

# 3238

## REPORT ON GEOLOGICAL, GEOCHEMICAL AND GEOPHYSICAL SURVEYS AND PHYSICAL WORK

done on the

EMPIRE METALS CORPORATION LTD. (N.P.L.) PROPERTY

Dokdaon Creek, B.C.  
Llard Mining Division

Under Option to and Work Done by or on Behalf of

SWISS ALUMINIUM MINING COMPANY OF CANADA LTD.

By

G. D. Ulrich, B.A.Sc.

Claims: DON GROUP  
Don 1 - 12 41896-41907  
Jon 1 - 4 254201M-254204M (tags)

DOK GROUP  
Pete 1 - 8 45455-45462  
Dok 1 - 4, 5-6, 13-16, 11074-11077, 39740-39741, 11086-11089  
17-20, 24, 60 39742-39745, 39747, 39746  
Thelma 66-81 39792-39807

Location: 22 miles south-southwest of Glenora  
Latitude  $57^{\circ} 32' N$  Longitude  $131^{\circ} 34' W$

Dates: May 31 - August 4, 1971

Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT

NO. 3238 MAP

August 4, 1971

Vancouver, B. C.

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## INTRODUCTION

The following report is based on field work carried out by Western Geological Services Ltd. for Swiss Aluminium Mining Company of Canada Ltd. during the 1971 field season. The work was completed on a 56 claim group in the Dokdaon Creek Area of the Stikine River System owned by Empire Metals Corporation Ltd. (N.P.L.) and presently held under option by Swiss Aluminium Mining Company of Canada.

The initial part of the 1971 programme consisted of cutting a line grid to cover the main area of interest on the property.

The second part of the programme consisted of a ground magnetometer survey and a geo-chemical soil survey. The object of the magnetometer survey was to pick up possible altered zones or geological features and the soil survey to find any anomalous copper, lead or molybdenum values that could be related to bedrock mineralization.

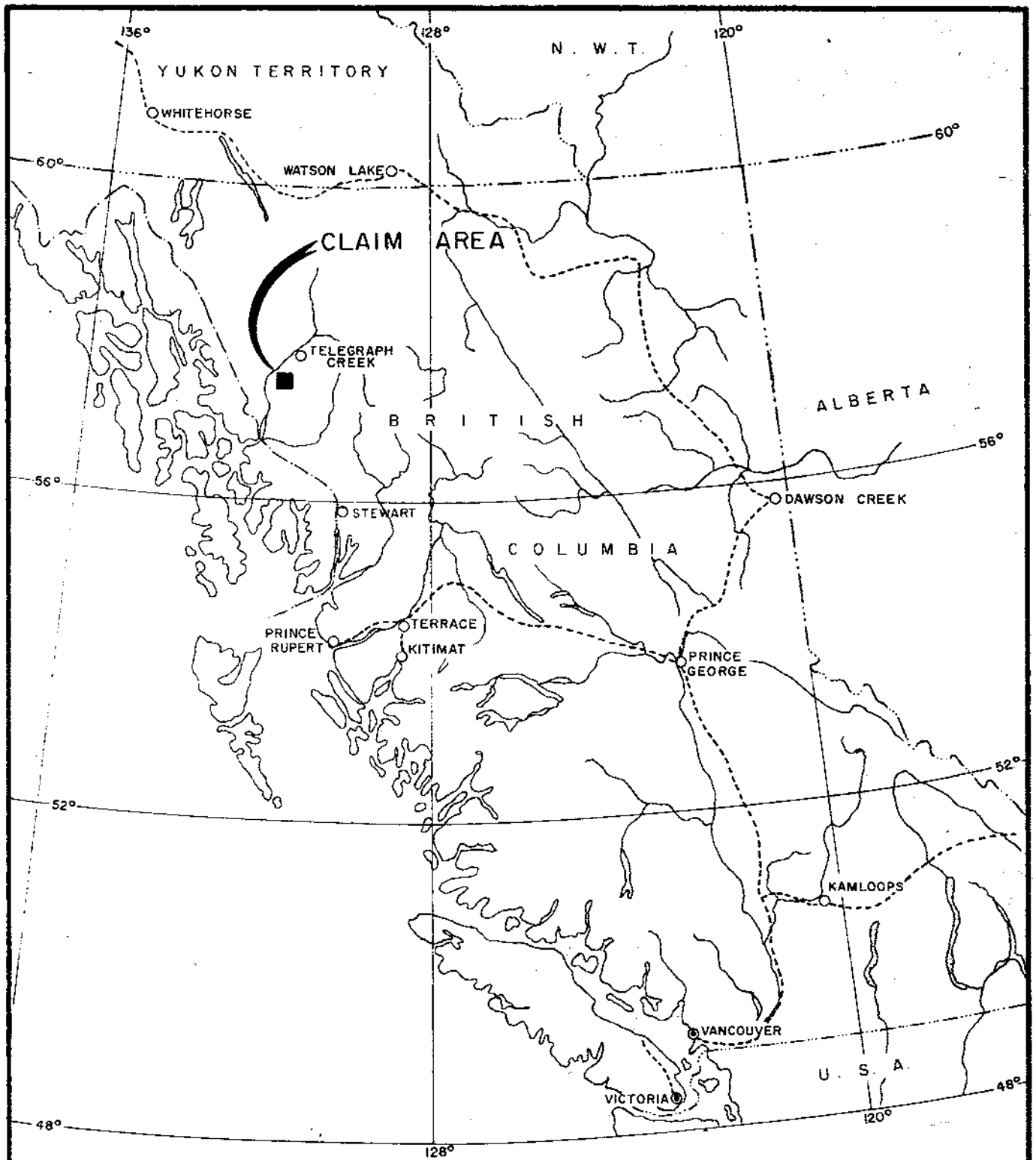
The third part of the programme consisted of detailed geological mapping of the grid area with emphasis on alteration and structures. Geological mapping was then extended beyond the grid to the outer claim boundary.

The fourth part of the programme consisted of detailed follow-up to the initial surveys. The physical work consisted of: hand trenching, drilling and blasting, detailed rock sampling and some further detailed soil sampling.

The programme on behalf of Swiss Aluminium Mining Company of Canada Ltd. was directed by T.J. Adamson of Swiss Aluminium and supervised by W. Meyer and J. Buchholz of Western Geological Services Ltd. Field mapping and field supervision of all surveys was carried out by the writer of Western Geological Services Ltd.

## LOCATION AND ACCESS

Swiss Aluminium Mining Co. of Canada Ltd. holds under option 56 contiguous mineral claims in the Dokdaon Creek area of the Stikine River System of North Western British Columbia. The group covers an area of approximately three square miles between Dokdaon Creek and Strata Creek to the Lard Mining Division centered around Lat.  $57^{\circ}32'$  N, Long.  $131^{\circ}34'$  W.



EMPIRE METALS CORPORATION LTD.

DOK AND DON GROUPS

**CLAIM LOCATION MAP**

57°-32' N 131°-34' W

LIARD MINING DIVISION

*S.D. 2.1.1*

FIGURE 1

The closest point of road access to the property is Glenora which is 22 air miles to the NNE. The claim area is easily accessible by helicopter. Three safe landing spots exist: 1) the camp area on the gravel flats of Dokdaon. 2) a hand built helicopter pad on the property 1,500 vertical feet above Dokdaon Creek. 3) the mountain ridge between Dokdaon Creek and Strata Creek. A trail was cut from the camp to the grid area giving easy access to the entire property from the camp by foot.

Airstrips in this area are located at the Scud River (20 miles from the property), Schaft Creek (28 miles from the property), and Telegraph Creek (30 miles from the property). Fixed wing aircraft equipped with floats can land on Yehiniko Lake, 13 miles from the property.

### CLAIMS

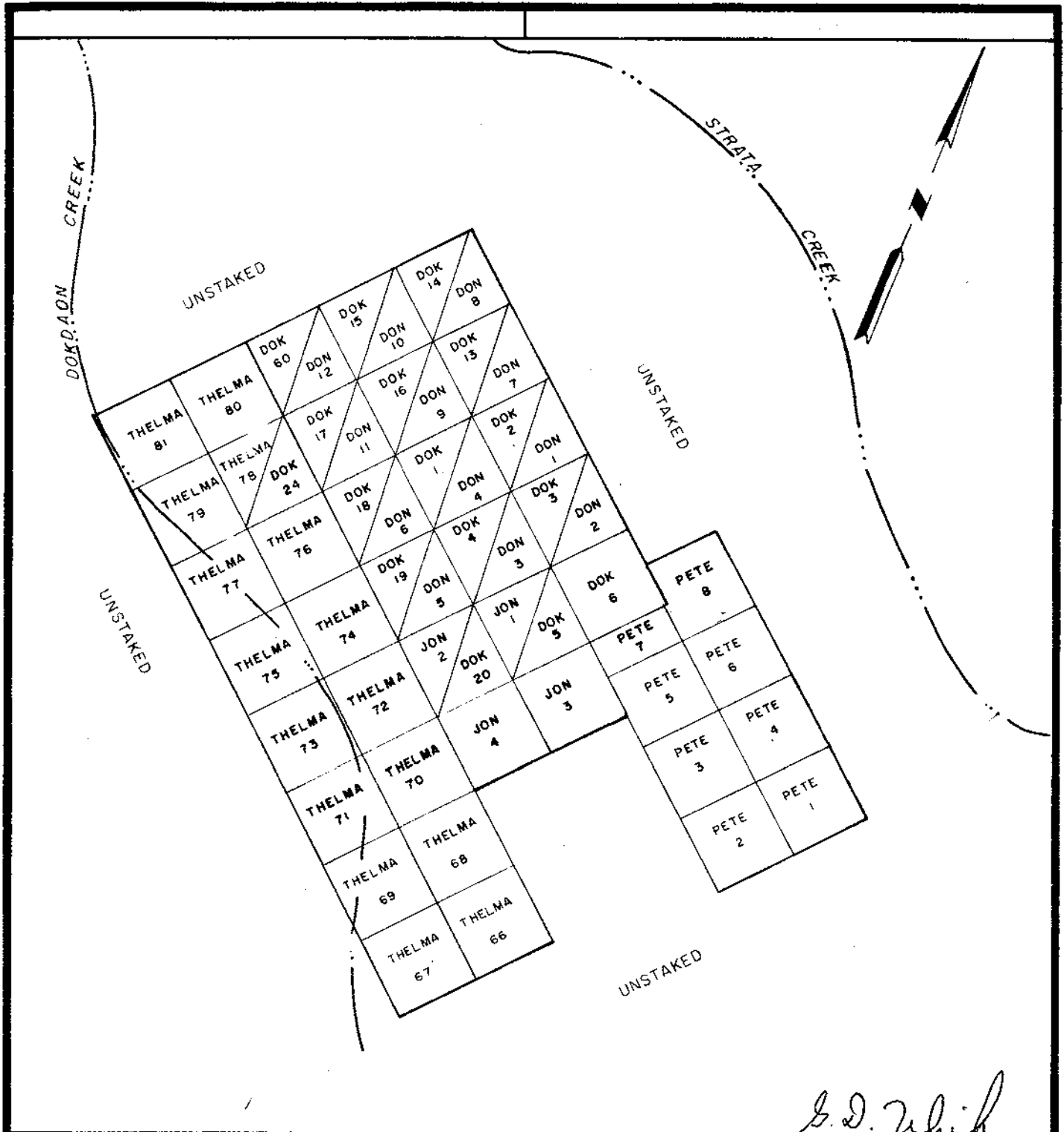
A complete list of the 52 claims on which work is being applied is tabulated in Appendix I attached to this report. The following is a summary of the groups:

<u>Group</u>	<u>Ownership</u>	<u>Mining Division</u>	<u>No. of Claims</u>
Dok	Optioned to Swiss Aluminium Mining Co. of Canada Ltd. by Empire Metals Corporation Ltd.	Liard	40
Don	Optioned to Swiss Aluminium Co. of Canada Ltd. by Empire Metals Corporation Ltd.	Liard	16

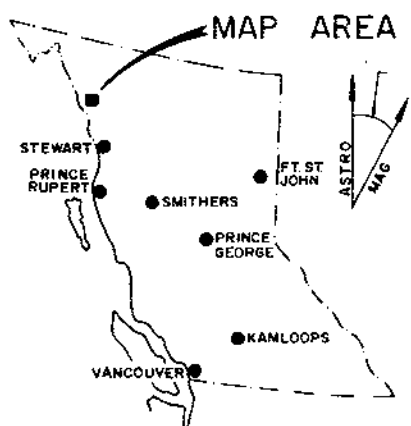
### GEOLOGY

#### General Statement

The property has approximately 15% outcrop which is restricted to bluffs below the ridge top. Poorly exposed rock exists further down slope. Some good rock exposure was found on the property along Dokdaon Creek.



