G E O L O G I C A L

and

G E O C H E M I C A L R E P O R T

on the

T (36-220) and VU (174-191)

MINERAL CLAIMS

by

C. P. Costin and G. S. Zimmer

Staking Sheet Nos. 105-M-14 and 105-M-15

Latitude: 63°-51' to 63°-57' N.

Longitude: 134°-59' to 135°-09' W.

Date: July 3 - September 3, 1966.

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INTRODUCTION

According to various old records, the McNeill Gulch-Mt. Hinton area appears to have been staked several times from the early 1940's through to the early 1950's. Around 1940-41, C. Brefalt and associates drove an adit at the head of McNeil Gulch, apparently on a sulfide-bearing quartz vein. It is rumored that the vein was either lost or not reached in the underground workings. An old assay report from the workings shows silver values from Tr to 129 oz/ton and gold values from Tr to 6.28 oz/ton. Claims in the E and SE portions of the area were allowed to lapse and activity in the area seems to have ceased until recent years, although 14 claims were maintained by Mrs. C. Erickson of Keno City.

On the basis of results released from a G.S.C. Geochemical Survey for total heavy metals, claims T(1-6), V(1-8), and U(1-6) were staked on March 31, 1965 by United Keno Hill Mines Ltd. Lead and silver results on the claims staked were obtained from the G.S.C. and claims T(7-27) and VU(1-25) were staked. During the summer of 1965, a geological-geochemical program was carried out on these claims and claims T(28-35) were added for extended coverage.

In April of 1966, the G.S.C. released the lead results for their 1964 survey. On the basis of this information and from information gathered from reconnaissance work to the NW and SW of the original T claims, claims T(36-173) and VU(176-191) were staked by U.K.H.M. on April 6, 7, and 8. Subsequent geological work in the area necessitated extended coverage and claims T(174-191) were staked on July 21, 1966. Claims T(192-193) and T(195-220) were staked August 7 because of interest stimulated in the Bunker Hill area.

At the end of the 1966 field season, ore grade float was found at the head of McNeill Gulch on several of the Erickson claims. Consequently, a three year working option was negotiated with Mrs. Caroline Erickson on 14 mineral claims. This option was also necessary because of indeterminate claim locations.

PROPERTY

The T, U, V, and VU claim groups were staked for and are held by United Keno Hill Mines Limited, Elsa, Yukon. The groups consist of the following claims:

T(1-6)	Grant Nos.	83428-84333
T(7-22)	Grant Nos.	84524-84539
T(23-27)	Grant Nos.	84575-84579
T(28-35)	Grant Nos.	84618-84625
T(36-173)	Grant Nos.	Y6111-Y6249
T(174-191)	Grant Nos.	Y6371-Y6388

T(192-220)	Grant Nos.	Y6403-Y6430
U(1-6)	Grant Nos.	84334-84339
V(1-8)	Grant Nos.	84340-84347
VU(1-25)	Grant Nos.	84540-84564
VU(174-191)	Grant Nos.	Y6250-Y6267

LOCATION

The T, U, V, and VU claims are located some 12 to 18 miles SE of Elsa and from 6 to 10 miles N of Mayo Lake. The claims enclose portions of Mt. Hinton, Granite Creek, McKim Creek, Allen Creek, McMillan Gulch, McNeill Gulch and Bunker Hill. The area is, at present, accessible by helicopter.

TOPOGRAPHY

The area is typical of alpine glaciation, consisting of deep valleys terminating in cirques. Elevations range from 4400 feet to 6800 feet and scarp faces rising to 1300' above the cirque floors are not uncommon. Timberline ranges from 4400-4500 feet and most of the claim areas are barren except for moss and occasional shrubs.

GENERAL GEOLOGY

The geology of the area has been described by Keele (1905), Bostock (1947), and Kindle (1955).

The consolidated rocks underlying the T, U, V, and VU claims belong to the Yukon Group and may be of PreCambrian or early Paleozoic age. They consist of sericitic and graphitic schists, thick and thin-bedded quartzites, and layers or lenses of greenstone.

The strata of the area lie on the limb of an anticline which has an axis trending from Keno Hill SE to the eastern arm of Mayo Lake. Regional strike exhibits a swing from EW to NS while the regional dip remains relatively constant at from 10° to 30°.

I. GEOLOGICAL SURVEY

A. Detailed Geology

Rock types in the area are very similar to those of Keno Hill with the exception of a deficiency of sericite schist in the Central Quartzite. The quartzites are, for the most part, of the dark grey variety, massive to thin-bedded, and containing the occasional discontinuous band of graphitic schist. Occasional bands of pale grey and pale brown quartzites are encountered, but these are gradational and seldom more than 10 to 15 feet thick.

A series of prominent greenstone lenses, interconnected by narrow sills, occurs throughout the area. These lenses occur sporadically in some areas, while in other areas, they appear to be continuous on specific horizons. Maximum lens thickness is probably about 500 feet, while the length varies to an estimated 3/4 mile. The lenses exhibit remarkably little shearing and are usually massive or blocky. The interconnecting sills are usually intensely sheared, occasionally to the extent that the greenstone becomes indistinguishable from schist or thin-bedded quartzite. The contact zone between the lenses and the enclosing quartzite is usually very distinct. In places, hardly any alteration was observed between the two.

Within the map area, the rocks exhibit a gradual strike change from E-W in the VU claims (Lower Schist) to N-S in the Mt. Hinton-Bunker Hill area (Upper Central Quartzite-Upper Schist). The dips usually lie in the 20°-30° range with local variations and reversals.

B. Structure

Unmineralized faults may be subdivided into three categories: (1) faults with a bedding strike and dip; (2) faults with a bedding strike, but with a considerably steeper dip (60°-90°); and (3) faults with a transverse strike and a steep dip (80°-90°).

The major or most pronounced faults are of the bedding and of the bedding-steep dip varieties. Both of these types have been traced or projected by brecciated float and/or air photo lineaments to lengths of several miles. These faults vary in width from 5 to 30 feet and may contain bands of breccia or may be completely brecciated. Some of the minor bedding faults appear to be overthrust, indicating a reverse movement. Apparent vein displacement on the major bedding faults indicates a right-hand displacement of 100 to 800 feet. No conclusive evidence has been obtained as to the direction of movement or the displacement on the bedding-steep dip faults.

The transverse-steep dip faults are numerous, but appear to be relatively weak structures. Observed widths were seldom greater than 10 feet and these faults were not traced for any great distances. Associated drag folding in the quartzites indicates a normal movement, but no evidence of displacement was obtained.

Vein faults are either transverse-steep dip (70°-90°) or bedding type structures. The bedding veins exhibit a pinch and swell structure varying in width from 1 to 6 feet. The transverse vein traces are oriented from 30° to 40° to the bedding, with dips of 70°-90°, and are structurally the stronger of the two vein types, having widths from 5 to 100 feet and lengths up to 6000 feet.

Of several mineralized faults observed, none appear to cut a greenstone lens. Due to heavy talus and snow conditions, no contact between a vein and a lens was found, but, no evidence of mineralization was ever observed in the greenstone. The #5, #12, #15 and #21 Veins were all noted to have this relationship to the greenstone.

Obtaining an attitude on any of the transverse vein faults was complicated both by a lack of exposure on the dip slopes and by an internal vein shear or fracture pattern, oriented at about 70° to the fault trace. Fault traces on the northerly facing slopes swing from NE-SW in the east end of McNeill Gulch to NW-SE in the vicinity of Mt. Hinton. This swing is in keeping with the bedding swing and the bedding-vein trace relationship.

C. Mineralization

Mineralogically, the area is fairly straightforward. Vein minerals noted in hand specimens, in order of frequency of occurrence, are: quartz, scorodite, arsenopyrite, galena, stibnite, pyrite, sphalerite, anglesite, siderite, and gold.

All veins appear to have a foundation of bull quartz which has been severely fractured several times. At least two periods of fracturing occurred before and during mineralization as galena and arsenopyrite occupy different sets of fractures. Fracturing occurred at least once after mineralization - the previously mentioned internal shear.

Arsenopyrite and scorodite appear in all the mineralized areas. Arsenopyrite occurs either as well developed crystals (to 15 mm) or as stringers in the quartz. Scorodite occurs as well developed crystals (after arsenopyrite); as a uniform colloidal-appearing fracture filling; and as a friable mass, intimately associated with arsenopyrite and, occasionally, galena.

