rock varies from a pinkish grey to grey-green due to weak sericitic and chloritic alteration. Most fractures are open and limonite stained. The closed fractures usually contain white to pink orthoclase ± sulphides and mafics. The foliation generally cuts the core axis at 35-45°. 13.7': a 1/2mm, 30° fracture is filled with pyrrhotite > arsenopyrite > chalcopyrite. 16.0'-16.4': a coarse grained, 10 cm wide, strongly radioactive syenite dyke cuts the core axis at 90°. The dyke contains 90% pink to green-grey orthoclase, 7% chloritized mafics, 2 1/2% pyrite, and <1/2% shiny, hard black minerals, which are probably the source of the radio-activity. Around this dyke are a number of pink orthoclase filled fractures varying from 1/2mm to 3mm wide. 19.4'-19.5': a group of hairline, 50° fractures contain pyrite and arsenopyrite. 21.8': a hairline, 60° fracture contains arsenopyrite and limonite. 22.4': SHARP 30° CONTACT	H46295	40/BKGD	34			0.4			10° to 20°	1/3'	10
	H46296	190/BKGD	449			1.0					15
	H46297	60/BKGD	41			0.1			50° to 60°	2-4/1'	
	H46298		46			0.6					20
22.4'-43.6': SYENITE DYKE: surrounded by a 10 cm weakly sericitized and chloritized alteration envelope. The dyke is composed of 90-95% coarse grained orthoclase and 5-10% interstitial, chloritized biotite and hornblende, 1% purple fluorite and 1/4-1% disseminated sulphides, mostly pyrrhotite, often replacing or occurring with the mafics. The color of the rock varies depending upon the color of the orthoclase. Generally the upper part of the dyke is green and the lower part pink. Pink syenite occurs between 28.5-30.8' and 33.4'-43.6'. Although the orthoclase looks fresh (very hard) some of the green color may be due to sericit-ization. The pink syenite is a 2 MICA SYENITE containing both biotite and abundant, up to 5%, sericite. A schiller effect is present in a few of the orthoclase crystals. The fractures are usually open and are moderately to strongly coated with limonite ± pyrrhotite or pyrite. 23.3'-23.7': small chlorite limonite and pyrite coated fracture zone with ~cm light green, sericitic alteration envelopes cuts the core axis at ~20°. 27.3'-27.5': blebs of disseminated or fracture chalcopyrite with pyrrhotite and purple fluorite near a 1mm, 20° fracture filled with pyrite. 28.5': a 2-6mm band of magnetite and chloritized mafics cuts the core axis at 60°. 36.1': a 10mm, white orthoclase >> purple fluorite = pyrrhotite filled fracture cuts the core axis at 60°. 39.5'-39.6': a 2 cm wide coarse grained orthoclase, chloritized mafic, purple fluorite and minor black mineral dykelet cuts the core axis at 45°. 43.5': another 4-8 mm wide band of magnetite and chloritized mafics cuts the core axis at 30°. 43.6': SHARP 35° CONTACT with no alteration of adjacent tinguaite. 43.6'-49.2': SHEARED TINGUAITE: as previously described except that biotite alteration is rare leaving the tinguaite with a salt and pepper color. Brecciation still dominates texturally with a weak 35° foliation in places. Sulphides are rare. 45.7': a 2 mm wide, fine grained syenite cuts tinguaite at 80° to core axis. 49.2'-71.7': SERICITIZED SHEARED TINGUAITE: as previously described except rock has been pervasively altered to sericite producing a mottled to uniform pale green color. Appears to be related to a series of sulphide bearing fractures described below. In addition to the sericitization, much of the biotite has gone to chlorite. Most open fractures are coated with chlorite and/or limonite. The closed fractures contain chlorite ± pyrrhotite, and other sulphides. 50.5'-50.9': a 3 cm wide intensely fractured and altered zone cutting the core axis at 20° contains abundant chlorite > pyrrhotite = dolomite > pyrite > a dark grey mineral with a brown streak (sphalerite? wolframite?) > chalcopyrite = arsenopyrite. Very heavy rock. 52.3-52.7': a 2mm, 10° fracture contains arsenopyrite > pyrite. 53.5'-53.8': an 8 mm white orthoclase dykelet cuts the core axis at 20°. 57.0'-57.6': a 1mm, 10° fracture is filled with pyrite. 58.4'-61.4': a fine grained, leucocratic, pale green syenite dyke cuts the core axis at 30°. Mafics are altered to sericite. Rock contains 1/4% pyrrhotite. A 2 cm wide zone of 20° fractures at 58.8'-62.2' contains abundant pyrite.	H46299	70/BKGD	79			0.6					25
	H48146	100/BKGD	85			0.4			10° to 25°	1/2'	30
	H48147		85			0.6			50° to 70°	2-5/1'	35
	H48143	80/BKGD	102			0.4	100				40
	H48149	50/BKGD	14			0.1					45
	H37621	BKGD	9.0								50
	H37622		16.5						0° to 20°	1-2/1'	
	H37623		13.5						30° to 45°	1-2/1'	55
	H43156		14								60
	H37624		33						60° to 70°	2-7/1'	65
66.2'-66.3': a 7 mm, medium grained syenite dykelet cuts the core axis at 30° 66.8-70.2': a group of small, up to 2mm, fractures contains chlorite > arsenopyrite > calcite. 71.7': SHEARED TINGUAITE: brecciated and foliated tinguaite. Foliation is stronger than in previous intervals and varies from 20°-40° to core axis. Most of the pl phenocrysts have undergone moderate biotite alteration rendering them almost invisible. Most fractures are open with weak limonite stains. Finely disseminated sulphides are present in trace amounts.	H37625		7.5								70
											75

MOUNT SOPRIS
GAMMA PROBE LOG



DRILL HOLE LOG

PROJECT UJV HOLE TH8 LOCATION Zone 517 CORE SIZE BQ STARTED 13/09/79 FINISHED 16/09/79

CLAIM GROUP TOMBSTONE LENGTH 397' DIP -50° AZIMUTH 000° COLLAR ELEVATION 4983' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8) ppm U	ppm Cu			% RECOV	GEOLOGY	STRUCTURE & TO core	HOLE DEPTH (FEET)
77.2'-77.4': 2, 6cm wide, green grey, fine grained syenite dykelets parallel foliation in the tinguaites at 40° to core axis. These dykes contain 10% arsenopyrite > pyrite.	H37626		8.5							
81.7'-85.0': tinguaites have a very faint greenish tint adjacent to haitline fractures containing pyrrhotite, arsenopyrite and chlorite. The green is probably weak sericitic alteration.	H48157		27						50° 1/1-2'	80
88.7'-89.2': a 9 cm wide, fine grained syenite dyke composed of 90% orthoclase and 10% interstitial pyrrhotite replacing mafics > mafics. Minor hematite stains around some mafics. Very sharp contacts cut tinguaite perpendicular to foliation, cut core axis at 50°.	H37627		39							85
91.0'-91.3': a 2-4mm wide, highly irregular white orthoclase and green chlorite dykelet cuts the tinguaite almost at right angles to foliation and the core axis at 45°. 92.5-92.6': another 2-4mm orthoclase and black mafic dyke cuts tinguaite at right angles. 94.4'-94.5': a 1 cm wide pink and green, medium grained syenite dyke parallels the tinguaite foliation at 30°.	H37628		6.0						60° to 75° 1/1-2'	90
95.0'-115.0': a series of greenish alteration zones accompanying chloritized fractures containing calcite, limonite ± arsenopyrite. The fractures vary from 15-45° to core axis. The alteration is sericite and chlorite overprinting weak biotite alteration in sheared tinguaite The net effect is a mottled rock.	H37629		13.5							95
	H37630		6.0						15° to 25° 1/1-3'	100
	H37631	BKGD	4.0				100		30° to 45° 1-3/1'	105
113.9'-114.4': a complex of fractures has produced very strong alteration. Like the other fractures these are coated with chlorite, arsenopyrite and limonite stains, however they also contain a milky white mineral which may be quartz. 115.0'-133.2': normal sheared tinguaite again, foliation is at 30-35° to core axis. Small, rare patches of pale green alteration. The tinguaite conatins a few 2 cm long xenoliths (?) of mafic rich rock.	H37632		4.5							110
	H37633		4.0							115
122.8'-122.9': a 3 cm wide, 35° fracture containing chlorite > quartz > calcite > arsenopyrite. A 10 cm alteration envelope surrounds the fracture.	H37634		2.5						50° 1/1-2'	120
	H37635		2.5						60° to 75° 1/1-2'	125
133.2': GRADATIONAL CONTACT TO SERICITIZED SHEARED TINGUAITE 133.2'-158.0': weak to pervasive, pale green sericitic and chloritic alteration common in sheared tinguaite adjacent to 0-20° fractures bearing strong chlorite and minor pyrrhotite. Alteration becomes pervasive below 139.0'. As before the alteration corresponds to an increased fracture density and the presence of chlorite, calcite, limonite and sulphide bearing veins. The rock is again a mottled pale green-dark grey-green. Locally the pale green is replaced by a pink color. The rocks contain minor amounts up to 1/4% of fine grained disseminated arsenopyrite.	H37636		3.5							130
	H37637		4.0						0° to 20° 1-7/1'	135
142.0': a fracture system subparallel to the core axis contains quartz.	H37638		4.5						30° to 40° 1/1'	140
	H37639		11.0						10° to 90° 1/1'	145
										150

MOUNT SOPRIS GAMMA PROBE LOG

DRILL HOLE LOG

PROJECT UJV HOLE TH 8 LOCATION Zone 517 CORE SIZE BQ STARTED 13/08/79 FINISHED 16/08/79

CLAIM GROUP TOMBSTONE LENGTH 397' DIP -50° AZIMUTH 000° COLLAR ELEVATION 4985' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY ($\%U_3O_8$) ppm U	ppm Cu			% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
154.5'-154.8': a 1mm, 20° fracture contains abundant arsenopyrite. 157.2'-157.4': a 2mm, 20° fracture contains arsenopyrite, dolomite and chlorite. 158.0'-163.6': NORMAL SHEARED TINGUAITE: again, foliation less intense, brecciation still important. Weak to moderate foliation at 30° to core axis. Most fractures are open with minor limonite coating them.	H37640		6.5								155
	H37641	BKGD	10.5								
163.6': GRADATIONAL CONTACT 163.6'-188.5': MIXED TINGUAITE: although described as mixed tinguaite, the normal plt lenses are somewhat unusual in that the pl phenocrysts are less distinct than usual. This is probably mostly due to a lighter than usual groundmass. Many of the pl and orthoclase phenocrysts look cloudy suggesting partial clay alteration. Also mafics are coarser than is usual in both the plt and the sheared tinguaite. Foliation is not as well developed as before but still is at 30-35°. Ratio of plt to sheared tinguaite is 1:2. Fractures if open, contain weak limonite stain; if closed then are filled with white orthoclase.	H37642		34						60° to 70°	1/1-2'	160
172.0'-174.5': a strong fracture zone, possibly a fault zone, is surrounded by a 100 cm wide alteration zone of sericitized tinguaite. The actual fracture zone is highly chloritized and brecciated. The zone is apparently controlled by a series of shallow 10-20° fractures giving the zone a true width of about 30 cm. The upper 10 cm contains 1/2-3% pyrite in 0.2mm subeuhedral to euhedral cubes in a matrix of chloritized rock. Below it is a 10 cm wide band consisting of 50% pyrite >> arsenopyrite as 1/2-3mm subhedral to euhedral crystals mixed with fragments of cream dolomite, quartz and chalcopyrite. Next is 3cm of symmetrically banded cream dolomite, quartz, chalcopyrite (as 1/2-1cm long blebs) Below this is almost barren chloritized tinguaite. The chalcopyrite rich band is cut by narrow chlorite and pyrite bearing fractures. It appears that this fracture system has been reactivated at least twice with the first mineralizing phases being the dolomite→quartz→chalcopyrite. This band was fractured and locally brecciated during the emplacement of the pyrite-arsenopyrite phase.	H37643	20/BKGD	39						25° to 30°	1/1'	165
	H37644		13.5						60°	1/1-3'	170
	H37645		21.5						90°	1/5'	175
	H37646		12.5								180
188.5'-199.0': SERICITIZED MIXED TINGUAITE: mixed tinguaite with a plt - sheared tinguaite ratio of 1:5 has undergone pervasive pale green sericite alteration accompanied by chloritization of the biotite and locally grading into dark green serpentine (?) alteration of pl phenocryst cores. The net effect is again a generally mottled appearance. The alteration again occurs in an area of higher than average fracture density. The fractures usually contain chlorite ± calcite and arsenopyrite or weak limonite stains.	H37647	BKGD	9.0				100				185
	H37648		7.0						10° to 20°	1-2/1'	190
	H37649		7.0						30°	2-3/1'	
199.0'-204.0': MIXED TINGUAITE: as above but unaltered and fewer fractures.									70° to 90°	2-3/1'	195
	H37650		5.5						35°	1/1-2'	200
204.0'-212.2': SERICITIZED MIXED TINGUAITE: as described for 188.5-199.0'. Foliation in rock varies from 20-40° to core axis.	H37651		6.5						0° to 20°	1/5'	205
									30° to 40°	2-3/1'	
210.3': strongly limonite stained fracture. 212.2'-271.7': MIXED TINGUAITE: sheared tinguaite to plt ratio is 5:1. The dominant characteristic of rock is a well developed foliation at 35-45° to core axis. Brecciation is unimportant. In the sheared tinguaite much of the pl is weakly to moderately altered to biotite. The normal plt is characterized by the abundance of sodalite or blue cancrinite in the pl phenocrysts (10-20%). The fractures are usually closed with white orthoclase or calcite. Only traces of sulphides occur in the mixed tinguaite. 216.1'-219.0': 3mm wide, medium grained, pink orthoclase and chloritized mafic syenite dykes cut core axis at 80°. 220.7': a 2mm salt and pepper syenite dyke with arsenopyrite replacing some of the mafic cuts the core axis at 35°. 223.5'-223.8': a 6 cm, fine to medium grained leucocratic syenite dyke composed 95% of orthoclase and 4% mafics with 1% pyrrhotite after mafics cuts the core axis at 60° at one contact and 35° at the other contact.	H37652		5.0						70° to 90°	1-2/1'	210
	H37653		8.0						30° to 45°	1/2'	215
	H37654		4.5								220
											225

MOUNT SOPRIS GAMMA PROBE LOG

DRILL HOLE LOG

PROJECT UJV HOLE TH 8 LOCATION Zone 517 CORE SIZE BQ STARTED 13/08/79 FINISHED 16/08/79

CLAIM GROUP TOMBSTONE LENGTH 397' DIP -50° AZIMUTH 000° COLLAR ELEVATION 4986' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8) ppm U	ppm Cu	% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
224.2'-224.7': a 3mm wide predominantly sodalite dykelet parallels the foliation of the tinguaite at 30°. This dykelet contains minor pyrrhotite. 225.7, 226.7, 228.0 and 230.2': more syenite dykelets as described at 223.5-223.8'. the largest is an 8 cm wide dyke at 228.0'. All are irregular shapes but generally are parallel to foliation.	H37655	BKGD	6.5					230
232.7'-233.4': a 13 cm wide band of sericitized tinguaite alteration envelope around 3, 8-10mm medium grained syenite dykelets cutting the core axis at 35°. The dykes contain minor pyrrhotite and are weakly stained with limonite as are the fractures and tinguaite adjacent to them.	H37656		7.5					
238.2'-238.6': a 25mm wide leucocratic syenite dykelet cuts the core axis at 20°. Contains only 4% mafics and 1% pyrrhotite after mafics. 240.5'-240.8': a 10 cm band of mixed tinguaite has red-orange pl phenocrysts due to hematite stains (?) probably derived from a 2mm irregular syenite dykelet containing magnetite and arsenopyrite. 241.4'-243.6': a band of mottled sericitized tinguaite is associated with chloritized fractures and contains 1/4% disseminated pyrite. 246.8': an 8mm, medium grained syenite dykelet cuts the core axis at 60°. 248.2'-248.4': a 6mm, medium grained syenite dykelet containing 20% mafics and 2% pyrrhotite >arsenopyrite cuts the core axis at 25°.	H37657	10/BKGD	8.0					235
	H37658	BKGD	21.5					240
251.7'-252.8' and 254.0'-254.8': 2, fine to medium grained, slightly porphyritic syenite dykes consisting of 85% orthoclase, 13% mafics and 2% pyrrhotite cut the core axis at 35°. The pyrrhotite is both disseminated and along cracks in the syenite.	H37659		37				30° to 45° 1/2'	245
255.2': an 8mm fracture as above cuts core axis at 40°. 256.0'-265.0': a number of small syenite dykelets as described above, most less than 1cm but up to 10 cm across cut the mixed tinguaite at a variety of angles. The fractures contain 1/2 to 2% pyrrhotite.	H37660	10/BKGD	37					250
	H37661	BKGD	12.5					255
	H37662		19.5					260
271.9' SHARP CONTACT AT 45°: above the syenite dyke are 30 cm of weakly sericitized altered tinguaite containing 1/4-1% pyrrhotite and a number of small syenite dykelets, feeding from the main dyke.	H37663		16.5					265
271.9'-282.5': SYENITE DYKE: highly variable in grain size, color and texture. The upper 20cm is a medium grained syenite similar to the small dykes found above the main dyke. It is composed of 85% white to pink orthoclase, 11-14% mafic and 1-4% pyrrhotite. Below this approximately 1-3 m of equivalent rock, but in which the orthoclase is green-grey and the mafics are predominantly chloritized. Another 7 cm of the white to pink syenite occurs above a 20 cm wide band of fine grained, green-grey strongly foliated syenite. The foliation cuts the core axis at 30°. Below this is a 25 cm porphyritic syenite with pink to grey-green orthoclase phenocrysts up to 2cm long in a fine grained groundmass comprised 50% of mafics.	H48158	15/BKGD	43				20° to 30° 1/1'	270
Cutting the porphyritic rocks are 2, 1 cm wide bands of orthoclase, diopside, pyroxene and magnetite. Under this is 17 cm of pink to grey-green syenite similar to the syenite at the top of the dyke. Below this is a 5 cm band of very dark, heavy, pegmatitic, strongly magnetic layer comprised of 30% orthoclase crystals, 40% green pyroxene (?), 25% magnetite 5% pyrrhotite, and traces of quartz and wolframite? sphalerite? Finally the bottom 10 cm is again grey-green syenite with a pink hue due to hematite stains. Large irregular shaped blebs of magnetite mixed with pyrrhotite occur in this bottom layer as well. All parts of the dyke contain 1/4-1% pyrrhotite mostly as disseminated grains.	H48159	10/BKGD	42				50° to 60° 2 1/1'	275
282.5' AN IRREGULAR 45° CONTACT: perpendicular to the foliation in the adjacent tinguaite.	H48145	20/BKGD	2					280
282.5'-306.2': MIXED TINGUAITE: sheared tinguaite to plt ratio 5:1. The sheared tinguaite is predominantly foliated tinguaite with a 30-35° angle to core axis. The rock is hematite stained giving it a pinkish color for 40 cm below the syenite dyke. Between 300.0'-304.0' the tinguaite is pale green due to sericitization and locally pink with hematite staining of	H37664		33					285
	H37665		25				0° to 20° 1/2'	290
	H48160		14				60° to 70° 1 3/1'	295
	H48161	30/BKGD	25					300

MOUNT SOPRIS GAMMA PROBE LOG

DRILL HOLE LOG

PROJECT UJV HOLE TH 8 LOCATION Zone 517 CORE SIZE BQ STARTED 13/09/79 FINISHED 16/09/79

CLAIM GROUP TOMBSTONE LENGTH 397' DIP -50° AZIMUTH 000° COLLAR ELEVATION 4785' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY [%U3O8] ppm U	GEOCHEMISTRY AND ASSAY ppm Cu	% RECOV	GEOLOGY	STRUCTURE / to core	HOLE DEPTH (FEET)	MOUNT SOPRIS GAMMA PROBE LOG
the pl phenocrysts. The sericitization is related to chlorite and arsenopyrite bearing 0-20° fractures. Aside from these bands alteration is slight or absent. Most fractures are usually closed and are filled with white orthoclase rich syenite. A number of 1-4 cm wide leucocratic syenite dykes cut the tinguaite. Some of these dykes are conformable with the tinguaite foliation while others cut it. 306.2' SHARP 45° CONTACT 306.2'-316.0': SYENITE DYKE: medium to coarse grained, grey to pink, in part slightly porphyritic syenite composed of 90% orthoclase, some exhibiting a schiller effect, 9% interstitial mafics and 1% pyrite, disseminated and on cracks. Where pink orthoclase is found the rocks generally contain 1-2% white sericite after orthoclase. Pale green sericite alteration halos surround some fractures. 307.8': an irregular 1-2 cm pegmatite dyke contains a green fibrous amphibole, orthoclase, magnetite and minor wolframite? sphalerite? 309.0': an 8mm pegmatite dyke containing 60% orthoclase, 35% smoky quartz and 5% green mafics cuts the core axis at 30°. 314.2'-314.5': a 1 cm wide pegmatitic dyke contains 40% orthoclase, 40% pale green sericite, 10% pyrrhotite, and 10% chlorite and a trace of chalcopyrite. 316.0' SHARP 60° CONTACT 316.0'-321.8': MIXED TINGUAITE: as previously described except from 319.5-321.8' a sericitized alteration envelope surrounds a syenite dyke. Between 320.3' and 320.8' is a syenite dyke as occurs between 306.2' and 316.0'. 321.8': POORLY DEFINED CONTACT 321.8': SYENITE DYKE: while the dyke appears to be highly variable based on color it was in fact relatively uniform prior to intense sericitic alteration associated with a mineralizing event. The fresh rocks are a pinkish-grey, medium to coarse grained syenite similar to the 306.3-316.0' dyke. Approximately 20% of the dyke is fresh. The remainder of the rock has been weakly to intensely altered to pale green sericite accompanied by arsenopyrite > chalcopyrite > pyrite ≈ purple fluorite. Disseminated pyrrhotite and arsenopyrite comprise 1-5% of the entire dyke. The principal mineralized bands are described below. 325.0'-328.2': Highly sericitized breccia zone cutting the core axis at 45°? contains 20%-30% subhedral to euhedral arsenopyrite and minor purple fluorite between 325.2-326.1' and 10% arsenopyrite, 1% chalcopyrite, 1% smoky quartz and minor purple fluorite between 327.5-327.8'. 330.8': smoky quartz and pyrrhotite common. 334.0'-334.8': a 2 mm fracture contains 25% smoky quartz, 25% arsenopyrite and 10% chalcopyrite. 335.0'-341.5': a broad zone contains numerous patches of intense alteration usually containing disseminated and fracture chalcopyrite > arsenopyrite >> pyrite > purple fluorite ≈ cream dolomite. The patches are generally 10-12 cm across and contain 1-5% chalcopyrite. The entire interval is estimated to contain 0.2% copper.	H48162	15/BKGD	22				0° to 20° 1-3/1' 60° to 70° 2-5/1'	305	
	H48163	BKGD	34				30° 1/2'	310	
	H48164		29				60° to 70° 1-2/1'	315	
	H48165		18				60° 1/1'	320	
	H48166		33					325	
	H48167	30/BKGD	65					330	
	H48168		50					335	
	H48169	40/BKGD	37		100		15° to 25° 1-3/1'	340	
	H48170		44					345	
350.7'-351.0': a 5 cm pegmatite dyke comprised of 45% orthoclase, 45% smoky to black quartz, 7% pyrrhotite and 3% mafics cuts the syenite at 30° to core axis. 353.1-353.2': a 2-4mm wide band of dark green to black mafics, magnetite and minor quartz cuts the core axis at 30°. 353.8'-354.0': 2 more, 1 cm wide bands of pegmatitic orthoclase ≈ quartz > magnetite > mafics > pyrrhotite.	H46369	30/BKGD	47				40° to 50° 1-2/1'	345	
	H46370	45/BKGD	60				60° to 70° 1-2/1'	350	
	H46371	50/BKGD	50					355	
	H46372	60/BKGD	49					360	
367.3'-367.9': extremely intense sericitic alteration is accompanied by 1-2% chalcopyrite in blebs, 1% purple fluorite in blebs and a cream colored carbonate.	H46373	50/BKGD	62					365	
	H46374	25/BKGD	65					370	
								375	

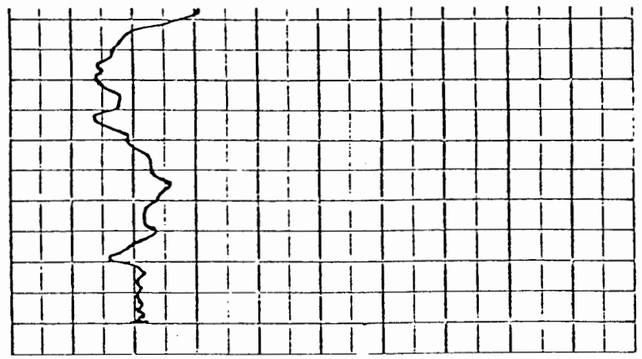
DRILL HOLE LOG

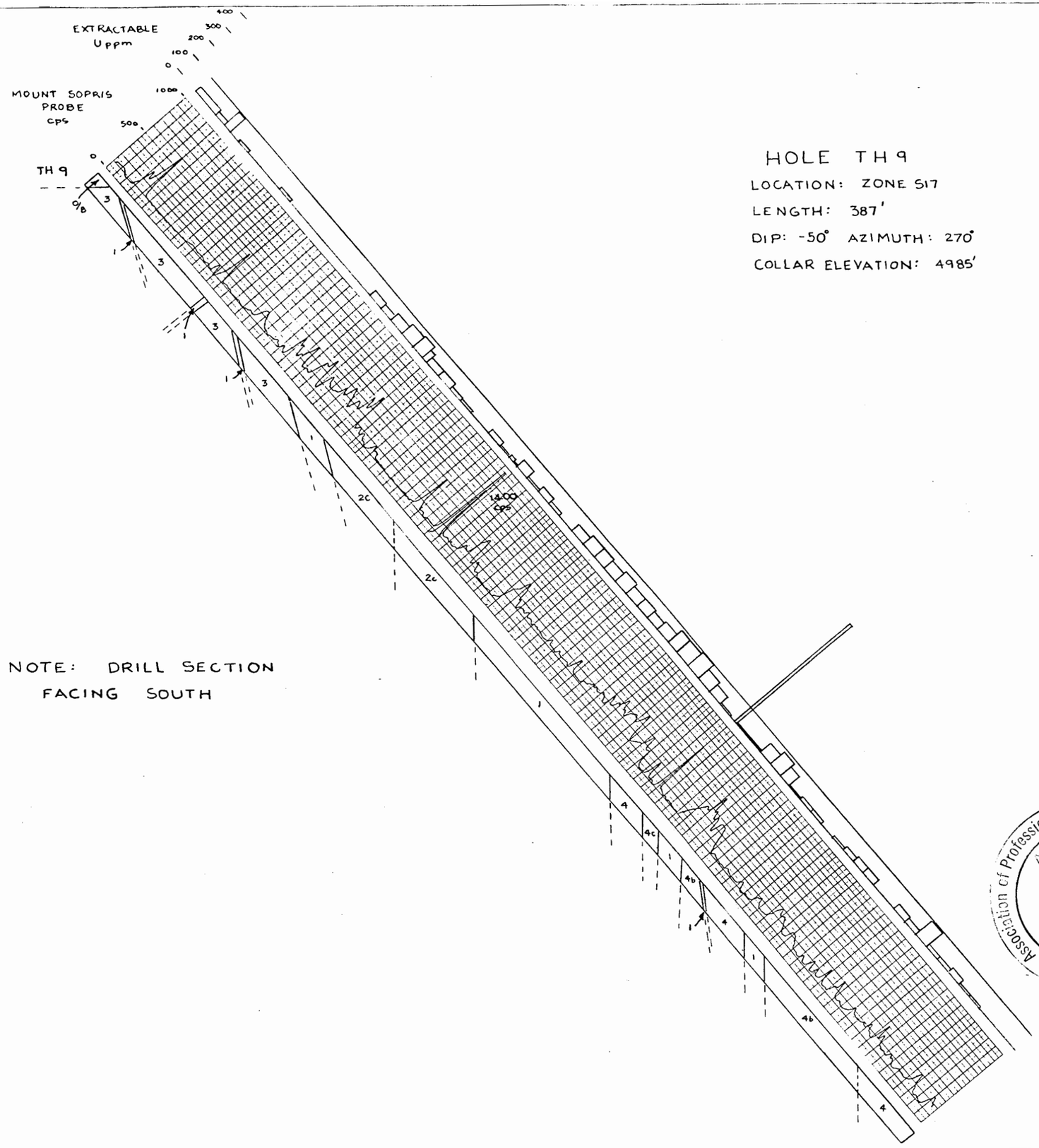
PROJECT UJV HOLE TH 8 LOCATION Zone 517 CORE SIZE BQ STARTED 13/08/79 FINISHED 16/08/79

CLAIM GROUP TOMBSTONE LENGTH 397' DIP -50° AZIMUTH 000° COLLAR ELEVATION 4985' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8) ppm U	ppm Cu			% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
Below this point alteration is much less intense and concentrations of sulphides are less abundant. Disseminated pyrrhotite > arsenopyrite still comprises 1-3% of the rock. Bands of porphyritic syenite with orthoclase crystals up to 3 cm long and concentrations of interstitial mafics are common. These bands are usually 5-8 cm wide. Shallow fractures usually closed are filled with chlorite and pyrrhotite. High angle fractures are open.	H37666		46					+			
389.1-390.5': a xenolith? of slightly bleached and possible recrystallized tinguaite.	H37667	10/BKGD	32					+	20° to 30°	1-3/1'	380
	H37668		45				100	+	60° to 70°	1/2'	385
	H37669		37					+			390
395.0'-397.0': strong sericitic alteration; the last 10 cm is brecciated with abundant purple fluorite, smoky quartz and cream carbonate.		BKGD						+			395
											397

MOUNT SOPRIS GAMMA PROBE LOG





NOTE: DRILL SECTION
FACING SOUTH

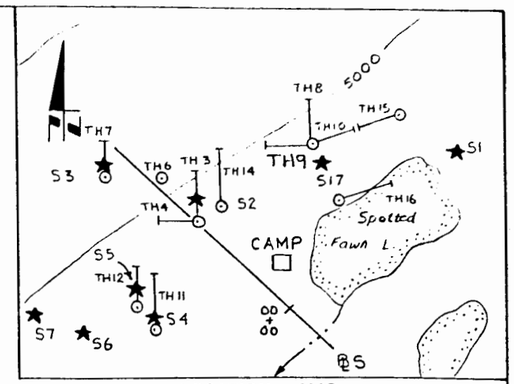
HOLE TH 9

LOCATION: ZONE 517

LENGTH: 387'

DIP: -50° AZIMUTH: 270°

COLLAR ELEVATION: 4985'



LOCATION MAP

SCALE 1:10,000

100 50 0 100 200 300 400 500

metres

1 SYENITE tan weathering, medium to coarse grained nepheline syenite often with abundant sulphides and purple fluorite

2 PSEUDOLEUCITE TINGUAITE 5-30%, 3-20mm pseudoleucite phenocrysts 1-10mm orthoclase phenocrysts in a medium grey, aphanitic groundmass

3 SHEARED TINGUAITE foliated and/or auto-brecciated tinguaite often biotite altered

4 MIXED TINGUAITE lenses or bands of pseudo-leucite phenocrysts in sheared tinguaite groundmass

5 FINE GRAINED TINGUAITE medium to dark grey tinguaite without pseudoleucite phenocrysts, some 1-3 mm orthoclase phenocrysts. Usually as dykes

6 INTERMEDIATE TINGUAITE medium grey tinguaite with pseudoleucite orthoclase phenocrysts. Pseudoleucite phenocrysts smaller than usual

B,b BIOTITE ALTERATION . intense, moderate

C,c CHLORITE ALTERATION intense, moderate

——— – – – geologic contact: sharp, gradational

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A. R. ARCHER
GEOLOGICAL
15
ENGINEER

FIG. U-TG23

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SECTION TH9

TOMBSTONE PROPERTY

UKON JOINT VENTURE

SCALE 1:400

4 2 0 4 8 12 16 20

metres

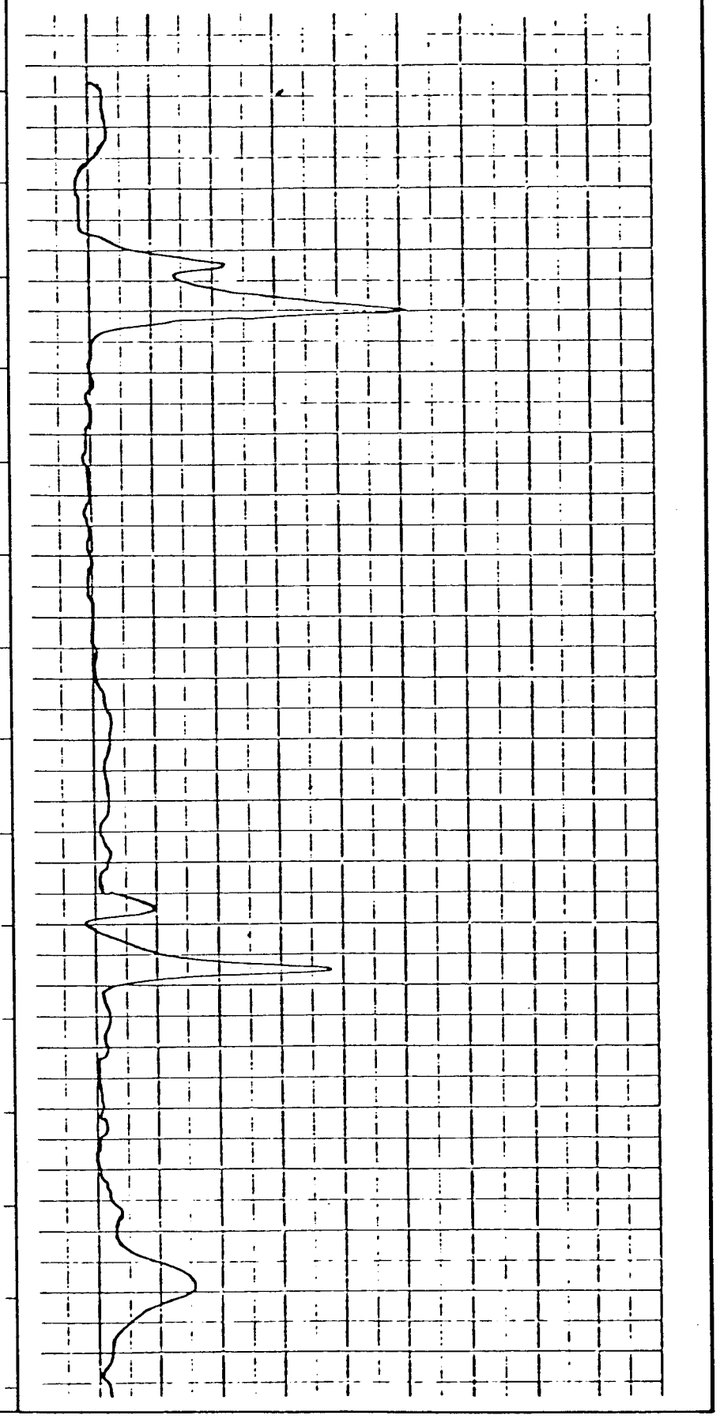
DRILL HOLE LOG

PROJECT UJV HOLE IH9 LOCATION Zone 517 CORE SIZE BQ STARTED 17/08/79 FINISHED 19/08/79 PAGE 1 OF 6

CLAIM GROUP TOMBSTONE LENGTH 387' DIP -50° AZIMUTH 270° COLLAR ELEVATION 4985' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8) ppm U	ppm Cu	% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
0-4.0': OVERBURDEN: syenite talus, weathered bedrock and soil.					0			
4.0'-13.8': SHEARED TINGUAITE: the rock contains 1-2mm, white orthoclase crystals or phenocryst fragments in an aphanitic groundmass composed of 80% light grey sheared pseudoleucite phenocrysts mixed with groundmass, orthoclase and 20% mafics. The orthoclase phenocrysts comprise 5-15% of the whole rock. Weak foliation at 70° to core axis is found in a few places. Weak, pink, hematite (?) stains are common along closed fractures. The open fractures are normally coated with moderate limonite stains (goethite > hematite > jarosite) and minor clay minerals.	H37145	15/BKGD	26		95		10° to 20° 2-5/1'; 35° to 45° 5/1'	5
13.8': SHARP BUT IRREGULAR ~20° CONTACT 13.8'-16.6': SYENITE DYKE: medium to coarse grained syenite composed of 80% buff, subhedral often elongate orthoclase crystals which have been partially altered to clay by supergene processes and 20% grey-green, interstitial chloritized mafics. Pitting, limonite and minor residual pyrite indicate the rock probably contained 1-3% pyrite when fresh. The fractures are usually moderately stained with limonite. The feldspars adjacent to the fractures are commonly tan colored due to limonite staining. The rock is weakly magnetic. Minor amounts of a soft, lime green mineral (replacing chlorite?), purple fluorite, and chalcopyrite (<0.1%) are present.	H46375	BKGD	22					10
16.6' SHARP 45° CONTACT	H46376	15/BKGD	85				20° to 30° 4/1'; 40° 2/1'	15
16.6'-49.8': SHEARED TINGUAITE: as before except that rock is often strongly bleached adjacent to chloritized, sulphide bearing fractures (usually 0-20° to core axis). A greenish tint to rocks in these bleached zones is due to sericitization. The sulphide bearing fractures are usually closed. The open fractures contain weak limonite, calcite, sericite and clays. The sericite overprints weak biotite alteration. 21.0'-22.5': a 10°, 1/2-3mm wide, sulphide bearing fracture contains pyrrhotite > chalcopyrite (30%) > purple fluorite > arsenopyrite. 25.0'-28.0': a series of 1-3mm wide fractures filled with pyrrhotite > chalcopyrite > an unidentified soft black mineral (tetrahedrite? chalcocite?) runs subparallel to the core axis. 29.5': minor disseminations of the soft, black mineral with grey streak. 30.0'-33.5': pyrite > chalcopyrite > black mineral on fractures subparallel to core axis. 35.5': a 20°, 2mm fracture with pyrrhotite, minor chalcopyrite and the black mineral. 39.0': a 1/2mm, 60° fracture with chalcopyrite, black mineral and molybdenite. 39.6'-40.6': 2 parallel, 20°, 1mm wide fractures contain pyrrhotite, chalcopyrite, black mineral, and minor purple fluorite.	H37146		0.5					20
	H37147		14				0° to 20° 3-10/1'	
	H37148		6				40° to 70° 1-2/1'	25
	H37149	BKGD	3					30
	H37170		5.5					35
	H37171		11		100			40
41.6'-44.7': 3 small 5-10° fractures contain the black mineral, chalcopyrite, and pyrrhotite. 44.0'-44.3': 2, 8 mm, 20° fractures contain pyrrhotite >> black mineral > chalcopyrite ≈ arsenopyrite.	H46377		7					45
49.8': SHARP 90° CONTACT 49.8'-51.7': LEUCOCRATIC SYENITE DYKE: composed of 90% fine grained orthoclase and 10% disseminated sulphides possibly replacing mafics. Rock is strongly pitted. Sulphides are 50% pyrrhotite, 40% arsenopyrite, 0-5% chalcopyrite and 0-5% black mineral. True width of dyke is 7 cm. 51.7' SHARP 90° CONTACT	H37172	40/BKGD	18.5				35° to 40° ½-2/1'	50
51.7'- 96.8': SHEARED AND ALTERED TINGUAITE: the tinguaite in the upper part of the interval is predominantly brecciated while lower, foliation is more important. Where the core is strongly foliated it is at 45° to the core axis. The upper interval appears to have undergone weak biotite alteration with sericite alteration envelopes 3-15mm wide around chloritized sulphide bearing fracture. The alteration grades from biotite to pale green sericitic alteration at approximately 57 m. Below 62 m the core has a mottled appearance due to sericitization of the groundmass and pl phenocrysts. The groundmass biotite is unaffected. The 20° fractures are generally chloritized and bear sulphides. The higher angle fractures are weakly coated with limonite. 52.4'-52.5': a 2 cm wide, 70° fine to medium grained dyke contains 10-15% sulphides including pyrrhotite > chalcopyrite ≈ black mineral. 59.5'-61.0': a small, 20° fracture contains pyrrhotite and arsenopyrite. 62.0'-64.8': a 1-3mm cream orthoclase dyke runs subparallel to the core axis. 65.8'-66.0': a 1mm, 20° fracture is filled with euhedral pyrite > arsenopyrite.	H37173		4				15° to 20° 1-2/1'; 30° to 35° 2-4/1'	55
	H37174	BKGD	6					60
	H37175		6.5				70° 1/3'	65
68.0'-70.0': SYENITE DYKE: a medium grained syenite dyke cuts the core axis at 25°. This is at right angles to the foliation which cuts the core axis at 55° in the opposite direction. The syenite dyke is 65% orthoclase and 35% chloritized mafics. A 1cm orthoclase dyke cuts the syenite dyke and parallels the foliation of the adjacent tinguaite; therefore syenite intrusion predated foliation event?	H37176	10/BKGD BKGD	11					70
								75

MOUNT SOPRIS GAMMA PROBE LOG



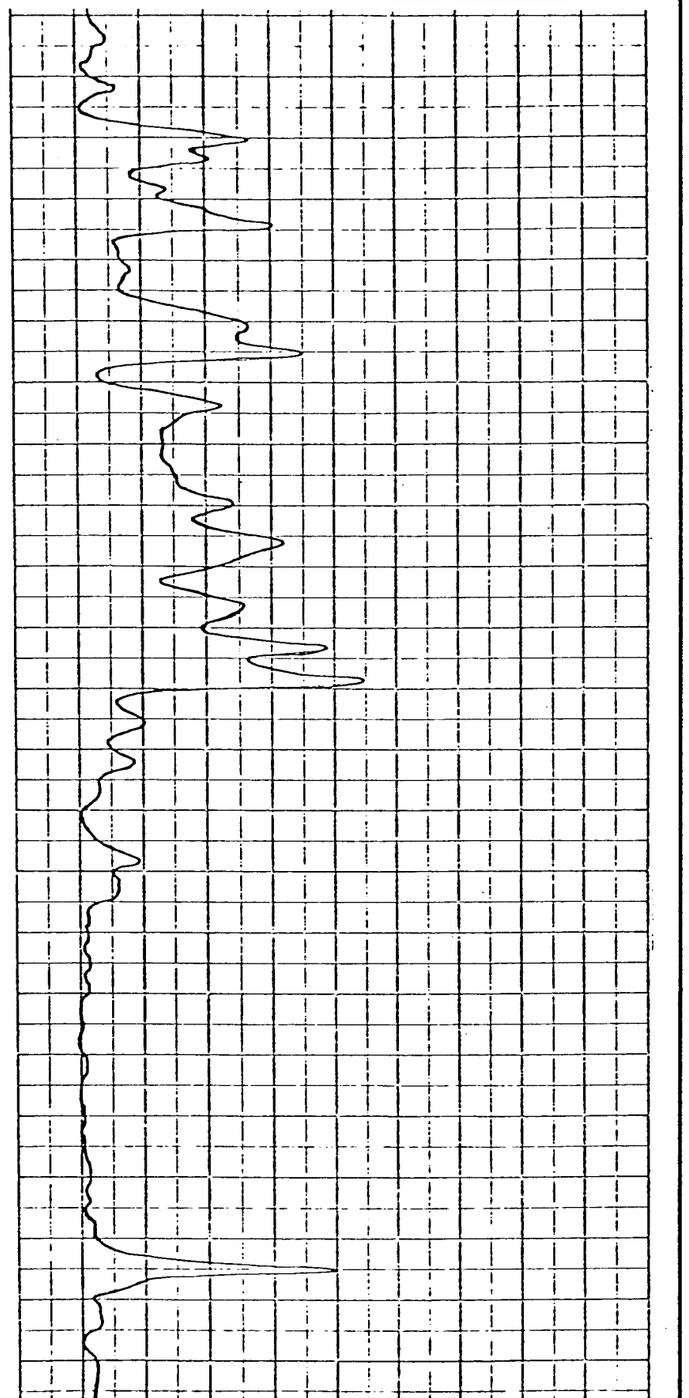
DRILL HOLE LOG

PROJECT UJV HOLE TH9 LOCATION Zone 517 CORE SIZE BQ STARTED 17/08/79 FINISHED 19/08/79

CLAIM GROUP TOMBSTONE LENGTH 387' DIP -50° AZIMUTH 270° COLLAR ELEVATION 4985' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (U_3O_8) ppm U	ppm Cu	% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
SHEARED TINGUAITE is still brecciated and moderately foliated with pervasive pale green sericite alteration of plt phenocrysts and groundmass. Below this point the groundmass biotite is commonly altered to chlorite. Adjacent to the sulphide bearing 20° fractures are 5mm-30mm highly sericitized alteration envelopes. 80.0': pink orthoclase, purple fluorite and an unidentified black mineral cut the tinguaite at 80°: a dyke? 83.0': a 1 cm wide buff orthoclase dyke with minor pyrrhotite cuts core axis at 60°. 83.4'-84.0': a 1/2mm, 15° fracture contains pyrite and the soft black mineral. 84.0': a 1cm, buff to pink orthoclase dyke containing chlorite and a trace of pyrite cuts the core axis at 80°. 85.4': another orthoclase dykelet 1cm wide contains minor quartz? 86.0'-87.2': minor pyrite on chloritized fracture. 88.4'-88.6': very strong yellow-brown limonite stains associated with 2 fracture sets at 35° and 45°. 90.0': a 1 cm, 60° white orthoclase dykelet contains minor arsenopyrite and weak hematite stains. 91.5': a 1 cm, 45° white orthoclase dykelet contains abundant pyrite. 92.1'-93.3': 2 fine grained syenite dykelets separated by 5 cm of strongly foliated tinguaite cut the core axis at 65°. They are dominantly feldspar with ~15% finely disseminated mafics and 5% sulphide mostly pyrrhotite, but also traces of arsenopyrite and chalcopyrite. 93.4'-94.0': a 10°, 1/2mm-2mm, horsetailed fracture is chloritized and con ins dolomite> pyrrhotite > chalcopyrite. 94.0'-94.2': 2 more < 1 cm, 70° orthoclase dykelets contain pyrrhotite. 96.3'-96.6': a gash fracture with maximum thickness 1 cm is filled with pyrite, arsenopyrite and chalcopyrite as well as chlorite and unidentified white and cream mineral gangues. 96.8' SHARP 25° CONTACT 96.8'-111.8': SYENITE DYKE: composed of 80-95% coarse grained, anhedral to subhedral, orthoclase with 5-15% interstitial chloritized mafics. Orthoclase is largely altered to sericite. Orthoclase crystals are often elongate with a subtrachytic texture. The dyke has a 10 cm fine grained chill zone on its upper contact. At 99.0'-99.6' the main syenite dyke contains 1-2mm wide arsenopyrite and pyrite filled cracks adjacent to a 7 cm leucocratic syenite dyke which contains disseminated arsenopyrite and pyrite. Below 104' the dyke is very bleached due to intense sericite alteration and contains 1/4-1% pyrite and pyrrhotite. The bottom 10 cm of the dyke contains hairline cracks filled with purple fluorite and chalcopyrite. 111.8' SHARP 30° CONTACT 111.8'-180.8': SERICITIZED TINGUAITE: similar to tinguaite above the dyke except that this tinguaite has been pervasively altered to sericite. Both the pl phenocrysts and the groundmass are affected. he alteration has produced a mottled rock in which much of the biotite has gone to chlorite and locally to serpentine? Unlike the tinguaite higher in the hole this rock does not appear to be highly sheared; despite the alteration, the pl phenocrysts are still recognizable. Adjacent to the stronger fractures, usually sulphide bearing, the tinguaite is bleached producing envelopes ranging from a few mm up to several cm. Minor amounts of sulphides are disseminated throughout the rock. 116.0-117.0': 4, 1/2mm to 3mm, strongly hematite stained fractures contain pyrrhotite and probably magnetite.	H37177	BKGD	8					
	H46378	40/BKGD	8				15° to 20° 1-2/1'	80
		BKGD						
	H46379	40/BKGD	44				20° to 25° 2-4/1'	85
		BKGD						
		20/BKGD						
	H46380	BKGD	25				70° 1/3'	90
	H46381	50/BKGD	53					95
	H46382	40/BKGD	69					100
		80/BKGD						
	H46383	50/BKGD	83				35° 2-4/1'	105
	H37178	40/BKGD	62		100			110
	H37179	BKGD	43					115
	H37180		3.5				25° to 35° 1-2/1'	120
	H37181		21.5				45° to 50° 1/1-2'	125
122.2'-123.2': a 10cm, fine grained, grey-green sericitized syenite dyke cuts the core at 20°. The dyke contains minor disseminated pyrrhotite and arsenopyrite. 125.0'-126.0': 2, 4mm wide 25° fractures are surrounded by 5 cm bleached alteration envelopes; the fractures are filled with pyrite, arsenopyrite and white dolomite. 130.7'-131.2': a 2mm, 15° fracture has a 5 cm bleached alteration envelope and is filled with minor arsenopyrite and talc. 133.5'-139.0': very intense sericitic and argillic altered rock surrounds and occurs in a fracture zone (100's/ft), within this zone are abundant pyrite and arsenopyrite.	H37182		11.5					130
	H37183		7.5				all angles 100% 1'	135
	H37184		9.5					
	H46384	10/BKGD	30				30° 10/1'	140
		BKGD						
144.0'-179.0': sericitic alteration is generally less intense and is usually restricted to areas of higher fracture density. Patches of normal or foliated breccia are present however normal plt is common. Where foliation is pronounced it is usually at 45° to the core axis but locally drops to as low as 20°. Most fractures are weakly to moderately coated with yellow-brown limonite. Pyrrhotite is common usually as minor disseminations and along narrow fractures surrounded by alteration envelopes.	H37185	40/BKGD BKGD	10.5				15° 1-2/1' 30° 1-3/1'	145
	H46385	10/BKGD	17					150

MOUNT SOPRIS GAMMA PROBE LOG



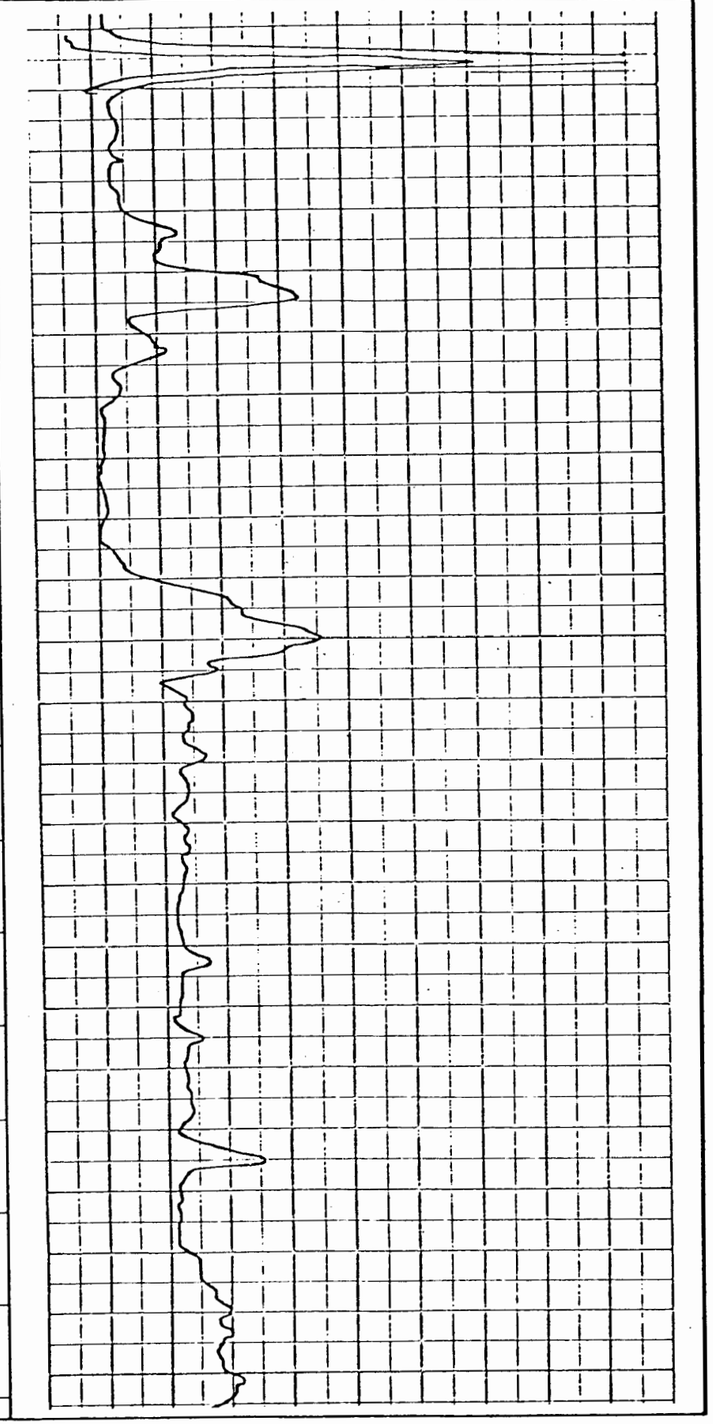
DRILL HOLE LOG

PROJECT UJV HOLE TH 9 LOCATION Zone 517 CORE SIZE BQ STARTED 17/08/79 FINISHED 19/08/79 PAGE 3 OF 6

CLAIM GROUP TOMBSTONE LENGTH 387' DIP -50° AZIMUTH 270° COLLAR ELEVATION 4935' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8) ppm U	ppm Cu	% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
153.0'-154.0': a series of narrow fractures running subparallel to the core axis are surrounded by intense sericitic and argillic altered rocks and are filled with pyrrhotite, chalcopyrite, arsenopyrite, purple fluorite, dolomite and an unidentified brownish mineral.	H37186	BKGD	9					
	H46386	60/BKGD	45					155
		BKGD						
158.4': 5mm, white to pink orthoclase dykelets at 85° to core axis.	H37187	20/BKGD	11					
		10/BKGD					15° 1-2/1'	160
161.4': trace of molybdenite occurs with pyrrhotite. 162.1'-163.7': a coarse grained, green grey syenite dyke cutting the core axis at 45° appears to be 80% orthoclase, 15% nepheline and 5% chloritized mafics. The dyke and adjacent tinguaite have undergone pervasive sericitic and argillic alteration. The dyke contains only traces of sulphide and purple fluorite.	H37188	BKGD	36					165
166.0': a 6mm-10mm white orthoclase and pyrrhotite bearing dyke cuts the tinguaite at 55°. 167.0'-168.5': a number of <1/2-2mm fractures are filled with pyrrhotite. They are accompanied by hematite stains and narrow alteration envelopes. Some of the biotite clusters in this interval have hematite halos.	H37189		18.5				30° 1-5/1'	
	H37190		6					170
								175
180.8' SHARP 45° CONTACT with 20 cm weak sericite envelope. 180.8'-246.9': SYENITE DYKE: coarse grained, grey-green syenite with anhedral to subhedral, elongate, frequently twinned orthoclase comprising 80% of the rock, and interstitial, dark green to black, chlorite after pyroxene making up the remainder. The greenish tint of the orthoclase may indicate weak sericitic alteration. The orthoclase crystals are often slightly aligned yielding a subtrachytic texture. Pyrrhotite and arsenopyrite together comprise about 1/4% of the rock, locally up to 1%. Purple fluorite is relatively common usually on closed fractures but also as disseminations. Both sulphides and fluorite are common on the 50° fractures. 181.8'-182.3': fine grained dyke with similar mineralogy cuts the main dyke at 45°.	H46387	25/BKGD	52		100	+		180
	H46388	5/BKGD	73			+	15° to 25° 1/1'	185
185.0'-187.0': another finer grained dyke cuts the main dyke with 2-10mm prismatic to stubby orthoclase phenocrysts and 1mm subhedral mafic phenocrysts in a fine grained groundmass. The greenish sections are sericitized envelopes around pyrrhotite bearing fractures. The pink tint is due to hematite stains surrounding the mafic phenocrysts. 187.4'-187.5': a 1-3mm wide, 60° fracture contains purple fluorite coating the walls which are in turn coated by pyrite which are then coated by pyrrhotite. Some of the pyrite has invaded the adjacent wall rocks. 190.3'-190.4': a 3mm wide, 70° fracture similar to the preceeding but containing relatively more purple fluorite and pyrite and less pyrrhotite. 195.2': a 2mm, 70° fracture is coated with purple fluorite > pyrite. 201.3'-201.5': 2, 8mm, 60-70° fractures are partially filled with purple fluorite, pyrite and pyrrhotite.	H46389	30/BKGD	69			+		
	H46390	35/BKGD	56			+	40° to 50° 1/1'	190
	H46391	15/BKGD	66			+		195
	H46392	30/BKGD	58			+	70° to 90° 1/7'	200
	H46393	40/BKGD	61			+		205
						+		210
	H46394		51			+		215
	H46395	30/BKGD	58			+		220
223.0'-226.9': still syenite as before however pyrrhotite and pyrite are much more abundant than previously, comprising up to 4% of the rock. They appear to be replacing interstitial mafics.						+		225

MOUNT SOPRIS GAMMA PROBE LOG



DRILL HOLE LOG

PROJECT UJV HOLE IH9 LOCATION ZONE 17 CORE SIZE BQ STARTED 17/08/79 FINISHED 19/08/79

CLAIM GROUP TOMBSTONE LENGTH 387' DIP -50° AZIMUTH 270° COLLAR ELEVATION 4986' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8) ppm U	ppm Cu	% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
226.4'-226.7': finer grained dyke with same mineralogy crosses main dyke at 45° to core axis.	H46396	40/BKGD	89				15° to 25° 1/1'	
229.0': sulphide again abundant as replacement of mafics. Comprise 1-3% of the rock to the bottom of the dyke.	H46397		88					230
236.7'-237.0': strongly foliated, fine grained rock appears to be a mylonite zone. Foliation at 45° to core axis. Rock is grey-green like surrounding rocks, except for a small red hematite stain surrounding a bleb of magnetite. 237.0'-237.8': well foliated syenite but still recognizable as syenite. Foliation parallels mylonite zone.	H46398	60/BKGD	96				40° to 50° 1/1'	235
237.8'-239.0': a second mylonite zone, not quite as well developed as the first contains small blebs of pyrite and pyrrhotite. A group of fractures in these three zones parallels the foliation and is filled with chlorite and talc bearing slickensides. 240.8'-242.4': 3, 1mm, 10° fractures are filled with calcite and small crystals of pyrrhotite, pyrite and purple fluorite.	H46399		70				70° to 90° 1/7'	240
245.5'-246.1': another fracture as above. Higher angle, 30-50° fractures between these calcite filled fractures contain traces of purple fluorite and pyrite. 246.9'-248.4': SHARP 45° CONTACT with a 30 cm sericitized envelope in tinguaite.	H37191	40/BKGD	46					245
248.4'-262.0': MIXED TINGUAITE: normal plt lenses up to 5 cm across surrounded by brecciated tinguaite. Pl phenocrysts in brecciated tinguaite are indiscernible and have again blended into the groundmass; they appear to have behaved plastically under stress. Plt to sheared tinguaite ratio 1:4. Fragments in the sheared tinguaite range from 1-4mm. Disseminated pyrrhotite is common but does not exceed 1/4% of the rock. A number of 1-4mm orthoclase> sodalite >pyroxene ≠ mafic dykelets cut the tinguaite at various angles. Fractures are rare; where present they are usually open and weakly coated wtih limonite. 251.5'-251.9': a 8 cm wide, green-grey, sericitized and chloritized syenite dyke containing 5% pyrrhotite after mafic cuts the tinguaite at 60° to the core axis.	H37192	10/BKGD	12.5					250
256.3'-256.6': an irregular patch of brecciated tinguaite has a dark grey groundmass and is strongly radioactive (300 over background). Also contains blebs of a dark mineral. 262.0'-269.0': SERICITIZED MIXED TINGUAITE: an envelope around a syenite dyke, as usual the alteration principally affects the pl phenocrysts and produces a mottled grey-green rock.	H37193	BKGD	7				30° 1/5'	255
	H46501	340/BKGD	723		100			
	H37194	BKGD	9					260
	H37195		9					265
269.0'-281.7': SYENITE DYKE: rock is variably fine to coarse grained grey-green, sericitized? syenite as was found in the earlier thicker dykes. Pyrite is common comprising from 1/8 to 1% of the rock. 270.0'-270.5': a 7 cm fine grained leucocratic syenite dyke cuts the grey-green syenite at 45° to core axis, that is, parallel to the grey-green syenite contact. This dyke contains relatively few sulphides. 277.4'-278.0': a small xenolith of altered plt. Parts of the pl phenocrysts are dark green possibly representing an initial biotite alteration now gone to chlorite. 278.5'-280.0': another coarse grained syenite dyke cuts the main syenite dyke with sharp but somewhat irregular 45-70° contacts. This smaller dyke is distinguished from the larger dyke by its dark almost black hornblende phenocrysts which have only partially gone to chlorite and its tan, almost pink orthoclase crystals. The smaller dyke also contains a few larger, up to 1.5 cm, grey orthoclase crystals. 281.0'-281.7': another small dyke similar to the above has intruded between the main syenite dyke and the adjacent tinguaite. This dyke is even more porphyritic than the one above with grey twinned orthoclase phenocrysts up to 5 cm long in a medium-coarse grained groundmass. A band of hornblende crystals 1cm wide occurs adjacent to the tinguaite contact. This dyke intrudes the other dyke at 45° to core axis and contacts the tinguaite irregularly at about 50°.	H46502		65				10° to 15° 1/3'	270
	H46503	60/BKGD	93				30° 1/5'	275
	H46504	50/BKGD	70					280
281.7'-290.0': MIXED TINGUAITE: similar to the tinguaite above the dyke with a normal plt to sheared plt ratio of 1:4. Weak to moderate biotite alteration in the sheared tinguaite. Many phenocrysts in the normal plt contain as much as 30% sodalite or blue cancrinite. Most fractures are closed wtih orthoclase.	H46196	20/BKGD	12					285
290.0'-291.2': SYENITE DYKE: a porphyritic syenite dyke with sharp contacts cuts the tinguaite at 30° to core axis. It is composed of 25% euhedral, light grey orthoclase phenocrysts up to 2 cm long in a fine grained medium grey groundmass. 1mm hornblende phenocrysts comprise 20% of the rock. Probably represents a rapidly cooled equivalent of the dyke 8' above.	H37197	BKGD	16.5					290
291.2'-310.0': MIXED TINGUAITE: as above, is often cut by 1-2mm orthoclase veins. Biotite	H37198	10/BKGD	22.5				20° to 30° 1/7'	295
	H37199	BKGD	6					300

