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REPORT ON

LEO AND KIO PROPERTIES

ON GALENA HILL

Mayo Mining District, Yukon.

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REPORTS

1. Resistivity Report on Galena Hill Property (239T) - A.P. Clark.

2. Resistivity Report on Leo Fraction and Poli Option (241T) - A.P. Clark.

3. Geol. Surv. Can. paper 57-1.

MAPS

1. Mayo (G.S.C. map 890A).

2. Mines and Prospects ... (Fig.2, G.S.C. Bull. 39).

3. Map 4-1957, Figs. 3,5,6 (G.S.C. paper 57-1).

4. Leo and KPO Property (Fig. 1).

5. Resistivity Survey Leo Property (Fig. 2).

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REPORT ON

LEO AND KPO PROPERTIES

ON GALENA HILL

Mayo Mining District, Yukon

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Consulting Geological Engineer. December 7, 1950.

SUMMARY

Galena Hill in Yukon has produced about $100 million worth of silver-lead-zinc ore from veins which cut massive quartzite members of the Central Quartzite formation.

The Central Quartzite formation extends through the Leo and KPO properties; the Gerlitzki vein has shown the presence of strong vein structure and high silver values between these two properties; and resistivity surveys have now defined several other northeast zones interpreted as vein-faults on these properties. The pattern of resistivity values confirms that the general structural pattern of Galena Hill does persist through these properties.

It therefore seems reasonable to suppose that one or more important silver-lead-zinc deposits may exist on the Leo and KPO properties and that such might be found associated with the northeast anomalous zones in one or more of several resistivity anomalies or structural geologic situations near

massive quartzite members.

Since the interesting localities are overlain by 20 to 80 feet of overburden, permanently frozen in most localities, and drilling is somewhat difficult and uncertain, it is proposed to test some of these localities by thawing prospect shafts down to bedrock and driving short drifts. A thawed section on the Lee property would be tested by vertical rotary drilling which may also prove to be a rapid way of exploring the zones as a guide to the shaft sinking. This drilling and shaft sinking should be done between February and April before the muskeg thaws. Other types of exploration work would follow.

It is recommended that a minimum of $50,000 to $75,000 be raised immediately for exploration of these properties in 1960 and that an additional $140,000 be reserved to follow up encouraging results to a decisive stage.

INTRODUCTION

Keno and Galena Hills in the Mayo Mining District of Yukon have produced over $125 million worth of high grade silver-lead-zinc-cadmium ore, largely from Galena Hill since 1947 under the management of United Keno Hill Mines.

The writer has carried out mining exploration in Yukon since 1953, has become familiar with this district, and has recognized that a sizeable favourable section of the Galena Hill portion of this camp lay unexplored due to cover of overburden. In August, 1959, the Leo and KPC properties were optioned for Keno Extension Mines, to cover this favourable section.

It appeared probable that one or more major orebodies may exist in this section and that such might be discovered by geophysics and drilling followed by shaft sinking to moderate depth. A geophysical survey in September, 1959, defined several resistivity anomalies which now provide likely zones for finding such ore.

GENERAL CONDITIONS

Location and Access

The Leo and KPC properties lie at about elevation 2500 feet at the north base of Galena Hill in central Yukon, 30 miles from Mayo and 2 miles WSW of Elsa. The Leo property straddles Galena Creek and the KPC property straddles Thompson Creek, paralleling the slope a half-mile below the

Mayo-Elsa road. The properties can be reached easily by short roads and trails and are convenient to other facilities in this district.

The properties have adequate room for camp location and tailings disposal.

Topography and Overburden

The southern 1500 feet of each property is on the gentle 10 to 15 degree slope of Galena Hill, while most of the remainder of the ground lies in the McQuesten Valley flats which slope very gently north.

Overburden of frozen glacial drift (mostly boulder clay), covered in the flats by muskeg, mantles all of the ground except for two small bedrock outcrop areas on the KPC claims and one on the Leo claims. The western end of the KPC property, crossed by Proctor's road, is mantled by fairly deep sand and gravel.

Power

Power, although presently available from the Northern Power Transmission line on the road, will require further investigation in the event of major development.

Timber

Timber is scarce on the properties but cut mine-timber, logging, and lumber can be obtained nearby from Proctor's Sawmill which supplies United Keno Hill Mines.

Water

Water is readily available from the several small streams which cross the property, or from McQuesten River. Flat Creek is contaminated by mill tailings from Elsa.

Climate

Climate, typical of central Yukon, is cool in summer and cold in winter with moderate precipitation, but presents no unusual difficulty in year around mining.

Communications

The district is served by twice-weekly flights by Canadian Pacific Airlines to Mayo, and by the Whitehorse-Mayo road which has had the disadvantage of being closed for freezeup and breakup. Now, however, bridges being built across the rivers will keep the road open at all times, and a land telephone line being installed will provide direct telephone communication.

Costs

Being relatively remote and about 1250 miles from smelters, this district faces higher than normal costs of operation. Mining and milling cost of the order of $30 per ton of ore, and transportation to smelters costs about $50 per ton of concentrates.

However, these costs are offset by the rich silver content of the ore, which gives United Keno Hill a silver-lead

concentrate with over 300 oz/ton silver and valued at over $400 per ton. Zinc concentrates, containing less silver, barely pay for themselves. For other details on United Keno Hill, the reader should refer to the Canadian Mines Handbook or Financial Post Survey of Mines.

HISTORY

District

The first silver-lead discovery in the district is said to have been made in the canyon of Galena Creek on Galena Hill by Jake Davidson and Harry McWharter in the fall of 1901. This discovery, the Silver King vein, was restaked in 1913 and mining began in the winter of 1913 to 1914. Further discoveries on Keno Hill in 1919 and 1920 brought in substantial production and by 1942 about $21 million or more had been mined, mostly by Treadwell Yukon Corporation. At this time the ore was hauled about 560 miles on rivers by sternwheel steamers to Whitehorse, over 300 miles farther than the present 1350 mile haul to smelters.

United Keno Hill Mines was first organized in 1945 and by 1948 its production and future had prompted the building of the 245 miles of road from Whitehorse to Mayo. At present United Keno Hill Mines own all the operating mines in the area and hold about 500 mineral claims covering most of the productive quartzite belt over a stretch of 12 miles, much of it still to be explored more closely. From 1947 to 1959 they

have produced about [illegible] million ounces of silver, 230 million pounds of lead, 175 million pounds of zinc, and 2½ million pounds of cadmium, totalling nearly $100 million at present prices. Net profits have ranged from $500,000 to $2 million annually for the last few years. Ore reserves are developed about 3½ to 4 years ahead for best efficiency.

More geologic mapping and deeper mining in the last decade has given better understanding of ore localization and future potential of this district so that now it can be expected that new mines will be discovered and developed and ore will be produced for many years to come.

Gerlitzki, Leo and KFO Properties

The area of the Leo and KFO properties has been staked various times in the past, but the Leo claims were first staked in 1950 as a group of about 20 claims held jointly by Harry Colley and Cecil Poli. In 1954 Poli retained the present Leo Group while Colley withdrew 8 claims and took Gerlitzki in as partner. The Gerlitzki vein was discovered on this group of 8 claims, 3½ miles west of Lisa, in June, 1955.

United Keno Hill optioned Colley's half interest; T.C. Richards bought half of Gerlitzki's half interest; then Mining Geophysics Corporation of Toronto optioned the Gerlitzki-Richards interest, and also the Leo property from Cecil Poli. In 1956 Dr. A.H. Clark tested the Leo property

and part of the Gerlitzki property with a resistivity survey, checked with a gravimeter. An interesting anomalous zone was discovered and Mining Geophysics attempted to diamond drill the strongest part of it. Three holes failed to reach the target and one hole (#3), west of the strongest part, penetrated considerable pyrite but gave no core recovery.

The KPC ground had also been staked in 1950 for Packeno Mines, then twelve claims were restaked in the fall of 1957 as the KPC Group by Alice A. Smith and Cecil Poli.

Colley died in 1958 and in 1959 United Keno Hill optioned Gerlitzki's and Richards' interests also, and stripped the Gerlitzki vein for 600 feet west of the discovery and drilled 9 to 10 holes in this section in August and September, apparently without encountering any body of ore.

More ground was staked onto the KPC Group in July and the Lee and KPC properties were optioned in August, 1959, by the writer for Keno Extension Mines. A resistivity survey was completed on the KPC claims and part of the Lee claims in September.

MINERAL CLAIMS

Lee

The Lee property consists of fifteen claims and fractions, optioned from Cecil D. Poli by Keno Extension Mines, and valid as follows:

Claim	Record No.	Expiry Date
Leo No. 9 - 17 incl.	59549 - 59557	Oct.2, 1960.
Leo No.18 and 19	59941, 59942	Oct.3, 1960.
Leo Fraction		June 11, 1960.
Leo Fraction No.1	62891	Oct.2, 1960.
Leo Fraction No.2	62892	Oct.2, 1960.
Leo Fraction No.3	80395	Oct.2, 1960.

KPC

The KPC property consists of 40 claims and fractions, optioned from Alice A. Smith and Cecil D. Poli by Keno Extension Mines, and valid as follows:

Claim	Record No.	Expiry Date
KPC No. 1 - 8	80088 - 80089	Oct. 5, 1960.
9--12	80092 - 80095	Oct.16, 1960.
KPC Fraction	80345	Oct.14, 1960.
KPC No.13 -27	80362 - 80376	July 24, 1960.
29 -36	80378 - 80385	July 24, 1960.
37 -39	80386 - 80388	July 24, 1960.
KPC Fractions 1-4	80389 - 80392	July 24, 1960.
KPC Fraction No.5	80393	Aug. 4, 1960.
KPC No.23	80394	Aug.25, 1960.

GEOLOGICAL DEVELOPMENT OF YUKON
(Refer to Geol. Surv. Canada Maps 1048A, 80-A, 50-12, 57-4)

Regional

A comparison of Yukon with other productive parts of the Cordillera suggests that several mining districts with productivity in excess of $250 million, perhaps one or two over a billion dollars, should be found in Yukon with more intensive exploration of new areas and known districts.

The Mayo camp occurs in a regional geologic

environment very similar to that of several of the other major Cordilleran districts, and it may prove as productive in silver, lead, and zinc as, for example, the Coeur d'Alene district of Idaho.

The Mayo district (G.S.C. maps 1048A and 890A) lies in an eastward-projecting lobe of Precambrian rocks, at the obtuse angle or hinge of intersection between a major southeast-plunging anticlinal fold of the Cordilleran trend and a N 75°E anticlinal cross-trend punctuated by granitic stocks and other mineralization.

Productive Belt

The silver-lead-zinc veins occur in a 15-mile-long productive belt which follows a southerly dipping section of favourable quartzite host rocks extending S 75°E through Keno and Galena Hills, and angling west into the flats of McQuesten Valley on the Leo and KPO properties (G.S.C. map 55-12). This belt consists chiefly of hard, blue-grey, grey, and white, thick-bedded quartzite with minor intercalated thin-bedded quartzite, graphite schist, quartz-mica schist, quartz-mica-chlorite schist, and greenstone. Although attitudes and thicknesses suggest a normal stratigraphic sequence, northerly-over turned isoclinal drag folds, common in the district, show very intense and pervasive bedding-plane movements. The quartzite section dips about 20 to 40 degrees south and is about 2500 feet thick on Galena Hill. The Leo and KPO

properties cover this section, known as the Central Quartzite formation (G.3.C. paper 57-1).

Overlying the Central Quartzite formation is a thick assemblage of quartz-mica schist with small lenses of limestone and thin layers of quartzite near its base, which crosses the southwest corner of the KPO property. This assemblage, the Upper Schist formation, is generally too soft, or incompetent, to have held veins open enough to form ore.

Underlying the quartzite belt is a thick schist-greenstone belt in which mineral showings occur where veins have opened up in or near sill-like lenses of hard, or competent, greenstone in the incompetent schists. This belt, the Lower Schist formation, has produced ore only at the Sadie-Ladue mine which lies near large greenstone lenses near a major quartzite section. This schist formation probably crosses the north part of the Leo property, and may underlie the north fringe of the KPO property.

Vein-Faults

The ore occurs mostly in northeast-trending vein-fault systems or lodes which usually dip moderately to steeply south, cutting the brittle quartzite beds or hard greenstone lenses. In these competent rocks the ore tends to be localized in the most massive members, particularly where the vein-faults intersect with one another or fork, or where they pass upward into less competent rocks such as schists or thin-bedded quartzites. A number of productive veins on Keno Hill show such conditions.

However, most of the production since 1935 has come from the vicinity of vein-fault intersections or forks in the quartzite belt on Galena Hill (U.S.G.S. map 57-4), notably from the Silver King, Elsa, and Hector-Calumet mines, these three properties having probably produced over $100 million. The Hector-Calumet structure (U.S.G.S. paper 57-1, Fig.3) has been the chief producer and is developed to a depth of 1300 feet; more depth potential is reportedly being developed at Elsa; and the Silver King mine, abandoned since the 1930s, still has good depth possibilities. On each of these properties this type of ore-bearing structure appears to be formed against a northwest fault.

The productive vein-fault structures lie at intervals along the quartzite belt so one or more is likely to occur on that section of the belt covered by the Lee and KFG properties.

GERLITZKI VEIN (See Figure 1)

The Gerlitzki vein consists of a zone of crushed rock and gouge up to 20 feet wide, striking N 45°E, dipping about 57°NE, and mineralized in places by pyrite, siderite, sphalerite, and galena. The wallrocks along the stripped section consist almost entirely of thin-bedded quartzite and minor schist. Massive white and blue-grey quartzite is exposed in outcrops several hundred feet to the west, north, and east of the vein.

The best section of mineralization was found in a

shaft at the east end of the stripped section. A width of about 12 feet was reported to consist of brecciated quartzite mineralized with siderite, pyrite, sphalerite, and a little galena from which an 18-inch sample assayed about 5% lead, 13% zinc, and 70 oz/ton silver, an encouragingly high silver-lead ratio.

Stripping about 100 to 200 feet west of the shaft exposed some massive sphalerite and small lenses of galena from which a grab sample of the better mineralization taken by the writer assayed 241 oz/ton silver, 48.2% lead, and 12.6% zinc. Galena from this vein has been variously reported to assay from 300 to 500 oz/ton silver.

The vein has been stripped for a total length of about 600 feet southwest of the shaft, and drilled to a depth of 100 feet for about 400 feet of this length, apparently without any ore being encountered. The vein appears to narrow out to the southeast end of the stripping, but resistivity anomalies suggest that it extends into the Leo Fraction to the southwest. A trench to the north also shows subparallel vein-fault structure. So far, the Gerlitzki vein has been traced well by Clark's resistivity survey and a complex group of anomalies extend westward onto the Leo Fraction and KPC claims.

