

3329

BRITAIN RIVER SYNDICATE

JERVIS INLET PROPERTY, B.C.

GEOPHYSICAL, GEOLOGICAL  
and  
GEOCHEMICAL SURVEYS

Linda 1-23 Claim Group

50° 00', 124° 05' W

92F / 16E, 92K / 1E

October, 1971.

Pioneer Consultants Limited.

Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT

NO. 3329 MAP

TABLE OF CONTENTS

<u>Title</u>	<u>Page No.</u>
<b>SUMMARY AND CONCLUSIONS</b>	
I. INTRODUCTION	1
II. PROPERTY, LOCATION AND ACCESS	1
III. TOPOGRAPHY	2
IV. HISTORY	3
V. GEOLOGY	3
VI. GEOLOGICAL SURVEY - 1971	4
a) Upper Showing Area	4
b) Lower Showing Area	6
VII. GEOPHYSICAL SURVEYS	8
a) EM Survey - North Grid	8
b) Magnetometer Survey - North Grid	8
c) EM Survey - South Grid	9
VIII. GEOCHEMICAL SURVEY	10
RECOMMENDATIONS	11
<b>CERTIFICATE</b>	
 <u>IN MAP POCKET:</u>	
# 2 1. GEOLOGICAL PLAN - UPPER SHOWING ...	1" = 100'
3 2. GEOLOGICAL PLAN - LOWER SHOWING ...	1" = 100'
4 3. MAGNETOMETER SURVEY - UPPER SHOWING ...	1" = 100'
5 4. ELECTROMAGNETIC SURVEY - UPPER SHOWING ...	1" = 100'
6 5. ELECTROMAGNETIC SURVEY - LOWER SHOWING ...	1" = 100'
7 6. GEOCHEMICAL SURVEY - LOWER SHOWING ...	1" = 100'
8 7. GRID LAYOUT - UPPER AND LOWER SHOWINGS ...	1" = 100'
9 <i>gridwork and trenching 1971</i>	
10 <i>survey grid &amp; location map</i>	
<u>APPENDED TO REPORT:</u>	
# 1 LOCATION MAP - BRITAIN RIVER CLAIM GROUP.	1" = 3,000'

## SUMMARY AND CONCLUSIONS:

The field program during August and September, 1971, on the Brittain River Syndicate property included geological, geophysical and geochemical surveys on grids located over two areas of known mineralization. The occurrences are in a mile-wide belt of Jarvis group sediments extending north through Diadem Mountain, northwest of Jarvis Inlet, B.C.

The purpose of the work was to attempt to trace the mineralized zones or to locate new targets, by the above means. The showings are separated by a series of steep cliffs, which have prevented a complete appraisal of the structure striking through the centre of the property.

Electromagnetic and magnetic surveys and mapping over the upper northern zone did not reveal any important mineralization, and suggest that the copper-zinc-silver mineralization exposed in three trenches, is limited in length to less than 200 feet, and is probably erratic and narrow at depth.

A limited area covering the lower showings was tested with electromagnetic and soil geochemical surveys. A distinct area of anomalous copper values was indicated over a length of 800 feet in an area with few outcrops east of previous known mineralization. A coincident stream drainage pattern and a weak EM conductor indication suggest that the source may be at the north end of the geochemical anomaly. This area is worth further investigation as well as the southern extension of the zone, as far as permitted by access to the cliffs of Diadem Mountain. A small copper-bearing magnetite zone was discovered and sampled on the flank of the southern end of the geochemical anomaly.

Additional geophysical and geological work is recommended to trace and locate this mineralization, before consideration is given to diamond drilling.

## I. INTRODUCTION:

During the period August 4 to September 24, 1971, a program of geological mapping, geophysical surveys and soil sampling was carried out on the 23 claim property northwest of Mount Diadem, Jarvis Inlet area, B.C., held by L. Hansen, under option to the Brittain River Syndicate. The Syndicate is composed of four equal partners - Home Oil Company Limited, Minorex Limited, China Gold Mines Limited and New Calumet Mines Limited. The work was performed under the direction of L. G. White, Consulting Engineer and Manager of the Syndicate, and field work was supervised by G. R. C. Dunlop, P.Eng., of New Calumet Mines Limited.

The purpose of the work was to explore in detail, by geophysical and geochemical surveys, the two sections of the property containing areas of copper-lead-zinc mineralization and particularly the portion of the ground between the two showings, where permitted by topography.

The property has been examined and prospected by many companies over the years, the earlier work including two short adits, and numerous trenches and test pits. Limited drilling of the upper zone in 1967, and surveys over the lower zone in 1970 were the most recent attempts to locate extensions of the showings prior to this year's program.

To test for extensions of the known mineralized zones and for additional areas of mineralization, an area was gridded on the upper zone extending 1,700 feet north of the trenches, with lines running east-west across the strike of the formations in lengths of 200 feet to 1,100 feet, as permitted by topography. The lines were spaced at 100 foot intervals over the showings, and at 200 foot intervals over the northern extension of the zones. This grid was used for geological mapping, and magnetic and electromagnetic surveys.

The lower showing area was covered by east-west grid lines at 200 foot intervals over a north-south length of 1,200 feet. This grid was extended as far as possible to the north, where it terminates against very steep terrain. Thus, a gap of 1,150 feet remains between the two grids, where linecutting and mapping are precluded. An electromagnetic survey and geochemical soil survey were performed on this grid. Magnetic work was limited to detail tracing of narrow zones.