*B.D. White*

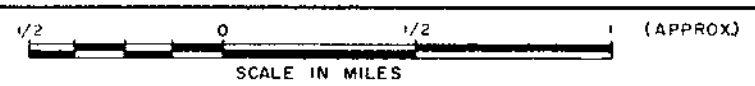


BRITISH COLUMBIA

EMPIRE METALS CORPORATION LTD.

**MINERAL CLAIM MAP**

DOKDAON CREEK, B.C.  
LIARD MINING DIVISION



SCALE: 1" = 1/2 MILE

DATE: JULY, 1971

FIG. 2

The property is underlain mainly by Permian (or Triassic ?) rocks which are andesitic and basaltic volcanic rocks (flows, breccias, and tuff) with minor interbedded sediments (siltstone, mudstone, limestone, conglomerate and breccia).

Large masses of Coast Range granodiorite and quartz monzonite (Jurassic ?) intrude these volcanics within two miles of the property. Tabular bodies of syenite and rhyolite occur on the property intruding the volcanics. These rocks are younger than the main Coast Range crystalline complex since they do intrude the large granodiorite mass near the property. The age of the syenite and rhyolite is either Cretaceous or Tertiary. Younger dykes of andesite or latite also occur on the property.

The general effects on the intermediate and basic volcanics after being fractured and intruded by young acidic rocks are metamorphism, alteration and sulphide mineralization. Hornfels and metadiorite are common on the property. High temperature alteration minerals such as biotite, potassium feldspar, sodium feldspar, and magnetite occur on the property. Lower grade minerals such as chlorite and epidote are widespread outside the high grade zones. Pyrite is a common mineral, but it is sparse on the property. Chalcopyrite is associated with high grade alteration along structures and is found in some dykes of syenite. Heavy pyrite does not accompany copper mineralization on the surface.

A geological map of the property on a scale of 1" = 400' was prepared (Fig. 3). The main showings were mapped on a scale of 1" = 100' (Fig. 4).

## Lithology

### Permian and/or Triassic

A sequence of volcanics and interbedded sediments of Permian or Triassic age underlies most of the property. A description of the rock types in this formation is given below. A volcanic section is described later in the report under "Stratigraphy".

#### 1. Andesitic and Basaltic Volcanics

The unit consists mainly of andesitic and basaltic volcanic rocks (flows, breccias, and tuffs with some interbedded sediments). This map unit groups all rock types found in the

formation. Most of the rocks are massive andesitic flows which vary in grain size from aphanitic to coarse grained. Much of the area has undergone contact metamorphism and hydrothermal alteration concealing the original nature of the rocks.

Two main types of andesite or basalt predominate in the relatively unaltered rock. The first type is a fine to medium grained, greenish-gray rock with about 60% plagioclase, and mafics of hornblende and pyroxene. When viewed with a hand lens, the volcanics are generally crystalline although, in a few instances, definitely fragmental material can be seen, and the rocks are properly called tuff or breccia.

The alteration of the rock was mapped in note form (Figs. 3 and 4) and is described later in the report under "Alteration".

Other units mapped, but considered to be part of the volcanic formation are described below.

#### 1 a. Green Tuff

A single bed of fine grained, soft, light green rock occurs in Dokdaon Creek on the downstream side of the property. It is a distinct unit which dips very shallowly underneath the volcanics above it (Fig. 3). No actual fragmental material was seen, but the bedded fabric and the soft chloritic mineralogy could have originated from very fine pyroclastic material.

#### 1 b. Interbedded Sedimentary Rocks

Some sediments were found interbedded with the volcanics on the property. They consist of tuff, siltstone, mudstone, limestone, conglomerate and breccia. These were mapped as a single unit and differentiated in notes on the map. (Fig. 3). The most predominant rocks in this unit are massive fine grained, greenish-gray siltstone and mudstone. Some of the beds are likely tuffs. The limestone found was always a dirty gray rock with a lot of very coarse grained recrystallized calcite. Breccia and interformational conglomerate were found interbedded with the finer grained sediments. They are, in general, of a similar composition to the siltstone.



### 1 c. Diorite

Areas of coarse grained pyroxene and hornblende rich rock occur in the volcanics. Large pyroxene phenocrysts up to  $\frac{1}{2}$  inch across often make up to 50% of the rock. Dark feldspars are common and they make up at least 30% of the "diorite". These rocks contain approximately the same amount of magnetite as the fine grained volcanics.

The coarse grained "diorite" is definitely part of the volcanic formation. The diorite zones could be primary coarse grained areas within the volcanics or they could be metamorphosed volcanics which have lost their original fine grained textures. Rock which was a fine grained or porphyritic andesite or basalt could have been metamorphosed to create a coarser grained diorite or gabbro.

## Jurassic

### 2. Coast Range Intrusive

Large masses of Coast Range intrusive occur within two miles of the property. These rocks are, in general, coarse grained hypidiomorphic granular granitic material. Their mineralogy is 10 - 20% quartz, 20% mafics (biotite and hornblende), 0 - 15% potassium feldspar, approximately 50% plagioclase and 3 - 5% magnetite. Most of this rock is very fresh with little alteration.

## Cretaceous or Tertiary

### 3. Rhyolite

Tabular bodies of rhyolite cut across the property, striking  $160^{\circ}$ . These are believed to be sills which follow the bedding of the volcanics. The same rock, with a similar attitude was found cutting the Coast Range Intrusive two miles to the southeast. Hence, the rhyolite is younger than the Permian volcanics although it appears to be interbedded with them.

The rhyolite is, in general, a fine grained white, feldspar rich rock which has visible quartz phenocrysts. The quartz is often scarce or unidentifiable. Some of the rhyolite

is aphanitic and has a marked fissility like a siliceous shale. Where the rock is coarser grained it has a sugary texture with very poorly formed equigranular feldspar phenocrysts. The rhyolite contains usually less than 3% mafics, and no more than 10%. The mafic is usually biotite and it is commonly leached out.

#### 4. Syenite

Many small dykes of syenitic material occur on the property. They appear to cut the rhyolite in two places. The dykes are, in general, from 5 to 25 feet wide and vary greatly in texture and mineralogy. The syenites appear to follow one general structural trend which strikes between N 10 W and N 10 E. A single dyke is usually mineralogically consistent although in some cases zoning occurs. Some dykes have pegmatitic cores.

All the syenite dykes are characterized by the absence of quartz, a low percentage of mafics, and a very high content of potassium feldspar. They are well described as pink dykes.

The syenites can be subdivided into three classifications: pegmatitic, porphyritic and fine grained.

The pegmatic form is composed of almost exclusively potassium feldspar with some plagioclase. It is coarse grained with crudely shaped feldspars two inches or more long.

The most common sort of syenite is the porphyritic form. This form is composed of a fine grained pink to gray groundmass with large feldspar phenocrysts 1" - 4" long, which make up a good 40 - 50% of the rock. Many dykes have feldspars with a well formed trachytoid texture parallel to the contacts. The feldspars are usually a potassium variety. Plagioclase occurs in these rocks but it is not an important mineral. The potassium feldspar phenocrysts are usually all pink. This rock type commonly contains up to 10% mafics but usually less than 5%. The

maffics are biotite or a green amphibole.

The third type of syenite is best described as a fine grained pink rock. It is very difficult to identify at times. The volcanic formation, if it has heavy potassium feldspar alteration, may easily be mistaken for a type of syenite. The altered volcanics and fine grained syenite may be distinguished by using the criteria that the intrusive should have more euhedral feldspars than the volcanics, and that the volcanics should contain more mafic material than the syenite.

A possible large body of intrusive underlying part of the grid may account for the unusually high density of syenite dykes on the property. The density of dykes drops off greatly at the grid boundaries. A large magnetic low on the property may be interpreted as such a body. (See "Magnetometer Survey - Results"). The outline of the low has been plotted on the geology and shown as a pluton underlying the property (Fig. 3).

#### 5. Porphyritic Dykes - Andesite and Latite

Some minor dykes occur on the property and, to a greater extent, off the property. These are porphyritic andesite or latite. They have a fine grained soft gray groundmass and subhedral plagioclase phenocrysts which make up 40% of the rock. They are distinctive from other young volcanic dykes and they appear to be younger than the fine grained andesite described below.

#### 6. Fine Grained Andesite Dykes

Fine grained, andesitic dykes occur off the property near the large intrusive body to the southeast. They do not occur on the property. These are the youngest rocks in the area. They cut all joints, all other rock types, follow faults and postdate all alteration and mineralization.

They consist of green to gray, fine grained and soft fresh andesitic material. They occasionally have up to 25% plagioclase phenocrysts. They form tabular bodies a few inches to 30 feet across.

### Stratigraphy

The Permian and/or Triassic volcanics have very indistinct bedding in most places. Due to the age of the formation and the great amount of intrusive activity in the area only a generalized section is possible. The formation strikes approximately  $160^{\circ}$  and dips to the North East.

A section taken from lower Dokdaon Creek to the Pete 5, 6, 7, 8 claim post on the ridge is approximately 7,000 feet thick and can be generalized from bottom to top as follows:

	<u>Unit</u>	<u>Thickness</u>
1a	- green chloritic tuff	500'
1, 1c	- porphyritic andesite with some fine grained andesite and diorite	3, 000'
1 3	- altered andesite with rhyolite sills	2, 000'
1, 1b	- fine to medium grained andesite with inter-bedded sediments and some diorite	1, 500'

### Structure

#### Contacts

Contacts between the intrusive syenite dykes and the volcanic formation are abrupt. The dykes generally do not have a chilled margin, but the volcanics are commonly altered and metamorphosed near the syenite contacts. Hornfels is common in a syenite dyke area.

The rhyolite-volcanic contacts are abrupt and show no evidence as to the origin of the rhyolite. Similarly, all other dykes contacts are abrupt.

#### Joints

Three important joint sets occur on the property. Two are related to syenite dyke intrusion and mineralization, and one to faulting. The joints related to mineralization are likely conjugate. Their attitudes are approximately  $160/90$  and  $090/90$ .

The 160/90 planes control most of the intrusion of syenite while the volcanic bedding controls the intrusion of the rhyolite. Copper mineralization and biotite alteration are directly related to this structure in the 3+00N - 0+00E area, the 4+00N - 10+00N area, and the 3+00S - 1+00E area. The 090/90 planes to a lesser extent control the syenitic intrusions. In the 1+00S - 7+00W area they control the biotite alteration and copper mineralization. (Fig. 4).

The third set of joints is approximately 050/90 and appears to be related to late faulting.

#### Faults

The only faults discovered on the property apparently postdate the rhyolite and syenite intrusions. One fault crosses line 16+00N at 16+00 East and trends 045° up the hill. This structure has created minor right hand fault movement and it has distorted greatly a rhyolite sill, causing drag folds in it. This fault shows up well in the magnetometer survey as a negative anomaly and is characterized by a gulley. Past the end of 16+00N to the East is an area of faulting at the same attitude of approximately 050°. This area is characterized by strong parallel jointing and a minor conjugate fault at approximately 075°.

Mineralization is seen in the vicinity of the faults, but cannot be directly related to the structures.

#### Folding

As mentioned above under 'Faults', drag folds occur in the rhyolite near the fault that crosses 16+00N - 16+00E. There is a syncline plunging steeply towards the East at 12+00N - 14+00E.

The only other folding is the apparent warping of part of the volcanic formation. In the grid area the formation has an attitude of 160/65NE and over the hill directly North of the grid area the attitude is 010/35SW.

## Alteration

Hydrothermal alteration varies from a very high grade biotite-feldspar alteration to a low grade chlorite-epidote type. The alteration minerals and associations are discussed below.

### 1. Biotite

Biotite occurs in every main showing area (see section, "Mineralization" below) and is closely associated with the copper. It is coarse grained forming very large books. In the main showing area at 3+00N - 0+00 it appears to be controlled by more than one joint set. Large masses up to six inches square of biotite have formed here and are not drawn out on any structure. In other showing areas the biotite is formed along fractures that control sulphide mineralization.

### 2. Feldspar

White feldspathization of the volcanics is common and it usually accompanies the biotite alteration in the showing areas. The fine grained feldspar conceals the original fabric of the rock. Some of the hornfels areas are completely feldspathized to form a white flinty rock. The volcanics and sediments in the pyrite zone to the East of the grid are white, due to the secondary feldspar.