MOUNT SOPRIS GAMMA PROBE LOG

DRILL HOLE LOG

PROJECT UJV HOLE IH9 LOCATION Zone 517 CORE SIZE BQ STARTED 17/08/79 FINISHED 19/08/79

CLAIM GROUP TOMBSTONE LENGTH 387' DIP -50° AZIMUTH 272° COLLAR ELEVATION 4986' DRILLED BY CABOT LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8) ppm U	ppm Cu	% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
alteration is common in the sheared tinguaite. Plt to sheared tinguaite ratio 1:5. Plt lenses up to 10cm across. Brecciated sheared tinguaite dominant, foliation is very weak but has a general sense of 45° to core axis. Sodalite still abundant. Sulphides rare. 303.2'-303.3': a 4 cm, fine to medium syenite dyke cuts tinguaite at 45° to core, is surrounded by 2, 2mm wide, hornblende rich bands on either side. These bands parallel the contacts. Disseminated pyrrhotite comprises 1/2% of dyke. Smaller (5-10mm) similar dykes are found at 308.0', 308.3' and 309.6'. The first 2 are at 30° to core axis, the third at 45°. Another larger dyke 6 cm wide occurs at 309.8'. It is also composed of orthoclase and hornblende but here the minerals do not form compositional bands. It cuts the core axis at 30°. 310.0'-320.0': SYENITE DYKE: with sharp 45° contact but no alteration halo in tinguaite. A small, 20 cm wide leucocratic syenite dyke similar to the even smaller dykes above but coarser grained has intruded along the contact between the main dyke and the tinguaite. This smaller dyke contains 2-3% pyrrhotite replacing hornblende. The main syenite dyke is predominantly orthoclase such as those found between 269.0'-281.7', however here the mafics have altered to serpentine rather than chlorite. Between 315.0' and 316.0' a zone of fault gouge cuts the core axis at 15°. Its true width is about 8 cm. Calcite and clay minerals plus brecciated fragments of syenite compose most of this zone. Below the fault the dyke contains xenoliths of sericitized and serpentinized tinguaite. Sulphides are relatively rare in this syenite dyke. A narrow 8 cm halo of altered tinguaite lies below the dyke. The contact is again sharp at 45°. 320.0'-365.5': MIXED TINGUAITE: the abundance of sodalite in the plt phenocrysts is the most striking aspect of the rocks. Plt to sheared tinguaite ratio is 2:3 with lenses of normal plt from 4 to 20 cm wide. Weak to moderate biotite alteration is common in the brecciated tinguaite. Foliation is absent to weak; where observed it is at 45° to core axis. Pyrrhotite comprises 1/4-1% of the groundmass of the sheared plt but is present in only minor amounts in the normal plt. 320.5'-321.1': an 8 cm syenite dyke as described above cuts the tinguaite at 35° to core axis. 329.8'-329.9': a 4cm and an 8mm coarse syenite dykelet as above, cut the tinguaite at 70° to core axis. They contain 2% pyrrhotite. 321.1': another 10mm coarse syenite dykelet contains 4% pyrrhotite and cuts the tinguaite at 60°.	H37200	10/BKGD	24.5					305
	H37201		29					310
	H37202		36					315
	H37203		35					320
	H37204		9				20° to 30° 1/7'	325
	H37205	BKGD	11					330
335.4' and 336.5': 2, 4mm fine grained white orthoclase dykelets cut the tinguaite at 80°.	H37206		35		100			335
340.6': another 10mm coarse grained dyke cuts tinguaite at 65°; this dyke is vuggy.	H37207		29					340
	H37208		9.5					345
348.3'-349.3': a 14 cm and a 15 cm, light grey, medium-coarse grained syenite dyke cut the tinguaite at 45° to 60° to core axis with 6 cm of plt between them. The dykes contain 2% pyrrhotite replacing mafics. Similar to dykes at 320.5'-321.1'. Minor hematite stains on the lower contact of the larger dyke. 351.4': another dyke as above, cuts tinguaite at 45° to core axis which is parallel to the foliation of the tinguaite.	H37209		16					350
356.0': flattening of pl phenocrysts gives good shear sense; somewhat irregular but basically cuts core axis at 45°.	H37210		15					355
359.1-359.2': a 3 cm coarse grained syenite dyke cuts the core axis at 70°. The pl phenocrysts are foliated at 85° to the core axis.	H37211	60/BKGD	29					360
365.5' to end of hole: MIXED TINGUAITE: over this interval foliation is dominant over brecciation in the sheared tinguaite. Biotite alteration is weak or absent. Pyrrhotite comprises up to 1/4% of the rock usually as minor disseminations in the groundmass. Sodalite is still very prominent in the pl phenocrysts. The fractures are usually coated with clay minerals and minor limonite if open, and filled with orthoclase if closed. The plt to sheared tinguaite ratio varies from 2:1 to 1:4 as one goes down the interval.	H37212		13					365
	H37213	BKGD	9				10° to 30° 1/1-2'	370
	H37214		7.5					375

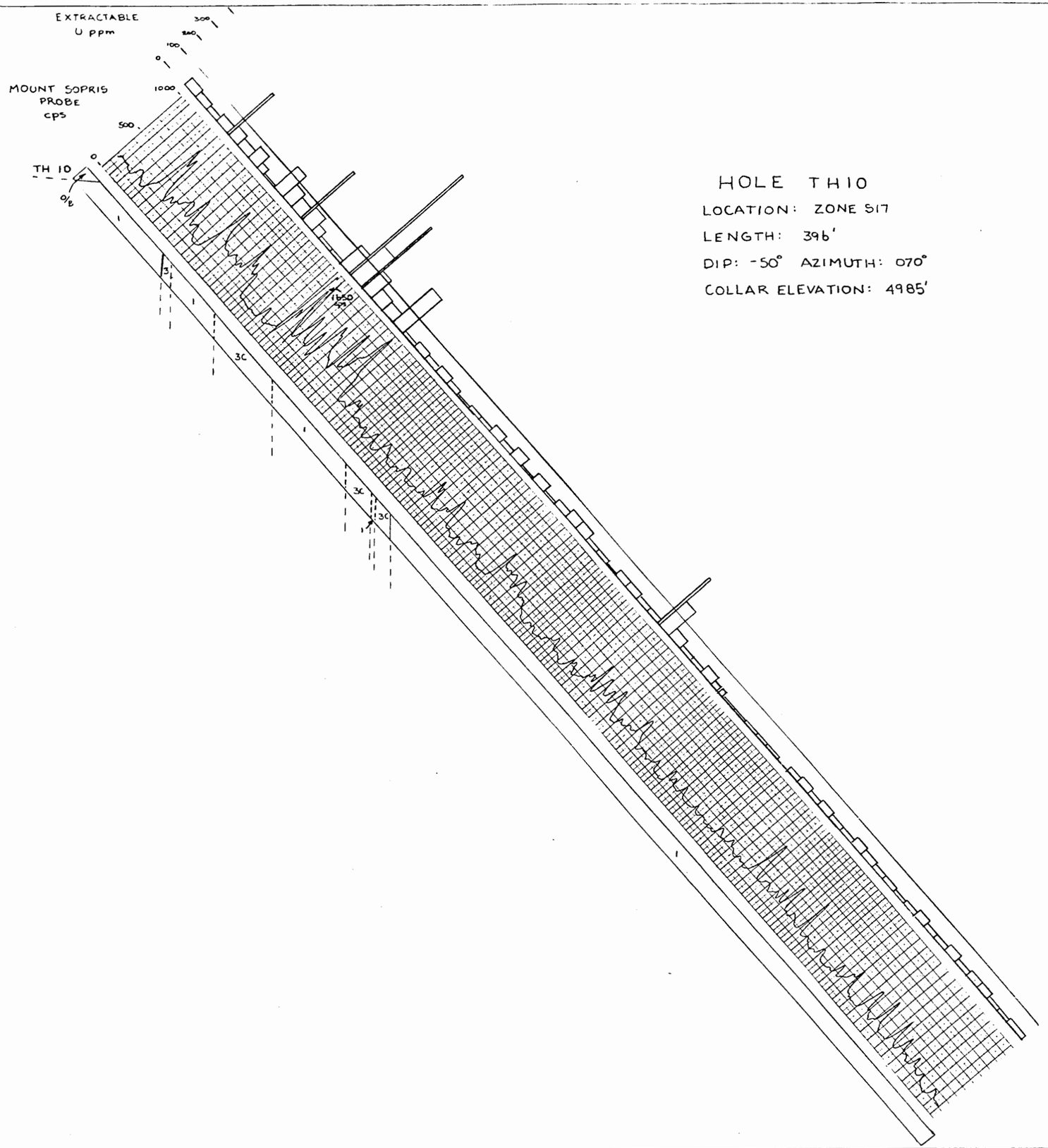
MOUNT SOPRIS GAMMA PROBE LOG

DRILL HOLE LOG

PROJECT UJV HOLE TH9 LOCATION Zone 517 CORE SIZE BQ STARTED 17/08/79 FINISHED 19/08/79

CLAIM GROUP TOMBSTONE LENGTH 387' DIP -50° AZIMUTH 270° COLLAR ELEVATION 4985' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8) ppm U	ppm Cu			% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)	MOUNT SOPRIS GAMMA PROBE LOG
377.5', 378.5' and 380.6': 3, 8-10mm white orthoclase, fine grained syenite dykelets cut the core axis at 35-45°.	H37215	BKGD	9.5				100		10° to 30°	1/-2'	380	
383.5'-384.8': a medium grained orthoclase-hornblende syenite dyke containing only minor sulphides cuts the core axis at 35° at the top contact and 20° at the lower contact.	H37216		11.5								385	
385.7'-386.0': a 1mm, 20° fracture contains abundant pyrrhotite.											387	



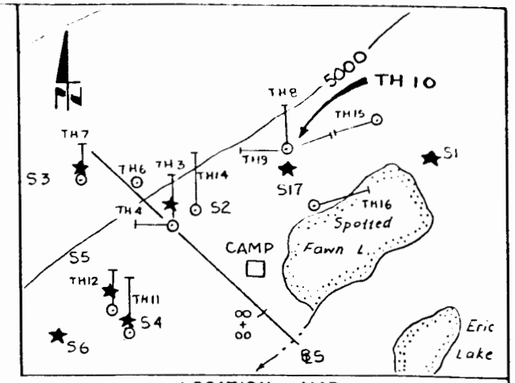
HOLE TH10

LOCATION: ZONE 517

LENGTH: 396'

DIP: -50° AZIMUTH: 070°

COLLAR ELEVATION: 4985'



LOCATION MAP

SCALE 1:10,000

100 50 0 100 200 300 400 500

metres

1 SYENITE tan weathering, medium to coarse grained nepheline syenite often with abundant sulphides and purple fluorite

2 PSEUDOLEUCITE TINGUAITE 5-30%, 3-20mm pseudoleucite phenocrysts 1-10mm orthoclase phenocrysts in a medium grey, aphanitic groundmass

3 SHEARED TINGUAITE foliated and/or auto-brecciated tinguaite often biotite altered

4 MIXED TINGUAITE lenses or bands of pseudo-leucite phenocrysts in sheared tinguaite groundmass

5 FINE GRAINED TINGUAITE medium to dark grey tinguaite without pseudoleucite phenocrysts, some 1-3 mm orthoclase phenocrysts. Usually as dykes

6 INTERMEDIATE TINGUAITE medium grey tinguaite with pseudoleucite orthoclase phenocrysts. Pseudoleucite phenocrysts smaller than usual

B,b BIOTITE ALTERATION . intense, moderate

C,c CHLORITE ALTERATION intense, moderate

——— – – – geologic contact: sharp, gradational

Association of Professional Engineers of the Yukon Territory
A. R. ARCHER
GEOLOGICAL
ENGINEER

FIG. U-TG24

ARCHER, CATHRO & ASSOCIATES LTD

SECTION THIO

TOMBSTONE PROPERTY

UKON JOINT VENTURE

SCALE 1:400

4 2 0 4 8 12 16 20

metres

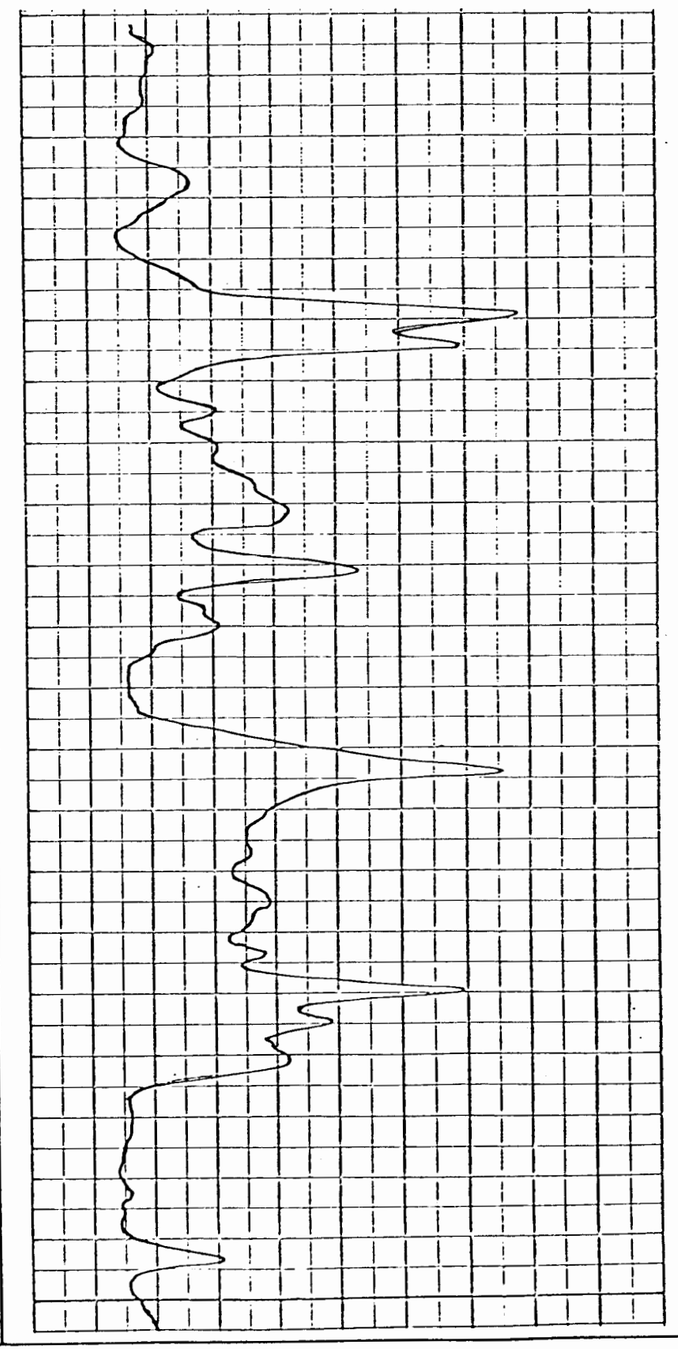
DRILL HOLE LOG

PROJECT UJV HOLE IH10 LOCATION Zone 517 CORE SIZE BQ STARTED 20/08/79 FINISHED 23/08/79

CLAIM GROUP TOMBSTONE LENGTH 396' DIP -50° AZIMUTH 070° COLLAR ELEVATION 4985' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8 ppm U)	ppm Cu	ppm Mo	ppm Ag	% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
0-4.0': OVERBURDEN: weathered syenite rock and soil.	H46505	BKGD	48	180	6	0.8	5				5
4.8'-38.0': SYENITE DYKE: coarse grained buff to grey-green syenite composed of 90% grey to grey-green subhedral to euhedral, prismatic, often twinned coarse grained orthoclase with 8-9% interstitial dark green chloritized mafics, 1-2% disseminated pyrite >> arsenopyrite associated with or replacing mafics and 1/4-1% disseminated purple fluorite. The rock weathers rusty with abundant supergene sericite alteration to about 7'. Although the feldspars in the unweathered rocks are hard and appear fresh the greenish tint may be due to weak sericitization. In the first 15' all fractures are moderately to strongly limonite stained and are often accompanied by limonite flooding extending 1/2 mm to 5mm into the wall rock. Disseminated sulphides begin to appear 4' below surface and fracture sulphides are common below 15' on closed fractures. Most closed fractures contain chlorite ± pyrite and/or arsenopyrite. The open fractures usually are coated with limonite. 10.1'-12.3': a fine grained light grey syenite with indistinct 1mm orthoclase crystals may be a brecciated tinguaite xenolith. A 5mm wide white orthoclase dykelet cutting the rock at 70° to core axis contains a few flakes of molybdenite. 12.3'-14.8': syenite is finer grained than usual but is more distinctly syenite than the above rock.	H46506		35	162	12	1.0	90	+			10
	H46507	30/BKGD	29	98	6	0.4		+	0° to 15°	1/3'	15
	H46508	20/BKGD	45	270	4	1.2			30° to 45°	10-20%	
20.3'-21.0': moderately radioactive syenite band (100/background) appears to be part of the rest of the syenite but is slightly coarser grained and has more of a tan tint and less green than the surrounding rocks. No specific radioactive minerals noted. Sulphide content not anomalous in type or abundance. 24.7'-25.1': a chloritized and brecciated 20-30° fracture zone contains abundant pyrite plus minor arsenopyrite and chalcopyrite. 28.5': a 3mm mafic rich band cutting the core axis at 90° contains pyrrhotite, purple fluorite and molybdenite.	H46510	220/BKGD	293	60	4	0.2					20
	H46509	20/BKGD	72	340	4	1.2		+			
	H46511	30/BKGD	54	174	84	1.0					25
	H46512	60/BKGD	77	148	4	0.6	100	+	30° to +45°	1-2/1'	30
34.8'-35.0': a 12mm wide 50° brecciated fracture contains abundant pyrite, biotite and minor purple fluorite. 37.1': a 4mm, 70° fracture is filled with purple fluorite, biotite and minor pyrrhotite. 38.0': IRREGULAR 50° CONTACT	H46513		43	144	6	0.8		+	45°	1-2/1'	35
38.0'-42.9': SHEARED TINGUAITE XENOLITH?: medium grey, brecciated, sheared tinguaite with aphanitic groundmass is similar to that found adjacent to the syenite dykes. The largest phenocrysts and fragments are 1-2mm across. Xenolith is cut by 3 narrow (5mm) syenite dykelets. The tinguaite contains 1/2-1% fine disseminated pyrite. Most fractures are moderately coated with pyrite. 42.9': GRADATIONAL CONTACT 42.9'-62.1': SYENITE DYKE: medium to coarse grained grey-green syenite containing 1-2% disseminated sulphide and 1/4% disseminated purple fluorite. Generally similar to the overlying syenite in its modal distribution. Closed fractures are generally filled with chlorite ± pyrite and/or arsenopyrite. Open fractures have weak to moderate limonite. 45.5'-45.6': a 45°, 1mm fracture is filled with chalcopyrite. 48.3': minor chalcopyrite on a hairline crack with arsenopyrite and pyrite. 49.5'-50.1': a 20°, 1mm fracture contains mafics > chalcopyrite >> purple fluorite. 50.8'-53.0': 0.1-0.5% finely disseminated chalcopyrite along with 2-4% arsenopyrite and pyrite. A 70°, 2mm fracture has mafics > chalcopyrite ≃ pyrite >> purple fluorite. 54.0'-57.0': minor disseminated chalcopyrite. 56.7'-57.0': a highly radioactive (200/background) 3cm wide dykelet is slightly pinkish, has above normal mafics, plus 5% sulphides including pyrite, arsenopyrite, pyrrhotite and chalcopyrite (1/2%). Dyke has 5mm mafic rich margin. 58.1'-58.6': 0.1-0.3% disseminated chalcopyrite. 60.5': minor disseminated chalcopyrite.	H46514	10/BKGD	13	50	36	0.4			20° to 40° / 40° to 50° / 70° to 90°	1/1' / 1-3/1' / 1-2/1'	40
	H46515	60-300/BKGD	154	330	4	1.4		+	20° to 25°	1/1'	45
	H46516	30/BKGD	87	830	4	3.8		+	40° to 45°	2/1'	50
	H46517	20/BKGD	72	1150	2	5.4	100	+	45° to 55°	1/1'	55
	H46518	140-360/BKGD	338	1100	2	5.0					
	H46519	40/BKGD	89	690	8	2.8		+			60
62.1': GRADATIONAL CONTACT: syenite finer toward contact. 62.1'-89.4': SERICITIZED, SHEARED TINGUAITE: pale grey-green, aphanitic to fine grained and in places slightly mottled appearance. May be a highly brecciated tinguaite such as surrounds the syenite which has undergone moderate to intense sericite alteration. Sulphides are common but not nearly so abundant as are found in the adjacent syenites. As before, pyrrhotite and arsenopyrite are abundant however pyrite is not. Chalcopyrite is common but only in minor amounts. Fracture sulphides far outweigh disseminated sulphides. Most closed fractures contain chlorite ± sulphides, while the open fractures are generally more cracked and fractured than the syenite. Below 72', unmistakeably tinguaite. 66.5'-66.6': 0.2% disseminated chalcopyrite with arsenopyrite. 69.4'-69.5': thin coat of chalcopyrite on a 15° fracture.	H46520	20/BKGD	46	690	6	3.0			15° to 30°	5-15/1'	
	H46521	10/BKGD	18.5	280	16	1.4			45° to 50°	3-5/1'	65
71.7'-71.9': 1/4% chalcopyrite in hairline fractures with pyrrhotite which comprise 10% of rock. Appear to be horsetailing cracks related to a 40° fracture filled with chlorite.	H46522	30/BKGD	21	210	56	0.6			60° to 70°	1/1'	70
											75

MOUNT SOPRIS
GAMMA PROBE LOG



DRILL HOLE LOG

PROJECT UJV HOLE TH10 LOCATION Zone 517 CORE SIZE BQ STARTED 20/09/79 FINISHED 23/09/79

CLAIM GROUP TOMBSTONE LENGTH 396' DIP -50° AZIMUTH 070° COLLAR ELEVATION 4983' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8) ppm U	ppm Cu	ppm Mo	ppm Ag	% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
79.0'-81.6': a strongly radioactive (100/background) 5mm medium grained pinkish tan syenite dykelet intrudes altered tinguaite subparallel to core axis. The dyke contains 5% disseminated chalcopyrite with 5% pyrrhotite and arsenopyrite combined. Black mafics comprise a further 5%.	H46523	70/BKGD	127	98	46	0.4			15° to 30°	5-15/1'	
	H46524	140-220/BKGD	112	86	180	0.4					
85.0': a moderately radioactive (100/background) 15mm medium grained syenite as above except much lower sulphides (5% combined) especially chalcopyrite.	H46525	60-220/BKGD	209	240	12	0.8			45° to 50°	3-5/1'	80
	H46526	200-320/BKGD	441	90	6	0.2					
89.4': GRADATIONAL CONTACT 89.4'-124.1': SYENITE DYKE: 89.4'-92.7': pale green, probably sericitized fine grained, mafic deficient syenite chill margin containing 1-3% fracture > disseminated sulphides. The abundance of pyrite is particularly significant as the tinguaite is pyrite deficient.	H46527	60-140/BKGD	126	52	14	0.6			60° to 70°	1/1'	85
90.6'-90.7': a 2-4mm, 35° fracture contains 10% chalcopyrite as large blebs with pyrite, pyrrhotite and white orthoclase.	H46528	100/BKGD	72	1600	1	6.6		+			90
92.7'-124.1': medium to coarse grained slightly porphyritic grey-green syenite composed of 90-95% green grey, euhedral, prismatic, orthoclase crystals usually 5-10mm long but rare phenocrysts are up to 35mm long, with 0-5% interstitial and fracture mafics, dominantly chlorite, 1-5% fracture >> disseminated sulphides: pyrite > arsenopyrite > pyrrhotite > chalcopyrite > molybdenite. The closed fractures and cracks are coated with chlorite ± sulphides. Rock is often weakly sericitized adjacent to sulphide bearing fractures. The open fractures are generally moderately coated with limonite. The rocks in this interval are locally weakly to moderately radioactive, however no radioactive minerals were observed.	H46529	110/BKGD 40/BKGD	57	1100	2	6.0		+	10° to 20°	2-10/1'	95
94.2': 2, 1mm 10° fractures contain chalcopyrite > arsenopyrite.	H46530	30/BKGD 100-600/BKGD	251	1750	10	7.0		+			100
97.0'-102.5': minor fracture and disseminated chalcopyrite with occasional larger blebs on some fractures (usually 45°). Estimated 0.05-0.10% Cu, associated with pyrrhotite and a trace of molybdenite.									30° to 45°	5-15/1'	
103.0'-104.0': strongly radioactive, weakly sericitized syenite similar to surrounding rocks. Most dark minerals are mafics but a few are unidentified, possibly radioactive. Minor disseminated chalcopyrite and good molybdenite at 130.5'. (the only molybdenite observed in the box.)	H46531	30/BKGD	16	945	6	3.8		+			105
104.0'-109.6': minor disseminated chalcopyrite, estimated < 300 ppm Cu.											
109.6'-113.0': excellent chalcopyrite with pyrrhotite > pyrite >> arsenopyrite; estimated 0.5% Cu. Host rock is noticeably less green than most syenite.									70° to 90°	1-3/1'	110
113.0'-115.3': greener syenite with limonite on many fractures. Some fracture chalcopyrite; estimated 0.1% Cu. Trace of molybdenite. Local limonite flooding of syenite producing a tan colored rock.	H46532	20/BKGD	36	6300	16	>20	100				
115.3'-123.6': widespread minor chalcopyrite, locally up to 0.3% but generally trace to minor; estimated 0.05-0.1% Cu over interval.	H46533	BKGD	25	1200	10	4.4		+			115
	H46534		42	3000	6	13					120
124.1': GRADATIONAL CONTACT 124.1'-137.3': ALTERED AND SHEARED TINGUAITE: highly fractured (usually hairline cracks) chloritized and sericitized, brecciated, sheared tinguaite cut by numerous 5-20mm medium to coarse grained syenite dykelets. Possibly a xenolith. Disseminated sulphides low but there are abundant fracture sulphides; pyrite = chalcopyrite > arsenopyrite > pyrrhotite. A few open fractures with moderate limonite. Chalcopyrite forms large blebs on some fractures and gilds others. It is particularly abundant at 124.1'-124.5', 125.5'-126.1' and 130.1'-130.2'. Estimated 0.2% Cu. Upper contact between tinguaite and syenite is slightly radioactive.	H46535	BKGD	25	2400	6	10.6			0° to 20°	5-15/1'	125
137.3'-138.4': SYENITE DYKE: as previously described, medium to coarse grained, slightly porphyritic grey-green syenite.	H46536		14	1050	6	4.8					130
138.4'-144.9': ALTERED SHEARED TINGUAITE: as above except rock is largely aphanitic and sulphides generally less abundant: pyrite > pyrrhotite > chalcopyrite. Cu probably < 300 ppm.											
144.9'- SYENITE DYKE: 144.9'-162.4': generally medium to coarse grained grey-green syenite as before however contains intermittent fine grained patches. These finer grained patches vary from pale green equivalents of the coarser grained rock to highly sericitized medium grey-green rock which may be partially digested tinguaite xenoliths. Sulphides are abundant throughout, comprising 1-4% of the rock. with fracture sulphides > disseminated. Pyrite > pyrrhotite > chalcopyrite ≥ arsenopyrite. These rocks differ from the more radioactive syenite dykes higher in the hole by the conspicuous absence of disseminated purple fluorite. As before the sulphides are greatest where the rock is sericitized and chloritized. Most fractures are he line cracks. Almost every fragment of core contains at least a trace of chalcopyrite.	H46537		24.5	590	6	2.2			30° to 45°	10-30/1'	135
147.1'-147.2': a 1cm wide, 60-70° fracture is filled withchlorite > purple fluorite > pyrrhotite > pyrite.	H46538	10/BKGD	15.5	465	8	1.8					140
149.3'-150.0': a series of 0-15° fractures contains chlorite > pyrite > purple fluorite > chalcopyrite > arsenopyrite > molybdenite. The adjacent wall rock is strongly sericitized.	H46539	30/BKGD	46	2100	8	14		+			145
150.0'-152.0': chalcopyrite occurs in 5mm blebs as well as disseminated: estimated 0.3% Cu and a trace of wolframite or sphalerite, usually with chalcopyrite and only as molybdenite. A hairline quartz vein with adjacent sericitization at 151.8' has the best wolframite or sphalerite with it.								+			150

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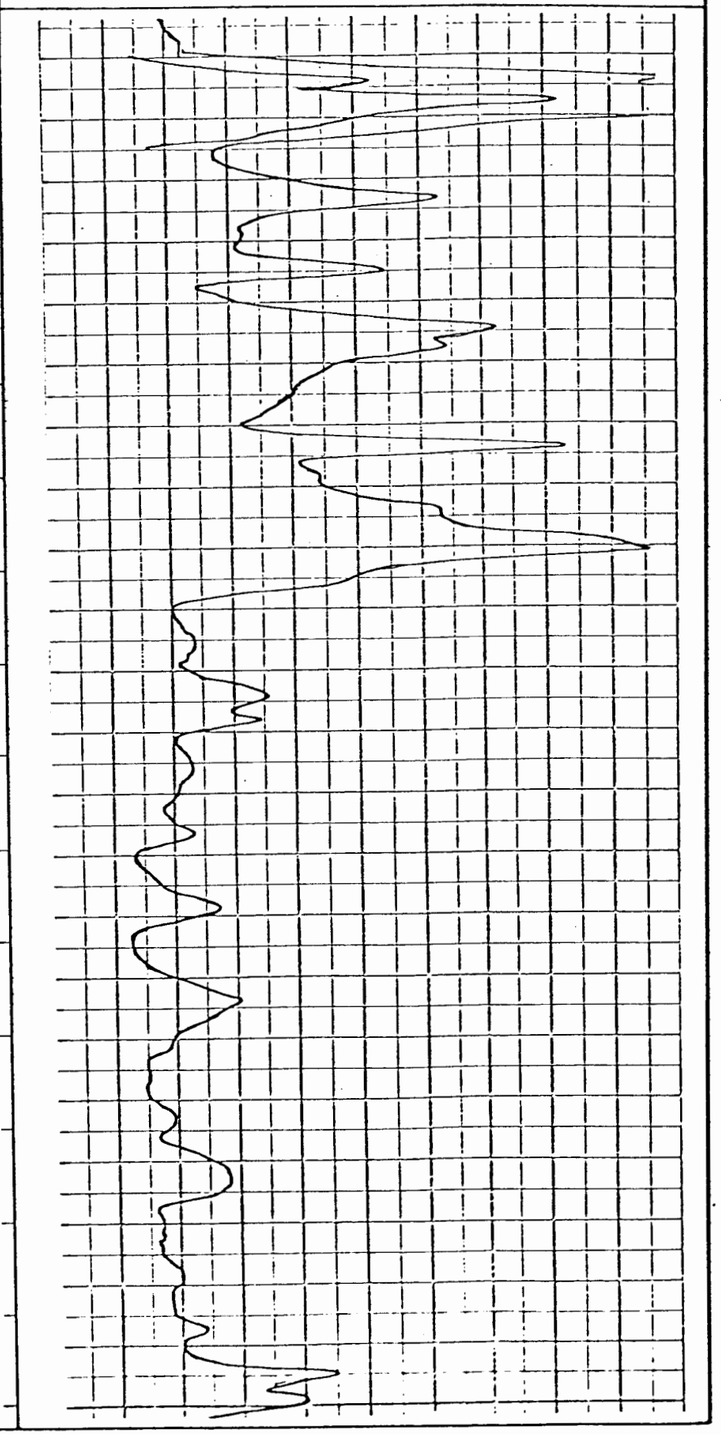
GAMMA PROBE LOG



DRILL HOLE LOG

PROJECT UJV HOLE TH 10 LOCATION Zone 517 CORE SIZE BQ STARTED 20/08/79 FINISHED 23/08/79

CLAIM GROUP TOMBSTONE LENGTH 396' DIP -50° AZIMUTH 070° COLLAR ELEVATION 4985' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8) ppm U	ppm Cu	ppm Mo	ppm Ag	% RECOV	GEOLOGY	STRUCTURE & to core	HOLE DEPTH (FEET)
	H46540		26	1550	4	7.4		+	10° to 20° 5-10%	
	H46541	10/BKGD	63	695	2	3.4			30° to 45° 10-30% 50° to 60° 1%	155
159.9'-161.4': strong, sooty, black chlorite and pyrrhotite on fractures. At 161.0' the pyrrhotite forms drusy crystals on fracture cavities. 163.4'-178.8': SYENITE DYKE: coarse grained syenite grades into fine grained, pale to medium grey-green syenite. The fine grained syenite is pervasively sericitized with patches of darker rock where the fractures are more intensely chloritized. The total sulphide content is lower than is generally found in the coarser rocks, rarely exceeding 1%. Pyrite >> pyrrhotite > chalcopyrite = arsenopyrite. Purple fluorite is restricted to rare fractures. Most fractures are little more than hairline cracks. The limonite on the open fractures is weak. LAST LIMONITE	H46542		14.5	610	6	2.2		+		160
167.1': small bleb of weakly smoky quartz.	H46543		50	180	4	0.6		+	5° to 20° 3-5%	165
170.8': a 12mm breccia filled fracture has 2mm quartz-calcite selvages and contains purple fluorite and pyrrhotite as a matrix. Contains chlorite fragments.	H46544	BKGD	24.5	490	6	2.2		+	30° to 40° 5-10% 50° to 70° 2%	170
178.8'-193.0': SYENITE DYKE: medium to coarse grained light grey-grey-green syenite again. Pale green sericitic alteration is pervasive but is most intense around sulphide bearing fractures. Relatively fewer disseminated sulphides but fractured similar to syenite higher in the hole. Sulphides 1/2-3% in places up to 20% fractures greater than disseminated sulphides. Limonite absent. Pyrite>pyrrhotite = chalcopyrite > arsenopyrite. Fractures are commonly hairline crack stockworks. Sericitization is pervasive.	H46545		36	220	8	2.2		+		175
184.8'-185.1': a 3cm wide, 30° fracture containing slightly smoky quartz > calcite > chlorite > pyrrhotite > pyrite = purple fluorite > molybdenite, is surrounded by a 20cm intensely sericitized and chloritized alteration halo. 186.0'-193.0': disseminated chalcopyrite and a trace of sphalerite with arsenopyrite, pyrite and pyrrhotite > purple fluorite; estimated 300 ppm Cu.	H46546		64	490	6	2.8		+		180
	H46547	20/BKGD	61	1550	6	8.0	100	+		185
193.0': SYENITE DYKE: intensively altered syenite; fine to medium grained but otherwise unchanged. 193.0'-198.0': good fracture chalcopyrite with arsenopyrite = pyrrhotite = pyrite and locally calcite and minor quartz; estimated 0.4% Cu. Mineralization on at least two fracture sets.	H46548	5/BKGD	32	2450	14	14		+		190
198.0'-202.2': fair chalcopyrite with significant wolframite or sphalerite below 200.0'. Sphalerite occurs disseminated more than on fractures often with chalcopyrite. The rock also contains minor quartz and on fractures, arsenopyrite. Estimated 0.1% Cu and 200 ppm Zn.	H46549	BKGD	25	11,800	6	>20		+	10° to 20° 1-5%	195
202.2'-209.1': 200-400 ppm Cu. Sulphides dominantly arsenopyrite and pyrite.	H46550	5/BKGD	9.5	2300	14	11		+	10° to 40° 1%	200
	H46551		20	540	12	3.8		+		205
209.1'-215.8': estimated Cu - 300-500 ppm as chalcopyrite with trace to 200 ppm Zn as sphalerite. Highest lower in interval. Rock is slighly coarser syenite with strong sericitic alteration around sulphide bearing fractures. Arsenopyrite, pyrite and pyrrhotite common.	H46552	BKGD	20.5	1600	4	7.8		+		210
215.8'-225.5': extremely intense, pervasive sericite alteration associated with hairline to 1cm quartz, pinkish purple fluorite and calcite filled fractures hosts abundant chalcopyrite, arsenopyrite, sphalerite, pyrite and arsenopyrite. The sphalerite and chalcopyrite are concentrated along fractures. Sphalerite is frequently associated with tan dolomite while the quartz is usually with pyrrhotite. Estimated 0.1% Cu and 0.05% Zn.	H46553		26	3650	8	11		+		215
	H46554		28	2600	6	2.6		+		220
	H46555	10/BKGD	33	1700	4	9.2				225

MOUNT SOPRIS GAMMA PROBE LOG

DRILL HOLE LOG

PROJECT UJV HOLE IH10 LOCATION Zone 517 CORE SIZE BQ STARTED 20/08/79 FINISHED 23/08/79

CLAIM GROUP TOMBSTONE LENGTH 396' DIP -50° AZIMUTH 070° COLLAR ELEVATION 4985' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8 ppm U)	ppm Cu	ppm Mo	ppm Ag	% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
225.5'-236.5': alteration decreases as one goes down the interval; accompanying this decrease is a similar drop in the total sulphide content of the rock. Below this interval disseminated sulphides are rare although fracture sulphides locally form very spectacular concentrations of chalcopyrite, pyrrhotite and pyrite. Between 232.0' and 236.5', alteration is generally confined to 5mm-2cm envelopes of secondary kspar and sericite with fresh rock between. Very little chalcopyrite in this interval.	H46556	BKGD	181	2900	10	15.6		+		
		40/BKGD								
	H46557	10/BKGD	60	4800	4	23.3				230
236.6'-237.7': a 5-7mm, 30° fracture is filled with 60% chalcopyrite plus chlorite and minor arsenopyrite and is surrounded by a 2mm wide alteration halo. 237.0': another broad band of pervasive strong to intense sericite alteration. Sulphides are generally restricted to fractures with arsenopyrite ≃ pyrite > chalcopyrite.	H46558	20/BKGD	29	5200	4	17.4		+		235
240.0'-240.1': a 2-5mm, 40° fracture contains 50% chalcopyrite. 243.4'-243.5': a 3-5mm, 30° fracture contains 25% chalcopyrite plus a trace of sphalerite and pyrrhotite in an orthoclase calcite quartz gangue.	H46559	10/BKGD	31	1900	4	8.6				240
245.0'-271.4': ALTERED SYENITE: very intense pale green sericite envelopes around sulphide bearing fractures form 60% of the rock. 245.2'-253.8': a series of shallow to intermediate angle quartz, dolomite, and calcite filled fractures form the core zone with sericite alteration envelopes. A small amount (200 ppm) of copper is associated with some of these fractures. 1cm long calcite crystals grow in a fracture cavity at 250.0'.	H46560		66	600	6	4.0		+	10° to 20° 3-5/1'	245
253.8'-254.0': a 9cm, 60° fracture is filled with 30% chalcopyrite, 20% pyrrhotite, 10% pyrite, and a trace of arsenopyrite in a white gangue of quartz, orthoclase and fluorite.	H46561		44	910	6	36			30° to 40° 1-4/1'	250
254.9'-255.8': a series of 2-4mm sulphide bearing fractures are surrounded by a pale green envelope. Total sulphides 5% with fracture > disseminated. Pyrite > chalcopyrite > pyrrhotite ≃ molybdenite ≃ arsenopyrite. Molybdenite is best on a 20° fracture while chalcopyrite is best on higher angle fractures. Estimated Cu 0.3%; Mo 0.1%.	H46562		2.5	115,000	4	432		+	50° to 70° 1-3/1'	255
255.8'-257.7': a number of hairline fractures are filled with pyrite > arsenopyrite > chalcopyrite. 257.7'-257.8': an irregular 3-7mm 20° fracture is filled with 50% chalcopyrite, 30% arsenopyrite, 15% pyrite and 5% pyrite. 257.8'-261.7': 1% sulphides in hairline fracture > disseminated. Pyrite > pyrrhotite ≃ chalcopyrite.	H46563		9.5	4000	46	20				
261.7'-261.8': an irregular 3cm fracture contains 60% white quartz, 35% chalcopyrite, 5% pyrrhotite. 261.8'-262.8': pyrite > quartz ≃ chalcopyrite, forming 2% of rock. 262.8'-263.0': 2, 35° fractures: the first is 11mm wide and contains 20% chalcopyrite, 20% pyrrhotite and 10% arsenopyrite with a sericite-chlorite gangue; the second is 7mm wide and contains 25% pyrite, 5% chalcopyrite and 20% purple fluorite in a similar gangue.	H46564	BKGD	14	14,400	6	59.7	100	+		260
264.2'-264.7': a series of 1-7mm, 30° fractures contain 5-30% chalcopyrite, 5% arsenopyrite 5-10% pyrite, 2-10% pyrrhotite and 0-5% purple fluorite.	H46565		16.5	565	4	3.0		+		265
266.7'-267.2': 2, 3mm, 30° fractures contain quartz > chalcopyrite ≃ pyrrhotite with a pink clay gangue. 268.1'-268.3': same as above but also minor arsenopyrite.	H46566		15.5	780	4	4.0		+		270
270.0'-271.4': a series of 20-30° fractures contains pyrite > arsenopyrite > quartz > purple fluorite. 271.4'-310.0': SYENITE: intense sericite alteration is less common (~25% of rock); still medium to coarse, slightly porphyritic syenite composed of 3% light grey orthoclase phenocrysts up to 15mm, 80-90% pink grey to grey-green orthoclase, and 7-10% dark green to black amphibole or pyroxene. Most open fractures are coated with calcite. As before, the sulphide bearing fractures are usually closed with pale green sericitc pink orthoclase, and/or pinkish clay alteration envelopes. 1/2-1% disseminated pyrrhotite > arsenopyrite occur in the unaltered rocks. In the fractures chalcopyrite ≃ pyrite > arsenopyrite ≃ pyrrhotite. White quartz, calcite and cream dolomite are common gangues.	H46567		23.5	1300	4	4.6				275
280.0'-280.3': a 30°, 2cm wide fracture contains 10% pyrite, 5% chalcopyrite and 2% black sphalerite or wolframite in a cream dolomite and quartz gangue. 280.3'-283.1': a series of narrow fractures and disseminated sulphides are enclosed by pervasive sericite and clay alteration. Pyrite ≃ chalcopyrite > sphalerite. Estimated 0.2% Cu and 0.1% Zn. Includes an irregular 8mm, 40° fractures with 45% chalcopyrite.	H46568		14.5	3500	10	14.8		+	10° to 20° 1/1'	280
283.1'-283.4': 3, 30°, 3-5mm wide fractures contain slightly smoky quartz, calcite, 5% chalcopyrite and 2% arsenopyrite. 284.0'-285.2': a series of 1-8mm wide, 30° fractures contain 25% chalcopyrite, 25% pyrite and 10% arsenopyrite.	H46569	5/BKGD	31	3500	2	16.6			30° to 40° 1-3/1'	285
288.0'-289.0': a series of irregular hairline to 9mm fractures contain 20% pyrite, 20% pyrrhotite and 5-15% chalcopyrite.	H-16570		37	1200	6	4.8			50° to 60° 1/1'	290
292.0-292.7': a 50°, 3mm fracture contains 30% chalcopyrite, 50% smoky quartz and 20% clays. 294.4'-294.7': a hairline and a 4mm, 30° fracture contain 15% chalcopyrite, 5% arsenopyrite and quartz.	H46571		25	550	4	2.2		+		295
										300

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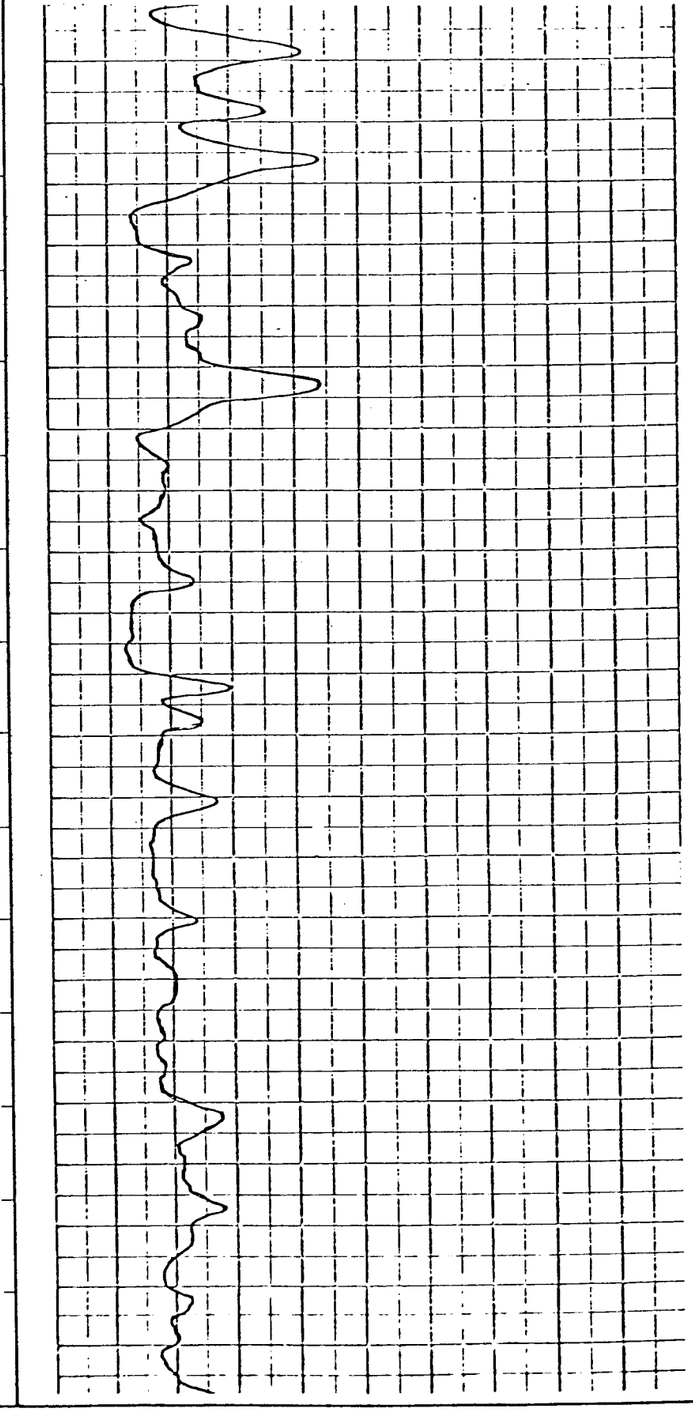
GAMMA PROBE LOG



DRILL HOLE LOG

PROJECT UJV HOLE IH10 LOCATION Zone 517 CORE SIZE BQ STARTED 20/08/79 FINISHED 23/08/79

CLAIM GROUP TOMBSTONE LENGTH 396' DIP -50° AZIMUTH 070° COLLAR ELEVATION 4985' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8) ppm U	ppm Cu	ppm Mo	ppm Ag	% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
300.0': below this point, 1cm secondary tan to pink kspar alteration envelopes are particularly common. 303.7': an irregular, hairline 20° fracture is filled with purple fluorite.	H46572	20/BKGD	36	80	4	0.8		+		
	H46573		29	180	16	0.8		+		
310.0'-365.0': SYENITE: below this point the syenite becomes more porphyritic. The rock has a grey to pinkish grey coloration with 20-30%, 5-25mm long, grey, often twinned orthoclase phenocrysts in a fine to medium grained groundmass composed of 70% grey orthoclase and 30% interstitial black mafics. 310.5': a 1mm, 30° fracture contains arsenopyrite and yellow orange limonite. 311.6'-311.7': a 7mm, 30° fracture containing 30% pyrite, 30% arsenopyrite, 20% chalcopyrite, 10% pyrrhotite and 10% cream dolomite is surrounded by 15cm pale green sericite and clay alteration envelopes.	H46574	10/BKGD	31	6100	8	29.5		+		
312.8'-313.3': a 10cm, 30° fracture containing quartz and chlorite with 20% chalcopyrite, 5% pyrrhotite, 5% pyrite, 3% arsenopyrite and 1% purple fluorite. 317.7'-317.9': 3, 2mm 30° fractures contain 50% pyrite and 30% chalcopyrite with chlorite and quartz. 318.8'-318.9': an 8mm, 30° fracture containing 25% chalcopyrite, 30% purple fluorite, 25% pyrite, 15% arsenopyrite and 5% pyrrhotite.	H46575	50/BKGD 100/BKGD	47	5400	8	18		+		
319.4'-319.5': a 25mm, 45° fracture contains chlorite with 20% purple and clear fluorite, 35% chalcopyrite and 15% pyrrhotite. 319.8'-320.0': a 50mm, 40° fracture contains chlorite with 15% chalcopyrite, 15% pyrite, 5% purple fluorite and 5% pyrrhotite. 323.3': a 1-2mm fracture contains 10% chalcopyrite, 5% pyrite and 10% clear and purple fluorite.	H46576	10/BKGD	37	940	4	3.8		+		
	H46577		33	230	12	1.2		+		
331.9'-332.0': a 2cm, 40° fracture contains quartz and cream dolomite with 10% pyrite and 5% chalcopyrite and 5% arsenopyrite. Another similar fracture 20cm lower in the hole contains smoky quartz and dolomite but no sulphides. Between, and for 10cm around these fractures, the hairline fractures are chloritized.	H46578	BKGD	25	980	8	4.8	100	+	20° 1 1/2'	
	H46579		19	100	44	0.6		+	30° 1-1/1'	
344.1'-344.2': a 4mm, 45° fracture containing quartz, pyrrhotite and arsenopyrite has a 5mm secondary kspar envelope but no lower grade envelopes.	H46580		31	60	8	0.4		+		
	H46581	10/BKGD	49	80	18	0.4		+		
349.8'-351.1': a 25mm, 30° fracture containing chlorite, quartz, 20% arsenopyrite, 5% pyrrhotite 5% pyrite and 2% chalcopyrite. 352.3'-356.0': a series of 20-30° fractures containing pyrite, arsenopyrite and chalcopyrite are surrounded by chlorite and sericite. There is a trace of yellow orange limonite with the arsenopyrite. 358.0'-359.5': a series of 10-30° fractures contain chlorite>> quartz = pyrite = arsenopyrite.	H46582	BKGD	27	440	10	4.4		+		
	H46583		28	660	10	3.2		+		
361.1'-361.3': a complex of hairline fractures contain pyrrhotite and purple fluorite. 361.9'-364.3': the syenite is very pink due to weak hematite stains. These stains are very strong around a few grains of mafic.	H46584	10/BKGD	45	65	5	0.4		+		
365.0'-378.3': SYENITE: coarse grained, grey green syenite with 90-95% euhedral orthoclase and 5-20% interstitial black amphibole or pyroxene. Hairline fractures filled with chlorite and minor pyrrhotite are common. Disseminated pyrrhotite is commonly associated with the mafics, usually 1/2-1% of rock. Intense sericitic alteration is rare except for a 10 cm sericitic and secondary kspar envelope around pyrite bearing fractures between 177.8'-178.0' and a 3m wide white quartz, cream dolomite and minor pyrite, 10° fracture with some sericite and chlorite between 371.0'-371.9'.	H46585	BKGD	29	410	6	1.6		+	0° to 20° 1-2/1'	
	H46586		38	2100	10	10		+	30° 3-1/2' 1/1'	
									45° to 50°	

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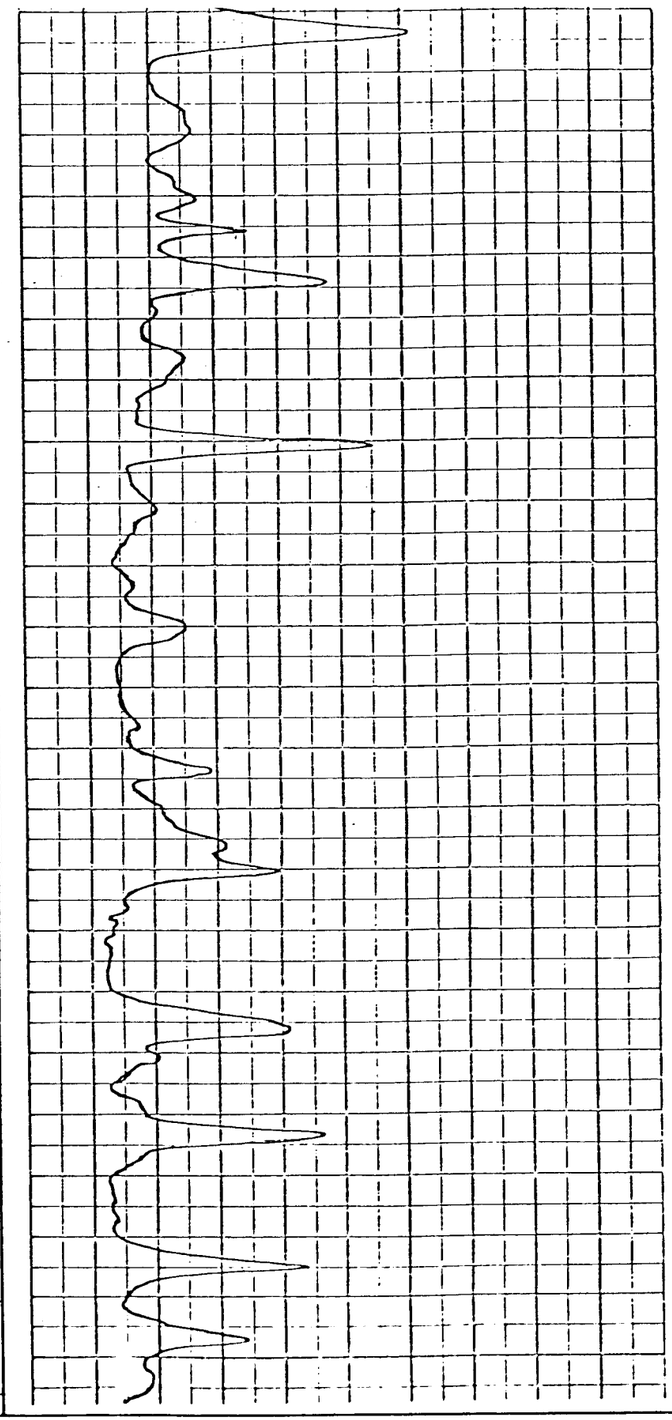


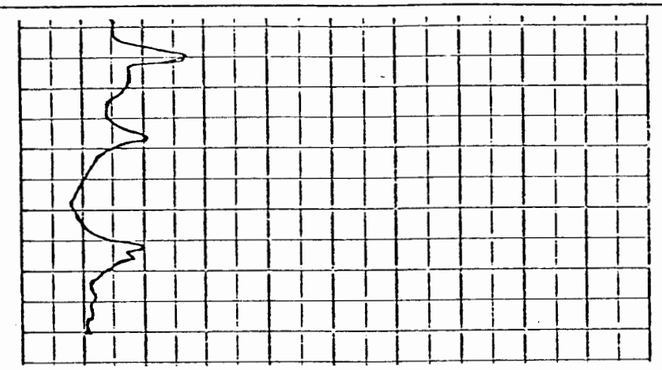
DRILL HOLE LOG

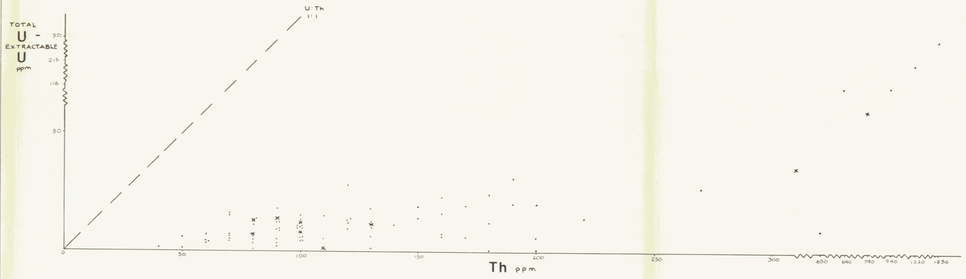
PROJECT UJV HOLE TH10 LOCATION Zone 517 CORE SIZE BQ STARTED 20/08/79 FINISHED 23/08/79 PAGE 6 OF 6

CLAIM GROUP TOMBSTONE LENGTH 396' DIP -50° AZIMUTH 070° COLLAR ELEVATION +985' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY				% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
			(U_3O_8) ppm U	ppm Cu	ppm Mo	ppm Ag					
378.3'-End of Hole: SYENITE: coarse grained pink grey syenite composed of 80-90% orthoclase and 10-20% interstitial mafics. The pink color may be hematite stains due to alteration of mafics. Disseminated pyrrhotite in the mafics is approximately 1% of the rock.	H46587	BKGD	35	2200	72	7.8	100	+			380
382.9'-383.0': a 2cm aplite dyke cuts the tinguaite at 55°. A 25° fracture adjacent to this dyke is moderately coated with yellow brown limonite, although this may be due to oxidation of the core.	H46588		20	40	6	0.6		+	0° to 20°	1/8'	385
	H46589		20.5	30	6	0.1		+	30° to 40°	1/2'	390
394.0'-396.0': the syenite again grey-green probably due to weak sericitization related to a number of hairline pyrrhotite bearing and chloritized fractures and a 5cm wide, 30°, quartz> pyrrhotite≃chlorite> cream dolomite filled fracture.	H46590		28	70	4	0.8		+			395 396

MOUNT SOPRIS GAMMA PROBE LOG





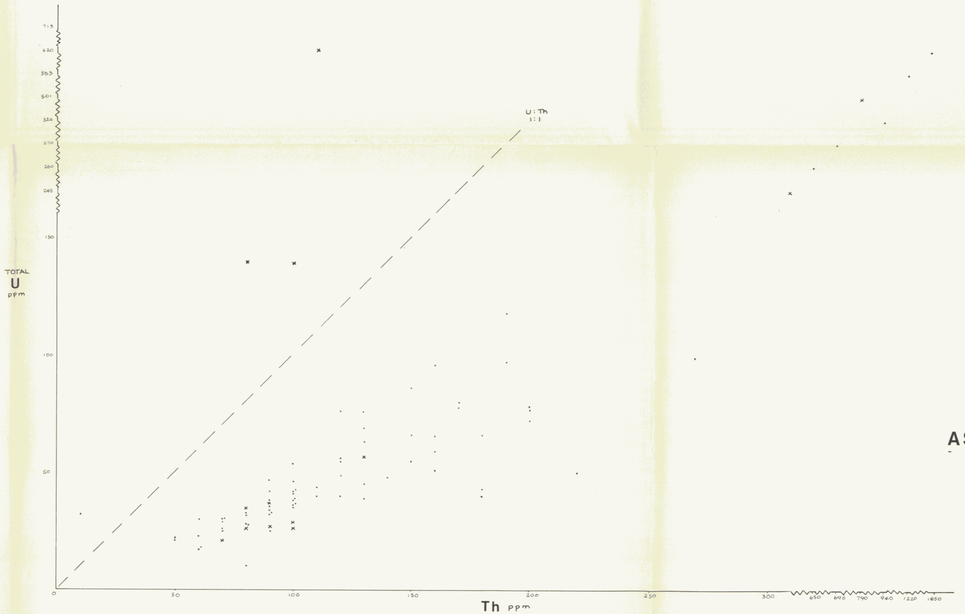


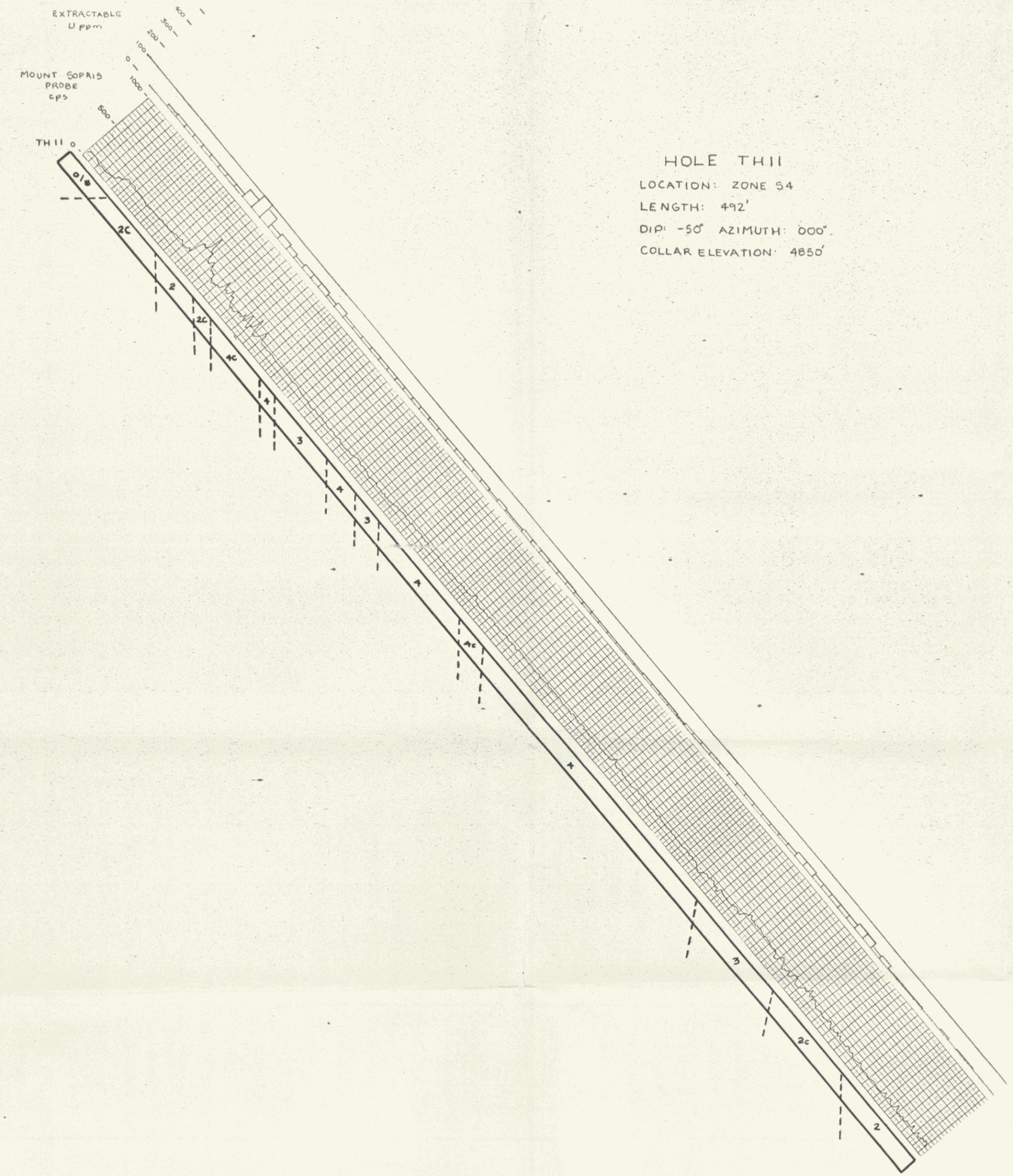
TABLE U-TG25

ASSAY DATA HOLE TH10

TOMBSTONE PROPERTY

UKON JOINT VENTURE

Association of Professional Engineers of the Yukon
A. R. ARCHER
GEOLOGICAL
ENGINEER



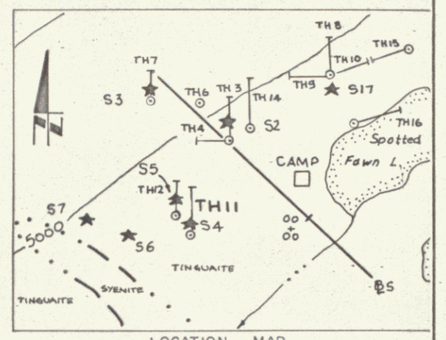
HOLE TH11

LOCATION: ZONE 54

LENGTH: 492'

DIP: -50° AZIMUTH: 000°

COLLAR ELEVATION: 4850'



LOCATION MAP

SCALE 1:10,000

100 50 0 100 200 300 400 500

metres

1 SYENITE tan weathering, medium to coarse grained nepheline syenite often with abundant sulphides and purple fluorite

2 PSEUDOLEUCITE TINGUAITE 5-30%, 3-20mm pseudoleucite phenocrysts 1-10mm orthoclase phenocrysts in a medium grey, aphanitic groundmass

3 SHEARED TINGUAITE foliated and/or auto-brecciated tinguaite often biotite altered

4 MIXED TINGUAITE lenses or bands of pseudo-leucite phenocrysts in sheared tinguaite groundmass

5 FINE GRAINED TINGUAITE medium to dark grey tinguaite without pseudoleucite phenocrysts, some 1-3 mm orthoclase phenocrysts. Usually as dykes