The Gerlitzki vein has shown the presence of strong vein structure and high silver values in an otherwise unexplored section of the Central Quartzite formation. Moreover, the stripping

in 1959 showed that despite the doubtful value of other geophysical methods, or geophysics in other parts of the district, the resistivity method distinguished and traced this vein very well under the overburden and thus it could be used to locate and trace other veins.

LEO PROPERTY (See Figures 1 and 2)

Fourteen claims and fractions of the Leo property tie onto the northeast end of the Gerlitzki property while the Leo Fraction, along with the KPO property, ties onto the southeast end of the Gerlitzki vein.

Geology

The only bedrock outcrop on the property is a rib of southerly-dipping, massive, blue-grey and grey quartzite extending about 100 feet easterly from drill hole setup No.4, 150 feet south of the baseline on section 1S. Southerly-dipping, blue-grey quartzite is also exposed on the adjoining Gerlitzki property 300 feet west of the baseline at about section 6.

Similar quartzite was struck in several pits or shafts --- about 70 feet southeast of drill setup No.4 at shallow depth, at 157 feet south on section 3 at a depth of 24 feet, and 300 feet south and 10 feet northeast on section 3 as float near bedrock at a depth of 20 feet. About a thousand feet south of drill setup No.4 float and timber

growth suggest quartzite bedrock at shallow depth; and pits nearby show quartzite at about 15 feet, rusty schist with minor galena float at similar depth, and greenstone at about 30 feet.

After going through 40 to 70 feet of overburden, diamond drill holes on sections 16, 17 and 18 encountered massive quartzite with some graphitic schist, dipping southerly about 15 to 30 degrees. Short holes reportedly drilled by Kennedy through 25 feet of overburden on an anomaly near Flat Creek on the east side of the property went into quartzite and greenstone.

Resistivity Survey
(Refer to Figure 2 and to 1956 resistivity survey)

Dr. Clark's resistivity survey (Figure 2), done for Mining Geophysics Corporation in 1956, showed a N 35°E zone of anomalously low electrical resistivity, with three main areas of low readings --- at section 3 where there could be a right lateral offset in the anomalous zone; at section 13 where a N 55°E fork may join it from the east; and at sections 17, 18, and 19 where a larger section of low readings coincides with a gravity anomaly. The gravity profile shows a high where the denser bedrock is exposed, a drop where the lighter overburden becomes deeper, then a more marked high over the main resistivity anomaly which is covered by deep overburden. This suggests a heavy, conducting material such as abundant pyrite which may occur with ore or very close to it. A check survey this season suggested that the resistivity anomaly resulted

from bedrock topography. A second anomaly 400 feet tothe northwest appears to be merely a bedrock trend, not a vein-fault structure as previously suggested.

Although the anomaly on section 15 lies largely within a corner of the Gerlitzki property, a southeasterly dip would carry it into the Leo property at shallow depth. A pit attempted on this anomaly went into 8 feet of thawed gravel on a former channel of Galena Creek.

A resistivity anomaly can only localize a target within a horizontal distance approximately equal to the depth of overburden.

Diamond Drilling

Following Clark's 1953 results, Mining Geophysics drilled four holes in an attempt to penetrate the main anomaly on sections 17, 18 and 19.

Hole No.1, set up on the baseline at section 18 and drilled at minus 50 degrees northwest to intersect the main anomaly, was abandoned in overburden at 104 feet (vertical depth 78 feet) due to broken casing. Material from the hole was said to be suggestive of proximity to bedrock. A broken rod was shoved down an additional 17 feet, showing soft material.

Hole No.2, set up 25 feet SE of the baseline on section 17 and drilled at minus 50 degrees northwest, went through 64 feet of overburden (vertical depth 50 feet), then through massive grey quartzite from 64 to 103 feet, through gouge and shattered quartzite between 103 feet and 118 feet,

and was abandoned at 118 feet due to caving in thawed ground. Water is said to have run out of the hole for some time, having stopped within two weeks.

Hole No.3, set up on the baseline at section 18 and drilled at minus 55 degrees northwest, went through 90 feet of overburden (vertical depth 73 feet). From 90 to 256 feet the rock was dominantly quartzite, thin-bedded quartzite, and graphitic schist, with occasional pyrite. From 256 to 342 feet little or no core was recovered, but the sludge shows considerable quartz and pyrite. An assay of the entire sludge by Dr. M.M. Frohberg gave 0.1 oz/ton silver and traces of lead and zinc. An assay of concentrates panned from the sludge by Poli, and consisting of about 50 percent metallic particles, gave him 1.9 oz/ton silver, 0.12 oz/ton gold, a trace of lead, 0.3% zinc, and 0.05% copper. From a tub of this sludge kept in Poli's yard, the writer washed and panned a pure concentrate which was nearly all pyrite but contained a number of fragments of sphalerite, some galena, and a grey mineral -- probably tetrahedrite or a silver mineral. Thus it appears that, even though this drill hole passed southwest of the main anomaly, it did cross mineralized vein structure.

Hole No.4, set up 150 feet south of the baseline on section 18 and directly over a pit in which bedrock was exposed at a depth of 6 feet beside the nearby quartzite outcrop, went through 40 feet of overburden at minus 45 degrees before hitting bedrock (vertical depth 28 feet). The presence of "live" looking quartz and altered quartzite at this depth, a report

by Poli of a small piece of galena float at the base of the outcrop to the east, and the vague anomalous zone extending S 55°W to join the main zone, suggest that there might be a vein-fault nearby, perhaps underneath the drill hole. From 45 feet to 173 feet hole No.4 cut massive quartzite; from 173 feet to 230 feet it cut quartzite with some interculated graphitic schist; from 230 feet to 259 feet sludge indicated graphite schist; and from 259 feet to 272 feet the hole cut quartzite-graphite schist, contorted and impregnated in places with pyrite and siderite. Due to caving, this hole stopped 50 feet or less from its objective under the main anomaly.

Conclusions on Leo Property

1. The rocks encountered on the Leo Property show that the Central Quartzite formation passes through the claims and is cut by a N 35°E zone of low electrical resistivity with anomalies on sections 3, 13 and 18. The Hecter-Calumet quartzite member along which the Hecter-Calumet and Misa mines are situated would pass through the Leo property if it continues this far.

2. The most logical interpretation of the northeast anomalous zone is that it is probably a vein-fault showing bedrock topography and perhaps sulfides which may constitute ore. This interpretation is supported by the poor core recovery and presence of pyrite and traces of silver-lead-zinc mineraliztion in the sludge from drill hole No.3 on section 18. A gravity profile on section 18 also suggests presence of heavy material in the main resistivity anomaly.

3. Although Dr. Clark does not suggest further work on the basis of this season's check survey (see geophysics report on Poli option), the structural picture and indicated presence of silver-lead-zinc mineralization do justify further exploration.

4. Diamond drilling here has proved difficult to carry out and to evaluate; moreover, the anomalies on sections 13 and 14 lie at least partly in thawed ground, thus partly precluding cheap sinking of prospect shafts due to water.

5. Although steeply dipping vein-faults are difficult targets for vertical drill holes, especially when located only by resistivity, vertical rotary drilling may prove rapid and effective for testing these anomalies under suitable conditions.

6. Prospect shafts should be thawed down to test the anomalous zone at depths of about 80 feet on section 3 and west of section 14. Cost of such work would be about $30 per foot on contract.

7. Pumping of water might add somewhat to costs in the event of mining, but major flows could probably be alleviated by simple diversion of Galena Creek.

KPC PROPERTY AND LEE FRACTION (See Figure 1)

The KPC property and Lee Fraction form a group of 45 claims extending westerly for nearly 4 miles from Gerlitzki property, and ending up at Proctor's Lake.

Geology

Rocks are exposed on or adjoining the KPC property in only four localities -- on the west part of the Gerlitzki property, on KPC No.10 claim, on Buconjo No.3 claim on United Keno Hill property just south of KPC Fraction, and below McPherson's cabin near line 48 + 00 on KPC No.3 claim.

On the Gerlitzki property massive, fractured grey quartzite in which Gerlitzki reports having found some silver-

rich galena, is exposed 500 feet east of the Leo Fraction along the eastward projection of baseline A. At 500 feet east, the northwesterly leg of United Keno Hill's bulldozer cut has exposed probable vein-fault material in thin-bedded quartzite. At the west end of the stripped area on the Gerlitzki vein south along this cut, thin-bedded quartzite strikes N 73°E and dips 23° south.

On KPO No.13 claim massive blue-grey and white quartzite is exposed in frost-heaved outcrops over an area about 500 feet long by 300 feet wide. Attitudes were obtained in two bulldozer cuts: the westerly one showing whitish brown quartzite striking N 80-83°E and dipping 27-30° south, and the easterly one showing intercalated graphitic quartz-mica schist striking N 75°E and dipping 25° south with gentle crumpling. Similar quartzite exposed on a ridge about 1500 feet east on the Gerlitzki property shows fracturing and rusty signs of mineralization.

On Buconjo No.8 claim 160 feet south of the boundary of KPO Fraction, United Keno Hill Mines have exposed an assemblage of thin-bedded quartzite, schist, minor limestone, and schistose greenstone striking east to northeast and dipping from 20 to 35 degrees southerly, with some folding. A strong vein-fault, barren of mineralization, extends across this section between 210 feet and 300 feet, the intervening 90 feet being much brecciated, with quartz, manganese stain, and a little carbonate. This structure was thought to be the extension of

the Gerlitzki vein until the latter was stripped and found to extend toward the Leo Fraction in a more westerly direction.

Below McPherson's cabin just west of line 48 ½ 00 and about 700 feet south of baseline A, Thompson Creek has exposed dark grey, fairly massive quartzite which strikes from N 78-95°E and dips 40-42 degrees south. Several pits above this are reported to have traced a contact between the quartzite and overlying schist. Frost-heaved boulders of altered feldspar porphyry can be seen at McPherson's cabin.

In addition to these outcrops, alternating bands of massive quartzite and schist are exposed on much of the ground held by Gilbert Rich, 1000 feet or more south of KPO Fractions No. 1, 2, and 5. To the west these rocks probably strike across the southwest corner of the KPO claims, and to the east they strike into the Buconjo claims south of the KPO claims. Overlying this assemblage on Strebchuk's ground is the incompetent Upper Schist formation with thin limestone and quartzite beds (see page 10). These rocks strike N 80-105°E and dip 45-60 degrees south. They are cut by two or more northerly striking, steeply westerly-dipping, silver-lead-zinc-bearing cross-fractures from which most specimens assay less than 40 oz/ton silver except for one specimen which may have contained 545 ounces.

Three thousand feet northwest of KPO No.36 claim, massive blue-grey quartzite outcrops again in an area a few hundred feet across, striking east-west and dipping 30 degrees

southerly, showing that the quartzites do continue through this group of claims. Farther on strike, on a ridge in the centre of the valley toward Mt. Haldane, the typical Upper Schist formation with limestone is exposed again for several thousand feet across strike. This formation strikes N 50-80°E and dips 30-40 degrees southeasterly. West of the end of the MPC Group a series of old shafts across the valley to this ridge are reported to have confirmed presence of the schist formation throughout.

The only mineralization found on the MPC claims consists of a small amount of galena float found by Alex Smith about 300 feet of baseline A on line 4 + 00 on MPC No.2 claim. Ice movement down the valley suggests a source to the east-northeast, perhaps on MPC No.2 claim or Leo Fraction. A few pieces of pyrite-replaced quartzite, up to 2 feet by 10 inches by 10 inches, were also found nearby to the south. An assay of the pyrite gave only 0.12 oz/ton silver and a trace of gold.

Resistivity Survey

In September, 1959, a resistivity survey, checked in places by electromagnetic tests, was carried out over the MPC property and Leo Fraction by J.H. Beatson and interpreted by A.R. Clark of Geophysical Engineering and Surveys, Toronto (see geophysical reports and maps). Further geologic interpretations based on structure of the district and closer study of the results are added below by the writer.

The anomalies could be caused by sulfides, graphite, bedrock topography, or overburden. Unless silver-lead-zinc ore is massive, it may not give low enough resistivity values to attract attention. Fortunately, pyrite may be associated with some of the ore; and most of the mineralized vein-faults strike northeast so they could be distinguished from east-west striking graphitic schists, and from bedrock topography or overburden resulting from the east-west glaciation. However, sections of ore could be masked easily by anomalies due to graphitic schist, bedrock topography, or overburden. Because of these uncertainties in interpretation, exploration must be guided not only by the most likely geophysical anomalies but by structural considerations, location of favourable massive quartzites, and other clues as well.

The pattern of resistivity values over the Leo, Gerlitzki, and KPO properties resolves into (a) numerous east-westerly trends probably caused by rock formations, bedrock topography, and overburden; (b) two or more northwest features interpreted by the writer as probable northwest cross-faults; and (c) several northeast anomalous zones very probably caused by vein-faults.

The east-westerly trends probably largely reflect underlying bedrock topography or rock types on the Leo property and the east half of the KPO property, and overburden on the west part of the KPO property. One trend, with associated white and grey massive quartzite outcrops, seems to extend east-west across the

Leo property and across [illegible] No.1 claim. This may be the Hector-Calumet quartzite member (G.S.C. paper 57-1, page 8) or a similar unit. Other trends on the KMC property strike from N 80-90°E on the east part to N 70-80°W in the centre of the property. An indefinite belt of high values extending N 60-70°E along the north edge of the property suggests some general difference, perhaps in rock type or structure.

A N 25°W change in resistivity crossing the KMC property at 4600 feet on baseline B and a suggestion of a similar northwest feature or features crossing around 11,000 to 12,000 feet on baseline B may be cross-faults similar to others on Galena Hill. East-west trends against the N 25°W feature suggest right-hand offset of the order of a thousand feet, also characteristic of these cross-faults (see G.S.C. map 4-1957). An interesting northeast anomalous zone crossing KMC No.1 and No.4 claims may be similarly offset onto KMC No.8 claim. Minor northwest trends are also suggested by detailed survey of anomalous areas on KMC No.1 claim and perhaps on Leo Fraction. Since the ore on Galena Hill occurs close to cross-faults, these northwest features may prove to be very useful structural guides in the search for ore.

Northeast-trending anomalous zones and variations in resistivity occur as follows:

1. On Leo property (already described).
2. Along Gerlitzki vein and Leo Fraction.
3. Across KMC No.1 and No.4 claims.
   (line 0 to 32-00 south of baseline A)

4. On KPC No.5 and No.8 claims.
(line 36-00 to 84-00 south of baseline A)

5. On KPC No.18 and No.20 claims.
(line 34-00 to 52-00 on baseline B)

6. On KPC No.28 and No.30 claims.
(line 118-00 to 134-00 north of baseline B)

7. On KPC No.26, No.27 and No.29 claims.
(line 100-00 to 120-00 south of baseline B)

The zone on the Leo property (1) was shown to be probably a mineralized vein-fault similar to the Gerlitzki vein (2).