Galena and stibnite usually occur together wherever the veins

have been intensely sheared, as in the head of McNeill Gulch. The two appear as a fine grained mass and fusibility must be used to determine the presence of stibnite. The #1, #2, and #5 Veins contain galena without appreciable stibnite, but these veins were not sheared to any considerable extent. All other veins appear to have a galena-stibnite mixture.

Anglesite was observed at the surface of the #15 vein as individual fragments and as shells containing cores of galena. Assays yielded 18-40% lead.

Sphalerite was encountered in the #15 and #25 veins with the heaviest concentration in the #25 vein. In both areas, the mineral was closely associated with galena.

All gold values seem to be dependent upon the association of galena, stibnite, arsenopyrite, and scorodite. The highest values are concentrated in McMillan and McNeill Gulches where 7 assays yield values in excess of 1 oz/ton. Visible gold was found in place in the #5 Vein. An assay for this sample gave Tr gold. However, a field split was retained and was later crushed, panned, and observed under a 10X binocular microscope with the result that about 10 flecks of gold (to 0.5 mm) were found. Upon close observation of this sample, the gold was seen to be protruding from weathered arsenopyrite.

D. Vein Descriptions

Note: Gold determinations on samples #16351-#16386 and #16451-#16494 were done locally and are erratic and generally unreliable.

#1 Vein: (See #2 Vein: Geol. & Geochem. Report on the T Mineral Claims, August 1965).
The vein outcrops on the cirque floor on the T-10 mineral claim. Topography is relatively flat with overburden and talus varying in depth from 1 to 12 feet. The vein is evident on aerial photographs as a NW trending lineament.

The vein has a bedding attitude (N55°W and 25°-30° SW dip) and was traced by trenching and vein float for 560 feet. The vein is faulted off on its northern extension by a barren cross fault trending N88°E and dipping 55°S. A left hand offset is indicated by drag folding at the intersection. The faulted vein extension to the north of the cross fault was not located. (The source of an isolated piece of float containing galena and assaying 34 oz/ton Ag and 1% Pb was not located.) The southern extension of the vein was lost in deep overburden.

Where exposed, the vein has a HW and FW of thick-bedded quartzite with laminae (1/8" - 1/4") of graphitic schist. Vein mineralization consisted primarily of scorodite with short discontinuous veinlets of galena 1/4" - 3" wide and paralleling the vein

attitude. Galena was also noted in small lenses and pods. Arsenopyrite and siderite were noted in minor amounts. The vein varies in width from 8"-24" and widens to 75" at the crossfault.

Character assays of clean galena returned extremely high values: 899 oz/ton Ag with 72% Pb and 424 oz/ton Ag with 75% Pb (see 1965 report). Channel sampling proved disappointing with typical assays of 6-8 oz. Ag over 5 feet. A high assay proved to be 18.8 oz. Ag over 5 feet near the crossfault. Gold assays were low (0.02 oz/ton to 0.30 oz/ton), but should be regarded as unreliable.

#2 Vein: The vein outcrops on the cirque rim on claim T-29. Overburden varies from shallow talus at the rim to an unknown depth on both slopes. From aerial photographs, the vein appears to coincide with a strong lineament striking NW with the bedding.

From approximately 100 feet of vein float, presumably in place, the vein would appear to strike N50°W. Dip is uncertain, but is thought to approximate bedding. The NW and SE vein extensions have not been traced due to heavy talus and overburden. Mineralized float (8-10 oz. Ag) has been found in talus approximately 1500' NW on the apparent strike. Trenches on the vein revealed mineralized breccia but failed to reach bedrock.

From talus and adjacent outcrops, the vein appears to lie in a medium thick-bedded quartzite. Considerable thin-bedded quartzite and graphitic schist float was noted near the vein. Observed vein material showed effects of strong leaching and oxidation. Vein material was typically a limonitic quartzite breccia. Galena is found as disseminated pea sized blebs in selected breccia. Cerussite and jarosite (?) were noted in minor amounts.

Character samples containing galena and cerussite returned an average assay of 62 oz. Ag and 17% Pb.

#5 Vein: The #5 Vein is by far the largest and strongest vein structure in the area. The fault trace has been followed for approximately 6000 feet - 1500 feet on the cirque face and 4500 feet on the Hinton dipslope. The vein strikes approximately N80°-85°E and dips approximately 70°SE. Vein widths vary from 40 to 100+ feet on the cirque face.

Mineralization consists of galena, galena-stibnite, arsenopyrite, scorodite, anglesite, pyrite, and gold. The following assay results were obtained from the vein:

Sample No.	16365	16366	16367	16374	16375	16376	16377
Au (oz/ton)	0.02	0.06	0.50	0.06	Tr	Tr	Tr
Ag (oz/ton)	23.53	14.01	54.82	34.59	12.97	4.29	18.38
Pb (%)	8.05	5.73	12.68	2.87	2.11	1.21	3.07
Zn (%)	0.63	0.87	0.63	-	-	-	-

Sample No.	16381	16382	16383	16384	16385
Au (oz/ton)	-	Tr	Tr	Tr	Tr
Ag (oz/ton)	13.82	7.56	5.70	10.49	4.92
Pb (%)	5.10	4.56	-	3.46	-
Zn (%)	-	-	-	-	-

Free gold was found in the vicinity of samples 16367, 16381, and 16382. Gold assays should be considered accordingly.

In all locations, mineralization was contained in shattered bull quartz, with the most intensive mineralization in the footwall of the vein. Mineralized width varies from 5-15 feet.

The vein was lost to the NE in the vicinity of a greenstone lens on the cirque face. No trace of the vein was found in the cirque floor by either geological or geochemical methods. The dipslope was covered by overburden and a total of 18 trenches, placed to locate the vein, revealed overburden in excess of 12 feet at the base of the dip slope (app. 5500 foot elev.) and 4 to 7 feet near the top. Only two trenches were felt to have reached bedrock. The vein did not outcrop and was projected by means of mineralized float and an air photo lineament.

#12 Vein: The #12 Vein consists of a fractured quartz system varying in width from 2 to 8 feet. Mineralization consists of galena, arsenopyrite, and scorodite in fractured quartz. Assays yielded the following results:

Sample No.	16378	16379	16380
Au (oz/ton)	0.06	0.16	0.32
Ag (oz/ton)	2.14	4.45	18.49
Pb (%)	2.82	2.36	21.48
Zn (%)	-	-	-

The fault trace was followed for approximately 300' to the NW of the discovery point where it was lost in talus. Unsatisfactory coverage was given to the area to the SE of the discovery point.

#13 Vein: This vein is also a large fractured quartz system with spotty mineralization consisting of arsenopyrite, scorodite, and galena-stibnite. Mineralization was traced over a 75 foot length and a variable width of 15 to 35 feet. The following assays were obtained from the vein:

Sample No.	16354	16355	16368	16369	16370	16371	16372	16373
Au (oz/ton)	0.48	0.06	0.06	0.08	0.12	Tr	0.30	0.54
Ag (oz/ton)	92.50	4.30	0.80	15.42	0.68	0.82	0.48	12.41
Pb (%)	18.64	0.51	0.40	9.46	0.40	0.50	0.50	5.13
Zn (%)	2.07	2.47	-	-	-	-	-	-

The vein has a bedding or near-bedding strike and a near-vertical dip. The vein was lost in severe cross-faulting to the E and appeared to pinch out to the W.

#15 Vein: This vein, at the head of McNeill Gulch, was located by reconnaissance prospecting in September of 1965. The vein consists of a bull quartz system containing arsenopyrite, scorodite, galena, galena-stibnite, and anglesite. Assays yielded the following results:

Sample No.	16388	16389	16397	16401
Au (oz/ton)	0.08	0.22	0.08	0.20
Ag (oz/ton)	Tr	54.0	Tr	136.1
PB (%)	-	18.52	-	42.12
Zn (%)	-	0.10	-	20.32
Sb (%)	-	0.20	-	0.58

The vein maintains the angular relationship to the bedding (30°) and would appear to have the usual dip to the SE. To the SW of the discovery point, the vein strikes into a small greenstone lens, but no faulting or mineralization was observed in the lens. Immediately adjacent to the lens, on the SW side, a major crossfault was encountered. Upon following the crossfault trace for about 200 feet to the NW, another vein was encountered which would appear to be the extension of the #15 Vein. Mineralization on this segment, however, is of a lesser degree than the previously discussed portion of the vein. This SW segment extends about 500 feet from the crossfault to the rim of the cirque where it was lost on the dipslope. Immediately to the NE of the discovery point, heavy talus was encountered and the vein was lost.