Pink feldspathization occurs near some fine grained syenite dykes especially in the 8+00N - 10+00E area. Here the intrusive is contaminated somewhat by the volcanics and the volcanics are shot through with pink feldspar. Pink feldspar (K-spar) is all through the volcanics on the property in minor quantities.

### 3. Calcite

Calcite occurs in stringers in the volcanics. In the mineralized areas it is strong and in some cases actually carries the mineralization. It occurs in at least trace amounts throughout the volcanics.

#### 4. Chlorite and Epidote

Chlorite and epidote are not seen in the areas of high grade alteration but occur in most of the volcanics outside this. The chlorite is weak and the epidote is mostly along fractures. This alteration is characteristic of the entire formation of volcanics.

#### Mineralization

##### 1. Pyrite

Pyrite occurs outside the zones of strong alteration and copper mineralization in small quantities. Strong pyrite mineralization occurs in the zone East of the grid, mostly along fractures where it makes up about 10% of the rock. It has a background of less than 1% of the volcanics. In some areas, such as the volcanics at the West end of the grid, the level of pyrite is about 3%.

##### 2. Copper

Copper sulphide mineralization is common throughout the entire area. Chalcopyrite occurs in the volcanics along fractures or as disseminations from fractures. These occurrences are generally close to syenite dykes and are contact controlled. The syenite does not usually carry the best mineralization in these minor occurrences. The characteristic biotite alteration and white or pink feldspathization accompany most of the copper occurrences (Fig. 3). Copper carbonates occur with chalcopyrite in most of the surface exposures.

The three main showing areas are described below. A map on a scale of 1" = 100' using a chain and compass was made of the geology and trenches here (Fig. 4). Assay results are discussed under "Trenching and Sampling - Results" (Fig. 12).

##### a) 3+00N - 0+00 Area

This is the main showing on the property. Sulphide mineralization occurs primarily as chalcopyrite with minor pyrite. The mineralization is partly on fractures and

partly disseminated. The controlling fractures trend approximately 160/90. Alteration minerals are white feldspar and biotite. The volcanics are altered to hornfels where intruded by syenite dykes. Mineralization occurs throughout all rock types or along the trail for about 250 feet west from the baseline.

b) 1+00S - 7+00W Area

Chalcopyrite occurs as the main mineral. A hornfelsic rock with a foliation of 050/90 is cut by a syenitic dyke approximately 3 feet wide. The mineralization occurs in disseminations through the hornfels. Biotite alteration forms only on fractures which trend approximately 100/90 (second major joint set). The mineralization occurs in an area approximately 100 foot square and may extend to showing "a".

c) 4+00N - 10+00W Area

A showing occurs in this general area where some good mineralization is in the intrusive. Spotty chalcopyrite may be seen along fractures in the volcanics. The mineralogy of the sulphides is chalcopyrite and minor bornite. The bornite accounts for the one high value of 0.88% Cu. near 3+00N - 10+00W (Fig. 11). The intrusive dykes are narrow and the showings are small. A very small amount of biotite was found here although the volcanics were well fractured and definitely somewhat hornfelsic.

3. Lead

Massive galena float was found on the property in pits below the large lead soil anomaly (Fig. 6). There is likely some lead mineralization below surface near 10+00N - 7+00W, although outcrop in this area contains no visible lead (See 'Geochemical Soil Survey' and 'Trenching and Sampling').

GEOCHEMICAL SURVEY

General

The geochemical survey was carried out by J. Gajda and W. Larsen. Samples were taken at 100 foot intervals along the lines spaced 400 feet apart. They were collected below the humus using a grubhoe. A total of 467 samples were taken. The samples were collected in 3½" x 6" envelopes and marked with the coordinates of the sample location.



They were shipped to Crest Laboratories in Vancouver for analysis. All samples were run for copper, lead and molybdenum.

The analytical procedure involved taking a sample of minus 80 mesh material, digesting it in nitric acid and perchloric acid for three hours. The copper and lead values were then obtained by atomic absorption and the molybdenum by the colorimetric method. All values were recorded in parts per million.

Figures 5, 6, and 7, drawn on a scale of 1" = 400' are plots of the results. Figure 8 is a histogram analysis of the results.

### Survey Results

#### 1. Copper

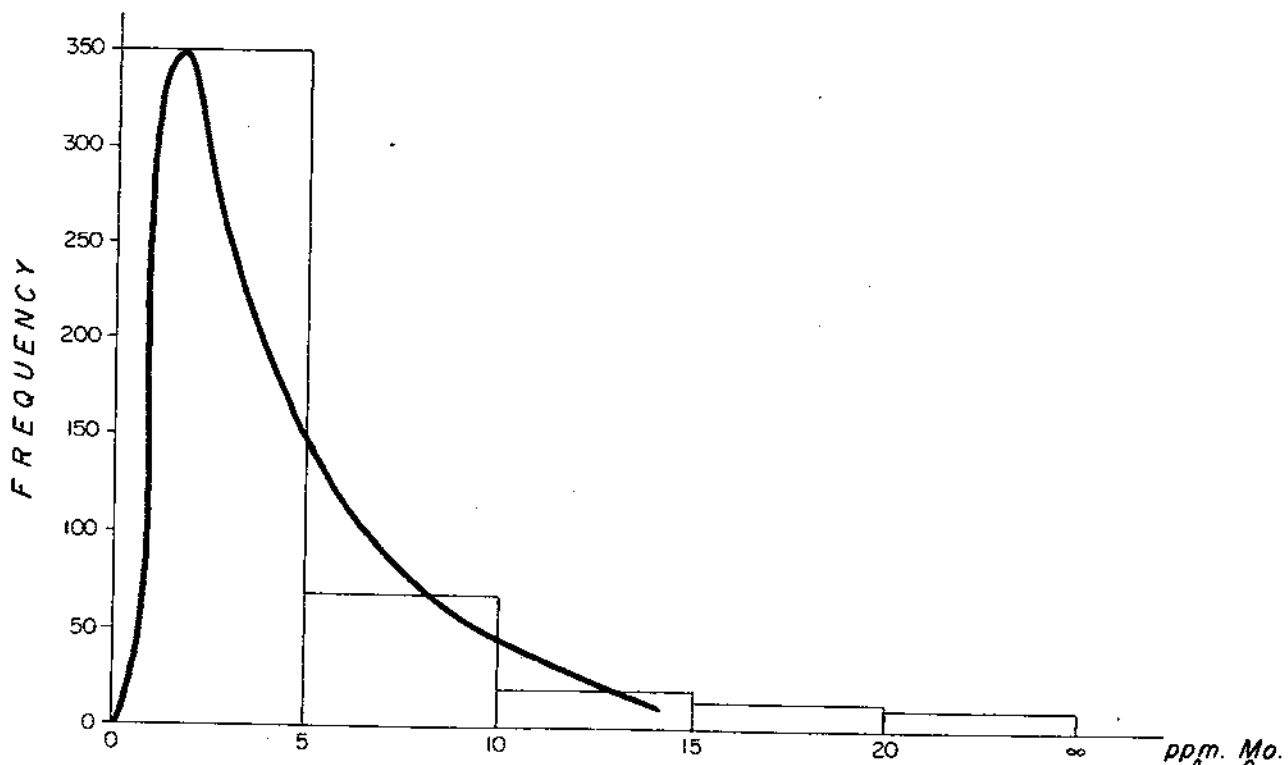
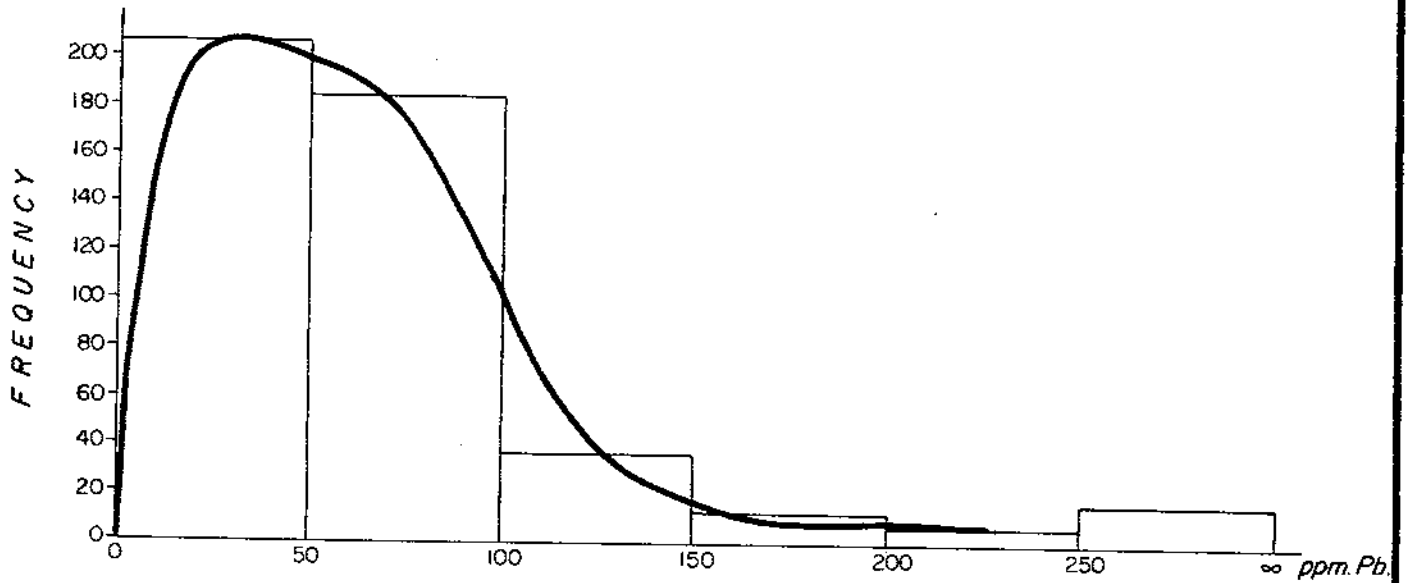
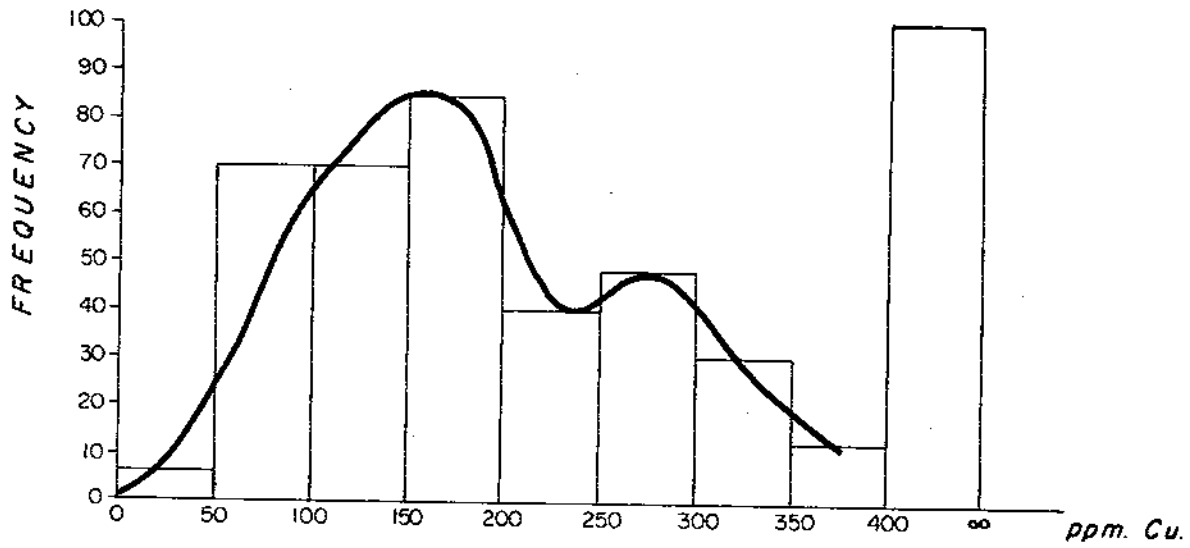
The statistical analysis of the 467 copper determinations indicates two populations with backgrounds of 200 ppm and 300 ppm. Both these populations have unusually high backgrounds. Values over 250 ppm were considered significantly anomalous. Over 20% of the total population were over 400 ppm.

The first peak at 150 ppm represents the largest population which lies outside the 250 ppm contour on the map (Fig. 5). This population represents an area low on the hillside (L4+00S to L20+00S) which has deep overburden and an area high on the hillside (L12+00N to L16+00N) which has shallow overburden and no significant copper content.