6 INTERMEDIATE TINGUAITE medium grey tinguaite with pseudoleucite orthoclase phenocrysts. Pseudoleucite phenocrysts smaller than usual

B,b BIOTITE ALTERATION intense, moderate

C,c CHLORITE ALTERATION intense, moderate

——— – – – geologic contact: sharp, gradational

Association of Professional Engineers of the Yukon Territory
A. R. ARCHER
GEOLOGICAL
15 Jan/80
ENGINEER

FIG. U-TG26

ARCHER, CATHRO & ASSOCIATES LTD

SECTION TH11

TOMBSTONE PROPERTY

UKON JOINT VENTURE

SCALE 1:400

4 2 0 4 8 12 16 20

metres

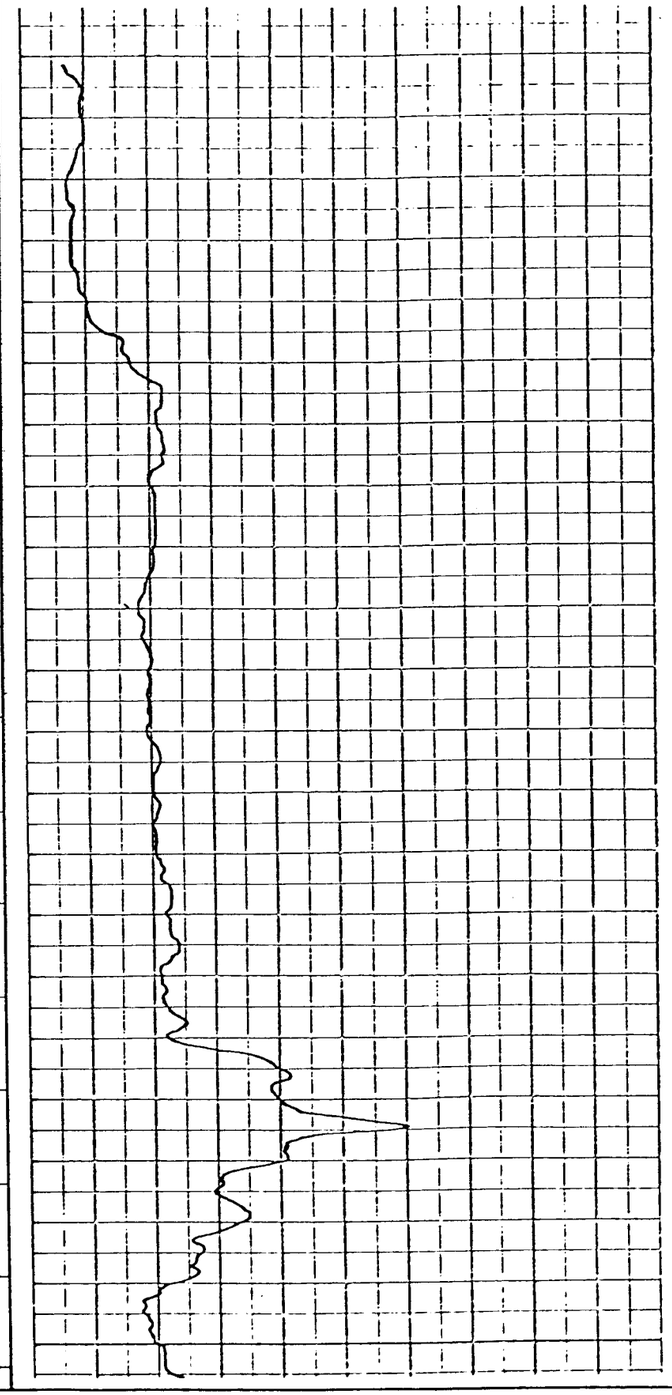
DRILL HOLE LOG

PROJECT UJV HOLE TH11 LOCATION ZONE 5A CORE SIZE BQ STARTED 29/08/79 FINISHED 01/09/79 PAGE 1 OF 7

CLAIM GROUP TOMBSTONE LENGTH 492' DIP -53° AZIMUTH 000° COLLAR ELEVATION 4850' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8) ppm U	ppm Cu			% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
0-19.9': OVERBURDEN: tinguaite and syenite glacial till and talus.							20				5
	H37670		10								10
	H37671		22.5								15
19.9'-53.0': INTENSELY SERICITIZED PSEUDOLEUCITE TINGUAITE: a mottled, pale green-olive green-tan groundmass contains 10-20%, 3-12mm pale green-dark green, anhedral pl phenocryst ghosts and <1%, 1-5mm, white-pale green orthoclase phenocrysts. The dark green alteration in the pl phenocryst ghosts which also forms irregular masses in the groundmass is probably chlorite overprinting biotite alteration. The fractures are generally open. The very shallow angle fractures are often chloritized hairline cracks while the steeper fractures are usually wider and strongly stained with limonite. Presumably this limonite is after sulphides. Similar intense sericitization is associated with sulphide bearing fractures in holes 8, 9, and 10. Disseminated pyrite is present in trace amounts near the top of the interval but increases to 1/2-1% near its bottom. The rock is weakly magnetic possibly due to very fine magnetite. 20.1': minor pyrrhotite coats a chloritized 10° hairline fracture. 22.8'-23.5': a narrow, 20° chloritized fracture zone. 25.7'-25.9': a 2mm, 30° fracture is filled with yellow brown limonite.	H37672	BKGD	18.5						10° to 20°	3-5/1'	20
	H37673		20.5						30° to 40°	2/1'	25
	H37674		17.5						65° to 80°	1/2'	30
35.0'-35.2': a 7 mm wide, 70° fracture is strongly stained with light brown limonite.	H37675		21.5								35
	H37676	20/BKGD	24				100				40
	H37677	5/BKGD	21								45
50.0'-53.0': GRADATIONAL CONTACT: intense sericitization decreases to weak sericitization in the contact zone. The groundmass is light grey but the pl phenocrysts exhibit abundant dark green alteration. 53.0': PSEUDOLEUCITE TINGUAITE: consisting of 10-25% light grey, 2-11mm, anhedral pl phenocrysts and 1% white, 1-6mm, subhedral to euhedral orthoclase phenocrysts in a medium grey aphanitic groundmass. The pl phenocrysts often display a pale green or pale tan tint due to weak sericitization; this is most common around narrow limonite stained fractures. The cracks contain 1-2% disseminated pyrite with the largest blebs occurring in the pl phenocrysts and the finer material in the groundmass.	H37678	20/BKGD	24						10° to 20°	2/1'	50
	H46591	25/BKGD	62						30° to 45°	1/1'	55
	H46592	40/BKGD	100								60
65.0'-65.5': a 70° and a 15° hairline fracture are surrounded by irregular, 3-10mm, brown limonite flooding of the wall rock.	H37679	20/BKGD	~~77~~						70° to 90°	1/5'	65
74.5'-77.1': GRADATIONAL CONTACT: similar to the upper contact of the plt with dark green pl phenocrysts and a light grey groundmass. At 74.7' and 75.6' fractures are surrounded by 1/2-1 cm limonite flooded wall rock. Much of the rock in the contact area has a pitted appearance probably due to leaching of sulphides.	H37680	25/BKGD	32								70
											75

MOUNT SOPRIS GAMMA PROBE LOG



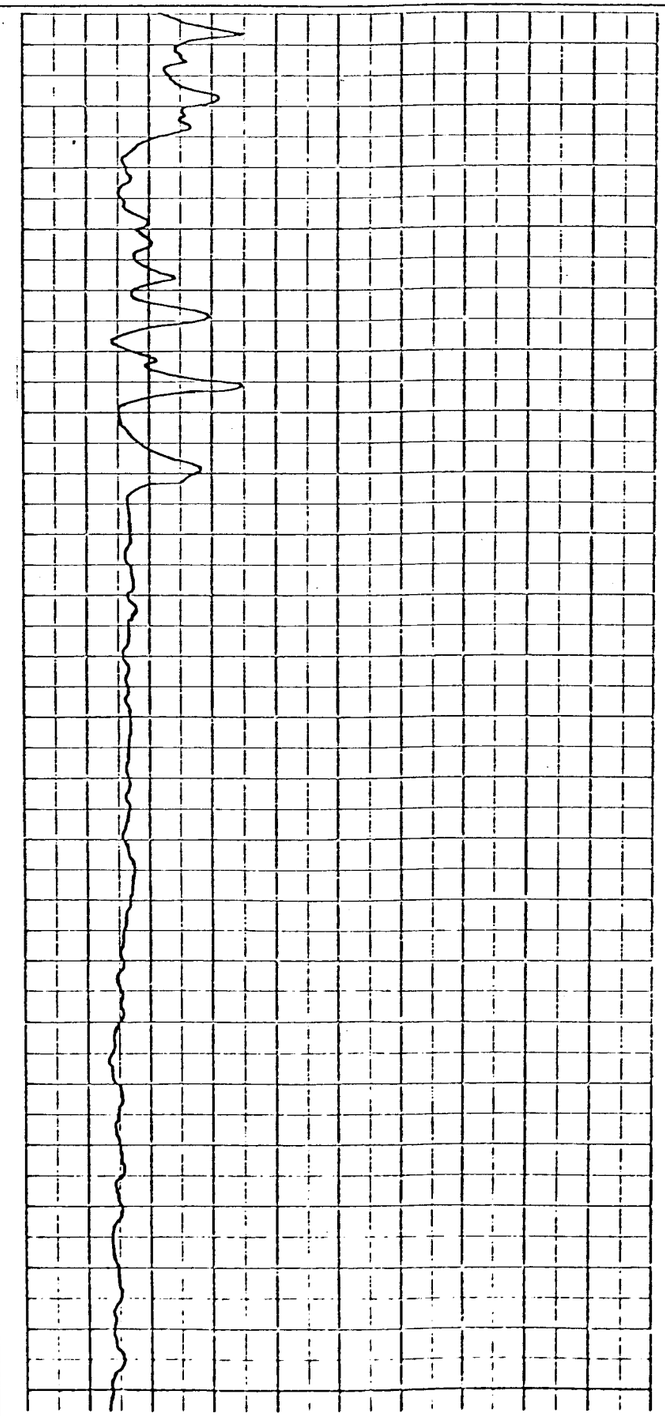
DRILL HOLE LOG

PROJECT UJV HOLE TH11 LOCATION ZONE 54 CORE SIZE BQ STARTED 29/08/79 FINISHED 01/09/79

CLAIM GROUP TOMBSTONE LENGTH 492' DIP -53° AZIMUTH 000° COLLAR ELEVATION 4350' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (U_3O_8) ppm U	ppm Cu			% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
77.1'-84.5': INTENSELY SERICITIZED PSEUDOLEUCITE TINGUAITE: mottled light green to olive green groundmass with dark green to silvery grey pl and orthoclase phenocrysts. Generally similar to 19.9'-53.0'. Pyrite is again less abundant, rarely exceeding 1/4%. A trace of arsenopyrite is also present. 78.8'-78.9': a 1mm, 50° fracture contains limonite and minor residual pyrite. 80.1'-80.8': a series of fractures between 15-50° contains limonite and residual pyrite. 82.3'-82.4': a 25°, 8mm, very hard, medium green quartz? vein contains breccia fragments of the wall rock and blebs of pyrrhotite. It is surrounded by 1cm wide pale green alteration envelopes in which all phenocrysts are destroyed. 84.5'- 86.2': a patch of less altered tinguaite has a medium grey groundmass, unaltered white orthoclase phenocrysts and medium grey altered pl phenocrysts. The nature of the pl phenocryst alteration is unknown. Pyrite again forms 1% of the rock.	H37681	10/BKGD	38						10° to 20° 3/1"	
	H37682		29						40° to 50° 2-5/1"	80
	H37683		24							85
86.0'-99.8': INTENSELY SERICITIZED MIXED TINGUAITE: the alteration has almost obliterated the textures of the sheared tinguaite and makes the sheared tinguaite to plt ratio uncertain. There is a weak foliation at 45° to the core axis around 93.0'. The lack of pl phenocryst ghosts over much of the interval suggests that brecciation and/or foliation must have been extensive. A rough sheared tinguaite to plt ratio of 4:1 seems reasonable. As before the rock has a mottled pale green to olive green color. Many of the pl phenocryst ghosts have a silvery-grey sheen. Disseminated pyrite comprises approximately 1/4% of the rock. Most open fractures contain limonite and/or chlorite while the closed fractures are usually filled with silver grey chlorite? and have 1-2mm tan alteration envelopes. 1mm-2cm limonite flooding surrounds several fractures. 99.8' SHARP 45° CONTACT 99.8'-102.2': SYENITE (?) DYKE: a weakly to strongly pale green to medium grey aphanitic groundmass contains 1-4mm, subhedral, white orthoclase phenocrysts which comprise 25% of the dyke. Although the rock is very similar to strongly brecciated tinguaite, the abundance of orthoclase phenocrysts (5-20 times greater than the surrounding tinguaites) suggest that is is a dyke. 102.2'-113.8': INTENSELY SERICITIZED MIXED TINGUAITE: as described for 86.0'-99.8'. Pyrite is still 1/4% of the rock and limonite flooding around fractures is common. 103.5'-103.8': pyrite and chlorite coat a hairline 15° fracture.	H37684		29						30° to 45° 1-3/1"	90
	H37685		28						70° to 90° 2-5/1"	95
	H37686		28							100
107.5'-108.0': chlorite and a trace of molybdenite fill a 10° hairline fracture.	H37687	BKGD	24				100		10° to 30° 3-5/1"	105
112.8'-113.8': GRADATIONAL CONTACT: grades from strongly sericitized to weakly sericitized tinguaite. 113.8'-122.5': MIXED TINGUAITE: consisting of weakly to very weakly sericitized plt and sheared tinguaite at a 1:1 ratio. The plt occurs in 3-6cm bands and is composed of 20% weakly altered, mottled, white-light grey-pale green, 2-14mm, anhedral pl phenocrysts in a medium grey aphanitic groundmass. In the sheared tinguaite, brecciation dominates over foliation. Typically the sheared rock is composed of white 1-4mm pl and orthoclase fragments in a medium grey groundmass. There are a few patches of biotite alteration in the sheared tinguaite and a number of 1cm wide blebs composed solely of mafics and pyrite which may be altered pl phenocrysts or the product of differentiation. Disseminated pyrite comprises 1/2-1% of the rock. The fractures are generally open and weakly stained with limonite.	H37688		29						70° to 90° 1/2"	110
	H37689		18.5							115
122.5'-153.0': SHEARED TINGUAITE: strongly brecciated tinguaite composed 20-30% of 1-4mm, white-grey fragments of pl and orthoclase phenocrysts and a few 5mm unbrecciated weakly sericitized pl phenocrysts in a medium grey aphanitic groundmass. 3-5cm unsheared plt bands are rare. Disseminated pyrite ranges from 1/4-1/2%. The open fractures are coated with white clay or orthoclase. The closed fractures generally contain white orthoclase and less commonly calcite.	H37690		21.5							120
	H37691		15.5							125
	H37692		16						55° to 70° 1-2/1"	130
	H37693		15							135
143.0'-144.2': 3, 1-3mm, 20° fractures are filled with calcite and are surrounded by 1cm light grey, bleached? alteration envelopes.	H37694		17						10° to 20° 1-1/1"	140
148.0'-150.9': The sheared tinguaite is bleached to a light grey and possibly weakly sericitized around a series of hairline to 5mm wide fractures running subparallel to the core axis. The fractures are filled with white orthoclase and a trace of molybdenite.	H37695		16						50° to 60° 1/2"	145
										150

MOUNT SOPRIS GAMMA PROBE LOG



DRILL HOLE LOG

PROJECT UJV HOLE TH 11 LOCATION ZONE 54 CORE SIZE BQ STARTED 29/08/79 FINISHED 01/09/79

CLAIM GROUP TOMBSTONE LENGTH 492' DIP -53° AZIMUTH 000° COLLAR ELEVATION 1350' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8) ppm U	ppm Cu			% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
153.0'-171.4': MIXED TINGUAITE: unaltered to slightly altered bands and lenses of plt are surrounded by brecciated and weakly foliated sheared tinguaite at a 1:4 ratio. The plt bands range from 3-30cm wide and are composed of 20-30%, 2-10mm, white to light grey, anhedral pl phenocrysts, 1%, 1-7mm, white subhedral orthoclase phenocrysts in a medium grey aphanitic groundmass. The sheared tinguaite is generally similar to the sheared tinguaite between 122.5'-153.0'. Brecciation generally dominates over foliation although there is commonly a weak foliation at 45° to core axis. Occasionally the shearing intensifies to produce a moderate foliation and between 157.8 and 158.0' a 4 cm mylonite zone occurs at 45° to core axis. The groundmass of the sheared tinguaite is often slightly lighter grey than the plt groundmass. Disseminated pyrite is less abundant, comprising 0.1-1/4% of the rock. The shallow angle fractures are generally filled with white orthoclase and higher angles open and weakly coated with clays and limonite. At 157.6' a 70° fracture is surrounded by 5mm limonite flooded wall rocks.	H37696		18.5						0° to 10°	1-5/1	
	H37697		17.5						50° to 70°	2-4/1	155
	H37698		23						10° to 30°	2-4/1	160
167.4': a 70°, 2mm orthoclase dykelet exhibits convolute folds with their axis at 30° to core axis.	H37699		20.5						50° to 70°	1-2/1	165
171.4'-183.8': SHEARED TINGUAITE: very similar to the sheared tinguaite between 122.5-153.0' except that its groundmass often has a bleached? light grey color possibly related to hairline, shallow angle, orthoclase filled fractures. Disseminated pyrite is only a minor accessory mineral (<0.1%). The fractures are usually coated with clay.	H37700		16.5								170
	H37701		17.5								175
183.8'-201.0': MIXED TINGUAITE: containing plt and sheared tinguaite at a 1:1 ratio. The plt bands and lenses are composed of fairly typical plt except that it commonly exhibits a weak sericitic alteration of the pl phenocrysts. The sheared tinguaite is variable, ranging from tinguaite with slightly stressed, indistinct pl phenocrysts, to brecciated tinguaite. The rock also contains a few 1-4cm fragments of unusual tinguaite: some are dark grey to black and composed largely of mafics, while others contain prismatic orthoclase phenocrysts in a typical medium grey groundmass but are devoid of pl phenocrysts. There are a few small patches of moderate, pale green sericitized tinguaite. Disseminated pyrite is in the range of 0.1-1/4%. Most fractures are open with minor orthoclase, clay and/or limonite stains; a few are closed with orthoclase. Between 184.0'-184.8' a shallow fracture is surrounded by 1cm of limonite flooded wall rock. 188.8'-190.6': a patch of moderately sericitized tinguaite. The alteration affects both the groundmass and the pl phenocrysts.	H37702	BKGD	21				100		30° to 40°	3-4/1	180
	H37703		22						10° to 30°	1/1	185
	H37704		22.5								190
199.2': a fragment of altered? sheared tinguaite with medium grey phenocryst fragments and a dark grey groundmass.	H37705		17.5								195
200.0': a 1cm mafic rich, fine grained syenite? dyke cuts the core axis at 70°. 201.0'-216.8': MIXED TINGUAITE: generally as between 183.8'-201.0' but exhibiting pervasive weak pale green and pinkish grey sericitic alteration and pyrite, comprises 1/2-1% of the rock. The odd 1-2cm dark grey fragments are still common.	H37706		13.5						50° to 70°	1-2/1	200
207.0'-207.4': a series of hairline-2mm grey quartz or orthoclase filled 30° fractures are surrounded by 3cm wide alteration envelopes comprised of intense pink sericitized groundmass and white clay? altered pl phenocrysts.	H37707		15.5								205
216.8'-232.0': MIXED TINGUAITE: differs from the above intervals by the presence of weak to moderate alteration in approximately 10% of the sheared tinguaite. The foliation is at 45° to core axis. At 217.2' a 2mm highly pitted dykelet runs subparallel to the foliation.	H37708		11								210
	H37709		11								215
222.6': a 1cm fragment in the sheared tinguaite has a medium to dark grey groundmass and contains abundant fine grained prismatic white orthoclase? phenocrysts. Dark grey to weak fragments are also common. 224.7': another 1cm mafic rich, fine grained syenite dyke cuts the core axis at 70°.	H37710		18.5								220
											225

MOUNT SOPRIS GAMMA PROBE LOG

DRILL HOLE LOG

PROJECT UJV HOLE TH 11 LOCATION ZONE 54 CORE SIZE BQ STARTED 29/08/79 FINISHED 01/09/79 PAGE 4 OF 7

CLAIM GROUP TOMBSTONE LENGTH 492' DIP -53° AZIMUTH 200° COLLAR ELEVATION 4850' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8) ppm U	ppm Cu			% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
	H37711		17								
230.0': a 3cm fragment similar to the 222.6' fragment. 232.0'-244.1': MODERATELY SERICITIZED MIXED TINGUAITE: the plt to sheared tinguaite ratio is still 1:1. The rock is similar to the previous intervals except that foliation is absent and alteration is more intense. The upper 10' has a medium grey to grey green groundmass and pale green to grey green pl phenocrysts, while the lower 12' has a slightly lighter than usual grey groundmass and tan to silvery grey-green pl phenocrysts. The fractures in this interval are usually limonite stained with limonite flooding of the adjacent wall rock. 235.0'-235.4': a hairline, 5° fracture contains pyrite and minor chalcopyrite. 236.0'-236.7': a hairline, 10° fracture is filled with pyrite. 239.1'-239.3': a large dark grey-green, fine grained fragment or dyke sits in the sheared tinguaite with 55° contacts.	H37712		20.5						10° to 20°	3-10/1'	230
	H37713		16						50° to 70°	1-3/1'	235
244.1'-273.0': MIXED TINGUAITE: weakly sericitized plt and sheared tinguaite at a 1:1 ratio. Brecciation is the dominant texture in the sheared tinguaite. Both pale green and pinkish grey sericite affect the pl phenocrysts. Fractures are rare. This rock is generally similar to the mixed tinguaite higher in the hole. Disseminated pyrite comprises 1/4% of the plt and up to 1% of the sheared tinguaite. 246.5': a 1mm, 70°, white orthoclase filled fracture contains minor molybdenite > pyrite.	H37714		21.5								240
	H37715		22.5								245
	H37716		19								250
											255
255.5'-255.7': an irregularly shaped 1-5cm fragment or dyke in sheared tinguaite contains abundant 2-20mm white, subhedral, prismatic orthoclase phenocrysts in a medium grey groundmass. This rock contains no pl phenocrysts. 262.0'-262.4': a 25°, hairline fracture is filled with pyrite. 264.1'-264.5': 2, hairline fractures containing minor pyrite have 1mm white orthoclase envelopes.	H37717	BKGD	20.5				100				260
	H37718		20.5						15° to 30°	1/1'	265
	H37719		21.5								270
273.0'-317.0': MIXED TINGUAITE: the only significant changes from the previous interval are a reduction in the plt to sheared tinguaite ratio to 1:3, an increase in the orthoclase phenocrysts in the plt, and a faint 40° foliation in places. The rock is still weakly sericitized and contains 1/4-1% finely disseminated pyrite. The shallow fractures are filled with white orthoclase, while the higher fractures are usually open and are coated with clay or orthoclase.	H37720		22.5						60° to 80°	1/3'	275
	H37721		23								280
	H37722		22.5								285
	H37723		24.5								290
	H37724		24.5								295
	H37725		22.5								300

MOUNT SOPRIS GAMMA PROBE LOG

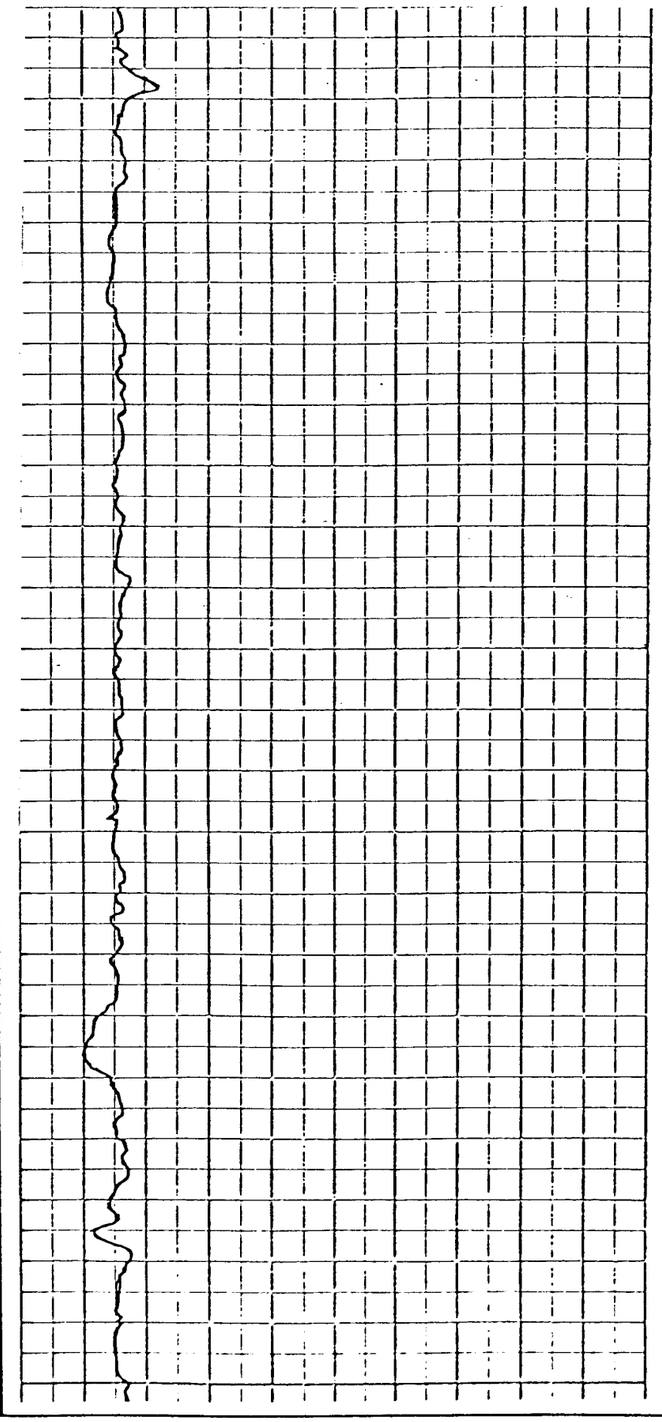
DRILL HOLE LOG

PROJECT UJV HOLE TH 11 LOCATION ZONE 54 CORE SIZE BQ STARTED 29/08/79 FINISHED 01/09/79 PAGE 5 OF 7

CLAIM GROUP TOMBSTONE LENGTH 492' DIP 53° AZIMUTH 000° COLLAR ELEVATION 4850' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8) ppm U	ppm Cu			% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
302.0': a 1 cm bleb of black mafics contains 10% pyrite.	H37726		15.5						15° to 30°	1-3/1'	305
305.0'-305.5': weakly foliated tinguaite is erratic between 0 and 30° and is intruded by a highly sericitized 7mm syenite dyke paralleling the foliation.											
309.5'-310.8': pl phenocrysts in plt and weakly foliated tinguaite contain 10% blue feldspathoids. 310.8': a 3mm, 60° fracture is filled with white orthoclase, black mafics and pyrite. 311.5'-312.0': a group of 2-4mm medium grey aphanitic fragments in sheared tinguaite are rimmed by pyrite so that pyrite comprises 2% of the rock.	H37727		16.5						60° to 80°	1/3'	310
315.8'-317.0': strongly brecciated tinguaite. The upper 15cm is intensely milled so that no fragment exceeds 1mm in diameter. The remainder of the interval contains white orthoclase and pl fragments ranging from 1-4mm across. 317.0'-317.1': a 1mm 30° fracture is filled with white calcite and the surrounding rocks contain 1-2% pyrite.	H37728		14								315
317.0'-369.9': MIXED TINGUAITE: weak pale green and pink sericitic alteration of the pl phenocrysts in plt and sheared tinguaite which occur in a ratio of 1:2. The plt is composed of 30%, 1-10mm, anhedral pl phenocrysts and 1-2%, 1-5mm white orthoclase phenocrysts in a medium grey aphanitic groundmass. The sheared tinguaite is dominantly brecciated and contains numerous 1-2cm fragments consisting of 1-3mm black mafic and 1-8mm white orthoclase phenocrysts in a medium to dark grey groundmass. Disseminated pyrite forms 0.1-1/4% of the rock. The shallow angle fractures are usually closed while the steeper fractures are open.	H37729		17								320
	H37730		16.5								325
327.2'-327.6': a hairline, 20° fracture is filled with pyrite and chlorite.	H37731		18						10° to 20°	2-5/1'	330
332.2'-332.5': another hairline 25° fracture is filled with pyrite and chlorite.	H37732	BKGD	20.5				100		30° to 40°	1/2'	335
337.9'-339.8': an irregular hairline to 1cm fracture contains pyrrhotite > white quartz >> chalcopyrite with a chlorite selvage and a 2cm bleached sericitized alteration envelope.	H37733		18								340
	H37734		19.5						60° to 70°	1/4'	345
346.0'-346.3': an 8cm porphyritic dyke with 10%, 1-6mm black pyroxene or hornblende and chloritized phenocrysts in a light to medium grey-green aphanitic groundmass cuts the core axis at 60°.	H37735		19								350
	H37736		17								355
355.2'-358.3': a porphyritic syenite dyke consisting of 10%, 1-9mm, grey prismatic orthoclase phenocrysts in a medium green grey aphanitic groundmass. The dyke contains 1-3% disseminated pyrite. The dyke is green due to either chloritization or sericitization of the groundmass. The dyke cuts the core axis at 45°.	H37737		16.5								360
366.2'-367.5': a porphyritic syenite dyke similar to the large dyke above except that the orthoclase phenocrysts comprise only 3% of the rock but are larger (4-12mm long). The phenocrysts are prismatic and are commonly bent. Pyrite is again 1-3%. The dyke cuts the core axis at 60°. 367.8': a 4mm white orthoclase and black mafic dyke cuts the core axis at 40°.	H37738		18.5								365
369.9'-380.4': SHEARED TINGUAITE: intensely brecciated tinguaite consisting of 10%, 0.5-4mm (rare phenocrysts up to 8mm) white phenocryst fragments in a light to medium grey, aphanitic groundmass. Disseminated sulphides are rare. The steeper fractures are open and the shallow fractures are filled with white orthoclase or chlorite.	H37739		16						20° to 50°	1-3/1'	370
	H37740		22.5						60° to 70°	1-2/1'	375

MOUNT SOPRIS GAMMA PROBE LOG



DRILL HOLE LOG

PROJECT UJV HOLE TH11 LOCATION ZONE 54 CORE SIZE BQ STARTED 29/08/79 FINISHED 01/09/79

CLAIM GROUP TOMBSTONE LENGTH 492' DIP -53° AZIMUTH 000 COLLAR ELEVATION 4850' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8) ppm U	ppm Cu			% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
	H37741		27								
380.4': SHARP 60° CONTACT 380.4'-398.7': MYLONITIZED TINGUAITE: medium grey, aphanitic mylonite with occasional 2-10cm bands of 1-5mm white orthoclase and pink sericitized fragments. There is a strong foliation at 60° to core axis. Sulphides are rare. The shallow fractures are filled with white orthoclase or calcite.	H37742		37								380
	H37743		36						20° to 30°	1-3/1'	385
	H37744		32								390
398.7'-401.0': SHEARED TINGUAITE: moderately foliated and strongly brecciated tinguaite contains intensely sericitized pink pl phenocrysts. The foliation is at 60° to core axis. Sulphides are rare.	H37745		26						60° to 70°	1-2/1'	395
401.0'-411.3': MYLONITIZED TINGUAITE: similar to the 380.4'-398.7' rocks except that this interval exhibits pronounced light and dark bandings which highlight the foliation and the foliation gradually flattens from 60° at the top of the interval to 0° then back to 30° at the bottom. It is intruded by a number of narrow white orthoclase dykes which run subparallel to the core axis. Most of the dykes contain pyrrhotite. The largest dyke (3cm) which lies between 406.5 and 406.8' contains 1% molybdenite and 1% of a black mineral with a hardness of ~4 and a dark brown streak (wolframite?).	H37746		26								400
	H37747	BKGD	31								405
411.3'-452.0': SERICITIZED PSEUDOLEUCITE TINGUAITE: consisting of 5-10%, 3-15mm, anhedral, pink-grey, sericitized pl phenocrysts, 5-10%, 1-17mm, subhedral prismatic to stubby, white-light grey orthoclase phenocrysts, and 0-3% 0.5-3mm black mafic phenocrysts in a light grey aphanitic groundmass. The rock contains 1-3% disseminated pyrite, usually associated with the mafics. The fractures generally contain white orthoclase. 415.7'-415.9': a 3cm, medium grey band of mylonitized tinguaite cutting the core axis at 45° contains 5% pyrrhotite. 418.5'-419.0': 2 irregular shaped 1-5cm wide mylonitized bands vary from medium grey to black and contain whisps of pyrrhotite associated with the blackest material.	H37748		27				100				410
	H37749		41								415
420.5'420.7': a 5cm medium grey mylonite band containing 2% pyrrhotite cuts the core axis at 50°. 421.6'-421.7': a 5mm x 2cm irregular, whispy bleb contains pyrrhotite > pyrite > black mafics. 422.1'-422.4': another 5-10cm irregular whispy mylonite zone contains 10% pyrite > pyrrhotite and 1% purple fluorite and a trace of molybdenite. 423.7'-424.1': a 15-20cm irregular mylonite zone with 2% pyrrhotite.	H37750		41						30° to 40°	1/5'	420
	H37751		18.5								425
431.5'-432.0': a 2mm, 15° fracture filled filled with orthoclase and pyrite.	H37752		26						60° to 70°	1/3'	430
437.6'-437.7': a 10mm, 70° white orthoclase and pyrite filled fracture. 439.2': a 70°, open white orthoclase filled and limonite stained fracture.	H37753		14.5								435
440.3'-440.4': a 30°, 1cm wide dykelet contains smoky quartz = white orthoclase > black mafics > pyrite. 440.6'-441.5': the plt is weakly foliated at 60° to core axis. 443.4'-443.5': a 30°, 5mm white orthoclase > smoky quartz > black mafics = pyrite.	H37754		14.5								440
447.6': another 4 x 5mm whisp of dark mafics and pyrite.	H37755		9.5								445
											450

MOUNT SOPRIS GAMMA PROBE LOG

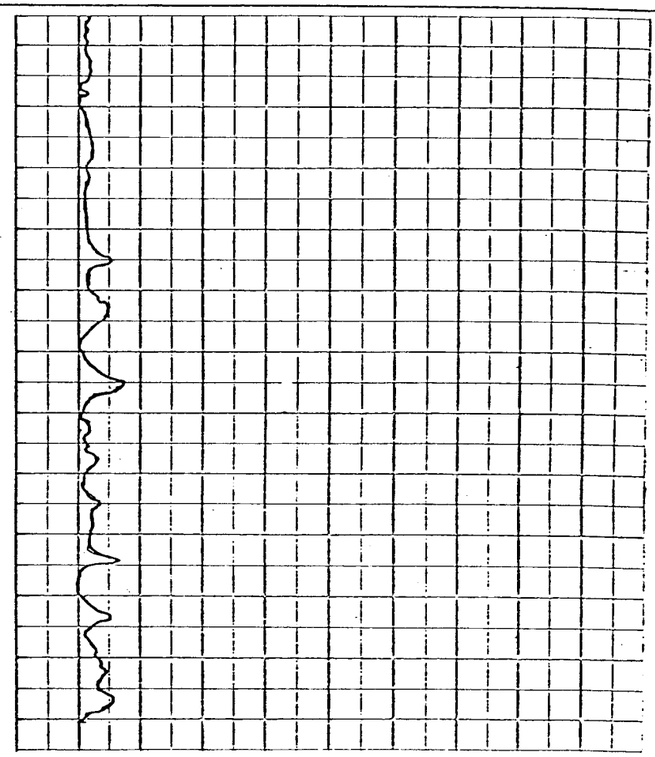
DRILL HOLE LOG

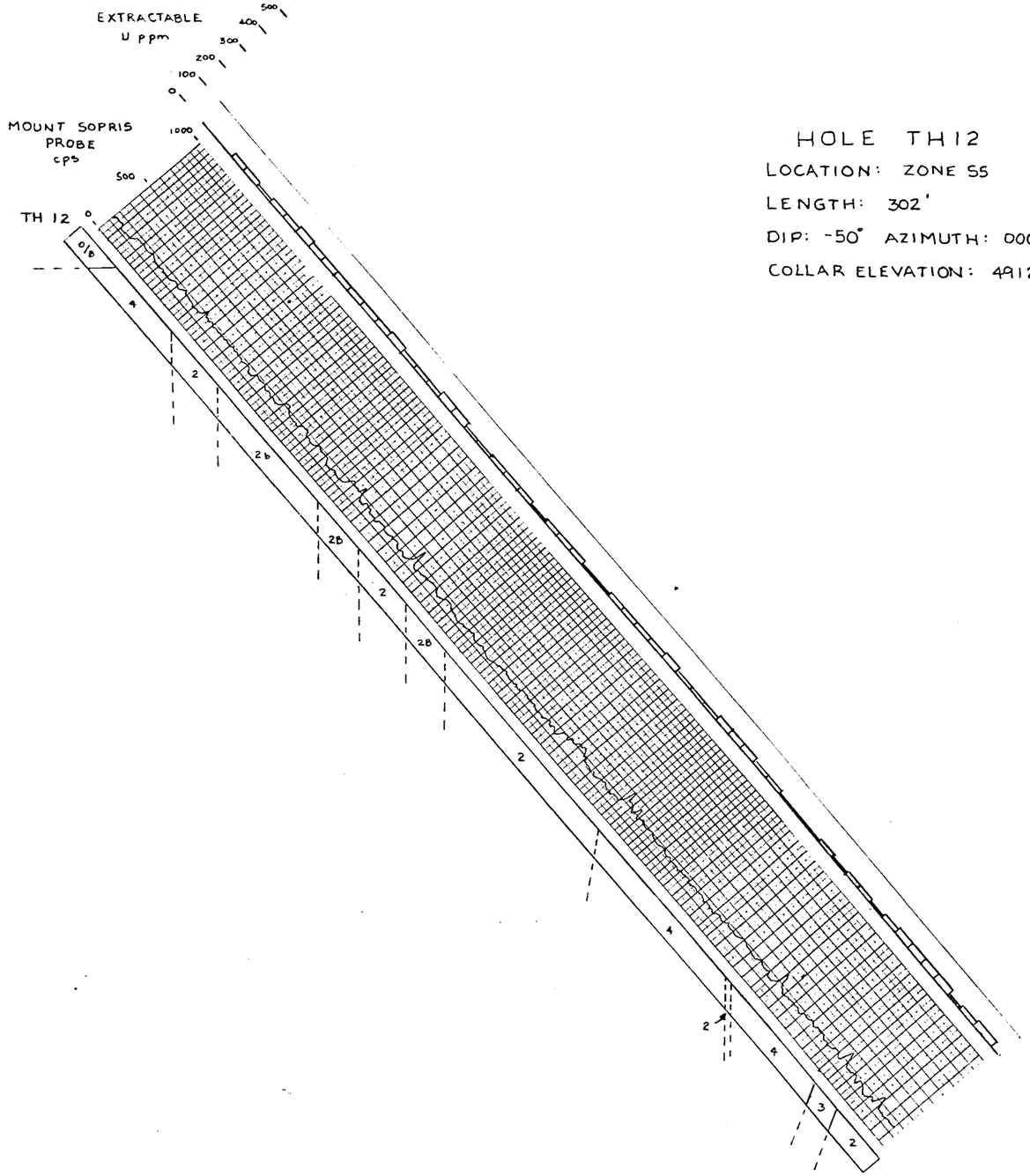
PROJECT UJV HOLE TH 11 LOCATION ZONE 54 CORE SIZE BQ STARTED 29/03/79 FINISHED 01/03/79 PAGE 7 OF 7

CLAIM GROUP TOMBSTONE LENGTH 492' DIP -53° AZIMUTH 000° COLLAR ELEVATION ±850' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (U_3O_8) ppm U	ppm Cu			% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
452.0'-End: PSEUDOLEUCITE TINGUAITE: fresh plt consisting of 5%, 2-10mm, anhedral to euhedral light grey pl phenocrysts, 5-10%, 2-15mm, subhedral, light grey orthoclase phenocrysts, 1-3%, 1-2mm black mafic phenocrysts in a medium grey, aphanitic groundmass. In places exhibits a weak 40-60° foliation. Sulphides are rare. Fractures are generally open.	H37756		10.5								
457.0'-458.0': a pitted fracture zone with clay and moderate limonite stains on the fractures. Fractures are at 30° and 60° predominantly.	H37757		7.5								455
	H37758		5.5								460
465.2'-465.4': 2, 60° open fractures are weakly stained with limonite.	H37759	BKGD	11.5						20° to 30°	½'	465
	H37760		7				100		60° to 70°	⅓'	470
475.9'-476.5': 2, 20° 2mm fractures are filled with white orthoclase>> pyrite > black mafics. 477.4': a 45°, 1.5mm fracture is filled with white orthoclase > pyrite.	H37761		12.5								475
482.4': a 45°, 1.5mm fracture is filled with white orthoclase> black mafic > pyrite.	H37762		9.5								480
487.2'-487.4': a 30°, 1mm orthoclase filled fracture has small folds at 45° to the core axis which is parallel to the weak foliation at this point.	H37763		8.5								485
490.5'-492.0': a 2mm orthoclase>> pyrite > black mafic filled fracture runs subparallel to the core axis.											490
											492

MOUNT SOPRIS GAMMA PROBE LOG





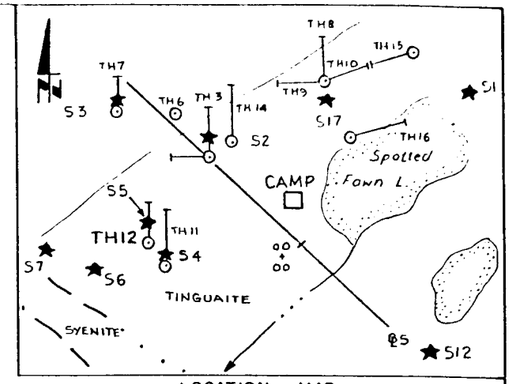
HOLE TH12

LOCATION: ZONE 55

LENGTH: 302'

DIP: -50° AZIMUTH: 000°

COLLAR ELEVATION: 4912'



LOCATION MAP

SCALE 1:10,000

100 50 0 100 200 300 400 500

metres

1 SYENITE tan weathering, medium to coarse grained nepheline syenite often with abundant sulphides and purple fluorite

2 PSEUDOLEUCITE TINGUAITE 5-30%, 3-20mm pseudoleucite phenocrysts 1-10mm orthoclase phenocrysts in a medium grey, aphanitic groundmass

3 SHEARED TINGUAITE foliated and/or auto-brecciated tinguaite often biotite altered

4 MIXED TINGUAITE lenses or bands of pseudo-leucite phenocrysts in sheared tinguaite groundmass

5 FINE GRAINED TINGUAITE medium to dark grey tinguaite without pseudoleucite phenocrysts, some 1-3 mm orthoclase phenocrysts. Usually as dykes

6 INTERMEDIATE TINGUAITE medium grey tinguaite with pseudoleucite orthoclase phenocrysts. Pseudoleucite phenocrysts smaller than usual

B,b BIOTITE ALTERATION . intense, moderate

C,c CHLORITE ALTERATION intense, moderate

——— – – – geologic contact: sharp, gradational

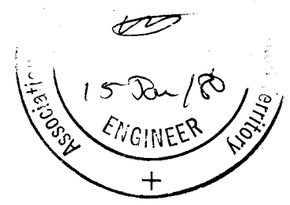


FIG. U-TG27

ARCHER, CATHRO & ASSOCIATES LTD

SECTION TH12

TOMBSTONE PROPERTY

UKON JOINT VENTURE

SCALE 1:400

4 2 0 4 8 12 16 20

metres

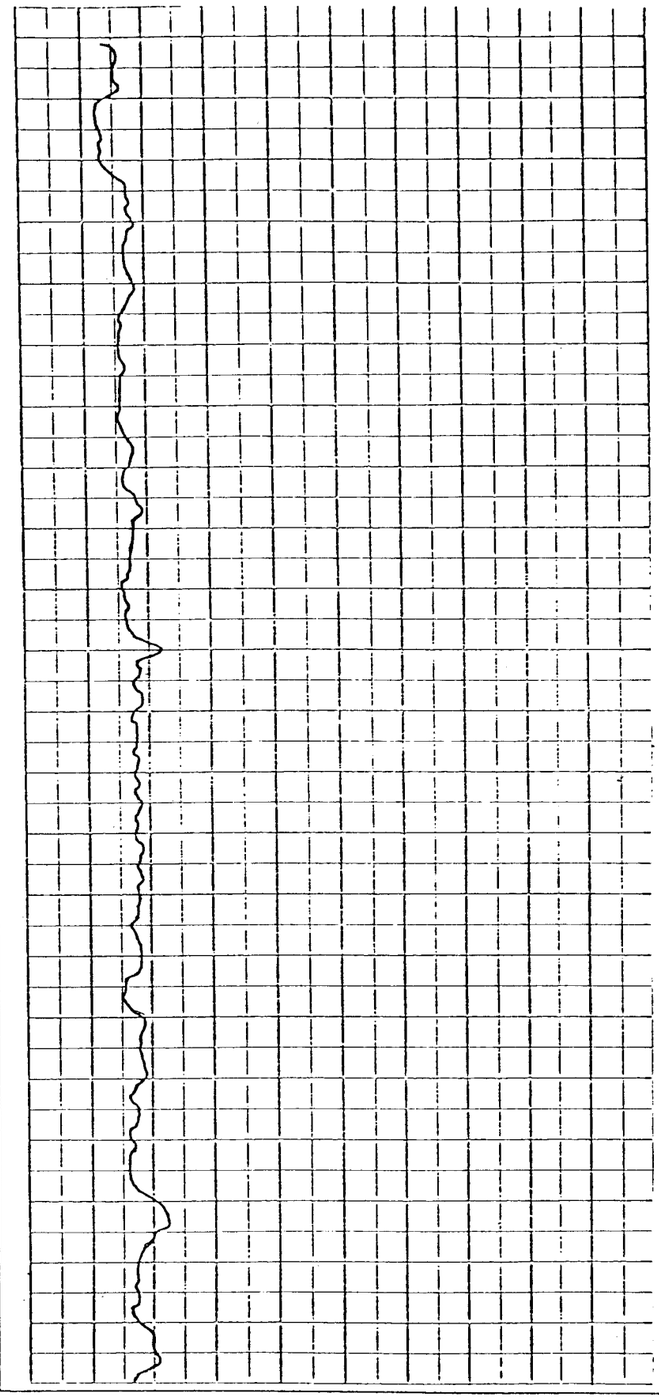
DRILL HOLE LOG

PROJECT UJV HOLE TH 12 LOCATION ZONE S5 CORE SIZE BQ STARTED 02/09/79 FINISHED 04/09/79

CLAIM GROUP TOMBSTONE LENGTH 302' DIP -50° AZIMUTH 000° COLLAR ELEVATION 4912' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8 ppm U)	GEOCHEMISTRY AND ASSAY (ppm Cu)	% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
0-11': OVERBURDEN: Tinguaite and syenite boulders in glacial till and talus.					0			5
11'-36.5': MIXED TINGUAITE: weakly altered pseudoleucite tinguaite bands or lenses mixed with sheared tinguaite at a ratio of 3:2. The plt consists of 15-25%, 3mm to 18mm, anhedral to subhedral altered pl phenocrysts, 1-2%, 1/2-5mm, light grey to white orthoclase phenocrysts and 1/2%, <1mm black mafic phenocrysts in a medium grey aphanitic groundmass. The altered pl phenocrysts typically exhibit a 0.2mm light grey rim with a mottled white medium grey interior. The grey color is probably due to weak biotite alteration; in places up to 10% of the phenocrysts are strongly altered to biotite. Similarly the milky white portion of the phenocrysts is probably a clay alteration and a faint greenish tint seen locally is probably due to sericitization. The sheared tinguaite is a mottly grey tan with very few recognizable pl phenocrysts. The shearing has weakly brecciated and foliated the tinguaite, in addition the sheared rock has been more extensively altered to biotite and sericite. The fractures are oper and are weakly coated with clay and/or yellow brown limonite. The foliation is consistently at 45° to core axis. The rock contains 0.1% disseminated pyrite.	H37764		18.5		95		50° to 60° 3-4', 80° to 90° 2-3'	10
	H37765		19					15
	H37766		13				25° to 30° 1/5'	20
	H37767		21				50° to 60° 1-3/2'	25
	H37768		19.5				80° to 90° 1/1-2'	30
36.5'-53.1': WEAKLY ALTERED PSEUDOLEUCITE TINGUAITE: weakly to moderately altered plt as described for the plt bands in the mixed tinguaite. Generally less fractured than the mixed tinguaite. Clays, white orthoclase and very weak limonite are common on open fractures. Sulphides are present in only trace amounts.	H37769	BKGD	25		100		40° to 55° 2-3/4'	35
	H37770		20					40
	H37771		23				70° to 90° 1-2/5'	45
53.1'-61.5': WEAKLY ALTERED PSEUDOLEUCITE TINGUAITE: this plt differs from the previously described plt in that it has on the average slightly smaller pl phenocrysts; alteration is somewhat more intense as characterized by biotite and a pinkish tint (probably pink sericite); and it contains up to 20cm bands of sheared tinguaite. The sheared tinguaite bands are better foliated than was seen in the mixed tinguaite, occasionally becoming mylonitic (56.0') The foliation of these bands is perpendicular to the core axis. The most striking aspect of the rock is still the mottled appearance of the pl phenocrysts. The fractures are again open and coated with clays and weak limonite. Disseminated pyrrhotite composes about 0.1% of the rock and is usually associated with the mafic phenocrysts.	H37772		22.5				40° to 50° 1-2/1'	50
	H37773		20				80° to 90° 1/5'	55
61.5'-66.4': pseudoleucite tinguaite as above but with stronger fractures. 20-30° fractures at 61.6-61.8' and 64.2-64.5' are 1-3mm wide and are filled with white clay. Adjacent to these fractures are 15mm wide envelopes which are flooded with weak limonite stains and which have undergone supergene alteration.	H37774		20.5				20° to 30° 1-3/1'	60
66.4'-91.5': predominantly weakly to moderately altered plt but again contains 10-20cm wide bands of sheared tinguaite. The shearing is not particularly intense, usually confined to flattening of pl phenocrysts. Foliation is erratic, ranging from 20-50° to core axis. Biotite alteration is most intense adjacent to and in these shear zones; commonly it will attack the smaller phenocrysts preferentially leaving only a narrow grey rim of unaltered rock. White orthoclase and weak limonite fill most fractures. In the normal plt disseminated pyrrhotite comprises about 0.1% of the rock but in the sheared bands, contain up to 0.5%. A 15° hairline fracture at 70.0' has produced a 3mm offset. These 15-30° fractures are usually closed while all others are open.	H37775		24				45° to 60° 1/1'	65
	H37776		26				20° to 30° 1/5', 30° to 45° 1/1', 50° to 55° 1/5', 70° to 90° 1/8'	70
								75

MOUNT SOPRIS GAMMA PROBE LOG



DRILL HOLE LOG

PROJECT UJV HOLE IH-12 LOCATION [illegible] CORE SIZE BQ STARTED [illegible] FINISHED [illegible] PAGE 2 OF 5

CLAIM GROUP [illegible] LENGTH 300' DIP -60° AZIMUTH [illegible] COLLAR ELEVATION 4912' DRILLED BY [illegible] LOGGED BY [illegible]

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%,oz/T, ppm U)	GEOCHEMISTRY AND ASSAY (ppm Cu)	% RECOV	GEOLOGY	STRUCTURE (∠ to core)	HOLE DEPTH (FEET)	MOUNT SOPRIS GAMMA PROBE LOG
	H37777		20				20° to 30° 1/5'		
	H37778		22				15° to 35° 1/1'	80	
	H37779		15				50° to 55° 1/5'	85	
	H37780		31				70° to 80° 1/8'	90	
91.5'-131.7': BIOTITE ALTERED PSEUDOLEUCITE TINGUAITE: the distinction between this tinguaite and the surrounding plt is arbitrary. While the surrounding plt commonly exhibits biotite and other alteration, biotite replacement is rarely present in every pl phenocryst. However over this interval almost every pl phenocryst has a narrow biotite rim and contains at least some biotite in the core. Most of the pl phenocrysts between 1-4mm are wholly gone to biotite. Typically a small pl phenocryst will have a biotite core with a light grey halo. The large phenocrysts are usually zoned: outer light grey halo, narrow biotite layer, mottled light grey-pink tan- medium grey interior and possibly a medium grey biotite core. In addition to the biotite alteration of pl phenocrysts, the tinguaite often contains narrow 1-5mm whisps of biotite comprising up to 3% of the rock locally. These whisps often are aligned perpendicular to the core axis. The k-spar phenocrysts are unaltered. Disseminated pyrrhotite still comprises 0.1% of the rock but the grains are coarser. The fractures usually are filled with white orthoclase and a trace of limonite.	H37781		28				45° to 65° 1/1-3'		
	H37782		14.5					95	
107.7'-124.0': WEAKLY ALTERED PSEUDOLEUCITE TINGUAITE: the rock has again shown a decrease in alteration. The pl phenocrysts range from a milky white in the larger phenocrysts to a pinkish grey in the medium and small ones. As before all phenocrysts have a light grey rim. In places up to 10cm wide bands with up to 20% small biotite altered phenocrysts occur. The description of the modal distribution, size and shape of phenocrysts and other characteristics of the tinguaite given at the start of the hole is still valid. Disseminated pyrrhotite in this interval is generally <0.1%. White orthoclase and/or very weak limonite coat or fill most fractures. Between 116.9-117.1' a 5cm band containing flattened pl phenocrysts has a foliation which cuts the core axis at 45°.	H37783		14					100	
	H37784	BKGD	17.5		100		10° to 20° 1-2/1'	110	
	H37785		15				10° to 20° 1/1-2'	115	
	H37786		20.5				45° to 55° 1-2/1'	120	
124.0'-140.2': BIOTITE ALTERED PSEUDOLEUCITE TINGUAITE: the bulk of the interval is similar to 91.5-131.7', however between 126.9 and 127.8' the pl phenocrysts are not biotite altered but become very indistinct with the small phenocrysts becoming almost indistinguishable from the groundmass. As always the orthoclase phenocrysts are unaffected by the alteration. A 15cm zone of sheared and altered tinguaite cuts the core axis at 60° between 125.0 and 125.3'.	H37787		14.5				20° 1/2'	125	
	H37788		15.5				50° to 60° 1-3/3'	130	
129.5'-195.4': WEAKLY ALTERED PSEUDOLEUCITE TINGUAITE: the pl phenocrysts are dominantly milky white - light grey - pinky grey with only small patches exhibiting biotite alteration, usually restricted to smallest phenocrysts. The rock is composed of 15-30%, 3-16mm, anhedral to subhedral, zoned and often mottled, pseudoleucite phenocrysts, 3%, 1-7mm, subhedral to euhedral, white orthoclase phenocrysts in a medium grey aphanitic groundmass. Very finely disseminated sulphides, probably pyrrhotite, comprise <0.1% of the rock and are usually in the more mafic parts of the rock. Approximately 3/4 of the fractures are open. Both the open and the closed fractures contain white orthoclase.	H37789		18				80° to 90° 1/5'	135	
	H37790		21.5				20° to 30° 2/1'	140	
	H37791		14.5				40° to 50° 1-2/1'	145	
							70° to 80° 1/2'	150	

DRILL HOLE LOG

PROJECT UJV HOLE JH 12 LOCATION ZONE 55 CORE SIZE BQ STARTED 05/04/79 FINISHED 04/05/79 PAGE 3 OF 5

CLAIM GROUP JOHNSTONE LENGTH 227' DIP -55° AZIMUTH 022° COLLAR ELEVATION 4912' DRILLED BY CANDO LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8) ppm U	ppm Cu			% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)	MOUNT SOPRIS GAMMA PROBE LOG
	H37792		11.5								
	H37793		21.5							155	
	H37794		16						20° to 30° 1-2/1'	160	
168.5': altered plt as previously described however pl phenocrysts contain up to 20% blue feldspathoids.	H37795		17						45° to 50° 1/3'	165	
172.0'-178.0': series of 2cm to 7cm wide bands of sheared tinguaite cut the plt at between 60° and 90° to core axis. Biotite alteration is usually more intense adjacent to these shears. 179.0'-195.4': the plt in the interval exhibits 10-20cm of weak shearing characterized by a slight flattening and alignment of the pl phenocrysts producing a foliation at 55° to the core axis accompanied by biotite alteration of the pl phenocrysts. A 30cm band at 184.0' contains significantly fewer pl phenocrysts than is normal - 10% of the rock.	H37796		24						60° to 70° 1/5'	170	
	H37797		30							175	
	H37798	BKGD	23							180	
	H37799		20.5						20° to 30° 1/10'	185	
	H37800		17						45° to 50° 1/10'	190	
	H37801		33						70° 1-1/1'	195	
197.5'-226.5' MIXED TINGUAITE: lenses of only slightly altered plt are surrounded by sheared tinguaite at a ratio of 1:6. The plt lenses are usually <5cm across however they do range up to 20cm occasionally. The lenses are often fringed by biotite altered pl phenocrysts. Between 222.1 and 223.0' the groundmass of a plt lense appears to have undergone recrystallization to produce a fine grained groundmass which is 80% grey orthoclase and 20% black mafic. The sheared tinguaite is weakly to moderately foliated and has undergone extensive biotite alteration of the pl phenocrysts. The orthoclase phenocrysts are still white and are often brecciated. Despite the biotite alteration of the pl phenocrysts the groundmass of the sheared tinguaite is usually lighter than the plt groundmass. This is probably due to the incorporation of unaltered pl phenocryst material. The foliation is at 40-50° to the core axis. The sulphides are still very finely disseminated and comprise <0.1% of the rock. The fractures normally contain a thin coat of white orthoclase; about 2/3 of the fractures are open.	H37802		25							200	
	H37803		25						60° to 70° 1-2/2'	205	
	H37804		16.5							210	
	H37805		17.5							215	
	H37806		12.5							220	
										225	

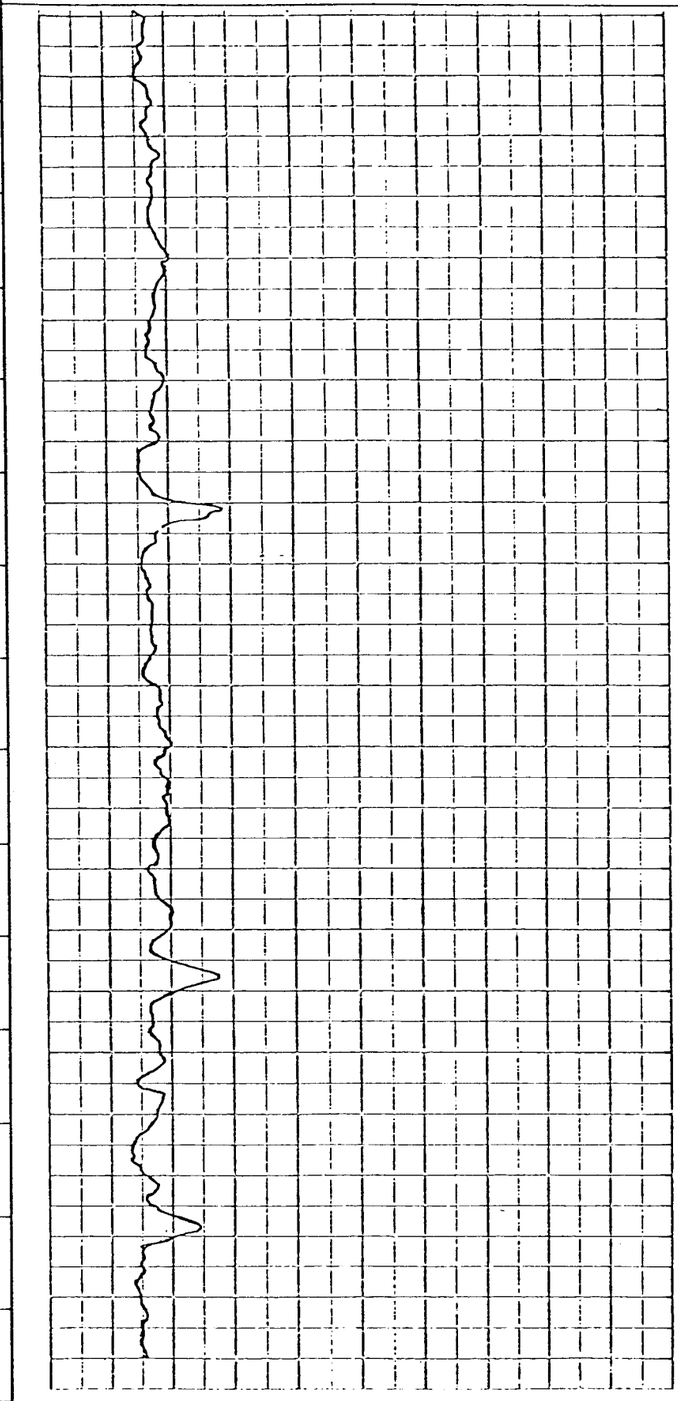
DRILL HOLE LOG

PROJECT KVI HOLE TH 12 LOCATION [illegible] CORE SIZE BQ STARTED [illegible] FINISHED [illegible]

CLAIM GROUP TOMBSTONE LENGTH 302' DIP -50 AZIMUTH 000° COLLAR ELEVATION 4912' DRILLED BY [illegible] LOGGED BY [illegible]