## II. PROPERTY, LOCATION AND ACCESS:

The property held under option by Brittain River Syndicate, through its agent, Exploration Services Limited, consists of 23 Mineral Claims listed as follows:

<u>Name</u>	<u>Record Number</u>
LINDA 1 - 12 inclusive	10701 - 10712 inclusive.
LINDA 13 - 23 inclusive	12708 - 12713 inclusive.

The claims are located in the Vancouver Mining Division northwest of Mount Diadem, and west of Brittain River, situated near Prince of Wales Reach, Jervis Inlet. The coordinates near the centre of the property are 50°00' North Latitude, 124°05' West Longitude. This location is approximately 65 air miles northwest of Vancouver, 4 miles west of Jervis Inlet, at an elevation of 3,800 feet. A creek on the west side of the property flows south through a prominent valley into Khartoum Lake, and then into Lois Lake to the southwest.

Transportation to the property is by means of helicopter from Vancouver or Powell River (via Campbell River), or by car to Egmont and then by water taxi up Jervis Inlet to an old dock at the mouth of Brittain River, thence by old trail or helicopter to the property. The trail from Brittain River up No Man's Creek was used by earlier prospectors, but has since grown in, and is quite precipitous, so it is not suitable for transporting equipment.

Logging roads used by McMillan Bloedel extend from the highway at Long Bay, south of Powell River, to the east end of Fraida Lake, about 1½ miles west of the centre of the property. From this point the property could be reached on foot, by climbing to the rim south of Skwin Lake, thence south to the campsite at the upper showing. This route has possibilities as a future road, but would involve a great deal of costly rock work over steep bare outcrop areas.

### III. TOPOGRAPHY:

The Brittain River - Mount Diadem area is deeply dissected mountainous country with numerous cliffs and ridges and steeply cut stream valleys. The elevation on the property varies from approximately 2,700 feet at the south boundary to nearly 5,000 feet at the north boundary. The upper showing, at elevation 3,800 feet, is located at the lowest end of a narrow valley which broadens to a wider ridge, south of Skwin Lake, about 3,000 feet north of the showing. This valley is cut by numerous deep creek gulleys, and is surrounded by very steep cliffs from 500 to 800 feet high, dropping into adjacent valleys.

The lower adit is located 2,200 feet south of the upper trenches, at an elevation of 2,700 feet. The trail joining the two showings traverses over very steep terrain and cliffs, where ropes are required for safety. This section, covering about 1,000 feet horizontally is inaccessible to any type of surveys or systematic prospecting.

The climate during the summer months is variable, with considerable precipitation throughout the year. In 1971, the upper part of the property above 3,500 feet was still covered with 5 to 10 feet of snow in mid July. Some snow remained in creek valleys in September, but did not hamper field work. Heavy fog and rain with very limited visibility produce hazardous conditions for ground work and helicopter access, for prolonged periods of up to 1 week.

IV. HISTORY:

Following work on the property in early years dating back to 1920, which mainly involved prospecting for gold, and examinations since 1949, as reported by A.O. Hall (1967), J. Buchholz and A.R. Bullis (1967), the most recent exploration efforts were geological mapping of the upper showing in 1967, diamond drilling of the upper showing by Sphere Development Corp.Ltd. in 1967, and geochemical and geophysical surveys of the lower showing area in 1970 by Tiger Silver Mines Limited. The owners of the claims have thoroughly prospected much of the ground, including two short drill holes in No.2 trench of the upper showing and numerous shallow test pits and trenches. The work by Buchholz and Bullis in 1967 led to recommendations for geophysical surveys prior to diamond drilling, but the drilling done by Sphere in 1967 was limited to testing for extensions of the copper-lead-zinc mineralization exposed in Trench No.1. In 1970, Tiger Silver Mines Limited performed a magnetometer and a geochemical soil survey (Cu, Zn) over the area of the lower showings. Prior to 1971, no electromagnetic surveys had been done on the property, and magnetometer work had not covered the upper showings or extensions of this zone to the north. Geological mapping had been limited to an area 600 feet by 300 feet surrounding the upper showings.

The three trenches of the upper showing were sampled by Buchholz and Bullis in 1967, and the results were described in their reports. The average values, adjusted for true widths were reported by Bullis as follows:

<u>Zone</u>	<u>True Width</u>	<u>Oz.Au</u>	<u>Oz.Ag</u>	<u>% Zn</u>	<u>% Cu</u>
Adit	7.0 ft.	.035	6.3	17.9	0.96
#1 Trench	17.5 ft.	.045	8.8	3.0	1.19
#2 Trench	15.0 ft.	.016	2.28	7.6	0.21
#3 Trench	1.5 ft.	Tr.	0.1	0.25	0.20

It was not clearly established by mapping or drilling that the mineralization is continuous between Trenches 1, 2 and 3, although they clearly lie within the same shear zone. Much attention has been given to the No.1 Trench zone, because of the impressive mineralization, which includes a fairly massive sulphide section 70 inches in width, which assayed 0.08 oz.Au, 16.4 oz. Ag, 0.39% Pb, 5.01% Zn, 2.77% Cu and 0.08% Cd. This zone contains abundant lenses of massive pyrrhotite, with seams of massive chalcopyrite and sphalerite up to 4 inches in width, as well as narrow chalcopyrite stringers on fracture planes.