The second peak at 275 ppm represents a large anomalous population. The values between 250 and 500 ppm can be related to transported material from known copper occurrences.

All the main showings and copper occurrences were picked up by the geochemistry as anomalies over 500 ppm. The elongated anomaly on the baseline that extends down the slope appears to be transported from a known occurrence at 3+00N.

FIG. 8 - HISTOGRAMS OF GEOCHEMICAL RESULTS



ppm. Mo.  
G. D. N. H. H.

## 2. Lead

The statistical analysis of the lead determinations indicates a background of 50 ppm. Values greater than 100 ppm were considered anomalous.

The lead anomalies are, in general, coincident with the copper anomalies but show less downslope dispersion (Fig. 5 and 6). One large lead anomaly occurs between 5+00E and 13+00E on lines 4+00N and 8+00N and appears to be transported downslope. Massive galena was found in float in a hand dug pit at 12+00S-6+00E. Some lead mineralization may occur between L8+00N and L12+00N above the anomaly.

## 3. Molybdenum

The statistical analysis of the molybdenum determinations indicates a background of less than 5 ppm. Values greater than 10 ppm were considered anomalous.

Three moderate molybdenum anomalies occur on the West side of the grid (Fig. 7) which coincide with some high copper values. These may reflect minor MoS<sub>2</sub> values associated with the mineralization.

## MAGNETOMETER SURVEY

### General

The magnetometer survey was carried out by W. Larsen. The instrument used was a McPhar M-700. Measurements of the vertical field were taken at 100 foot intervals along lines spaced 400 feet apart. Control stations were located along the baseline and all surveys were looped within two hours. A total of 10 line miles were completed.

The purpose of the survey was to define rock types in the covered areas and outline structures and areas of hydrothermal alteration.

Figure 10 is a plot of the corrected field data, with 500 gamma contours.

Figure 9 is a plot of the corrected field data in profile. Both plots are on a scale of 1" = 400'.

### Results

The magnetometer survey outlines 5 principal magnetic features which are briefly discussed below:

1. The area in 'grid' north east bounded by 10+00E and 4+00N and extending 'grid' north and east beyond the surveyed area is characterized by a relatively high field and a high density of contours. This area is probably underlain by basic volcanic rock, corresponding to the fine to medium grained andesite of map unit 1.
2. An area of moderate intensity and low density of contours strikes grid north east from approximately 8+00S-28+00E to 16+00N-0+00. This area may represent a unit more acid and/or more altered than feature 1 and probably underlies it.
3. The third feature bounds feature 2 on the 'grid' south west. This feature is characterized by a moderate field and a moderate density of contours. In composition it is probably intermediate between 1 and 2 and underlies both and may correspond to the porphyritic andesite of map unit 1.
4. A magnetic low within feature '3' above and bounded approximately by 8+00W-10+00E and 6+00S-20+00S has a low field and low density of contours. This feature is known to be underlain at least in part by intrusive rocks (syenite) and may represent a small stock intruding rocks of feature '3'.
5. A prominent magnetic low extending from 8+00S-12+00E and 16+00N-16+00E probably represents a major fault cutting the first three units described above and may bound the inferred stock on the grid east.

## TRENCHING AND SAMPLING

### General

A total of 83 hand dug pits with an average size of 3'x3'x4' were dug to evaluate areas with interesting mineralization and to follow-up geochemical anomalies in covered areas. Powder was used to blast in both bedrock and overburden in order to facilitate sampling. All the physical work was supervised by the writer.

Grab samples were taken of bedrock in all hand dug pits near mineralized areas to trace the extent of the mineralization. Soil profiles were taken in pits east of the baseline that did not reach bedrock. Chip samples were taken of mineralized outcrops. The samples were assayed for copper, lead, molybdenum, and silver. Some pits east of the baseline having no visible sulphides were not sampled. The rock exposed in pits was mapped by the writer (Fig. 3 and 4). All pits, trenches and significant assay results are plotted on a map on a scale of 1"=100' (Fig. 11).

### Results

The sampling data in pits and mineralized exposures is summarized below:

#### 1. Area 3+00N-0+00

Chip sampling at 25' intervals of mineralized bedrock along the trail returned assays of 0.66% Cu across 125' and 0.32% Cu across 75'. The direction of the sampling is close to the strike of the mineralization. The individual assays are plotted on Figure 11.

#### 2. Area 0+00-8+00W

The bedrock in the pits in this area was sampled by taking a 5 lb. sample from the bottom of each pit. Pits over an area of approximately 200'x200' returned an arithmetic average grade of 0.12% Cu. The mineralization striking 110° appears to end above 3+00S.

#### 3. Area 4+00N - 2+00W

Chip sampling at 25' intervals of mineralized bedrock returned assays of 0.72% copper along a narrow dyke over a 50' length, and a 20' width of

0.40% copper across two narrow dykes intruding the volcanics. A sampled area 50' x 200' between the dykes has an arithmetic average grade of 0.11% copper.

4. Area 4+00N to 8+00N - East Side

The area is geochemically anomalous in copper and lead. Bedrock was sampled showing little copper and only a trace of lead. Soil profiles were taken at 6+00N - 7+00E and 8+00E. The values are similar at 1' and 6' depths indicating the source of the metals to be up slope but not far from 6+00N.

5. Area 4+00S to L12+00S - 0+00 to 6+00E

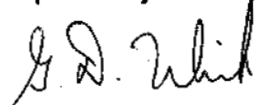
This area is anomalous in copper and lead. The pits and bedrock were mapped (Figs. 3 and 4) and soil profiles were taken where no bedrock was encountered. The bedrock contains little mineralization. The soil profile results are almost identical on surface as at depth. High silver values coincide with the copper-lead anomaly. The source area of the high values appears to lie above 4+00S.

CONCLUSIONS

During the 1971 field season technical surveys consisting of magnetometer, soil geochemistry and geological mapping were carried out on the Dok and Don groups located in the Telegraph Creek area. Widespread copper mineralization related to the intrusion of syenite dykes was sampled either in outcrop or hand dug pits.

Further work in the form of an induced polarization survey and possibly a drill programme will be necessary to evaluate this area.

Respectfully submitted



G. D. Ulrich, B.A. Sc.

CLAIMS

<u>Claim</u>	<u>Record Number</u>	<u>Expiry Date</u>	<u>Title</u>
<u>DON GROUPING</u>			
Don 1 - 12	41896-41907	Nov. 18, 1971	Empire Metals Corporation Ltd. (NPL) (under option to Swiss Aluminium Mining Company of Canada Ltd.)
Jon 1 - 4	Metal Tag Nos. 254201M-254204M	August 2, 1972	Empire Metals Corporation Ltd. (NPL) (under option to Swiss Aluminium Mining Company of Canada Ltd.)
<u>DOK GROUPING</u>			
Pete 1 - 8	45455-45462	August 4, 1971	Empire Metals Corporation Ltd. (NPL) (under option to Swiss Aluminium Mining Company of Canada Ltd.)
Dok 1 - 4	11074-11077	Sept. 28, 1971	Empire Metals Corporation Ltd. (NPL) (under option to Swiss Aluminium Mining Company of Canada Ltd.)
Dok 5 - 6	39740-39741	Aug. 25, 1971	Empire Metals Corporation Ltd. (NPL) (under option to Swiss Aluminium Mining Company of Canada Ltd.)
Dok 13 - 16	11086-11089	Sept. 28, 1971	Empire Metals Corporation Ltd. (NPL) (under option to Swiss Aluminium Mining Company of Canada Ltd.)
Dok 17 - 20	39742-39745	Aug. 25, 1971	Empire Metals Corporation Ltd. (NPL) (under option to Swiss Aluminium Mining Company of Canada Ltd.)
Dok 24	39747	Aug. 25, 1971	Empire Metals Corporation Ltd. (NPL) (under option to Swiss Aluminium Mining Company of Canada Ltd.)
Dok 60	39746	Aug. 25, 1971	Empire Metals Corporation Ltd. (NPL) (under option to Swiss Aluminium Mining Company of Canada Ltd.)
Thelma 66 - 81	39792-39807	Sept. 10, 1971	Empire Metals Corporation Ltd. (NPL) (under option to Swiss Aluminium Mining Company of Canada Ltd.)

## C E R T I F I C A T E

I, Gordon Ulrich, do hereby certify that:

1. I am a geologist with residence at 603 Rutland Court, Coquitlam, B. C.
2. I am a graduate of the University of British Columbia, (BASc - 1970, Geological Engineering).
3. Since May, 1970 I have been registered with the Association of Professional Engineers of B. C. as an Engineer in Training.
4. From graduation to present I have been employed as a geologist with Western Geological Services Ltd.
5. During the period May 31 - August 4, 1971 I supervised all geophysical and geochemical work and carried out the geological mapping of the claims covered by this report.



G. D. Ulrich  
G. D. Ulrich  
August 4, 1971



PERSONNEL & DATES

<u>Name and Address</u>	<u>Position</u>	<u>Dates of Work</u>	<u>Days</u>
H. Schielly #202-717 W. Pender St.	Geologist	June 24 - 26/71	3
T. J. Adamson #202-717 W. Pender St.	Geologist	June 1 - 6, 23 - 29, July 11 - 14/71	15
J. Buchholz #1015-470 Granville St.	Geologist	July 12 - 13/71	2
W. Meyer #1015-470 Granville St.	Geologist	May 31 - June 2/71	1½
P. Dunsford #1015-470 Granville St.	Technologist	May 31 - July 5/71	5
G. Ulrich #1015-470 Granville St.	Geologist	May 31, June 1 - 2, 4 - 16, 18 - 28, July 1, 3 - 5, 7, 9 - 14, 16, 19 - 23, 26 - 30, August 2 - 4/71	52
J. Heal #1015-470 Granville St.	Assistant Geologist	June 4 - 16, 18 - 23, 25 - 28, 30, July 1, 19/71	24
B. Corrigan #1015-470 Granville St.	Prospector	June 7 - 16, 22, 23, 25 - 28, 30, July 1, 12, 13/71	20
T. Inkster Telegraph Creek	Line Cutter	June 7 - 17/71	11
J. Gajda #1015-470 Granville St.	Helper	June 4 - 16, 22, 14 - 28, 30, July 1, 3, 4, 8 - 10, 12, 16 - 18	30
W. Larsen #1015-470 Granville St.	Helper	June 4 - 16, 18 - 22, 24, 26 - 28, 30, July 1, 3, 4, 8 - 13/71	32

## COST OF SURVEYS

### Professional and Technical Services:

Western Geological Services	\$9,949.26
Swiss Aluminium Mining Co. of Canada Ltd.	1,950.00

### Related Costs:

Assaying	1,781.60
Draughting, maps prints and reports	1,875.60
Camp equipment and cookery	2,430.86
Magnetometer and drill rental, miscellaneous field equipment	901.97
Transportation (helicopter)	6,708.09
	<u>25,597.38</u>

The above costs are property related costs only and do not include preliminary compilation of previous data, administration costs, transportation to and from Vancouver and other costs not normally applicable for assessment credits.

AFFIDAVIT RE COST OF SURVEY

I, Gordon Donald Ulrich of 603 Rutland Court in the Municipality of Coquitlam in the Province of British Columbia, DO SOLEMNLY DECLARE that the geological, geophysical and geochemical surveys and physical work done on the Empire Metals Corporation Ltd. (N.P.L.) property held under option by Swiss Aluminium Mining Co. of Canada Ltd. were conducted during the field season of 1971 and are described in this report. The data were obtained by Western Geological Services Ltd. for Swiss Aluminium Mining Co. of Canada Ltd. at a total property related cost of at least \$25,597.38.