On the Leo fraction the anomalous zone caused by the Gerlitzki vein bends westerly to form a local stronger anomaly. A similar anomaly 400 feet to the northwest parallels bedrock trends but lies west of the probable vein-fault, anomalous areas, and the mineralization Gerlitzki reported on his property northwest of the Gerlitzki zone. A vague northwesterly tendency may be suggested partly by low values connecting the two anomalies. Moderately low values extend westward into KPC No.1 and No.2 claims. The galena float found by Alex Smith lay 200 feet southwest of the lowest values on KPC No.2 claim. The complexity of the anomalous areas on the Leo fraction, along with the above factors, justifies further exploration.

Diamond drill hole No.1, started N 30°W at minus 60 degrees to intersect the southern anomaly in the first week of October, 1959, went to 59 feet (vertical depth 40 feet) in overburden and had to be stopped due to mechanical difficulties and freezing.

On KPC No.1 and No.4 claims (3) a zone of intermittent moderate to very low resistivity values, similar to the Lee and Gerlitzki zones, extends 4000 feet N 48°E across KPC No.4 claim, swinging to N 30°E across KPC No.1 claim. The lowest and most contrasting values occur on KPC No.1 claim (Clark's Anomaly Group A), extending west from the zone as a herringbone pattern which is interpreted as bedrock trends under an estimated cover of about 25 feet of overburden. The shape of the anomalous zone near baseline A vaguely suggests a possible N 30°W cross-fault with typical right hand displacement. In view of this, and of the contrasting resistivity, this locality should be explored further.

On KPC No.4 claim (Clark's Anomaly Group B), because of its depth (80 feet) and uncertain nature, the anomalous zone should be left until some other localities have been tested first.

On KPC No.6 and No.8 claims (4), northeast-striking anomalous areas (Clark's Anomaly Group C) have not been as closely surveyed but general proximity to the inferred northwest cross-fault may favour this as a location for ore, particularly if it is an offset of the KPC No.1-4 zone. The anomaly recommended for drilling by Clark on line 84.00 lies under 30 feet of overburden, and a possible northeast extension in shallow overburden on line 48+00 might be stripped to bedrock. The other anomaly is estimated to lie under about 60 feet of overburden.

On KPO No.18 and No.20 claims (5) a suggestion of northeast structures with one anomaly occur against the inferred N 25°W cross-fault, perhaps offset against it. This may thus deserve further work, especially since it lies near the strike of massive quartzites.

On KPO No.28 and No.30 claims (6) two areas of low values form part of a N 40-50°E zone; and on KPO No.26, No.27 and No.29 claims (7) an irregular zone of moderate lows and average values extends northeasterly. Both of these northeast trends cross the changes in resistivity values which may reflect N 35-45°W cross-faulting. However, not enough detail is available and anomalies caused by deep overburden and bedrock trends tend to modify and mask these features. This area could contain another swarm of vein-faults like the Leo-Gerlitzki-KPO swarm, and would warrant further work if results on the other parts of the properties are encouraging.

Conclusions on KPO Property

1. Outcrops are rare on the KPO property but much of the ground is believed to be underlain by the favourable Central Quartzite formation.

2. Galena float found on KPO No.2 claim suggests mineralization to the northeast.

3. The pattern of resistivity values resolves into numerous east-west bedrock and overburden trends, two or more northwest features suggestive of cross-faults, and several northeast zones almost certainly caused by vein-faults which could contain ore, particularly near cross-faults.

4. Anomalous localities on the Leo fraction, KPO No.1 claim, and KPO No.8 claim should be explored further, and other localities would also warrant exploration if encouraging results are obtained.

5. For check surveys electromagnetic tests can give further information, magnetometer work may give additional structural data, and a gravimeter could probably distinguish heavy sulfide sections. Geochemistry may give anomalies down the direction of ice movement from mineralization but overburden may be too deep in most places.

6. The most interesting localities appear to be overlain by 20 to 50 feet of frozen overburden and could be tested best by thawing prospect shafts to bedrock and drifting on bedrock.

GENERAL CONCLUSIONS AND RECOMMENDATIONS

The Central quartzite formation extends through the Leo and KPO properties; the Gerlitzki vein has shown the presence of strong vein structure and high silver values between these two properties; and resistivity surveys have defined several other northeast zones interpreted as vein-faults on the properties. The pattern of resistivity values confirms that the general structural pattern of Galena Hill does persist through these properties. The Silver King, Elsa, and Hector-Calumet mines have contained metals worth, at present prices, something over $15 million, $8 million, and $80 million respectively; and it seems reasonable to suppose that one or more such deposits may exist under the overburden on the Leo and KPO Properties. There are therefore reasonable chances of finding important ore

associated with the northeast anomalous zones in one or more of several resistivity anomalies or structural geologic situations near massive quartzites on these properties.

The interesting localities are overlain by 20 to 30 feet of overburden, frozen in most localities, and the most certain way to test the more promising localities is to thaw exploratory shafts down to bedrock and drive drifts. This work can be contracted for about $30 per foot.

Because of thawed ground, anomalies on sections 15 and 18 of the Leo property might be tested better by drilling. Due to the difficulties of diamond drilling, however, it is proposed to try vertical rotary drilling which might also prove to be a rapid way of testing anomalies as a guide to the exploratory shaft sinking. Diamond drill hole No.4 should be extended into the main Leo anomaly.

In order to take advantage of cold weather to keep shaft walls frozen, the shaft sinking should be started in February So a few holes could be completed before breakup about April 30th. In order to transport the drill over frozen muskeg and to help guide the shaft sinking, much of the drilling should be done sometime in this period also.

Although the resistivity survey is most likely the best basic exploration guide, response from ore might be too slight to attract much attention or it might be masked by effects of graphitic schists, bedrock topography or overburden. Because of these uncertainties in interpretation, structural

geology, location of massive quartzites, more detailed resistivity or other geophysical methods and probably geochemistry should be used, when weather permits, to delineate probable targets more closely for further exploration after the presently defined localities have been tested to some degree.

If ore is intersected in this work it may be best to proceed directly with underground exploration, following ore as closely as possible with the best of geologic guidance. Surface drilling should be continued only if it appears likely to give reasonably good results.

It is recommended that a minimum of $60,000 to $75,000 be allotted immediately to exploration of the Leo and KMO properties in 1960. This work should determine largely the potential value of the Leo property and to some extent that of the KMO property.

An additional $140,000 or so should be reserved to follow up encouraging results to a decisive stage and to carry the option payments to September, 1961.

Respectfully submitted,

Aaro E. Aho, P.Eng.

Vancouver, B.C.
December 7, 1959.

Additional Notes to Supplement Report
on Leo and Bat Properties on Galena Hill in Yukon
by A.L. Lee, Jan/60.

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1. In C.I.M.M. paper 57-1 Boyle suggests that northeast cross-faults are post-ore and merely offset the ore. Other geologists more closely concerned with mining believe on good evidence that the tendency or actual occurrence of such faulting has localized tensional fracturing, and ore near the fault and that continued or recurrent faulting has displaced the ore.

2. Downward gradation into zinc is a definite possibility in deposits of this type but mining to date suggests that sections of zinc in this district may not necessarily indicate zonal bottoming of silver-rich ore. The Silver King Mine was high in zinc on the lowest level but galena and ruby silver are reported below this so the evidence is not conclusive. If such zoning does exist, it may occur at different levels or stratigraphic horizons in different vein structures.

3. A recent report by United Keno Hill Mines on the Berlitzki vein, supplied by Berlitzki, shows scanty

mineralization for most of the drill holes and a better mineralized section in the stripping for 100 feet west of the shaft. The mineralized section showed narrow blebs of galena, variable silver values and lenses of sphalerite, all of which averaged about 11 oz/ton silver, 0.5% lead and 10% zinc across about 10 feet over a length of 100 feet. One six-inch section assayed 63.6 oz/ton silver, 4.2% lead and 13.0% zinc. This part of the vein lies in pyrite-bedded quartzite and schist between the Silver King and Jim-Calumet quartzite sections. It is not in the center of the stratum this section that has proven most productive.

4. Projected from I.P. line 4-1W, the main Alice-Calumet anomalous zone will extend through the Lot 37 claim and actual outcrops on the Berlikum property and Lot 38 claim show that such mineral extends into the Lot property along a resistivity trend that runs cross Lot 37 claim. Many fair to good drill holes, outcrops, and the continuing resistivity pattern indicating normal differences in normal mineralization, all indicate a section about a thousand feet wide containing abundant quartzite. The suggestion of favorable vein fault in this section should also be checked. There is ample depth potential except probably around section 13 on the projection No.5, which may be getting close

to the base of the section. Anomalies on KPC Nos. 19 and 20 claims should lie near the top of this quartzite section.

5. On the KPC property the resistivity pattern suggests that the above 1000-foot section of quartzites is cut off along the north edge of the property, perhaps by a major 30° N normal fault which brings the underlying schist up in the core of the McQueston anticline. Possibly the quartzite section is repeated again by cross-faulting on KPC No.28 claim. Such a pattern is typical, not only of the district, but also of tensional faulting of uplifts or anticlinal structures in other Cordilleran mining camps. (See U.S.A. Memoir 77, 1960; "Relation of Ore Deposition to Doming in the North American Cordillera" by Edward Wisser.)

6. The Silver King quartzite section is higher stratigraphically than the Lion-Calumet section (although lower on the hill), and would project into the Lee Fraction and adjoining KPC No.1 and No.2 claims (Anomaly Group "B"). Thus, the northeast anomalous zones near the inferred cross-faults should be favourable.

7. The anomalous area on KPC No.3 claim extends partly through an area with 10 feet or less overburden and part of it could be stripped, although not over the strongest part of the anomaly. Sandy Patterson, who dug a few test pits in this

general area years ago, reports generally shallow overburden. The strongest part of the anomaly has a shape suggestive of a conductor pitching southwest and this could be caused by sulfides localized near the top of the quartzite section exposed nearby, like much of the ore in the district.

3. The above comments serve to narrow down further the most likely sections to search for ore, and if the northeast zones indicated by resistivity in these sections are checked in detail by electromagnetic or other means, the targets for prospect shafts or drill holes should be fairly specific.

Respectfully submitted,

[signature]

A.L. Ako, M.Sc.

Vancouver, B.C.
January, 1960.

Report 239T

ELECTRICAL RESISTIVITY SURVEY

LONG WIRE METHOD

GALENA HILL PROPERTY

ELSA, YUKON TERRITORY

GEOPHYSICAL ENGINEERING & SURVEYS LTD.
11 Adelaide Street West,
Toronto, Ontario.

ABSTRACT

In the fall of 1959 an electrical resistivity survey followed by electromagnetic tests were completed over selected areas.

Four anomalous areas were outlined. In the anomalous areas two specific anomalies have been recommended for further tests by diamond drilling.

The results are described in a (6) page report with accompanying maps and profiles.

ELECTRICAL RESISTIVITY SURVEY

LONG WIRE METHOD

GALENA HILL PROPERTY

ELSA, YUKON TERRITORY

INTRODUCTION

Previous geophysical investigations had shown that the north-east trending vein systems of the area were sufficiently conductive to be outlined by earth resistivity methods.

A resistivity survey covering a considerable area was undertaken in an attempt to trace buried conductors and to determine those worth further investigation.

LOCATION AND ACCESS

The property is situated approximately 35 miles north-east of Mayo and three miles west of the Elsa Mine.

It is easily reached by motor vehicle since the Elsa-Mayo road is within one half mile to the south and Proctors road, which is gravelled, crosses three claims at the west end of the property and joins the Mayo-Elsa road.

TOPOGRAPHY

The south part of the property lies on the northerly flank of Galena Hill and slopes at 3 to 15 degrees into flat permanently frozen swamps which cover at least three quarters of the claim group.

The permanently frozen overburden consists of glacial till, rock float, black muck and muskeg and is covered with a mixture

the search coil is held depends on the component of the field desired.

Eddy currents induced in buried conductors cause an increase in the total field thus revealing their presence.

The method does not respond to flat dipping, or shallow conductors as markedly as the resistivity methods. The two used together provide a better means of differentiating between overburden and useful conductors.

DISCUSSION OF RESULTS

The resistivity values were calculated in ohm cms. In all such surveys there is a large variation in values ranging from 1×10^6 to as low as 1×10^2 ohm cm. As a convenience in plotting such wide variations the logs to the base 10 of the values are plotted, i.e. a value of 6.2×10^5 ohm cms. would be plotted as 5 times log 6.2 or 5.79.

The general values over the normal parts of the property were in the 5/ range. Values in the 4/ range and lower were worth further attention.

From east to west there are four anomalous areas:

(A) From line 0 / 00 to line 24 / 00 near the base line.

(B) From line 22 / 00 to line 32 / 00 south of the base line.

(C) From line 36 / 00 to 70 / 00 north and south of the base line.

(D) From line 104 / 00 to 164 / 00 north and south of the base line.

The anomalies are extremely complex and are caused by a network of conductors. The axes of the main conductors are shown by dashed lines.

ANOMALY GROUP (A)

The conductors in this group all strike east and slightly south. From lines 0 + 00 to 18 + 00 they are interrupted on the east end by a structure striking north-east which makes the anomaly appear to strike north-east. No conductors striking north-east are evident.

It is difficult to determine the cause of the conductors, the two most likely explanations are shearing or bedrock topography.

The complicated pattern makes depth determinations unreliable except for the isolated anomaly on lines 2 + 00 and 4 + 00 approximately 1000 feet north of the base line. At this point the depth to the top of the conductor is maximum of 25 feet.

Electromagnetic measurements were made along lines 1,2,3,7,9,11 and 15. Both the horizontal and vertical component of the field were measured. The results strengthened the idea that the anomalous values were due to bedrock topography since the electromagnetic values did not behave as they should do over conductors which extend downward a large distance. For such conductors the horizontal component should come to a peak over the top of a conducting body while the vertical component should be zero at this point and should show a peak on either side of this low.

If the conductors are of shallow depth extent (i.e.) in the overburden, the horizontal component reaches a peak at or close to the resistivity low values but the vertical component is above normal along its length or produces erratic peak values.

The electromagnetic results obtained were characteristic of those due to conducting overburden or of conducting areas due to disseminated sulphides, schists or slates.

ANOMALY GROUP (B)

Only one north-east striking anomaly was noted and occurred on lines 22 ∠ 00 and lines 24 ∠ 00. The Conductor is at a depth of nearly 60 feet. No electromagnetic tests were made.