V. GEOLOGY:

The general and local geology have been described in the previous reports already mentioned, and in the B.C. Department of Mines Bulletin

No. 39 - Geology of Lower Jervis Inlet, W. R. Bacon, 1957, and will be summarized only in this report.

The property lies entirely within a northwesterly striking belt of steeply-dipping sedimentary and volcanic rocks of undetermined age surrounded by Coast Range Intrusives, mainly granodiorite and diorite. Most of the belt is occupied by sediments over about a mile in width, with basic volcanics occurring in some areas near the eastern contact. The sediments are known to have a vertical extent of at least 4,000 feet, extending from an elevation of 2,000 feet to the top of Mount Diadun.

On the Brittain River Syndicate property, the sediments are composed mainly of thin bedded shaly argillites, interbedded with fine-grained impure quartzites, sandstones and conglomerates, all striking N 10°-20° W, and dipping steeply east at 75°-90°. More massive outcrops of quartzite occur in the northern part of the property, and in many cases are difficult to distinguish from fine-grained diorite intrusives.

The sediments are cut by irregular diorite dykes associated with minor transverse faults and are tightly folded in steeply plunging attitudes. The mineralization occurs as very fine disseminations of pyrite and pyrrhotite over large areas of the property, generally in the more siliceous argillite beds, and in very erratic concentrations along fault zones associated with diorite dykes. The upper zone of mineralization includes lenses of massive sulphides in shear zones associated with folding and cross-faulting, as described by Bullis (1967.)

## VI. GEOLOGICAL SURVEY - 1971:

### a) Upper Showing Area.

Since previous mapping of the property had been limited to the immediate area of the trenches, and little of the geology had been recorded in the northern part of the property, further mapping in conjunction with geophysical work was required to investigate possibilities of additional copper-zinc mineralization. A base line, bearing N 10° W Ast. was established over a length of 2,200 feet, extending from Trench #3 at 8 + 00 S, to a point at 14 + 00 North, considered sufficient to cover the most promising area. North of this grid, outcrops are numerous and large, and were mapped from a secondary base line at 16 + 00 W by pace and compass control. Picket lines were run east and west of the main base line as far as practicable, to limits imposed by topography.

The accompanying geological plan at a scale of 1 inch to 100 feet, illustrates outcrop geology within the grid area, and reconnaissance geology extending 1,400 feet north of the grid, to provide a general cross-section over a width of 2,000 feet. Time and weather did not permit detailed mapping in this northern area, so that geology is generalized to some extent.

The sediments within the map area are predominantly thin bedded banded argillites, varying from grey-white calcareous beds to siliceous black and rusty members, usually 1/2 inch to several inches in thickness. Quartzite occurs as both thin, fine-grained, dark grey beds, and in broad zones of massive coarser grained impure members. In the latter case, some outcrops of quartzite are very difficult to distinguish from dykes and sills of diorite and granodiorite. Rusty gossan zones are very common in the argillite members, particularly in altered silicified zones. Very minor chalcopyrite can often be detected, but the rusty areas are generally caused by fine disseminations of pyrite, with lesser pyrrhotite. A typical rusty zone is exposed on a cliff face at 18 N on the western edge of the map area, where a sandy argillite face is exposed over a length of 400 feet, and contains about 2% - 5% fine pyrite.

To the west of the map area, reconnaissance traverses were made to the western boundary, where the sediments are predominantly liney argillites and limestones, cut by occasional quartz veins and narrow diorite dykes. In this area, north of the small lake at the head of Lois Creek, on Claim Linda 23, there is a very definite reduction in sulphide content of the argillites, and there are very few rusty gossan zones.

As reported by Nullis and Suchholz, the sediments are tightly folded, generally in steeply plunging folds, although gently plunging isoclinal folds are well defined on the south wall of the creek valley at 5 + 00 N, 5 + 00 W, and in a cliff face 300 feet north of the centre of the map area.

Intrusive dykes occur in some cases along fault planes, such as (1) in the creek bed east of No.1 Trench zone, at 3 + 60 S; (2) crossing the base line at 1 + 00 S, and (3) north of the grid at 15 N, 0 W. Other intrusives occur as broad masses, both crosscutting the sediments, such as the large area striking N.W. across the 16 W base line at 16 N, and in zones intercolated with the sediments, assumed to be sills. Except for coarse grained phases which are readily distinguished, these intrusives of quartz diorite are not readily separated from quartzites, and in some cases the two types appear to blend together without an apparent contact. The quartzite and diorite members are generally sparsely mineralized, with several exceptions. Galena and minor sphalerite are exposed in trenches on the large north-striking diorite mass at 21 + 00 N, 5 + 00 W. In a zone of strong cross fracturing, galena occurs irregularly in seams of 4 inches to 1 foot in width, over a total width of 12 feet. This occurrence is apparently very limited in length, as observed in a smaller trench 40 feet north.

Additional trenching on the showing exposed in No.1 Trench at 5 + 30 S, 1 + 00 W was done to provide a fresh face over the best part of the sulphide zone, to obtain a better view of the mineralization and structure. The north face of the showing was benched off over a width of 25 feet, exposing a massive pyrrhotite zone with associated chalcopyrite in fractures and irregular concentrations within the pyrrhotite. The trench was not resampled. The fold structure of the sediments in this zone



is not clearly defined, but local drag folds and warping appear to be an important control.