Minor trenching was carried out on the discovery point and yielded heavy galena and sheared sphalerite (see sample 16401).

#16 Vein - #17 Vein: The #16 and #17 Veins appear to be highly faulted with minor offsets. Mineralization is spotty and consists of arsenopyrite, scorodite, and minor galena. Assays from the system yield:

Sample No.	16386	16387	16393	16394	16395
Au (oz/ton)	0.02	0.64	0.58	1.56	0.20
Ag (oz/ton)	Tr	4.0	22.5	2.10	Tr
Pb (%)	-	-	8.59	0.56	-
Zn (%)	-	-	0.82	0.72	-
Sb (%)	-	-	0.12	0.14	-

It is assumed that the adit in the upper cirque face was driven on this vein system. Samples 16386, 16387, 16393, and 16394 were taken from the old workings.

#18 Vein: The trace of the #18 Vein is located on the east rim of the head of McNeill Gulch and extends some 200 feet to the SW where it is cut off by a major crossfault. Mineralization grades from nil at the cirque rim to moderate arsenopyrite-scorodite adjacent to the crossfault. A composite assay from the vein yields:

Sample No.	16396
Au (oz/ton)	0.28
Ag (oz/ton)	Tr

Previous mapping appears to be indicated by several old pickets.

#19 Vein: A well-defined lineament, evident both on air photos and from the floor of the McNeill Cirque, marks the trace of the #19 Vein. At the discovery point, the vein consists of lacy galena-stibnite in scorodite-stained quartz with fair arsenopyrite. A composite assay of the vein yields:

Sample No.	16398
Au (oz/ton)	5.06
Ag (oz/ton)	7.10
Pb (%)	1.68
Zn (%)	0.36
Sb (%)	0.12

Vein width averages 10 feet over a 150 foot length to the SW of the discovery point, where a major bedding fault was encountered. Unsatisfactory coverage was given to the area to the NE of the discovery point, but the air photo lineament indicates extended length in that direction.

#21 Vein: The #21 Vein is probably the faulted SW extension of the #19 Vein as it lies some 400 feet to the NW of the #19 Vein on the bedding fault, indicating a right-hand displacement. The vein consists of strong arsenopyrite, strong galena, strong stibnite, and moderate scorodite. Assays yield:

Sample No.	16399	16402
Au (oz/ton)	1.52	0.38
Ag (oz/ton)	20.0	27.60
Pb (%)	14.27	36.82
Zn (%)	0.67	0.46
Sb (%)	4.83	5.78

Snow conditions and heavy talus yielded a very poor exposure, but the vein is thought to extend from the bedding fault to a major greenstone lens. Preliminary examination shows no mineralization in the greenstone.

#22 Vein: Exposure of the #22 Vein was practically non-existent and was limited to locallized float. However, an air photo lineament indicates a possible 400-500 foot trace length on the cirque face. Vein float consists of good galena-stibnite, minor scorodite, and minor anglesite, all in fractured bull quartz. The only reliable assay from the vein yields:

Sample No.	16400
Au (oz/ton)	0.44
Ag (oz/ton)	10.9
Pb (%)	21.03
Zn (%)	5.89
Sb (%)	8.91

As U.K.H.M. did not hold the ground at the time of discovery, no trenching or further exploration was carried out.

#23 Vein: The #23 Vein consists of weak arsenopyrite in scorodite stained bull quartz. A composite assay from the vein yields 0.10 oz. gold.

An air photo lineament indicates a possible trace length of 1200 feet. Unsatisfactory coverage was given to the vein because U.K.H.M. did not hold the ground.

#24 Vein: The vein is located on the McNeill Cirque face on claims T37 and 39. The vein outcrops in several places, but for the most part is buried in talus and overburden of unknown depth. The vein is evident on aerial photographs as a NE-SW trending lineament.

The vein has an apparent strike of NNE and was traced by breccia and vein float for approximately 1700 feet. True strike and dip were not defined. The extension to the NE of the discovery point was not traced and the western extension was eventually lost in heavy talus.

The vein outcrops cut a sequence of thick-bedded quartzites and medium to thin-bedded quartzites with interbedded graphitic schists. A limonite stained breccia is evident for the full strike length, but mineralization was found only in the NE portion. Mineralization consists of coarsely crystalline galena in blebs in quartz, usually associated with scorodite and arsenopyrite. At one bedrock exposure the galena appears as a relatively minor constituent in a quartz, scorodite, arsenopyrite vein with a 3 foot width. Further NE, in schistose talus, galena as blebs in quartz was located.

Three character samples containing galena in quartz returned:

Au (oz/ton)	0.48	1.84	1.34
Ag (oz/ton)	29.0	51.6	42.8
Pb (%)	9.38	10.8	9.08

Character samples of quartz with arsenopyrite returned Tr Ag, 0.24 oz. Au and 0.50 oz. Au. All samples contained approximately 0.12% Sb.

#25 Vein: The vein outcrops on the W slope of McMillan Gulch. Overburden is up to 12 feet deep. The vein is evident on aerial photographs as a sharply defined N-S lineament.

The vein has an apparent strike of N02°E and has been traced by float and trenching for approximately 2000 feet. True strike and dip were not obtained, but float indicates a transverse NE trending strike. To the N of the discovery point, the vein is lost in heavy overburden. To the S of the discovery point, the vein is lost in a grass covered slope at approximately the 5600 feet elevation.

The vein trace cuts thick-bedded quartzites to the north and medium-thin-bedded quartzites to the south. Mineralization was noted at three points along the strike length and is typically small blebs of galena in quartz. At one point, a discontinuous 2 inch vein of galena and sphalerite was noted filling a transverse fracture in a schistose section of the vein zone. Minor arsenopyrite is noted in the vein quartz.

Character samples of galena bearing quartz typically assayed 12 oz. Ag and 4% Pb. Two selected grab samples returned 162 oz. Ag and 53% Pb - 12.8 oz. Ag, 4.32 Pb, and 52.72% Zn.

II GEOCHEMICAL SURVEY

A. Sampling

A total of 11,596 soil samples were taken in 292 man days. Preliminary sampling was done on 300 foot line spacings with samples taken at 100 foot intervals on the lines. The claim base lines were used in setting up the sampling grid and in some areas of rough topography, contour sampling was done.

Samples, approximating a handful, were taken by using a mattock to dig holes from 6 to 18 inches deep in order to obtain an "organic free" sample. All samples were logged and placed in small plastic sample bags.

B. Lab Procedure for Geochemical Analysis of Soil Samples for Lead and Zinc.

1. General

The initial laboratory techniques and methods of analysis were set up by Dr. R. E. Delevault of the University of British Columbia during a three week visit early in 1964. Dr. Delevault felt that the techniques, as set up, were those best applicable to the particular conditions of the area.

2. Sampling
   a. Place approximately 200 grams of the soil sample on a clean sheet of paper and allow to dry thoroughly.
   b. When the soil has dried, mix thoroughly and crush.
   c. With a one gram scoop, select a sample possessing as little organic matter as possible and discard any rock fragments larger than one mm (a 1 mm mesh sieve may be used).
   d. Place the one gram sample in a small aluminum cup (made from aluminum foil) and tag.

3. Digestion
   a. Place the one gram (well crushed) sample in a 22 x 175 mm test tube, add one ml aqua regia and heat gently (about an hour) in the fume hood until the aqua regia has evaporated.
   b. Allow the sample residue to cool for 10 or 15 minutes.
   c. Add one ml dilute hydrochloric acid (L HCl:10 H_2O) to the residue and gently heat (approx. 15 minutes) until the soil is just moist.
   d. Dilute to 20 mls with demineralized water and shake well.