The numerical values are not extremely low leading to the conclusion that the anomaly is most likely due to overburden.

ANOMALY AREA (C)

Several north-east trending anomalies occur. Of the two most interesting, one crosses line 42 ∠ 00 at 1300 feet south of the base line and the other crosses line 54 ∠ 00 at 850 feet south. Both are of short strike length and the values are low enough to be caused by veins of galena.

The first is at a depth of approximately 60 feet and the second is approximately 30 feet below surface.

ANOMALY AREA (D)

All the anomalies in this region are most likely due to overburden.

The electromagnetic profiles on lines 124, 132, 168 were typical of anomalies due to overburden, they were long and narrow and many terminated in or close to small lakes or ponds. There does not seem to be anything of interest in this part of the survey.

RECOMMENDATIONS

It is recommended that the anomalies at 850 s line 54 ∠ 00 and the anomaly at 1300 s, line 42 ∠ 00 be drilled.

If no encouragement is obtained no further work is suggested. If either prove due to vein material then other north-east striking

of black spruce, arctic black birch and groves of aspen and poplar.

An accompanying aerial photograph on which the base lines, stop lines and picket lines have been accurately placed shows the location of all topographic features of interest.

GEOPHYSICAL SURVEY

A long north-south insulated wire was placed on the surface and grounded at its ends which were large distances beyond the east-west boundaries of the property. (See Resistivity Map)

Audio frequency current of approximately 1200 cycles per second was fed into the ground through the wire from a suitable motor generator set.

The current flowing in the ground caused a potential difference between points along lines parallel to the current wire. The magnitude of the potential difference between these points was dependent on the conductivity of the ground material between and below the points. The potential difference between equally spaced points was measured along suitable lines and the results used to calculate ground resistivities. The calculated values were plotted on a map and contoured.

The long wire resistivity method has the advantage that it may also be utilized to make electromagnetic measurements.

The currents flowing in the wire and in the ground set up electrical eddy currents in conducting ore bodies which in turn produce an alternating magnetic field. The total field due to primary and eddy currents can be measured using a search coil and sensitive vacuum tube voltmeter. The direction in which the plane of

conductors in anomaly areas B,C should be tested by drilling.

Respectfully submitted,

GEOPHYSICAL ENGINEERING & SURVEYS LIMITED

A. R. Clark

A. R. Clark,
President.

Toronto, Ontario,
November 26, 1959.

ELECTRICAL RESISTIVITY SURVEY

LEO FRACTION AND POLI OPTION

YUKON TERRITORY

PETCAL COMPANY LIMITED

GEOPHYSICAL ENGINEERING & SURVEYS LTD.
11 Adelaide Street West,
Toronto, Ontario.

ABSTRACT

In the fall of 1959 the Leo Fraction and three lines on the Poli Option were surveyed by the long-wire resistivity method.

It has been recommended that one anomaly on the Leo Fraction be tested by drilling.

The results are discussed in a three (3) page report with one accompanying map.

ELECTRICAL RESISTIVITY SURVEY

LEO FRACTION AND POLI OPTION

YUKON TERRITORY

PETCAL COMPANY LIMITED

INTRODUCTION

Previous geophysical investigations had shown that the north-east trending vein systems of the area were sufficiently conductive to be outlined by earth resistivity methods.

A resistivity survey was undertaken in an attempt to trace buried conductors and to determine those worth further investigation.

LOCATION AND ACCESS

The property is situated approximately 35 miles north-east of Mayo and three miles west of the Elsa Mine.

It is easily reached by motor vehicle since the Elsa-Mayo road is within one half mile to the south.

TOPOGRAPHY

The south part of the property lies on the northerly flank of Galena hill and slopes at 3 to 15 degrees into flat permanently frozen swamps.

The permanently frozen overburden consists of glacial till, rock float, black muck and muskeg and is covered with a mixture of black spruce, arctic black birch and groves of aspen and poplar.

GEOPHYSICAL SURVEY

A long north south insulated wire was placed on the surface and grounded at its ends which were large distances beyond the east-west boundaries of the property. (See Resistivity Map)

Audio frequency current of approximately 1200 cycles per second was fed into the ground through the wire from a suitable motor generator set.

The current flowing in the ground caused a potential difference between points along lines parallel to the current wire. The magnitude of the potential difference between these points was dependent on the conductivity of the ground material between and below the points. The potential difference between equally spaced points was measured along suitable lines and the results used to calculate ground resistivities. The calculated values were plotted on a map and contoured.

DISCUSSION OF RESULTS

(A) Leo Fraction

The rather complicated anomaly on the southern part of the claim is part of a larger one extending west for nearly one half mile.

The conductor axis pattern was erratic.

On and north of base line A the anomalies consisted of single values and were difficult to trace from line to line.

South of base line A the strike of the conductors axes was north or north-east. The most interesting of these crossed line 31 + 25, 200 feet north

of the so called Clark base line. It was isolated enough that a depth determination was possible.

Overburden appeared to be approximately 20 feet deep over the anomaly.

On line 2+00 a broad anomaly was centred 350 feet south of base line A. It's shape suggested that it was due to overburden.

(B) Poli Option

Three resistivity profiles were obtained. The general anomaly pattern had a north east strike and was characterized by broad and flat anomalies. The general direction of the conductor axes was the same as a previous survey although the resistivity values were lower.

The difference in the two surveys was likely due to different overburden conditions.

Depth determinations were made as follows:

Line 17 - 450S - 40 feet

Line 19 - 150N - 40 feet

The anomalies strongly suggest that the anomalies were due to bedrock topography under the overburden.

RECOMMENDATIONS

(A) Leo Fraction - The anomaly crossing line 31 + 25 at 200 feet north of the Clark base line should be tested by drilling.

(B) Poli Option - No further work is suggested.

Respectfully submitted,

GEOPHYSICAL ENGINEERING & SURVEYS LTD.

A. R. Clark,
President.

Toronto, Ontario.
November 30, 1959.

SILT [illegible] RESULTS FOR TOTAL COPPER, ZINC, MOLYBDENUM AND LEAD

SAMPLE NO.		PPM CU	PPM ZN	RATIO CU/ZN	PPM MO	PPM PB
60 HP	1	15	290	.050	0.8	1
	2	23	690	.033	0.8	20
	3	11	250	.046	0.8	6
	4	20	330	.060	0.8	16
	5	8	150	.056	2	8
	6	9	220	.041	0.8	20
	7	52	880	.059	6	80
	8	26	850	.031	4	30
	9	23	410	.056	4	<0.8
	10	21	270	.079	4	<0.8
	11	20	310	.063	2	18
	12	20	230	.087	2	4
	13	13	110	.12	0.8	<0.8
	14	18	210	.087	2	7
	15	29	570	.052	3	16
	16	18	220	.083	4	0.8
	17	21	660	.032	2	0.8
	18	11	140	.083	3	<0.8
	19	13	150	.089	2	<0.8
	20	23	160	.15	2	0.8
	21	10	150	.067	0.8	5
	22	20	240	.081	0.8	2
	23	3	87	.038	<0.8	0.8
	24	11	140	.083	<0.8	3
	25	5	2600	.0020	<0.8	20

SAMPLE NO		PPM Cu	PPM Zn	RATIO Cu.Zn	PPM Mo	PPM Pb	
50 AP	26	7	190	.038	<0.8	2	
	27	14	84	.17	<0.8	<0.8	
	28	7	160	.045	<0.8	3	
	29	3	69	.047	<0.8	3	
	30	10	61	.16	<0.8	2	
	31	11	69	.17	<0.8	3	
	32	11	87	.13	<0.8	12	
	33	18	160	.12	0.8	8	
	34	15	87	.17	<0.8	4	
	35	16	130	.13	<0.8	<0.8	
	36	13	95	.14	<0.8	5	
	37	15	95	.15	<0.8	4	
	38	15	95	.15	<0.8	0.8	
	39	8	120	.068	<0.8	5	
	40	5	69	.071	0.8	4	
	41	8	95	.086	<0.8	4	
	42	13	87	.15	0.8	0.8	
	43	8	110	.073	<0.8	4	
	44	18	140	.13	<0.8	4	
	45	25	87	.28	0.8	2	
	46	18	120	.15	<0.8	2	
	47	20	87	.23	<0.8	4	
	48	7	87	.076	<0.8	4	
	49	15	69	.21	<0.8	3	
	50	8	69	.12	0.8	3	

SAMPLE NO		PPM CU	PPM ZN	RATIO CU : ZN	PPM MO	PPM PB	
60 AP	51	15	69	.21	<0.8	3	
	52	11	87	.13	<0.8	<8	
	53	21	110	.19	<0.8	3	
	54	23	110	.20	<0.8	3	
	55	21	110	.19	0.8	4	
	56	16	95	.17	0.9	3	
	57	20	160	.13	1	4	
	58	11	84	.13	<0.8	6	
	59	21	400	.054	<0.8	6	
	60	32	190	.17	0.8	6	
	61	55	700	.079	0.8	0.8	
	62	29	230	.13	<0.8	<0.8	
	63	20	520	.038	<0.8	3	
	64	27	250	.11	<0.8	<0.8	
	65	21	390	.055	0.8	<0.8	
	66	12	100	.12	<0.8	0.8	
	67	18	420	.042	0.8	<0.8	
	68	<4	59	<.060	<0.8	2	
	69	16	420	.038	2	2	
	70	20	120	.17	<0.8	3	
	71	<4	76	<.047	0.8	6	
	72	18	670	.027	0.9	3	
	73	14	170	.085	<0.8	3	
	74	21	250	.085	3	3	
	75	16	320	.050	0.8	2	

SAMPLE NO		PPM CU	PPM ZN	RATIO CU : ZN	PPM MO	PPM PB	
O AP	76	23	800	.029	3	<0.8	
	77	12	180	.071	2	0.8	
	78	32	530	.060	2	6	
	79	12	220	.045	2	8	
	80	16	170	.075	3	<0.8	
	81	12	160	.078	6	16	
	82	16	430	.037	2	5	

Aug 3/60 Silt Analyses for Total Cu, Zn, Mo and Pb ABS 4?

ASARCO

Sample No		ppm Cu	ppm Zn	Ratio Cu:Zn	ppm Mo	ppm Pb	
O AP	83	18	98	.19	0.8	6	
	84	13	89	.14	0.8	3	
	86	7	89	.082	<0.8	2	
	86	16	63	.26	2	2	
	87	35	98	.36	2	4	
	88	33	130	.25	0.8	2	
	89	18	63	.30	0.8	2	
	90	18	71	.26	0.8	2	
	91	12	45	.28	2	4	
	92	16	63	.26	2	2	
	93	8	36	.23	<0.8	2	
	94	10	45	.23	0.8	2	
	95	18	63	.30	2	2	
	96	37	80	.46	<0.8	2	
	97	8	54	.15	<0.8	3	
	98	12	45	.28	<0.8	2	
	99	29	150	.19	1	8	
	100	18	120	.15	0.8	10	
	101	43	120	.37	2	12	
	102	23	120	.18	0.8	16	

SILT SAMPLES For Cu, Zn, Mo and Pb with Hot Sulphuric ASARCO

-80 Mesh Screened Fraction

SAMPLE NO.	ppm Cu	ppm Zn	Ratio Cu:Zn	ppm Mo	ppm Pb
80 AM 103	22	120	0.18	4	6
104	26	150	0.17	2	12
105	24	240	0.10	4	27
106	21	83	0.25	2	12
107	34	140	0.24	8	10
108	30	160	0.19	4	10
109	22	140	0.16	4	12
110	26	100	0.26	2	12
111	16	110	0.15	2	6
112	16	110	0.16	2	8
113	30	350	0.086	4	63
114	14	380	0.037	2	20
115	30	190	0.16	8	20
116	22	160	0.14	8	20
117	28	170	0.16	8	10
118	38	180	0.21	4	10
119	20	120	0.17	4	12
120	12	100	0.12	4	20
121	8	150	0.13	3	4
122	30	210	0.14	8	12
123	18	100	0.18	12	4
124	28	150	0.19	12	9
125	26	240	0.11	12	12
126	26	360	0.072	60	20
127	27	740	0.036	16	47

-80 Mesh Screen Fraction

	LL No.	ppm Cu	ppm Zn	Ratio Cu:Zn	ppm Mo	ppm Pb
60 AM	128	13	29	0.45	2	4
	129	4	39	0.098	2	4
	130	10	78	0.12	12	4
	131	6	58	0.094	8	4
	132	6	97	0.057	0.8	4
	133	8	49	0.16	2	2
	134	8	110	0.071	8	6
	135	4	49	0.073	2	2
	136	8	39	0.20	8	2
	137	32	210	0.15	12	4
	138	6	58	0.098	2	3
	139	15	68	0.22	40	3
	140	8	49	0.16	2	2
	141	4	97	0.039	2	4
	142	10	70	0.14	2	2
	143	22	80	0.27	0.8	8
	144	28	200	0.14	0.8	6
	145	8	60	0.13	0.8	8
	146	16	130	0.12	0.8	8
	147	14	200	0.070	2	5
	148	16	70	0.23	0.8	5
	149	10	60	0.17	2	2
	150	4	50	0.080	0.8	2
	151	32	78	0.42	8	6
	152	4	58	0.066	0.8	8

-80 Mesh Screened Fraction

Lab No.	ppm Cu	ppm Zn	Ratio Cu:Zn	ppm Mo	ppm Pb
60 AM 128	13	29	0.45	2	4
129	4	39	0.093	2	4
130	10	78	0.13	12	4
131	6	58	0.103	8	4
132	6	97	0.057	10.8	4
133	8	49	0.16	2	2
134	8	110	0.071	8	6
135	4	49	0.073	2	2
136	8	39	0.20	8	2
137	32	210	0.15	12	4
138	6	58	0.098	2	3
139	15	68	0.22	40	3
140	8	49	0.16	2	2
141	4	97	0.039	2	4
142	10	70	0.14	2	2
143	22	80	0.28	0.8	8
144	28	200	.14	0.8	6
145	8	60	0.13	0.8	8
146	16	130	0.12	0.8	8
147	14	200	0.070	2	5
148	16	70	0.23	0.8	5
149	10	60	0.17	2	2
150	4	50	0.080	0.8	2
151	32	78	0.42	8	6
152	4	53	0.076	0.8	8

-80 Mesh Screened Fraction

SAMPLE NO.	ppm Cu	ppm Zn	Ratio Cu:Zn	ppm Mo	ppm Pb
60 AM 153	13	97	0.14	2	6
154	27	190	0.14	0.8	2
155	8	39	0.20	2	4
156	57	340	0.17	4	6
157	23	240	0.094	12	6
158	23	200	0.11	4	4
159	8	78	0.098	4	4
160	4	78	0.049	4	2
161	4	49	0.078	0.8	2
162	8	58	0.13	0.8	2
163	6	58	0.098	2	0.8
164	8	68	0.11	2	1
165	8	49	0.16	0.8	2