A new exposure of copper mineralization was located on the east side of the creek gully, northeast of No. 1 Trench, at 3 + 60 S, 0 + 20 E. A narrow diorite intrusive varying in width to 4 feet strikes S 30° W, toward the No. 1 Trench area. Good chalcopyrite mineralization to a maximum width of 2 feet occurs on the north contact of this dyke, but apparently is limited to less than 20 feet in length. It is considered that there is a definite relationship between sulphide mineralization and these dykes, when sufficient fracturing is developed in the folded sediments.

Additional trenching on a showing located at 4 + 60 S, 2 + 00 W, on a shear zone parallel to the No. 1 Trench zone, revealed copper and zinc mineralization over 13 feet. A chip sample over the low grade western section returned 0.44% Cu and 0.34% Zn over 10 feet, and an assay of better grade material in the centre of the trench ran 0.90% Cu, ~~1.7~~ 0.8% Ag and .26% Zn over 3 feet.

1.2

b) Lower Showing Area

A chain and compass traverse was carried as accurately as possible from the north grid down the steep trail, to tie in the lower showing for future structural interpretation. A grid was established from the most northerly point possible, and carried south and east to the limit of access on the flank of Mount Diadem. The south western part of the grid extends to cliffs dropping into Lois Creek valley. Grid lines were established at 200 foot intervals from a base line bearing N 10° W. Due to a heavy undergrowth of devil's club and brambles in much of the area, lines were run mainly by chain and compass with a minimum of cutting.

Apart from cliff faces, outcrops are relatively scarce within the grid area, particularly in the eastern section, so a good geological interpretation is not possible from mapping alone.

Scattered outcrops distributed through the centre of the grid are mainly massive and bedded impure quartzite, some lightly mineralized with pyrite and very occasional traces of malachite stain. The western section of the grid is mainly underlain by argillites, with interbedded volcanics. The cliff faces on the northern part of the grid were not mapped in detail, but were prospected intermittently as permitted by difficult topography. Apart from the narrow lenses of sphalerite exposed in the adit and trenches north of the adit, the only concentration of sulphides discovered is at the top of the cliff at 12 + 00 S, 5 + 00 E.

A narrow magnetite zone 1 to 2 feet in width occurs along the east contact of a gabbro dyke, striking N 25° W. Chalcopyrite occurs as disseminations in the magnetite and gabbro over a width of 2 feet. Adjoining this zone to the east are two additional barren dykes 2 to 4 feet wide separated by 4 feet of rusty gossan material derived from altered argillites. The trench was chip sampled over a width of 15 feet, but copper values were quite low. The best section, over a width of 3.5 feet across the magnetite zone, ran 0.20% Cu, 0.02% Zn.

The magnetite zone was traced by traversing on short lines at 25 foot intervals for approximately 600 feet to the north. A steady weakening of the zone occurs to the north, and the only exposure in a small outcrop contained a 2 foot cluster of narrow seams of magnetite. It is likely that the zone follows an intrusive contact, but no further exposures of gabbro could be located. It is conceivable that this zone continues more strongly to the southeast, up the northwest flank of Diadem Mountain. A large gossan with extensive fracturing is exposed on the mountain side on strike of the showing, about 600 feet to the southeast. Special equipment and experienced climbers would be necessary to reach the exposure, but further work should be done in the creek valley below the showing to the southeast.

Little new information has been obtained over the area between the north and south grids and it is unlikely that conventional prospecting methods would add much to the picture. A projection of the north showing to the lower adit passes along the face of an extremely steep cliff striking parallel to the mineralized zone. It is thought that the upper and lower zones are located in the same structural horizon, by assuming an average dip of 80° E. Thus, the mineralized belt could have a total length of over 2,000 feet. The only thorough way to test the zone would be by diamond drilling from selected locations at regular intervals.

## VII. GEOPHYSICAL SURVEYS:

### a) Electromagnetic Survey - North Grid

Because of limitations imposed by topography, a one-man EM unit was preferred, particularly in the southern part of the grid where lines were limited to a few hundred feet in length. A Ronka EM-16, VLF unit, receiving from Jim Creek, Washington, was used to cover the grid initially, with a Crone J.E.M. unit to test and screen out anomalies as required. In-Phase and Quadrature readings are shown in profile on the accompanying plan, expressed as percentage of slope of resultant tilt angles. The instrument was used with the operator facing west, normal to the direction of transmission from Jim Creek. A normal cross-over, indicating a conductor axis, would be demonstrated by positive In-Phase readings on the east side of the conductor, changing to negative readings on the west side. Readings were taken at 50 foot intervals wherever possible.

The instrument did not respond well in detail traverses at 25 foot line intervals over the No. 1 Trench area, suggesting a narrow weak conductor of limited length of less than 200 feet, probably plunging steeply to the southeast. Most of the profiles are greatly exaggerated and strongly influenced by topographical features, such as cliff faces and high steep slopes. It is probable that most of the sediments are very mildly conductive, so that a steep sloping face or bedrock overburden interface produces the effect of a large conductive mass. These features can be readily recognized by the operator, but an isolated narrow conductor on a hill-side could be masked by the overall effect of the hill. The well-defined conductor indications are indicated on the plan, showing a weak trend extending from 10 N, 8 W to 14 N, 3 W, striking from due North to N 10° E. Conductors marked at the eastern end of lines 10 N and 14 N are deemed to be caused by topographical features, mainly a steep cliff plunging down to the east.