4. Lead Test
   a. Make a series of lead standards by taking 1 ml of the 100ϑ/ml stock solution and diluting it to 100 mls with demineralized water. The standards should have the following range: 0ϑ, 0.2ϑ, 0.5ϑ, 0.8ϑ, 1ϑ, 1.5ϑ, 2ϑ, 3ϑ, 4ϑ, 5ϑ, 8ϑ. Therefore, measure with a pipette 0.2, 0.5, 0.8, 1, 1.5, 2, 3, 4, 5, 8 mls, respectively, of the diluted stock solution (1ϑ) into separate 18 x 150 mm test tubes. To each standard, add 1 ml buffer and ½ ml cyanide. Add 10 mg/litre dithizone in the following amounts:

to:	0ϑ	0.2ϑ	0.5ϑ	0.8ϑ	1ϑ	1.5ϑ	2ϑ	3ϑ
Add Dz:	½ ml	½ ml	½ ml	1 ml	1 ml	2 ml	2ml	3 ml

4ϑ	5ϑ	8ϑ
3 ml	3ml	4 ml

Stopper and shake well to obtain desired colors. These standards will keep for about 4 hours at normal room temperatures.

b. To an aliquot of the unknown sample, add 5-10 mg ascorbic acid, wait a few minutes, then add ½ ml potassium cyanide solution and 1 ml of ammonium-citrate buffer solution. Wait at least two minutes if much iron is present.
c. Add ½ ml or 1 ml dithizone working solution (dithizone dissolved in chloroform).
d. Shake and compare with the standards unless the color is the pink of the pure complex. In such case, add more dithizone until a mixed color persists and compare with standards. The amount contained in the matching standard must be multiplied by the total number of ½ mls dithizone used.

5. Zinc Test
   a. Make zinc standards by pipetting the following amounts of the 1% stock solution into separate 18 x 150 mm test tubes:
      0 (blank), 0.2 ml, 0.5 ml, 0.6 ml, 0.8 ml, 1.0 ml
      Add 1 ml acetate buffer, ½ ml thiosulfate (if used), and 2 ml of 20 mg/litre dithizone to all test tubes. Stopper and shake to obtain required colors. Standards will keep for about 1½ hours at normal room temperatures.
   b. To an aliquot of the unknown sample solution, add 5-10 mg ascorbic acid, wait a few minutes, then add 2 ml sodium-acetate buffer solution and 2 ml dithizone working solution (dithizone dissolved in toluene - 10 mg/litre).
   c. Shake from 30 to 40 seconds and compare to standards.

6. Notes
   a. Extreme care must be taken to prevent contamination from any source. This necessitates thorough cleaning of glassware with metal-free water. Acetone and/or ethyl ether may be used as a rinse. Extreme care must be exercised with these organic solvents as they are extremely flammable.
   b. Lead and zinc standards are very unstable at normal room temperatures. In the presence of heat and light, the metal dithizonate tends to decompose. If standards are to be preserved for any length of time, they should be placed in a refrigerator or other cold, dark container. Artificial standards, made with inks or food colouring, have been tried and found unsatisfactory as the colors faded slightly in a short time with the result that the desired accuracy could not be maintained.

C. Interpretation of Results

Four years of previous work on Keno and Galena Hills has proven soil sampling to be an effective tool for locating vein zones in areas of relatively shallow overburden (to 10 feet). In previous

years, a three-metal determination was done on all samples so as to fully interpret the G.S.C. anomalies given in total heavy metals. Experience has shown, however, that copper values are very erratic and usually reflect areas of greenstone or sericite schist. Accordingly, copper determinations have been discontinued.

Lead, with its relative insolubility and low dispersion rate, has proven to be the best indicator. Zinc values occasionally reflect lead values, but they usually tend to be widespread and erratic, making interpretation difficult. Consequently, heaviest emphasis has been placed on lead values.

In contouring, lead values in excess of 50 ppm have arbitrarily been selected as being anomalous. It should be noted that values as low as 24 ppm might also be considered anomalous as they occasionally give better definition to veins or vein extensions. The zinc cut-off has been arbitrarily selected at 100 ppm.

Anomaly Descriptions

#1 Anomaly
Both lead and zinc show very little contrast to the background as might be expected since trenching in the area has shown overburden depth to be excessive. If the lead cut-off is dropped to 24 ppm, a better definition of the #5 vein may be obtained.

#2 Anomaly
This continuous lead anomaly undoubtedly represents the #15, #16, #17, #19, #21, #22, #23, and #24 Veins, as the anomaly occurs at the base of the scarp face on which the veins are located. A very minor zinc high accompanies the lead anomaly.

#3 Anomaly
This lead anomaly appears to define a major bedding fault. From the relationship of the #2 Vein to the fault (parallel or coincident), further mineralization may be indicated.

#4 Anomaly
The #4 Anomaly has the same relationship to the above bedding fault as the #3 Anomaly. The accompanying zinc high ties the #3 and #4 lead anomalies together along the trace of the bedding fault.

#5 Anomaly
This lead high probably represents the extension of the #18 Vein into the area of the original T claims. A zinc high is coincident with the lead.

#6 Anomaly
Both lead and zinc highs consist of 5 isolated peaks. Several old trenches are coincident with the highs and vein quartz was noted in the excavated material.

#7 Anomaly
This high consists of two lead peaks with coincident zinc highs. The more widespread zinc may indicate an extension of the #6 Anomaly.

#8 Anomaly
The lead high appears to define the #25 Vein in three major peaks. The accompanying zinc high could probably be interpreted as defining an off-set, but is most probably an expression of terrain.

#9 Anomaly
The lead anomaly is coincident with the #1 Vein and its limits are substantiated by trenching in the area. A very minor zinc anomaly accompanies the lead high.

#10 Anomaly
This isolated lead high is of the bulls-eye variety and would seem to be an erratic. The accompanying zinc high is widespread and extends to the #11 lead anomaly. This anomaly possibly expresses a transverse fault.

#11 Anomaly
This lead high approximates the bedding-vein trace relationship and could possibly indicate a vein zone. A transverse fault was mapped in the area, but no mineralization was observed.

#12 Anomaly (See #2 Anomaly - Geol. and Geochem. Report on the VU Mineral Claims - 1965)
The lead highs occur in several isolated peaks enclosed by two zinc peaks. This anomaly is by far the largest in the area and is located in an area of schist and greenstone, which would account for some values. However, the extensive high values would seem to indicate a vein system of some sort, although geological reconnaissance found no mineralization.

CONCLUSIONS

Geological reconnaissance located 15 vein zones in the area, 5 of which are closely supported by geochemical anomalies. Of these veins, 6 appear to have mineralization of ore grade (#5, #15, #19, #21, #24, and #25 Veins).

The highest degree of mineralization and the strongest vein structures appear to be concentrated in the upper horizons of the Central Quartzite.

The area has a favorable Ag:Pb ratio, averaging 7:1 (#1 Vein), 5:1 (#2 Vein), 5:1 (#5 Vein), 2:1 (#12 Vein), 3:1 (#13 Vein), 3:1 (#15 Vein), 3:1 (#16 and #17 Veins), 4:1 (#19 Vein), 1:1 (#21 Vein), 1:2 (#22 Vein), 4:1 (#24 Vein), and 3:1 (#25 Vein).

Gold values to 5 oz/ton were obtained from the McNeill-Mt. Hinton area along with antimony values to 9%.

Hand trenching on the #15 and #25 Veins has yielded silver values between 130 and 170 oz/ton along with zinc values between 20 and 55%.

Rough topography required 12 camp sites to work the claim blocks efficiently.

Heavy overburden with slide rock made hand trenching ineffective on the #5 Vein.

Prospecting in the VU claim area found no support for high geochemical values.

RECOMMENDATIONS

A detailed geological program should be carried out on the face of the McNeill cirque to further define and sample the vein systems, to define any structures affecting the veins, and to pick up any new veins on the newly acquired Erickson claims. In preparation for this detailed work, aerial photographs have been blown up to a scale of 1" = 400'. Photo positives of the same scale were obtained, from which paper prints may be reproduced as an aid to field work.

Hand trenching should be done on the #15, #19, #21, #22, #23, #24, and possibly #25 Veins to obtain structural information and more detailed samples. At some later date, the #5 Vein should be trenched on the Mt. Hinton dipslope by means of a bulldozer.

The use of antimony as a geochemical indicator should be investigated, possibly by sending splits of anomalously high lead areas for antimony analysis.

A more detailed geological investigation might well be done on the geochemical anomaly containing the #2 Vein and trending to the NW along the bedding fault.

At some future date, the geochemical high on the VU claims should be explored, both geologically and geochemically, on a more closely spaced grid pattern.