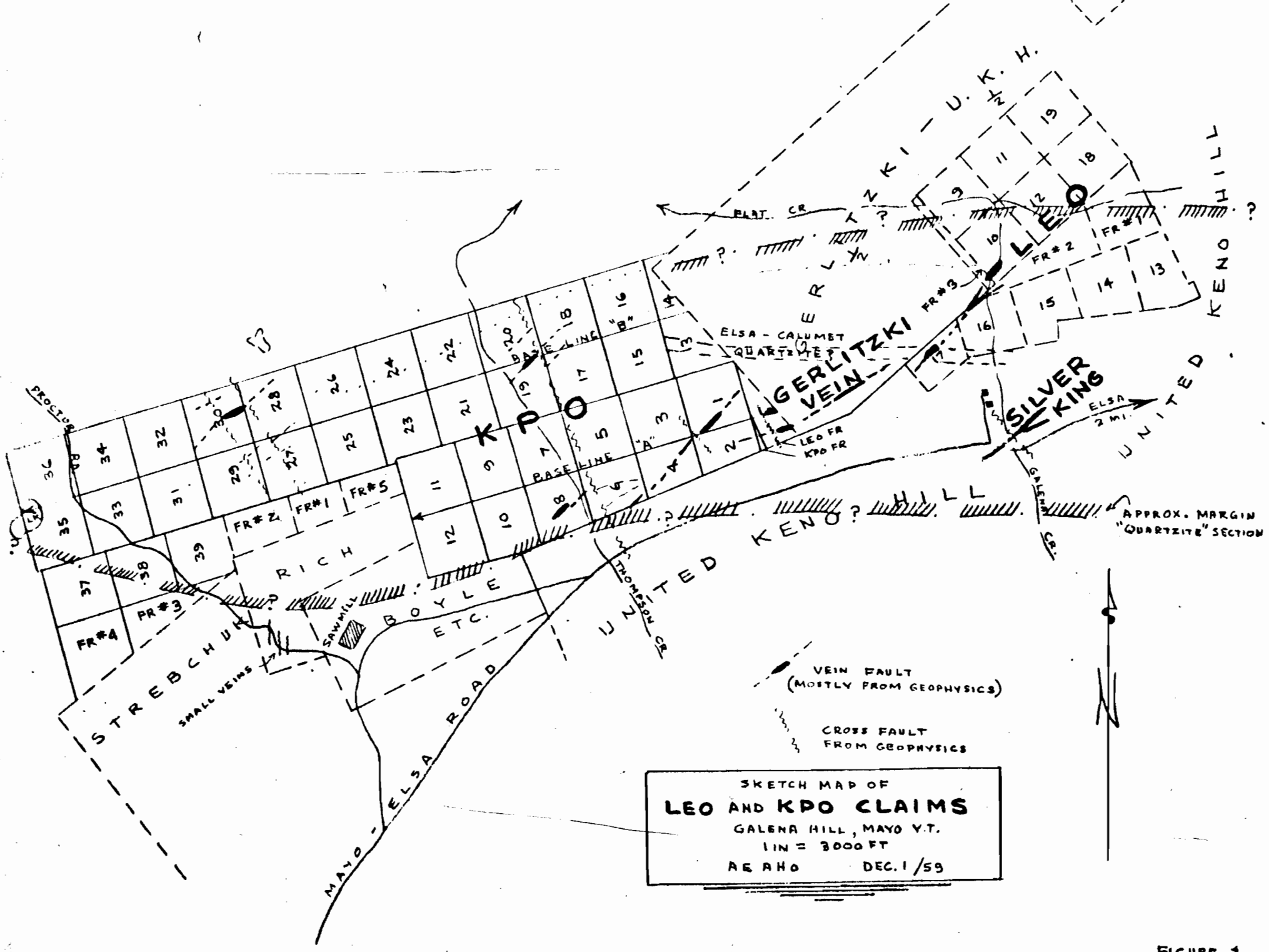
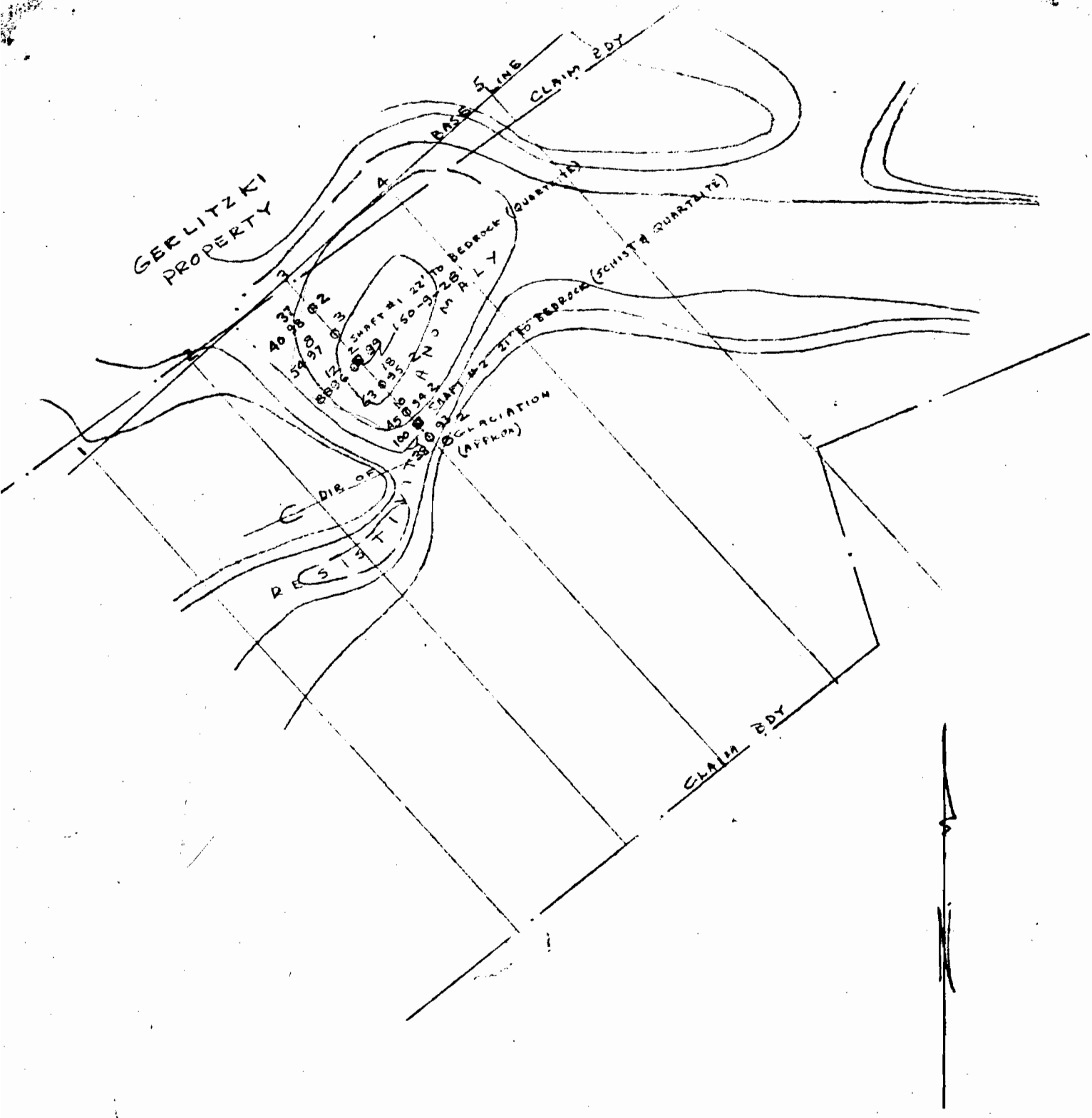
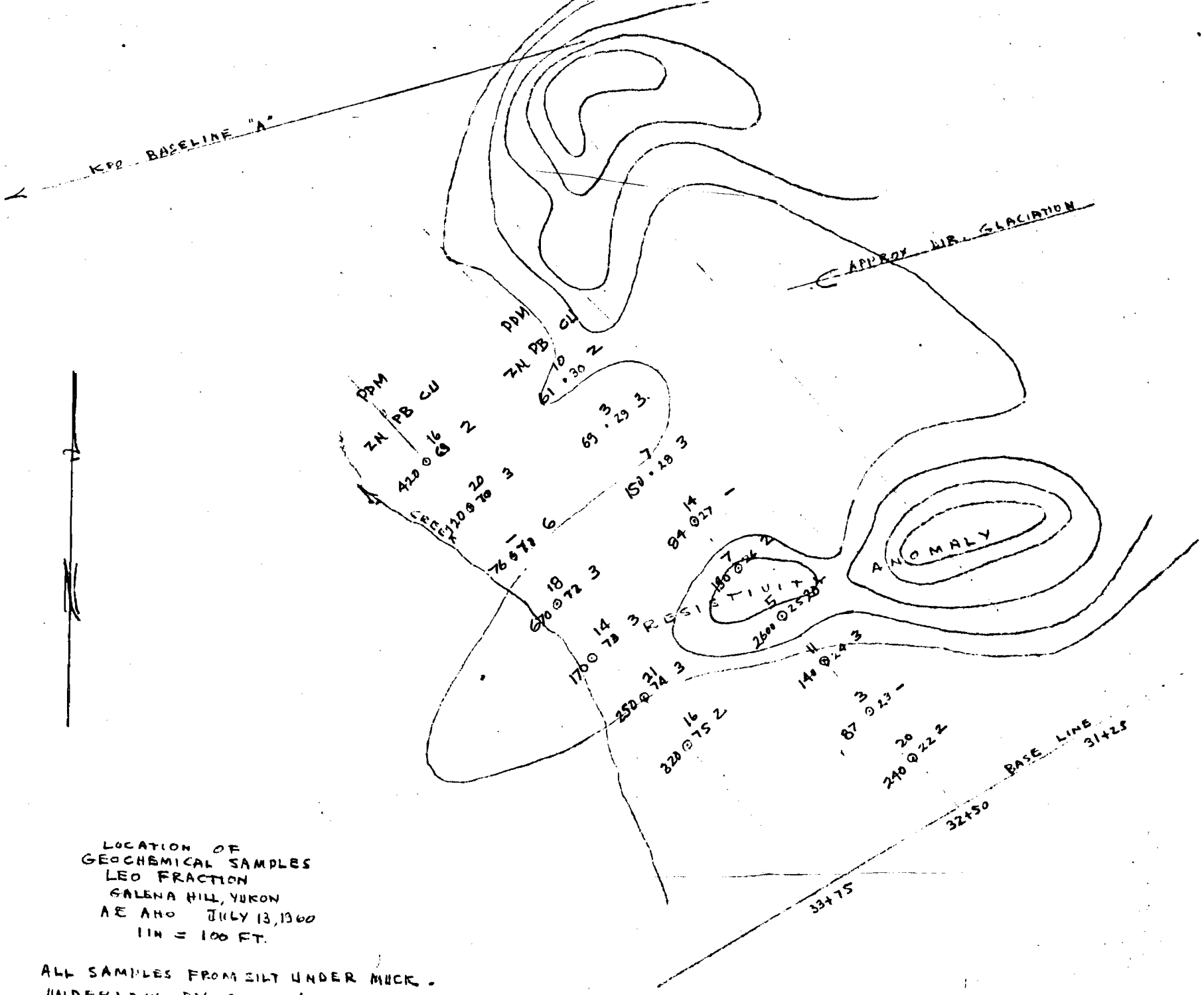

U. K. H.
KERLYN
LEO
FR#1
FR#2
FR#3
PLAT. CR.
ELSA - CALUMET QUARTZITE ?
GERLITZKI VEIN
SILVER KING
ELSA 2 MI.
UNITED KENO HILL
KPO
BASE LINE
LEO FR
KPO FR
PROCTOR
RICH
BOYLE
ETC.
STREBCHUK
SMALL VEINS
SAWMILL
THOMPSON CR.
GALENA CR.
APPROX. MARGIN "QUARTZITE" SECTION
MAYO - ELSA ROAD
VEIN FAULT (MOSTLY FROM GEOPHYSICS)
CROSS FAULT FROM GEOPHYSICS
N
SKETCH MAP OF
LEO AND KPO CLAIMS
GALENA HILL, MAYO Y.T.
1 IN = 3000 FT
AE AHO DEC. 1/59

FIGURE 1



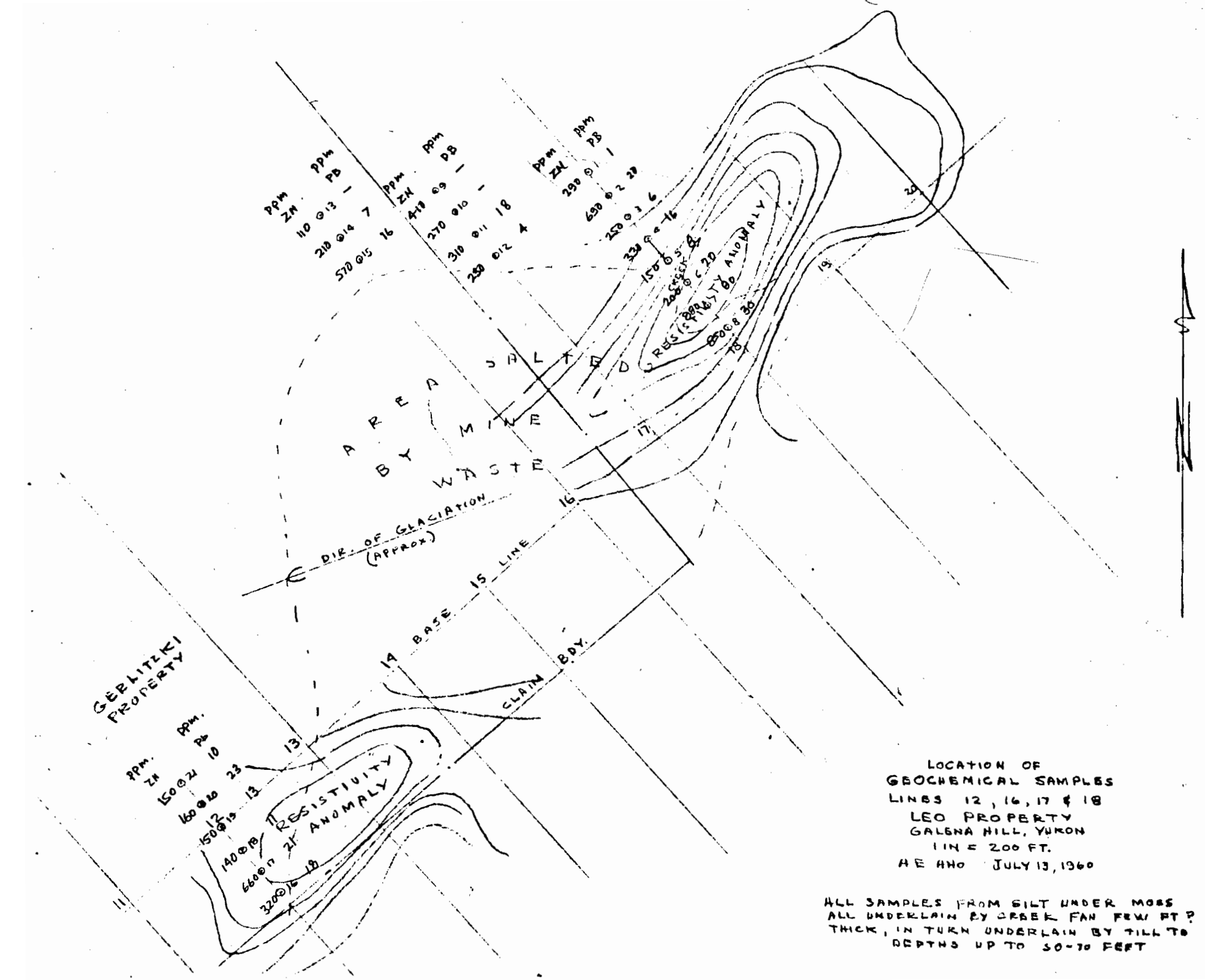
LOCATION OF
GEOCHEMICAL SAMPLES, LINE 3
LEO PROPERTY
GALENA HILL, YUKON
1 IN = 200 FT.
A.E. AHO JULY 13, 1960