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8) ppm U	ppm Cu			% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
	H37807		13								
226.5'-247.7': MIXED TINGUAITE: differs principally from the previous interval in that the ratio of plt to sheared plt is now 1:1. The sheared tinguaite exhibits a weak to strong foliation dominantly expressed by a flattening of the pl phenocrysts. Most of the sheared tinguaite also shows moderate biotite alteration. The foliation cuts the core axis at 30-40°. Shallow angle fractures are closed. They usually contain white orthoclase although a few contain biotite as well. The other characteristics of the rock are unchanged.	H37808		14						20° to 30°	1-2/2'	230
	H37809		17								235
	H37810		14						60° to 70°	1-2/3'	240
245.7'-247.9': a hairline fracture running subparallel to the core axis contains white orthoclase >> biotite >pyrrhotite	H37811		16								245
247.7'-252.0': PSEUDOLEUCITE TINGUAITE: similar to the plt lenses in the Mixed Tinguaite. It is weakly to moderately altered generally at the subbiotite level.											250
252.0'-264.7': MIXED TINGUAITE: dominantly sheared tinguaite with 3-15cm lenses of plt at a ratio of 6:1. The sheared tinguaite is moderately to strongly foliated and often exhibits good brecciation of both the orthoclase phenocrysts and the plt groundmass. The foliation cuts the core axis at 45-50°. The abundance of orthoclase fragments gives the sheared rock a speckled appearance. Biotite alteration is common in the sheared tinguaite. The plt lenses are similar to previously described plt except that there is very little alteration. Sulphides still are present in minor amounts. Most shallow fractures are closed with orthoclase.	H37812		23.5						15°	1/1'	
	H37813	BKGD	13				100		30°	1/2'	255
	H37814		20.5								260
264.7-279.5': MIXED TINGUAITE: a complex mixture of relatively fresh plt and weakly sheared and altered plt. The ratio over the interval is 1:1 although in the upper half plt is more abundant and in the lower half sheared rock is predominant. The plt consists of 10-20%, 3-15mm white to light grey, anhedral to subhedral pl phenocrysts, 5-10%, 1-8mm white, subhedral to euhedral, orthoclase phenocrysts in a medium grey aphanitic groundmass. The pl phenocrysts in place contain minor blue feldspathoids. The sheared tinguaite is weakly foliated at 70° to core axis. Moderate biotite alteration is common particularly affecting the smaller pl phenocrysts. Minor sulphides are present, associated with mafics.	H37815		27						10° to 20°	1/1'	265
271.3'-271.7': a 1mm, 15° fracture contains blue feldspathoid > biotite.	H37816		29						60° to 70°	1/1-2'	270
											275
279.5': SHARP 70° CONTACT: with mylonite at the contact.	H37817		31						10° to 20°	1/5'	
279.5'-287.8': SHEARED TINGUAITE: the upper 10 cm is strongly mylonitized and grades into strongly foliated and brecciated tinguaite. Near the upper contact all orthoclase fragments are milled to less than 1mm which gradually increases to a maximum of 7mm toward the middle and bottom of the interval. The rock is generally lighter grey than the groundmass of the plt. The foliation is best expressed by the mafic material; it is at 60-70° to the core axis. Between 284.8'-285.4' is a lense of weakly altered plt.	H37818		27						60° to 70°	1/5'	280
											285
287.8'-End of Hole: PSEUDOLEUCITE TINGUAITE: chiefly distinguished from earlier plt on its high orthoclase content, its high blue feldspathoid content and its weak alteration. It is composed of 10-20%, 1-15mm, white - light grey - blue zoned, anhedral pl phenocrysts, 10-20%, 1-12mm, white to light grey, often twinned, commonly broken orthoclase phenocrysts and 1%, <1-3mm black mafic phenocrysts and medium grey aphanitic groundmass. Sulphides are minor.	H37819		12						15° to 20°	1/3'	290
	H37820		21.5						60° to 70°	1/1-2'	295
	H37821		31								300

MOUNT SOPRIS
GAMMA PROBE LOG

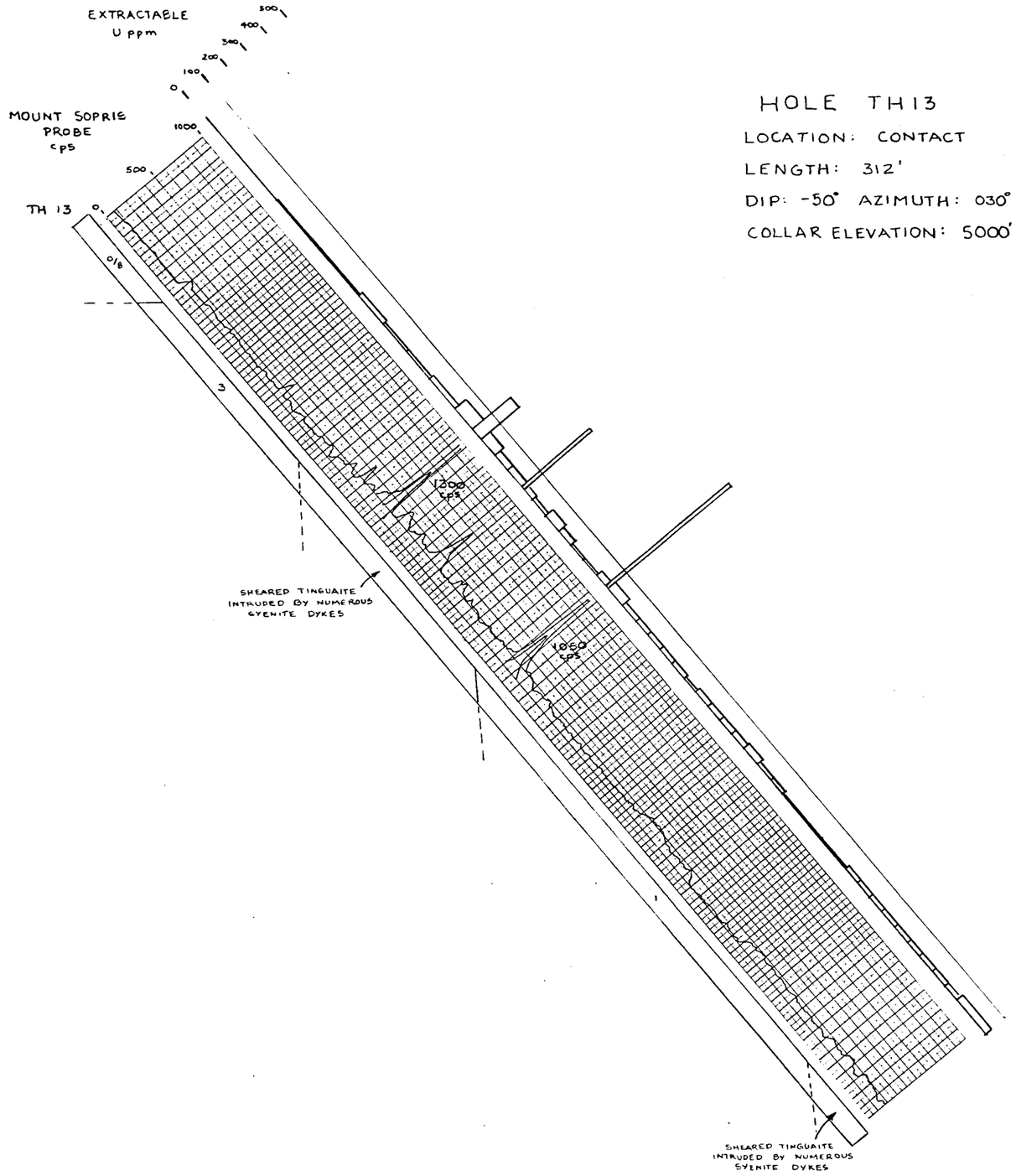


DRILL HOLE LOG

PROJECT DUV HOLE TH12 LOCATION [illegible] CORE SIZE BQ STARTED [illegible] FINISHED [illegible] PAGE 5 OF 5

CLAIM GROUP [illegible] LENGTH 302' DIP -52 AZIMUTH 022° COLLAR ELEVATION 4912' DRILLED BY CARBO LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8 / ppm U)	GEOCHEMISTRY AND ASSAY (ppm Cu)	GEOCHEMISTRY AND ASSAY	GEOCHEMISTRY AND ASSAY	% RECOV	GEOLOGY	STRUCTURE ∠ to core	STRUCTURE	HOLE DEPTH (FEET)	MOUNT SOPRIS GAMMA PROBE LOG
		BKGD					100	° ○ °			302	



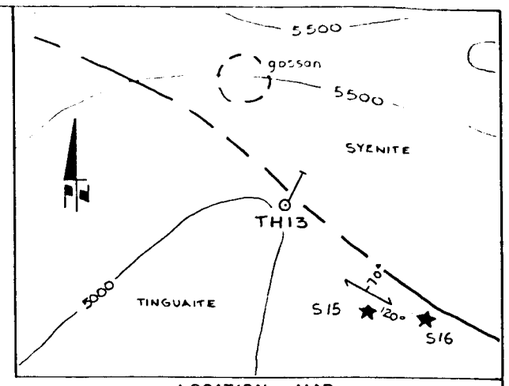
HOLE TH13

LOCATION: CONTACT

LENGTH: 312'

DIP: -50° AZIMUTH: 030°

COLLAR ELEVATION: 5000'



LOCATION MAP

SCALE 1:10,000

100 50 0 100 200 300 400 500

metres

1 SYENITE tan weathering, medium to coarse grained nepheline syenite often with abundant sulphides and purple fluorite

2 PSEUDOLEUCITE TINGUAITE 5-30%, 3-20mm pseudoleucite phenocrysts 1-10mm orthoclase phenocrysts in a medium grey, aphanitic groundmass

3 SHEARED TINGUAITE foliated and/or auto-brecciated tinguaite often biotite altered

4 MIXED TINGUAITE lenses or bands of pseudo-leucite phenocrysts in sheared tinguaite groundmass

5 FINE GRAINED TINGUAITE medium to dark grey tinguaite without pseudoleucite phenocrysts, some 1-3 mm orthoclase phenocrysts. Usually as dykes

6 INTERMEDIATE TINGUAITE medium grey tinguaite with pseudoleucite orthoclase phenocrysts. Pseudoleucite phenocrysts smaller than usual

B,b BIOTITE ALTERATION . intense, moderate

C,c CHLORITE ALTERATION intense, moderate

——— – – – geologic contact: sharp, gradational

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A. R. ARCHER
GEOLOGICAL
15 Jan 80
ENGINEER

FIG. U-TG28

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SECTION TH13

TOMBSTONE PROPERTY

UKON JOINT VENTURE

SCALE 1:400

4 2 0 4 8 12 16 20

metres

DRILL HOLE LOG

PROJECT UJV HOLE JH 13 LOCATION syenite contact CORE SIZE BQ STARTED 05/09/79 FINISHED 07/09/79

CLAIM GROUP JOMBSIDE LENGTH 312' DIP -50° AZIMUTH 030° COLLAR ELEVATION 5000' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8 / ppm U)	GEOCHEMISTRY AND ASSAY (ppm Cu)	% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
0'-28.0': OVERBURDEN AND HIGHLY WEATHERED SHEARED TINGUAITE					0			5, 10, 15, 20, 25
28.0'-67.2': SHEARED PSEUDOLEUCITE TINGUAITE: strongly foliated salt and pepper pseudoleucite tinguaite. The tinguaite groundmass and pl phenocrysts have been recrystallized into sugary, fine grained crystals of light grey orthoclase, feldspathoids and black mafics (hornblende and biotite). The orthoclase phenocrysts from the original tinguaite are essentially unchanged but are aligned subparallel to the foliation. The pl phenocrysts have been flattened into lenses or bands paralleling the foliation. Phenocrysts comprise 15-20% of the rock with pl phenocrysts >>orthoclase phenocrysts. A white chalky color to the rock suggests weak argillic alteration. Where the mafic phenocrysts are largest they exhibit a pronounced poikilitic texture. The foliation is at 45° to core axis. Sulphides are rare. All fractures are open; most contain a dusting of clay minerals, but only a few have weak limonite stain. Traces of disseminated purple fluorite are common.	H46593	BKGD	10.5		100		0°-10° 1/1-2'; 40°-50° 2-4/1'	30, 35, 40, 45, 50, 55, 60, 65, 70, 75
47.0'-47.4': purple fluorite is slightly more abundant, up tol/2% of rock.	H46594		11.5					
52.8'-53.3': a hairline, 5° fracture has been cut and offset by a hairline 45° fracture. Both fractures are filled with abundant purple fluorite, pyrrhotite, and biotite. The fractures are enclosed by 1-2mm white orthoclase envelopes.	H46595		12					
55.5'-56.8': more purple fluorite and pyrrhotite bearing hairline fractures as above; most parallel foliation although a few cut the core axis at a shallow angle.								
60.2'-67.2': sheared plt as before except there is a slightly higher percentage of orthoclase phenocrysts (2% of rock) and the pl phenocrysts less distinct.								
67.2'-86.9': SHEARED TINGUAITE: the pl phenocrysts are again distinct although they are very drawn out. Orthoclase phenocrysts are up to 1% of the rock. The foliation is now at 30-40° to core axis. The sugary texture of the recrystallized rocks is not so evident due primarily to lack of surface weathering which removes much of the interstitial material.	H46596		16					
74.5'-74.9': a 7mm wide leucocratic syenite dykelet parallels the foliation at 30° to core axis.	H46597		9.5					

MOUNT SOPRIS GAMMA PROBE LOG

DRILL HOLE LOG

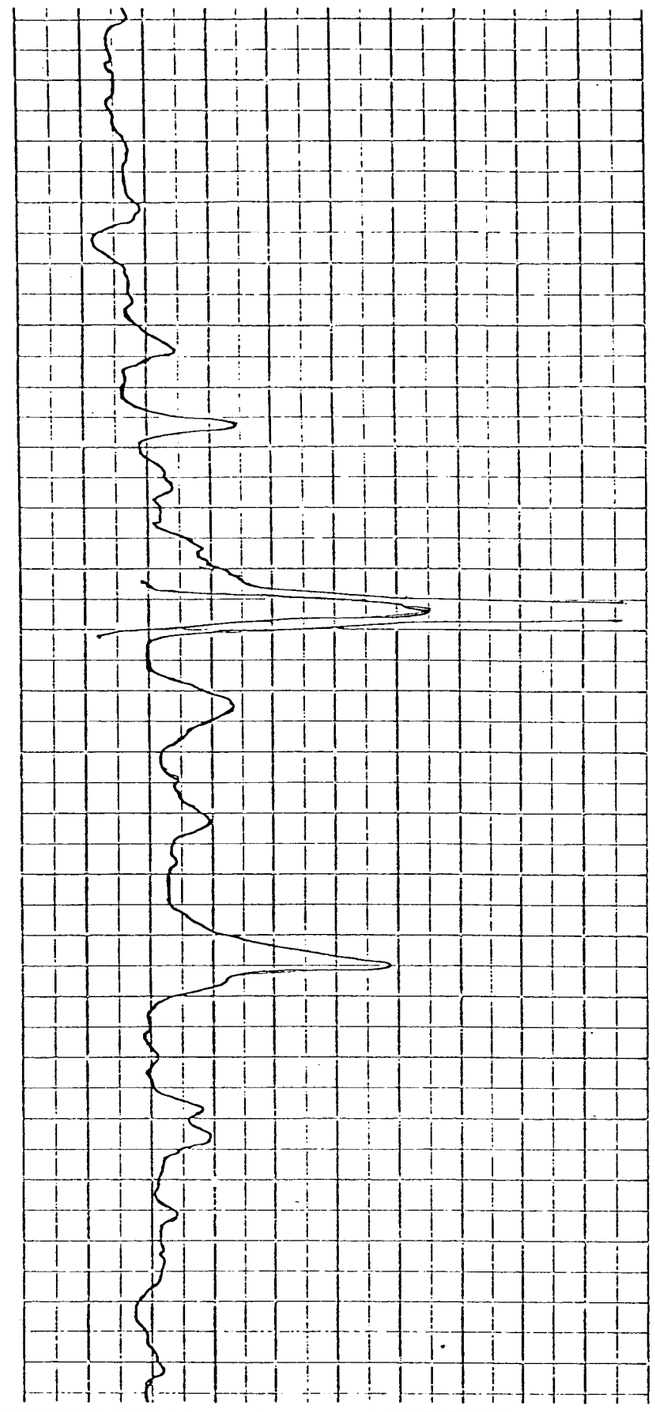
PROJECT WJV HOLE TH-13 LOCATION specific sample CORE SIZE BQ STARTED 05/04/81 FINISHED 05/06/81 PAGE 2 OF 5

CLAIM GROUP TOMBSTONE LENGTH 812' DIP -52° AZIMUTH 330° COLLAR ELEVATION 5000' DRILLED BY Cabot LOGGED BY Eaton

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8 / ppm U)	GEOCHEMISTRY AND ASSAY (ppm Cu)	% RECOV
87.7'-109.0': INTRUDED SHEARED PSEUDOLEUCITE: the tinguaite has been strongly foliated to the point where most pl phenocrysts have been destroyed, leaving a fine grained, medium grey tinguaite gneiss. This gneiss has then undergone either extensive intrusion by dykes composed of white orthoclase and black mafic (hornblende). These intrusives generally parallel the foliation although they do locally crosscut it. In addition to orthoclase and mafics the dykes commonly contain minor purple fluorite, pyrrhotite and an unidentified light brown mineral. Outside of these dykes the rocks rarely contain sulphides. The foliation is at 35-45° to core axis. Most fractures are open with a weak to moderate clay coating.	H46598	BKGD	11		
	H46599		23		
104.9'-105.6': an 11cm wide, fine grained, orthoclase-mafic syenite dyke similar to the smaller dykes mentioned above, parallels the foliation at 40° to core axis.					
107.0-107.1': an irregular 1.5-2cm pegmatite dyke cutting the core axis at 70° contains pink and grey orthoclase, a black mafic, 2% magnetite and a trace of molybdenite. 107.8'-109.0': a 20cm wide band of sericitic and argillic sheared tinguaite is moderately stained with hematite and yellow U oxides. It also contains a 3mmwide vein of white calcite. The upper part of the band is moderately radioactive at 160/background.	H37101	20/BKGD	55		
109.0'-132.0': INTRUDED SHEARED TINGUAITE: as before except that the foliation varies from subparallel to 10° to the core axis and the syenite dykes are highly irregular, both paralleling and crosscutting the core axis. The mafic in the syenite is hornblende with the distinctive poikilitic textures. Occasional blebs of pyrrhotite occur in the dykes but otherwise sulphides are rare. The sheared tinguaite contains minor hematite stains. Most fractures are open with a moderate coating of calcite.	H37102	40-240/ BKGD	197		100
	H37103	20/BKGD	52		
	H37104	10/BKGD	28		
	H37105	BKGD	27		
126.0'-127.0': moderately radioactive sheared tinguaite similar to the surrounding tinguaite except that there is a higher density of syenite dykelets and a trace of hematite on one fracture.	H37106	60/BKGD	360		
	H37107	30/BKGD	27		
132.0'-146.3': INTRUDED SHEARED TINGUAITE: the tinguaite is lighter grey than usual but is still strongly foliated and recrystallized. It is intruded by syenite dykes. The foliation is between 10-20° to core axis. This interval is distinguished from the surrounding intervals by the width and abundance of the orthoclase and hornblende dykes and by the size of the poikilitic hornblende crystals in the dyke. Approximately 25% of the interval is syenite dyke material. These dykes generally cut the tinguaite at a shallow angle and the core axis at 30-40°. They vary in width from 5mm-15cm. The hornblende crystals tend to form aggregates. Individual crystals up to 8mm across are present. The dykes also contain minor pyrrhotite with mafics and a trace of disseminated molybdenite.	H37108	10/BKGD	17.5		
	H37109	20/BKGD	40		
	H37110		28		
146.3'-159.0': the syenite dykes are less common (1% of the rock) but otherwise the rock is unchanged. The foliation varies from 15-30° to core axis. Fractures are open and coated with white dolomite. 146.7'-147.6': 2 hairline, 20° bands of pyrrhotite parallel the foliation.	H37111	BKGD	12.5		

GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
			80
			85
			90
	25° to 30°	1/10'	95
	45°+	1-5/1'	100
	45° to 50°	1/2'	105
			110
			115
			120
			125
			130
	10° to 20°	1/3'	135
	50° to 70°	1/2'	140
			145
	80° to 90°	1-2/1'	150
	80° to 90°	1/1-2'	

MOUNT SOPRIS
GAMMA PROBE LOG



DRILL HOLE LOG

PROJECT _ UJV __ HOLE TH 13 LOCATION [illegible] CORE SIZE BQ STARTED 25/09/79 FINISHED 27/09/79 PAGE 3 OF 5

CLAIM GROUP _ TOMBSTONE __ LENGTH 232' DIP -50° AZIMUTH 033° COLLAR ELEVATION 5000' DRILLED BY CANDY LOGGED BY ERSON

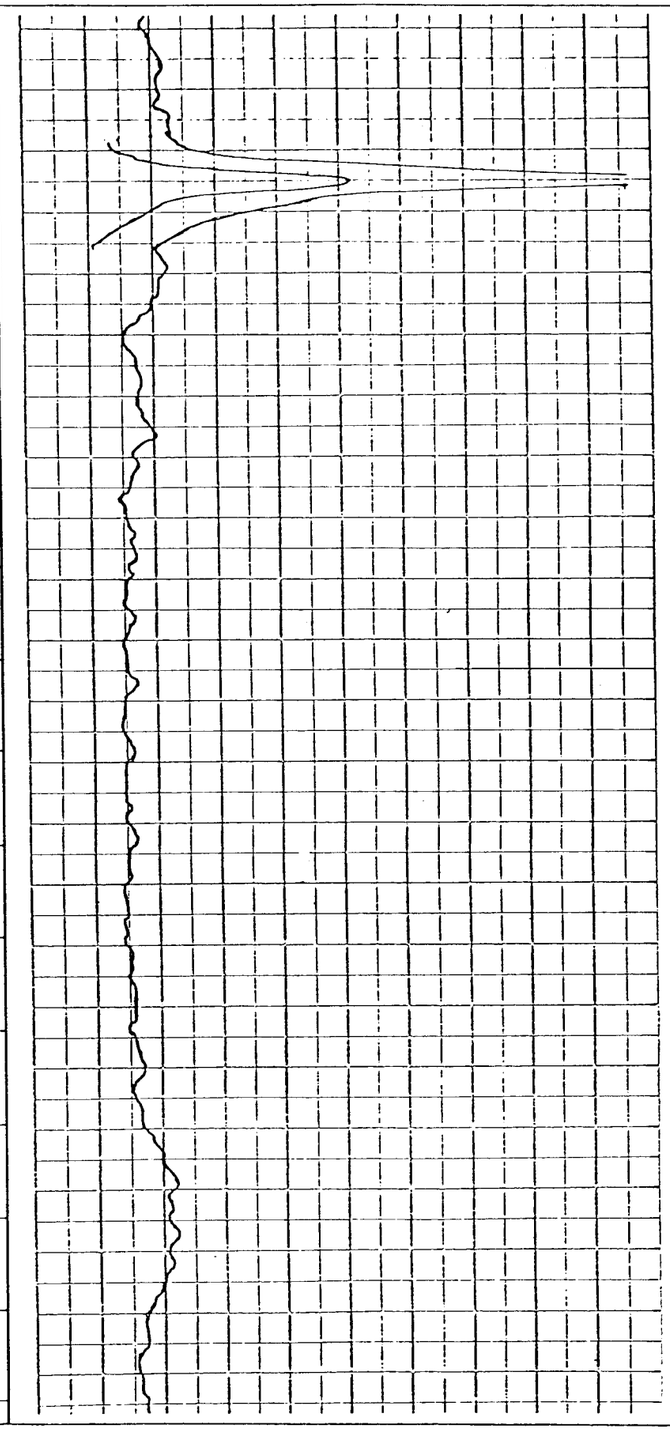
GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY $\%U_3O_8$	GEOCHEMISTRY AND ASSAY ppm U	GEOCHEMISTRY AND ASSAY ppm Cu	% RECOV
159.0'-196.0': CHILL MARGIN SYENITE: a salt and pepper, fine grained, moderately foliated syenite. Although it is tempting to suggest that this syenite represents recrystallized tinguaite, a 10cm xenolith of stressed tinguaite at 164.0' hurts this argument. The fine grained syenite has been extensively intruded by the same white and black orthoclase--poikilitic hornblende dykelets that intrude the surrounding tinguaites. Over this interval the orthoclase-hornblende dykes comprise 15-25% of the total rock. The dykes cut the core axis at 25-40° while the foliation is generally 10-20°. Traces of pyrrhotite occur throughout the interval. Much of the hornblende has gone to chlorite. Between 159.0' and 160.0' the fine grained syenite is strongly radioactive--2CD/background and contains 1% purple fluorite, 1/4% pyrrhotite , 3% a pink-tan mineral, possibly pink mica, and 3% olive mineral, probably sericite.	H37112	20/BKGD		13		
	H37113			27		
	H37114	[illegible]		636		
	H37115	25/BKGD		40		
	H37116	15/BKGD		22		
171.5'-172.0': a 2cm wide dyke or band within an orthoclase-hornblende dyke contains approximately 25% chloritized non-poikilitic hornblende as compared to the 5-10% found in the normal dykes.. This band cuts the core axis at 20°.	H37117			20		
	H37118			18.5		
	H37119			15.5		
	H37120			16.5		
	H37121			14.0		
	H37122	BKGD		14.5		
196.0'-232.5': ORTHOCLASE-HORNBLENDE SYENITE: over this interval the orthoclase-hornblende dykes are the predominant rock while the intervening fine grained syenites comprise less than 30% of the rock and do not exceed 10cm in width. The orthoclase-hornblende syenite appears to cut the core axis at 25-35°. The orthoclase-hornblende syenite is 85-95% light grey fine-medium grained orthoclase and 5-15% black to green-brown hornblende and chlorite(?) after hornblende. Approximately 70% of the hornblende appears to have gone to chlorite. The hornblende phenocrysts dominate the rock, ranging from 2-12mm in length and exhibiting striking poikilitic texture. The rock is weakly magnetic probably due to magnetite liberated by the destruction of hornblende. Sulphides are rare. The fine grained syenites are as previously described. Their mineralogy is generally similar to the coarser dykes. The fractures are open and coated with white dolomite.	H37123			15		
	H37124			16.5		
218.0'-218.3': a 10cm long xenolith(?) of more mafic and coarser syenite containing 25% non-poikilitic hornblende and chlorite. This is similar to broad dykes found lower in the hole.	H37125			20.5		
	H37126			25		
	H37127			16		

GEOLOGY

STRUCTURE: 60° to 90° — 1/1-2'; 70° to 80° — 1/5'; 70° to 80° — 1-2/1'; 75° to 85° — 1-3/1'

HOLE DEPTH (FEET): 155, 160, 165, 170, 175, 180, 185, 190, 195, 200, 205, 210, 215, 220, 225

MOUNT SOPRIS GAMMA PROBE LOG



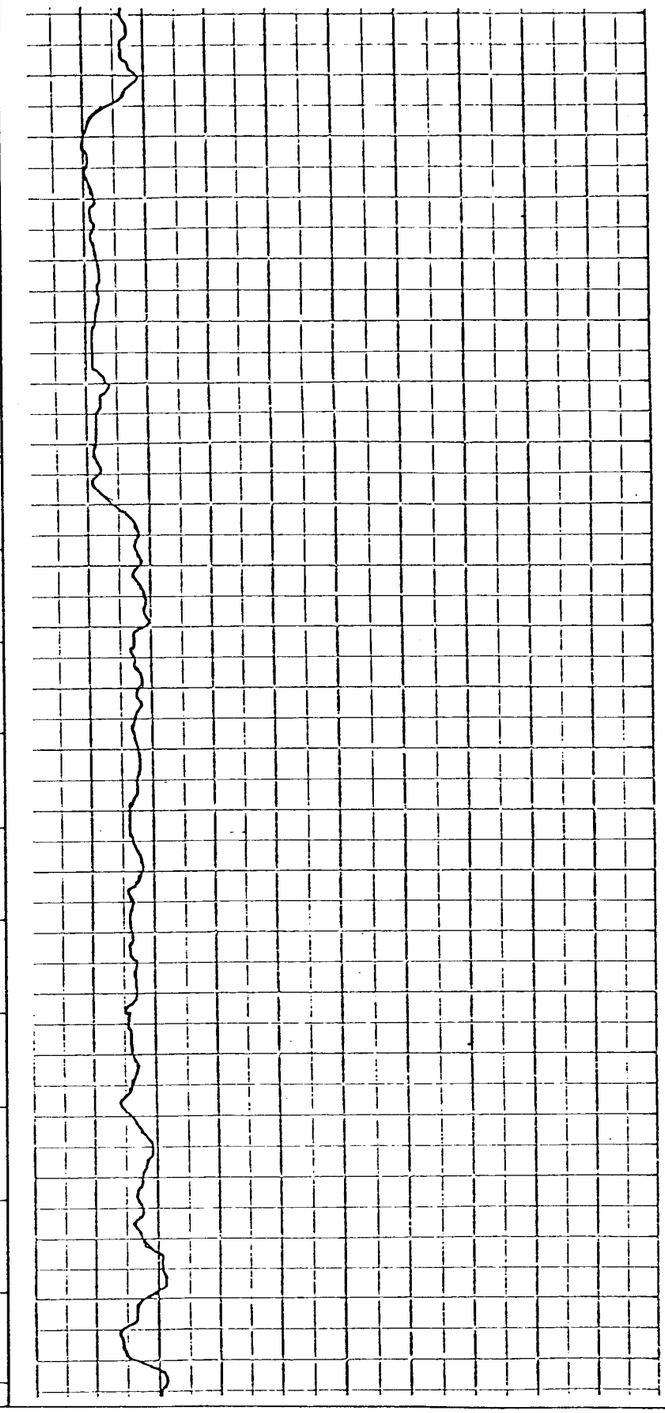
DRILL HOLE LOG

PROJECT DV1 HOLE JH-13 LOCATION [illegible] CORE SIZE BQ STARTED 05/09/11 FINISHED 05/10/11 PAGE 4 OF 5

CLAIM GROUP JOKERSTORE LENGTH 312' DIP -50° AZIMUTH 222° COLLAR ELEVATION 5020' DRILLED BY [illegible] LOGGED BY [illegible]

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8) ppm U	ppm Cu			% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
232.5': SHARP 55° CONTACT 232.5'-253.6': MAFIC RICH SYENITE: medium to coarse grained, slightly porphyritic, well foliated syenite composed of 75-80% light grey orthoclase, generally as ground-ass but less commonly as anhedral phenocrysts ranging from 5-12mm across, 5-10% black hornblende or pyroxene and 10-15% green chlorite after the principal mafic. The feldspars often exhibit a chalky white color suggesting weak argillic alteration. Sulphides are rare. Fractures are open and coated with dolomite.	H37128		19					+			230
	H37129		13					×			235
	H37130		10.5					×	50° to 70°	1/2'	240
	H37131		11					×			245
	H37132		11.5					×			250
253.6': SHARP 45° CONTACT: with a 7mm green chlorite rich chill margin. 253.6'-278.5': ORTHOCLASE-HORNBLENDE SYENITE: as before. 256.1'-256.5': an irregular 8-14mm mafic rich syenite dyke cuts the core axis at 20°.	H37133		11					×			255
	H37134	BKGD	20				100	+			260
	H37135		18					+	55° to 70°	1/4'	265
	H37136		20.5					+			270
	H37137		19					+			275
278.5'-292.7': FINE GRAINED SYENITE: the orthoclase-hornblende syenite is still abundant however it now forms only 25-35% of the rock while the fine grained syenite makes up the remainder. Near the top of the interval the fine grained syenite is very weakly foliated, but as one goes down the interval the foliation becomes more pronounced. The orthoclase syenite dykes cut the core axis at 40-50° which is subparallel to the 30-45° angle of the foliation. The dykes vary in width from 1-10cm. Both the fine grained syenite and the orthoclase-hornblende syenite are mineralogically and texturally similar to their previous description. Fractures are very rare and open. Sulphides are rare.	H37138		18					+			280
	H37139		18					+	50° to 60°	1/5-10'	285
292.6': SHARP 25° CONTACT 292.6'-293.0': MAFIC RICH DYKE: slightly more porphyritic than previously described with orthoclase phenocrysts up to 1.5cm long. Still contain 25% mafics.	H37140		21.5					+			290
293.0'-End of Hole: INTRUDED AND SHEARED PSEUDOLEUCITE TINGUAITE: typical sheared tinguaite, with lenticular pl phenocrysts highlighting the foliation, has been intruded by numerous 3mm-30cm orthoclase hornblende dykes. Although the dykes cut the core axis at angles ranging from 20-60° most are aligned parallel or subparallel to the 35° foliation of the plt. The dykes comprise approximately 1/2 of the rock by volume. The best preserved sheared plt is between 299.5 and 301.8'. Over most of the interval the tinguaite is largely recrystallized so that the pl phenocrysts are only weakly recognizable. Sulphides are rare. Fractures are open and weakly coated with white dolomite.	H37141		22.5					×			295
	H37142		23.5					×	50° to 60°	1-2 1/1'	300

MOUNT SOPRIS GAMMA PROBE LOG

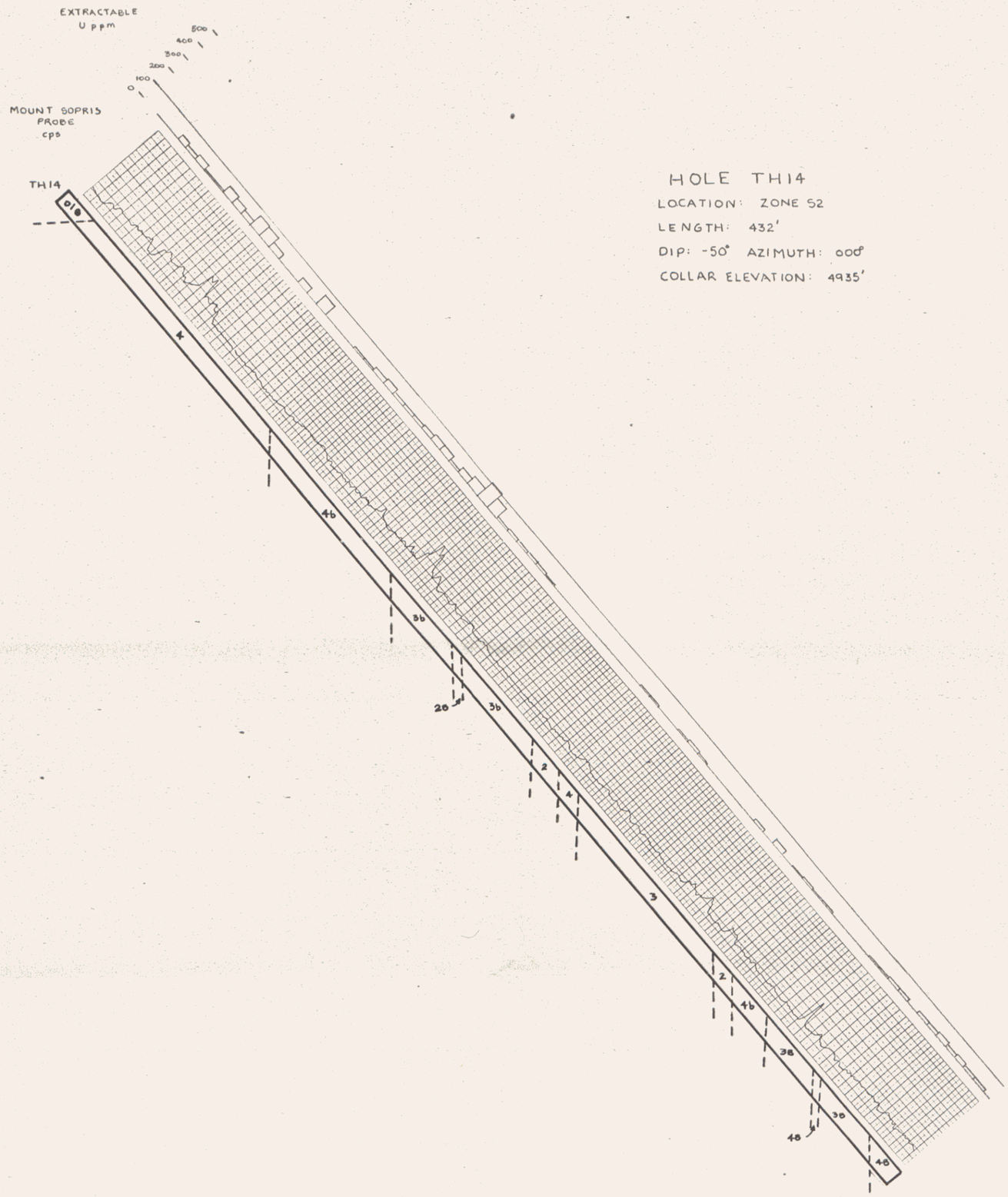


DRILL HOLE LOG

PROJECT [illegible] HOLE IH 13 LOCATION [illegible] CORE SIZE BQ STARTED [illegible] FINISHED [illegible] PAGE 5 OF 5

CLAIM GROUP [illegible] LENGTH 312' DIP [illegible] AZIMUTH 230° COLLAR ELEVATION 5022 DRILLED BY [illegible] LOGGED BY [illegible]

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8 ppm U)	GEOCHEMISTRY AND ASSAY (ppm Cu)	% RECOV	GEOLOGY	STRUCTURE (∠ to core)	HOLE DEPTH (FEET)	MOUNT SOPRIS GAMMA PROBE LOG
	H37143	BKGD	27		100		50° to 60° 1-3/4"	305	
	H37144		25					310	



HOLE TH14

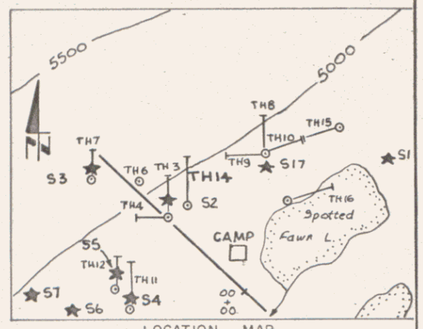
LOCATION: ZONE 52

LENGTH: 432'

DIP: -50° AZIMUTH: 000°

COLLAR ELEVATION: 4935'

Association of Professional Engineers of the Yukon Territory
A. R. ARCHER
GEOLOGICAL
15 Jan/80
ENGINEER



LOCATION MAP

SCALE 1:10,000

100 50 0 100 200 300 400 500

metres

1. SYENITE tan weathering, medium to coarse grained nepheline syenite often with abundant sulphides and purple fluorite
2. PSEUDOLEUCITE TINGUAITE 5-30%, 3-20mm pseudoleucite phenocrysts 1-10mm orthoclase phenocrysts in a medium grey, aphanitic groundmass
3. SHEARED TINGUAITE foliated and/or auto-brecciated tinguaite often biotite altered
4. MIXED TINGUAITE lenses or bands of pseudo-leucite phenocrysts in sheared tinguaite groundmass
5. FINE GRAINED TINGUAITE medium to dark grey tinguaite without pseudoleucite phenocrysts, some 1-3 mm orthoclase phenocrysts. Usually as dykes
6. INTERMEDIATE TINGUAITE medium grey tinguaite with pseudoleucite orthoclase phenocrysts. Pseudoleucite phenocrysts smaller than usual

B,b BIOTITE ALTERATION intense, moderate

C,c CHLORITE ALTERATION intense, moderate

geologic contact: sharp, gradational

FIG. U-TG 29

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SECTION TH14

TOMBSTONE PROPERTY

UKON JOINT VENTURE

SCALE 1:400

4 2 0 4 8 12 16 20

metres

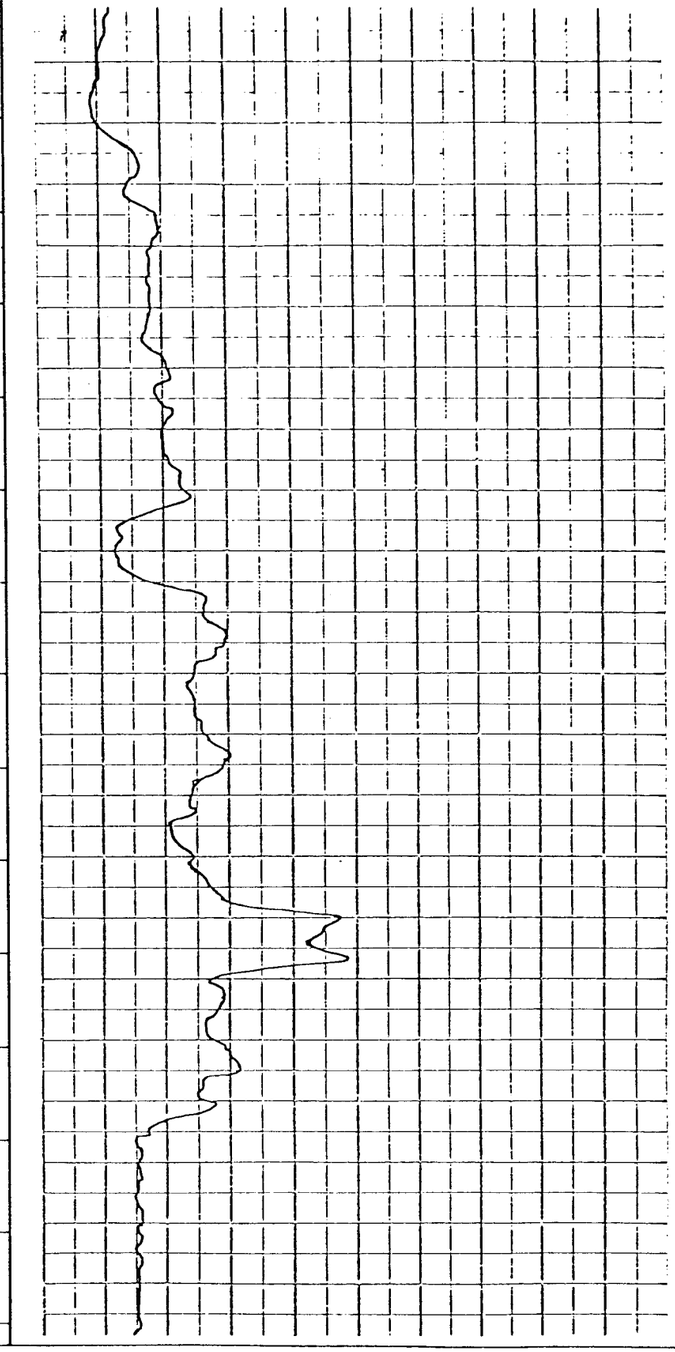
DRILL HOLE LOG

PROJECT UJV HOLE TH14 LOCATION — CORE SIZE BQ STARTED 08/09/79 FINISHED 10/09/79 PAGE 1 OF 6

CLAIM GROUP TOMBSTONE LENGTH 432' DIP -50° AZIMUTH 000° COLLAR ELEVATION 4935' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8) ppm U	ppm Cu	% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
0-11.5': OVERBURDEN: tinguaite and syenite in glacial till and talus.					0			5
								10
11.5'-24.8': MIXED TINGUAITE: weakly altered plt lenses are mixed with weakly to moderately sheared plt at a ratio of 1:1. The weakly altered plt consists of 30-40%, 3-14mm, subhedral to euhedral pinkish beige to light grey, pl phenocrysts, 1%, 1-5mm, prismatic, subhedral to euhedral white orthoclase phenocrysts in a medium grey groundmass. The weakly sheared tinguaite is the direct equivalent of the plt, with only minor flattening and alignment of the pl phenocrysts. The moderately sheared plt exhibits brecciation of the orthoclase phenocrysts and extensive alteration and flattening of the pl phenocrysts, resulting in their destruction.. The foliation is at 30-40° to the core axis. Only minor pyrrhotite is present. Some cave occurs mixed with the core at 12 and 17'. Most open fractures are weakly coated with clay and limonite. The closed fractures are filled with white orthoclase.	H37217	BKGD	29				20° to 30° 2-3/1'	15
	H37218		16				60° to 70° 1-2/1'	
	H37219		26					20
24.8'-35.0': WEAKLY SERICITIZED PSEUDOLEUCITE TINGUAITE: a pervasive, weak, pale green sericite alteration with occasional patches of more intense sericitization has attacked plt consisting of 20-25%, 2-15mm, anhedral to subhedral, light grey-white pl phenocrysts, exhibiting pronounced light grey rims, 5-10% light grey-white subhedral orthoclase phenocrysts in a medium grey groundmass. Disseminated pyrite composes about 0.2% of the rock. The fractures differ from those higher in the hole by the presence of strong brown to yellow brown limonite stains. Some of the stronger shallow angle fractures are chloritized and have 1cm wide limonite flooded and/or sericitized alteration envelopes. 30.7'-31.0': a strong, 1-2mm, 20° fracture contains strong yellow-orange brown limonite and minor residual arsenopyrite and molybdenite. The fracture has an 8mm bleached clay alteration envelope.	H37220		14.5				10° to 20° 3-3/1' 30° to 40° 3-3/1'	25
	H37221		9				50° to 60° 1/2'	30
35.6'-52.0': MIXED TINGUAITE: lenses and fragments of relatively unaltered plt with a modal distribution similar to the overlying altered plt are surrounded by sheared and weakly biotite altered tinguaite, at a ratio of 1:1. The sheared tinguaite has flattened the pl phenocrysts often causing them to behave plastically, enclosing fragments of orthoclase phenocryst and tinguaite groundmass. The net effect of this destruction of the pl phenocrysts is to produce a lighter grey groundmass. There is a weak somewhat erratic foliation in the sheared tinguaite at 50-70° to core axis. In places the sheared tinguaite contains abundant brecciated orthoclase fragments. 2/3 of the fractures are open; they are usually coated with clay ± weak limonite stains. The closed fractures are usually the shallow fractures and are filled with white orthoclase ± black mafics. Minor pyrite is associated with mafic phenocrysts.	H37222	20/BKGD	50		100			35
	H37223	BKGD	40				20° to 30° 1/2' 60° to 70° 1-2/3'	40
	H37224		33					45
52.0'-61.8': MIXED TINGUAITE: differs from the above in that the plt to sheared tinguaite ratio is now 1:4; biotite alteration is moderate to strong in the sheared tinguaite, the pl phenocrysts are indistinct in parts of the plt, and the rock is weakly to moderately radioactive.	H37225	10/BKGD	72					50
	H37226	20/BKGD	72					55
61.8'-87.8': MIXED TINGUAITE: has an even lower plt to sheared tinguaite ratio - 1:6 - with the plt lenses ranging from 3-10cm wide. The sheared tinguaite is moderate to strongly foliated and generally makes a 15-30° angle with the core axis although it can range up to 60°. This sheared tinguaite is also moderately to strongly altered to biotite. The orthoclase phenocrysts are unaltered but are often brecciated. The foliation is best expressed by the mafics both the original mafic phenocrysts and the stretched out biotite altered pl phenocrysts. Disseminated sulphides are rare.	H37227	BKGD	37					60
	H37228		3				10° to 30° 1/2' 60° to 70° 1/5'	65
	H37229		3					70
								75

MOUNT SOPRIS
GAMMA PROBE LOG



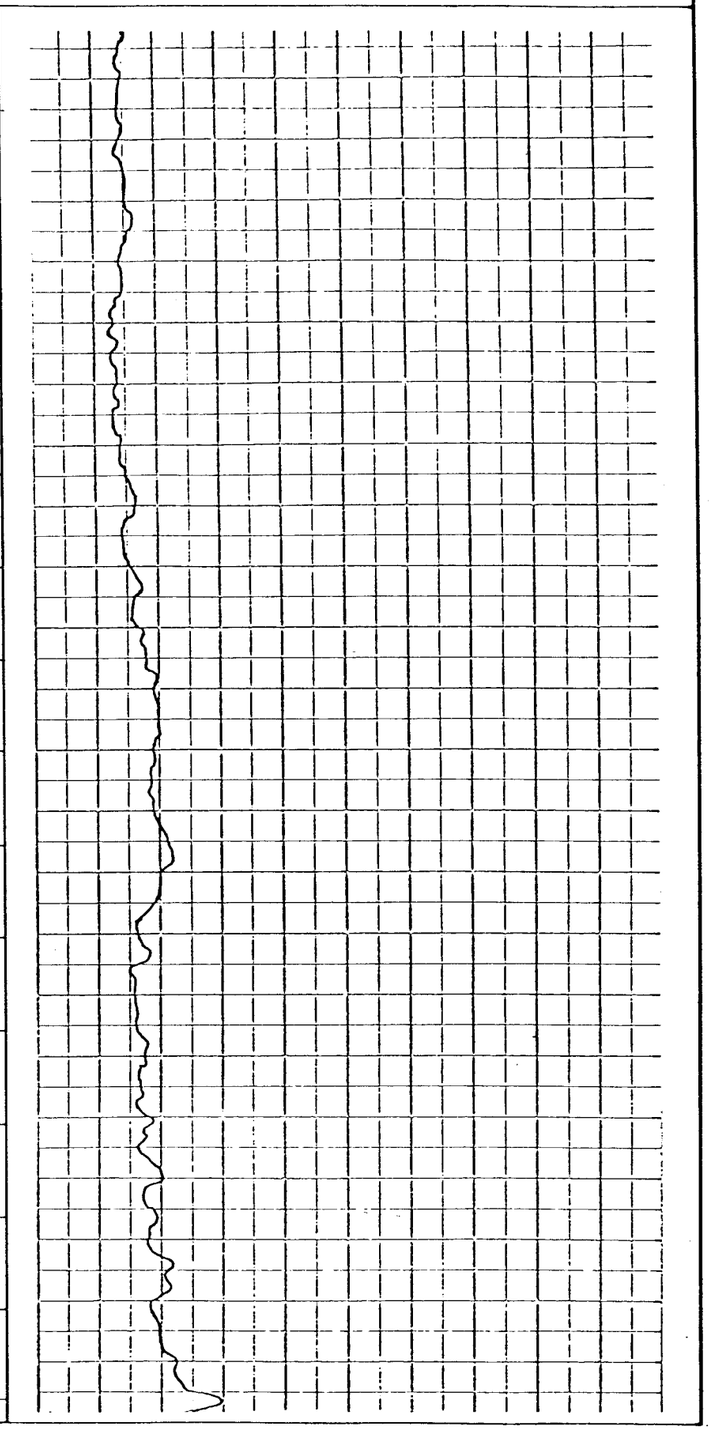
DRILL HOLE LOG

PROJECT ____ HOLE TH 14 LOCATION ____ CORE SIZE BQ STARTED 12/12/79 FINISHED 12/13/79

CLAIM GROUP [illegible] LENGTH 432' DIP -45° AZIMUTH 090° COLLAR ELEVATION 4535' DRILLED BY [illegible] LOGGED BY [illegible]

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8) ppm U	ppm Cu	% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
77.8'-78.3': a 2mm, 10° fracture is filled with white orthoclase and pale green sericite.	H37230		3.5				10° to 30°	1/2'	80
87.8'-94.6': WEAKLY SERICITIZED PSEUDOLEUCITE TINGUAITE: similar to weakly sericitized plt found between 24.8' and 35.0'. Most of the pl phenocrysts have a mottled light grey and pale green color. The orthoclase phenocrysts and the groundmass are unaffected. These rocks contain 1/2% disseminated pyrite. A few 2cm bands of sheared tinguaite cut the plt at 30° to core axis. The open fractures are coated with white orthoclase, clays and weak limonite stain. 93.8'-94.0': a 1mm, 20° fracture is filled with white orthoclase and arsenopyrite.	H37231		2				60° to 90°	1/5'	85
94.6'-105.7': MIXED TINGUAITE: with a 1:6 plt to sheared tinguaite ratio. The plt is weakly sericitized but otherwise normal. The sheared tinguaite is moderately to strongly biotite altered and is weak to moderately foliated. Brecciation is also important usually producing orthoclase and groundmass fragments and a plt groundmass. Sulphides are again present in only minor amounts. The fragments are closed with white orthoclase.	H37232		6.5				0° to 20°	3-5/1'	90
	H37233		5				30° to 45°	1/1'	
							60° to 80°	1-2/1'	
	H37234		2						95
102.2'-102.4': a hairline 20° fracture is filled with calcite, white orthoclase and pyrite.	H37235		8				20° to 30°	1-2/1'	100
105.7': SHARP 20° CONTACT parallels foliation 105.7'-107.1': SYENITE DYKE: 20 cm wide, medium grained, syenite composed of 85% light grey to grey green sericitized orthoclase and 15% interstitial black mafics. 107.1': SHARP 20° CONTACT	H37236	BKGD	16		100				105
107.1'-148.4': MIXED TINGUAITE: plt to sheared tinguaite ratio is 1:2. The plt consists of typical plt. In places the pl phenocrysts exhibit a pale green color due to weak sericitization and in other places a blue tint due to blue feldspathoid. The sheared tinguaite is generally weakly to moderately foliated with good brecciation and moderate to strong biotite alteration. The foliation is normally at 60-70° however between 120.5'-124.8' it is subparallel to the core axis. Only minor disseminated sulphides are present. Most fractures are open and are coated with clay ± weak limonite stains.	H37237		21.5				15° to 30°	2-3/1'	110
117.4'-119.8': several hairline shallow angle fractures and a 30°, 3mm fracture surrounded by sericitized envelopes. The large fracture is strongly chloritized and contains arsenopyrite; the fracture has a 5-8mm secondary orthoclase envelope as well as a 5 cm sericite envelope.	H37238		27				50° to 60°	1-2/2'	115
121.5'-122.4': an 8mm white orthoclase and black mafic (pyroxene?) syenite dykelet cuts the core axis at 20° and the foliation which is parallel to the core axis.	H37239		36				75° to 85°	1/3'	120
	H37240		16.5						125
129.8'-130.4': a 5mm, syenite dykelet as above cuts the core axis at 15°.	H37241		17						130
135.0': the plt to sheared tinguaite ratio has fallen to 1:3. Brecciation generally dominates over foliation in the sheared tinguaite. The foliation ranges from 45-70° to core axis.	H37242		21				20° to 30°	1/1-2'	135
148.4': SHARP 20° CONTACT parallels local foliation.	H37243		31				70° to 80°	1/1-3'	140
148.4'-149.4': SYENITE DYKE: a fine to medium grey 20cm syenite is composed of 90% light grey orthoclase and 10% black interstitial mafics.									145
149.4'-172.4': MIXED TINGUAITE: as above except that the foliation is at 20° to the core axis and the plt to sheared ratio is 1:1. Fractures are rare. Biotite alteration is moderate to strong in the sheared tinguaite.	H37244		35						150

MOUNT SOPRIS
GAMMA PROBE LOG



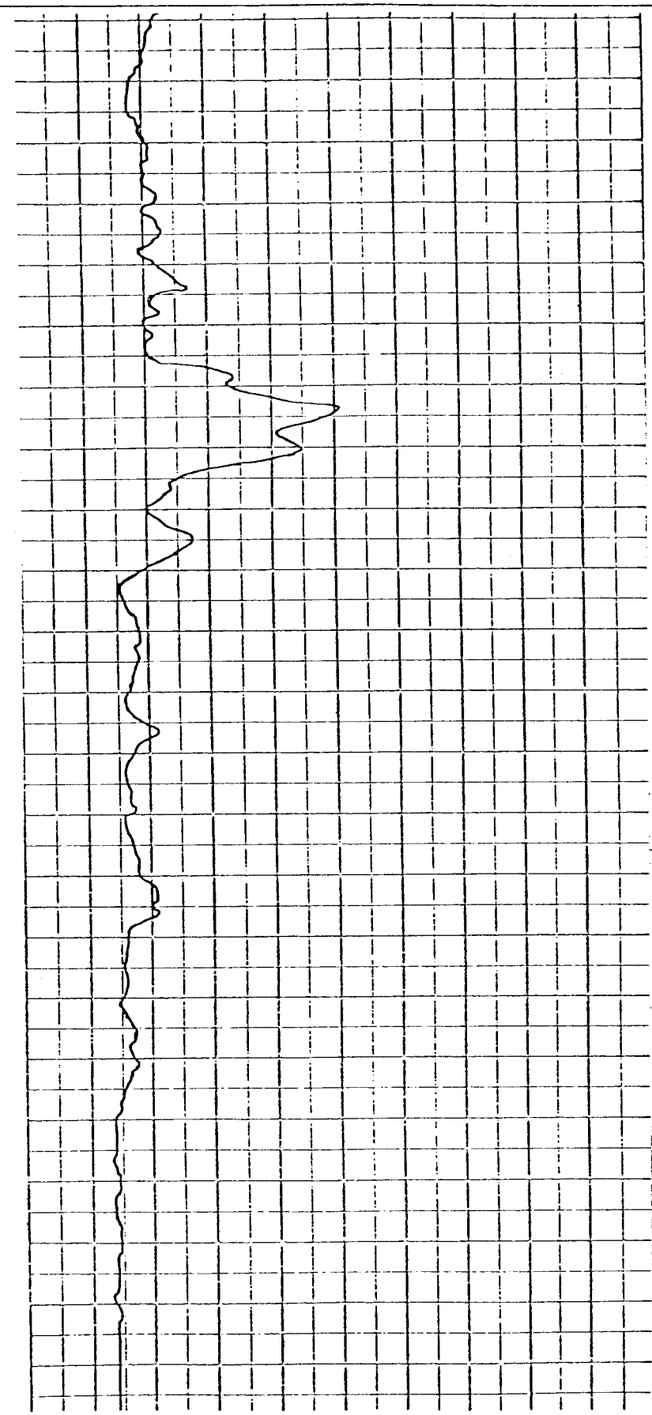
DRILL HOLE LOG

PROJECT DV1 HOLE TH14 LOCATION — T — CORE SIZE BQ STARTED [illegible] FINISHED 10/[illegible]

CLAIM GROUP JONES STONE LENGTH 432' DIP -45° AZIMUTH 022° COLLAR ELEVATION 4939' DRILLED BY [illegible] LOGGED BY [illegible]

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8 ppm U)	GEOCHEMISTRY AND ASSAY (ppm Cu)	% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
150.8'-152.5': 2, 1cm wide pegmatite dykelets, running subparallel to the core axis and paralleling the foliation contain 50% light grey orthoclase, 47% blue sodalite, 3% black mafics and 2% pyrite. 153.2': a 5cm long fragment of medium grey mylonite(?) is surrounded by brecciated, sheared tinguaite.	H37245	20/BKGD	41					155
	H37246	BKGD	24.5					
162.8'-163.0': a lenticular fragment of diabase(?) is surrounded by brecciated sheared tinguaite. Its mafic content is 25%.	H37247		38				60° to 90° 1/8' 30° 1/2'	160
	H37248	5/BKGD	57					165
172.4'-181.0': SHEARED TINGUAITE: brecciated and weakly foliated tinguaite contains rare <5cm fragments of plt. The pl phenocrysts in the sheared tinguaite have been strongly to intensely altered to biotite. Where evident the foliation is at 35-45° to the core axis. The brecciated tinguaite contains biotite altered pl fragments, orthoclase fragments and plt groundmass fragments. The groundmass fragments range up to 9mm but the others rarely exceed 4mm in diameter. Sulphides are present in trace to minor amounts.	H37249	20/BKGD	108					170
	H37250		84					175
181.0'-202.0': SHEARED TINGUAITE: foliation supersedes brecciation as the dominant texture. The foliation is quite consistent at 45° to core axis. In places biotite altered ghosts of flattened pl phenocrysts are visible. The orthoclase fragments are still unaltered and are generally less brecciated with phenocrysts up to 10mm long. Fractures are still rare.	H37251		22.5		100			180
	H37252		16				70° to 90° 1/2'	185
	H37253	BKGD	17					190
	H37254		18					195
202.0'-208.9': ALTERED PSEUDOLEUCITE TINGUAITE: only slightly sheared, strongly altered pseudoleucite tinguaite. Alteration has predominantly affected the pl phenocrysts which with few exceptions are present only as ghosts. The pl phenocrysts are altered to biotite and a chalky white mineral (either clay or sericite). A weak foliation is present in places at 40° to core axis. The orthoclase phenocrysts are unaffected by the alteration but the plt groundmass is a lighter grey around the altered pl phenocrysts. The rock contains minor pyrite.	H37255		205					200
	H37256		11					205
208.9'-252.4': SHEARED TINGUAITE: contains a few 5-15cm wide lenses of weakly to intensely alterd plt but is predominantly foliated tinguaite. Typically the foliated tinguaite has a medium grey, aphanitic groundmass with 1-3mm mafic (biotite?) stretches aligned to produce a 40° foliation. Flattened biotite altered pl phenocryst ghosts are common. The white orthoclase phenocrysts range from 1-10mm in length. Sulphides are rare. The fractures are open and have thin coats of clay minerals.	H37257		4					210
	H37258		4				30° 1/3' 70° to 90° 1-2/5'	215
	H37259		5					220
								225

MOUNT SOPRIS
GAMMA PROBE LOG



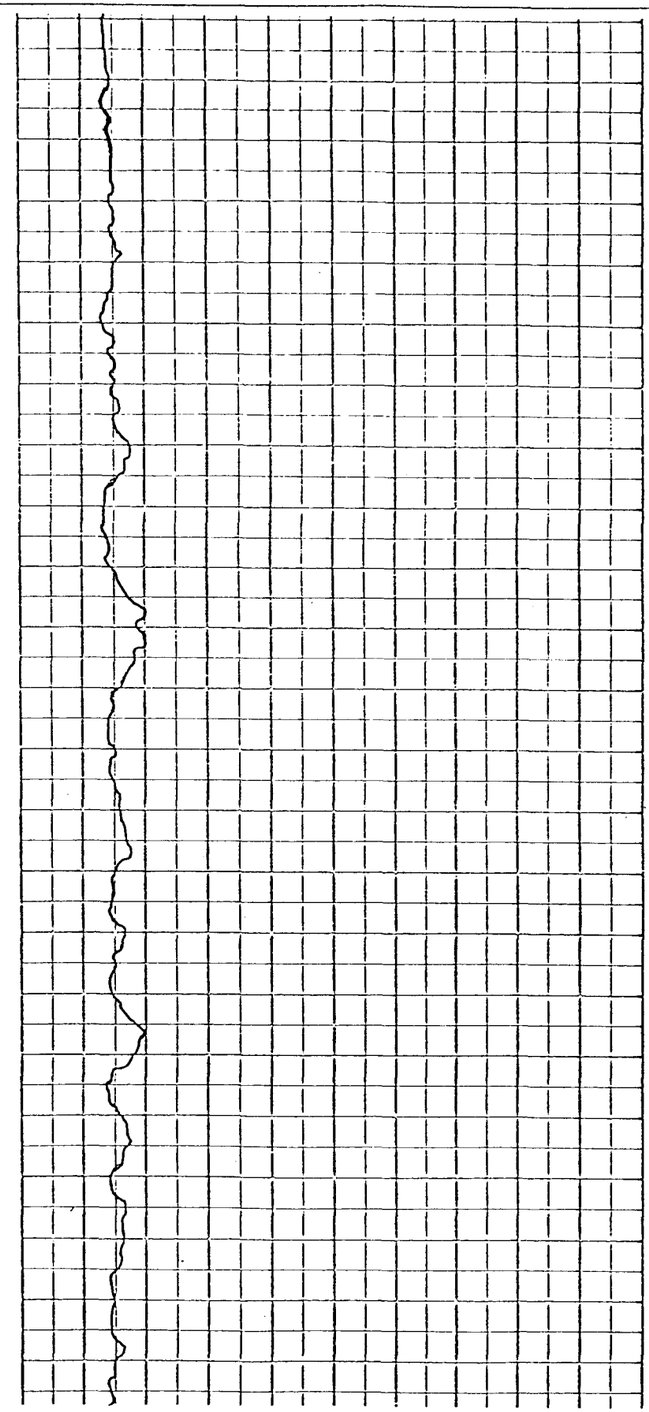
DRILL HOLE LOG

PROJECT DVL HOLE DH14 LOCATION — CORE SIZE BQ STARTED 12/20/11 FINISHED 12/22/11 PAGE 4 OF 6

CLAIM GROUP IDIDIDIDL LENGTH 432' DIP -82° AZIMUTH 225° COLLAR ELEVATION 4935' DRILLED BY [illegible] LOGGED BY [illegible]