The Crone J.E.M. unit was used to check lines 14 N and 12 N, using the "shootback" method with coil separation of 200 feet. The Crone survey did not support the VLF conductors, indicating only a very broad and very weak conductor, as might be reflected by a clay-filled valley.

It is evident from the EM surveys that no strongly conductive sulphide bodies of appreciable strike length occur in attitudes paralleling the sediments. The No. 1 zone is suspected to be of limited length, and very lensy in nature. The mineralization exposed in the trench would most definitely be conductive, if it were continuous vertically and horizontally for 200 feet in each direction. Additional larger lenses at greater depths, but of short length might easily remain undetected, however.

### b) Magnetometer Survey - North Grid

Because of the association of copper and zinc with pyrrhotite, a magnetic survey over the north grid could be expected to locate any large bodies of such mineralization near surface, as well as to assist in

structural interpretation. Using a Sharpe MF-1 Fluxgate magnetometer readings were taken at 25 to 50 foot intervals over the southern part of the grid, and 100 foot intervals over the longer lines to the north. Contrary to expectations very close detail readings directly over the best mineralization in No.1 Trench showed practically no variation in magnetic intensity, suggesting that the pyrrhotite mineralization is erratic, as indicated by the EM work. A strong local attraction was noted over a one foot band of magnetite in Trench No. 2, but only a weak anomaly of about 100 gammas was obtained over the shear zone extending through the three trenches. The few lines crossing the creek east of the trenches, where a north-striking fault is suspected, did not reveal any significant anomaly along the fault, although more detail would be necessary to attempt to trace this feature.

A weakly anomalous broad zone trends in a northeasterly direction across the northern part of the grid, suggesting from the contours a large continuous mass dipping southeasterly. This feature does not coincide with the geological interpretation although it does overly parts of the large intrusive masses. Because of the lack of correlation this feature is not given much importance. It can be generally said that there is insufficient difference in magnetic properties of the intrusives and sediments to permit accurate interpolation of their boundaries.

a) Electromagnetic Survey - South Grid

The Crone J.E.M. unit was used exclusively on the south grid, since the lines were sufficiently long to permit the use of a two-man unit less susceptible to topographic effects than the VLF unit used on the north grid. The instrument was used in the in-line "shootback" configuration with a coil separation of 200 feet. Both operators record tilt angles for high and low frequency, and the resultant angles are plotted at the mid-point between the coils. Steeply dipping conductors near surface are indicated by positive readings over the conductor axis, with negative angles on each side of the positive readings. Deeper conductors may not produce positive readings, but would reflect a curve in the profile toward the positive attitude. A comparison of high and low frequency values over conductors permits an assessment of the degree of conductivity of the conductor.

The results of the EM survey are plotted in profile on the attached plan, showing separate profiles for high and low frequency. The profiles generally indicate only broad zones of very weak conductivity over heavily overburdened valleys, which are likely caused by clay-filled depressions in the bedrock. The steep sloping hillsides and cliffs cause an exaggerated effect on the resultant angle as shown by the high positive readings on the eastern end of the lines, where high positive readings indicate the steepening slope up to the west. A weakly conductive trend occurs on line 0 at 5 E, and on line 2 S at 5E. This trend could reflect a conductor of good width under fairly heavy overburden, and warrants further investigation. A vertical loop unit could be used in this area, where topography does not present a serious problem, to obtain better depth coverage of this suspected conductor.

### VIII. GEOCHEMICAL SURVEY - SOUTH GRID

A soil sampling survey was carried out over the south grid at 100 foot intervals, and the samples analyzed at Vancouver Geochemical Laboratories for copper and molybdenum. The samples were collected with grub hoes at depths of 12" to 18", from the "B" horizon wherever possible. Most of the soil is predominantly sandy clay or loam, but where humus or other organic material was present, the result is marked clearly on the plan. The samples were air-dried in camp, for shipment. An 0.5 gm sample was taken from the -60 M fraction, digested in hot  $\text{HClO}_4$  -  $\text{HNO}_3$  and analyzed in a Techtron Atomic Absorption unit, indicating results in parts per million. A total of 94 samples were collected and analyzed.

Previous work over this area had been done for copper and zinc, at double the line spacing. The zinc results were inconclusive and of very low magnitude, but the copper assays suggested the need for additional detail in the area east of the adit.

The plan of the geochemical survey shows the contoured values of copper analyses at 50 ppm intervals. A very clear and continuous anomaly extends parallel to the formational strike, over a length of 800 feet, about 700 feet east of the base line. This clarifies an anomalous indication from the previous survey. Some tie-in stations from the other survey are plotted for comparison, but are not used in contouring. There is a definite association with a group of creek tributaries which closely follow the trend of the anomaly. This is particularly evident at 10 + 00 S, 7 + 00 E, where the creeks have joined into a narrow valley. The anomaly is considered to represent a drainage concentration of copper, originating from a source near 4 + 00 S, 6 + 00 E. The northern section of the anomaly, from line 4 + 00 S to line 6 + 00 S deserves additional examination and sampling. There is a strong suggestion of migration from a second source east of the stream channels, as indicated by values of 175 ppm at 6 S, 9E, and 8S, 8 E. These locations occur on a steep slope to the west in an area of talus and overburden. An isolated value of 300 ppm at the eastern end of line 8 S could be close to the source of this anomaly.