References:

1. Geological and Geochemical Report on the T (1-35) Mineral Claims, R. E. Van Tassell, 1965.

2. Geological and Geochemical Report on the VU Claim Group, R. E. Van Tassell, 1965.

3. Aerial Photographs

A. Hunting Survey Corporation Ltd. (August 1963)
photos from 76396 to 76403 1" = 1000'
from 76472 to 76483 1" = 1000'
from 76320 to 76323 1" = 2000'
from 76362 to 76363 1" = 2000'

B. Royal Canadian Air Force
line A-10997 from 230 to 231 1" = 1/2 mile
from 249 to 253 1" = 1/2 mile
line A-12281 from 277 to 281 1" = 1/2 mile
from 298 to 303 1" = 1/2 mile
from 327 to 330 1" = 1/2 mile

A P P E N D I X

SUMMARY OF WORK AND COSTS

I. Geological Mapping

A. Three men prospected the claim area on a reconnaissance basis using claim lines and aerial photos for a total of 155 man days

B. Costs

1. Two party chiefs @ $550.00 per month for 135 man days at $17.74 per man day	$	2,394.90
2. One party chief @ $470.00 per month for 20 man days at $15.18 per man day		303.60
Total	$	2,698.50

II. Geochemical Survey

A. Six soil samplers collected 11,596 soil samples for a total of 292 man days. All samples were analyzed in the Geochemical Lab at Calumet.

B. Costs

1. Six soil samplers @ $375.00 per month for 292 man days at $12.10 per man day	$	3,533.20
2. 11,596 soil samples @ $1.00 per sample for 2 analysis (lead and zinc)		11,596.00
Total	$	15,129.20

III. Helicopter

A. See page 11iAppendix for work and cost breakdown.

B. Costs

1. One hr. 45 minutes by Bell G-2 @ $102.00 per hour	$	178.50
2. Fifty-nine hrs. 45 minutes by Hiller 12E and Bell 3GB-1 @ $135.00 per hour		8,066.25
Total	$	8,244.75

IV. Total Costs

A. Geological Survey	$	2,698.50
B. Geochemical Survey		15,129.20
C. Helicopter		8,244.75
Total	$	26,072.45

V. Trenching

A. A two-man team carried out trenching operations by drilling, blasting, and hand mucking on 7 mineral claims.

B. Costs

1. See pages iv-vii Appendix for work and cost breakdown.
2. A total of 928.3 cu. yds. were removed @ $25.00 per cu. yd. $ 23,207.50

Total $ 23,207.50

VI. Total Expenditures for 1966 Field Season

A.	Geological Survey	$ 2,698.50
B.	Geochemical Survey	15,129.20
C.	Helicopter	8,244.75
D.	Trenching	23,207.50
	1966 Total Work	$ 49,279.95

HELICOPTER WORK AND COST BREAKDOWN

Dates	Purpose	Flying Time	Type	Rate
July 3 - 5	Ferry Whitehorse to Calumet, establish 3 camps complete, put out camp caches in immediate working area.	17 hrs. 10 mins.	Bell 3GB-1	$ 135.00
July 9	Supplies to camps.	1 hr. 45 mins.	Bell G-2	$ 102.00
July 13-15	Ferry Ross R. to Calumet. Food and supplies to camps, move 3 camps.	11 hrs. 15 mins.	Hiller 12E	$ 135.00
July 21-22	Move camps and supplies.	7 hrs. 40 mins.	Hiller 12E	$ 135.00
July 26-27	Move camps and supplies.	4 hrs. 25 mins.	Hiller 12E	$ 135.00
Aug. 6 - 8	Move camps and supplies.	8 hrs. 25 mins.	Hiller 12E	$ 135.00
Aug. 19-22	Move camps and supplies.	2 hrs. 15 mins.	Hiller 12E	$ 135.00
Sept. 4-7	Move camps, men and supplies	6 hrs. 00 mins.	Hiller 12E	$ 135.00
Sept. 13	Measure up assessment trenches.	0 hrs. 55 mins.	Bell 3GB1	$ 135.00
Sept. 18	Measure up assessment trenches.	1 hr. 40 mins.	Bell 3GB1	$ 135.00
	TOTAL	59 hrs. 30 mins.		

1 hr. 45 mins. by Bell G-2 @ $102.00/hr.	=	$ 178.50
59 hrs. 45 mins. by Hiller 12E & Bell 3GB1 @ $135.00/hr.	=	8,066.25
	TOTAL	$ 8,244.75

T 29 Mineral Claim

Pit 1 25 x 6 x 6 = 900 cu ft
Pit 2 10 x 5 x 5 = 250 cu ft
Pit 3 7 x 5 x 4 = 140 cu ft
TOTAL 1290 cu ft

or 47.8 cubic yards

T 11 Mineral Claim

Pit 4 62 x 5 x 3.5 = 1085 cu ft
TOTAL 1085 cu ft

or 40.2 cubic yards

T 10 Mineral Claim

Pit 5 6 x 21 x 3.5 = 441 cu ft
Pit 6 6 x 6 x 2 =
30 x 6 x 3
35 x 16 x 1 = 1172 cu ft
Pit 7 11 x 5 x 2 = 110 cu ft
Pit 8 22 x 6 x 5
14 x 6 x 3 = 912 cu ft
Pit 9 12 x 6 x 5 = 360 cu ft
Pit 10 9 x 6 x 4 = 216 cu ft
Pit 11 18 x 9 x 6 = 972 cu ft
Pit 12 9 x 4 x 5 = 180 cu ft
Pit 13 8 x 6 x 1
8 x 4 x 4
9 x 7 x 6
9 x 7 x 4 = 806 cu ft
Pit 14 9 x 5 x 5 = 225 cu ft
Pit 15 9 x 5 x 6 = 270 cu ft
Pit 16 12 x 4 x 5 = 240 cu ft
Pit 17 12 x 4 x 3 = 144 cu ft
Pit 18 7 x 3 x 4 = 84 cu ft
Pit 19 9 x 4 x 4 = 144 cu ft
Pit 20 9 x 4 x 3 = 108 cu ft
Pit 21 8 x 4 x 4 = 128 cu ft
TOTAL 6512 cu ft

or 241.2 cubic yards

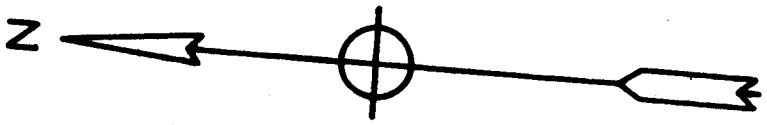
T 13 Mineral Claim

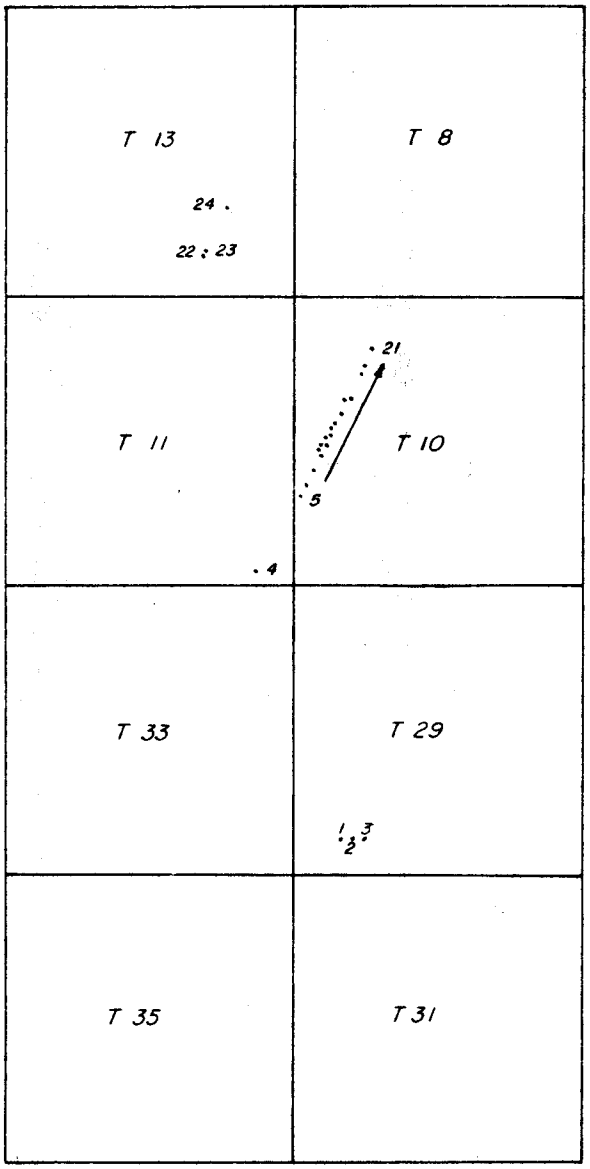
Pit 22 12.5 x 7 x 5 = 437.5 cu ft
Pit 23 7 x 6 x 5 = 210 cu ft
Pit 24 45 x 5 x 3 = 675 cu ft
TOTAL 1322.5 cu ft

or 48.9 cubic yards

Grand Total 10,209.5 cu ft OR
378.1 cubic yards

Drilling and blasting 378.1 cu yds
@ $25.00/cu yd = $ 9,452.50





LOCATION OF TRENCHES — T. GROUP
MINERAL CLAIMS T10, 11, 13, & 29

UNITED KENO HILL MINES LTD.