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8 / ppm U)	GEOCHEMISTRY AND ASSAY (ppm Cu)	% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
	H37260		3					
233.0'-239.5': foliation is subparallel to the core axis.	H37261		4.5					
	H37262		6.5				30° 1/3'	
	H37263		7				70° to 90° 1-2/5'	
	H37264		7.5					
250.5': a 1mm, 75° leucocratic syenite dykelet has a fold in it whose axis parallels the foliation at 50°. 250.6'-250.8': a 25°, 1mm fracture is filled with orthoclase and sericite and is surrounded by a 3mm secondary orthoclase alteration envelope. 252.4'-258.0': PSEUDOLEUCITE TINGUAITE: consists of 10-15% light grey, 2-12mm, anhedral, often cracked pseudoleucite phenocrysts, 1-2%, 1-5mm, white subhedral orthoclase phenocrysts in a medium to dark grey groundmass. The rock contains only a trace of finely disseminated sulphides. 256.8'-257.0': a 6mm, leucocratic syenite dykelet cuts the core axis at 20°. 258.0'-269.0': MIXED TINGUAITE: 2cm-1m bands or lenses of normal plt as above are surrounded by foliated and/or brecciated, sheared tinguaite. The sheared tinguaite is generally moderately altered to biotite. The foliation is at 30-40° to core axis. Sulphides are rare. All fractures contain white orthoclase; about 2/3 of the fractures are closed.	H37265		7.5					
	H37266	BKGD	13.5		100			
	H37267		10.5				20° to 35° 1-2/1'	
269.0'-311.5': SHEARED TINGUAITE: weakly to strongly foliated sheared tinguaite with rare 10-20cm patches of normal plt. Above 297' the foliation principally consists of flattening and stretching of the pl phenocrysts. Between 297' and 303.5' the shearing is stronger and the pl phenocrysts have been destroyed. Below 303.5' shearing is again less intense. In places the flattened pl phenocrysts have been extensively altered to biotite. The attitude of the foliation is variable ranging from 0-45°. Angular orthoclase phenocrysts and phenocryst fragments comprise less than 10% of the rock. Sulphides are rare. White orthoclase coats most fractures. 269.5'-269.7': an 8mm, light - medium grey, fine grained tinguaite(?) dyke cuts the core axis at 35° which is parallel to the foliation.	H37268		6.5				70° to 90° 1/5'	
	H37269		8.5					
272.4'-273.0': a 25mm porphyritic syenite dykelet consisting 10% of light grey, 3-8mm orthoclase phenocrysts in a fine grained groundmass of 80% orthoclase and 10% interstitial mafics cuts the core axis at 18° which is parallel to the foliation.	H37270		10.5					
276.0': a 7mm dyke similar to the 269.5-269.7'dyke cuts the core axis at 80°. These may be fine grained equivalents of the 272.4-280.0' dyke. 276.7'-277.8': a 20 cm porphyritic syenite dyke identical to the 272.4-273.0' dyke also cuts the core axis at 18°.	H37271		16.5				20° to 35° 1-2/1'	
281.0'-283.4': another porphyritic syenite dyke. This one is 30cm wide and has a 20° upper contact and a 30° lower contact. The contacts of this dyke and those of the surrounding similar dykes parallel the foliation of the tinguaite.	H37272		11.5				70° to 90° 1/5'	
286.8'-288.5': another 30cm porphyritic syenite dyke has a 20° upper contact and a 10° lower contact.	H37273		8.5					
	H37274		8					

MOUNT SOPRIS GAMMA PROBE LOG



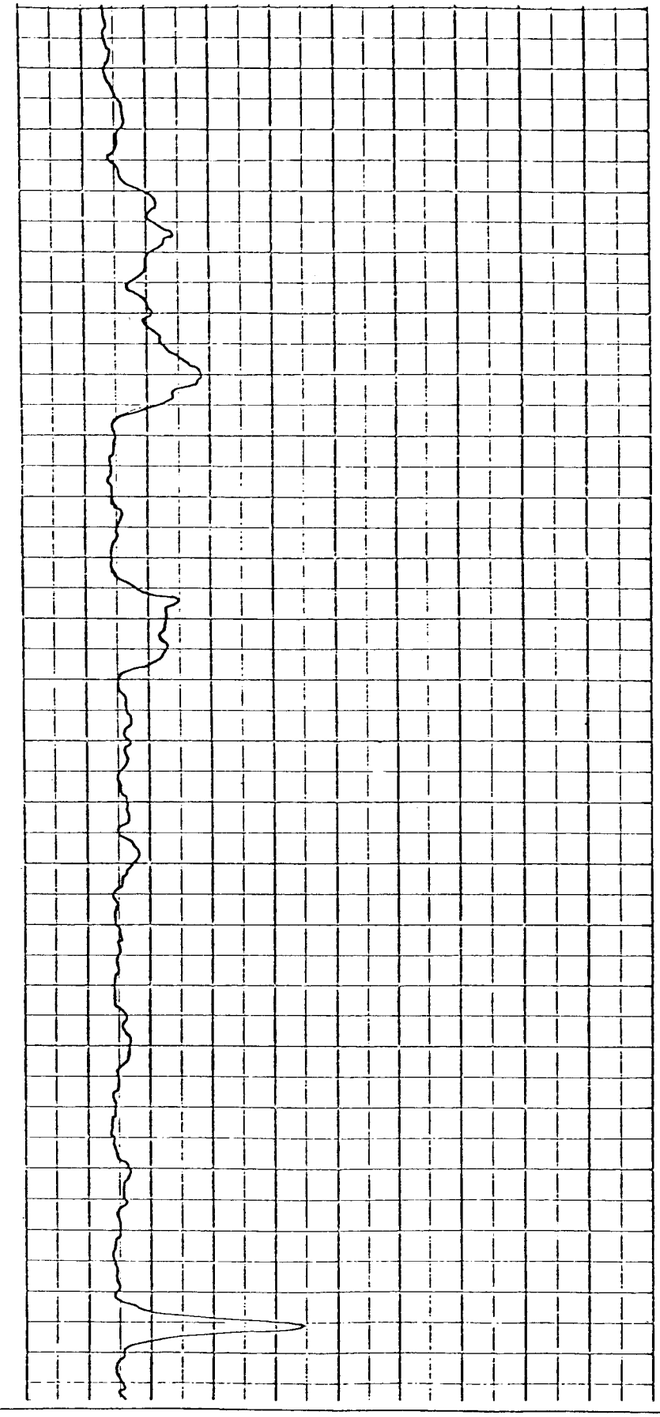
DRILL HOLE LOG

PROJECT [illegible] HOLE [illegible] LOCATION [illegible] CORE SIZE [illegible] STARTED [illegible] FINISHED [illegible] PAGE 5 OF 6

CLAIM GROUP [illegible] LENGTH [illegible] DIP [illegible] AZIMUTH [illegible] COLLAR ELEVATION [illegible] DRILLED BY [illegible] LOGGED BY [illegible]

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8)	GEOCHEMISTRY AND ASSAY ppm U	GEOCHEMISTRY AND ASSAY ppm Cu	% RECOV	GEOLOGY	STRUCTURE ∠ to core	STRUCTURE	HOLE DEPTH (FEET)
303.8'-304.3': a 10°, 18mm, brecciated fracture is filled with white orthoclase fragments of tinguaite wall rock, 1% black mafic, 1% pyrite and a trace of chalcopyrite.	H37275			6.5				20° to 35°	1-2/1'	
305.5'-310.2': a swarm of narrow, 5mm-5cm, fine to medium grained, slightly porphyritic syenite dykelets comprised of 90% orthoclase and 10% mafics parallels the foliation in the sheared tinguaite at 40° to the core axis.	H37276			8.5				70° to 90°	1/5'	305
311.5'-323.5': BLEACHED (?) SHEARED TINGUAITE: light grey, moderate to strongly foliated, sheared tinguaite which is chiefly distinguished from the above sheared tinguaite by its lighter grey, bleached appearance. Accompanying the shearing is a moderate to strong biotite alteration which has resulted in numerous flattened pl phenocryst ghosts. Unsheared tinguaite lenses are absent in this rock. Sulphides are still rare.	H37277			16.5						310
	H37278			9.0						315
323.5'-334.8': SHEARED TINGUAITE: slightly less sheared with a medium grey groundmass. Biotite and clay altered pl phenocryst ghosts are common. Foliation is generally at 30-45° to core axis.	H37279			28				30°	1/5'	320
	H37280			3.0				70° to 80°	1/10'	325
334.8'-338.5': BLEACHED (?) SHEARED TINGUAITE: as between 311.5'-323.5'. Biotite alteration of pl phenocrysts moderate to strong. Foliation at 40-45° to core axis. 338.5': GRADATIONAL 40° CONTACT: rock goes from bleached sheared tinguaite to sheared tinguaite to pl tinguaite in 10 cm.	H37281			11.5						330
338.5'-348.1': PSEUDOLEUCITE TINGUAITE: consisting of 5-10%, light grey, 2-12mm, anhedral pl phenocrysts and 1%, 1-5mm, white, subhedral orthoclase phenocrysts in medium grey, aphanitic groundmass. In places pl phenocrysts are slightly flattened at 40° to core axis. Very local patches of strong biotite alteration otherwise alteration minimal. Sulphides are rare. The fractures are generally filled with white orthoclase or blue feldspathoid.	H37282	BKGD		20.0		100				335
	H37283			9.5				60° to 70°	1-2/3'	340
347.4'-367.2': MIXED TINGUAITE: 5-60cm bands and lenses of normal plt as described above are surrounded by sheared tinguaite at a ratio of 1:1. The sheared tinguaite is moderately to strongly foliated; brecciation is only locally significant. Moderate biotite and clay alteration of the pl phenocrysts in the sheared tinguaite is common. The sheared tinguaite groundmass is slightly lighter grey than the plt groundmass. Between 352' and 354' blue feldspathoids are common in the pl phenocrysts. Sulphides are rare. Most fractures are filled or coated with white orthoclase.	H37284			9.5						345
	H37285			6.5				30°	1/2'	350
	H37286			7.0				70° to 90°	1-2/1'	355
	H37287			5.0						360
367.2'-389.8': ALTERED SHEARED TINGUAITE: a few lenses of plt occur in this interval however the plt to sheared tinguaite ratio is<1:7. The most striking aspect of the interval is the abundance of intensely biotite and clay altered pl phenocrysts. In the plt lenses the pl phenocrysts are generally indistinct with a pale green tint suggesting sericitization. The sheared tinguaite is weakly to moderately foliated and often has a significant breccia component. Near the top of the interval the foliation cuts the core axis at 30° but is gradually steeper until it hits 70° near the bottom of the interval. Similarly, there is a general decrease in the intensity of the foliation from top to bottom. Disseminated pyrite comprises 0.2% of the rock.	H37288			6.5				30°	1/3'	365
	H37289			14.5				70° to 90°	1/10'	370
										375

MOUNT SOPRIS
GAMMA PROBE LOG



DRILL HOLE LOG

PROJECT UIV HOLE JH14 LOCATION - CORE SIZE BQ STARTED 12/ /82 FINISHED 12/ /82

CLAIM GROUP TOMBSTONE LENGTH 432' DIP -65° AZIMUTH 090° COLLAR ELEVATION 4932' DRILLED BY [illegible] LOGGED BY [illegible]

389.8'-394.8': MIXED TINGUAITE: lenses of plt are surrounded by weakly sheared and strongly biotite altered tinguaite at a ratio of 3:2. The plt consists of 20-30%, 2-10mm light grey to pale green to pale blue, anhedral pl phenocrysts and 1%, white, anhedral, 1-5mm orthoclase phenocrysts in a medium grey aphanitic groundmass. The sheared tinguaite moderately brecciated and weakly to moderately foliated with strong biotite-clay alteration of the pl phenocrysts. The foliation is at 70° to core axis. Finely disseminated pyrite comprises 0.1-0.2% of the rock, usually in close association with the mafics. The pale green coloration is due to weak sericitization and the pale blue tint is due to minor blue feldspathoids.

394.8'-419.2': ALTERED SHEARED TINGUAITE: weakly to moderately sheared, intensely biotite clay altered tinguaite. There are abundant pl phenocryst ghosts in a light to medium grey groundmass. The foliation cuts the core axis at 40-60°. This rock is quite similar to the rock between 367.2-389.8'. Disseminated pyrite is common, forming 0.3-0.5% of the rock.

400.5': a 3mm, 70° fracture filled with white orthoclase contains a trace of molybdenite.

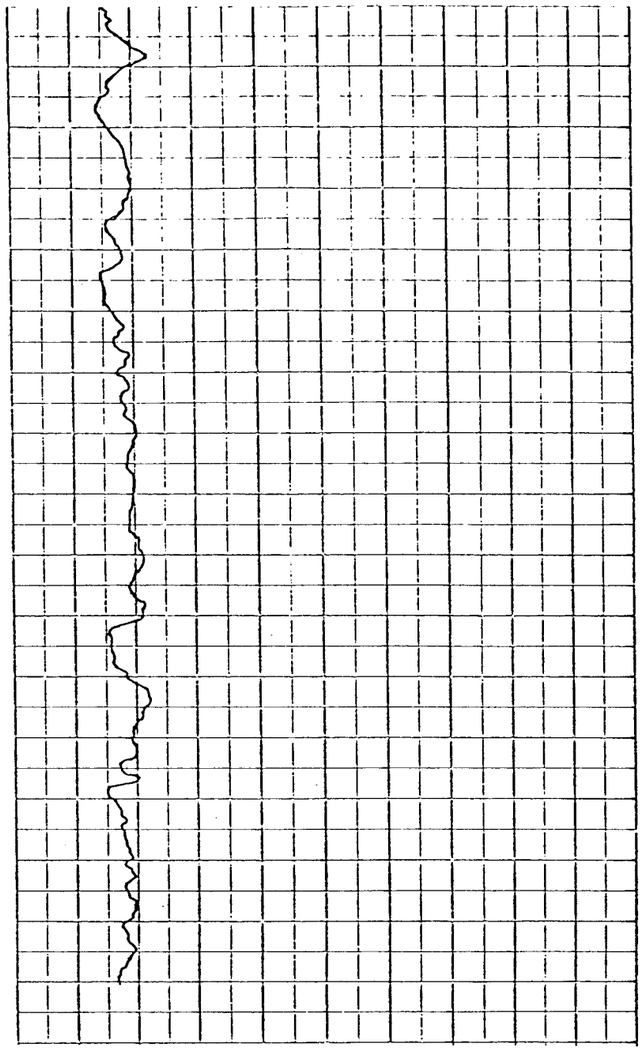
410.2'-410.8': a 7-9mm wide, 30° mafic filled fracture is surrounded by a 2cm pale green sericite alteration envelope and contains minor molybdenite > pyrrhotite.

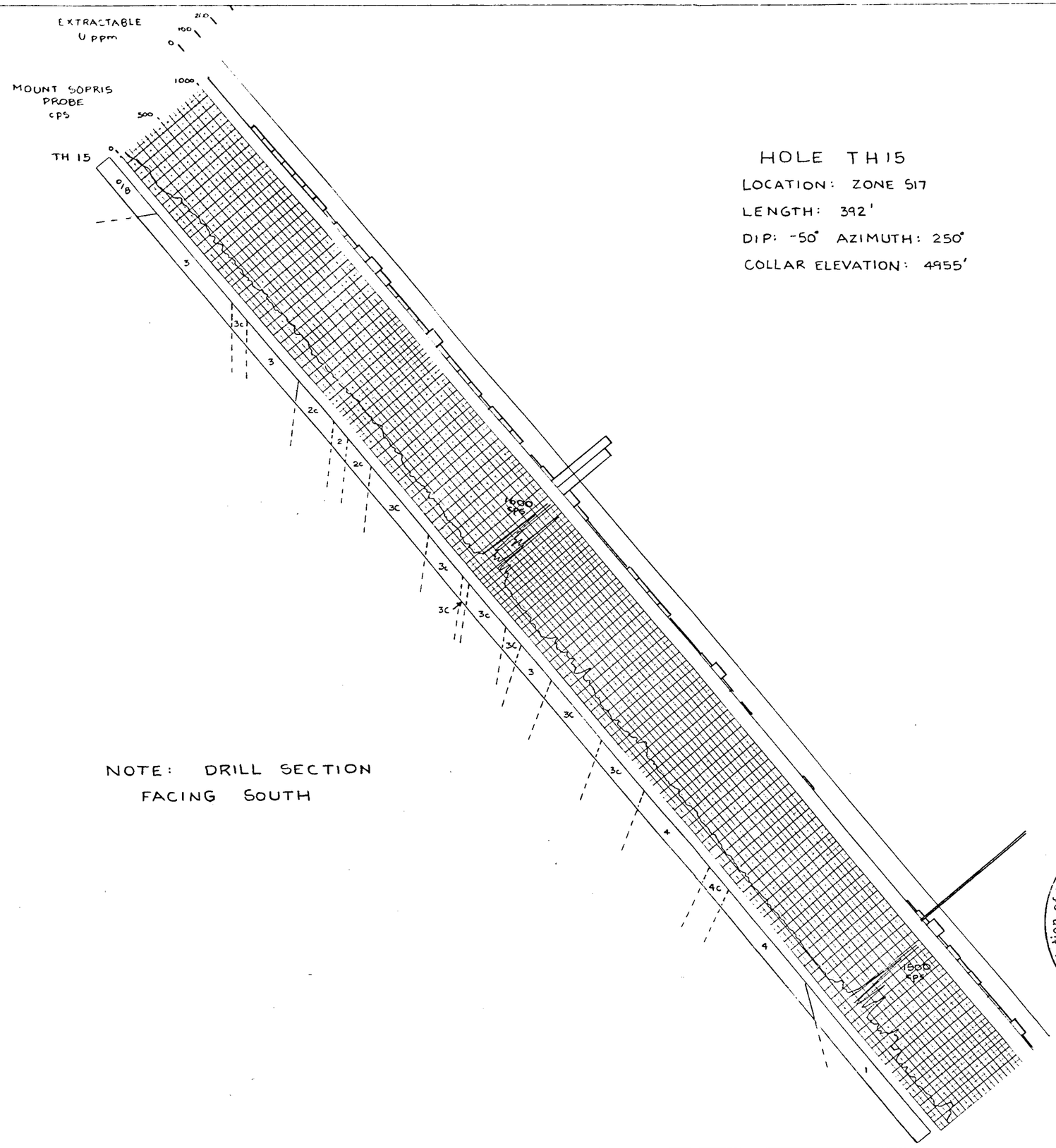
419.2'-432.0': MIXED TINGUAITE: plt to sheared tinguaite ratio is 1:2. The plt is normal except for the presence of blue feldspathoids. The sheared tinguaite is similar to the overlying altered sheared tinguaite. As before the rock is dominantly composed of a light-medium grey groundmass with black pl phenocryst ghosts composed of biotite and clays. There is weak to moderate brecciation and foliation at 30° to core axis. Disseminated pyrite comprises 0.1-0.2% of the rocks.

421.1'-421.3': a series of 45° hairline fractures are surrounded by a 2cm sericitized envelope.

SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%, oz/t) ppm U	ppm Cu	% RECOV	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
H37290		12.5			30°	1/3'	380
H37291		20.5			70° to 90°	1/10'	385
H37292		15.0					390
H37293		8.0					395
H37294	BKGD	17.0		100	30°	1/4'	400
H37295		22.0			70°	1/2'	405
H37296		28.0					410
H37297		16.0					415
H37298		27					420
H37299		18.0			30°	1/2'	425
H37300		21.0			45°	1/4'	430
					70	1/3'	432

MOUNT SOPRIS GAMMA PROBE LOG





HOLE TH15

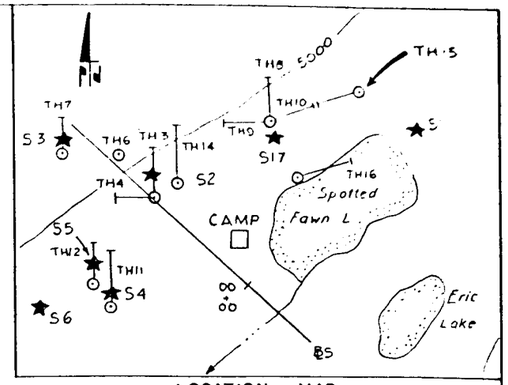
LOCATION: ZONE 517

LENGTH: 392'

DIP: -50° AZIMUTH: 250°

COLLAR ELEVATION: 4955'

NOTE: DRILL SECTION
FACING SOUTH



1 SYENITE tan weathering, medium to coarse grained nepheline syenite often with abundant sulphides and purple fluorite

2 PSEUDOLEUCITE TINGUAITE 5-30%, 3-20mm pseudoleucite phenocrysts 1-10mm orthoclase phenocrysts in a medium grey, aphanitic groundmass

3 SHEARED TINGUAITE foliated and/or auto-brecciated tinguaite often biotite altered

4 MIXED TINGUAITE lenses or bands of pseudo-leucite phenocrysts in sheared tinguaite groundmass

5 FINE GRAINED TINGUAITE medium to dark grey tinguaite without pseudoleucite phenocrysts, some 1-3 mm orthoclase phenocrysts. Usually as dykes

6 INTERMEDIATE TINGUAITE medium grey tinguaite with pseudoleucite orthoclase phenocrysts. Pseudoleucite phenocrysts smaller than usual

B,b BIOTITE ALTERATION . intense, moderate

C,c CHLORITE ALTERATION intense, moderate

——— – – – geologic contact: sharp, gradational

Association of Professional Engineers of the Yukon Territory
A. R. ARCHER
GEOLOGICAL
ENGINEER

FIG. U-TG30

ARCHER, CATHRO & ASSOCIATES LTD

SECTION TH15

TOMBSTONE PROPERTY

UKON JOINT VENTURE

SCALE 1:400

4 2 0 4 8 12 16 20
metres

DRILL HOLE LOG

PROJECT UJV HOLE JH15 LOCATION ____-____ CORE SIZE BQ STARTED 11/09/79 FINISHED 15/09/79 PAGE 1 OF 6

CLAIM GROUP TOMBSTONE LENGTH 392' DIP -50 AZIMUTH 250 COLLAR ELEVATION 4955' DRILLED BY CAPON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8 / ppm U)	GEOCHEMISTRY AND ASSAY (ppm Cu)	% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
0-21.4': OVERBURDEN: tinguaite and syenite boulders in glacial till and talus.					1			5, 10, 15, 20
21.4'-61.8': SHEARED TINGUAITE: well foliated pseudoleucite tinguaite consisting of 25-30% light grey, flattened lenticular pl phenocrysts and 1% white-grey, subhedral, angular orthoclase phenocrysts in a medium grey groundmass. The foliation is at 50-65° to core axis. Most fractures are open and are coated with minor clay, orthoclase and/or limonite. The rock is weakly magnetic due to very finely disseminated pyrrhotite. The closed fractures are usually the 20-30° fractures; they are hairline fractures filled with pyrrhotite > pyrite >> arsenopyrite and commonly exhibiting 1-2mm bleached altereation envelopes.	H37301		16.5					
	H37302		19.0				20° to 30° 1/1-2'	25, 30
	H37303		22.0				30° to 40° 3-5/1'	35
	H37304		17.5					40
	H37305	BKGD	17.5		100			45
45.5'-47.2': weak biotite alteration makes the pl phenocrysts a medium grey color. 48.6': minor 1cm wide limonite flooding of pl phenocrysts adjacent to a 35° fracture.	H37306		16.0				0° to 20° 3-4/1'	50
60.4'-60.7': light grey-pale green to pink alteration around a pair of hairline shallow angle fractures filled with pyrite and chlorite. The pink may be due to hematite stain.	H37307		18.5				30° to 40° 3-5/1'	55
61.8'-68.6': SERICITIZED SHEARED TINGUAITE: sheared tinguaite similar to that in the overlying interval has been moderately to strongly sericitized resulting in a mottled light grey to pale green rock. The alteration has attacked the pl phenocrysts and the groundmass leaving the orthoclase phenocrysts relatively untouched. The foliation is at 45-55°. The rock contains 0.1-1/4% disseminated pyrite > pyrrhotite. The fractures, if closed, contain pyrite and pyrrhotite and, if open, are strongly stained with limonite.							70° 1/1'	
61.8'-63.0': a 7°, hairline to 2mm fracture has an irregular 1mm to 3cm pink orthoclase alteration envelope. It contains pyrite > purple fluorite » molybdenite. The fracture itself contains pyrite » purple fluorite.	H37308		10.0					60
	H37309		23.5				0° to 20° 5-8/1'	
68.6'-92.0': SHEARED TINGUAITE: again well foliated plt exhibiting a pronounced flattening of the pl phenocrysts to produce lenticular phenocrysts. Foliation is quite consistent at 50-55°. The modal distribution is the same as from 21.4-61.8'. The closed fractures are usually hairline cracks filled with pyrrhotite. The open fractures are weakly coated with clay ± limonite. Disseminated pyrrhotite is less than 0.1% generally, however the rock is often weakly magnetic.	H37310		18.5				30° to 45° 2-4/1'	65
							0° to 20° 1/1'	70
74.6'-76.2': a 6cm leucocratic syenite dyke composed almost completely of light grey orthoclase cuts the core axis at <10°. The dyke contains 2-3% pyrite and a trace of magnetite. Much of the dyke has a strong pink color due to hematite stains. Aside from local weak hematite staining of pl phenocrysts the dyke has little effect on the wall rocks.	H37311		25				35° to 45° 2-3/1' 70° 1-2/3'	75

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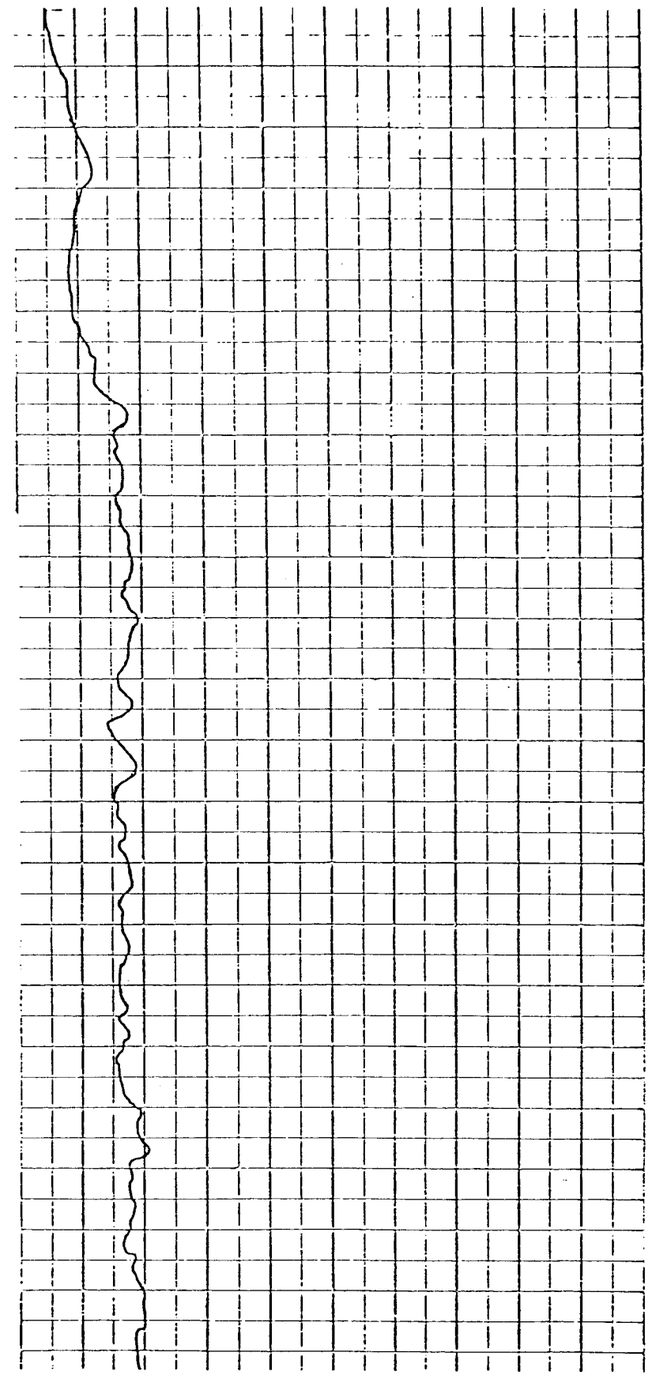

DRILL HOLE LOG

PROJECT [illegible] HOLE TH 15 LOCATION [illegible] CORE SIZE [illegible] STARTED [illegible] FINISHED [illegible] PAGE 2 OF 6

CLAIM GROUP [illegible] LENGTH [illegible] DIP [illegible] AZIMUTH [illegible] COLLAR ELEVATION [illegible] DRILLED BY [illegible] LOGGED BY [illegible]

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8) ppmU	ppm Cu			% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
	H37312		40						0° to 20°	1/1'	80
	H37313		26						30° to 45°	2-3/1'	85
89.0': although the rock is still foliated, the intensity of foliation varies erratically. 92.0'-108.6': PARTIALLY SERICITIZED PSEUDOLEUCITE TINGUAITE: a highly variable interval involving a mixture of weakly foliated and unsheared plt which has been locally overprinted by 5-60cm wide bands of moderate to intense sericitization. The pl phenocrysts in the unsericitized plt often exhibit a milk white color which may indicate clay alteration. The sericitized tinguaite has pale green to olive green groundmass and in the most intensely altered area has olive to dark green pl phenocrysts. The orthoclase phenocrysts are also being attacked. The foliation, where evident, is 50-55° to core axis. Disseminated pyrite comprises up to 1/2% of the rock and is most abundant in the sericitized tinguaite. Adjacent to the sericitized bands the pl phenocrysts in the normal plt are occasionally a pink-orange color probably due to hematite staining. Most fractures in the sericitized rock are limonite stained and many exhibit 2-20mm limonite flooded wall rocks adjacent to them. The fractures in the normal plt are either filled with white orthoclase or if open are relatively clean.	H37314		16.5						70°	1-2/5'	90
	H37315		18.5								95
	H37316		22.0						10° to 20°	1-5/1'	
108.6'-115.5': PSEUDOLEUCITE TINGUAITE: often exhibits weak foliation at 50° to core axis but is predominantly plt. The rock consists of 20-25%, blue-grey, anhedral 2-10mm pl phenocrysts, often speckled with <1mm flecks of mafic, <1%, light grey subhedral 1-3mm orthoclase phenocrysts, and 2-3% small flecks of mafics in a medium grey aphanitic groundmass. The mafics give the rock a vague salt and pepper appearance; they appear to be primary rather than an alteration. Most fractures are white orthoclase and pyrite filled hairline cracks. The open fractures contain white orthoclase ± minor limonite. Disseminated sulphides are minor.	H37317		23.5						30° to 45°	2-7/1'	100
	H37318	BKGD.	37				100		60° to 70°	1/1-2'	105
115.5'-126.9': MODERATELY SERICITIZED PSEUDOLEUCITE TINGUAITE: mottled medium grey-pale green -pinky tan sericitized plt. The basic rock prior to alteration was similar to plt between 108.6-115.5'. The pale green-pinky tan color generally affects the groundmass while the sericitization of the pl phenocrysts results in a silvery grey to olive green color. Extensive tan limonite and red hematite flooding are common around fractures. The limonite is generally associated with open fractures, while the hematite surrounds fractures filled with pyrite and magnetite. The rock contains between 0.1 and 1/4% disseminated pyrite> magnetite. 121.1'-122.3': an 8mm, medium grained leucocratic syenite dyke containing minor smoky quartz, sericite and pyrrhotite cuts the core axis at 5°. 124.6'-125.6': intensely sericitized, pale green plt surrounds a 2mm, smoky quartz and calcite filled fracture running parallel to the core axis.	H37319		20.0						10° to 20°	3-5/1'	110
									30° to 40°	1-2/1'	
									70° to 90°	1/1'	115
	H37320		23.5						0° to 20°	5-10/1'	
	H37321		16.5						30° to 40°	2-3/1'	120
126.9'-154.3': INTENSELY SERICITIZED TINGUAITE: intense pale green-olive green sericitization and a high fracture density have largely destroyed the original tinguaite texture. Many of the fractures and some of the pl phenocrysts are altered to a tan mineral which may be a clay. Most of the fractures are at least partially chloritized and a few are filled with white orthoclase. Disseminated pyrite forms less than 1/4% of the rock. Fracture pyrite is common but rarely exceeds minor amounts.	H37322		18.0						70° to 90°	1/1'	125
											130
	H37323		9.0						0° to 20°	10-5/1'	
	H37324		15.5						30° to 40°	3-8/1'	135
											140
141.0'-144.0': extremely highly fractured and partially brecciated, intensely sericitized tinguaite contains 1-2% pyrite, often as 0.5-1mm euhedral crystals.	H37325		23.0				30		70° to 90°	1/2'	
											145
149.8'-154.3': intensely fractured, sericitized tinguaite stockwork with tan clay (?) in the fractures.	H37326		19.0				100				150

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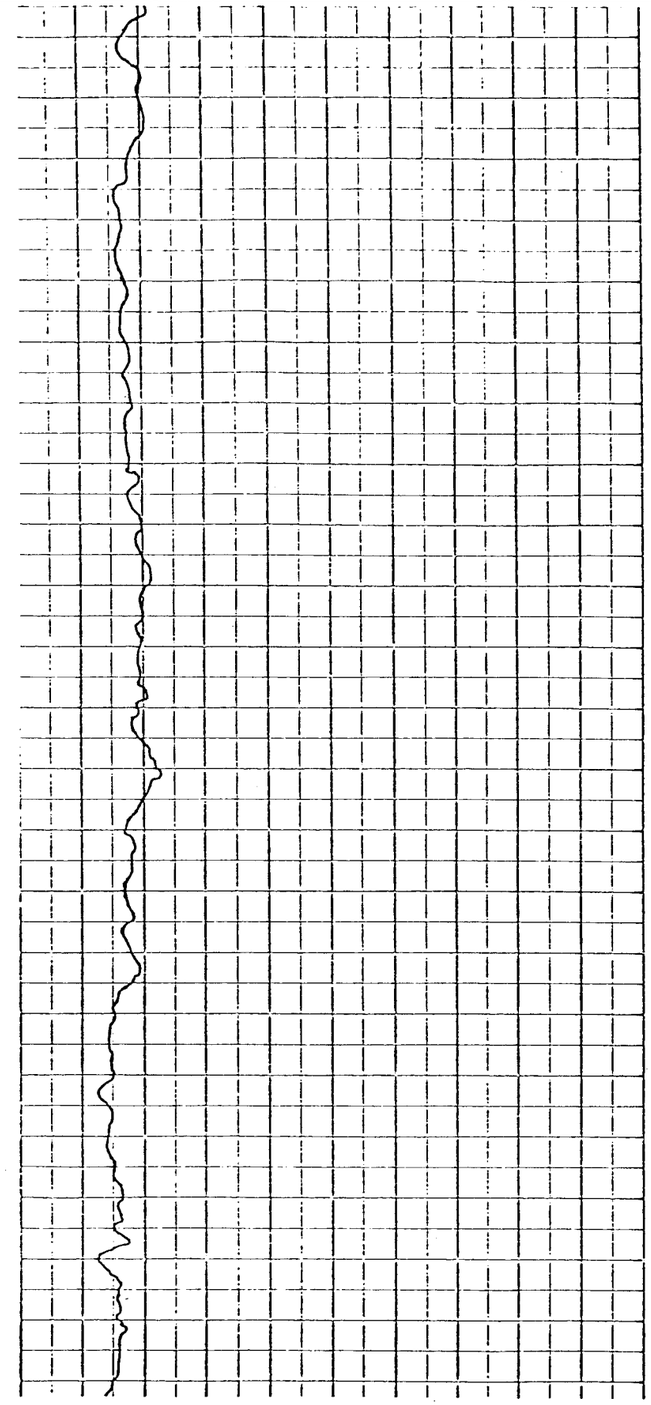
GAMMA PROBE LOG



DRILL HOLE LOG

PROJECT [illegible] HOLE TH-12 LOCATION [illegible] CORE SIZE BQ STARTED [illegible] FINISHED [illegible]

CLAIM GROUP [illegible] LENGTH [illegible] DIP -52° AZIMUTH [illegible] COLLAR ELEVATION [illegible] DRILLED BY [illegible] LOGGED BY [illegible]

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8 / ppm U)	ppm Cu	% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
154.3'-170.4': MODERATELY SERICITIZED TINGUAITE: consists of 20%, slightly to moderately sheared, 2-10mm, anhedral pale green-pinkish grey pl phenocrysts and 1%, 1-3mm subhedral light grey orthoclase phenocrysts in a medium grey to pale green aphanitic groundmass. The weak foliation is at 45-50° to core axis. Disseminated pyrite is a minor component of the rock. The open fractures are sericitized and may contain moderate limonite stains. Closed fractures are rare and are filled with white-pale green orthoclase.	H37327		8.0					
161.0'-162.8': relatively unaltered sheared tinguaite with a moderate foliation at 55° to core axis. 164.5'-165.6': a 1-2mm, 5° fracture is filled with calcite and clays.	H37328	BKGD	11.5				0° to 20° 5-20/1'	155
166.0'-167.0': a moderately radioactive chloritized fracture zone. 166.8': foliation in the rock becomes very intense, completely destroying pl phenocrysts. 167.2'-167.8': intense tan-pale green sericite alteration envelopes surround hairline shallow fractures.	H37329		22.0				30° to 40° 1-5/1' 60° to 80° 1-5/1'	160
170.4'-174.3': INTENSELY SERICITIZED SHEARED TINGUAITE: strongly foliated tinguaite has been highly fractured and altered to produce a pale green-olive green rock with a pronounced stockwork of cream dolomite filled hairline to 1cm fractures. The upper 3 feet is weakly to strongly radioactive and contains minor amounts of a black mineral (possibly uraninite) and purple fluorite in some of the fractures. Disseminated sulphides are a minor component of the rock.	H37330	60/BKGD	340					165
174.3'-190.9': MODERATELY SERICITIZED SHEARED TINGUAITE: consists of strongly foliated medium grey-pale green often mottled tinguaite. The pl phenocrysts have been destroyed by the foliation which is at 50° to core axis. The fracture density is generally lower than was seen in previous intervals. Where the fracture density increases so does alteration in the adjacent rocks. A few hairline fractures contain pyrite. Disseminated sulphides are about 0.1% of the rock.	H37331	100/BKGD	301					170
	H37332		36				0° to 20° >100/1'	
182.0'-182.5': a 20°, 13mm wide fracture exhibits symmetric zonation beginning with a 4mm wide band of arsenopyrite, enclosed in 1-3mm of white quartz containing minor molybdenite and chalcopyrite, then 1-2mm of cream dolomite containing minor black sphalerite or wolframite. Around this is a 17mm pale green sericite alteration envelope.	H37333		17.0					175
183.3'-183.7': a group of hairline fractures contains orangy brown limonite. 190.0'-198.0': INTENSELY SERICITIZED TINGUAITE: highly fractured, pale green tinguaite is cored by a stockwork of cream dolomite and grey quartz veins and veinlets. The veins often contain sulphides, predominantly arsenopyrite. Disseminated and fracture pyrite comprise about 0.5% of the rock.	H37334		12.0		100		30° to 40° 1/1' 60° to 70° 1/1'	180
195.0': a quartz vein contains blebs of a metallic black mineral which is very hard and non-radioactive (cassiterite?) as well as arsenopyrite. 196.5': a quartz stockwork contains arsenopyrite>>sphalerite. 197.0'-197.4': a 2cm wide, 20° orthoclase > slightly smoky quartz vein also contains 5% sulphides: arsenopyrite > sphalerite ≃ chalcopyrite ≈ molybdenite ≈ pyrite.	H37335		13.0					185
198.0'-199.4': GRADATIONAL CONTACT: moderately sericitized tinguaite. 199.4'-210.9': SHEARED TINGUAITE: brecciation dominates over foliation until the last 2' of the interval. The rock consists of 1-3mm white angular fragments of orthoclase and pl phenocrysts in a light-medium grey groundmass. The foliation where evident ranges from 60-90° to core axis. The rock contains only minor fine disseminated sulphides. Fractures are little more than hairline cracks filled with white orthoclase or calcite.	H37336	BKGD	13.0				0° to 20° >10/1' 30° 1-2/1' 60° to 70° 2-4/1'	190
205.8'-207.0': a 5cm wide leucocratic syenite dyke runs subparallel to the core axis. This dyke consists of 90% grey orthoclase and 10% black mafic with minor disseminated arsenopyrite and small patches of blue feldspathoids. The contacts are irregular possibly due to reaction with the wall rock.	H37337		14.5					195
210.9'-236.5': INTENSELY SERICITIZED TINGUAITE: the rock is similar to the 190.7-198.0' sericitized tinguaite in that it is predominantly pale green sericitized tinguaite with an abundance of grey quartz and dolomite veins. In addition, this interval has a number of pale grey alteration envelopes which appear to be clay envelopes. Disseminated sulphides form <1/4% of the rock but fracture sulphides are common, especially pyrite and arsenopyrite. A few fractures are heavily coated with orange brown limonite. Most fractures are filled or coated with quartz dolomite, clays or sericite. Occasionally the quartz and orthoclase show graphic intergrowths. 210.9'-211.3': a brecciated and altered fracture system contains 5% sulphides with pyrite > arsenopyrite. There are also minor limonite and a dark grey mineral with a dark grey streak (hardness ~4-5).	H37338		22.0				30° to 40° 1-2/1' 60° to 70° 1/4'	200
	H37339		23.0					205
	H37340		16.5					210
217.0'-218.6': a series of 3-10mm quartz veins contain 5-10% arsenopyrite (2% of whole rock); 219.2': rock contains ½% disseminated sphalerite or wolframite as 1mm blebs.	H37341		23.5				0° to 20° >10/1'	215
220.2'-220.6': fractures contain abundant arsenopyrite (2-3% of rock). Also 1/4-1/2% disseminated sphalerite or wolframite as above. 223.7': arsenopyrite again 2-3% of rock in fractures.	H37342		11.0					220
								225

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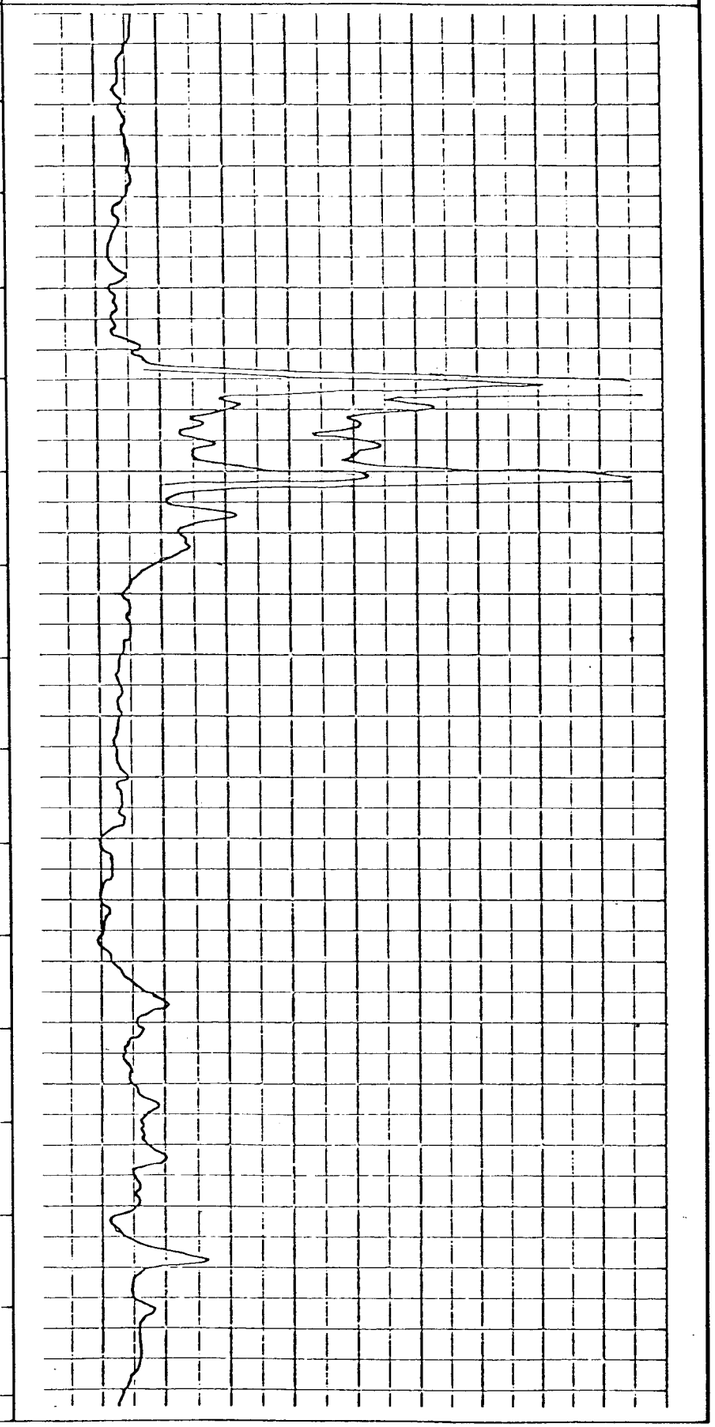

DRILL HOLE LOG

PROJECT JV HOLE IH15 LOCATION — CORE SIZE BQ STARTED [illegible] FINISHED [illegible] PAGE 4 OF 6

CLAIM GROUP [illegible] LENGTH [illegible] DIP [illegible] AZIMUTH [illegible] COLLAR ELEVATION 4455' DRILLED BY [illegible] LOGGED BY [illegible]

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (ft/oz/ton ppm U)	(ppm Cu)			% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
228.3'-228.6': a strongly limonite stained fracture zone. Predominantly orange-brown with no residual sulphides. 229.5-230.7': a stockwork contains 7% sulphides with arsenopyrite >> pyrite ≃ chalcopyrite ≃ sphalerite (wolframite?) > molybdenite.	H37343		11.0						0° to 20°	>10%	230
	H37344		11.0								
236.5'-256.8': MODERATELY SERICITIZED TINGUAITE: mottled pale green-light grey-medium grey sericitic overprint of sheared tinguaite. Much of the original texture has been destroyed but it appears that foliation dominated over brecciation. The residual foliation is at 60° to core axis. Disseminated pyrite is minor. The high angle fractures are usually open and are relatively clean. The shallow fractures are filled with sulphides, sericite or dolomite and are usually only hairline cracks. The shallow fractures are often surrounded by more intensely sericitized alteration envelopes. The fracture filling sulphides are pyrite, arsenopyrite and pyrrhotite.	H37345		16.0								235
	H37346		40						0° to 20°	50%	240
	H37347		13.0						50° to 60°	1-3/4"	245
	H37348		8.5								250
255.4': a 24mm, leucocratic syenite dyke cuts the core axis at 70°. The foliation in the tinguaite is 90° to core axis at this point. The dyke contains 2% pyrite replacing mafics and traces of molybdenite and hematite stain. 256.0'-256.8': a 20cm wide dyke? marks the contact between the moderately sheared, sericitized tinguaite and less altered mixed tinguaite. This dyke has an odd fishnet appearance. It consists of 85%, 1-3mm orthoclase crystals or crystal fragments surrounded by 13% interstitial mafics which give the fishnet effect and 2% interstitial sulphides. The odd texture may be due to brecciation during the emplacement of the dyke. The sulphides are pyrite ≃ arsenopyrite > chalcopyrite > molybdenite. The contacts are sharp and cut the core axis at 80°. 256.8'-286.7': MIXED TINGUAITE: lenses of unsheared plt are surrounded by sheared tinguaite at a ratio of 1:5 near the top of the interval but increasing to 1:2 near the bottom. The pl phenocrysts in the top 5' of the interval are pervasively stained with pink hematite(?) staining. This same area is weakly sericitized while the remainder of the interval is relatively fresh except for small patches of sericitized rock and local clay alteration of the pl phenocrysts. The sheared tinguaite is weakly to moderately foliated and is brecciated in places. The foliation is generally at a steep angle to the core axis except between 268.0 and 269.5', where it parallels the core axis. Disseminated pyrite forms 0.1-1/4% of the rock. The fractures are usually open and clean. Sulphides and white orthoclase are the most common fracture filling minerals and are generally found in the shallow fractures.	H37349	BKGD	10.5				100				255
	H37350		4.5						10° to 50°	1-4/1"	260
	H37351		6.0						45° to 60°	2-5/1"	265
265.7'-266.5': a series of 30-35° hairline chloritized and pyrite bearing fractures are surrounded by a moderately sericitized envelope.	H37352		4.0						70° to 90°	1/2"	270
272.3': trace of disseminated molybdenite.	H37353		5.5								275
283.0'-284.0': a patch of pale green moderately sericitized tinguaite. Alteration especially affects pl phenocrysts. 285.0': the foliation is at 70° to core axis.	H37354		6.0								280
286.7'-296.5': MODERATELY SERICITIZED MIXED TINGUAITE: the original rock prior to alteration was similar to the surrounding unaltered mixed tinguaite with a plt to sheared tinguaite ratio of 1:2. The sericitization has given the rock a mottled medium grey to pale green color. The alteration is related to a series of 0-20° fractures which are filled with sulphides, cream dolomite, calcite, sericite and minor quartz. The higher angle fractures are open and quite clean. Disseminated sulphides, dominantly pyrite comprise 1/4% of the whole rock. 287.1'-288.2': an irregular fracture running subparallel to core axis contains 10% arsenopyrite.	H37355		9.0								285
	H37356		2.5						0° to 20°	10-20/1"	290
293.3'-294.4': a series of fractures running subparallel to the core axis contain 50% arsenopyrite, 1% a submetallic black mineral (hardness 5-6), and a trace of chalcopyrite.	H37357		4.0						50° to 60°	1-3/1"	295
											300

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GAMMA PROBE LOG

DRILL HOLE LOG

PROJECT [illegible] HOLE TH15 LOCATION [illegible] CORE SIZE BQ STARTED [illegible] FINISHED [illegible]

CLAIM GROUP [illegible] LENGTH 339' DIP - AZIMUTH 225° COLLAR ELEVATION [illegible] DRILLED BY [illegible] LOGGED BY [illegible]

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (ppm U)	% RECOV	GEOLOGY	STRUCTURE (∠ to core)	HOLE DEPTH (FEET)
296.5'-338.1': MIXED TINGUAITE: weak clay altered or sericitized to fresh mixed tinguaite consisting of plt lenses in sheared tinguaite at a ratio of 1:2. The alteration is patchy and where present preferentially attacks the pl phenocrysts. The plt lenses are composed of 20-40% 2-15cm, light grey, anhedral pl phenocrysts which are partially white or pale green when altered, and 2%, 1-10mm, light grey, subhedral to euhedral, occasionally twinned, orthoclase phenocrysts in a medium grey aphanitic groundmass. The sheared tinguaite is weak to moderately foliated usually at 50-70° to core axis. Although the foliation is not intense the pl phenocrysts are generally destroyed and because of this, the groundmass of the sheared tinguaite is lighter than the plt groundmass. Finely disseminated pyrite comprises 1/4-1% of the rock. The open fractures are usually clean while the closed fractures are filled with white orthoclase and/or sulphides, predominantly pyrite and pyrrhotite. Fractures rarely exceed 1mm in width.	H37358		2.5				
	H37359		2.5				305
	H37360		3.0			0° to 20° 2-3/1'	310
315.4'-315.6': pl phenocrysts have a pinkish tint, possibly due to alteration or hematite stain. 319.0' and 320.0': hairline fractures contain a trace of molybdenite with white orthoclase and pyrrhotite.	H37361		5.0			30° to 40° 2-5/1'	315
323.5'-323.6': a 25mm medium grained mafic rich syenite dyke cutting the core at 45° is surrounded by foliated tinguaite with pink tinted pl phenocrysts. The dyke is 25% hornblende or pyroxene and 75% feldspar.	H37362	BKGD	2.0			30° to 40° 1/1'	320
335.0'-338.1': an alteration halo in the tinguaite: between 335.0' and 336.7' the pl phenocrysts exhibit patchy white clay alteration which gives way to pale green sericitic alteration and pink hematite staining of the pl phenocrysts. Very near the contact there may have been minor recrystallization of the tinguaite. There are a few shallow angle hairline fractures filled with magnetite and surrounded by red hematite stain.	H37363		2.0			60° to 70° 1/2'	325
338.1': GRADATIONAL, IRREGULAR CONTACT: at about 20°. 338.1'-344.5': SYENITE CHILL MARGIN: consists of a grey-green to pink aphanitic groundmass with 1/2-6mm black to dark green mafic phenocrysts which commonly aggregate into clusters. The grey-green is due to sericitization while the pink is hematite staining. The chill margin is frequently cut by shallow fractures filled with sulphides, cream dolomite and/or chlorite and exhibiting 1-2mm light grey secondary orthoclase alteration envelopes. Disseminated pyrrhotite forms 1/4-1% of the rock. The most common fracture sulphides are pyrite > pyrrhotite > arsenopyrite.	H37364		2.5	100			330
341.2'-341.9': a moderately sericitzed, sheared tinguaite xenolith. 342.1'-342.2': a pair of high angle fractures contain orange brown limonite. 343.7': a 2cm wide pegmatite dyke cut by the core axis at 50° contains honey brown, smoky quartz crystals up to 2cm long interground with calcite and a subeuhedral, almost black, purple fluorite crystal 18mm across. 343.7'-344.5': a strongly brecciated and sericitized pale green rock with some hematite staining of feldspars is very radioactive, especially near the pegmatite dyke. The zone also contains 5% smoky quartz, 1% pyrite, minor arsenopyrite, minor purple fluorite, weak limonite and blebs of chalcopyrite up to 1cm across totalling 1% of the rock. A 10°, 1mm wide tan dolomite filled fracture cuts across the zone.	H37365		10.5				335
	H37366		18.5			15° to 30° 3-6/1' 15° to 30° 1-3/1' 50° to 60° 1-3/1'	340
	H37367	380 BKGD	649				
344.5'-357.5': SYENITE DYKE: coarse grained slightly porphyritic syenite consisting of 90% light grey-pale green-pinkish grey, anhedral-euhedral, 2-30mm orthoclase crystals with 10% black interstitial mafics. Hairline, sulphide bearing (pyrrhotite > pyrite > arsenopyrite), chloritized fractures are common. Disseminated sulphides, basically pyrite, form 1/2-1% of the rock and are generally with the mafics.	H37368		49			15° to 30° 1-5/1'	345
349.0'-347.6': the syenite exhibits pale green sericitic alteration around a series of both steep and shallow fractures containing chlorite > pyrite = purple fluorite ≃ chalcopyrite ≃ arsenopyrite.	H37369		18.5			50° to 70° 1-3/1'	350
351.5'-352.5': weak sericitization around a network of chloritized pyrite > pyrrhotite bearing fractures.	H37370		32				355
357.5'-368.5': SERICITIZED SYENITE DYKE: rock similar to that described above has undergone moderate, pale green sericitization related to an intensely fractures stockwork filled with sericite, cream dolomite, a variety of sulphides and minor purple fluorite. Sulphides comprise approximately 5% of the whole rock with pyrite > arsenopyrite >> chalcopyrite > pyrrhotite.	H37371	BKGD	15.0			0° to 20° >100/1'	360
365.5'-384.6': SYENITE DYKE: as previously described between 344.5'-357.5'.	H37372		15.5				365
370.7'-372.7': a series of 1-3mm, 20-40° fractures are chloritized and contain pyrite > chalcopyrite ≃ pyrrhotite > quartz. They are enclosed by irregular 4-7mm tan 2° secondary orthoclase alteration envelopes. 373.8' and 374.6': 2 hairline, 70° chloritized fractures are filled with chalcopyrite. 374.6'-375.0': a 20°, 18mm wide chloritized fracture contains 60% pyrrhotite, 1% pyrite and 1% chalcopyrite.	H37373		14.0			0° to 20° 5-20/1' 30° to 40° 10-10/1' 50° to 70° 1-4/1'	370
							375

MOUNT SOPRIS GAMMA PROBE LOG

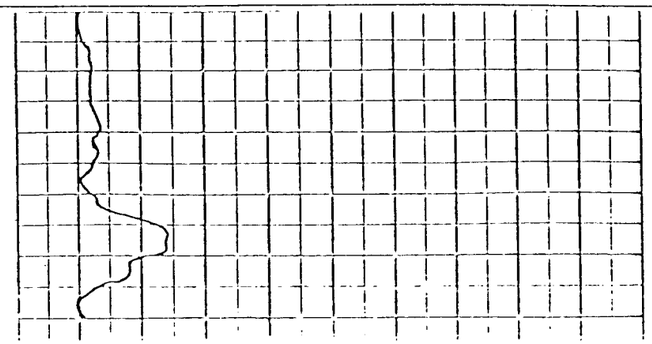
DRILL HOLE LOG

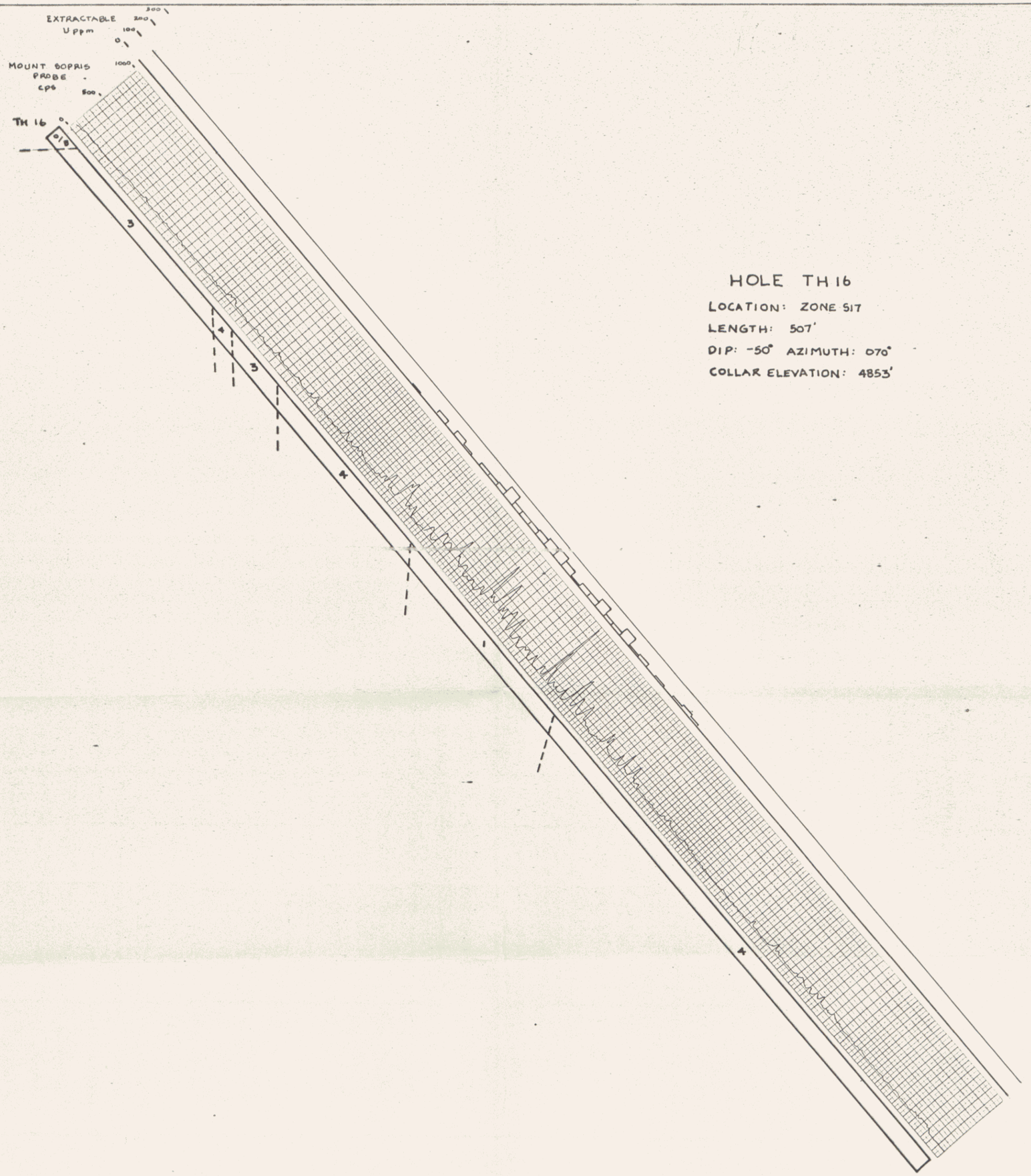
PROJECT UNV HOLE TH15 LOCATION — CORE SIZE BQ STARTED 11/[illegible]/79 FINISHED 12/[illegible]/79

CLAIM GROUP [illegible] LENGTH 392' DIP -50° AZIMUTH 230° COLLAR ELEVATION 4999' DRILLED BY [illegible] LOGGED BY [illegible]

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%eU3O8 ppm U)	GEOCHEMISTRY AND ASSAY (ppm Cu)	% RECOV	GEOLOGY	STRUCTURE (∠ to core)	HOLE DEPTH (FEET)
378.5'-379.8': a complex stockwork of chloritized fractures contain pyrrhotite> pyrite>> chalcopyrite.	H37374		12.0			+	0° to 20° 5-20%	380
384.6'-End of Hole: SERICITIZED SYENITE DYKE: consists of weakly to intensely sericitized light grey-pale green syenite and syenite stockwork. The fractures are generally chloritized hairline cracks and often are sulphide bearing with pyrite >> pyrrhotite ≅ chalcopyrite. The original rock was similar to the syenite described above. Disseminate sulphides are 1/4-1% of the rock usually with the mafics.	H37375	BKGD	12.5		100	+	30° to 40° 10-70%	385
	H37376		26			+	50° to 70° 1-4%	390
	H37377		14.5			+		392

MOUNT SOPRIS
GAMMA PROBE LOG





Association of Professional Engineers of the Yukon Territory
A. R. ARCHER
GEOLOGICAL
15 Jan/80
ENGINEER

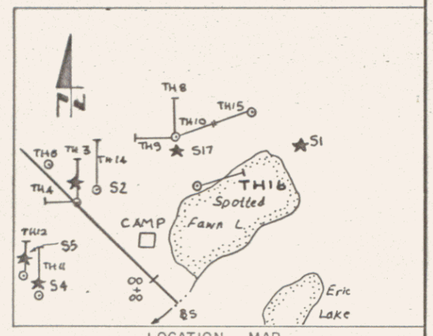
HOLE TH 16

LOCATION: ZONE 517

LENGTH: 507'

DIP: -50° AZIMUTH: 070°

COLLAR ELEVATION: 4853'



LOCATION MAP

SCALE 1:10,000

100 50 0 100 200 300 400 500

metres

1 SYENITE tan weathering, medium to coarse grained nepheline syenite often with abundant sulphides and purple fluorite

2 PSEUDOLEUCITE TINGUAITE 5-30%, 3-20mm pseudoleucite phenocrysts 1-10mm orthoclase phenocrysts in a medium grey, aphanitic groundmass

3 SHEARED TINGUAITE foliated and/or auto-brecciated tinguaite often biotite altered

4 MIXED TINGUAITE lenses or bands of pseudo-leucite phenocrysts in sheared tinguaite groundmass

5 FINE GRAINED TINGUAITE medium to dark grey tinguaite without pseudoleucite phenocrysts, some 1-3 mm orthoclase phenocrysts. Usually as dykes

6 INTERMEDIATE TINGUAITE medium grey tinguaite with pseudoleucite orthoclase phenocrysts. Pseudoleucite phenocrysts smaller than usual