The copper-magnetite zone at 12 + 00 S, 5 + 00 E, lies on the western fringe of the main copper anomaly, near a sample returning 72 ppm. Drainage from this zone would travel south and east over the major cliff plunging down to Lois Creek.

Slightly anomalous molybdenum values occur in the same area as the copper anomalies, following the stream channels. One isolated high value of 70 ppm is located on the eastern flank of the main copper anomaly.

**RECOMMENDATIONS:**

1. The geochemical copper anomaly in the eastern section of the south grid should be thoroughly tested by trenching, prospecting and detailed geophysics. A magnetometer survey and vertical loop electromagnetic survey on a 50 foot by 100 foot pattern over the length of the anomaly and on its extensions to the north and south should locate any important zones of mineralization.

2. No further work should be done on the upper showings, at least until after the lower area is re-examined. Since previous drilling apparently did not completely test the zone under the No.1 Trench, a deeper hole could be justified if a drill is brought to the property for work on the lower area.

3. Since weather conditions are more favourable at the lower elevation, an earlier start would be possible. A heliport has been established on the south side of the grid to permit helicopter access. A four-man crew should begin the work in late July, and could complete the initial work in approximately three weeks. The cost of the initial work is estimated at \$10,000.

Respectfully submitted,



G. R. C-Dunlop, P.Eng.

Toronto, Ontario.  
October 29, 1971.

I HEREBY CERTIFY that the above programme was supervised by G. R. Cunningham-Dunlop under my direction.



L. G. White, P. Eng.

DISTRIBUTION OF LABOUR AND COSTS FOR GEOPHYSICAL,  
 GEOLOGICAL AND GEOCHEMICAL SURVEYS, AND TRENCH-  
 ING, ON LINDA 1 - 23 INCL. CARRIED OUT FROM AUGUST 4-  
 SEPTEMBER 24, 1971

---

1. Electromagnetic Surveys:

L. Meindl - Control Survey, grid layout, linecutting and instrument operation - 17 days @ \$30/day			\$ 510.00
C. Blore - Linecutting -	5	" "	23.08/day 115.40
J. A. Pollock - Linecutting -	5	" "	50/day 250.00
G. R. Dunlop - Supervision, Instruments	25	" "	75/day 1875.00

2. Magnetometer Survey:

L. Meindl - Instrument Operator -	8	days @	30/day 240.00
G. R. Dunlop - Supervision & detail -	2	" "	75/day 150.00

3. Geochemical Survey:

L. Meindl - Supervision, Records -	5	" "	30/day 150.00
B. Corrigan, Sampler, Linecutter -	5	" "	35/day 175.00
L. Bancroft, Sampler, Linecutter -	5	" "	30/day 150.00

4. Geological Mapping:

J. A. Pollock -	15	" "	50/day 750.00
G. R. Dunlop -	8	" "	75/day 600.00
L. Meindl -	3	" "	20/day 90.00

5. Trenching:

B. Corrigan -	5	" "	35/day 175.00
L. Bancroft -	5	" "	30/day 150.00
J. Pollock -	8	" "	50/day 400.00


---


C/F \$ 5780.40

	B/F	\$ 5780.40
<u>Equipment:</u>		
Ronka EM 16 rental		200.00
Crone JEM rental		183.75
Magnetometer		100.00
Copco Cobra & steel		150.21
<u>Food and Camp Supplies</u>		1520.29
<u>Geochemical Assays</u>		288.30
<u>Engineering and Reports</u>		1375.00
Administrative and Supervision - L. G. White, P. Eng., Mining Consultant		600.00
		\$ 10197.95
		\$ 10197.95

I, L. G. White, hereby declare that the information contained in the above schedule is true to the best of my information, knowledge and belief 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 4 day of )  
November, A. D. 1971 )