	BY	DATE	SCALE: 1 inch = 1000 feet
DRAWN	C.P.C.	13/10/66	
CHECKED			DWG. NO.

T 43	T 41 Trench → Claim Baseline	T 39
T 42	T 40	T 38

Hand Trench on Mineral Claim T 41

20' x 4' x 5' = 400 cu ft or 14. 8 cubic yards

Drill and blast 14.8 cu yds at $25.00/cu yd
= $ 370.00

LOCATION OF TRENCH ON T 41 M. C.

Head of McNeil Gulch

UNITED KENO HILL MINES LTD.

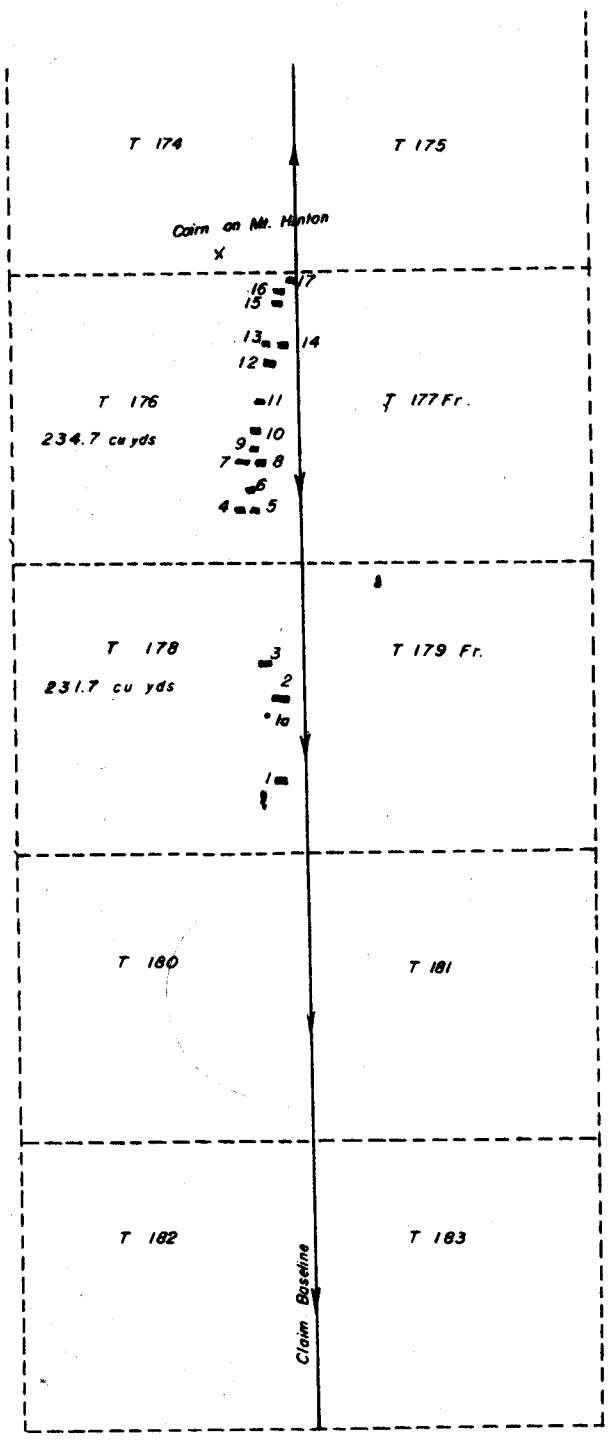
	BY	DATE	SCALE: 1" = 1000 feet
DRAWN	REV	17/10/66	
CHECKED			DWG. NO.

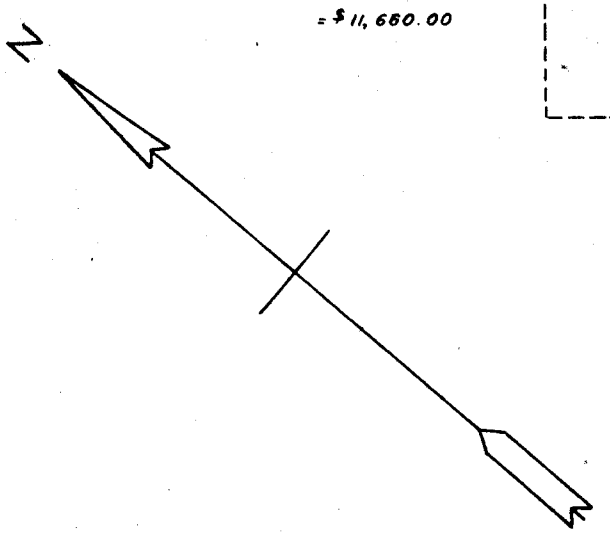
PIT 1	20' x 8' x 8' =	1280 cu ft
PIT 1a	3' x 3' x 3' =	27 cu ft
PIT 2	65' x 8' x 8' =	
	15' x 4' x 5' =	4460 cu ft
PIT 3	14' x 7' x 5' =	490 cu ft
	TOTAL =	6257 cu ft
PIT 4	14' x 4' x 4' =	224 cu ft
PIT 5	14' x 7' x 6' =	588 cu ft
PIT 6	12' x 8' x 5' =	480 cu ft
PIT 7	8' x 8' x 5' =	320 cu ft
PIT 8	8' x 4' x 5' =	160 cu ft
PIT 9	14' x 5' x 5' =	350 cu ft
PIT 10	5' x 5' x 5' =	125 cu ft
PIT 11	18' x 8' x 6' =	864 cu ft
PIT 12	27' x 6' x 5.5' =	891 cu ft
PIT 13	10' x 5' x 5' =	250 cu ft
PIT 14	12' x 6' x 4.5' =	324 cu ft
PIT 15	14' x 6' x 5' =	420 cu ft
PIT 16	28' x 8' x 5.5' =	1232 cu ft
PIT 17	12' x 3' x 3' =	108 cu ft
	TOTAL	6336 cu ft

GRAND TOTAL = 12593 cu ft or 466.4 cu yds

Drill and blast 466.4 cu yds at $25.00 / cu yd

= $11,660.00





LOCATION OF TRENCHES – MT. HINTON

MINERAL CLAIMS T176 and T178

UNITED KENO HILL MINES LTD.

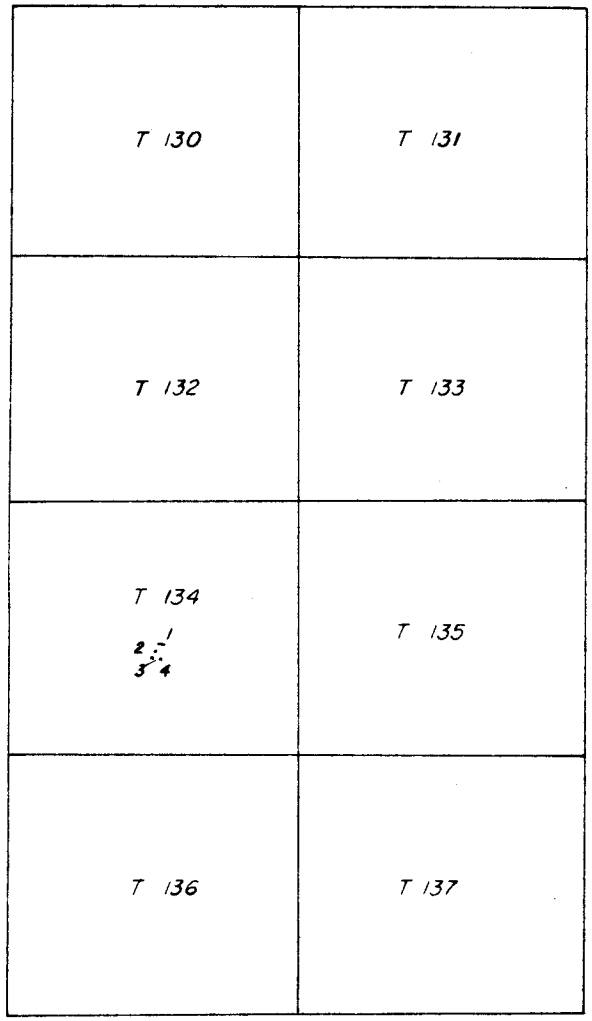
	BY	DATE	SCALE: 1 inch = 1000 feet
DRAWN			
CHECKED			DWG. NO.