B,b BIOTITE ALTERATION intense, moderate

C,c CHLORITE ALTERATION intense, moderate

——— – – – geologic contact: sharp, gradational

FIG. U-TG 31

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SECTION TH16

TOMBSTONE PROPERTY

UKON JOINT VENTURE

SCALE 1:400

4 2 0 4 8 12 16 20

metres

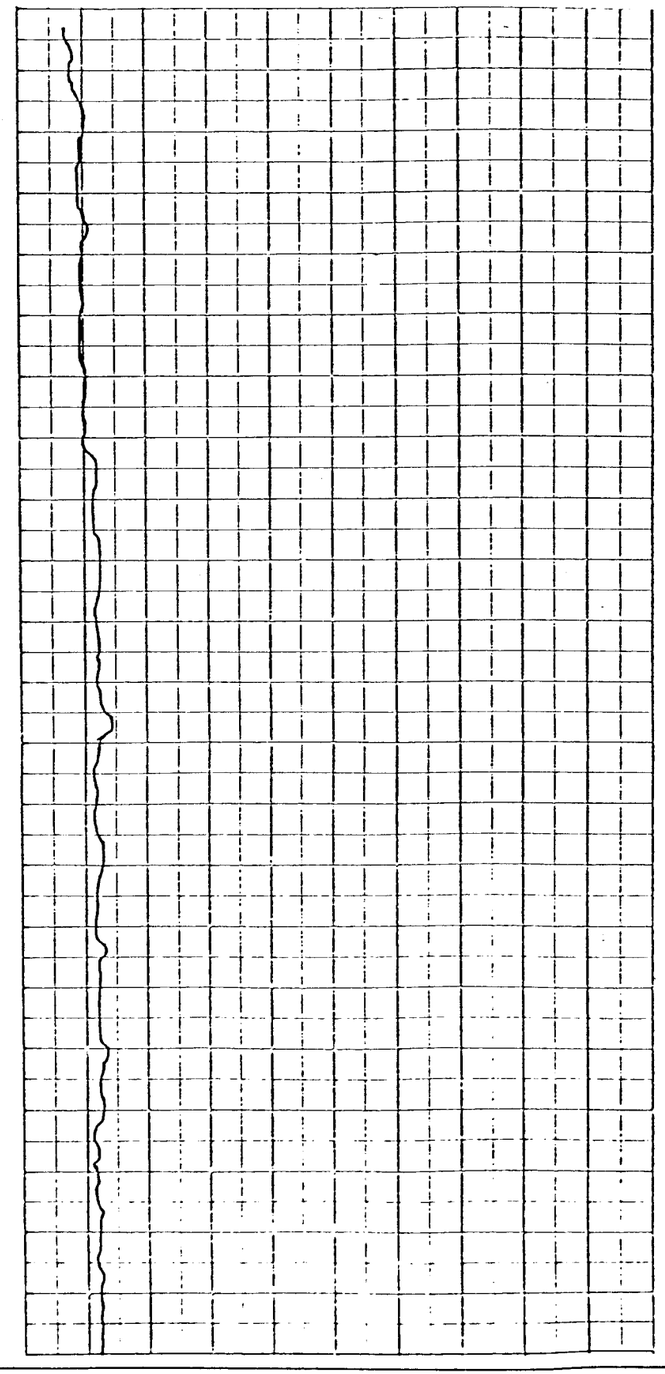
DRILL HOLE LOG

PROJECT UJV HOLE TH 16 LOCATION Zone S17 CORE SIZE BQ STARTED 16/09/79 FINISHED 19/09/79 PAGE 1 OF 7

CLAIM GROUP TOMBSTONE LENGTH 507' DIP -50° AZIMUTH 070° COLLAR ELEVATION 4853' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (U_3O_8) ppm U	ppm Cu	% RECOV	GEOLOGY	STRUCTURE ∠ to core	HOLE DEPTH (FEET)
					0			5
0-8.0': OVERBURDEN: tinguaite and syenite boulders in talus and glacial till.								10
8.0'-49.0': SHEARED TINGUAITE: consisting of strongly brecciated and weakly foliated tinguaite with 2-5%, 0.5-7mm (average, 2-3mm), white orthoclase phenocrysts and fragments in a light to medium grey, aphanitic groundmass composed of destroyed pl phenocrysts and tinguaite groundmass. The foliation where evident is generally around 40° but is subparallel to core axis near the top of the interval. There are small patches of weak biotite alteration in the lower part of the interval. Very fine disseminated pyrite averages 1/4% of the rock and is closely associated with the most mafic rich parts of the rock. Most fractures contain clay if open and white orthoclase if closed. Between 8' and 15' most fractures also are weakly to moderately coated with orangy brown limonite.	H37822		6				10° to 20° 1/4'	15
19.5': a 30°, 1mm, white orthoclase filled fracture contains a trace of molybdenite.	H37823		4.5				30° to 40° 3-5/1'	
	H37824		5.5				30° to 40° 1/2'	20
	H37825		4					25
30.6': another 30°, 1mm white orthoclase filled fracture contains a trace of molybdenite.	H37826	BKGD	4		100			30
39.1'-40.0': a 20cm porphyritic SYENITE dyke with sharp 25° contacts. The dyke consists of 20%, 3-20mm light grey, subhedral, orthoclase phenocrysts in a fine grained groundmass containing 70% orthoclase and 30% black mafics (amphiboles or pyroxene). The dyke also contains minor disseminated pyrrhotite and hairline 30° fractures filled with chlorite > calcite > pyrrhotite and weakly stained with hematite.	H37827		4.5				30° to 40° 2-3/1'	35
	H37828		5				30° to 40° 1/2'	40
49.0': GRADATIONAL CONTACT: arbitrary division.								45
49.0'-92.4': WEAKLY SHEARED AND ALTERED TINGUAITE: exhibits weak foliation and less intense brecciation but biotite alteration is slightly more common. The rock consists of 2-3%, 0.5-7mm, white, subhedral orthoclase phenocrysts, 50% are up to 3cm wide, fragments of plt and plt groundmass and 10% pl phenocrysts and altered phenocryst ghosts in a light grey groundmass dominantly comprised of stressed pl phenocrysts. Foliation is generally 40-60° to core axis. The rock contains 1/4-1% disseminated pyrite. The open fractures contain clays ± weak limonite while the closed fractures are filled with white feldspars.	H37829		3					
	H37830		5				10° to 20° 4/1'	50
							30° to 40° 1-3/1'	
57.1'-57.6': a 12cm porphyritic dyke with sharp 55° contacts which parallel the foliaton. This is generally similar to the 39.1-40.0' dyke except that it contains 1% disseminated pyrrhotite and its contacts have been invaded by 5cm leucocratic syenite dykelets as described below.	H37831		5.5				30° to 40° 1/2'	55
58.0'-58.3': a 4cm, 30° leucocratic syenite dykelet comprised of 95% orthoclase and 5% black mafic.								
	H37832		4.5				30° to 40° 1-1/1'	60
	H37833		3.5				30° to 40° 1/3'	65
	H37834		4				60° to 80° 1/3'	70
								75

MOUNT SOPRIS GAMMA PROBE LOG



DRILL HOLE LOG

PROJECT UJV HOLE TH16 LOCATION Zone 517 CORE SIZE BQ STARTED 16/09/79 FINISHED 19/09/79 PAGE 2 OF 7

CLAIM GROUP TOMBSTONE LENGTH 507' DIP -50° AZIMUTH 070° COLLAR ELEVATION 4853' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8) ppm U	ppm Cu			% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)	MOUNT SOPRIS GAMMA PROBE LOG
	H37835		3									
82.5': a 1cm, 50° fracture is filled with white orthoclase >> pyrite > mafics.	H37836		3						30° to 40°	1-3/4'	80	
85.0': a 4cm, 60° leucocratic dykelet contains orthoclase > blue feldspathoid >> mafic > pyrite.									30° to 40°	1/3'		
88.2'-88.4': a 4cm, 25°, medium to coarse grained leucocratic syenite consisting of 95% white orthoclase and 5% black mafics with only minor pyrite. 89.7'-90.1': a 25cm, fine grained leucocratic syenite dyke with 40° contacts parallels the foliation in the surrounding rock.. It has a modal distribution similar to the 88.2-88.4' dyke.	H37837		6.5						50° to 60°	1/3'	85	
90.3': a 5cm x 3cm mafic rich lense in the sheared tinguaite appears to consist 50% of a black mafic and 50% of light grey orthoclase.	H37838		8								90	
92.4'-103.8': MIXED TINGUAITE: consisting of 2-15cm lenses of plt surrounded by sheared tinguaite at a ratio of 1:4. The plt consists of 10-20%, 2-10mm, anhedral, white light grey pl phenocrysts and <1%, 1-6mm, white, subhedral orthoclase phenocrysts in a medium grey aphanitic groundmass. The pl phenocrysts occasionally contain up to 10% blue feldspathoids. Disseminated pyrite forms 1/2-1% of the rock. The sheared tinguaite is weakly brecciated, foliated and altered producing a somewhat mottled medium and light grey rock similar to the sheared tinguaite in the above interval. Disseminated pyrite averages 1% of the sheared tinguaite. The fractures are generally filled with white orthoclase.	H37839		4						10° to 20°	1/4'	95	
98.9'-99.4': a 12cm wide composite SYENITE DYKE, the upper half consisting of medium grained syenite with 35% black mafics, 64% light grey orthoclase and 1% pyrrhotite and the lower half consisting of porphyritic syenite with 60%, 5-40mm long, prismatic, euhedral light grey orthoclase phenocrysts in a groundmass of 70% black mafics and 30% light grey orthoclase. The upper part is probably the chilled equivalent of the lower portion.	H37840		4.5						30° to 40°	1/12'	100	
103.7'-130.0': WEAKLY SHEARED AND ALTERED TINGUAITE: as described for the interval of 49.0-92.4'. The rock averages 1% disseminated pyrite.							100					
107.1'-107.8': a 20cm, fine-medium grained slightly porphyritic syenite dyke consists 20% of black mafics, 3% pyrite > pyrrhotite >> arsenopyrite and 77% light grey orthoclase. The dyke contains a few 1 cm long light grey orthoclase phenocrysts. It has irregular 90° contacts. 112.0'-112.5': a 16cm porphyritic syenite dyke with light grey to grey green orthoclase phenocrysts up to 4cm long in a groundmass composed of 60% light grey orthoclase, 39% black mafics and 1% pyrite. The contacts parallel the foliation at 60° to core axis. 112.8'-113.3': a 17mm, leucocratic syenite dyke cuts the core axis at 20°.	H37841	BKGD	4								105	
115.5'-115.7': a 5cm porphyritic syenite dyke contains light grey to grey green orthoclase phenocrysts up to 3cm long. The dyke is distinguished by a large well formed carlsbad twin and its groundmass which contains only 2% mafics but 25% blue feldspathoids. 116.3'-116.5': a 3cm, 40° medium grained leucocratic syenite dyke is symmetrically zoned with 5mm light grey orthoclase margin and a core composed of 70% orthoclase, 10% black mafics and 20% of a medium grey, greasy mineral (nepheline?). 118.0'-119.8': a 40° and a 50°, 5mm fine grained leucocratic syenite dyke.	H37842		5.5								110	
	H37843		7.5						30° to 40°	1/1-2'	115	
	H37844		2								120	
	H37845		4.5								125	
130.0'-150.2': MIXED TINGUAITE: with a plt to sheared tinguaite ratio of 1:4 to 1:6. Generally the rock is as described between 92.4-103.7'. An unusual texture is observed occasionally in 5-10cm patches. In these patches the rock exhibits wormy 1-4cm long blebs of mafics which are themselves composed 25% of pyrite. The best example is at 140.0'. They do not appear to be an alteration. Disseminated pyrite still averages 1% of the rock.	H37846		2								130	
132.0'-132.8': a 20cm, medium grained, slightly porphyritic syenite dyke composed of 70% light grey orthoclase, 10% medium grey nepheline, and 20% mafics often in aggregates. There is also a 2cm long, carlsbad twinned orthoclase phenocryst.											135	
138.0'-138.1': a 7cm wide, 35° leucocratic syenite dyke. 138.3'-138.4' and 138.6'-138.7': 2, 2cm wide leucocratic dykes composed 90% of light grey orthoclase, 5% of medium grey nepheline and 5% of black mafics with minor pyrite, cut the core axis at 40° and parallel the tinguaite foliation.	H37847		3.5						30° to 40°	1/1-3'	140	
143.4'-143.5': a 3cm fine to medium grained slightly porphyritic dyke composed 80% of orthoclase and 20% of black mafics cuts the core axis at 50°.	H37848		2								145	
148.1'-148.2': a 1cm, leucocratic syenite dykelet containing 15% blue feldspathoid cuts the core axis at 30° which is parallel to the core axis.	H37849		1.5								150	

DRILL HOLE LOG

PROJECT UJV HOLE TH16 LOCATION Zone 517 CORE SIZE BQ STARTED 16/09/79 FINISHED 19/09/79

CLAIM GROUP TOMBSTONE LENGTH 507' DIP -50° AZIMUTH 070° COLLAR ELEVATION 4353' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8) ppm U	ppm Cu	ppm Mo		% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)	MOUNT SOPRIS GAMMA PROBE LOG
150.2'-151.4': MYLONITE ZONE: a medium grey strongly foliated, somewhat grainy, aphanitic rock with sharp but slightly irregular 40° contacts.	H37850		1.5									
151.4'-175.0': MIXED TINGUAITE: generally as previously described but with a very low plt to sheared tinguaite ratio of 1:5 to 1:8. The sheared tinguaite is still poorly developed and lacks strong pervasive foliaton or brecciation. Disseminated sulphides average 1/4% of the rock. Most fractures are coated or filled with white orthoclase. 156.6'-156.8' and 157.0'-157.3': 2 porphyritic syenite dykes, containing light grey orthoclase phenocrysts up to 4cm long and composed of 80% orthoclase and 20% interstitial mafics, cut the core axis at 60°.	H37851		8								155	
158.7'-158.9': a 6cm wide medium grained leucocratic syenite dyke containing 1% pyrrhotite cuts the core axis at 50°. 160.0'-160.5': a 7cm wide porphyritic syenite dyke similar to the 156.6-156.8' dyke, but with grey mafics, cuts the core axis at 30°, which parallels the foliation in the tinguaite.	H37852		9.5						30° to 40°	2-3/4'	160	
162.2'-162.4': a 9mm, coarse grained syenite dyke composed of 75% light grey orthoclase, 20% medium grey nepheline and 5% black mafics. 164.2'-164.9': a multiphase syenite dyke containing porphyritic and leucocratic phases cuts the core axis at 50°. The leucocratic dykes appear to postdate the porphyritic phase. 172.0'-172.3': a hairline 1mm 20° fracture is filled with pyrrhotite > calcite.	H37853		4								165	
	H37854		4.5								170	
175.0'-207.9': WEAKLY ALTERED MIXED TINGUAITE: the rock is highly variable in appearance due to weak shearing and alteration probably related to the numerous syenite dykes which intrude it. It is probable that the tinguaite is in places slightly recrystallized. The rock has a generally mottled appearance largely due to the shearing of the pl phenocrysts which often lead to their incorporation into the groundmass. The color of the rock is usually a mixture of light and medium greys but also includes whites (clay alteration?), tan and pale greens (sericitized) and black and white salt and pepper designs (biotite alteration?). Most of the alteration affects the pl phenocrysts in the plt and the pl phenocrysts component of the groundmass in the sheared tinguaite. Although foliation is weak, it is the dominant texture in the sheared tinguaite. The foliation is erratic often whispy in appearance. Disseminated pyrite comprises 1/4-1% of the rock and is usually highest near the syenite dykes.	H37855		28		3						175	
	H37856		3.5		23		100				180	
177.3'-177.8': an 11cm fine to medium grained syenite dyke composed of 90% orthoclase, 9% mafics and 1% pyrrhotite cuts the core axis at 50°. 178.7'-180.7': a porphyritic syenite dyke with 65% light grey orthoclase phenocrysts up to 4.5cm long in a groundmass composed 60% of black mafics and 40% of orthoclase. The lower part of the dyke contains up to 2% disseminated sulphides. A number of hairline to 1mm fractures in the dyke contain purple fluorite > pyrrhotite > chalcopyrite = molybdenite. The contacts are at 50° to core axis.	H37857	BKGD	34		38				30° to 40°	2-4/1'	185	
186.0'-188.5': a coarse grained, in part pegmatitic, pale green, sericitized syenite dyke cuts the core axis at 50° and moderately sericitizes the surrounding tinguaite. The dyke contains minor purple fluorite and pyrite and traces of molybdenite and chalcopyrite. This dyke and the one below are further distinguished by large mica crystals of sericite, biotite and chlorite.	H37858		12.5		>250				60° to 70°	1-3/1'	190	
189.2'-190.3': another pegmatitic syenite dyke; however this dyke is unaltered and runs sub-parallel to the core axis. Its true width is unknown. It contains 90% pinkish grey orthoclase crystals, 10% biotite and chlorite (after biotite?) crystals up to 3cm long and traces of pyrrhotite, purple fluorite, molybdenite and chalcopyrite.	H37859		2.5		25						195	
192.3'-194.6': a coarse grained to pegmatitic syenite dyke with the upper half pegmatitic and the lower half coarse grained. It contains 90% orthoclase, 5% biotite and chlorite, and 5% pyrrhotite with a trace of chalcopyrite. Its contacts cut the core axis at 40°. 202.7'-204.4': a medium to coarse grained leucocratic syenite dyke, composed of 98% tan orthoclase and 2% chloritized, interstitial mafics, cuts the core axis at 30°.	H37860		15.5		8						200	
207.9'-290.8': SYENITE DYKE: most of the dyke is composed of porphyritic syenite with 50-60% 5-45mm prismatic and tabular, subhedral to euhedral, light grey to pinkish grey, occasional carlsbad twinned, orthoclase phenocrysts in a fine grained groundmass containing 30-70% black mafics and/or chlorite and 30-70% light grey to pink orthoclase. Disseminated sulphides are rare. The fracture sulphides are dominantly pyrrhotite and are described in more detail below. Purple fluorite and red hematite stains are common but are minor. The dyke is cut by a number of later leucocratic syenite dykes and their occurrence is notable. There is a 30cm chilled margin on the upper contact with a bulk composition similar to the syenite as a whole: 90% orthoclase and 10% mafics.	H37861		21		2						205	
207.9'-208.7': a fine to medium grained chilled margin as described above containing 1/2% pyrrhotite. 208.7'-208.8': a 4cm wide tinguaite xenolith. 208.9'-210.1': a medium grained leucocratic syenite dyke with highly irregular, ~30° contacts. It is composed of 95% pink and light grey orthoclase, 5% micas, chlorite > biotite > sericite and a trace of pyrrhotite.	H37862		30		1						210	
	H37863		66		1				30° to 40°	1/1'	215	
212.0'-213.5': another leucocratic syenite dyke, as above but with a few 2cm wide pegmatite bands, has irregular 20-30° contacts. 214.0'-217.1': yet another medium grained leucocratic syenite dyke with a modal distribution as above but with fairly sharp 40° contacts. This dyke contains a 30°, 3mm fracture which is filled with 50% pyrrhotite and 50% purple fluorite and a trace of sericite at 214.7'.	H37864		23		30				40° to 50°	1-2/1'	220	
											225	

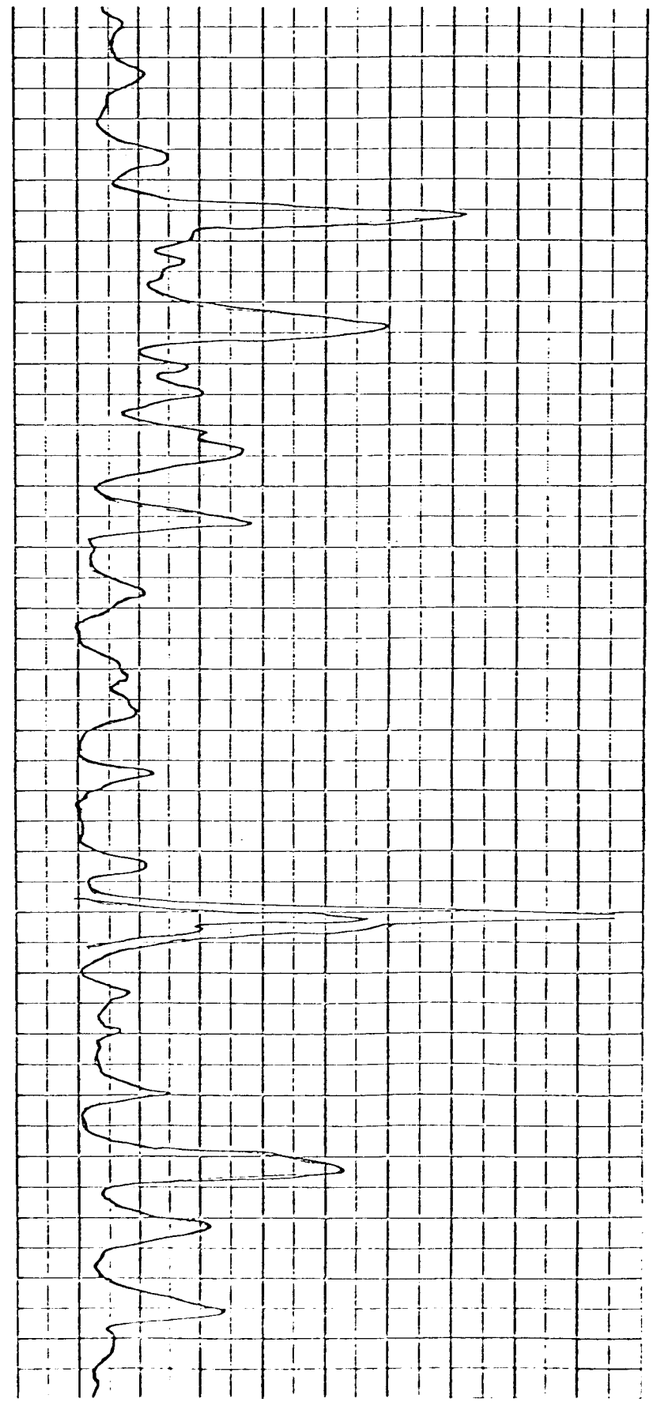
DRILL HOLE LOG

PROJECT UJV HOLE TH16 LOCATION Zone 517 CORE SIZE BQ STARTED 16/09/79 FINISHED 19/09/79 PAGE 4 OF 7

CLAIM GROUP TOMBSTONE LENGTH 507' DIP -50° AZIMUTH 070° COLLAR ELEVATION 4853' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U_3O_8) ppm U	ppm Cu	ppm Mo	% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
227.5': the syenite contains a few 3mm blebs of a lime green mineral, hardness about 4.	H37365		25		1		+			
236.9': the syenite has been sheared and possibly mylonitized to produce a fine grained rock with bands of chlorite containing 10% pyrrhotite and minor purple fluorite. A 2mm fracture at 236.8' contains yellow-orange limonite and is weakly radioactive, possibly a uranium secondary.	H37366	BKGD	32		1		+	30° to 40°	1/1'	230
238.0'-239.0': a 7cm wide band or irregular fracture running subparallel to the core axis contains 30% pyrrhotite, 1% chalcopyrite and minor smoky (black) quartz.	H37367		44		1		+	40° to 50°	1-2/1'	235
241.0'-243.2': another 7cm wide band or fracture running subparallel to the core axis contains 10-30% pyrrhotite, abundant green chlorite and mafic and up to 10% purple fluorite. Some of the narrow high angle fractures also contain purple fluorite and/or pyrrhotite.	H37368	40/BKGD	47		1		+			240
245.4' and 246.1': a pair of 3-8mm wide fractures contain abundant chlorite, 2-3% pyrrhotite, 1% purple fluorite and minor chalcopyrite; in addition, the 246.1 fracture contains a 5cm wide bleb of a black mineral with a dark brown streak (hardness about 5) - wolframite?	H37369	10/BKGD	78		10		+			245
246.5'-247.9': a hairline to 2mm fracture running subparallel to the core axis contains abundant pyrrhotite and purple fluorite.		20/BKGD								
252.3'-253.0': a small fracture zone at 30° to core axis contains 10% pyrrhotite, 1% chalcopyrite and minor molybdenite.	H37370		37		87		+	0° to 30°	2-5/1'	250
255.8'-258.8': a sheared tinguaite xenolith with 80° contacts.										255
260.9'-261.4': a 15cm, 30° fracture zone contains 5% pyrrhotite, minor chalcopyrite and purple fluorite	H37371		9.5		1	100	+	40° to 60°	1/2'	
262.2': a 3cm, 60° fracture is filled with dark green chlorite, black mafics and 10% pyrrhotite.										260
262.8'-264.0': a number of hairline to 1cm fractures contain 5% pyrrhotite. Their attitudes are at both 20° and 60°.	H37372	BKGD	29		1		+			
266.7'-267.1': a series of 2-5mm chlorite> pyrrhotite filled fractures cut the core axis at angles between 20-45°.										265
267.6'-270.3': a moderately sericitized tinguaite xenolith.	H37373		29		1		+			
267.8'-268.2': a 3cm, 20° fracture contains 60% pale purple fluorite, 39% pyrrhotite and 1% arsenopyrite.										270
268.5'-269.5': a hairline fracture running subparallel to the core axis contains chlorite >> chalcopyrite > pyrrhotite > purple fluorite.										
269.5'-270.1': a 5cm wide fracture cutting the core axis at 10° contains purple fluorite >> chalcopyrite > arsenopyrite.										275
272.6' and 273.1': 2, 2cm wide 30° chlorite>pyrrhotite filled fractures.	H37374		58		155		+			
273.3'-273.7': an 11cm wide strongly sericitized fracture zone contains 5% pyrrhotite, 1% molybdenite throughout.		50/BKGD								
274.5'-275.0': a series of shallow angle hairline fractures again contain pyrrhotite and molybdenite (about 20cm of 0.1% molybdenite).										280
275.0'-275.6': trace of disseminated molybdenite.	H37375		24		79		+			
278.1': a 75°, 5cm wide fracture contains 5% pyrrhotite and 5% molybdenite.										
280.0'-288.0': the syenite is weakly to moderately sericitized.										285
280.0': a 2cm wide 45° fracture contains 1% molybdenite and 10% pyrrhotite.	H37376		22		4		+			
281.0'-281.2': a 30° 1cm wide fracture contains 5% pyrrhotite.										
281.9'-282.0': a 25°, 1cm wide fracture contains 1% pyrrhotite and a trace of molybdenite.										290
285.4'-285.6': a pair of weakly hematite stained fractures contain 10% purple fluorite and a trace of arsenopyrite.	H37377	BKGD	62		165		+			
287.4'-287.6': a 6cm, possibly incompletely cored, strongly sericitized dyke? contains 1% pyrrhotite, 1% molybdenite and 1% purple fluorite with a trace of chalcopyrite.										
287.9'-280.0': a 30°, 1cm wide fracture contains 3% pyrrhotite and a trace of purple fluorite and molybdenite.										
288.5'-288.7': a 30°, 1cm wide fracture contains 4% pyrrhotite and a trace of chalcopyrite and purple fluorite.										
290.8': SHARP 70° CONTACT: with pink alteration of pl phenocrysts for 10cm from contact.	H37378		14.5		8			30° to 40°	1-3/1'	295
290.8': MIXED TINGUAITE: with a plt to sheared tinguaite ratio of 1:2. The plt lenses consist of 30% anhedral, 2-12cm, white pl phenocrysts occasionally with minor blue feldspathoid, 1-3% 1-8mm, subhedral, white to light grey orthoclase phenocrysts, and 1%, 0.5-2mm mafic phenocrysts in a medium grey groundmass. The sheared tinguaite is weakly foliated and brecciated, mottled light and dark grey with the pl phenocrysts generally being absorbed into the groundmass. The shearing has little effect on the orthoclase phenocrysts. Weak biotite alteration is present locally. Disseminated sulphides are present in only minor amounts. Most fractures are relatively clean if open or filled with white orthoclase.	H37379		15.5		10			50° to 70°	1/2'	300

MOUNT SOPRIS GAMMA PROBE LOG



DRILL HOLE LOG

PROJECT UJV HOLE TH 16 LOCATION Zone 517 CORE SIZE BQ STARTED 16/09/79 FINISHED 19/09/79 PAGE 5 OF 7

CLAIM GROUP TOMBSTONE LENGTH 507' DIP -50° AZIMUTH 070° COLLAR ELEVATION 4353' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (%U3O8 ppm U)	ppm Cu	ppm Mo		% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)	MOUNT SOPRIS GAMMA PROBE LOG
295.4'-302.0': moderate sericitization of tinguaite consisting of pale green alteration of the pl phenocrysts and some groundmass in the strongest parts and grading outward to a pink alteration of the pl phenocrysts in the less intense parts. Appears to be related to a number of 1mm chlorite, pyrrhotite, arsenopyrite and minor molybdenite bearing fractures which are often weakly hematite stained and to a few 5-20mm leucocratic syenite dykelets.	H37880		4.5		21						305	
	H37881		11.5								310	
309.2': a 4mm sericitized leucocratic syenite dyke cuts the core axis at 45°. 310.7': a hairline 40°, pyrrhotite filled fracture.	H37882		3.5									
315.0' and 316.4': 2, 1cm and 4cm medium grained syenite dykes containing 90% orthoclase and 10% black mafics.									30° to 40°	1-3/4'	315	
	H37883		13.5						30° to 40°	1/2'		
324.3'-324.5': a 15mm leucocratic syenite dyke with 2% pyrrhotite parallels the foliation in the tinguaite.	H37884		15.5						50° to 70°	1/2'	320	
											325	
327.8'-328.3': a 15cm very dark, 25% mafic and chloritized mafic fragment, possibly undigested diabase.	H37885		12.5									
	H37886		3								330	
		BKGD					100				335	
336.3'-336.6': a 20°, 2mm leucocratic dykelet contains 2% pyrrhotite. 337.0': foliation is well developed at 45° to core axis and is fairly consistent for the next 10'.	H37887		2.5									
343.4': another mafic rich fragment. This one is 3cm wide and contains a few 5-7mm orthoclase phenocrysts.	H37888		3								340	
345.0'-353.0': there is slightly more biotite alteration than is usual in this interval but it is still weak. 346.5'-346.7': a 14mm leucocratic syenite dyke cuts the core axis at 45°.	H37889		4.5								345	
351.5'-351.3': a 5cm wide fragment in the sheared tinguaite contains abundant 1-2mm orthoclase phenocrysts in a medium grey groundmass.	H37890								30° to 40°	1/2'	350	
	H37891								60° to 70°	1/8'	355	
	H37892										360	
											365	
369.5'-369.7': a 1mm, 30° fracture is filled with blue feldspathoid.	H37893											
	H37894										370	
											375	

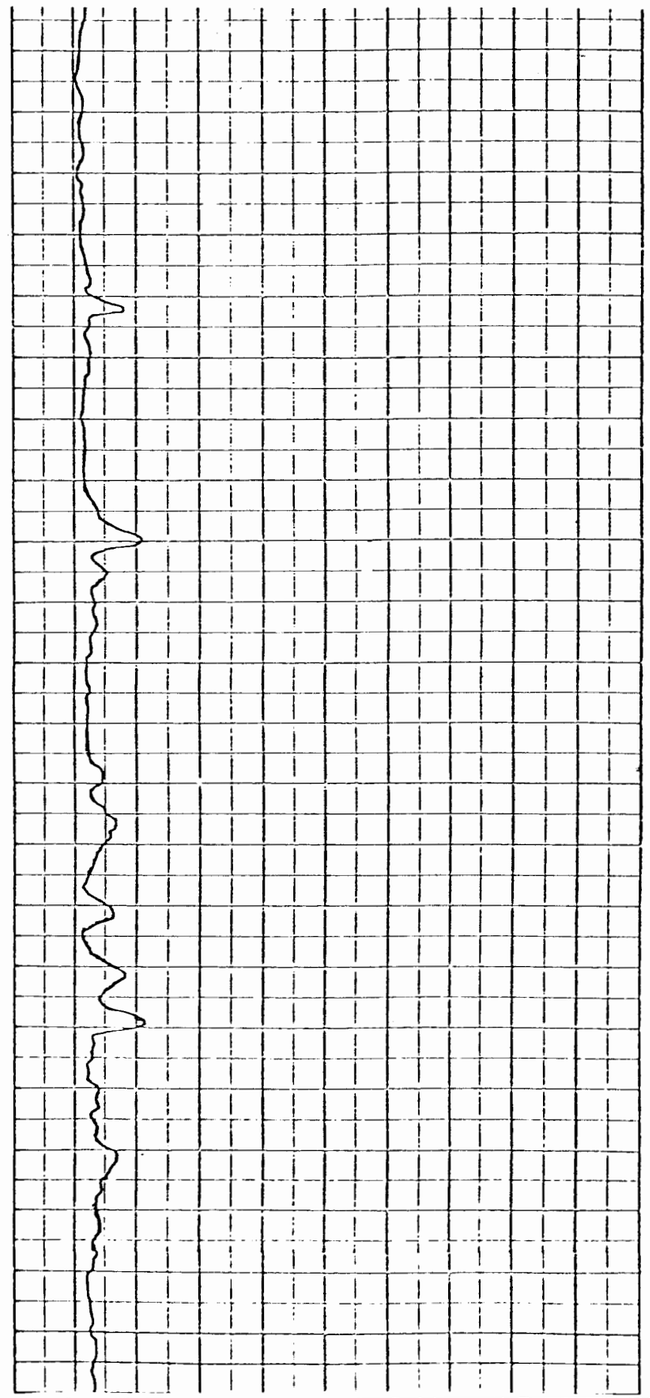
DRILL HOLE LOG

PROJECT UJV HOLE TH 16 LOCATION Zone S17 CORE SIZE BQ STARTED 16/09/79 FINISHED 19/09/79

CLAIM GROUP TOMBSTONE LENGTH 507' DIP -50° AZIMUTH 070° COLLAR ELEVATION 4353' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY ($\%U_3O_8$) ppm U	ppm Cu			% RECOV	GEOLOGY	STRUCTURE ∠ to core		HOLE DEPTH (FEET)
379.0': the foliation is well developed at 40° and often results in the flattening of pl phenocrysts in the sheared tinguaite. The plt to sheared tinguaite ratio is a little higher than 2:3. Blue feldspathoids are common in the pl phenocrysts of the plt lenses. Fracture and disseminated sulphides are minor to rare. Most fractures are filled with white orthoclase.	H37895		2								
383.5' and 384.0': 2, 1mm, 20° fractures are filled with blue feldspathoids.	H37896		2								380
	H37897		1.5								385
	H37898		2.5								390
392.0'-402.0': brecciation > foliation but rock is otherwise unchanged. 403.5'-403.6': a 7mm leucocratic syenite dyke cuts the core axis at 35° which is parallel to the strong foliation in the surrounding tinguaite.	H37899		2.5								395
408.7'-409.3': orthoclase phenocrysts are more abundant than usual in the plt comprising 5-10% of the rock.	H37900		1						0° to 20°	1/1'	400
	H37901		1.5						30° to 40°	1-2/1'	405
	H37902	BKGD	0.5				100		50° to 60°	1/6'	410
411.0'-413.5': foliation in the sheared tinguaite has flattened slightly to 25° and is best shown by the flattened pl phenocrysts. 414.3'-415.1': moderate biotite alteration of the pl phenocrysts in the sheared tinguaite as before. The groundmass to the sheared tinguaite is a lighter grey than in the plt. Foliation is absent in this interval.	H37903		1.5								415
419.1-422.0': the rock contains 1-3% pyrrhotite often associated with whisps of mafics. 423.7'-423.8': a 5mm sericitized syenite dykelet cuts the core axis at 25° which is parallel to a weak foliation in the tinguaite.	H37904		4.5								420
427.7'-428.2': 4, 1cm long pyrrhotite rich blebs contain 25% pyrrhotite while the remainder of the rock is relatively sulphide deficient. 429.7'-430.0': a 1cm wide pyrrhotite rich band (7% of the rock) parallels a 25° contact between sheared tinguaite and a plt lense.	H37905		3								425
431.6'-431.7': a 30° fracture is weakly stained with limonite. The sheared tinguaite around the fracture again contains 1-3% pyrrhotite in whisps. 431.3'-431.4': a 4mm sericitized leucocratic syenite dykelet cuts the core axis at 30°. 434.4'-434.8': a 4mm sericitized leucocratic syenite dykelet has been convolutely folded. Its fold axes are not consistent.	H37906		6.5								430
438.0'-438.6': moderate biotite alteration of pl phenocrysts in the sheared tinguaite.	H37907		3.5								435
440.0'-495.0': MIXED TINGUAITE: with a plt to sheared tinguaite ratio of 1:3. The plt is variable in composition with 5-20%, 1-12mm, anhedral, light grey, sometimes cracked and often slightly flattened, pl phenocrysts, 1-5%, white, anhedral-subhedral, 1-8mm, orthoclase phenocrysts and 1% 0.5-3mm, anhedral black mafic phenocrysts in a medium grey groundmass. The sheared tinguaite usually has a lighter grey groundmass with only a few orthoclase fragments remaining. In the most intensely sheared portions even these orthoclase fragments become streaked out and obscured. Generally foliation ranges from weak to moderate; locally it is strong. Brecciation is weak to moderate. Biotite alteration ranges from weak to moderate in places. Disseminated sulphides are a minor component of the rock. Whispy bands of mafic are common but rarely contain sulphides over this interval. Fracture density is low. Most fractures are weakly coated with clay or filled with white orthoclase.	H37908		4.5						10° to 20°	1/4'	440
	H37909		2						30° to 40°	1-2/1'	445
											450

MOUNT SOPRIS GAMMA PROBE LOG



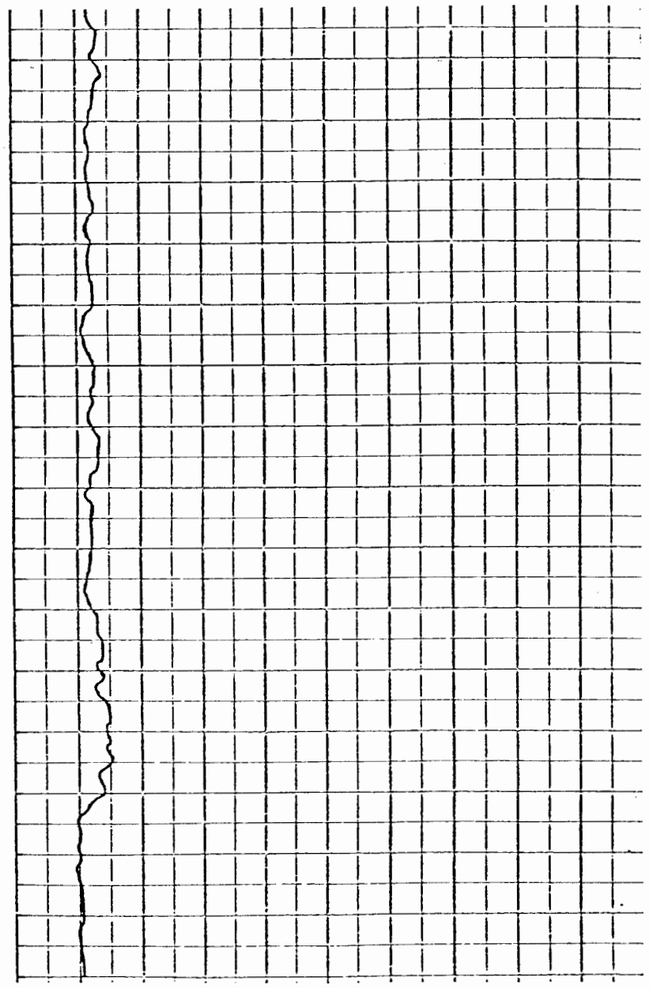
DRILL HOLE LOG

PROJECT UJV HOLE TH16 LOCATION Zone S17 CORE SIZE BQ STARTED 16/09/79 FINISHED 19/09/79 PAGE 7 OF 7

CLAIM GROUP TOMBSTONE LENGTH 507' DIP -50° AZIMUTH 070° COLLAR ELEVATION 4853' DRILLED BY CARON LOGGED BY EATON

GEOLOGICAL DESCRIPTION	SAMPLE NUMBER	RADIO-ACTIVITY IN CPS BGS-ISL	GEOCHEMISTRY AND ASSAY (U_3O_8) ppm U	ppm Cu	% RECOV	GEOLOGY	STRUCTURE α to core	HOLE DEPTH (FEET)
	H37910		1					455
	H37911		1				10° to 20° 1/4"	
	H37912		0.5				30° to 40° 1-2 1/2"	460
	H37913		1					465
473.7'-473.9': a 30° and a 70°, 1mm fracture are filled with blue feldspathoids.	H37914	BKGD	2		100			470
	H37915		1.5					475
482.3': minor pyrrhotite in a white orthoclase filled hairline 70° fracture.	H37916		2				10° to 20° 1/6"	480
	H37917		2.5				30° to 40° 1/3"	485
	H37918		2.5				60° to 70° 1/2"	490
495.0'-507.0': BIOTITE ALTERED MIXED TINGUAITE: the upper 2' are fine grained, light grey sheared tinguaite with 15% <1mm mafic blebs. Below this the rock is a mottled light grey-medium grey groundmass with 5% 1-17mm light grey pl phenocrysts and 10%, 1-4mm black mafic phenocrysts containing up to 10% disseminated pyrrhotite. The black phenocrysts are actually strongly biotite altered plt phenocrysts. Disseminated pyrite is rare except in the biotite rich rocks.	H37919		2.5					495
	H37920		4.5					500
								505
								507

MOUNT SOPRIS GAMMA PROBE LOG



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TOMBSTONE AREA -116-B6+7

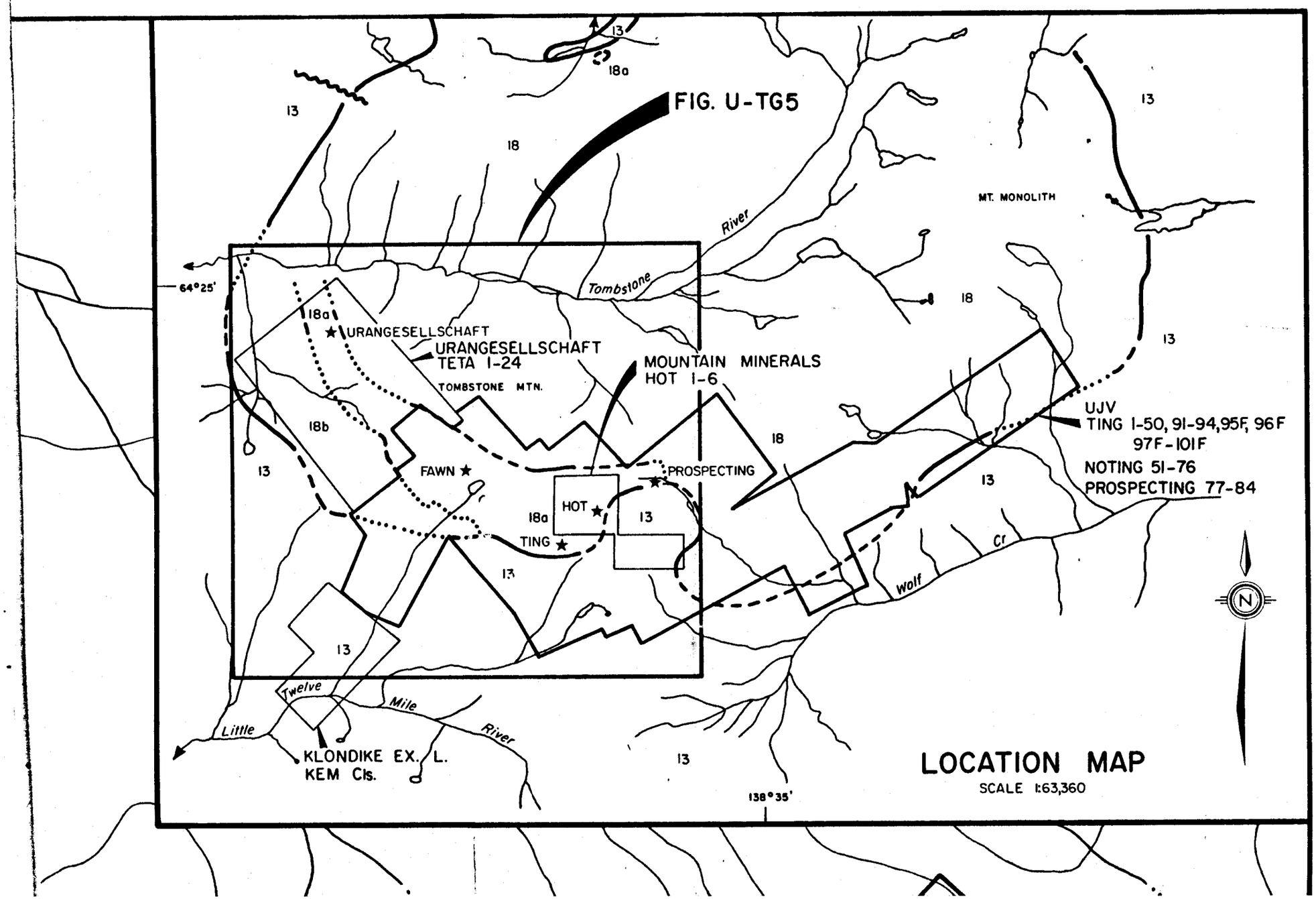


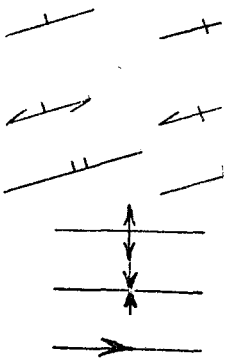
FIG. U-TG5
18a
13
18
MT. MONOLITH
River
Tombstone
64°25'
18a
URANGESELLSCHAFT
URANGESELLSCHAFT
TETA 1-24
TOMBSTONE MTN.
MOUNTAIN MINERALS
HOT 1-6
18b
FAWN
PROSPECTING
HOT
TING
UJV
TING 1-50, 91-94,95F, 96F
97F-101F
NOTING 51-76
PROSPECTING 77-84
Wolf
Cr
Twelve
Mile
Little
River
KLONDIKE EX. L.
KEM Cls.
138°35'
LOCATION MAP
SCALE 1:63,360
N

Interbedded black chert and argillite; minor chert pebble conglomerate

Bedding (inclined, vertical)

Foliation (primary in granitic rocks; inclined, vertical)

Joints (inclined, vertical)



Anticlinal axis

Synclinal axis

Plunge of fold axis

Geological boundry (defined, approximate, assumed)

Foliation, primary (in cross sections)

Joints (in cross section)

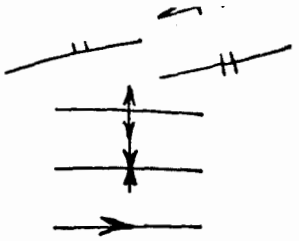
Geology by M. B. Lambert, 1964

Topography modified after advanced print of 116 B/7, Department of Mines and Technical Surveys, 1963.

Approximate magnetic declination 33° 27' East.

Drawn by M. B. Lambert

Joints (inclined, vertical)



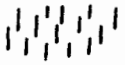
Anticlinal axis

Synclinal axis

Plunge of fold axis

Geological boundry (defined, approximate, assumed)

Foliation, primary (in cross sections)



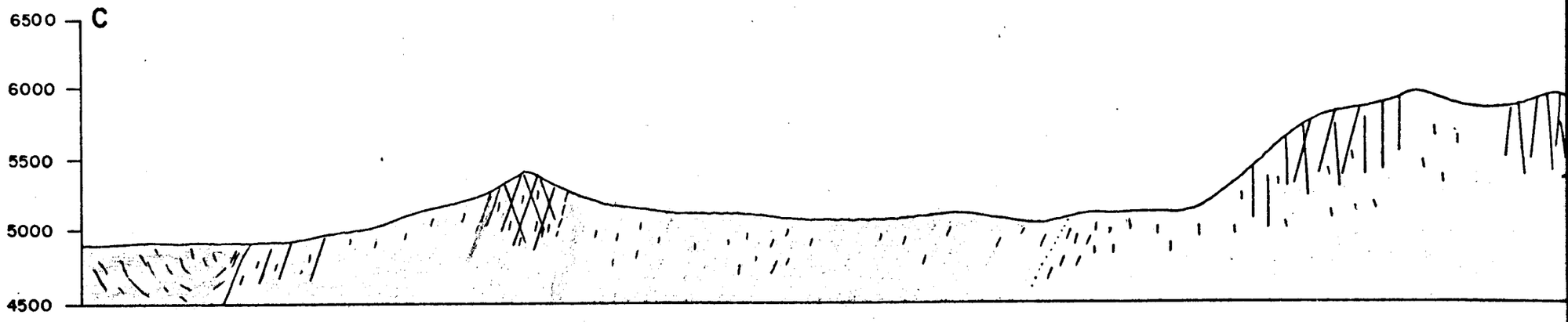
Joints (in cross section)

Geology by M. B. Lambert, 1964

Topography modified after advanced print of 116 B/7, Department of Mines and Technical Surveys, 1963.

Approximate magnetic declination 33° 27' East.

Drawn by M. B. Lambert


C
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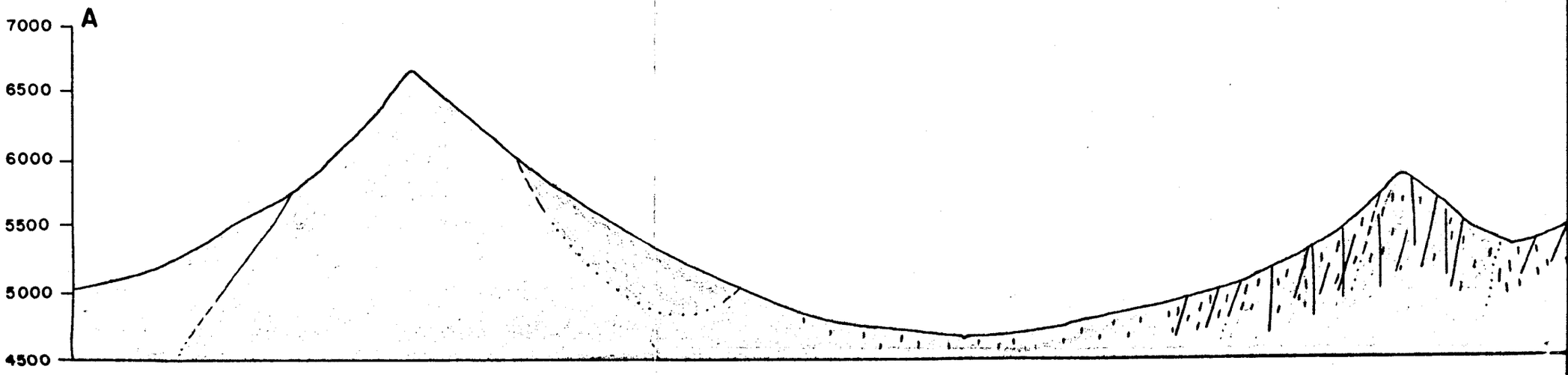
A
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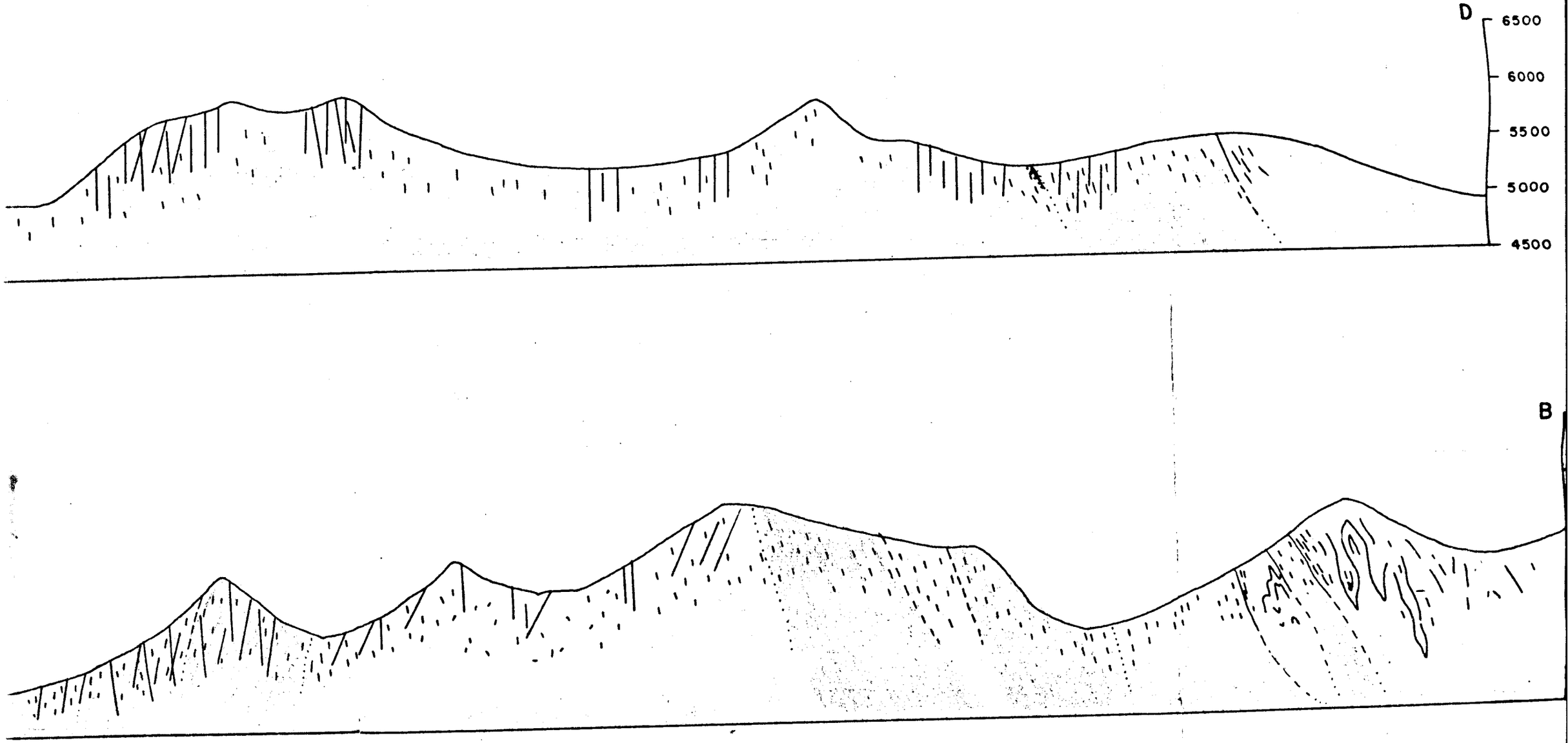
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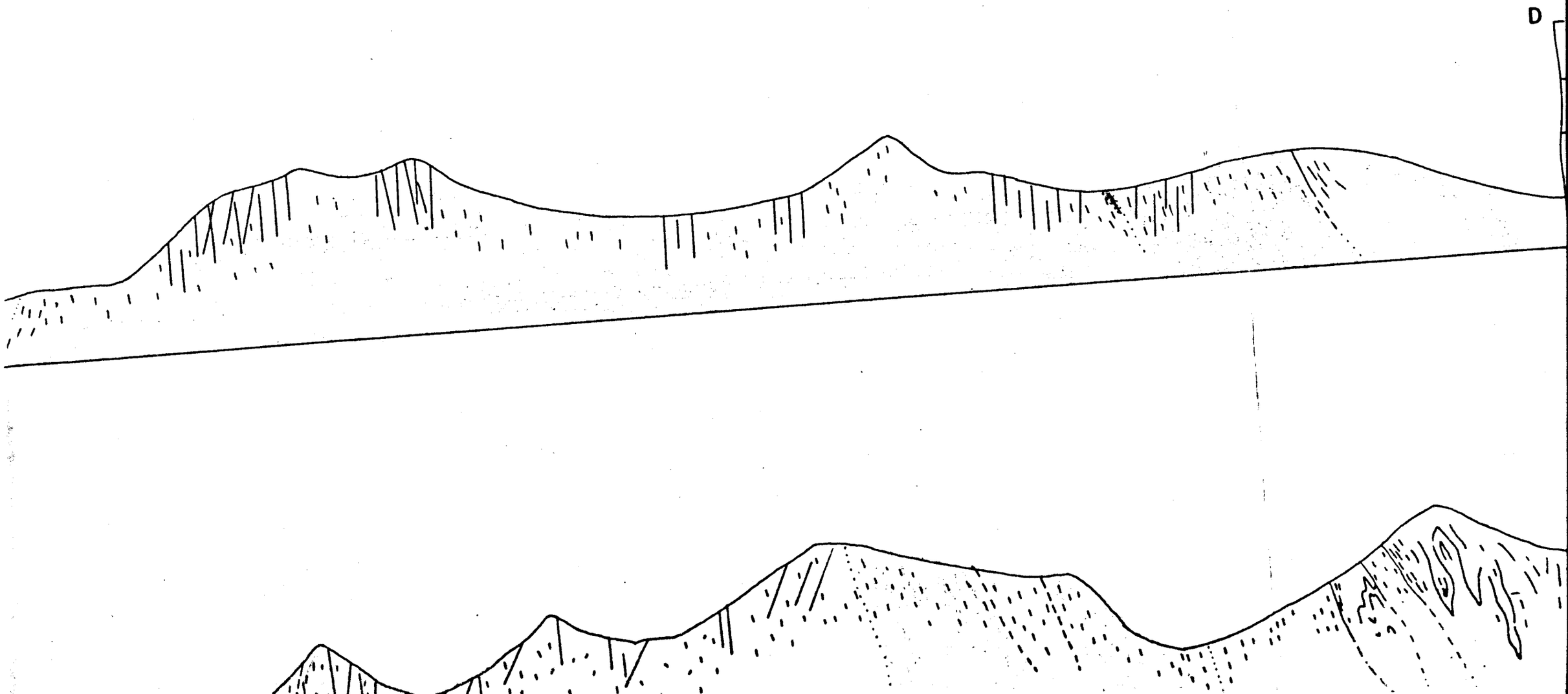
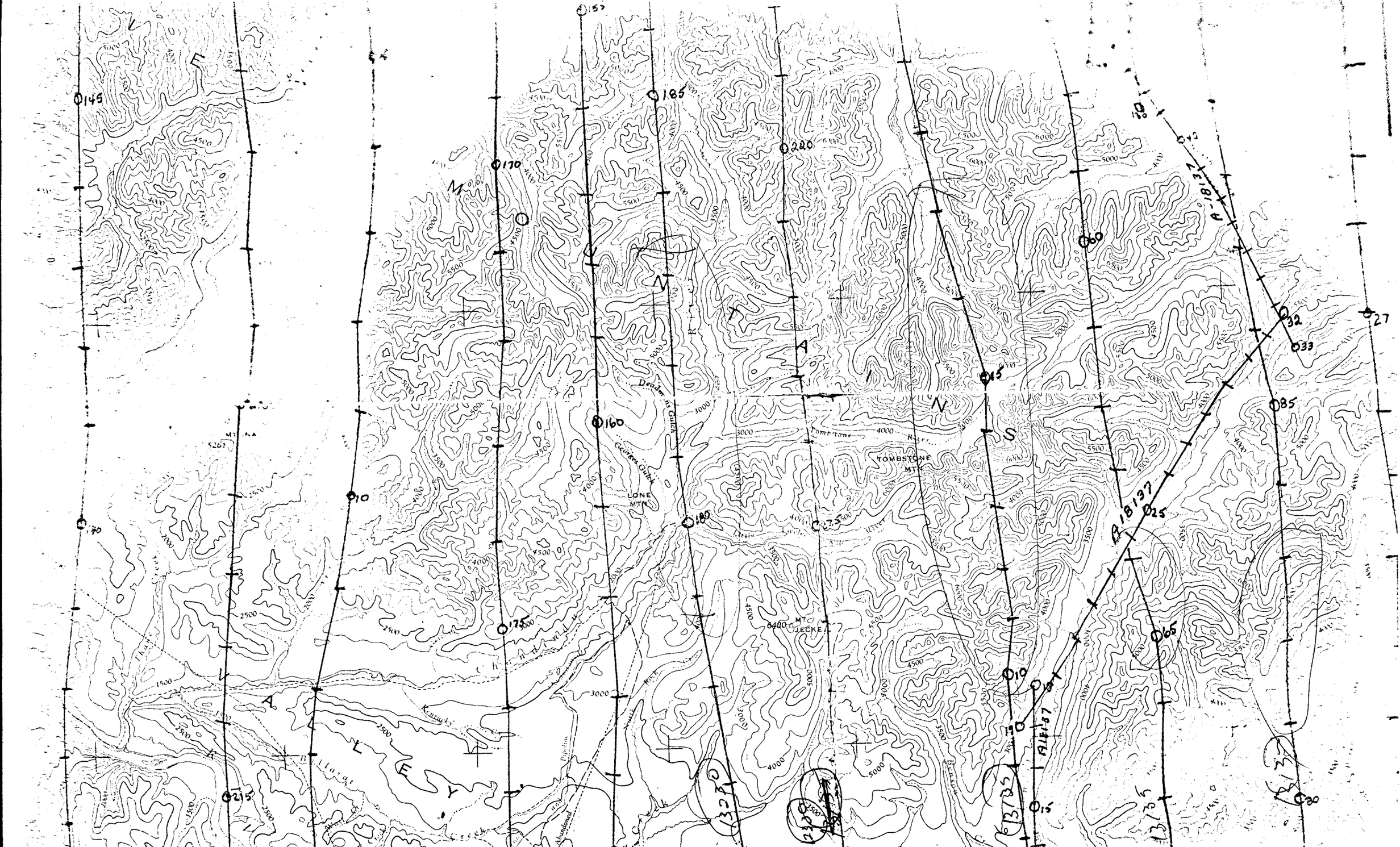
5000
4500
B


D


LOVE
MOUNTAIN
VALLEY
TOMBSTONE MTN.
LONE MTN.
6400 MT. JECKE
Deadman Gulch
Geiger Gulch
Kennedy
Abandoned
A-18137
B-18137
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225
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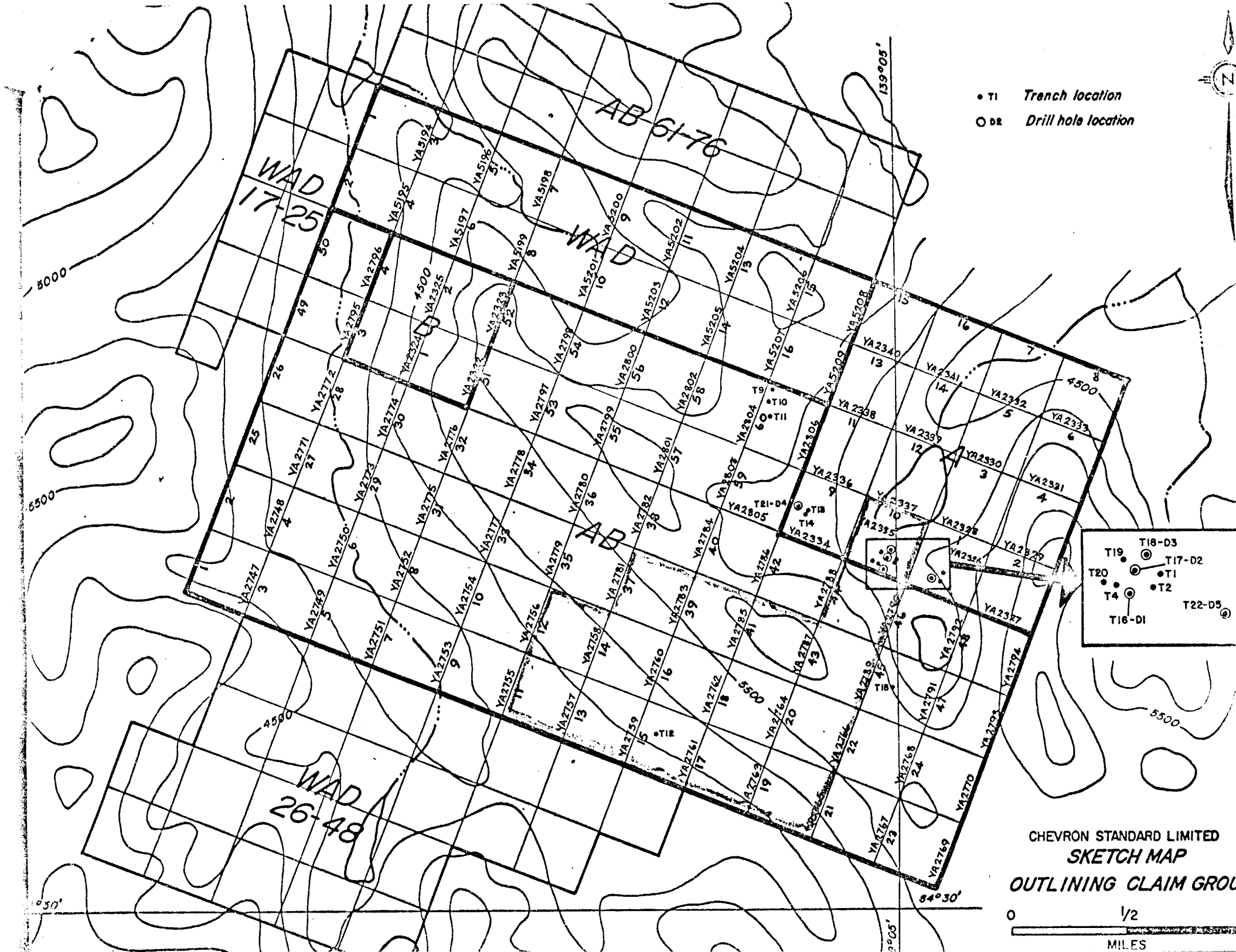
130
135
140

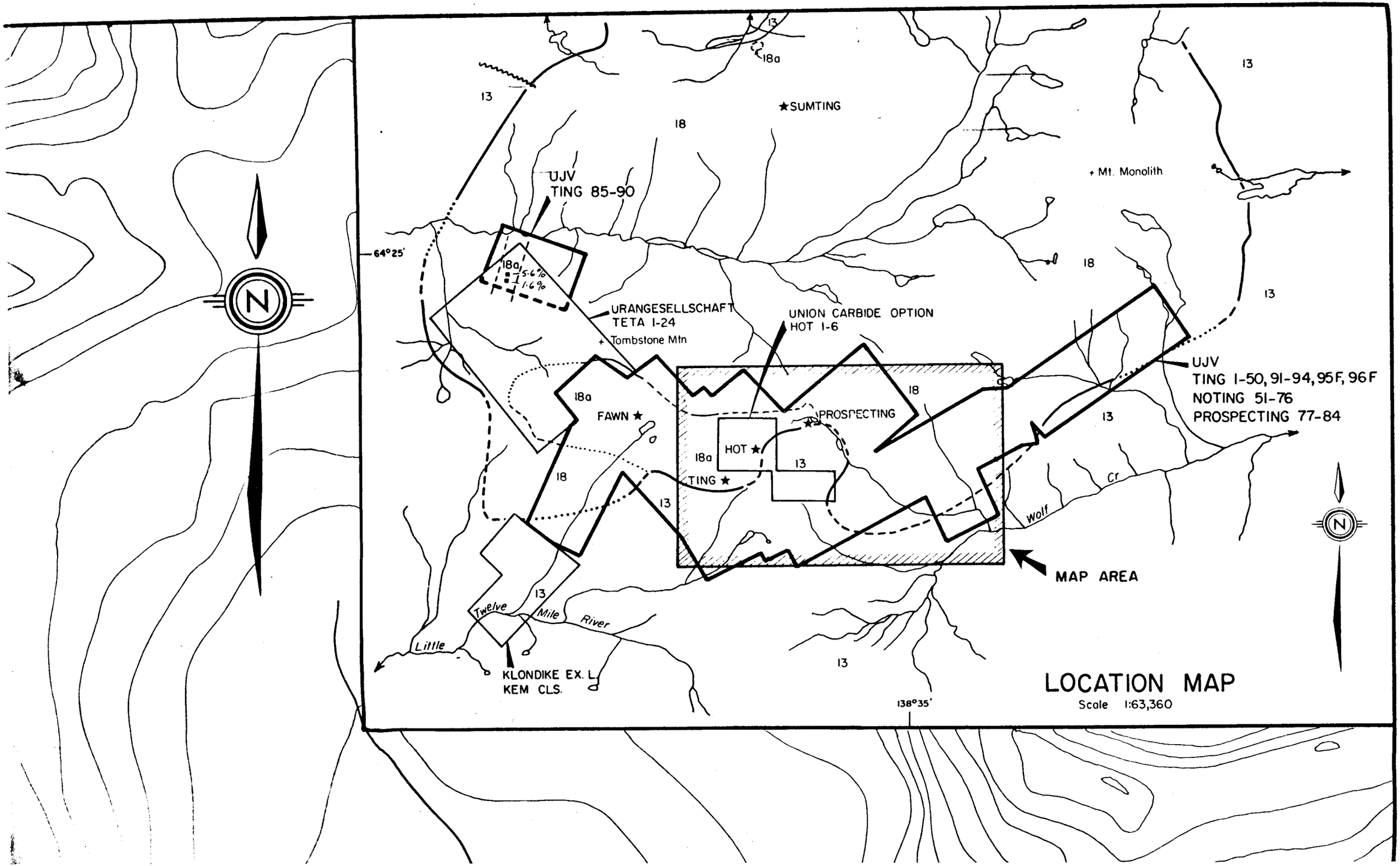
Tombstones

Sedulitia has been observed in Vesuvius

Large Zinian (first size) has been seen also } D. Eaton

Eaton will be doing B. Sc. Thesis on Tomb- Rob/Sn Cat.