SAMPLES FROM SILT UNDER 5"-12" MUCK
96 GLACIAL DRIFT (TILL)
ALL UNDERLAIN BY GLACIAL DRIFT (TILL)
TO BEDROCK.
#S 99, 100 FROM DRIFT ON BEDROCK



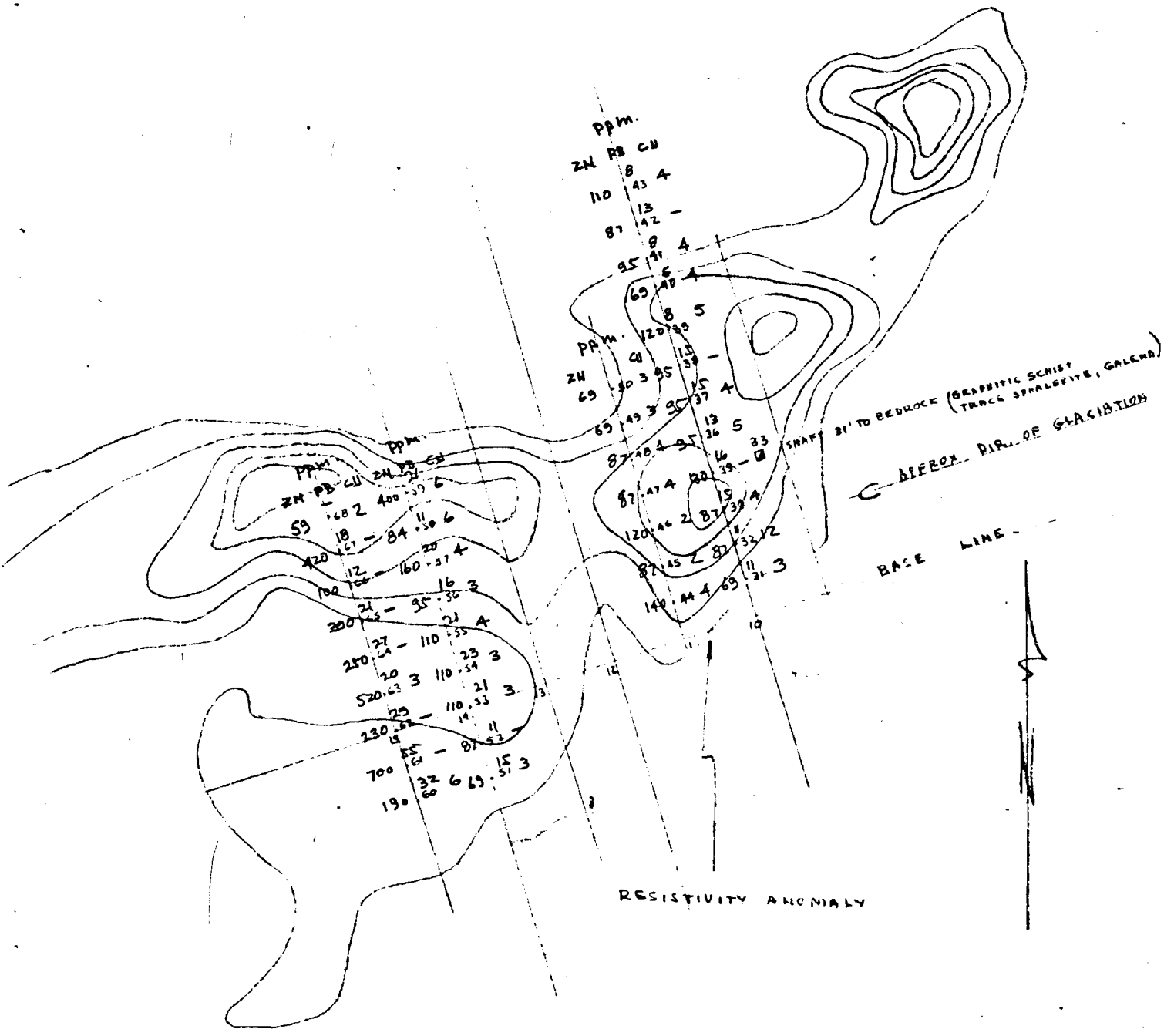
LOCATION OF
GEOCHEMICAL SAMPLES
LEO FRACTION
GALENA HILL, YUKON
AE AND JULY 13, 1960
1 IN = 100 FT.

ALL SAMPLES FROM SILT UNDER MUCK.
UNDERLAIN BY 30-50' TILL.



LOCATION OF
GEOCHEMICAL SAMPLES
LINES 12, 16, 17 & 18
LEO PROPERTY
GALENA HILL, YUKON
1 IN = 200 FT.
A E AHO JULY 13, 1960

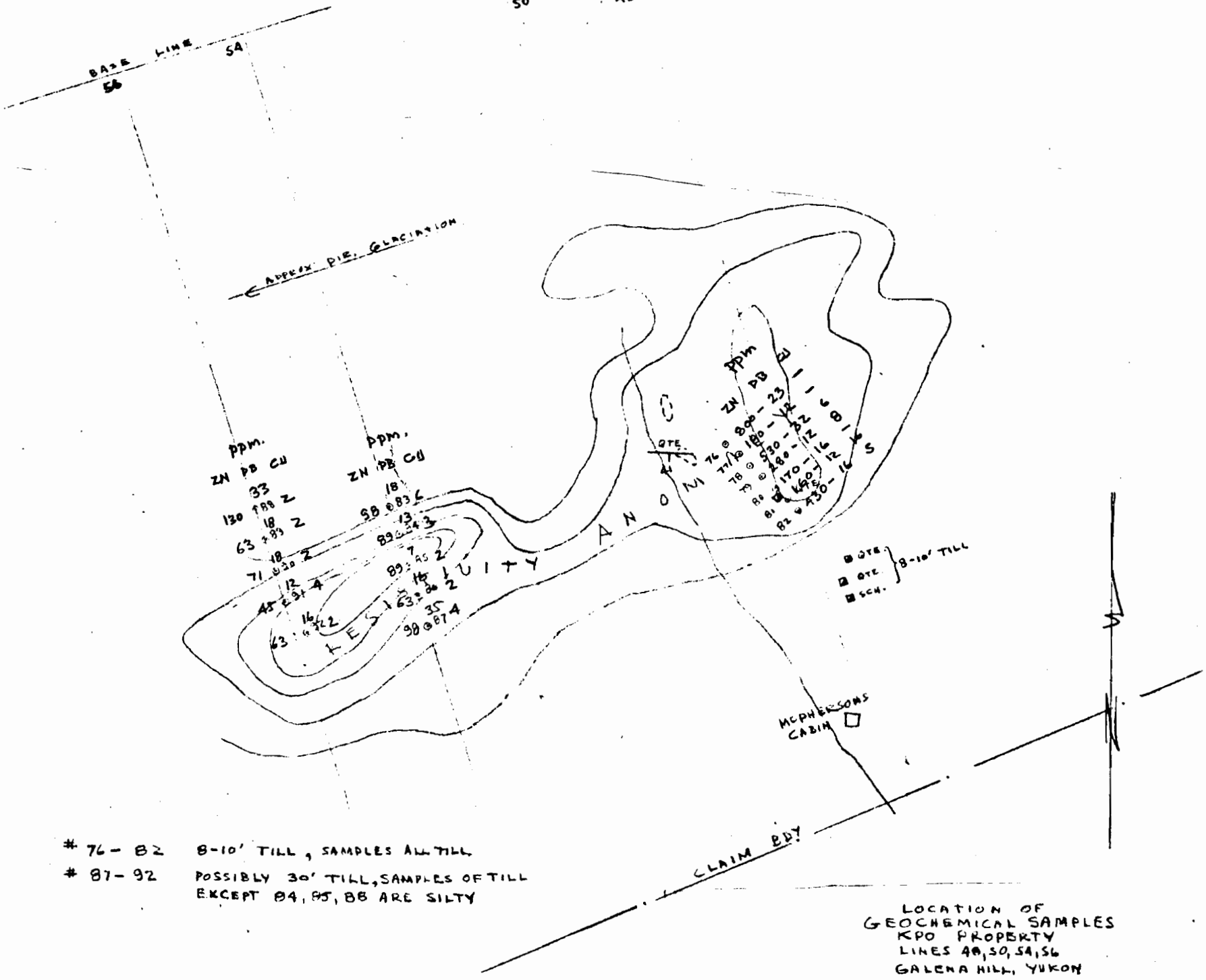
ALL SAMPLES FROM SILT UNDER MOSS
ALL UNDERLAIN BY CREEK FAN FEW FT ?
THICK, IN TURN UNDERLAIN BY TILL TO
DEPTHS UP TO 50-70 FEET



LOCATION OF
GEOCHEMICAL SAMPLES
KPO PROPERTY
GALENA HILL, YUKON
1 IN = 200 FT.
AE AND JULY 13, 1960

SAMPLES FROM SILT OR UNDERLYING TILL
UNDER 6" - 2' MUCK
#33 FROM TILL ON BEDROCK IN SHAFT

50 AB

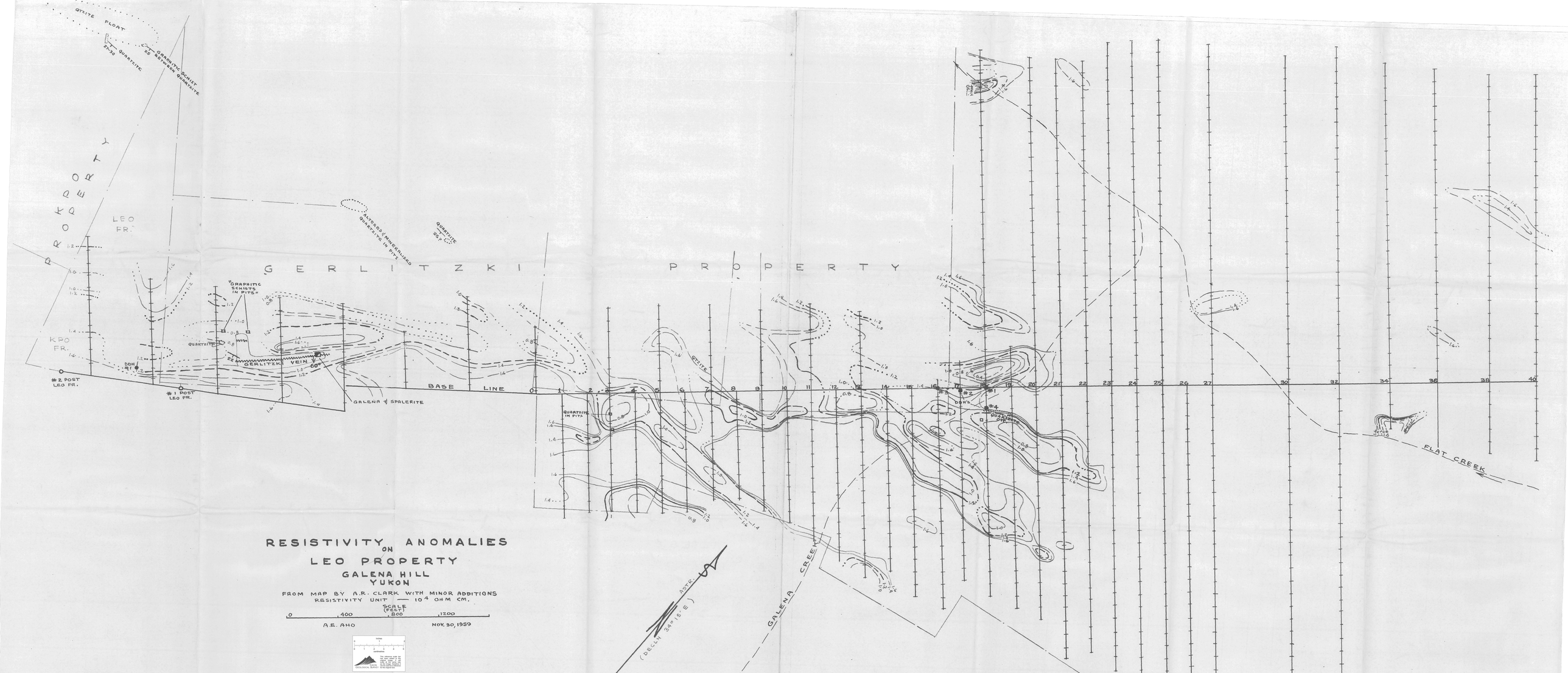


\# 76 – 82 8-10' TILL, SAMPLES ALL TILL

\# 87 – 92 POSSIBLY 30' TILL, SAMPLES OF TILL EXCEPT 84, 85, 88 ARE SILTY

LOCATION OF
GEOCHEMICAL SAMPLES
KPO PROPERTY
LINES 48, 50, 54, 56
GALENA HILL, YUKON
A.R. AHO JULY 13, 1960

1 IN = 200 FT



RESISTIVITY ANOMALIES ON LEO PROPERTY

GALENA HILL
YUKON

FROM MAP BY A.R. CLARK WITH MINOR ADDITIONS

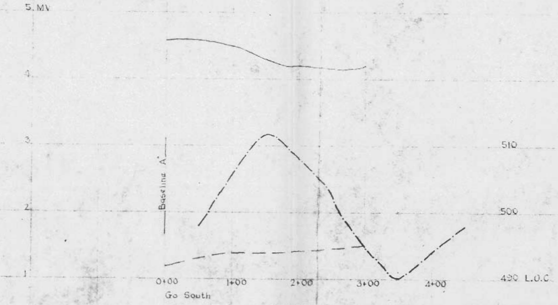
RESISTIVITY UNIT — 10^4 OHM CM.