  
\_\_\_\_\_  
L. G. White

  
\_\_\_\_\_  
A Commissioner for taking Affidavits  
for British Columbia



C E R T I F I C A T E

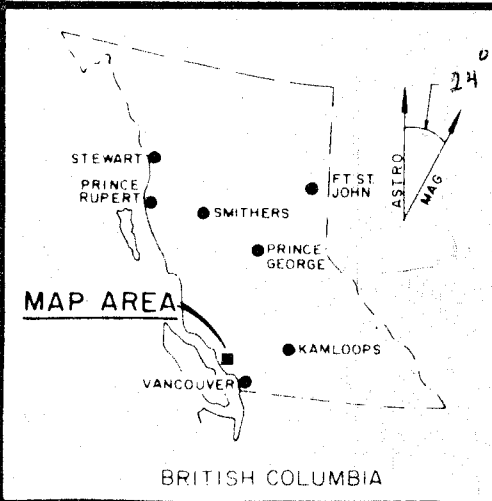
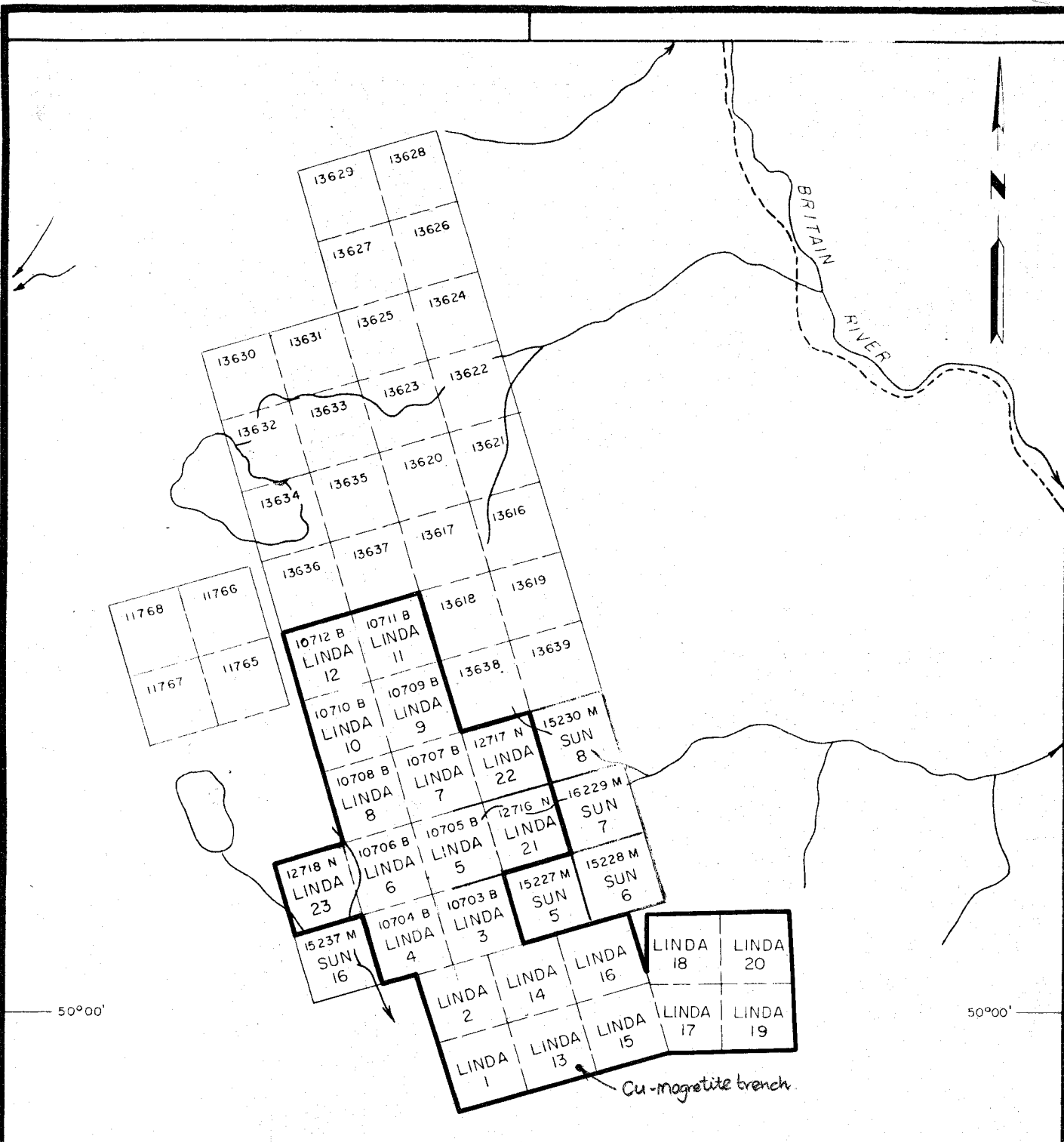
I, G. R. Cunningham-Dunlop, residing in Haileybury, Ontario, do hereby certify:

1. I am a mining engineer, having graduated from Queen's University with a Bachelor of Science degree, in 1957.
2. I am a registered Professional Engineer of the Province of Ontario, and have been practicing my profession since 1957.
3. I have specialized in exploration and geophysics, and have been manager of Pioneer Consultants Limited, providing exploration services to other companies, for the past 10 years.
4. I personally was present on the property described in this report, and supervised the field work from August 22 to September 24, 1971.
5. I have no direct interest in the property or in the Brittain River Syndicate, other than an indirect interest in New Calumet Mines Limited, one of the members of the syndicate.

Dated at Toronto, Ontario, October 29, 1971.



G. R. Cunningham-Dunlop, P.Eng.



LOCATION MAP  
BRITAIN RIVER  
CLAIM GROUP

3000 0 3000 6000  
SCALE IN FEET

JULY, 1971

**Brittain River Syndicate**

**Financial Statements**

**31st October, 1971**

**CHRISTIAN, ROLFE & CO.**

CHARTERED ACCOUNTANTS

VANCOUVER, B.C.

Brittain River Syndicate

Balance Sheet

31st October, 1971

Assets

Cash in bank

\$ 2,806.41

---

Liabilities

Accounts payable

\$ 300.00

Capital - partners equity

Home Oil Company Ltd.  
New Calumet Mines Ltd.  
Chino Gold Mines Ltd.  
Minorex Ltd.

\$ 6,250.00  
6,250.00  
6,250.00  
6,250.00

25,000.00

Deduct: Expenses to 31st October, 1971  
- per Exhibit B

22,493.59

2,506.41

---

\$ 2,806.41

---

Prepared from the books and records  
of the syndicate without audit.