• T1 Trench location
○ D2 Drill hole location
AB 61-76
WAD 17-25
WAD
AB
WAD 26-48
139°05'
84°30'
5000
5500
4500
T9
T10
T11
T12
T13
T14
T15
T16
T17
T18
T19
T20
T21-D4
T18-D3
T17-D2
T1
T2
T4
T16-D1
T22-D5
CHEVRON STANDARD LIMITED
SKETCH MAP
OUTLINING CLAIM GROU
0
1/2
MILES


13
18a
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★SUMTING
18
13
+ Mt. Monolith
UJV
TING 85-90
64°25'
18a
5-6%
1-6%
18
13
URANGESELLSCHAFT
TETA 1-24
UNION CARBIDE OPTION
HOT 1-6
+ Tombstone Mtn
UJV
TING 1-50, 91-94, 95F, 96F
NOTING 51-76
PROSPECTING 77-84
18a
FAWN ★
18
PROSPECTING
HOT ★
18a
13
TING ★
18
13
Wolf
Cr
MAP AREA
13
Twelve
Mile
River
Little
KLONDIKE EX. L
KEM CLS.
138°35'
LOCATION MAP
Scale 1:63,360

1977

TING, NOTING, PROSPECTING
Archer, Cathro and
Associates Limited
~~(Ukon Joint~~ Venture)

Uranium
116 B 7
(64°23'N, 138°38'W)

References: Cockfield (1920); Tempelman-Kluit (1970); Green (1972); Goodfellow and Jonasson (1977); Morin et al (1977, p. 140).

Claims: TING 1-50, 85-94, 95-96 Fr; NOTING 51-76; PROSPECTING 77-84

Location and Access:

The claims are located 49 km northeast of Dawson. Access in 1976 was by helicopter from a camp at Mile 45 (Km 72) of the Dempster Highway.

History:

The claims were staked in the spring and summer of 1976 for the Ukon Joint Venture managed by Archer, Cathro and Associates Limited.

Description:

The TING, NOTING and PPROSPECTING claims are located on the Tombstone Stock. The stock is composed of coarse-grained alkaline plutonic rocks of Lower Cretaceous age, ranging from alkali syenite, tinguaite, nepheline syenite and monzonite to silica-saturated rocks of granodioritic and quartz dioritic composition. The major minerals observed are orthoclase, plagioclase, nepheline, cancrinite, calcite, biotite, hornblende pyroxene and quartz. Accessory minerals identified so far include sphene, zircon, apatite, melanite garnet, fluorite, apatite and opaques. Trachytic dykes are found in the area of the stocks cutting the country rocks. Radioactivity is associated with the tinguaite and dykes at the eastern margin of the stock near Mt. Monolith. The stock is intrusive into orthoquartzite, (Keno Hill Quartzite) and diabase and xenoliths of the country rocks are common in the stock.

Current Work and Results:

Three hand trenches were blasted into bedrock on the TING showing exposing a uranium-bearing zone averaging 2.67 m wide for a length of 35 m. Radioactivity here seems to be associated with the aphanitic tinguaite unit. The average of all trenches was 2.67 m wide averaging 0.232% U_3O_8 and .001% ThO_2. Two new zones of radioactivity were located on the property. Continuous zones of uranium mineralization only seem to be associated with the tinguaite, particularly the aphanitic phase.

1977

SUMTING

Archer, Cathro and Associates Limited (Ukon Joint Venture)	Uranium 116 B 7 (64°27'N, 138°27'W)

References: Cockfield (1920); Tempelman-Kluit (1970); Green (1972); Goodfellow and Jonasson (1972).

Claims: Sumting 1-22

Location and Access:

The claims are located approximately 59 km northeast of Dawson in the Tombstone Mountains.

History:

The claims were staked in 1976 to cover an area or radioactive float.

Description:

The property is underlain by a zone of tinguaite as well as several roof pendants of sedimentary rock within the Tombstone syenite stock.

Current Work and Results:

The northern accessible portion of the claim block was mapped. Seven roof pendants composed of limestone, schist and "Keno Hill Quartzite" were located. The limestone is recrystallized to marble. Isolated spots of anomalous radioactivity are associated with tinguaite but no strong anomaly was located on the 350 m by 250 m radiometric grid.

1977

NEBULOUS
Archer, Cathro and
Associates Limited
(Ukon Joint Venture)

Uranium
116 B 7
(64°28'N, 138°46'W)

References: Cockfield (1920); Lambert (1963); Tempelman-Kluit (1970); Green (1972).

Claims: NEBULOUS 1-33

Location and Access:

The claims are located 49 km northeast of Dawson in the Cloudy Range between the Chandindu and Blackstone Rivers. Access is by helicopter from Dawson.

History:

The claims were staked in the summer of 1976 ~~for the Ukon Joint Venture~~.

Description:

The claims are located on the Lower Cretaceous Mt. Brenner stock which has a core of porphyritic quartz monzonite and is concentrically zoned successively by prophyritic hornblende monzonite, monzonite porphyry, a thin band of pyroxenite and augite-biotite porphyry (Lambert, 1963). The stock is surrounded mainly by a Lower Cretaceous orthoquartzite (Keno Hill quartzite) and diabase.

Current Work and Results:

Several trenches were dug to ~~obtain better samples and to see if the joints contained~~ more secondary mineralization ~~at depth~~. A 10 m long trench from the best area averaged 0.0105% U_3O_8, of which 0.0082% ~~is contained~~ in the porphyritic monzonite and 0.0023% by secondary enrichment. An 80 m x 100 m grid radiometric survey ~~indicated~~ a slightly anomalous area of ~~monzonite that chip sampling give results~~ of 50 ppm U and 220 ppm Th. No secondary oxides were seen in this area.

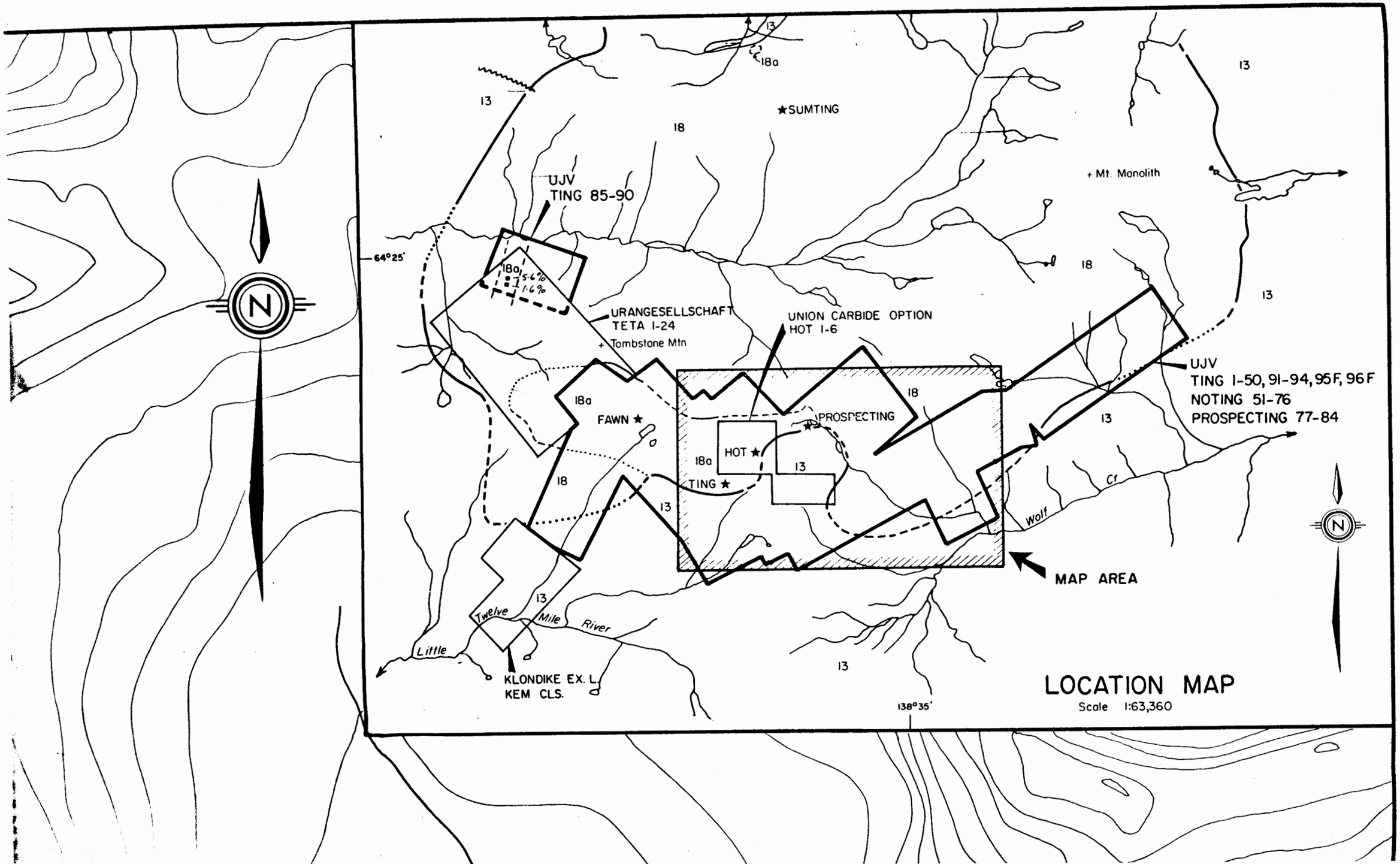
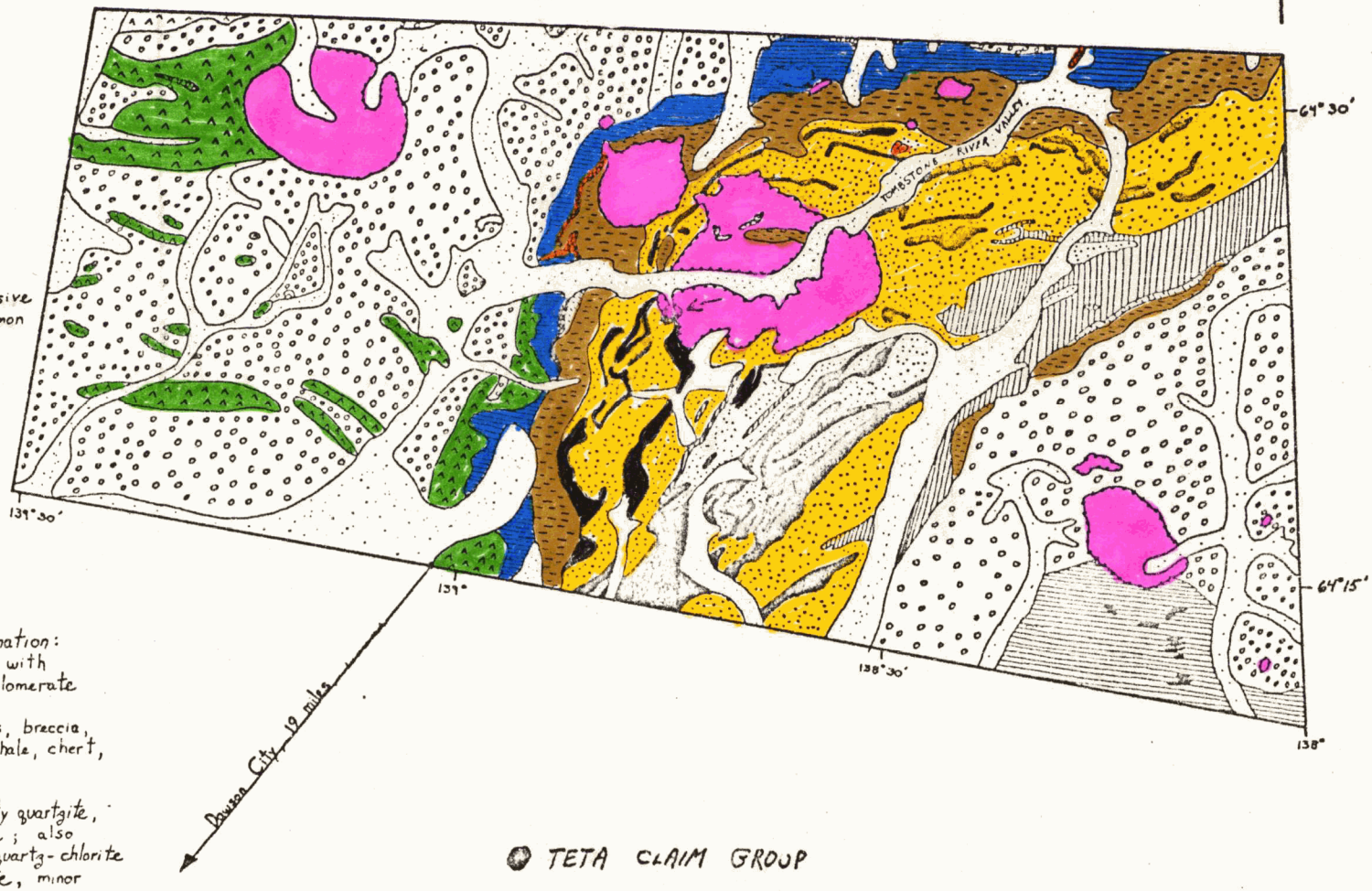

13
18a
★SUMTING
18
13
UJV
TING 85-90
+ Mt. Monolith
64°25'
18a
5.6%
1.6%
18
13
URANGESELLSCHAFT
TETA 1-24
+ Tombstone Mtn
UNION CARBIDE OPTION
HOT 1-6
UJV
TING 1-50, 91-94, 95F, 96F
NOTING 51-76
PROSPECTING 77-84
18a
FAWN ★
PROSPECTING
18
13
18a
HOT ★
13
TING ★
18
13
Wolf
Cr
MAP AREA
13
Twelve
Mile
River
Little
KLONDIKE EX. L.
KEM CLS.
13
138°35'
LOCATION MAP
Scale 1:63,360

Figure 3



Quaternary: Unconsolidated glacial and fluviatile deposits

Cretaceous: Medium grained to porphyritic hornblende & hornblende/biotite syenite

Cretaceous: Biotite-granodiorite and biotite-quartz monzonite

Mesozoic: Diorite and Gabbro

Mesozoic: Shale and thin bedded siltstone, commonly limy

Mesozoic: Keno Hill Quartzite: massive quartzite, minor slate and phyllite, common graphitic, argillaceous quartzite

Jurassic: Lower Schist division: predominantly dark grey argillite, slate, and phyllite.

Permian: Limestone with some chert

Triassic: Platey, black limy shale and limestone

Ordovician & Silurian: Road River Formation: mainly black chert and black argillite with minor quartzite and quartz pebble conglomerate

Precambrian &/or later: volcanic rocks, breccia, tuff, agglomerate; minor interbedded shale, chert, siltstone, and sandstone.

Precambrian &/or Cambrian: Mainly gritty quartzite, sandstone, and quartz pebble conglomerate; also shale, slate, schistose quartzite, quartz-chlorite schist, quartz-mica schist and phyllite, minor limestone and black chert

Scale 1:250,000

Miles 4 0 4 8 12

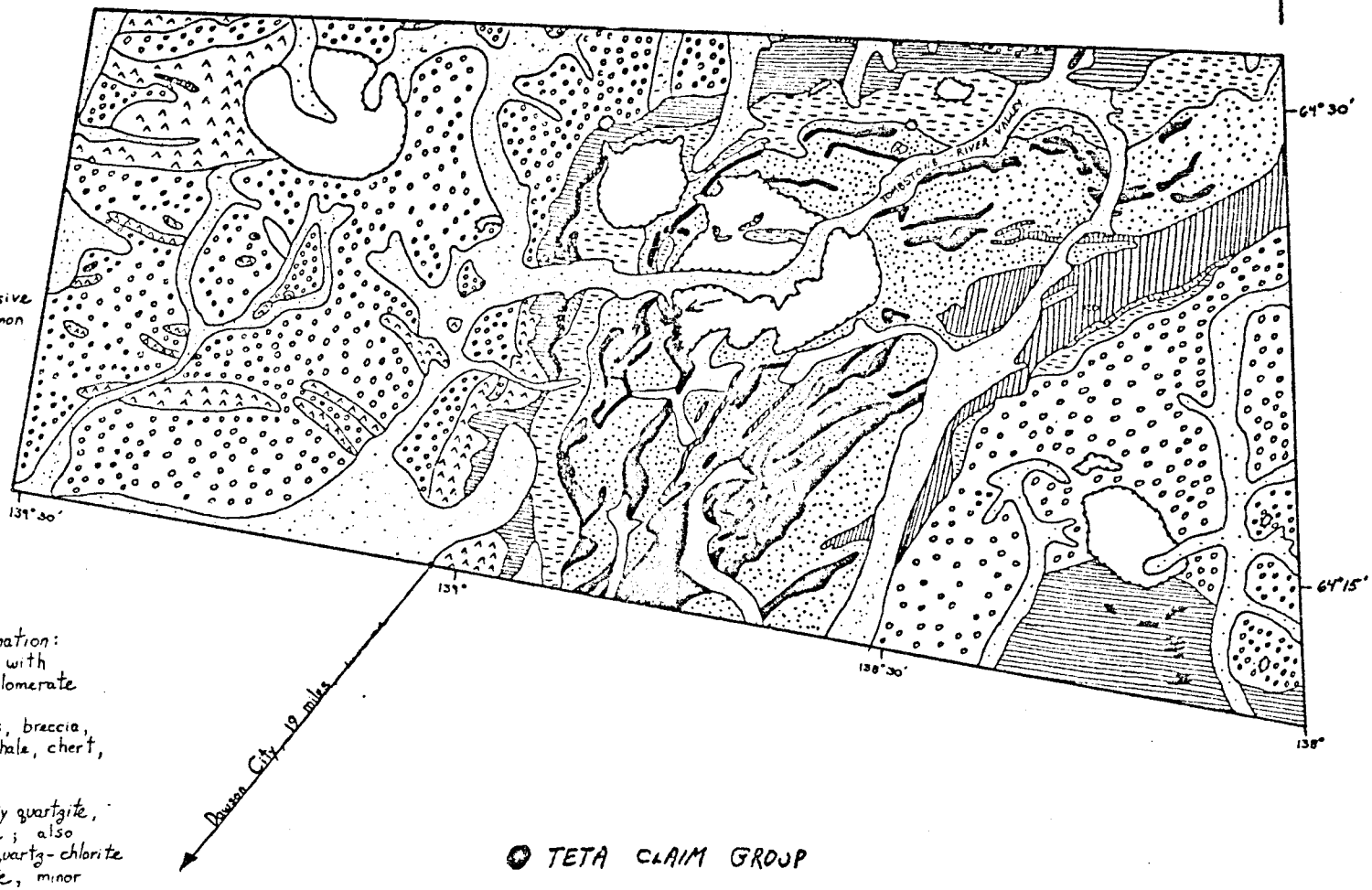
Kilometres 6 0 6 12 18

URANGESELLSCHAFT CANADA LIMITED
PROJECT: K14, 1.7
Regional Geology, Tombstone Area
DWG NO. 116 8 7 SCALE DRAWN BY DATE CHECKED BY

LEGEND

- Quaternary: Unconsolidated glacial and fluviatile deposits
- Cretaceous: Medium grained to porphyritic hornblende / hornblende / biotite syenite
- Cretaceous: Biotite-granodiorite and biotite-quartz monzonite
- Mesozoic: Diorite and Gabbro
- Mesozoic: Shale and thin bedded siltstone, commonly limy
- Mesozoic: Keno Hill Quartzite: massive quartzite, minor slate and phyllite, common graphitic, argillaceous quartzite
- Jurassic: Lower Schist division: predominantly dark grey argillite, slate, and phyllite.
- Permian: Limestone with some chert
- Triassic: Platey, black limy shale and limestone
- Ordovician & Silurian: Road River Formation: mainly black chert and black argillite with minor quartzite and quartz pebble conglomerate
- Precambrian &/or later: volcanic rocks, breccia, tuff, agglomerate; minor interbedded shale, chert, siltstone, and sandstone.
- Precambrian &/or Cambrian: Mainly gritty quartzite, sandstone, and quartz pebble conglomerate; also shale, slate, schistose quartzite, quartz-chlorite schist, quartz-mica schist and phyllite, minor limestone and black chert

Figure 3



Scale 1:250,000

Miles 4 0 4 8 12

Kilometers 6 0 6 12 18

URANGESELLSCHAFT CANADA LIMITED
PROJECT: K14, 1.7
Regional Geology, Tombstone Area
DWG. NO. 116 8 7 SCALE DRAWN BY DATE CHECKED BY

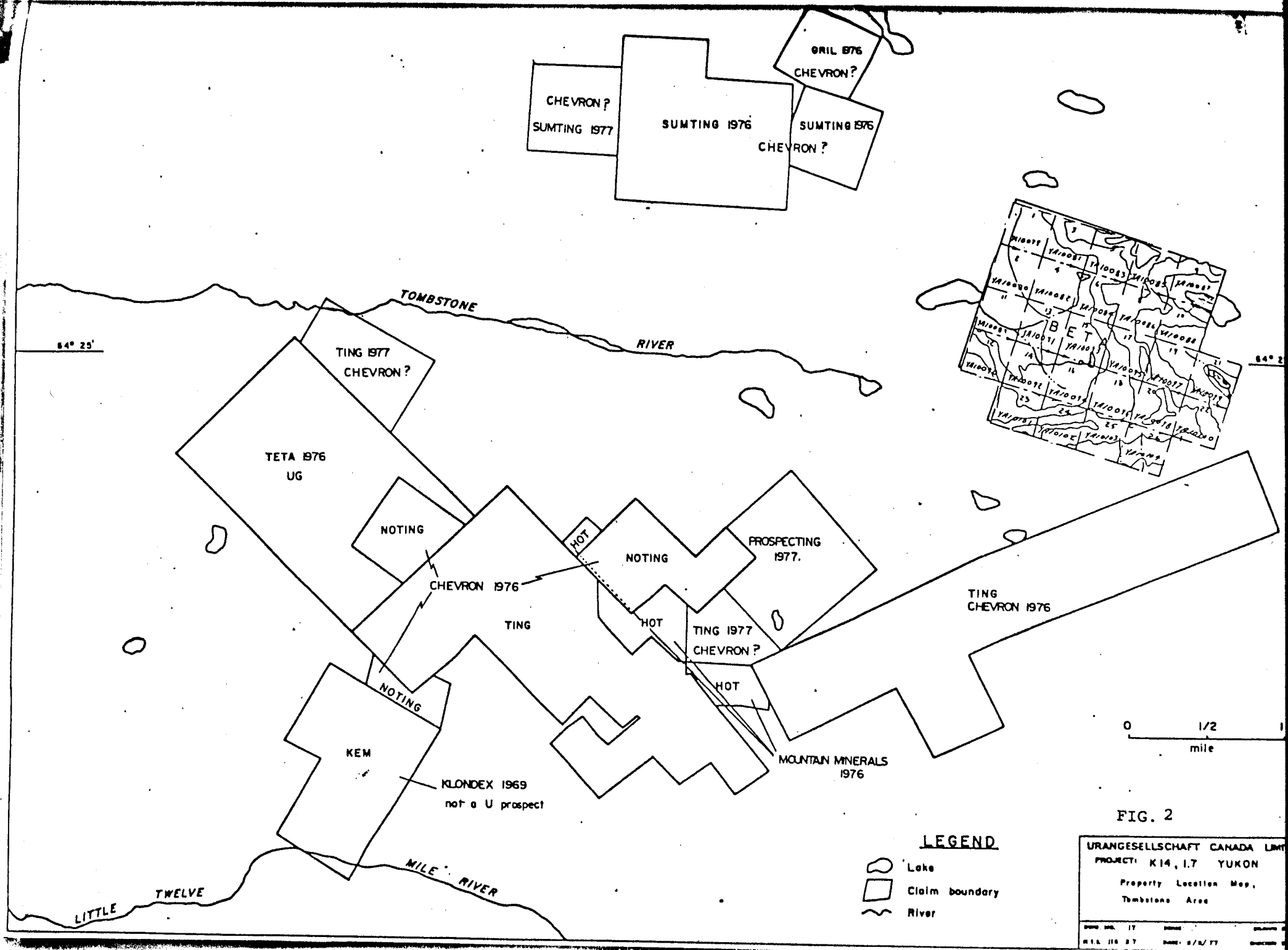


FIG. 2

URANGESELLSCHAFT CANADA LIMI
PROJECT: K14, I.7 YUKON
Property Location Map,
Tombstone Area

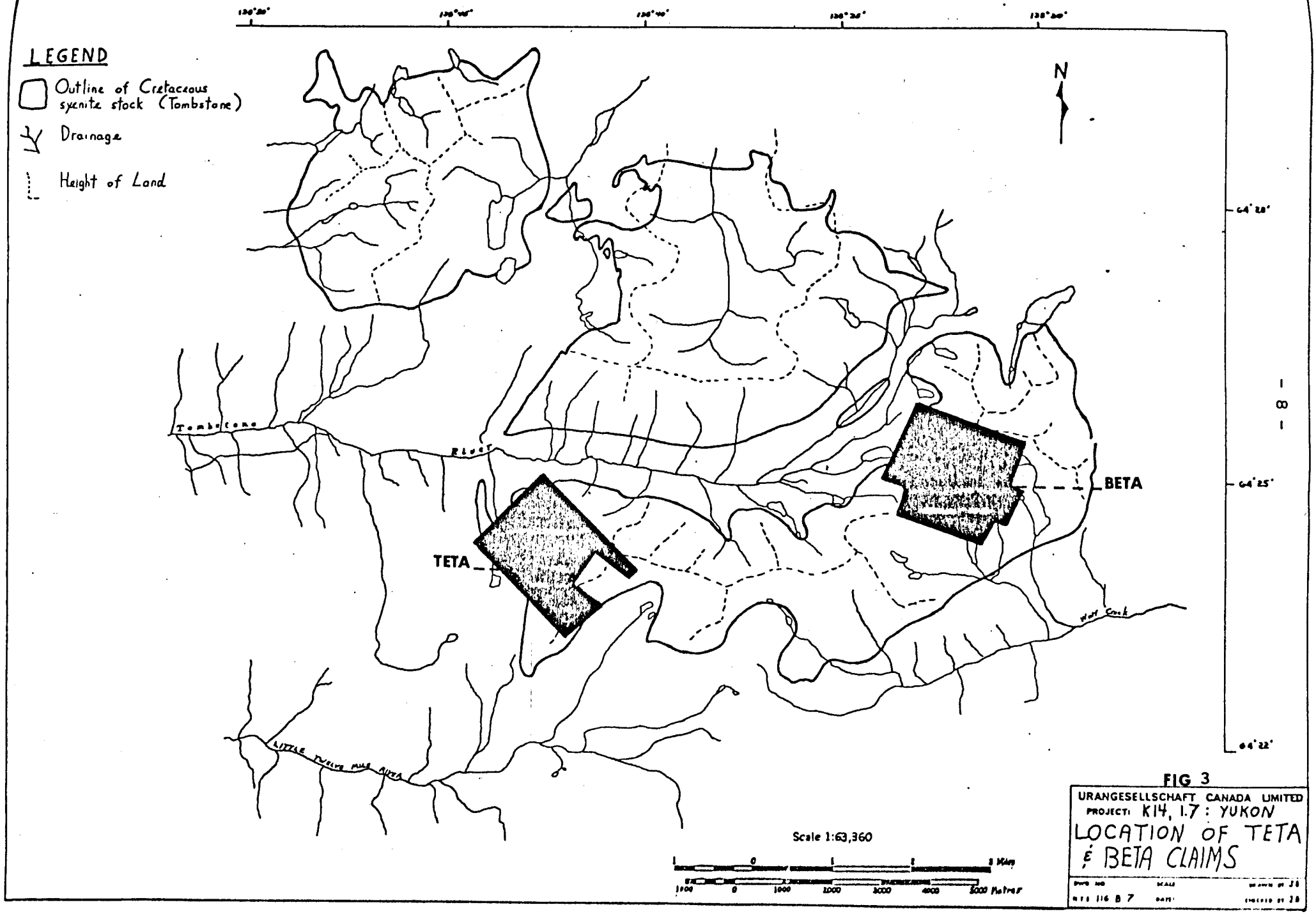


FIG 3

URANGESELLSCHAFT CANADA LIMITED

PROJECT: K14, 17 : YUKON

LOCATION OF TETA & BETA CLAIMS

DWG NO 116 B 7 | SCALE | DRAWN BY | DATE | CHECKED BY

TOMBSTONES

Tombstones - July-13-78

Morning - went around with DTK

Afternoon

STOP 1 - Tiny A/C trenches

pitchblende in thin veinlets with secondary U mineralization. YA-78-45

STOP 2 - Mineral Thucstrene stockpile

UG Th ± Cu ± Pb ± U Silicate

YA-78-46

STOP 3 Shaved Tiny vein.

UG. YA-78-47

MAIN Showings

A/C

Ting showing: float. 0.41% U_3O_8

.53% " .015 ThO_2

unmineralized ringwalite - 20-35 ppm U.

representative float — .104 % U_3O_8 .010 ThO_2

a Selected spec; 10000 cps - 4.18 % U_3O_8; 0.005 ThO_2; 3.0% Y

500 ppm Ce, 200 Nd; 20 Tb, 5 Yb, 50 Y.

Fawn- highest grab - .726 % U_3O_8

190 ppm Th

1010 Y

others > .08% U_3O_8.

Prospecting: .372 to 1.20 ⟹ % U_3O_8 & 520 ppm Th.

Nebulous - sample containing 10% yellow oxide 1.1 % U_3O_8 & 30 ppm Th

typ. spec from N. zone - 165 ppm U - 340 ppm Th - 530 Y.

Channel samp. of fresh rx. no. joints: 12 to 57 ppm U

East Zone - U_A secondary mineral filling fractures.

- large Am't Mo + Bi

typ. Assays .107 % U_3O_8

0.58% ThO_2 + some REE

- Assay - .26%, .98%, .07 % V_3O_8

TOMBSTONE AREA.

116-B-7

HOT - SANX Wise

KEM = Klondike Explo- Gem Fish.

166-7 AJ — A. A. Weins.
WALKER.

PROVISIONAL MAP
116 B/11

CANADA

1:50,000

EDITION 1

CARTE PROVISOIRE
116 B/11

Refer to this map as: 116B/11 EDITION 1 MCE SERIES A 722

Joins 116 B/14

Joins 116 B/12

Joins 116 B/10

Joins 116 B/6

O G I L V I E

M O U N T A I N S

Chandindu River

Fifteenmile River

Parker

Gillie

Scale 1:50,000 Échelle

Miles 1 0 1 2 3 Milles

Metres 1000 0 1000 2000 3000 4000 Mètres

Yards 1000 0 1000 2000 3000 4000 Verges

CONVERSION SCALE FOR ELEVATIONS

Metres 300 250 200 150 100 50 0

Feet 1000 900 800 700 600 500 450 400 350 300 250 200 150 100 50 0

T.N.

1°35' or 28 Mils

31°24' or 558 Mils

Grid North

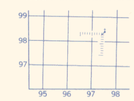
Magnetic North

Use diagram only to obtain numerical values.
APPROXIMATE MEAN DECLINATION 1967
FOR CENTRE OF MAP
Annual change decreasing 3.8'

ONE THOUSAND METRE
UNIVERSAL TRANSVERSE MERCATOR GRID
ZONE 7

GRID ZONE DESIGNATION	100,000 M. SQUARE IDENTIFICATION
7 W	EB

EXAMPLE OF METHOD USED
TO GIVE A REFERENCE TO NEAREST 100 METRES
THE FOLLOWING GRID REFERENCE IS A SAMPLE ONLY AND DOES NOT REFER TO A POINT ON THIS MAP



REFERENCE POINT	CHURCH (as above)	
EASTING. Read number on grid line immediately to left of point	97	
Estimate tenths of a square from this line eastward to point		5
	975	
NORTHING. Read number on grid line immediately below point	98	
Estimate tenths of a square from this line northward to point		4
	984	

EXAMPLE MILITARY GRID REFERENCE 975984

Nearest similar grid reference 100,000 metres (about 63 miles)

Produced, 1968, by the SURVEYS AND MAPPING BRANCH, DEPARTMENT OF ENERGY, MINES AND RESOURCES, from aerial photographs taken in 1951 and 1963. Field surveys 1965. Printed 1970.

Copies may be obtained from the Map Distribution Office, Department of Energy, Mines and Resources, Ottawa.

YUKON TERRITORY

This Provisional Map is equivalent to a standard map in accuracy of content.

Some names on this map are not yet official. Corrections or additions are invited by the Surveys and Mapping Branch.

CONTOUR INTERVAL 100 FEET
Elevations in Feet above Mean Sea Level
North American Datum 1927
Transverse Mercator Projection

Cette carte provisoire équivaut une carte régulière au point de vue précision de l'information.

Certains noms inscrits sur cette carte ne sont pas encore officiels. La Direction des levés et de la cartographie saurait gré au public de lui signaler corrections et additions.

ÉQUIDISTANCE DES COURBES 100 PIEDS
Élévations en pieds au-dessus du niveau moyen de la mer
Système de référence géodésique nord-américain 1927
Projection transverse de Mercator

Établie en 1968, par la DIRECTION DES LEVÉS ET DE LA CARTOGRAPHIE, MINISTÈRE DE L'ÉNERGIE, DES MINES ET DES RESSOURCES, d'après des photographies aériennes prises en 1951 et 1963. Levés sur le terrain en 1965. Imprimée en 1970.

Ces cartes sont en vente au Bureau de distribution des cartes, ministère de l'Énergie, des Mines et des Ressources, Ottawa.

116 B/11
EDITION 1

Spotted Fawn Ck.

64°25'
138°41'

Age 85 m.y.

138° 50'
64° 30'

138° 45'

64° 30'

WEST BLACKSTONE RIVER

LOWER SYENITE LAKE

UPPER SYENITE LAKE

Shown

MOUNT BRENNER STOCK

FEET 0 1000 2000 3000 FEET

METRES 0 300 600 METRES

138° 50'

138° 45'

PROVISIONAL MAP

CANADA

CARTE PROVISOIRE

116 B/8

1:50,000

EDITION 1

116 B/8

Refer to this map as: 116 B/8 EDITION 1 ASE SERIES A 722

Joins 116B/9

Joins 116B/7

Joins 116A/12

Joins 116B/13

OGILVY MOUNTAINS

ANTIMONY MOUNTAIN

Klondike River

North Klondike River

Antimony Creek

Brewery Creek

FB

6246

6472

6046

5010

6325

5986

6120

5143

6696

2908

2738

2517

BM 3260

Compiled, 1965, by the SURVEYS AND MAPPING BRANCH, DEPARTMENT OF ENERGY, MINES AND RESOURCES, from aerial photographs taken in 1951. Field surveys 1962-64. Printed 1967.

Copies may be obtained from the Map Distribution Office, Department of Energy, Mines and Resources, Ottawa.

Roads: Routes:

		more than 2 lanes / plus de 2 voies	2 lanes / 2 voies
hard surface, all weather	pavée, toute saison	less than 2 lanes	moins de 2 voies
loose or stabilized surface, all weather	gravier aggloméré, toute saison	2 lanes or more / 2 voies ou plus	less than 2 lanes / moins de 2 voies
loose surface, dry weather	de gravier, période sèche		
cart track	de terre		
trail or portage	sentier ou portage		

UPPER KLONDIKE RIVER

YUKON TERRITORY

SCALE 1:50,000 ÉCHELLE

Miles 1 0 1 2 3 Miles

Metres 1000 500 0 1000 2000 3000 4000 Mètres

Yards 1000 500 0 1000 2000 3000 4000 Verges

CONTOUR INTERVAL 100 FEET
Elevations in Feet above Mean Sea Level
North American Datum 1927
Transverse Mercator Projection

Some names on this map are not yet official. Corrections or additions are invited by the Surveys and Mapping Branch.

This Provisional Map is equivalent to a standard map in accuracy of content.

ÉQUIDISTANCE DES COURBES: 100 PIEDS
Élévations en pieds au-dessus du niveau moyen de la mer
Niveau de référence nord-américain 1927
Projection transverse de Mercator

Certains noms inscrits sur cette carte ne sont pas encore officiels. La Direction des levés et de la cartographie saurait gré au public de lui signaler corrections et additions.

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Établie en 1965, par la DIRECTION DES LEVÉS ET DE LA CARTOGRAPHIE, MINISTÈRE DE L'ÉNERGIE, DES MINES ET DES RESSOURCES, d'après des photographies aériennes prises en 1951. Levés sur le terrain en 1962-64. Imprimée en 1967.

Ces cartes sont en vente au Bureau de distribution des cartes, ministère de l'Énergie, des Mines et des Ressources, Ottawa.

116 B/8
EDITION 1

CONVERSION SCALE FOR ELEVATIONS

Metres 1500 1000 500 0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500 6000 6500 7000

Feet 5000 4000 3000 2000 1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 11000 12000 13000 14000 15000 16000 17000 18000 19000 20000 21000 22000 23000

T.N.

2°29′ or 44 Mils

30°58′ or 551 Mils

Grid North

Magnetic North

Use diagram only to obtain numerical values.
APPROXIMATE MEAN DECLINATION 1965
FOR CENTRE OF MAP
Annual change decreasing 3.9′

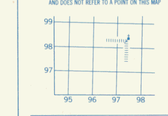
ONE THOUSAND METRE UNIVERSAL TRANSVERSE MERCATOR GRID

GRID ZONE DESIGNATION	100,000 M. SQUARE IDENTIFICATION
7 W	F B

ZONE 7

EXAMPLE OF METHOD USED TO GIVE A REFERENCE TO NEAREST 100 METRES

THE FOLLOWING GRID REFERENCE IS A SAMPLE ONLY AND DOES NOT REFER TO A POINT ON THIS MAP



REFERENCE POINT	CHURCH (as above)
EASTING. Read number on grid line immediately to left of point	97
Estimate tenths of a square from this line eastward to point	5
	975
NORTHING. Read number on grid line immediately below point	98
Estimate tenths of a square from this line northward to point	4
	984

EXAMPLE MILITARY GRID REFERENCE 975984

Nearest similar grid reference 100,000 metres (about 63 miles)

BROWN NUMBERED TICKS INDICATE THE 1000 METRE U.T.M. GRID ZONE 8

7130000m. N. 7128000m. N.

622000m. E. 333000m. E. 642000m. E. 355000m. E.

138°30′ 138°00′ 64°15′ 64°30′

Government of Canada / Gouvernement du Canada

ACTION REQUEST / **FICHE DE SERVICE**

TO - *À*

Ucon

FILE NO. — *DOSSIER N°*

DATE

FROM - *DE*

CONFIDENTIAL

☐ PLEASE CALL *PRIÈRE D'APPELER*	TEL. NO. - *N° DE TEL.*	EXT. - *POSTE*
☐ WANTS TO SEE YOU *DÉSIRE VOUS VOIR* ☐ WILL CALL AGAIN *DOIT RAPPELER*	DATE	TIME - *HEURE*
CALL RECEIVED BY *MESSAGE REÇU PAR* ▶		

☐ ACTION *DONNER SUITE*	☐ APPROVAL *APPROBATION*	☐ NOTE & RETURN *NOTER ET RETOURNER*
☐ COMMENTS *COMMENTAIRES*	☐ DRAFT REPLY *PROJET DE RÉPONSE*	☐ NOTE & FORWARD *NOTER ET FAIRE SUIVRE*
☐ MAKE *FAIRE* ..... *COPIES*	☐ SIGNATURE	☐ NOTE & FILE *NOTER ET CLASSER*

Tombstone

CGSB STANDARD FORM 12d

FORMULE NORMALISÉE 12d DE L'ONGC

Tombstone Area

A Summary Claim map of Intrusive.

- Short pre-Amble on geology (?).

photographs.

Mineralogy.

Tonopah Uranium

RAD SVY:

50' xl. 15-30cm

Background - 120 QTZ
400 Hybrid
500 Sandstone

Considerable MASS effects due to cliffs

Felsic dyke - radioactive.

- one oc 30x40' - Shear parallel trend

Mineral - found in Scheelite boulders.
- highly sheared & Mo.
Yellow U oxide stains visible on sheared surfaces

RX Analyses U- few Cu-Mo-Au-Ag.

some boulders 500 → 4000 ppm U.
1-2000 ppm Au.

MAGNetic + EM Surveys

BONDAR-CLEGG &

764 BELFAST ROAD, OTTAWA, ONTARIO

Report # 1249-7

Geochemical Lab

Extraction U- HNO_3 Th XRF Report

Method Fluorimetric From

Fraction Used -100 rocks Date Au

SAMPLE NO.		U ppm	Th ppm	U lb/ton	Th lb/ton
OC 77 JB 1-10		97	[illegible]	.19	
2		141		.282	
3		54		.108	
4		104	76	.208	.152
5		50		.100	
6		198		.396	
7		9		.018	
8		8	80	.016	.16
9		15		.03	
10		16		.032	
11		9		.018	
12		67	62	.134	.124
13		134		.268	
14		6		.012	
15		134		.268	
16		630	27	1.260	.054 .054
OBB 77JB 3-10		31500		63	
4		3000	97	6	.19
5		2940	[illegible]	5.9	
6		890		1.78	
7		2500		5	
8		2210	98	4.4	.196
9		2100		4.2	
10		990		1.98	
11		480		.96	
12		12530	355	25	.71 Due to
13		2940		5.9	on you
16		3950	84	7.9	.168 result
		Th: to follow			

JOHN ISKO PTY

BONDAR-CLEGG & COMPANY LTD.

764 BELFAST ROAD, OTTAWA, ONTARIO, K1G 0Z5 PHONE: 237-3110

Geochemical Lab Report

25 AUG REC'D

Extraction Cu, Mo, Ag-HNO_3-HCl, U-HNO_3 Report No. 1248-7

Method A.A. Fluorimetric From Urangesellschaft Canada Limited Project # K 14, 17

Fraction Used -100 rocks Date August 22, 19 77

SAMPLE NO.	Au ppb	Cu ppm	Mo ppm	U ppm	Ag ppm	U lb/ton		REMARKS
OB 77 JB 14-10			3042	60000				
15-10			212	16000				
OC 77 JB 18-10	N.D	205	887	500	1.1			
19-10	< 5	84	214	95	0.6			
20-10	10	138	26	70	0.4			
21-10	< 5			450				
OBB77 JB 1-10	65			560				
2-10	35			2500				
		Au- results to follow						
		Due to the extensive reporting required on your samples we are						
		submitting the results on our regular office forms.						

Further Work Planned on New Insco's Prairie Lake Uranium-Niobium Property

The Prairie Lake Property of New Insco Mines Ltd. is located about 16 miles from Lake Superior, northwest of Marathon, Ontario. By virtue of an option agreement executed in April, 1976, on 37 claims owned by International Minerals & Chemicals Corporation (Canada) Ltd., which surrounded the original 2 claims, this property has been expanded to a total of 39 claims, covering the entire Prairie Lake carbonatite pipe. Under the agreement, IMC are to receive 10% of net profits, after recovery of capital costs, from any ore (execept phosphates, which IMC retains) discovered on their portion of the claim group.

Concentrations of uraniferous pyrochlore and betafite occur in annular complex of carbonatite and alkalic silicate rocks which cut a central nepheline syenite stock and early Precambrian metasediments and granitic rocks. Most of the complex is covered by glacially transported overburden. So far, surface prospecting has been effective only on patches of residual soil developed on steep slopes.

Mineralized zones, trenched and drilled by another company in 1968 and 1969, have been re-evaluated in the light of escalating prices and current interest in uranium as an energy source. During the past field season, New Insco completed over 30 line miles of radiometric survey, 150 overburden drill holes, some trenching, pitting and geological mapping, and considerable "hands-and-knees" prospecting. Several new areas of uranium and niobium mineralization were discovered.

Although the entire complex is highly radioactive, work so far has focused attention on the contact between carbonatite and the core of nepheline syenite. This favourable contact is over 2 miles long. Between Centre and Anomaly lakes, where most New Insco prospecting has been concentrated, the contact has been marked by betafite-bearing pyroxenite which contains significant amounts of U_3O_8. In no place has the mineralization been delimited either on strike or to depth.

Work on the remainder of the complex has located significant concentrations of uraniferous pyrochlore and a fourth betafite occurrence.

The next work program will include: (1) drill test of the carbonatite-syenite contact between Centre and Anomaly lakes; (2) surface examination of the rest of this favourable contact; and (3) continued prospecting over the entire carbonatite complex.

Carbonatite pipes are worldwide in their distribution, but comprise a minute percentage of the over-all volume of rocks. In this type of geological feature, ore zones can be expected to have significant depth potential. This property is a typical alkalic (carbonatite) complex, unique only for its extraordinary uranium content.

Name	Galore Creek, Stikine River district (SR-76; Fig. 57)
Location and access	The chain of syenite bodies follows approximately the course of the lower Stikine River. The Galore Creek body lies near 57°12′N, 131°26′W. Access is difficult, and is principally by helicopter from Stewart, or by the Stewart–Cassiar highway.
Form and structure	At least six syenites occur along a north-northwest-trending belt some 80 miles long. Each forms a composite, subcircular pluton, elongated along the trend of the belt, intruding upper Triassic greywacke, arkose, conglomerate, and fragmental volcanic rocks of basaltic, andesitic, and trachytic composition. The volcanic rocks may be effusive equivalents of the intrusions.
Petrography	The Galore Creek body, which may be taken as typical, consists of at least five phases having intrusive relations to one another. All phases are predominantly composed of orthoclase and epidotized mafic minerals, but the darker marginal phases also contain pseudoleucite phenocrysts, in which the nepheline part has been altered to sericite. Brecciated phases of the syenites contain lenses and pods of intensely metamorphosed biotite-orthoclase-garnet-epidote rocks assumed to have been derived from the surrounding volcanic rocks, some of which also display pseudoleucite phenocrysts. The whole intrusion is altered, presumably by later intrusions of granodiorite, and some parts of it now contain secondary quartz, as well as veins containing carbonates, riebeckite, barite, and fluorite, among other minerals.
Age	The Galore Creek intrusion gives maximum K-Ar dates on biotite of 198 m.y. This is in reasonable agreement with the upper Triassic age of the presumably cognate pseudoleucite-bearing lavas.
Economic aspects	Disseminated pyrite, chalcopyrite, and minor bornite is associated with the mafic minerals of the Stikine River syenites. Minor galena, sphalerite, and molybdenite have also been reported from the Galore Creek body, which was extensively explored from 1960 to 1966 by Stikine Copper Ltd.
Remarks	According to Kerr (1948), three of these syenites contain nepheline. It seems reasonable to suppose that the others are also alkaline.
Selected references	Barr, D. A. (1966): The Galore Creek copper deposits; Can. Inst. Mining Met., Bull. 59, p. 841–853. Kerr, F. A. (1948): Lower Stikine and western Iskut River areas, British Columbia; Geol. Surv. Can., Mem. 246, p. 49–53.

Name	Spotted Fawn Creek (SR-77; Fig. 58)
Location and access	Forty miles northeast of Dawson, Yukon Territory (64°25′N, 38°41′W), in rugged country accessible only by aircraft or by arduous traverse on foot.
Form and structure	Alkaline rocks occur at two localities on the contact between the Late Cretaceous Tombstone batholith and Early Cretaceous orthoquartzites. The alkaline rocks form dyke-like masses up to 4,000 feet wide intruding both rock-types. At a third locality near the centre of the batholith, phonolitic rocks appear to form a gradational phase in enclosing syenite.
Petrography	The alkaline rocks are fresh porphyritic rocks with euhedral phenocrysts of pseudoleucite (nepheline-orthoclase intergrowths in trapezohedral form) up to 2 inches across, and tabular clear orthoclase set in an aphanitic groundmass of biotite, calcite, melanite, and sphene, as well as sparse cancrinite. Nepheline forms small altered grains intergrown with feldspar. Chemical analyses are shown in Table 24. The rocks of the Tombstone batholith range from alkalic syenite at the core to quartz monzonite nearer the margins.
Age	The Tombstone batholith yielded K-Ar ages on coexisting hornblende and biotite of 80 ± 13 and 91 ± 5 m.y., respectively. The age of the phonolite is assumed to be similar.

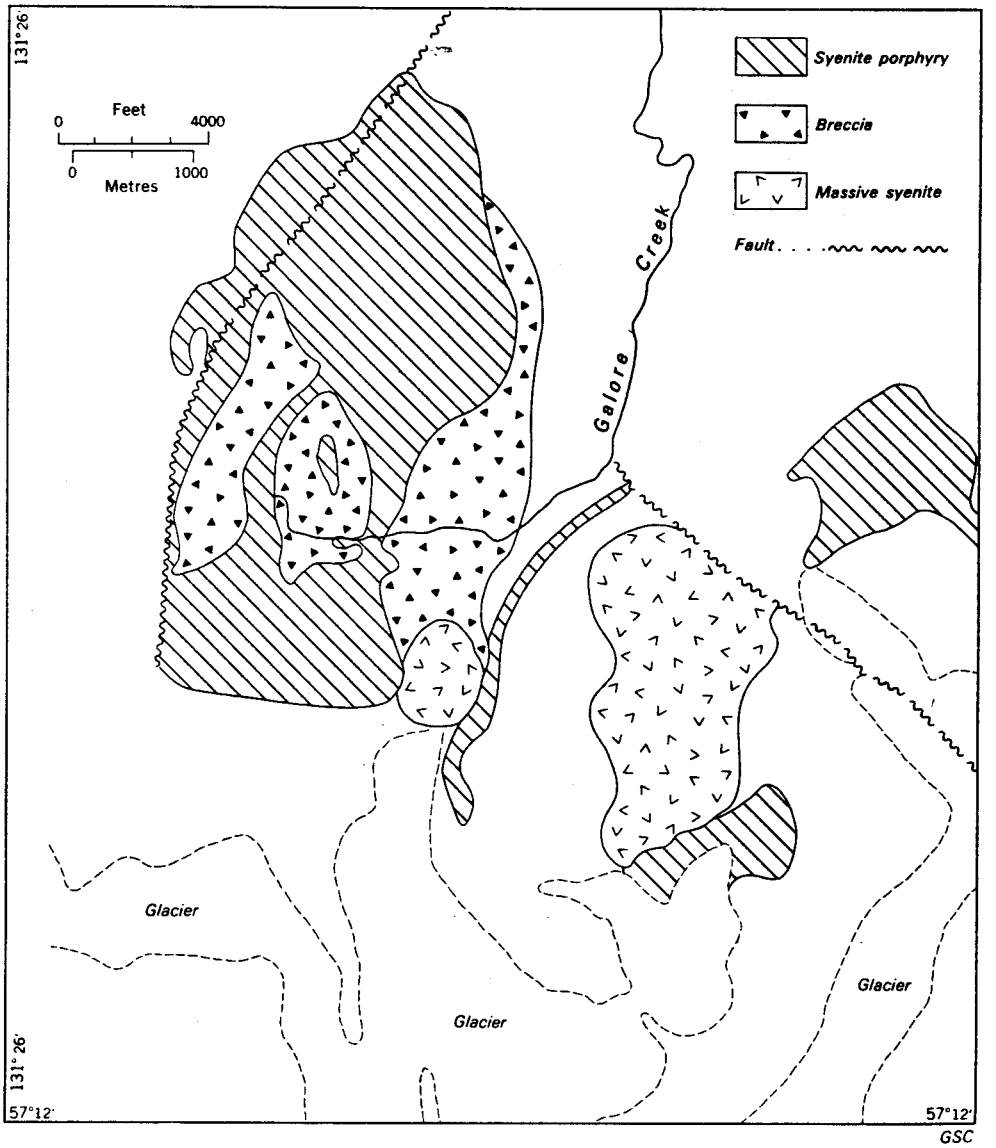


FIGURE 57. Geology of the Galore Creek syenite (after Barr, 1966).

Economic aspects	None at present.
Remark	The Spotted Fawn Creek and Galore Creek occurrences of pseudoleucite suggest that other similar occurrences may be present within the syenitic rocks of the Cordillera.
Selected reference	Tempelman-Kluit, D. J. (1969): A re-examination of pseudoleucite from Spotted Fawn Creek, west-central Yukon; Can. J. Earth Sci., v. 6, p. 55–62.

Alkaline Rocks

Delineation of Locations of Alkaline Rocks in Yukon

(1) Diamonds - Assoc with recently identified kimberlite (?)

(2) Rare Earths & Nb - Assoc. with intrusives

(3) Uranium - low grade deposits Assoc with intrusives.

Mic. - Cret. syenite. +qtz monzonitic stocks.

intrude $\in$ → L.K. ~~sedimentary~~ strata of argil. seds, v.l.c, ls, phyllitic s.l.t, qtz.b) diabase/gabbro.

DTK- KAr. 80±13 mys. (Hb) ~~91 ± 5 mys.~~ (Si)

N/C.

.3 mm or less in length), that show yellowish green to brownish green pleochroism and that are marginally altered. The plagioclase (An_{55}) phenocrysts are thick, tabular crystals .5 mm) that are commonly partly or completely sericitized. Phenocrysts make up about alf the rock. Chilled margins are narrow and sedimentary rocks around the dykes are not ltered. Few xenoliths occur in the dykes.

The dykes post-date the folding of the Mesozoic rocks and they are therefore id-Cretaceous or younger. It is not known whether the dykes were emplaced before, uring, or after intrusion of unit 18. Units 17 and 18 may be related, but the dyke rocks ssociated with the quartz monzonites (unit 18) are trachytes, unlike the porphyritic iorite that forms unit 17.

Map-unit 18

Distribution

Syenite and quartz monzonite stocks (unit 18) occur in central and northern Tombstone area where they intrude strata of units 4, 5, 11, 13, 16, and the Road River and Tahkandit Formations. Similar rocks, considered to have been intruded contemporaneously, are found southeast of the map-area (Fig. 11).

The syenite (unit 18) is well exposed in an area where peaks and shear cliffs form rugged and imposing mountains (*Frontispiece*, Fig. 2). The Tombstone stock occupies an area of roughly 35 square miles and the Brenner stock outcrops over an area of 8 square miles. Two smaller plutons occur in the northwest part of the area.

Lithology

The Tombstone intrusions range from nordmarkite (alkali syenite) to quartz monzonite and quartz diorite. Syenite makes up about three-quarters of the stocks and occurs in their central parts. Quartz monzonite and quartz diorite form marginal phases of the intrusions. The alkali syenite varies in grain-size, texture, and composition. It is commonly porphyritic and medium grained allotriomorphic; medium- and coarse-grained non-porphyritic types are locally important. The stocks show a concentric trachytoid texture by virtue of alignment of tabular orthoclase phenocrysts.

The alkali syenite consists of orthoclase with subordinate amounts of pyroxene and plagioclase; where the proportion of plagioclase is high the rock is monzonitic.

An estimated mode for the alkali syenite is given below:

Orthoclase	55 – 95 per cent
Placioclase	0 – 25
Quartz	0 – 5
Pyroxene	0 – 20
Amphibole	0 – 10
Biotite	0 – 10

Orthoclase is microperthitic and somewhat sericitized. In porphyritic varieties it makes up the phenocrysts and occurs also in the groundmass. The phenocrysts are subhedral, thick, tabular crystals as much as an inch across that show ubiquitous Carlsbad twinning and rare simple zoning. In the medium-grained, non-porphyritic varieties and in the groundmass of porphyritic rocks, orthoclase forms intergrowths of anhedral, equant, and generally untwinned grains, as much as 5 mm across.

Plagioclase (andesine) occurs in both the porphyritic and non-porphyritic syenites, but is more abundant in the former, and occurs as subhedral, tabular grains, several millimetres across, enclosed by orthoclase, and interstitial to it. In non-porphyritic syenites plagioclase occurs with quartz as small, euhedral grains around the margins of the orthoclase crystals.

Pyroxene is the general mafic constituent of the syenite. Its properties vary; in central parts of the stocks this mineral is commonly pleochroic in yellowish green and deep grass green colours, elsewhere it is a paler green or colourless variety. The pyroxenes are members of the aegirine–augite series; variation in their properties indicate a trend from more sodic to less sodic varieties away from the central parts of the stocks. Amphiboles show a parallel change. Where the pyroxene is soda-rich an arfvedsonitic amphibole accompanies it, and where the pyroxene is augite, hornblende is the amphibole. Pyroxene, amphibole, and biotite are interstitial to the feldspars and occur as intergrown aggregates of small, anhedral equant grains 1 or 2 mm across. Biotite is absent or subordinate in most rocks.

Accessory minerals are fairly abundant and include sphene, zircon, apatite, and opaques. They are usually intergrown with the mafic minerals, or enclosed by them. Melanite garnet occurs locally. Myrmekitic intergrowths along the rims of orthoclase crystals are fairly common in the coarse-grained syenites. Deuteric fluorite, calcite, and galena occur interstitially in some of the coarse-grained leucocratic syenites.

Quartz monzonite is generally medium grained, with hypidiomorphic granular texture. Porphyritic varieties are common and as with the syenites they show trachytoid textures. The quartz monzonite differs from the syenite only in its higher content of quartz and plagioclase and the two are not readily distinguished in the field; they probably grade into one another. The estimated mode for the quartz monzonite follows:

Orthoclase	40 – 45 per cent
Plagioclase	25 – 35
Quartz	10 – 20
Pyroxene	0 – 15
Hornblende	0 – 20
Biotite	1 – 15

Orthoclase and plagioclase (andesine) show the same textural characteristics in the quartz monzonite as in the syenite. The pyroxenes in the quartz monzonite are aegirine–augite and are less sodic than those of the syenite; they are commonly partly uralitized. Amphiboles have the properties of hornblende and are more abundant than pyroxene in the quartz monzonites. They form subhedral, stout prismatic grains several millimetres long that are commonly intergrown with lesser amounts of biotite. Accessory minerals are not as abundant in the quartz monzonite as in the syenite; they include sphene, zircon, apatite, and opaque minerals.

Granodiorite and quartz diorite constitute a narrow marginal phase along the northern contacts of the Tombstone and Brenner stocks and form most of the smaller stocks. They are characterized by abundant fresh plagioclase (andesine) and contain little orthoclase. The granodiorite and quartz diorite are fine grained or medium grained with an hypidiomorphic granular texture. Biotite is the chief mafic mineral and pyroxene is generally absent.

Pseudoleucite tinguaite (unit 18a) occurs along the southern margin of the Tombstone stock, where it forms a marginal phase or a dyke as wide as half a mile. It occurs also in a restricted area near the centre of the Tombstone stock. The rock is medium grey and contains phenocrysts of sanidine, orthoclase, and aegirine–augite as well as white, euhedral crystals of pseudoleucite, less than an inch across, all in a fine-grained groundmass of trachytic orthoclase and aegirine–augite. The pseudoleucite crystals were described by Knight (1906); they contain a fine-grained aggregate of nepheline, orthoclase, and scapolite.