SCALE (FEET)

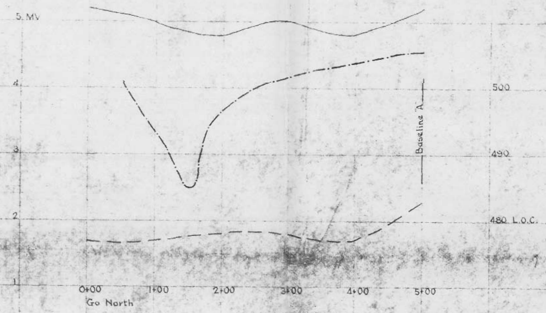
0 400 800 1200

A.E. AHO NOV. 30, 1959

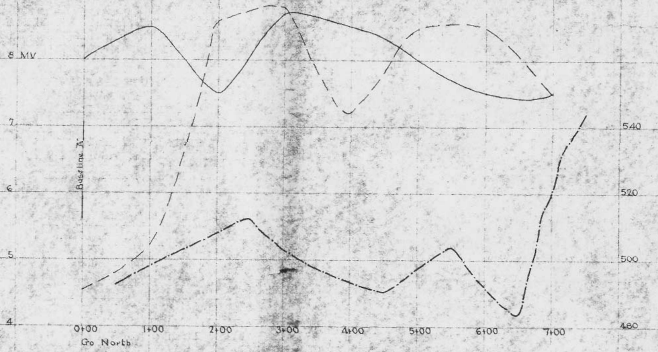
017622



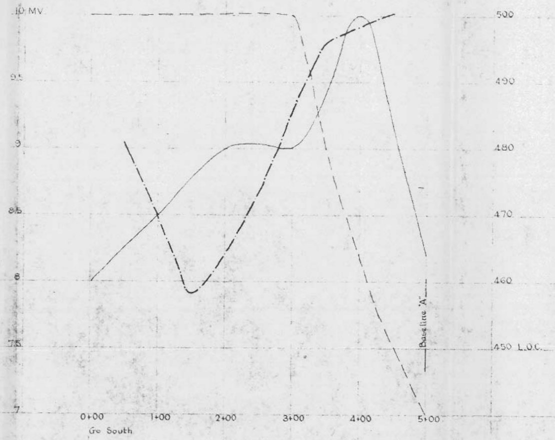
LINE 1+00



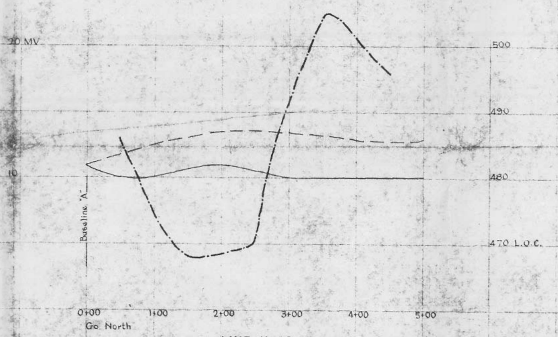
LINE 3+00



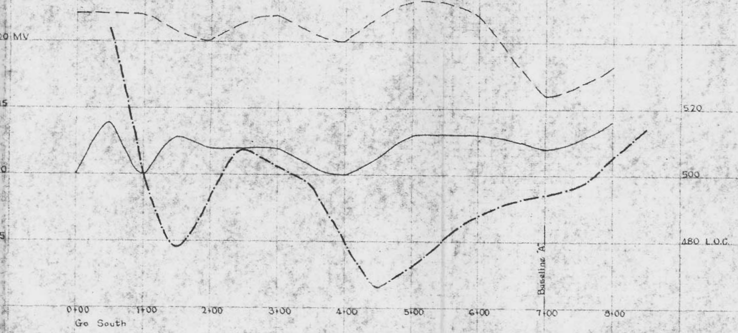
LINE 7+00



LINE 9+00



LINE 11+00

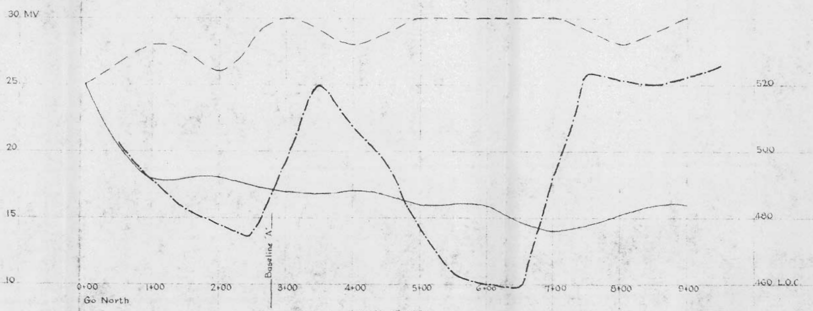


LINE 13+00

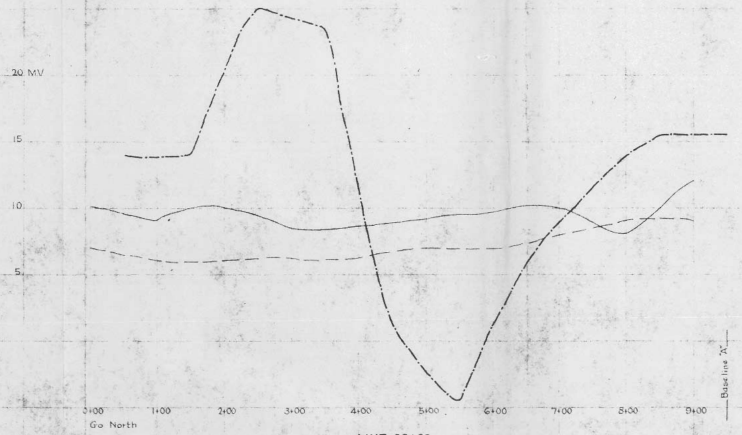
KEUFFEL & ESSER CO.
MADE IN U.S.A.

K+E STANDARD CROSS SECTION
10 X 10 TO THE INCH

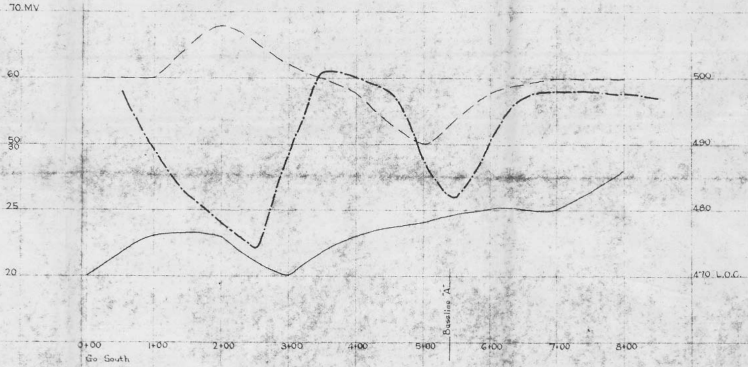
KEUFFEL & ESSER CO.
MADE IN U.S.A.



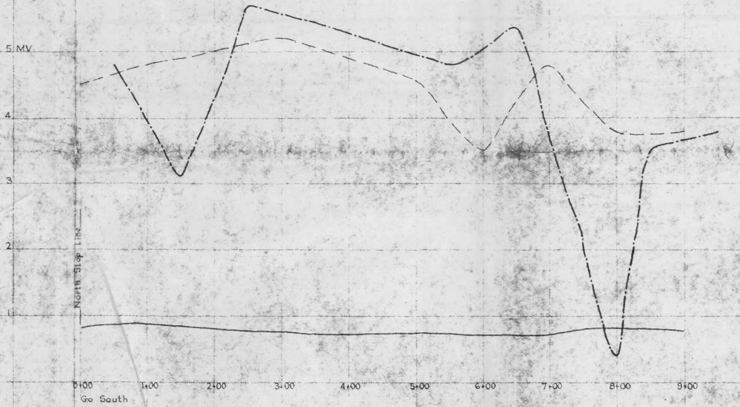
LINE 15+00



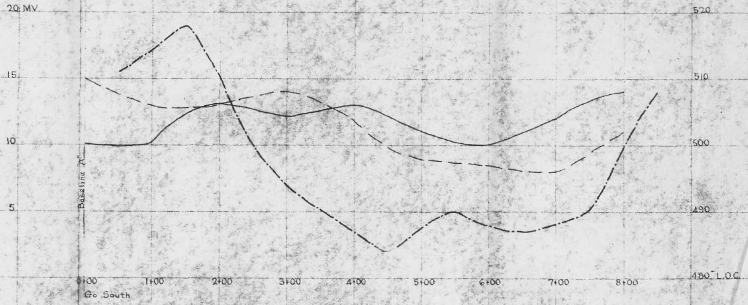
LINE 29+00



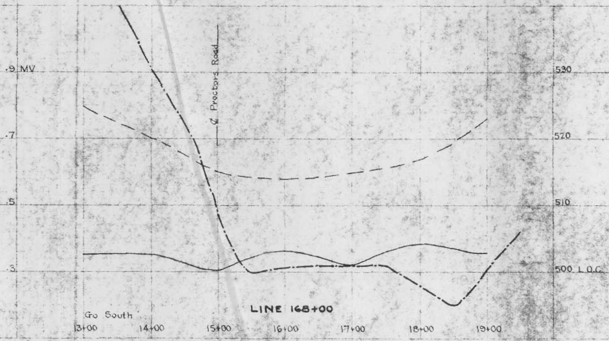
LINE 17+00



LINE 124+00



LINE 27+00

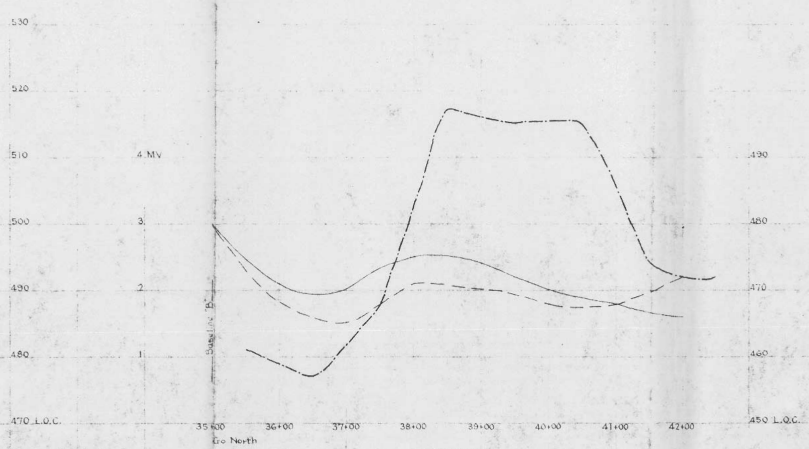


LINE 168+00

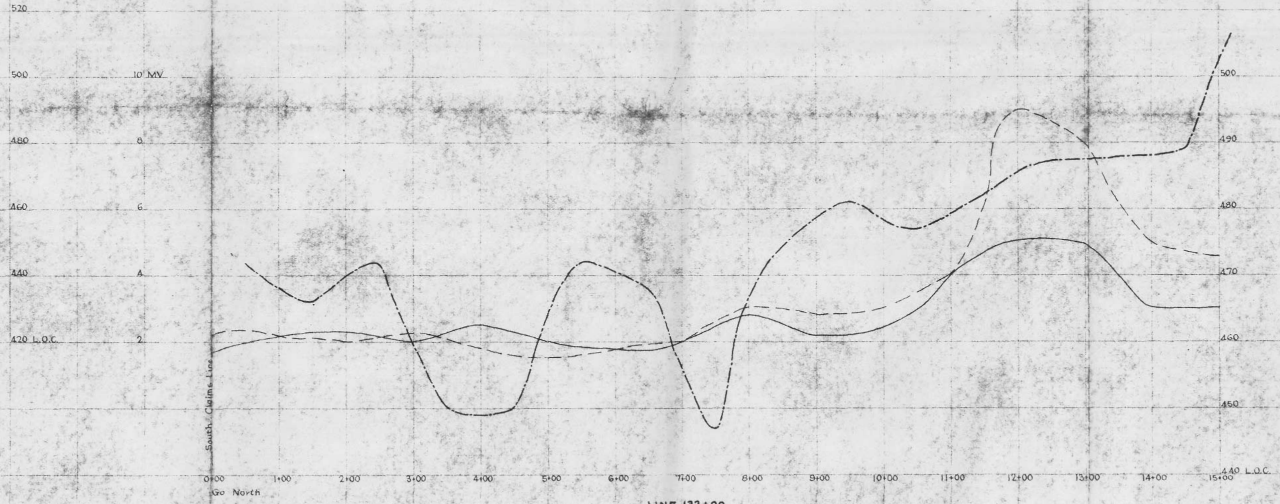
K+E STANDARD CROSS SECTION
10 X 10 TO THE INCH

KEUFFEL & ESSER CO.
MADE IN U.S.A.