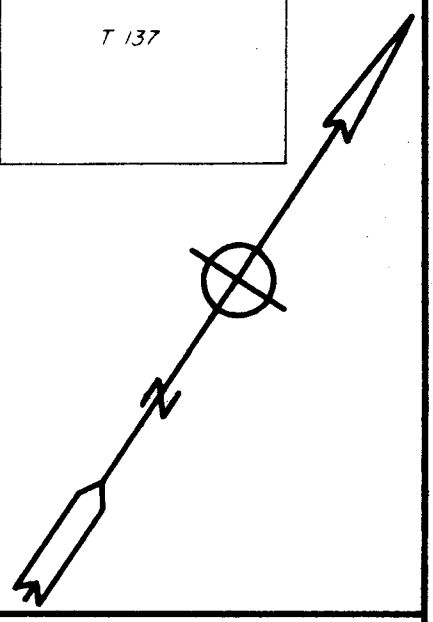
T 134 Mineral Claim

Pit 1	24	x 5	x 3	=	360 cu ft
Pit 2	30	x 10	x 2	=	600 cu ft
Pit 3	10	x 8	x 5	=	400 cu ft
Pit 4	12	x 6	x 7	=	504 cu ft
			TOTAL		1864 cu ft

or 69.0 cubic yards

Drilling and blasting 69.0 cubic yards
@ $25.00/cu yd = $ 1,725.00





LOCATION OF TRENCHES — T GROUP
MINERAL CLAIM T 134

UNITED KENO HILL MINES LTD.

	BY	DATE	SCALE: 1 inch = 1000 feet
DRAWN	C. P. C.	14/10/66	
CHECKED			DWG. NO.

AFFIDAVIT OF COSTS

I, Robert E. Van Tassell, Agent and Chief Exploration Geologist for United Keno Hill Mines Limited, of Calumet in the Yukon Territory, make oath and say:

That the cost statement on pages i and ii of the appendix of the Geological and Geochemical Report on the T (36-220), and VU (174-191) Mineral Claims, to the best of my knowledge and belief, is the true amount of money spent on the geological reconnaissance and geochemical survey of the said claims in 1966.

Robert E Van Tassell

Sworn before me at Calumet in the Yukon Territory this

5th day of April, 1967

Rob Falconer

ROBERT FALCONER
A Commissioner for Oaths for Yukon Territory
JUSTICE OF THE PEACE (2)
FOR THE YUKON TERRITORY

UNITED KENO HILL MINES LTD.

ELSA YUKON

EXPLORATION DEPARTMENT

LOCATION OF OUTSIDE CLAIMS - 1966

4 2 0 4 8 12

Scale : 1 inch = 4 miles

NOVEMBER 1966

R.E. Van Tassell

Claims	Staked
U1 - U6	5 - 4 - 65
V1 - V8	5 - 4 - 65
VU1 - VU2	27 - 6 - 65
VU3 - VU25	29 - 6 - 65
VU176 - VU191	6 - 4 - 66
T1 - T6	6 - 4 - 65
T7 - T27	29 - 6 - 65
T28 - T35	8 - 8 - 65
T36 - T53	6 - 4 - 66
T54 - T87	7 - 4 - 66

Claims	Staked
T88 - T99	6 - 4 - 66
T100 - T101	7 - 4 - 66
T102 - T109	6 - 4 - 66
T110 - T113	7 - 4 - 66
T114 - T153	6 - 4 - 66
T154 - T160	7 - 4 - 66
T160 - T173	6 - 4 - 66
T174 - T185	20 - 7 - 66
T186 - T191	21 - 7 - 66
T192 - T193	7 - 8 - 66

Claims	Staked
T195 - T220	7 - 8 - 66

UNITED KENO HILL MINES
ELSA YUKON
EXPLORATION DEPARTMENT

T and VU CLAIMS

June 1966 SCALE: 1 inch = 1/2 mile G H Seale

UNITED KENO HILL MINES LTD.

ELSA YUKON

EXPLORATION DEPARTMENT

T CLAIM GROUP

SURFACE

CLAIM LOCATION MAP

Claim baseline and direction of staking

Y6789 Claim grant number

Claims	Staked
U 1 — U 6	5 — 4 — 65
U 1 — V 8	5 — 4 — 65
VU 1 — VU 2	27 — 6 — 65
VU 3 — VU 25	29 — 6 — 65
VU 176 — VU 191	6 — 4 — 66
T 1 — T 6	6 — 4 — 66
T 7 — T 27	29 — 6 — 65
T 28 — T 35	8 — 6 — 65
T 36 — T 53	6 — 4 — 66
T 54 — T 87	7 — 4 — 66
T 88 — T 99	8 — 4 — 66
T 100 — T 101	7 — 4 — 66
T 102 — T 109	6 — 4 — 66
T 110 — T 115	7 — 4 — 66
T 116 — T 153	6 — 4 — 66
T 154 — T 160	7 — 4 — 66
T 160 — T 173	6 — 4 — 66
T 174 — T 185	20 — 7 — 66
T 186 — T 191	21 — 7 — 66
T 192 — T 193	7 — 8 — 66
T 195 — T 220	7 — 8 — 66

Contour interval 500 feet

1000 500 0 1000 2000 3000 4000

Scale 1 inch = 1000 feet

Map compiled from parts of National Topographical Survey Sheets 105 M/14 (Keno Hill) and 105 M/15 (Mayo Lake) with scale increased from 1/4 inch = 1 mile to 1 inch = 1000 feet

UNITED KENO HILL MINES LTD.

ELSA YUKON

EXPLORATION DEPARTMENT

T CLAIM GROUP

SURFACE

SURFACE LEGEND

Sediments

1 Limestone

2 Quartzite

2a Quartzite with Graphitic Schist

2b Quartzite (broken or crushed)

3 Pale Siliceous Quartzite

4 Graphitic Schist

4a Graphitic Shist with Quartzite

Sericite Schist

Intrusives

6 Greenstone

6a Greenstone (altered or highly schistose)

7 Acid Dyke

Vein reference number

8 Lamprophyre

Vein Material

9 Vein Material (siderite, limonite, etc.)

10 Sulfides

11 Quartz

Outcrop

Slide rock or Float heave

Diamond drill hole (D.D.H.)

Overburden hole

Bedding

Schistosity

Trenched areas

Prospect pit

Building or campsite

Shaft

Adit

Vein (observed)

Vein (projected or possible)

Fault (observed)

Fault (assumed)

Geological contact

Geological contact (assumed)