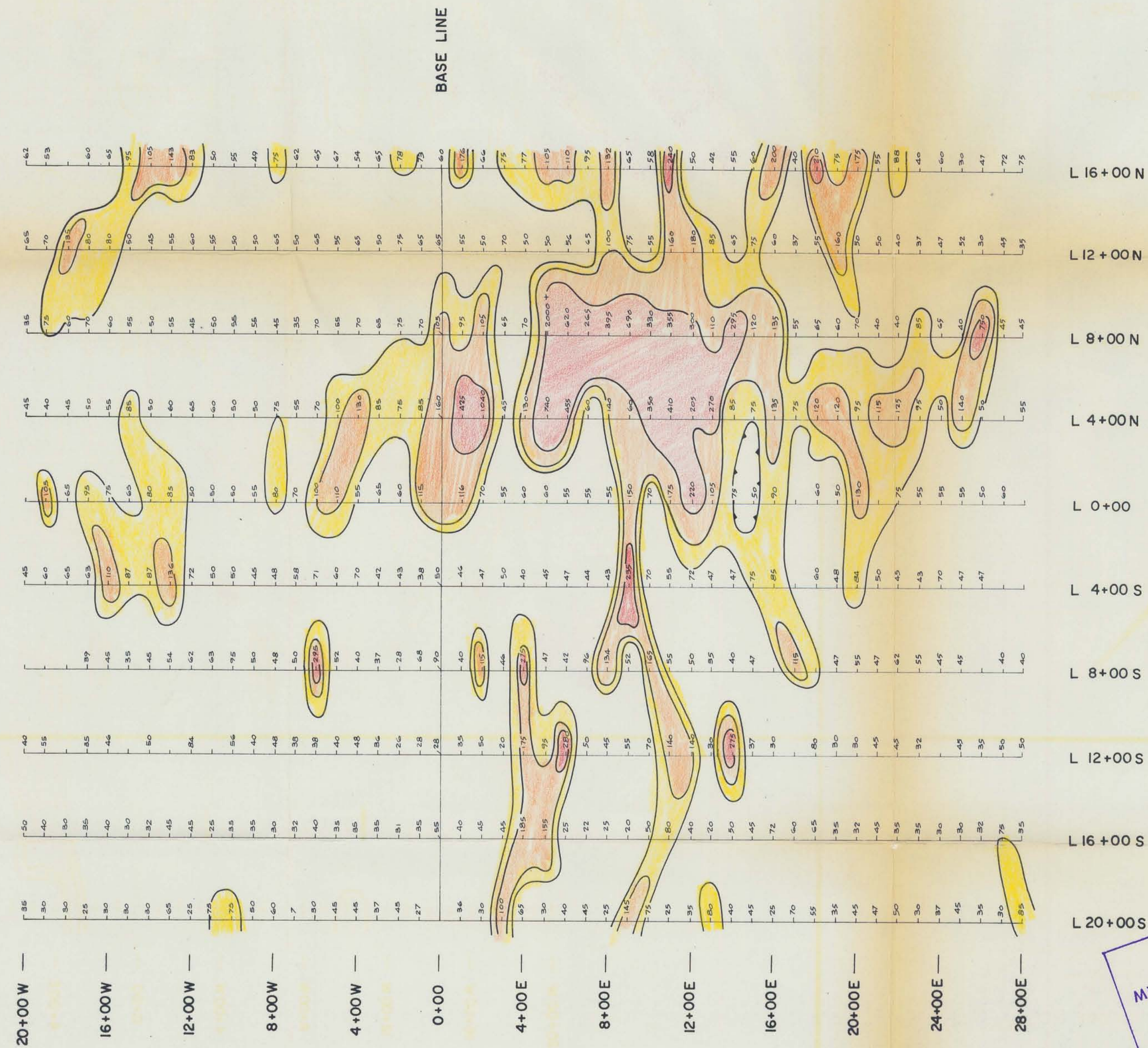
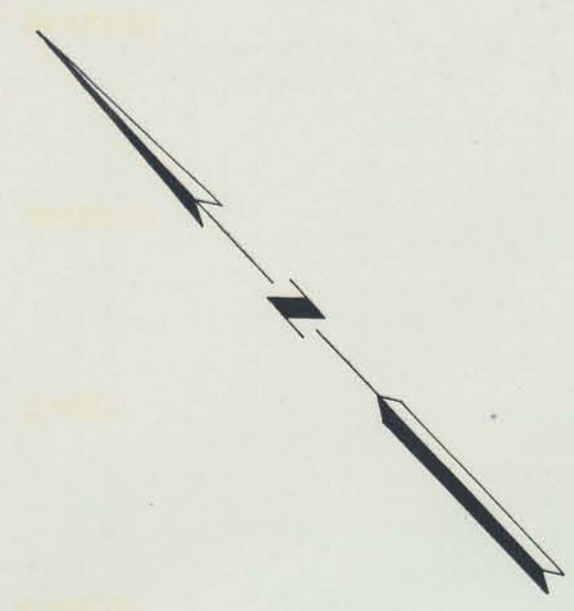
AND I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the 'Canada Evidence Act'.

DECLARED before me at the City  
of Vancouver, in the Province of  
British Columbia, this 24  
day of August, A.D. 1971.

*Neil Turner*  
Sub-mining Recorder

*G. D. Ulrich*  
G. D. Ulrich





Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 3238 MAP # 6

**NOTE:**

CONTOURS: 75 p.p.m., 100 p.p.m., 200 p.p.m.  
VALUES IN PARTS PER MILLION (ppm)

TO ACCOMPANY: " REPORT ON GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL SURVEYS AND PHYSICAL WORK DONE ON THE EMPIRE METALS CORPORATION LTD. (NPL) PROPERTY "

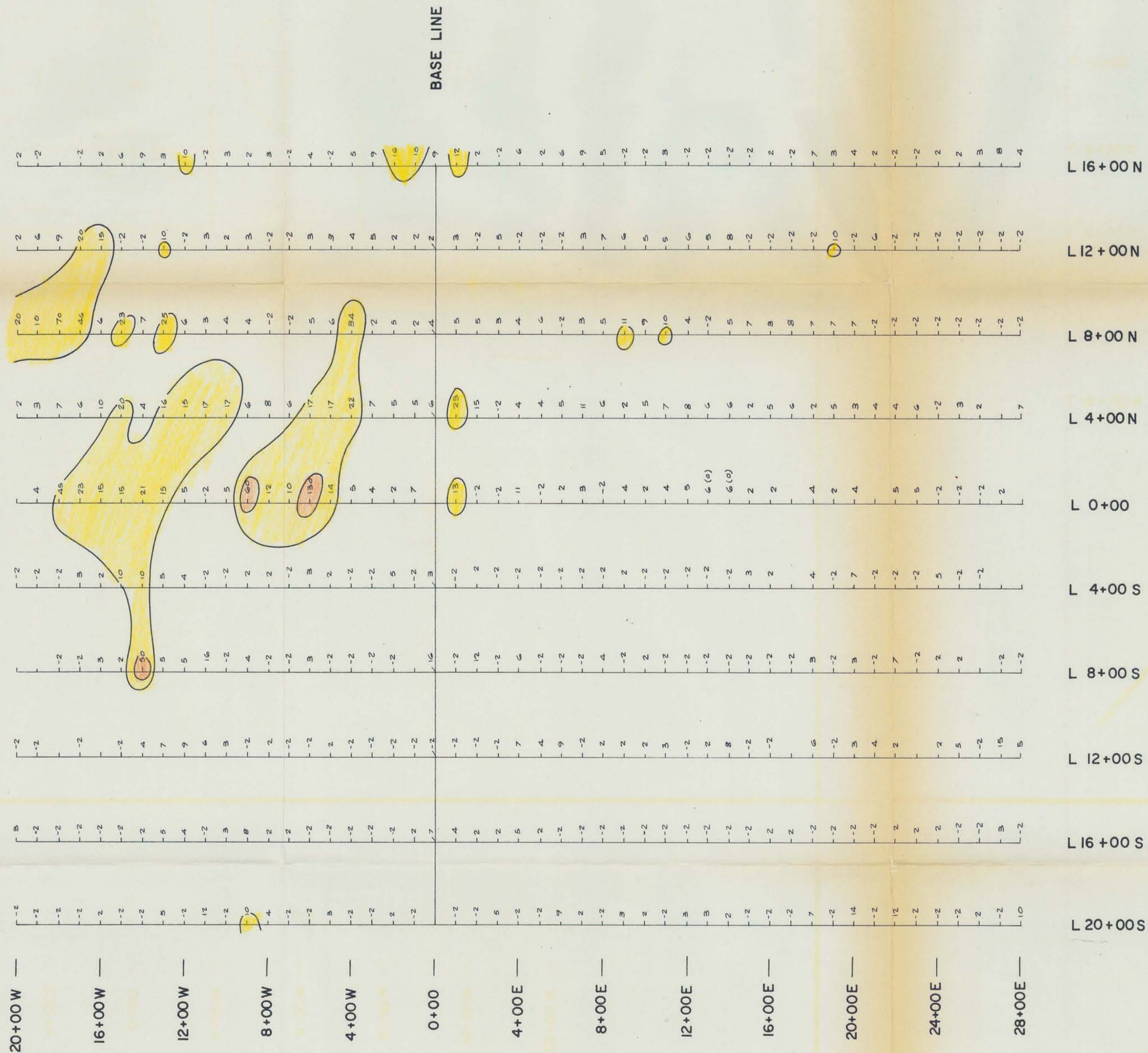
DOKDAON CREEK, B.C. LIARD MINING DIVISION  
BY: G.D. ULRICH, B.A. Sc. DATED: AUGUST 4, 1971

*G.D. Ulrich*

FIG. 6

Prepared for <b>SWISS ALUMINIUM MINING CO. OF CANADA LTD.</b>			
Title <b>GEOCHEMICAL SURVEY LEAD VALUES DOK AND DON GROUPS EMPIRE METALS CORPORATION LTD. DOKDAON CREEK, BRITISH COLUMBIA</b>			
Scale 1 inch = 400 feet	Survey by W.L. & J.G.	Drawn by VERSATILE INDUSTRIES LTD.	Date JUNE, 1971
<b>WESTERN GEOLOGICAL SERVICES LTD.</b> SUITE 1015 470 GRANVILLE ST. VANCOUVER 2, B.C. PHONE 688-2305			





NOTE:

CONTOURS: 10 p.p.m., 50 p.p.m.  
VALUES IN PARTS PER MILLION (p.p.m)


TO ACCOMPANY: " REPORT ON GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL SURVEYS AND PHYSICAL WORK DONE ON THE EMPIRE METALS CORPORATION LTD. (NPL) PROPERTY "

DOKDAON CREEK, B.C. LIARD MINING DIVISION  
BY: G.D. ULRICH, B.A. Sc. DATED: AUGUST 4, 1971

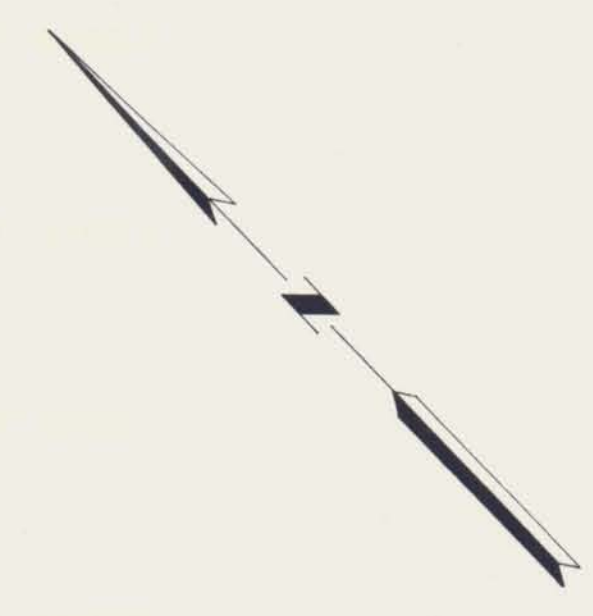
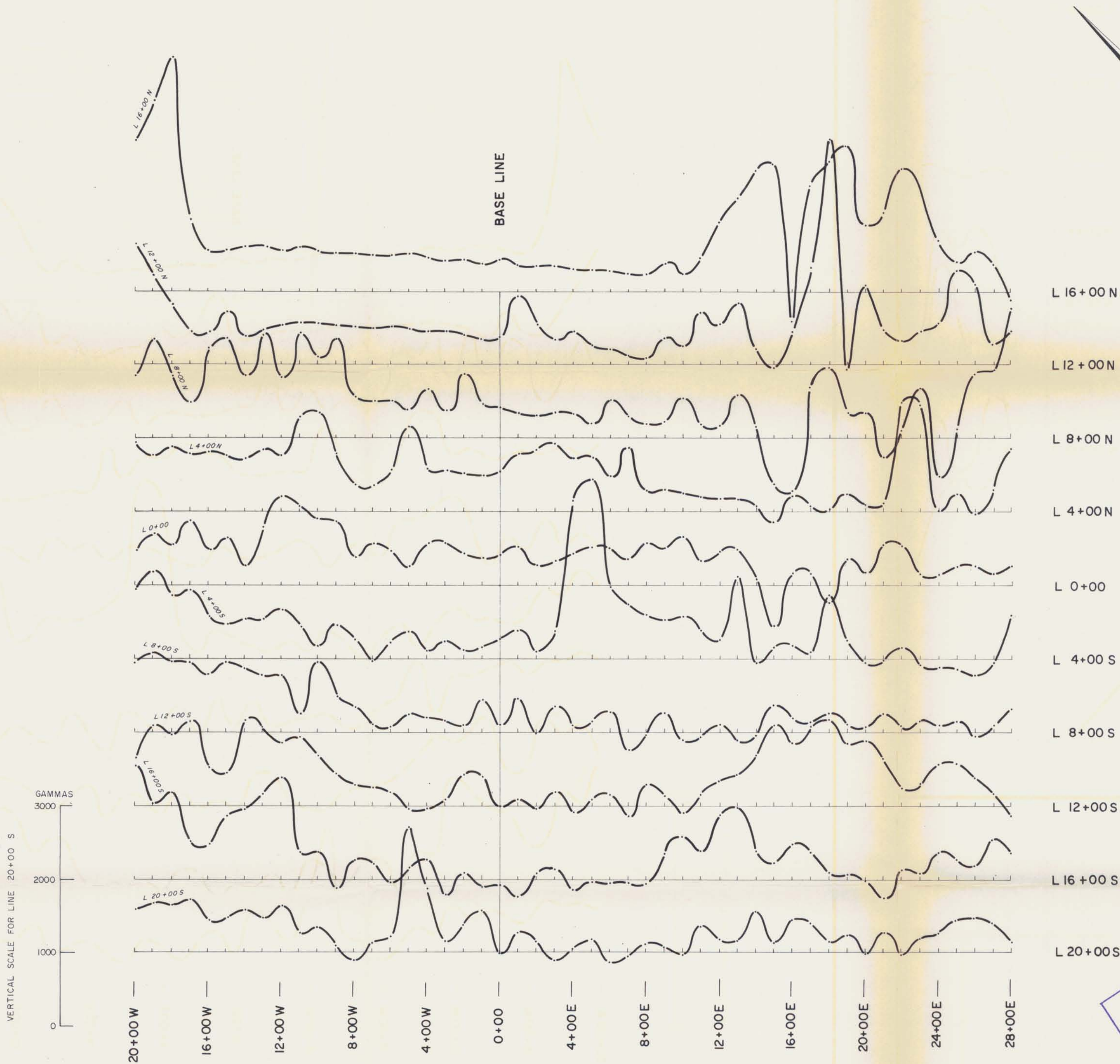
*G.D. Ulrich*

Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO 3238 MAP # 7

FIG. 7

Prepared for <b>SWISS ALUMINIUM MINING CO. OF CANADA LTD.</b>			
Title <b>GEOCHEMICAL SURVEY MOLYBDENUM VALUES</b> DOK AND DON GROUPS <b>EMPIRE METALS CORPORATION LTD.</b> DOKDAON CREEK, BRITISH COLUMBIA			
Scale 1 inch = 400 feet	Survey by W.L. & J.G.	Drawn by VERSATILE INDUSTRIES LTD.	Date JUNE, 1971
 <b>WESTERN GEOLOGICAL SERVICES LTD.</b> SUITE 1015 470 GRANVILLE ST., VANCOUVER 2, B.C. PHONE 688-2305			





NOTE :

VERTICAL SCALE : 1" = 1000 GAMMAS

LINES ARE BASED AT +1000 GAMMAS

EG. A PROFILE FOR LINE 20+00 S HAS A VALUE OF +1000 GAMMAS WHEN IT CROSSES 20+00 S, AND +2000 GAMMAS WHEN IT CROSSES 16+00 S (1" BETWEEN LINES ON MAP)

ALL OTHER LINES ARE A SIMILAR BASE FOR THEIR RESPECTIVE PROFILES.

TO ACCOMPANY : " REPORT ON GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL SURVEYS AND PHYSICAL WORK DONE ON THE EMPIRE METALS CORPORATION LTD. (NPL) PROPERTY "

DOKDAON CREEK, B.C. LIARD MINING DIVISION  
BY: G. D. ULRICH, B.A. Sc. DATED: AUGUST 4, 1971

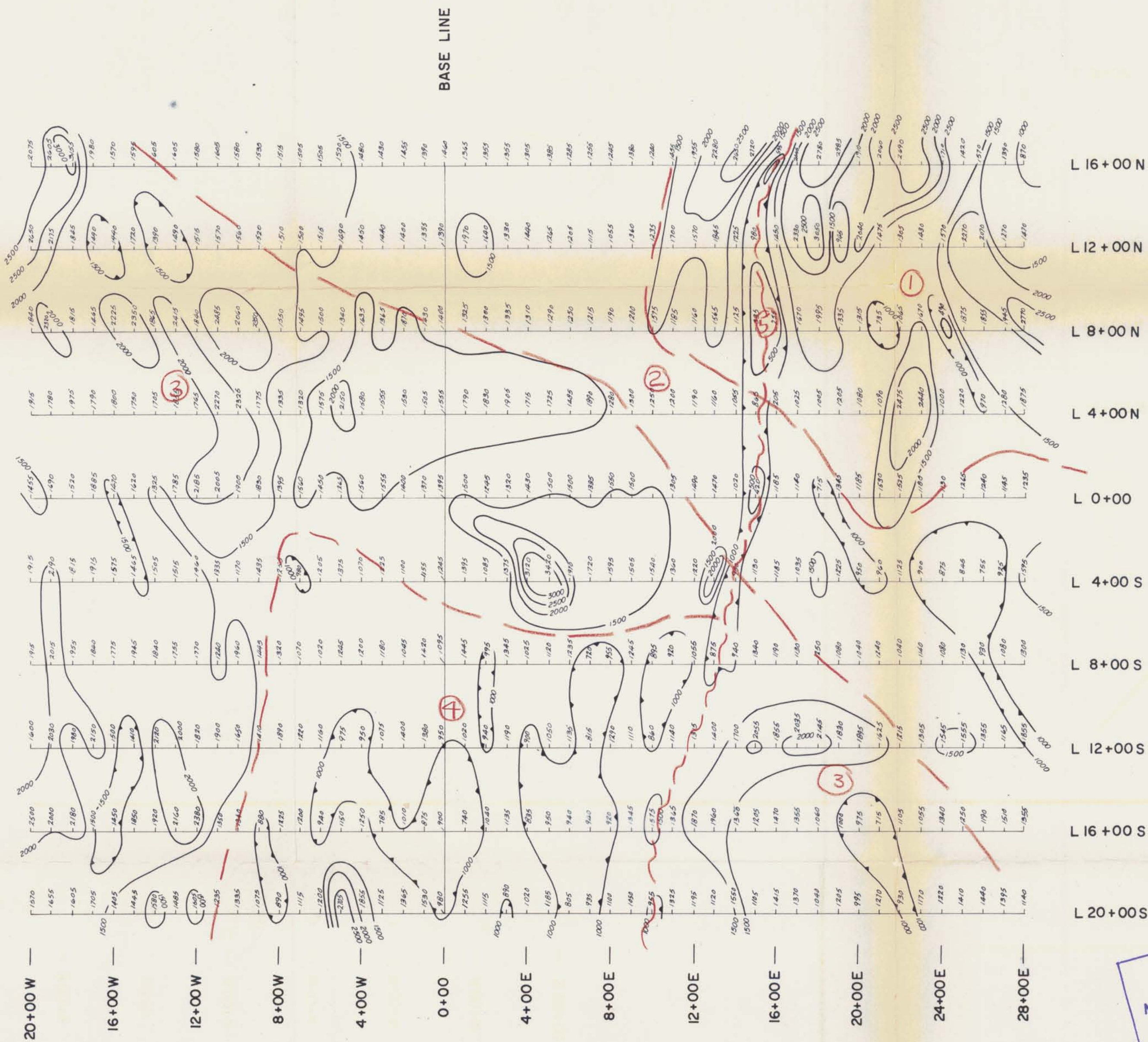
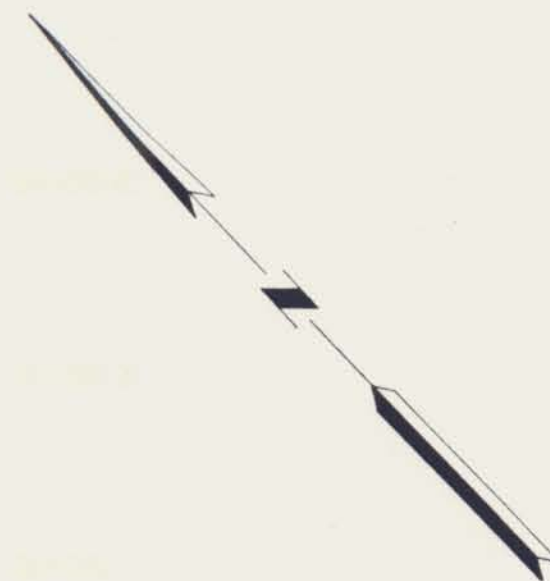
*G. D. Ulrich*

Department of  
 Mines and Petroleum Resources  
 ASSESSMENT REPORT  
 NO. 3238 MAP # 8

FIG. 9

Prepared for <b>SWISS ALUMINIUM MINING CO. OF CANADA LTD.</b>			
Title <b>GROUND MAGNETOMETER SURVEY PROFILES</b> DOK AND DON GROUPS <b>EMPIRE METALS CORPORATION LTD.</b> DOKDAON CREEK, BRITISH COLUMBIA			
Scale 1 inch = 400 feet	Survey by W. L.	Drawn by VERSATILE INDUSTRIES LTD.	Date JUNE, 1971
<b>WESTERN GEOLOGICAL SERVICES LTD.</b> <small>SUITE 1015 470 GRANVILLE ST. VANCOUVER 2, B.C. PHONE 688-2305</small>			





**NOTE:**

CONTOUR - INTERVAL = 500 GAMMAS  
 VALUES IN GAMMAS  
 INSTRUMENT: Mc PHAR - M-7

**TO ACCOMPANY:**

" REPORT ON GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL SURVEYS AND PHYSICAL WORK DONE ON THE EMPIRE METALS CORPORATION LTD. (NPL) PROPERTY "

DOKDAON CREEK, B.C. LIARD MINING DIVISION  
 BY: G. D. ULRICH, B.A. Sc. DATED: AUGUST 4, 1971

Department of  
 Mines and Petroleum Resources  
**ASSESSMENT REPORT**  
 3238 MAP #9

FIG. 10

Prepared for  
**SWISS ALUMINIUM MINING CO. OF CANADA LTD.**

Title

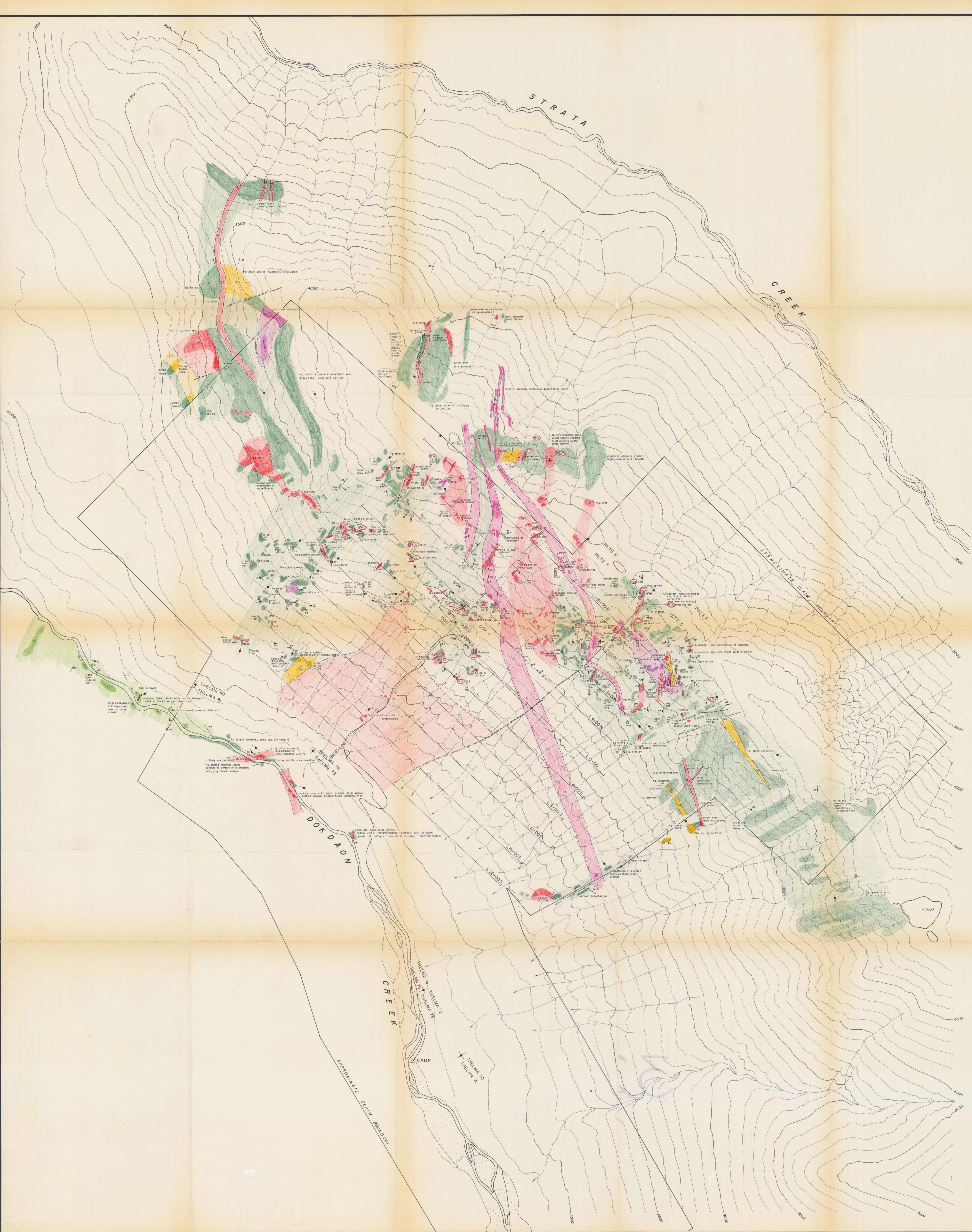
**GROUND MAGNETOMETER SURVEY  
 CONTOUR MAP**  
 DOK AND DON GROUPS  
**EMPIRE METALS CORPORATION LTD.**  
 DOKDAON CREEK, BRITISH COLUMBIA