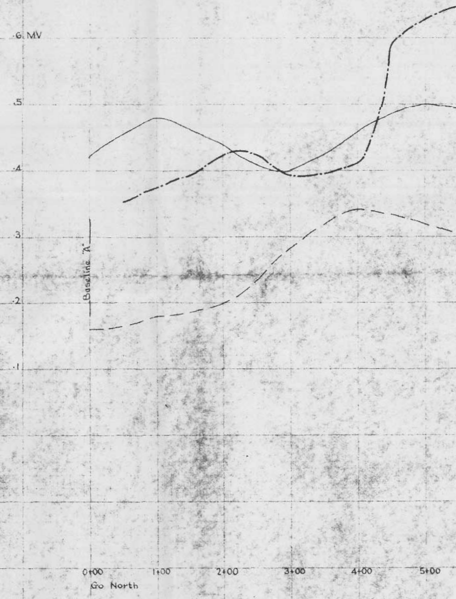
K+E STANDARD CROSS SECTION
10 X 10 TO THE INCH



LINE 132+00



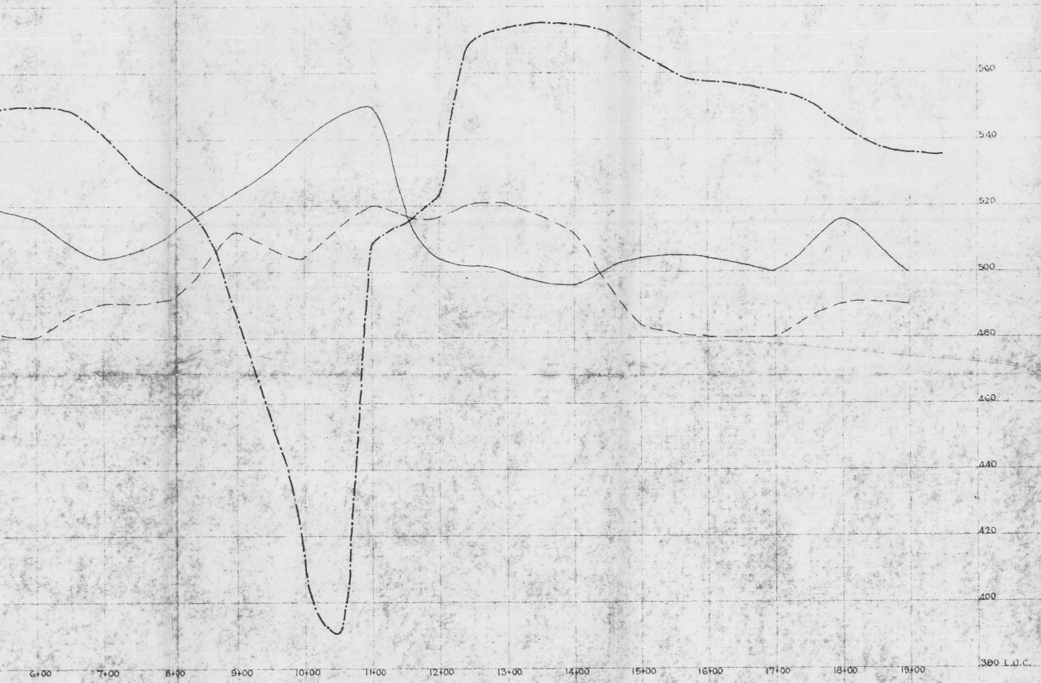
LINE 132+00



KEUFFEL & ESSER CO.
MADE IN U.S.A.

K&E STANDARD CROSS SECTION
TO THE INCH

KEUFFEL & ESSER CO.
MADE IN U.S.A.



LINE 2+00

NOTE:

Horizontal Componeht shown thus: ————

Vertical Component shown thus: — — —

Resistivity Component shown thus: —·—·—

ELECTROMAGNETIC & RESISTIVITY PROFILES
FOR
PETCAL COMPANY LIMITED
CALGARY ALBERTA
BY
GEOPHYSICAL ENGINEERING AND SURVEYS LIMITED
OF
K.P.O. CLAIMS AT GALENA HILL
MAYO MINING DIVISION
YUKON TERRITORY

Horizontal Scale 1 inch = 100 feet
E.M. Profiles in millivolts
Resistivity Profiles in log ohm cms

C.H. Smith

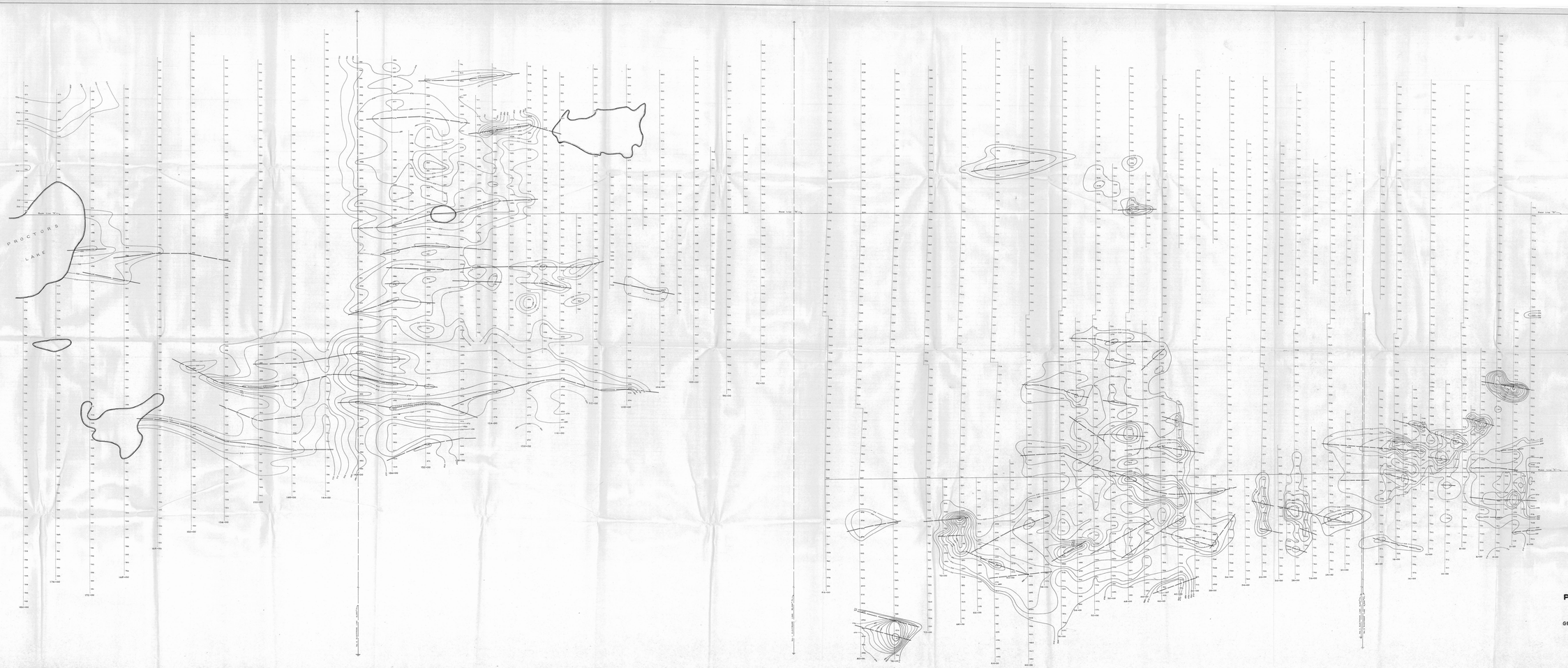
Nov. 1959

Ref. Dwg 1351

inches
0 1 2
0 1 2 3 4 5
centimetres
YUKON GEOLOGICAL SURVEY
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

017622

K+E STANDARD CROSS SECTION 10 X 10 TO THE INCH
KEUFFEL & ESSER CO. MADE IN U.S.A.
K+E STANDARD CROSS SECTION 10 X 10 TO THE INCH
KEUFFEL & ESSER CO. MADE IN U.S.A.



RESISTIVITY SURVEY

FOR

PETCAL COMPANY LIMITED

CALGARY ALBERTA

BY

GEOPHYSICAL ENGINEERING & SURVEYS LIMITED

OF

K.P.O. CLAIMS AT GALENA HILL

MAYO MINING DIVISION

YUKON TERRITORY

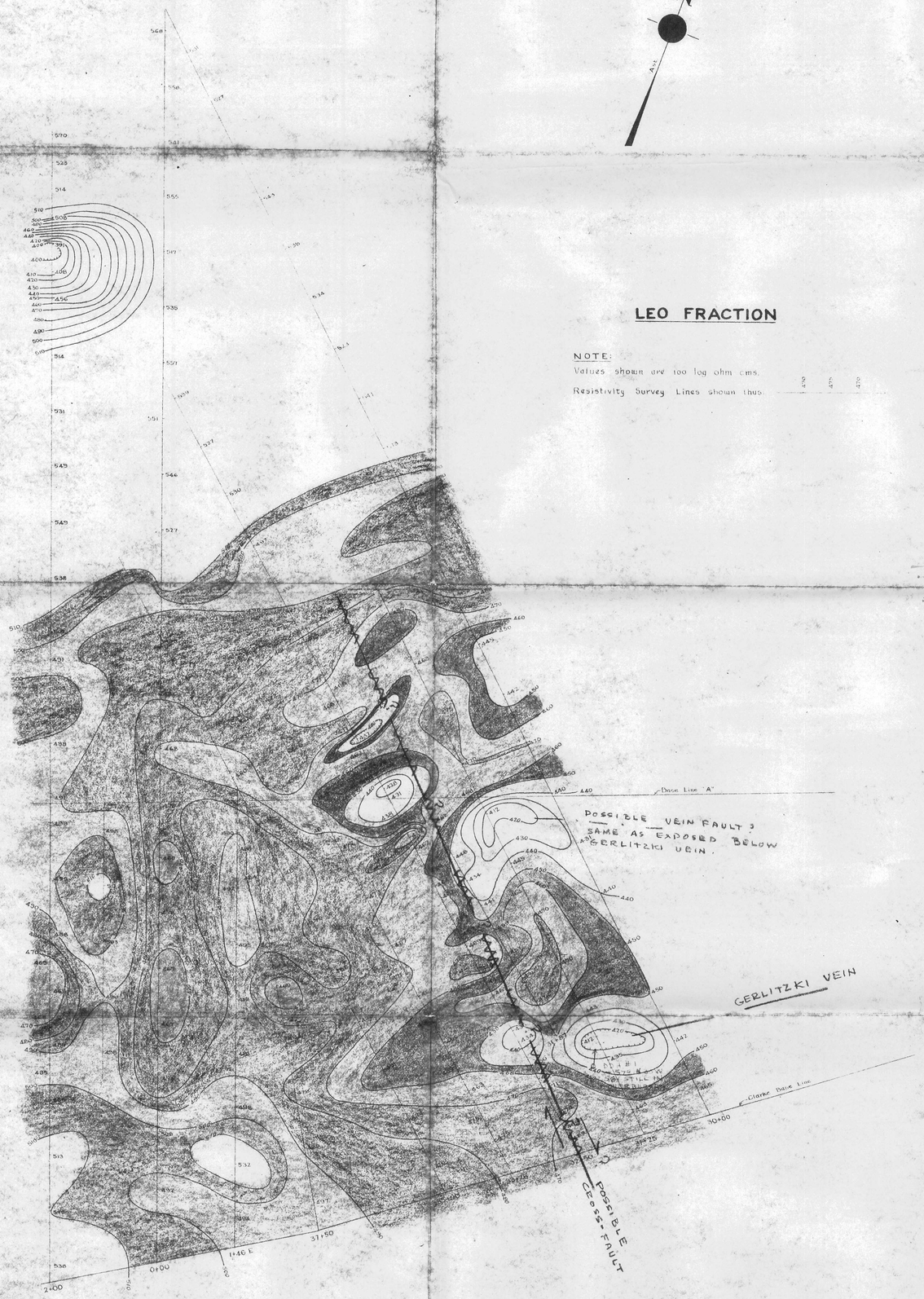
SCALE - 1 INCH = 200 FEET

Drawn: K.M.

Checked: J.R.

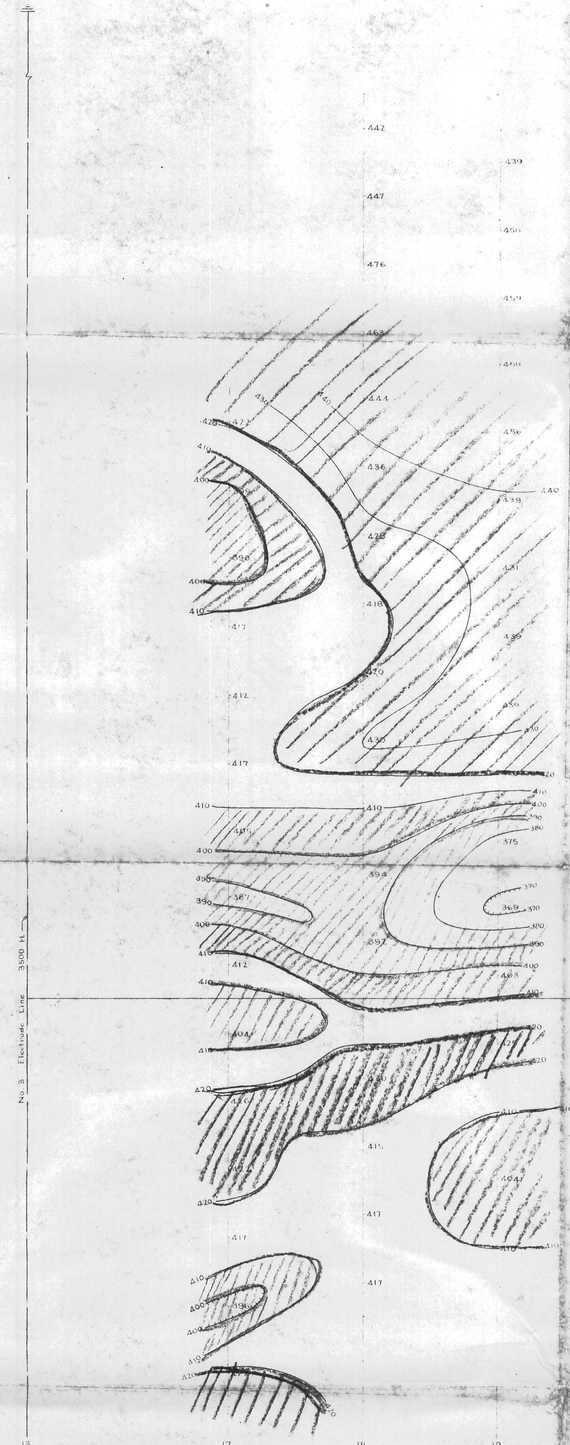
OCT. 1959

DWG. 1397



LEO FRACTION

NOTE:
Values shown are 100 log ohm cms.
Resistivity Survey Lines shown thus:



POLI OPTION

NOTE:
Values shown are 100 log ohm cms.
Resistivity Survey Lines shown thus:

RESISTIVITY SURVEY
FOR
PETCAL COMPANY LIMITED
CALGARY ALBERTA
BY
GEOPHYSICAL ENGINEERING & SURVEYS LIMITED
OF
LEO FRACTION &
POLI OPTION
MAYO MINING DIVISION
YUKON TERRITORY

SCALE 1 INCH = 100 FEET

This reference scale bar has been added to the original drawing. The scale, at the same ratio as the image, therefore is can be used as a reference for the original size.

Drawn: G.H.S.
Checked: J.B.
OCT 1959
DWG. 1399