Few dykes cut the country rocks; most of them are less than 20 feet thick and do not extend beyond the stocks for more than a mile. They are trachytes with thin, tabular phenocrysts of orthoclase as large as an inch across, small subhedral crystals of oscillatory zoned andesine, small equant euhedral crystals of uralitized sodic pyroxene, and small books of brown biotite set in a fine-grained trachytic groundmass of feldspar and aegirine–augite. The trachytic texture parallels the dykes' walls. Garnet phenocrysts occur in some dykes.

Variations in mineralogy of the rocks of unit 18 indicate a general trend from peralkaline, silica-deficient nordmarkite at the centres of the stocks to calcic, silica-saturated quartz diorite at their margins. This composition variation may be the expression of differentiation of single intrusive masses, but it may also reflect several stages of acid intrusion, in which case the stocks would be composite. The absence of observed sharp contacts between the various phases supports the former view. The various rocks of unit 18 are evidently all related to the same period of intrusion and are lithologically similar to syenites, monzonites, quartz monzonites, and granodiorites that occur southeast of the map-area (Bostock, 1948b; Green and Roddick, 1962).

Contact Metamorphic Effects

A contact metamorphic aureole, less than a mile wide, surrounds the Tombstone and Brenner stocks. Slates (units 11 and 13a) are commonly altered to biotite quartz schists, chiastolite slate, and cordierite andalusite hornfels. The following assemblages of minerals occur in the metamorphosed pelitic rocks:

Quartz – biotite
Quartz – biotite – muscovite
Quartz – andesine – biotite
Andalusite – quartz

The sandy limestones of unit 13b are metamorphosed to various medium-grained calc-silicate rocks that contain the assemblages:

Quartz – diopside
Quartz – diopside – hornblende – plagioclase
Diopside – quartz – calcite – plagioclase
Wollastonite – quartz sphene

Diabases (unit 16) are changed to amphibolites containing the assemblage:

Hornblende – biotite – plagioclase – quartz

Near the intrusive rocks orthoquartzites (unit 13) are recrystallized and bleached white. Their grain-size is notably increased (0.4 mm) and their texture is changed so that the rocks consist of interlocking mosaics of quartz grains with strongly sutured and interpenetrating boundaries.

A large xenolith of white marble (probably Tahkandit Formation), within the Tombstone stock has a skarn, consisting of a varied assemblage of coarsely crystalline calc-silicate minerals, around its margin. It contains, in order of abundance, idocrase, garnet (grossularite), scapolite (mariolitic), actinolite, epidote, calcite, fluorite, and sphene.

The rocks and mineral assemblages around the Tombstone and Brenner stocks are typical of those found in contact metamorphic aureoles around acid intrusive stocks and reflect the varied response of rocks of different composition to a thermal gradient. Most mineral assemblages belong to the hornblende–hornfels facies of thermal metamorphism, but some are transitional to the lower temperature albite–epidote–hornfels facies, whereas others reflect the higher temperature conditions of the pyroxene–hornfels facies. Metasomatism appears to have been slight. Boron was probably introduced in restricted areas where the proportion of tourmaline is high, and scapolitization and silica metasomatism have occurred in the marble xenolith.

Mode of Emplacement

The contacts of the two larger, roughly circular stocks of Tombstone area are sharp and dip outward at angles steeper than 60 degrees. The stocks are markedly discordant and sharply truncate stratigraphic units, folds, and thrust faults. The axes of some folds are bent near the margins of the larger stocks and the country rocks dip steeply along the northern margin of the Tombstone stock, but intrusions have not otherwise disrupted the host rocks. Tombstone stock contains several large (one is 3 miles long) xenoliths of rocks belonging to units 11 and 13. One of the xenoliths, composed of coarsely crystalline marble, is probably derived from the Tahkandit Formation. The marble xenolith and the large one belonging to unit 11 cannot be roof pendants and were evidently brought up from a depth of about 5,000 feet; they may have been rotated in the process. Sharp contacts between intrusive and country rocks suggest that assimilation was slight. The intrusive rocks probably crystallized from a magma emplaced singly, or in stages, by intrusion into the country rocks. There is little evidence to suggest forceful intrusion at the present exposed level of the stocks, a fact that may be interpreted as indicating that the present exposed level is close to the upper surface of the stocks. The intrusions are epizonal in character, indicating they were emplaced at relatively high levels under comparatively low load pressures. Stratigraphic evidence suggests that the present exposed level of the stocks was at least 3,000 feet below the land surface at the time of intrusion (3,000 feet is the thickness of units 15, 14, and part of 13 now eroded). Structural data suggest that the present level may have been considerably deeper (in the order of 10,000 feet), if the overthrust Precambrian rocks (above the North Fork thrust) in the southeast part of Tombstone area extended northwestward beyond their present position.

Age and Correlation

The syenites (unit 18) intrude Lower Cretaceous orthoquartzites (unit 13) and diabase (unit 16) and they postdate the deformation in which the probable Lower Cretaceous units 13 – 16 were involved. Stratigraphic data do not provide an upper limit for the age of intrusion in Tombstone area and evidence for the age of the syenite must be sought elsewhere.

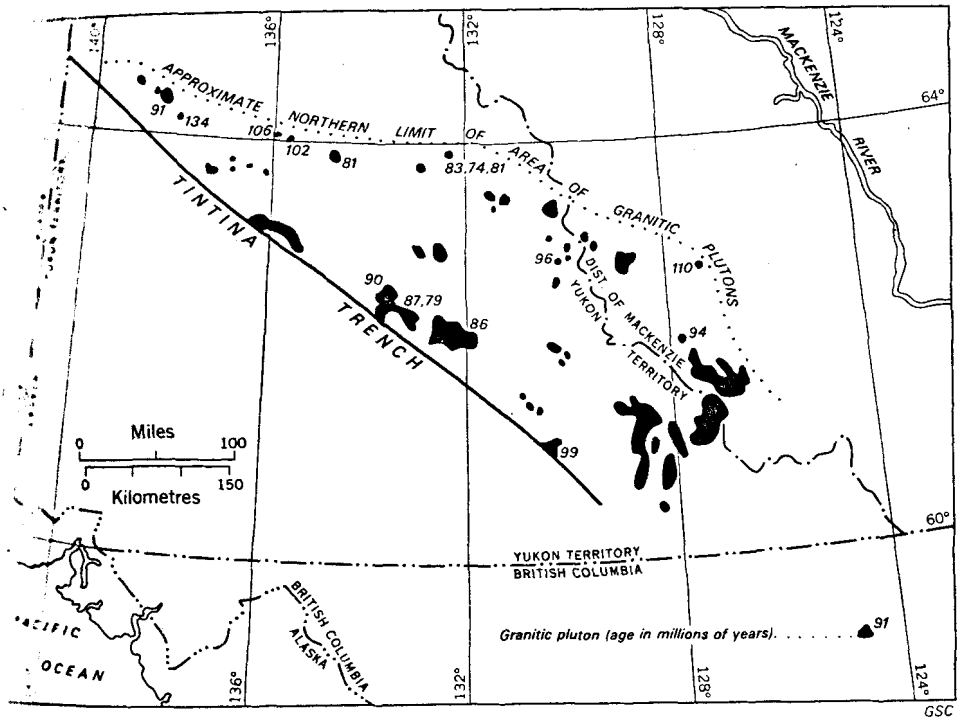


FIGURE 11. Potassium argon age determinations of granitic rocks north of the Tintina Trench.

One potassium–argon absolute age determination on biotite from a sample of hornblende biotite quartz monzonite from the Tombstone stock yielded an age of 91 ± 5 million years (m.y.)[1]. This date indicates an early Late Cretaceous time of emplacement for the Tombstone intrusions (unit 18) on presently accepted geological time scales.

The Tombstone and Brenner stocks are two of forty or more lithologically similar bodies of acid igneous rocks that occur in a broad region north of Tintina Trench (Fig. 11). Potassium–argon age determinations on granitic rocks from some of the stocks in this belt of plutons fall within the range 74 to 134 m.y. (Appendix II, Fig. 11) and a grouping of the ages about 80 to 100 m.y. is evident. The single potassium–argon date from Tombstone stock agrees with the other age determinations from these related plutons and the suggested early Late Cretaceous time of emplacement is therefore thought reliable.

Stratigraphic data indicate that an orogeny[2] took place about late Early Cretaceous time in Alaska (Mertie, 1930a, p. 110). In parts of Alaska intrusion is thought to have accompanied or followed this orogeny (Gates and Gryc, 1963, pp. 272, 273). The post-orogenic Upper Cretaceous and younger conglomerates and sandstones in east central Alaska extend along Tintina Trench to within 20 miles of Tombstone area (Fig.

[1] The associated hornblende in this sample has recently been dated at 80± 13 m.y. by the potassium–argon method.

[2] The term orogeny is used throughout this report to indicate an episode of mountain making by folding and faulting: it may have been accompanied or followed by intrusion of igneous rocks.

7). These rocks contain potash feldspar (Brabb and Churkin, 1964), which suggests that by the time they were being deposited (i.e., Late Cretaceous) plutonic rocks (? unit 18 and equivalents?) were available for erosion. The maximum and minimum ages indicated by the stratigraphic evidence and the absolute age suggested by the radiometric data support each other and an early Late Cretaceous time of emplacement is presumed for the Tombstone intrusions.

The age relations of intrusive rocks south of Tintina Trench in southern Yukon Territory and northern British Columbia were investigated by Gabrielse and Reesor (1964). They demonstrated three periods of major plutonic activity, indicated by radiometric ages and corresponding to three distinct stratigraphic breaks in the Mesozoic succession. The three igneous episodes in the region south of the Tintina Trench occurred during Late Triassic, post-Early Jurassic and pre-Late Cretaceous, and post-Earliest Tertiary times. Radiometric evidence in the area north of the Tintina Trench suggests that only the second of these plutonic events is represented there.

Discussion of Stratigraphic Data

The general absence of recognized Lower and Middle Triassic strata and the regional unconformity below the Upper Triassic in much of the western Canadian Cordilleran belt suggest that early Triassic time in southern Alaska, south-central Yukon Territory, and western British Columbia was a period of widespread diastrophism, plutonism, and volcanism (Dott, 1961). Dott has summarized the evidence and related the late Triassic transgression that followed this diastrophic interval to the eugeosynclinal parts of the Cordilleran geosyncline. Tozer (1958) subdivided the Triassic of the western Cordillera into an eastern and western system. His eastern system, in which Lower, Middle, and Upper Triassic are represented, occurs in the Rocky Mountains and Foothills and contains siltstones, shales, and limestones, but lacks volcanic rocks. Tozer's western system, which occurs in the southern Yukon and western British Columbia, is characterized by the presence of the Upper Triassic alone and includes abundant volcanic rocks. The Triassic rocks of Tombstone area evidently belong to Tozer's eastern system, indicating that miogeosynclinal conditions prevailed there during the Triassic and showing that the extensive, early Triassic diastrophism that affected the western Cordilleran region 200 miles south of Tombstone area did not extend to parts of central Yukon Territory north of the Tintina Trench.

The apparent completeness and relative thinness of the Mesozoic succession in Tombstone area indicate that this region was one of comparatively uninterrupted, largely marine, and probably miogeosynclinal sedimentation during that era. The continuity of the Mesozoic formations along the Keno Hill – Tombstone River belt further indicates that these conditions were not restricted to Tombstone area, but that they prevailed in much of the central Yukon. This area, which was previously thought to have been a highland throughout the Mesozoic, appears therefore to have been an area of marine sedimentation during Triassic, Jurassic, and early Cretaceous times. The region was tectonically quiet throughout the early Mesozoic, but in late Early Cretaceous time the rocks were intruded by diabase and folded and faulted; intrusion of syenitic rocks followed soon after this orogenic event.

APPENDIX II

Radiometric Ages

Potassium-Argon Ages of Igneous Rocks Probably Equivalent to Unit 18

Age (m.y.)	Lithology	Location	Ref.
74		N62°56′/W132°27′	4
79		N62°17′/W133°03′	4
81	Porphyritic quartz diorite	N63°54′/W134°46′	3
81		N62°54′/W132°27′	4
83		N63°57′/W132°30′	4
86		N62°15½′/W132°03½′	4
87		N62°17′/W133°03′	4
90		N61°46′/W133°26½′	4
91		N64°27′/W138°33′	4
94	Quartz monzonite	N62°05′/W127°40′	1
96	Granodiorite	N62°55′/W130°10′	1
99		N61°23′/W130°33′	4
102	Biotite quartz monzonite	N64°02′/W135°26′	3
106	Granodiorite	N64°02′/W135°50′	3
110	Quartz monzonite	N62°50′/W127°40′	2
134	Biotite feldspar porphyry	N64°09′/W138°10′	3

References

1. Baadsgaard, H., *et al.* (1961).
2. Gabrielse, H., *et al.* (1965).
3. Leech, G.B., *et al.* (1963).
4. Unpublished.

A re-examination of pseudoleucite from Spotted Fawn Creek, west-central Yukon

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Received July 3, 1968
Accepted for publication November 5, 1968

New petrographic and chemical data for pseudoleucite from Spotted Fawn Creek and two new nearby localities in central Yukon Territory are presented and discussed in the light of recent experimental evidence on the origin of pseudoleucite. The petrologic, chemical, and experimental data suggest that natural pseudoleucite results from subsolidus breakdown of leucite under water pressure and that the space provided by this breakdown results in influx of the fluid phase that accomplishes partial removal of potash, enrichment in soda, and addition of water.

Introduction

This paper presents and discusses new chemical and petrologic data on pseudoleucite from three localities near Spotted Fawn Creek in Yukon Territory. Pseudoleucite, an intergrowth of potash feldspar and nepheline, pseudomorphous after a mineral with trapezohedral crystal habit, has an overall composition fairly close to that of leucite and is generally thought to form by the subsolidus breakdown of leucite, or by reaction of early crystallized leucite with residual magma. The data presented here are viewed in the light of recent experimental evidence on the origin of pseudoleucite.

Pseudoleucite was discovered on Spotted Fawn Creek in 1904 by R. G. McConnell and was described by Knight (1906). McConnell's locality on Spotted Fawn Creek and two nearby occurrences were examined by the writer during stratigraphic and structural studies in the area in the summers of 1964 and 1965. Restudy of the pseudoleucite was undertaken because chemical data on pseudoleucite are scanty and because the high soda value of Knight's (1906) chemical analysis of the Spotted Fawn material seemed questionable.

Geological Setting

Pseudoleucite occurs at three localities (Fig. 1) in Tombstone Range, about 40 miles northeast of Dawson in Yukon Territory. McConnell's locality (#1 of Fig. 1), the most extensive, is at the head of Spotted Fawn Creek, a minor tributary of Little Twelvemile River. At McConnell's locality, pseudoleucite tinguaite[1] underlies an area of about $1\frac{1}{2}$ square miles along the southern margin of the Tombstone batholith, where it forms a dike-like mass, up to 4000 ft wide, between monzonite and orthoquartzite. Contacts between pseudoleucite-bearing rocks and other types are sharp and apparently intrusive. Field relations at the second locality are like those at the first. At the third pseudoleucite locality, a $\frac{1}{4}$ sq. mile area near the center of the Tombstone batholith is underlain by pseudoleucite tinguaite. There contacts with the enclosing syenite are gradational and the tinguaite appears to be a facies of the Tombstone batholith.

Tombstone batholith ranges from nordmarkite (alkali syenite) at its center to monzonite, quartz monzonite, and quartz diorite nearer its margins. Alkali syenite makes up about three quarters of the intrusion. The syenite is porphyritic, having a medium-grained allotriomorphic groundmass that contains microperthitic orthoclase with lesser andesine, aegirine-augite, arfvedsonitic amphibole, biotite, and minor quartz with phenocrysts of orthoclase. Accessory minerals include sphene, zircon, apatite, and opaques; melanite is found locally.

There is no evidence limiting the age of the tinguaite closely, but the pseudoleucite-bearing rocks are younger than the Early Cretaceous orthoquartzite that they intrude at localities 1 and 2. Similarities and spatial relationships between the tinguaite and rocks of the Tombstone batholith suggest that they are temporally related. Potassium–argon determinations on coexisting hornblende and biotite from the Tombstone batholith gave ages of 80 ± 13 m.y. and 91 ± 5 m.y. respectively, and it appears from these and other data that the batholith crystallized in early Late Cretaceous time.

[1]A tinguaite is the intrusive equivalent of a soda-rich phonolite, made up largely of potash feldspar and nepheline and characterized by the presence of abundant aegirine-augite.

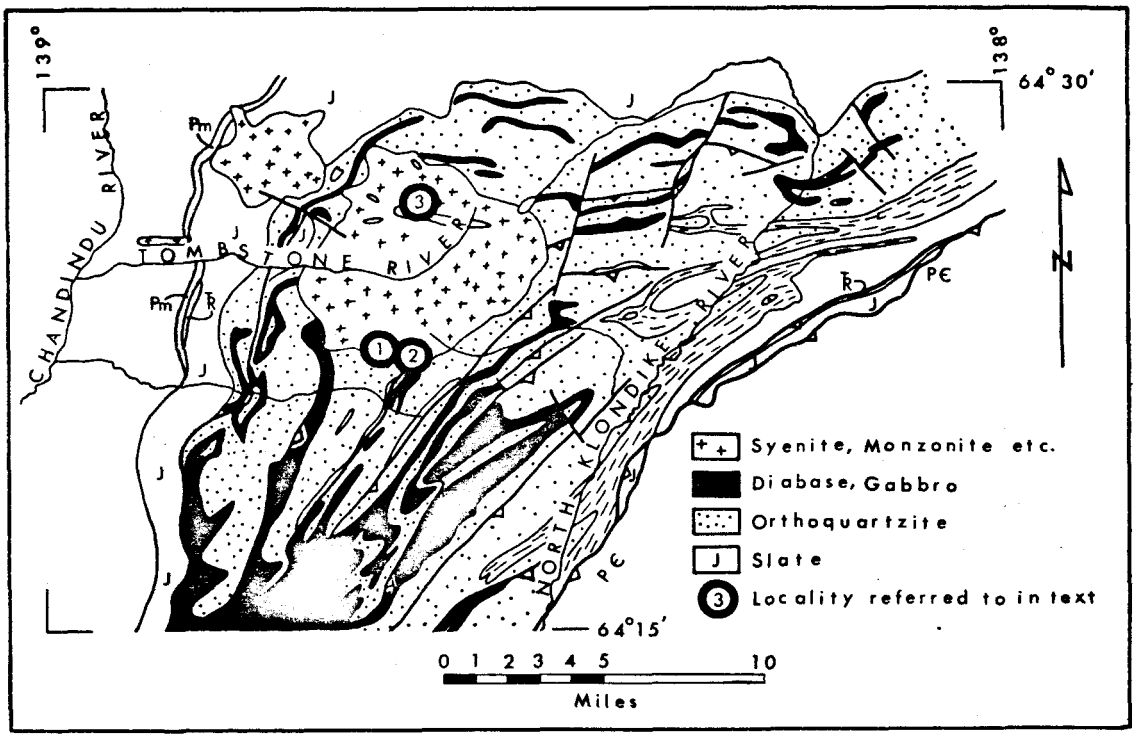

FIG. 1. Sketch map showing the location and geologic setting of the pseudoleucite-bearing rocks in the Tombstone area, central Yukon.

Pseudoleucite Tinguaite

Localities 1 and 2

Specimens collected from the first and second localities (Fig. 1) are so similar that one description covers both occurrences.

The pseudoleucite tinguaite is a fresh porphyritic rock with euhedral equant phenocrysts of white pseudoleucite (30%) up to 4 cm across and subhedral, tabular, clear orthoclase crystals (10%) up to 1 cm long, in a medium gray aphanitic groundmass (see Fig. 2). Pseudoleucite crystals are generally about 1 cm across, and readily break free from the enclosing rock. They show excellent trapezohedral crystal form with preferred development of certain faces, so that many crystals appear distorted (Fig. 2). The specific gravity of sixty-six individual crystals and crystal fragments of pseudoleucite from localities 1 and 2 were measured with Jolly and Berman balances. Values so determined are distributed in the range from 2.48 to 2.62 with no distinct modes and with an average of 2.578 ± .010 (Fig. 3). No systematic difference was noted between values determined on part or whole crystals from locality 1 or locality 2. Specific gravities reported in the literature differ from those given here. Yagi (1954) gave 2.486 as the specific gravity of a pseudoleucite crystal from Tzu Chin Shan, and Sukheswala and Sethna (1967) measured specific gravities of 2.436 and 2.408 on two crystals from India. As pseudoleucite is not porous its specific gravity must be higher than that of leucite (2.485), because the specific gravities of its constituent minerals, nepheline and orthoclase, are about 2.61 and 2.59 respectively (see Fig. 3).

Microscopic study shows that the tinguaite has a groundmass of subhedral fresh potash feldspar tablets, about 0.1 mm long, that generally show a rough trachytoid alignment. Orthoclase laths adjacent to pseudoleucite phenocrysts are oriented parallel with the phenocryst boundaries. Nepheline occurs in minor amounts as equant, anhedral grains

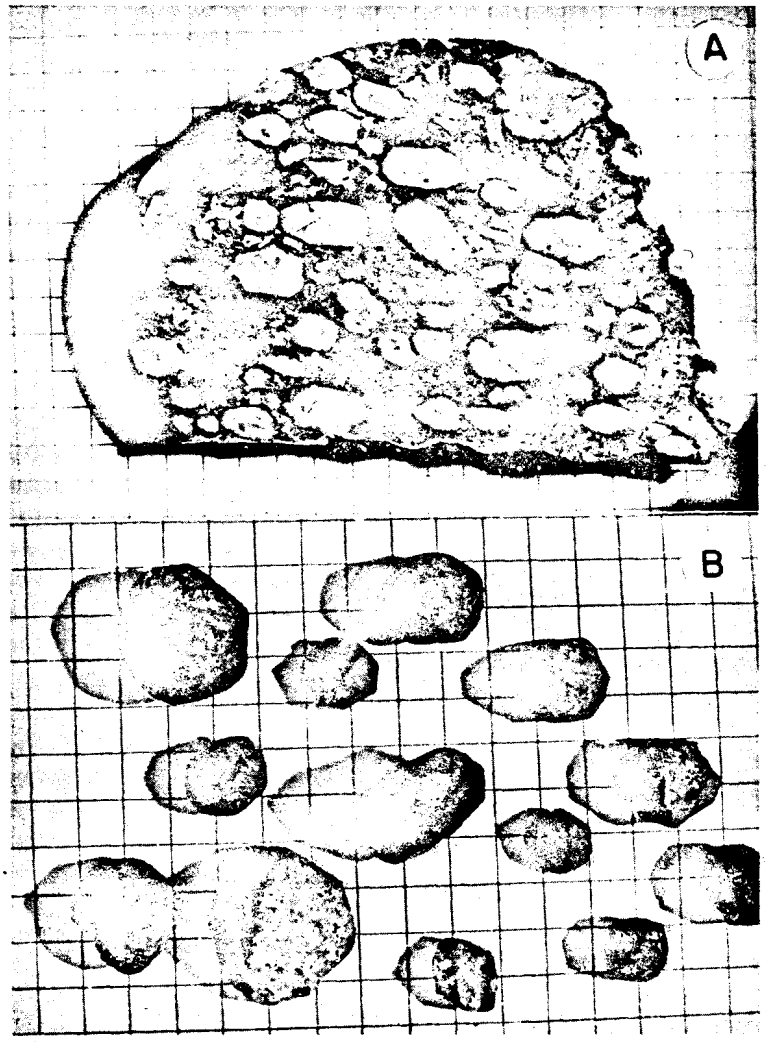

FIG. 2. Cut and polished specimen of pseudoleucite tinguaite (A) and separate crystals of pseudoleucite (B) from locality 2. Ruled squares are ¼ inch. Note the excellent trapezohedral crystal form of the pseudoleucite both in the rock and individual crystals.

generally somewhat larger than the feldspar. Nepheline is commonly partly altered near grain centers to very fine grained clay minerals. In addition to orthoclase and nepheline, the groundmass contains biotite (5%), both as individual flakes up to 0.05 mm across scattered through the rock and as aggregates or clusters of somewhat larger flakes. Biotite shows the pleochroic scheme X = brownish yellow, Y = Z = dark khaki green. Small equant grains of calcite are scattered throughout the rock. Small amounts of melanite are present in most specimens as subhedral grains less than .05 mm across. Small subhedral crystals of sphene are common. Biotite clusters commonly contain fluorite and interstitially an opaque, dark green mineral, possibly amphibole. Cancrinite, an important constituent of the pseudoleucite phenocrysts, appears sparingly in the tinguaite groundmass.

Potash feldspar phenocrysts in the tinguaite have $2V = 52°$, with $n_\alpha = 1.520$, $n_\beta = 1.524$, $n_\gamma = 1.525$, indicating that they are low orthoclase with a composition of about Or_{85} (Tuttle

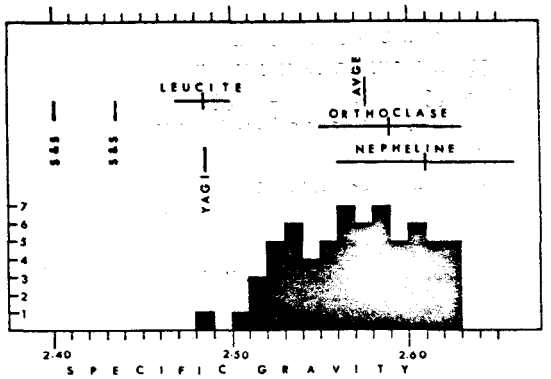

FIG. 3. Frequency distribution of 66 specific gravity measurements on whole or partial pseudoleucite crystals from localities 1 and 2 with their average value (AVGE). For comparison the range in specific gravities of leucite, nepheline, and orthoclase are shown by bars with their average values indicated by cross-lines on these. The measured specific gravities of 3 pseudoleucite crystals from other localities, reported by Yagi (1954) and by Sukheswala and Sethna (1967) and labelled YAGI and S & S respectively are also shown.

1952, p. 553). Twinning according to the Carlsbad and Baveno laws is commonly seen.

Pseudoleucite crystals themselves contain a fine-grained equigranular intergrowth of potash feldspar (60%), nepheline (20%), and cancrinite (10%), with minor calcite (5%), plagioclase (3%), biotite (1%), and melanite (1%). The main mineralogical difference between the tinguaite groundmass and the pseudoleucite phenocrysts is the relatively small proportion of dark minerals and the higher proportion of nepheline and cancrinite in the pseudoleucite. Grain size of the minerals within the pseudomorphs ranges from 0.02 to 0.2 mm; no regular variation in grain size from cores to pseudoleucite margins is evident, though the cores of some pseudomorphs contain coarser intergrowths than the margins. A weak tendency toward "palisade texture", in which orthoclase laths near pseudoleucite margins are oriented at right angles to the pseudoleucite crystal boundaries, is evident in some crystals.

Potash feldspar in the pseudoleucite forms equant, subhedral grains about 0.05 mm across. The feldspar gives the X-ray powder pattern of low orthoclase, and the spacing of the $\bar{2}01$ planes indicates a composition about Or_{90}.

Nepheline resembles orthoclase in habit and forms small, somewhat altered grains, intimately intergrown with the potash feldspar. Cancrinite appears as tiny grains in irregular patches and veinlets through the pseudocrystals.

Pseudoleucite crystals also contain euhedral grains of brown melanite, about 0.02 mm across, as well as minor amounts of biotite like that scattered through the tinguaite groundmass. Calcite is present in small anhedral equant grains, and sphene and zircon show subhedral crystal form. Narrow veinlets filled with fluorite and minor galena cut the rock locally. The central sections of many pseudoleucite crystals are partly or slightly altered to a mixture of clay minerals and sericite.

None of the specimens of pseudoleucite examined contains scapolite, which Knight (1906) described from pseudoleucite of this locality. Knight may have misidentified the cancrinite in the pseudoleucite as scapolite, because the two minerals have similar optical properties and can be distinguished only by their refractive indices.

Locality 3

Pseudoleucite tinguaite collected from the third locality (Fig. 1) differs from that already described principally in being more coarsely crystalline. In hand specimen the tinguaite is a fresh, brownish colored rock with a fine-grained groundmass and euhedral, equant white phenocrysts of pseudoleucite between 2 and 4 cm across. Pseudoleucite crystals weather from the rock readily and cover outcrops with a rubble of 'marbles'. Pseudoleucite makes up roughly one third of the rock's volume at the third locality.

The groundmass of the tinguaite is made up of fresh potash feldspar (75%), with nepheline, (15%), plagioclase (5%), and biotite (5%). Potash feldspar forms subhedral simply twinned tablets about 0.5 mm long; tablets generally show subparallel alignment, lending the rock a trachytoid texture. The potash feldspar has $2V = 47°–50°$ and its optic plane is perpendicular to (010), indicating the structure of low orthoclase; the mineral has $n_\beta = 1.524$, which, together with the 2V indicates a composition about Or_{85} (Tuttle 1952, p. 553). Equant grains of nepheline are intergrown with the feldspar. Plagioclase is present as aggregates of tiny, anhedral, equant grains, which rarely show twinning. Biotite showing a pleochroic scheme from deep red-brown to light yellowish brown

forms small subhedral books, 0.1 to 0.3 mm across, scattered through the rock.

Pseudoleucite crystals contain the same minerals found in the groundmass, but in somewhat different proportions. Potash feldspar is similar to that in the groundmass ($2V = 45°–48°$, optic plane perpendicular to (010), $n_\beta = 1.524$), and makes up about 60% by volume of the pseudoleucite. Nepheline and plagioclase each make up between 10% and 15%, while cancrinite and biotite constitute as much as 5% and 1% respectively. Nepheline and K-feldspar are intimately intergrown and form equant grains up to 0.5 mm across. Small grains of plagioclase and cancrinite aggregate near nepheline crystals. Biotite is like that found in the groundmass of the tinguaite. Calcite is a minor constituent, and muscovite and clay minerals are commonly seen as alteration products of the orthoclase.

Chemistry

Pseudoleucite

Three analyses were made of the pseudoleucite crystals studied. Two of these (A and B, Table I) were each done on about a dozen whole or partial pseudoleucite crystals from locality 1. The third analysis (C on Table I) is of eight pseudoleucite crystals from locality 3. For comparison Table I includes pseudoleucite analyses reported in the literature and presents formulae calculated from the analyses by assuming a leucite molecule with six oxygen atoms. The new analyses of Tombstone pseudoleucites are fairly consistent with one another, though they show considerable variation in alkali content. Furthermore the analyses are in good general agreement with those reported previously. The new analyses of pseudoleucite from locality 1 (A and B, Table I) are lower in soda and higher in potash than those of Knight (I, Table I).

Formulae of natural pseudoleucites calculated in terms of the leucite formula are, without exception, too low in total alkalis (see Table I). This is surprising especially as the molecular proportions of the other major elements (Al and Si) conform closely to the ideal ratios for leucite. Furthermore, the molecular ratio of sodium to potassium in the recalculated pseudoleucite formulae (Table I) is not constant, but ranges from about 1:4 to about 1:1. Finally, water is present in natural pseudoleucites (Table I), which cannot be accounted for in terms of the leucite formula and which has been disregarded in calculation of the formulae in Table I.

Pseudoleucite Tinguaite

Two analyses were made of the pseudoleucite tinguaite from localities 1 and 3 (Table II). It is interesting to note the general similarity between analyses of the whole rock and those of their coexisting pseudoleucite crystals (compare, A, B, and C, Table I, with Table II). The tinguaites contain extremely high proportions of potash in comparison with similar igneous rocks, and are also notably richer in alumina and poorer in magnesia and lime than other igneous rocks with similar silica content.

The relatively high potash and silica content and the low soda and alumina content of the tinguaite compared with their pseudoleucite reflects the overall concentration of orthoclase in the groundmass of the rock and nepheline in its pseudoleucite phenocrysts. The amounts of the four major oxides (silica, alumina, soda, and potash) in the tinguaite analyses can be accounted for by combining nepheline and orthoclase in proportions of 6% and 94%.

Discussion

Because of their peculiar nature pseudoleucite intergrowths have been studied extensively and several theories on their origin have been proposed. Knight (1906), Yagi (1954), and Sukheswala and Sethna (1967) have suggested that pseudoleucite can form by the subsolidus breakdown of soda-rich leucite. Bowen and Ellestad (1937) thought that pseudoleucite forms by reaction between leucite and residual magma before complete crystallization of the leucite-bearing rock, and were supported in their idea by Zies and Chayes (1960). Fudali (1963), however, has shown experimentally that pseudoleucite can form by subsolidus breakdown of soda-rich leucite solid solutions upon cooling. Seki and Kennedy (1964) showed that pure leucite breaks down in a water saturated environment upon cooling, to a mixture of sanidine and hexagonal kalsilite.

$$2\ \text{leucite} \longrightarrow \text{sanidine} + \text{hexagonal kalsilite}$$
$$2\ KAlSi_2O_6 \quad KAlSi_3O_8 \quad KAlSiO_4$$

TABLE I

Analyses of pseudoleucite

	A	B	C	D	E	F	G	H	I	J	K	L	M
SiO_2	54.94	55.78	57.91	54.54	51.42	55.55	57.42	57.46	58.15	55.06	56.26	56.9	56.19
TiO_2	0.04	0.21	0.10	0.02	tr	0.11	0.24	0.07	—	—	—	0.1	0.11
Al_2O_3	23.02	23.51	22.83	24.58	23.53	22.27	21.85	21.94	23.66	25.26	21.93	22.6	23.08
Fe_2O_3	0.20	0.13	0.61	1.69	2.11	1.66	1.70	0.66	1.59	—	0.67	0.6	1.09
FeO	0.41	0.89	0.61	0.60	0.60	0.33	—	0.13	—	—	—		0.54
MnO	—	0.02	0.02	nd	nd	tr	0.03	0.04	—	—	—	—	
MgO	—	—	—	tr	tr	0.09	0.07	—	0.21	0.28	—	—	
CaO	2.63	1.29	1.89	1.64	1.48	2.16	0.19	0.20	0.43	0.60	1.46	1.3	1.17
Na_2O	4.98	6.32	3.30	5.60	5.83	2.80	4.78	4.78	7.08	7.60	4.95	3.9	5.16
K_2O	10.98	10.82	12.22	10.45	9.73	10.37	13.40	13.76	8.49	10.34	10.63	10.8	10.99
H_2O+	2.39	1.29	1.06	1.40	2.70	4.09	0.27	0.36	1.35	1.78	4.16	3.5	2.12
H_2O-	0.05	0.03	0.02			0.99	0.03						
P_2O_5	—	—	0.08										
BaO							0.28	—					
CO_2								0.23					
SO_3								0.18					
Rb_2O								0.08					
Cs_2O								0.01					
	99.64	100.29	100.65	100.52	97.40	100.42	100.26	99.90	100.96	100.92	100.06	99.7	100.45
Recalculated "formulae" of pseudoleucite (Numbers of ions on the basis of 6 oxygens)													
Si	2.00	1.99	2.03	1.94	1.96	1.96	2.02	2.05	1.95	1.96	2.04	2.05	2.00
Al	.99	.99	.94	1.03	1.00	.92	.91	.92	.94	1.06	.94	.96	.97
Fe+3	—	—	.02	.05	.06	.04	.05	.02	.04	—	.02	.02	.03
Fe+2	.01	.03	.02	.02	.02	.01	—	—	—	—	—	—	.02
Ca	.10	.05	.07	.06	.05	.08	.07	.01	.02	.02	.06	.05	.05
Na	.37 .98	.43 .97	.22 .84	.39 .92	.41 .91	.19 .64	.33 1.00	.33 .97	.46 .84	.48 .97	.35 .90	.27 .82	.37 .92
K	.51	.49	.55	.47	.45	.47	.60	.63	.36	.47	.49	.50	.50

A. Pseudoleucite, tinguaite: Spotted Fawn Creek, locality 1, Yukon, H. Soutar, analyst (this paper).
B. Pseudoleucite, tinguaite: Spotted Fawn Creek, locality 1, Yukon, H. Soutar, analyst (this paper).
C. Pseudoleucite, tinguaite: Spotted Fawn Creek, locality 3, Yukon, H. Soutar, analyst (this paper).
D. Pseudoleucite, tinguaite: Ghori, India (R. N. Sukheswala and S. F. Sethna 1967).
E. Pseudoleucite, tinguaite: Ghori, India (R, N. Sukheswala and S. F. Sethna 1967).
F. Pseudoleucite, tinguaite: Tzu Chin Shan, Shansi, N. China (Yagi 1954).
G. Pseudoleucite, BpM4: Bearpaw Mountains, Montana, E. G. Zies, analyst (Zies and Chayes 1960).
H. Pseudoleucite, BpM3: Bearpaw Mountains, Montana (Fe minerals removed magnetically before analysis) C. O. Ingamells, analyst (Zeis and Chayes 1960).
I. Pseudoleucite: Spotted Fawn Creek, Yukon Territory; C. W. Knight, analyst (Knight 1906).
J. Pseudoleucite: Magnet Cove, Arkansas; J. F. Williams, analyst (Knight 1906).
K. Pseudoleucite: Loch Borolan Laccolith, Scotland; S. J. Shand, analyst (Shand 1939).
L. Pseudoleucite: Headed Dike, Highwood Mountains, Montana; F. A. Gonyer, analyst (Larsen and Buie 1938).
M. Average of all twelve analyses.

TABLE II

Analyses of pseudoleucite tinguaite from Spotted Fawn Creek area, Yukon

	A	B
SiO_2	57.86	58.28
Al_2O_3	19.42	20.70
Fe_2O_3	.66	1.50
FeO	2.44	1.55
CaO	2.18	1.95
MgO	.29	.10
Na_2O	3.21	2.23
K_2O	12.41	12.77
TiO_2	.48	.36
MnO	.05	.04
P_2O_5	.15	.03
H_2O+	.89	1.18
H_2O-	.02	.03
	100.06	100.72

A. Pseudoleucite tinguaite, locality 1, H. Soutar, analyst.
B. Pseudoleucite tinguaite, locality 2, H. Soutar, analyst.

This reaction involves a volume decrease of 3.82%.

Variation in the chemical composition of pseudoleucite specimens and their distinct difference from natural leucites (Fig. 4) weigh against a simple subsolidus breakdown of leucite to form pseudoleucite, and support liquid reaction theories. The main criticism of the reaction theory, however, is that pure and sodic leucites break down experimentally upon cooling to potassium feldspar and nepheline without liquid reaction, and under conditions at which all primary rock components are crystalline, so that liquid should not even be present (except interstitially in trace amounts). Neither theory of pseudoleucite genesis appears by itself sufficient to explain the formation of all pseudoleucites, but a combination of both may explain the origin of pseudoleucites in general.

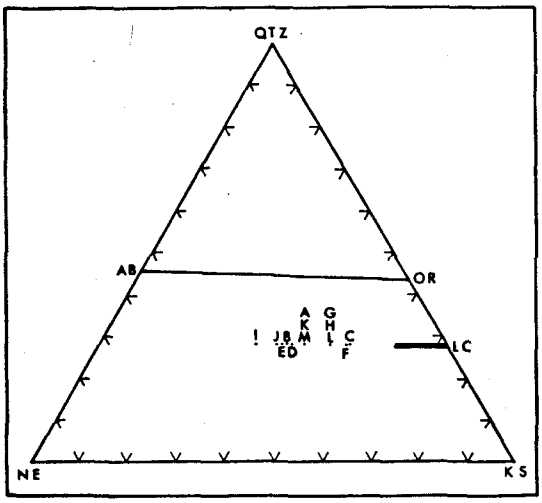

FIG. 4. Compositions of pseudoleucites in the ternary system quartz–nepheline–kalsilite plotted on the leucite – soda leucite join in terms of the Na:K ratios given in the recalculated "formulae" of pseudoleucite (Table I). The composition range of natural leucite is shown for comparison.

If pseudoleucite results from the breakdown of leucite according to Seki and Kennedy's (1964) reaction, the density difference between natural leucite and pseudoleucite should be similar to that postulated on theoretical grounds. If, on the other hand, reaction of leucite with liquid is important the density difference between leucite and pseudoleucite might be expected to vary and should be unpredictable. The average specific gravity of natural pseudoleucites from Spotted Fawn Creek is 2.578, 3.75% higher than the 2.485 given by Deer *et al.* (1963) for leucite. This is essentially the same as the 3.82% volume difference predicted by Seki and Kennedy's reaction. Unfortunately the specific gravity of the Spotted Fawn Creek pseudoleucite has a wide range and the evidence is not as conclusive as these figures would indicate, but it nevertheless supports the idea that breakdown according to Seki and Kennedy's reaction is important in the formation of the Spotted Fawn Creek pseudoleucite.

Breakdown alone, however, cannot account for the chemical anomalies observed in natural pseudoleucites. The low values in total alkalis in terms of the leucite formula point to partial removal of these elements during or after breakdown. Similarly the water in pseudoleucites, present in minerals like cancrinite and micas, implies addition of water because analyzed natural leucites contain negligible water. Finally, the high soda content of pseudoleucites indicates either that the parent leucite, from which pseudoleucite presumably formed, was sodic or that soda has been added during or after transformation to pseudoleucite. The low soda content of natural leucite and the range in the soda-potash ratio of pseudoleucite suggest the addition of soda.

Removal of alkalis, addition of water, and the possible addition of sodium to leucite during or after breakdown are difficult to accomplish in a

dry reaction when the entire rock is crystalline and when only minor amounts of interstitial water are present. However, the space created by leucite breakdown according to Seki and Kennedy's reaction amounts to somewhat more than 1% of the rock's total volume (i.e. 30% pseudoleucite × 3.8% volume change), and this should be sufficient to allow entry of a fluid phase to permit chemical exchange.

The evidence therefore suggests that natural pseudoleucite is formed largely by subsolidus breakdown of leucite when the entire rock is crystalline, with subsequent reorganization of alkalis facilitated by the introduction of a hydrous fluid phase into the space created by this breakdown. This scheme accounts for the chemical differences between leucite and pseudoleucite and ascribes minerals such as cancrinite, analcite, clays, and micas to an inherent part of pseudoleucite formation rather than an unrelated late hydrothermal alteration. Pseudoleucites lacking these hydrous minerals are unknown; if found they would constitute a serious argument against this process. Variation in the amount of alkali deficiency and water excess may be related to the pressure at which the fluid phase is introduced or the time over which it acts. The question of whether the parent leucite or pseudoleucite is more sodic than natural leucite is unanswered, but the scheme proposed here does not require that the parent leucite be sodic and can account for all the soda in pseudoleucite by introduction through the fluid phase following breakdown. Even if all soda were introduced, a reorganization of only about 5 wt.% of the pseudoleucite is required.

Acknowledgments

The writer is indebted to the Department of Geological Sciences, McGill University, for the chemical analyses presented in this paper. He is also grateful to K. C. McTaggart of the University of British Columbia and L. H. Green of the Geological Survey of Canada for critically reading the manuscript.

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NEBULOUS
Archer, Cathro and Associates Limited
(Ukon Joint Venture)

Uranium
116 B 7
(64°28'N, 138°46'W)

References: Cockfield (1920); Lambert (1963); Tempelman-Kluit (1970); Green (1972).

Claims: NEBULOUS 1-33

Location and Access:

The claims are located 49 km northeast of Dawson in the Cloudy Range between the Chandindu and Blackstone Rivers. Access in 1976 was by helicopter from a camp at Mile 45 (Km 72) of the Dempster Highway.

History:

The claims were staked in the summer of 1976 for the Ukon Joint Venture.

Description:

The claims are located on the Lower Cretaceous Mt. Brenner stock which has a core of porphyritic quartz monzonite and is concentrically zoned successively by prophyritic hornblende monzonite, monzonite porphyry, a thin band of pyroxenite and augite-biotite porphyry (Lambert, 1963). The stock is surrounded mainly by a Lower Cretaceous orthoquartzite, ~~the~~ (Keno Hill quartzite) and diabase.

Current Work and Results:

A helicopter-borne radiometric survey was conducted over the stock with the instrument in the total count mode. Spectral checks for U, Th and K were made on anomalies. The highest zone of radioactivity was associated with a crescent shaped zone of monzonite porphyry, but most is likely due to a high thorium content. Soils, silts, waters and rock chips and whole rocks were analyzed for uranium. Uranium mineralization is visible mostly as a yellow coating on joints and as fracture fillings in two zones. A typical assay from a specimen containing about 10 per cent yellow oxide mineral ran 1.1 per cent U_3O_8 and 30 ppm Th. However, a sample of fresh monzonite free from fractures ran only 40 to 80 ppm uranium.

TING, NOTING, PROSPECTING
Archer, Cathro and Associates Limited
(Ukon Joint Venture)

Uranium
116 B 7
(64°23'N, 138°36'W)

References: Cockfield (1920); Tempelman-Kluit (1970); Green (1972).

Claims: TING 1-50; NOTING 51-76; PROSPECTING 77-84

Location and Access:

The claims are located 49 km northeast of Dawson. Access in 1976 was by helicopter from a camp at Mile 45 (Km 72) of the Dempster Highway.

History:

The claims were staked in the spring and summer of 1976 for the Ukon Joint Venture (Chevron Canada Limited and Kerr-Addison Mines Limited; managed by Archer, Cathro and Associates Limited).

Description:

The TING, NOTING and PROSPECTING claims are located on the Tombstone Stock. The stock is composed of coarse-grained alkaline plutonic rocks of Lower Cretaceous age, ranging from alkali syenite, tinguaite, nepheline syenite and monzonite to silica-saturated rocks of granodioritic and quartz dioritic composition. The major minerals observed are orthoclase, plagioclase, nepheline, cancrinite, calcite, biotite, hornblende, pyroxene and quartz. Accessory minerals identified so far include sphene, zircon, apatite, melanite garnet, fluorite, apatite and opaques. Trachytic dykes are found in the area of the stocks cutting the country rocks. Radioactivity is associated with the tinguaite and dykes at the eastern margin of the stock near Mt. Monolith. The stock is intrusive into orthoquartzite, (Keno Hill Quartzite) and diabase and xenoliths of the country rocks are common in the stock.

Current Work and Results:

Helicopterborne radiometric surveys near the area outlined numerous anomalies of which some are contained within these claim groups. Anomalies are associated with the intrusive rocks. The spectrometer was operated on the total count mode for the surveys but anomalies were checked spectrally on U, Th and K channels. Uranium was found to be out of equiblibrium in some places because samples with low counts returned high assays. Mineralization seems to be associated with the pseudoleucite tinguaite as primary uranium minerals disseminated in the rock. Secondary yellow uranium mineralization is found on fractures. In addition to a scintillometer survey, soil, silt, water and rock samples near the showing were analyzed for uranium and thorium. Assays of the radioactive tinguaite ran from 0.37 to 4.68 per cent U_3O_8 with unmineralized rock contains about 35 ppm uranium.

A, B, AB
Chevron Standard Limited

Uranium
116 B 11
(64°32'N, 139°07'W)

References: Cockfield (1920); Tempelman-Kluit (1970); Green (1972).

Claims: A 1-16; B 1-4, AB 1-76; WAD 1-16.

Location and Access:

The property is located near Deadman's Gulch about 56.3 km north of Dawson. Access in 1976 was by helicopter from Dawson.

History:

The claims were staked in 1975.

Description:

The claim groups are underlain by unit 21b of Green (1972) which is an intrusive stock of Cretaceous age. The intrusive, which is called the 'Deadman Stock', is a multiphase pluton in which the three main phases are; (1) pink and grey equigranular hornblende biotite syenite, (2) pseudolucite-tinguaite, and (3) quartz monzonite. Uranium and thorium mineralization is found associated with the intrusive.

Current Work and Results:

A ground radiometric survey with total count scintillometers over a grid was carried out in conjunction with a soil geochemical survey. The claims were also mapped geologically and further work was recommended.

C
Chevron Standard Limited

Uranium
116 B 8
(64°17'N, 139°13'W)

References: Cockfield (1920); Tempelman-Kluit (1970); Green (1972).

Claims: C 1-69

Location and Access:

The property is located on Antimony Mountain 61 km east-northeast of Dawson. Access in 1976 was by helicopter from Dawson.

History:

The claims were staked in 1975. In the past, interest has been shown in the stock for gold, copper and antimony mineralization.

Description:

The claim group is underlain by unit 21b (Green, 1972) which is an intrusive stock of Cretaceous age named the "Antimony Stock". The stock consists of hornblende and hornblende/biotite syenite.

Current Work and Results:

A ground radiometric survey using total-count scintillometers, was carried out on grid lines. A uranium soil and stream silt geochemical survey was also conducted. No significant anomalies were indicated though certain phases of the intrusive have a higher background. Further work was recommended.

A/c

Ting showing: float. 0.41 % U_3O_8

.53 % " .015 ThO_2

unmineralized tinguaite - 20-35 ppm U.

representative float — .104 % U_3O_8 .010 ThO_2

a Selected specimens - 4.18 % U_3O_8; 0.005 ThO_2; 3.0 % K

500 ppm Ce, 200 Nd, 20 Tb, 5 Yb, 50 Y.

Fawn- highest grab - .726 % U_3O_8

190 ppm Th

10.0 K

other > .08 % U_3O_8.

Prospecting: .372 to 1.20 ⟹ % U_3O_8 & 520 ppm Th.

Nebulous - sample containing 10% yellow oxide 1.1 % U_3O_8 & 30 ppm Th

typ. assay from N. zone - 165 ppm U - 340 ppm Th - 5.5 K.

Channel samp. of fresh rx. no. joints: 12 to 57 ppm U

East Zone - U in secondary mineral filling fractures.

- large amt Mo + Bi

typ. Assays .107 % U_3O_8

0.58 % ThO_2 + some REE

- Assays - .26 %, .98 %, .1 % U_3O_8

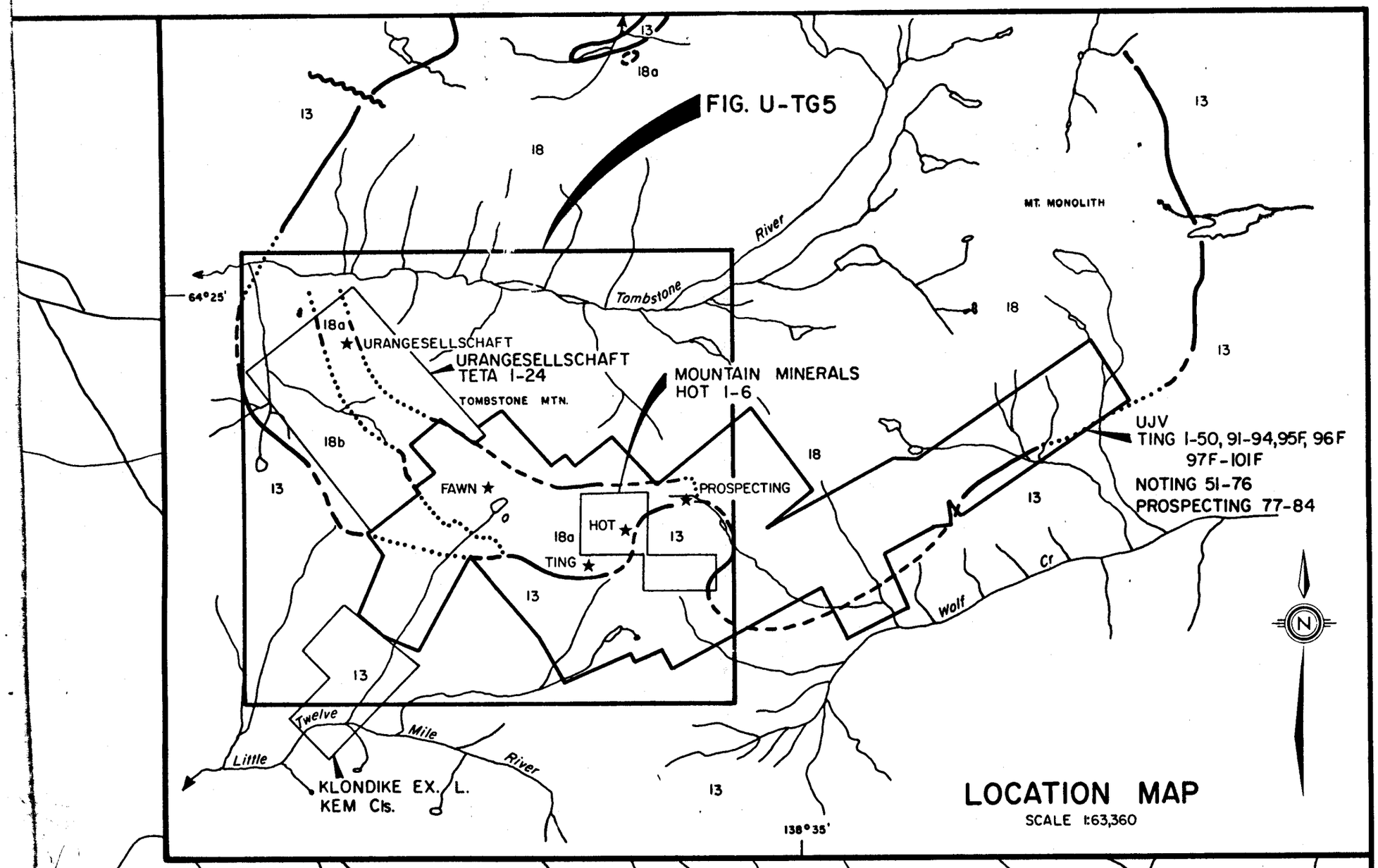


FIG. U-TG5
18a
13
18
MT. MONOLITH
River
Tombstone
64°25'
18a
URANGESELLSCHAFT
URANGESELLSCHAFT
TETA 1-24
TOMBSTONE MTN.
MOUNTAIN MINERALS
HOT 1-6
UJV
TING 1-50, 91-94,95F, 96F
97F-101F
NOTING 51-76
PROSPECTING 77-84
18b
FAWN
PROSPECTING
HOT
TING
Wolf
Cr
Twelve
Mile
Little
River
KLONDIKE EX. L.
KEM Cls.
138°35'
N
LOCATION MAP
SCALE 1:63,360

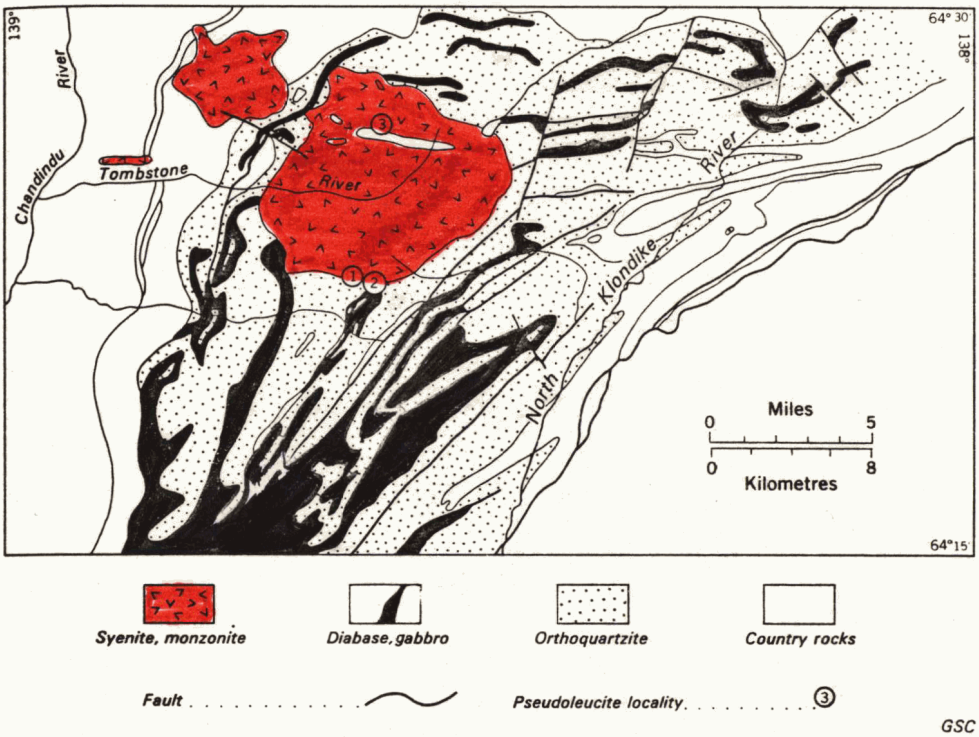


FIGURE 58. Location and geological setting of the pseudoleucite-bearing rocks in the Tombstone batholith (after Tempelman-Kluit, 1969).

TABLE 24 *Chemical analyses of alkaline rocks from Spotted Fawn Creek*

	1	2
SiO_2	57.86	58.28
TiO_2	0.48	0.36
Al_2O_3	19.42	20.70
Fe_2O_3	0.66	1.50
FeO	2.48	1.55
MnO	0.05	0.04
MgO	.29	.10
CaO	2.18	1.95
Na_2O	3.21	2.23
K_2O	12.41	12.71
H_2O	0.91	1.21
P_2O_5	.15	0.03
TOTAL	100.10	100.66

Analyses from Tempelman-Kluit (1969), p. 61.
1. Pseudoleucite phonolite from locality 1, Figure 58.
2. Pseudoleucite phonolite from locality 2, Figure 58.

who Ukon JT. V.

Poco de Caldas - 17 000 ton U_3O_8

4#/ton

in Gr. Triyanit Pecablende Complex.

.25 – .6 MoO_3

lots Zircon.

↳ metamict zircon.

MIDDLE PERMIAN

Light to dark grey phosphatic fossiliferous limestone

SILURIAN

Interbedded black chert and argillite; minor chert pebble conglomerate

Bedding (inclined, vertical)

Foliation (primary in granitic rocks; inclined, vertical)

Joints (inclined, vertical)

Anticlinal axis

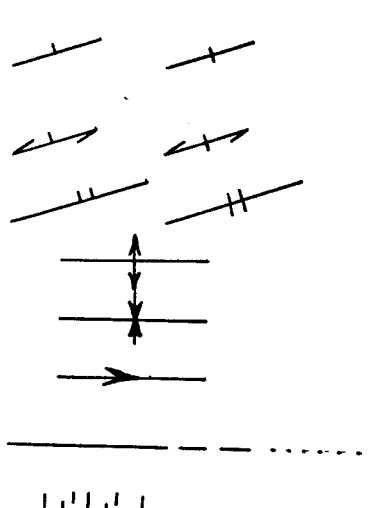
Synclinal axis

Plunge of fold axis

Geological boundry (defined, approximate, assumed)

Foliation, primary (in cross sections)

Joints (in cross section)



Geology by M. B. Lambert, 1964

Topography modified after advanced print of 116 B/7, Department of Mines and Technical Surveys, 1963.

Approximate magnetic declination 33° 27' East.

Drawn by M. B. Lambert

LEGEND

MIDDLE CRETACEOUS(?)

MOUNT BRENNER STOCK

- Aplite, fine grained leuco quartz monzonite
- Pink quartz monzonite porphyry
- Porphyritic hornblende monzonite
- Monzonite porphyry
- Hornblende biotite pyroxenite
- Augite biotite monzonite

LOWER CRETACEOUS

- Dark blue grey to grey quartzite with minor slate and phyllite

JURASSIC

- Dark grey argillite, shale, slate, phyllite; minor limestone

MIDDLE PERMIAN

- Light to dark grey phosphatic fossiliferous limestone

SILURIAN

- Interbedded black chert and argillite; minor chert pebble conglomerate

Bedding (inclined, vertical)

Foliation (primary in granitic rocks; inclined, vertical)

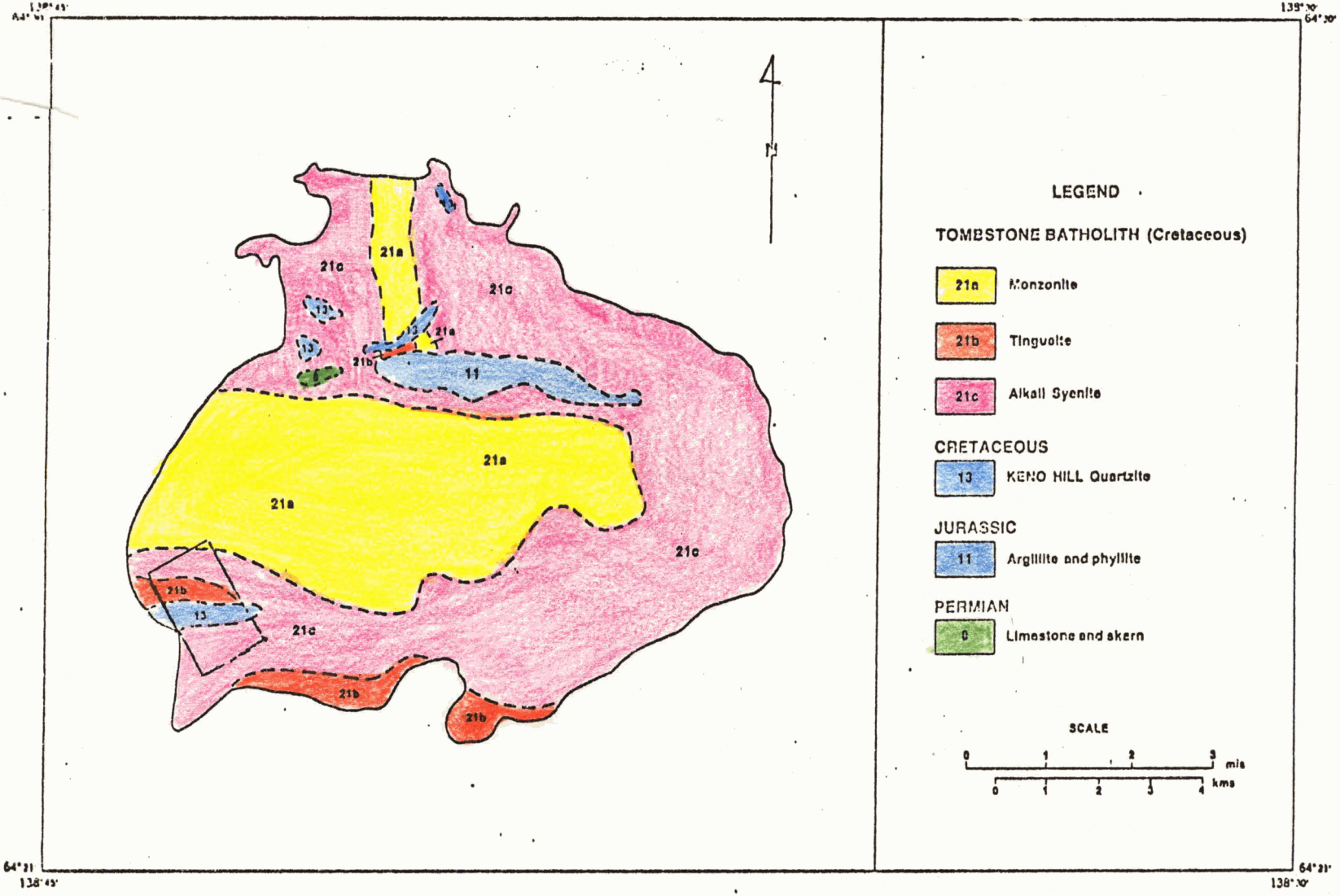

139°45'
64°30'
139°30'
64°30'
N
21a
21c
13
21a
21b
11
21a
21a
21c
21b
13
21c
21b
21b
LEGEND
TOMBSTONE BATHOLITH (Cretaceous)
21a Monzonite
21b Tinguaite
21c Alkali Syenite
CRETACEOUS
13 KENO HILL Quartzite
JURASSIC
11 Argillite and phyllite
PERMIAN
Limestone and skarn
SCALE
0 1 2 3 mls
0 1 2 3 4 kms
64°21'
138°45'
64°21'
138°30'

Fig. 2

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