Photo lineament

Bulldozer cuts or Trenches

Bulldozer trail

Mine dump

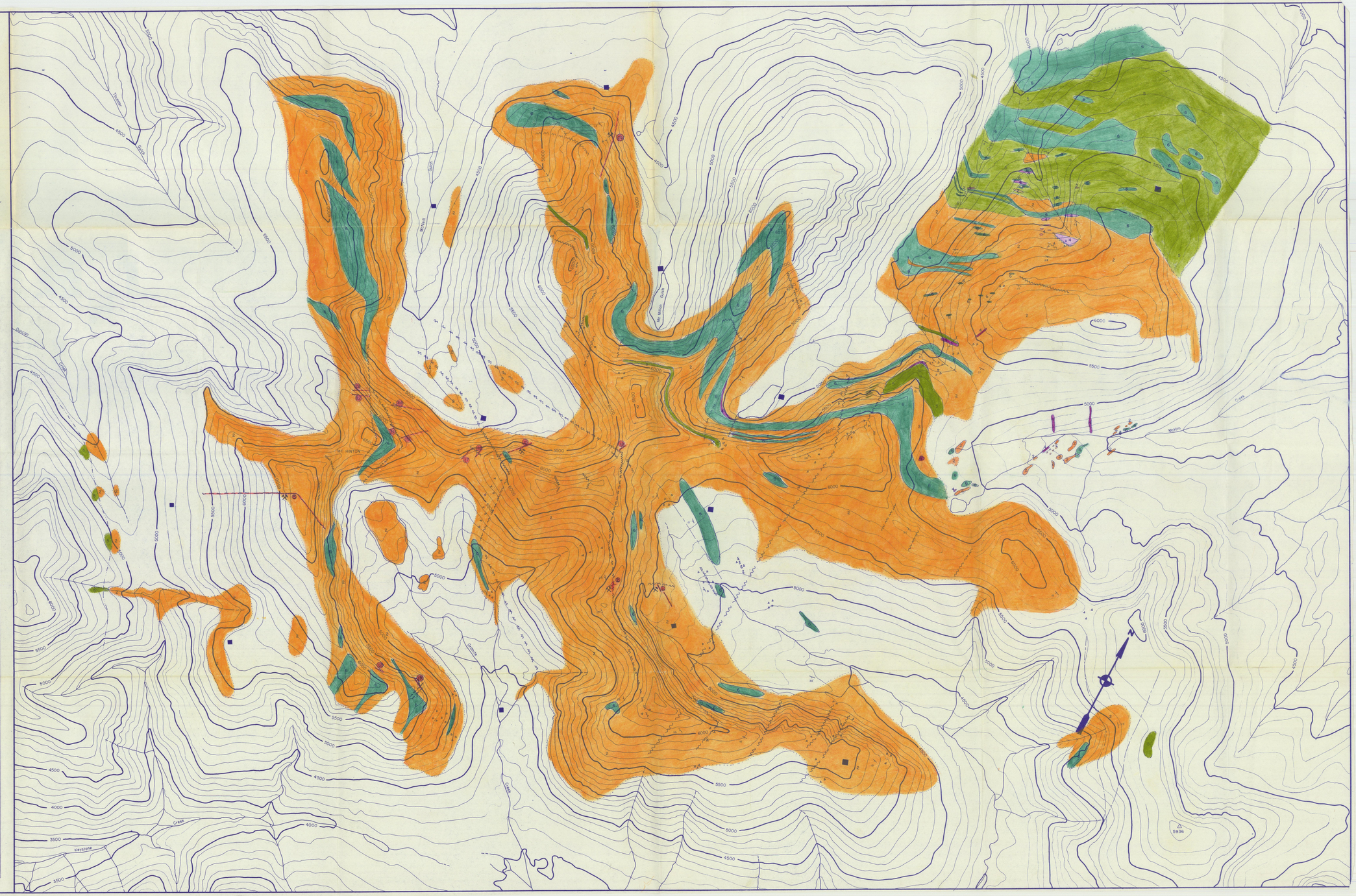
Ditch or stream

Contour interval 100 feet

1000 500 0 1000 2000 3000 4000

Scale: 1 inch = 1000 feet

Map compiled from parts of National Topographical Survey Sheets 105 M/14 (Keno Hill) and 105 M/15 (Mayo Lake) with scale increased from 1¼ inch = 1 mile to 1 inch = 1000 feet



UNITED KENO HILL MINES LTD.

ELSA YUKON

EXPLORATION DEPARTMENT

T CLAIM GROUP

SURFACE

SOIL SAMPLING

LEAD PLOT

CONTOUR INTERVALS IN PARTS PER MILLION (P.P.M.)

	0	-	24
	24	-	50
	50	-	100
	100	-	200
	200	-	400
	400	-	800
	800	-	1600
	1600	-	3200
	3200	-	6400
	6400	-	12800

Lead Plot in parts per million (PPM)

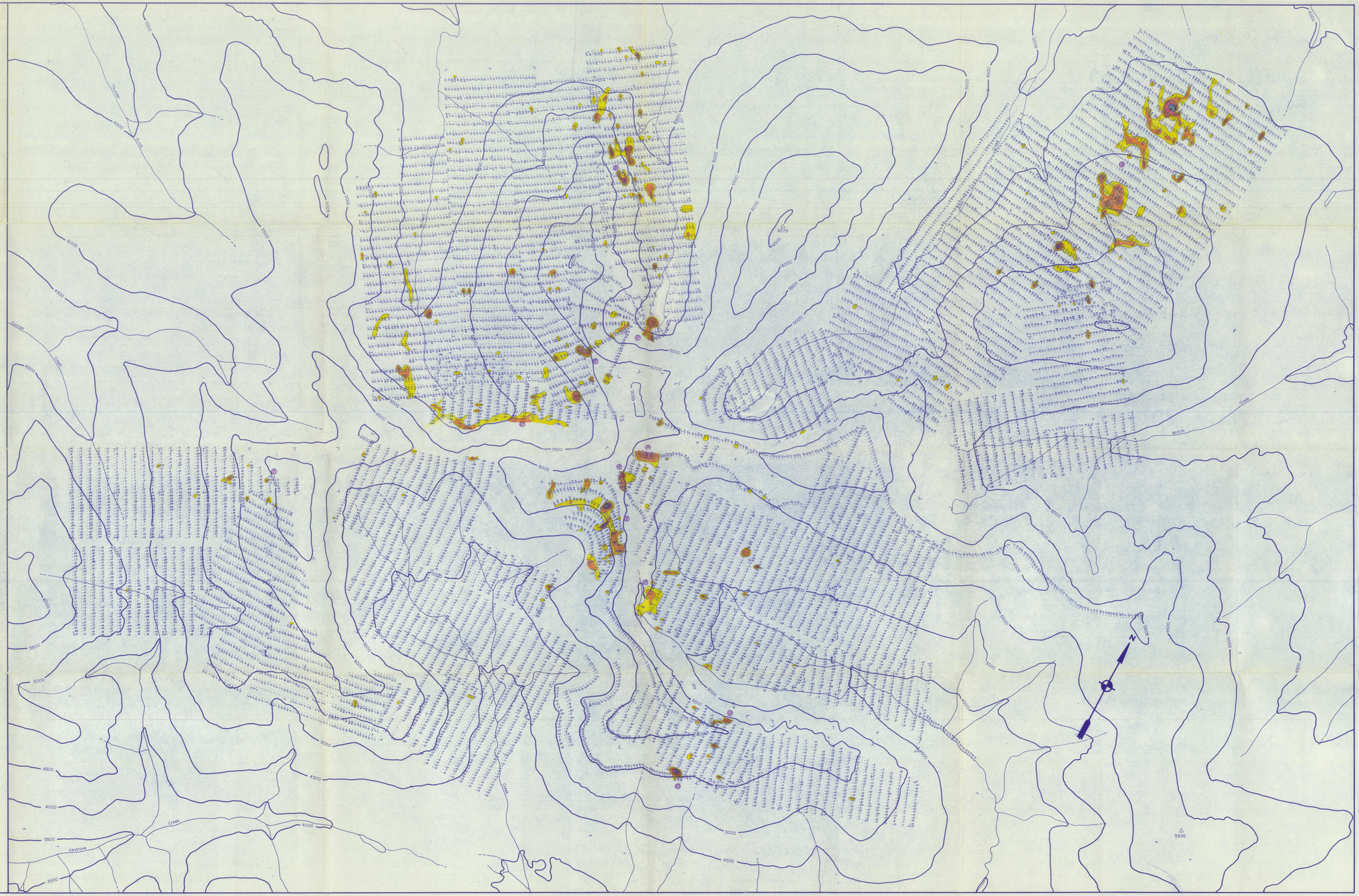
Anomaly Reference Number

Contour interval 500 feet

1000 500 0 1000 2000 3000 4000

Scale : 1 inch = 1000 feet

Map compiled from parts of National Topographical Survey Sheets 105 M/14 (Keno Hill) and 105 M/15 (Mayo Lake) with scale increased from 1/4 inch = 1 mile to 1 inch = 1000 feet



UNITED KENO HILL MINES LTD.

ELSA YUKON

EXPLORATION DEPARTMENT

T CLAIM GROUP

SURFACE

SOIL SAMPLING

ZINC PLOT

CONTOUR INTERVALS IN PARTS PER MILLION (PPM)

	0	-	100
	100	-	200
	200	-	400
	400	-	800
	800	-	1600
	1600	-	3200
	3200	-	6400
	6400	-	12800
	12800	-	25600

xx xx xx
xx xx xx *ZINC Plot in parts per million (ppm)*

(5) *Anomaly Reference Number*

Contour Interval 200 Feet

1000 500 0 1000 2000 3000 4000

Scale 1 inch = 1000 feet

Map compiled from parts of National Topographical Survey Sheets 105 M/14 (Keno Hill) and 105 M/15 (Mayo Lake) with scale increased from 1¼ inch = 1 mile to 1 inch = 1000 feet