Scale 1 inch = 400 feet	Survey by W. L.	Drawn by VERSATILE INDUSTRIES LTD.	Date JUNE, 1971
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**WESTERN GEOLOGICAL SERVICES LTD.**  
 SUITE 1015 - 470 GRANVILLE ST., VANCOUVER 2, B.C.  
 PHONE 688-2305

*G.D. Ulrich*





LEGEND

- PERMIAN AND/OR TRIASSIC**
- 1 MAINLY ANDESITIC AND BASALTIC VOLCANIC ROCKS, FLOWS, BRECCIA, TUFF. SOME INTERBEDDED SEDIMENTS, (7b)
  - 1a FINE GRAINED GREEN CHLORITIC TUFF
  - 1b TUFF, SILTSTONE, MUDSTONE, LIMESTONE, CONGLOMERATE, BRECCIA
  - 1c DIORITIZED BASALTIC AND ANDESITIC VOLCANICS.
- JURASSIC (?)**
- 2 COAST RANGE INTRUSIVE COARSE GRAINED QUARTZ MONZONITE, GRANDIORITE AND QUARTZ DIORITE
- CRETACEOUS OR TERTIARY**
- 3 RHYOLITE AND QUARTZ PORPHYRY, MOSTLY WHITE AND FINE GRAINED.
  - 4 SYENITE, FINE GRAINED TO COARSELY PORPHYRITIC, QUARTZ POOR INTRUSIONS
  - 5 INTRUSIVE DIORITE, BRECCIA
  - 6 PORPHYRITIC DYKES: ANDESITE AND LATITE
  - 7 FINE GRAINED ANDESITE DYKES

SYMBOLS

- |   |                       |         |                                 |
|---|-----------------------|---------|---------------------------------|
| — | CONTACT               | +       | CLAIM POST                      |
| — | OUTCROP               | x       | HAND DUG PIT (no Bedrock)       |
| — | VERTICAL JOINT        | ⊗       | HAND DUG PIT (reaching Bedrock) |
| — | JOINT SHOWING DIP     | tr      | TRACE                           |
| — | VERTICAL SHEAR        | bx      | BRECCIA                         |
| — | SHEAR SHOWING DIP     | w fract | WELL FRACTURED                  |
| — | SHEAR BEDDING         | fg      | FINE GRAINED                    |
| — | BEDDING SHOWING DIP   | mg      | MEDIUM GRAINED                  |
| — | FAULT SHOWING DIP     | cg      | COARSE GRAINED                  |
| — | POSSIBLE FAULT        | syen    | SYENITE                         |
| — | VERTICAL FOLIATION    | volc    | VOLCANICS                       |
| — | FOLIATION SHOWING DIP | l.s.    | LIMESTONE                       |
| — | TRENCH                | phen    | PHENOCRYSTS                     |
| — | TRAIL                 | porph   | PORPHYRITIC                     |
| — | CUT LINE              |         |                                 |

ALTERATION

- |      |                       |        |               |
|------|-----------------------|--------|---------------|
| arg  | ARGILLIC              | bio    | BIOTITE       |
| cal  | CALCITE               | chl    | CHLORITE      |
| clay | CLAY                  | cp     | CHALCOPYRITE  |
| ep   | EPIDOTE               | felds  | FELDSPAR      |
| hem  | HEMATITE              | k-s    | K-SPAR        |
| lim  | LIMONITE              | mal    | MALACHITE     |
| py   | PYRITE                | qtz    | QUARTZ        |
| ser  | SERICITE              | sil    | SILIFICATION  |
| ⊗    | COPPER MINERALIZATION | pyrite | PYRITE GOSSAN |

Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 3238 MAP #3

TO ACCOMPANY: "REPORT ON GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL SURVEYS AND PHYSICAL WORK DONE ON THE EMPIRE METALS CORPORATION LTD. (INFL.) PROPERTY".  
DOKDAON CREEK, B.C. LIARD MINING DIVISION  
BY G.D. ULRICH, B.A. Sc. DATED: AUGUST 4, 1971

3238 M-3  
J.D. Ulrich

Prepared for  
**SWISS ALUMINIUM MINING CO. OF CANADA LTD.**

Title  
**GEOLOGY**  
DOK AND DON GROUPS  
EMPIRE METALS CORPORATION LTD.  
DOKDAON CREEK, BRITISH COLUMBIA

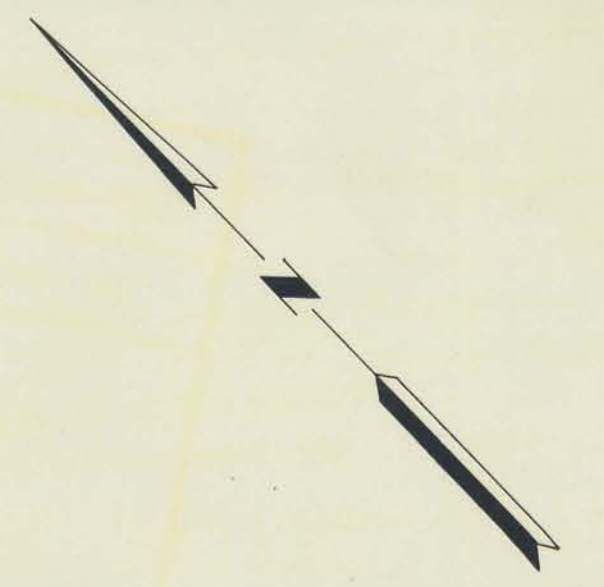
Scale 1 inch = 400 feet  
Survey by G. D. U.  
Drawn by VERSATILE INDUSTRIES LTD.  
Date JULY, 1971

WESTERN GEOLOGICAL SERVICES LTD.  
SUITE 1010 475 GRANVILLE ST. VANCOUVER 1, B.C. PHONE 683-3305

FIG. 3



15 W 14 W 13 W 12 W 11 W 10 W 9 W 8 W 7 W 6 W 5 W 4 W 3 W 2 W 1 W BASELINE 1 E 2 E 3 E 4 E 5 E 6 E 7 E



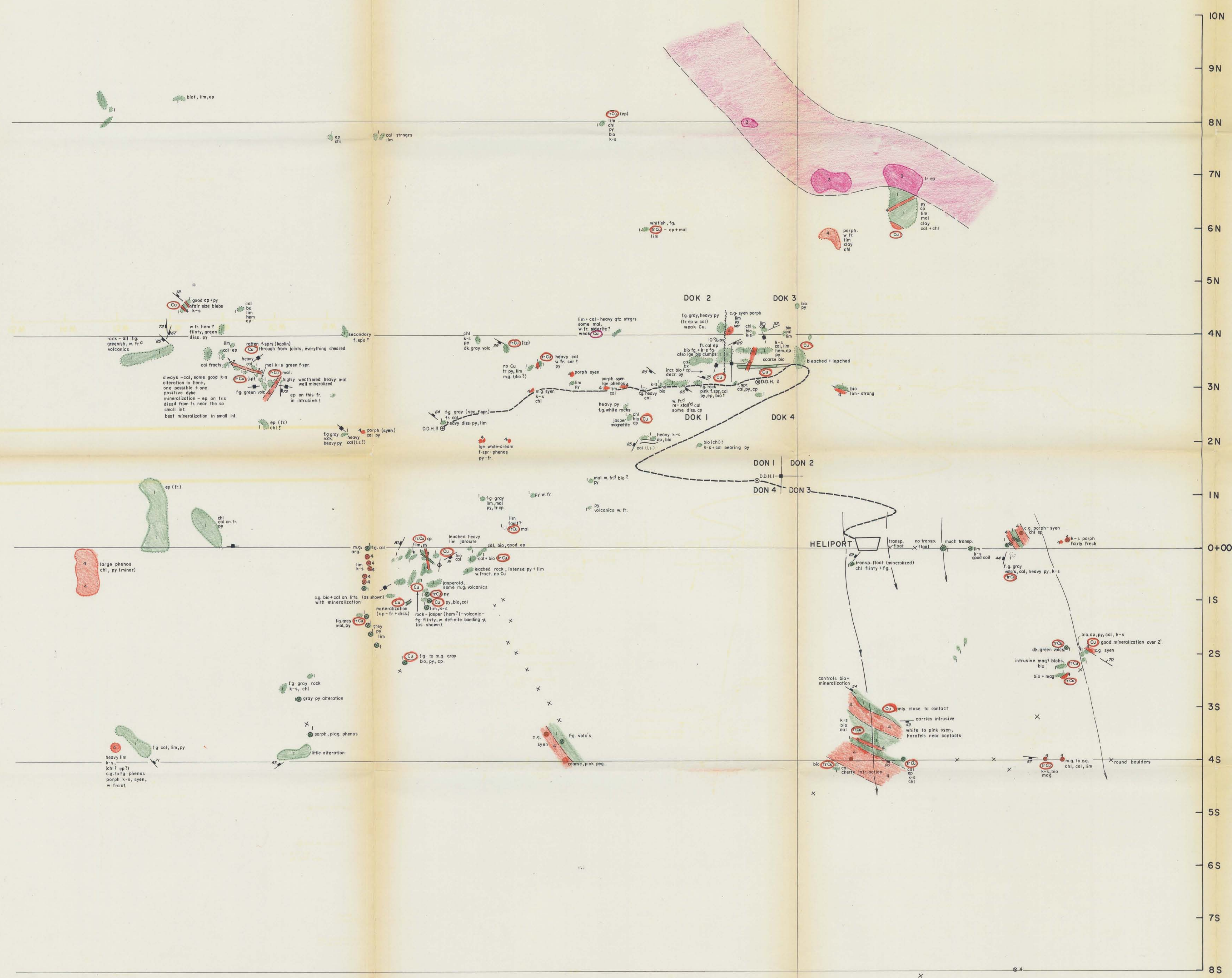
LEGEND

PERMIAN AND/OR TRIASSIC  
 1 MAINLY ANDESITIC AND BASALTIC VOLCANIC ROCKS, ALTERED

CRETACEOUS OR TERTIARY  
 3 RHYOLITE AND QUARTZ PORPHYRY, MOSTLY WHITE AND FINE GRAINED.  
 4 SYENITE, FINE GRAINED TO COARSELY PORPHYRITIC, QUARTZ POOR INTRUSIONS.

SYMBOLS

syen	SYENITE	k-s	POTASSIUM FELDSPAR
lim	LIMONITE	bio	BIOTITE
mal	MALACHITE	cal	CALCITE
ser	SERICITE	l.s.	LIMESTONE
hem	HEMATITE	py	PYRITE
ser	SERICITE	cp	CHALCOPYRITE
ep	EPIDOTE	chl	CHLORITE
phenos	PHENOCRYSTS	porph	PORPHYRITIC
mag	MAGNETITE	felds	FELDSPAR
arg	ARGILLIC-ALTERATION	and	ANDESITE
cu	COPPER MINERALIZATION	trc	TRACE COPPER
fract.	FRACTURES	fg	FINE GRAINED
m.g.	MEDIUM GRAINED	c.g.	COARSE GRAINED
---	FAULT	---	TRAIL
---	GEOLOGICAL CONTACT	+	CLAIM POST
---	JOINTS	○	DRILL SITE
---	BANDING (Metasomatic)	x	HAND-DUG PIT (no Bedrock)
---	BEDDING	●	HAND-DUG PIT (reaching Bedrock)
---	TRENCH	---	CUT LINE



TO ACCOMPANY: " REPORT ON GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL SURVEYS AND PHYSICAL WORK DONE ON THE EMPIRE METALS CORPORATION LTD. (NPL) PROPERTY".  
 DOKDAON CREEK, B.C. LIARD MINING DIVISION  
 BY: G. D. ULRICH, B.A. SC. DATED: AUGUST 4, 1971

**Department of  
Mines and Petroleum Resources**

**ASSESSMENT REPORT**

NO. 3238 MAP # 4

Prepared for  
**SWISS ALUMINIUM MINING CO. OF CANADA LTD.**

Title  
**GEOLOGY OF MAIN SHOWINGS**  
DOK AND DON GROUPS  
**EMPIRE METALS CORPORATION LTD.**  
DOKDAON CREEK, BRITISH COLUMBIA

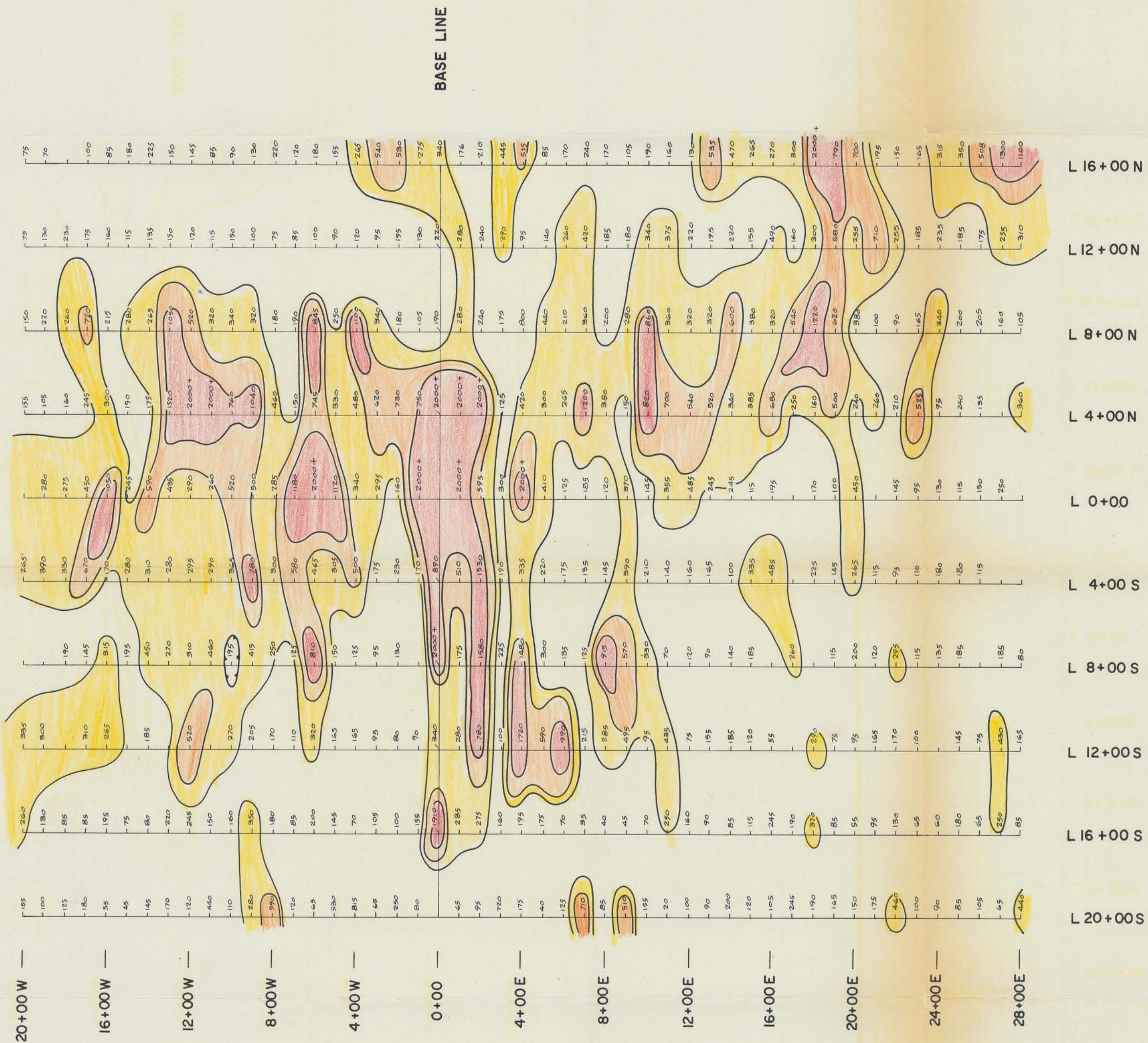
Scale 1 inch = 100 feet	Survey by G. D. U	Drawn by VERSATILE INDUSTRIES LTD.	Date JULY, 1971
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**WESTERN GEOLOGICAL SERVICES LTD.**  
SUITE 1015 470 GRANVILLE ST., VANCOUVER 2, B.C. PHONE 688-3305

*G. D. Ulrich*

FIG. 4





**NOTE :**

CONTOURS : 250 p.p.m. , 500 p.p.m. , 750 p.p.m.  
VALUES IN PARTS PER MILLION (ppm).

TO ACCOMPANY : " REPORT ON GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL SURVEYS AND PHYSICAL WORK DONE ON THE EMPIRE METALS CORPORATION LTD. (NPL) PROPERTY."

DOKDAON CREEK, B.C. LIARD MINING DIVISION  
BY: G.D. ULRICH, B.A. Sc. DATED: AUGUST 4, 1971

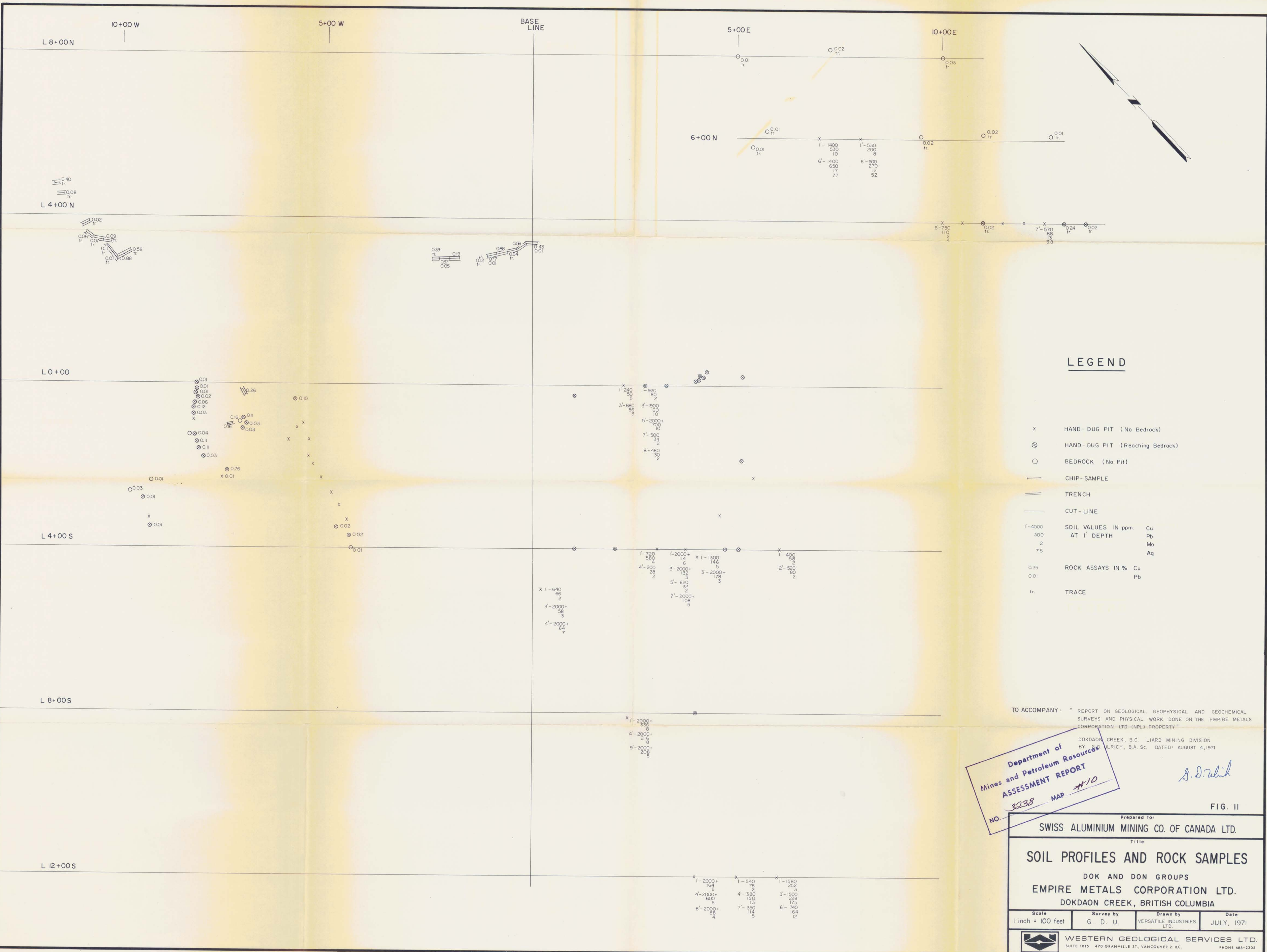
*G.D. Ulrich*

FIG. 5

Prepared for <b>SWISS ALUMINIUM MINING CO. OF CANADA LTD.</b>			
Title <b>GEOCHEMICAL SURVEY COPPER VALUES DOK AND DON GROUPS EMPIRE METALS CORPORATION LTD. DOKDAON CREEK, BRITISH COLUMBIA</b>			
Scale 1 inch = 400 feet	Survey by W.L. & J.G.	Drawn by VERSATILE INDUSTRIES LTD.	Date JUNE, 1971
<b>WESTERN GEOLOGICAL SERVICES LTD.</b> <small>SUITE 1015 470 GRANVILLE ST., VANCOUVER 2, B.C.    PHONE 688-2305</small>			

Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 2238    MAP #5





**LEGEND**

- X HAND-DUG PIT (No Bedrock)
- O HAND-DUG PIT (Reaching Bedrock)
- O BEDROCK (No Pit)
- CHIP-SAMPLE
- TRENCH
- CUT-LINE
- 1'-4000 SOIL VALUES IN ppm Cu
- 300 AT 1' DEPTH Pb
- 2 Mo
- 7.5 Ag
- 0.25 ROCK ASSAYS IN % Cu
- 0.01 Pb
- tr. TRACE

TO ACCOMPANY: \* REPORT ON GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL SURVEYS AND PHYSICAL WORK DONE ON THE EMPIRE METALS CORPORATION LTD. (NPL) PROPERTY \*  
 DOKDAON CREEK, B.C. LIARD MINING DIVISION  
 BY: G. D. ULRICH, B.A. Sc. DATED: AUGUST 4, 1971

Department of  
 Mines and Petroleum Resources  
**ASSESSMENT REPORT**  
 NO. 3238 MAP #10

*G. D. Ulrich*

FIG. II

Prepared for  
**SWISS ALUMINIUM MINING CO. OF CANADA LTD.**

Title  
**SOIL PROFILES AND ROCK SAMPLES**  
 DOK AND DON GROUPS  
**EMPIRE METALS CORPORATION LTD.**  
 DOKDAON CREEK, BRITISH COLUMBIA

Scale 1 inch = 100 feet	Survey by G. D. U.	Drawn by VERSATILE INDUSTRIES LTD.	Date JULY, 1971
----------------------------	-----------------------	---------------------------------------	--------------------

WESTERN GEOLOGICAL SERVICES LTD.  
 SUITE 1015, 470 GRANVILLE ST., VANCOUVER 2, B.C. PHONE 688-2305