CHRISTIAN, ROLFE & CO.,  
Chartered Accountants

Brittain River Syndicate

Exhibit B

Statement of Expenses

for the month of October and

the three months ended 31st October, 1971

	<u>Month of</u> <u>October</u>	<u>3 mos. to</u> <u>31/10/71</u>
Brittain River option		\$ 2,000.00
Geo-chemical	\$ 119.00	288.30
Consulting		5,400.00
Salaries and wages	52.00	3,906.03
Outside labour	42.80	42.80
Geological and engineering supplies		63.85
Employee benefits	155.10	252.26
Camp and field	19.39	1,510.73
Transportation - helicopter		4,392.27
- fixed wing		1,142.20
- other		353.00
Maps and supplies		16.73
Claim costs		282.25
Equipment rental		463.75
Management fee	300.00	900.00
Entertainment		16.14
Office and postage	10.15	67.60
Communications	.80	225.06
Legal		611.00
Accounting	50.00	120.00
Equipment - Schedule 1		419.62
	<u>\$ 749.24</u>	<u>\$ 22,493.59</u>
<u>Estimated budget for the 1971 program</u>		<u>\$ 25,000.00</u>
<u>Expenditures to date</u>		<u>22,493.59</u>
<u>Balance 31st October, 1971</u>		<u>\$ 2,506.41</u>

Prepared from the books and records of the  
syndicate without audit.

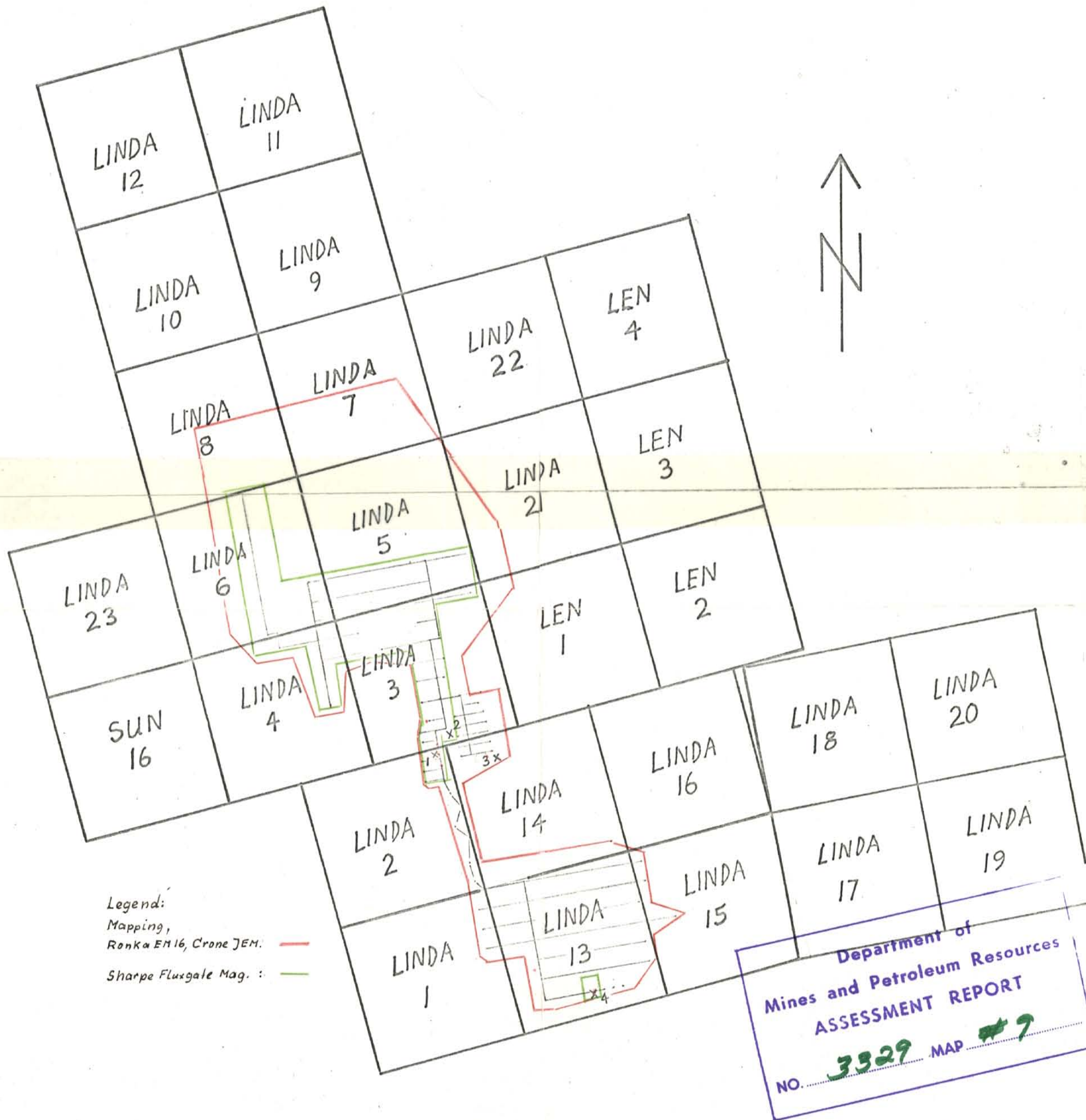
CHRISTIAN, ROLFE & CO.,  
Chartered Accountants

Brittain River Syndicate

Equipment

31st October, 1971

300'	1/4" nylon rope	\$	65.03
2	Machettes		12.38
2	Trapper Nelsons		65.10
500'	B Line		35.55
1	Pair safety glasses		2.62
3	20 lb. propane cylinders		77.81
1	18" Stelson wrench		10.92
7	Coro steel		145.05
1	Air filter		5.16
		\$	<u>419.62</u>

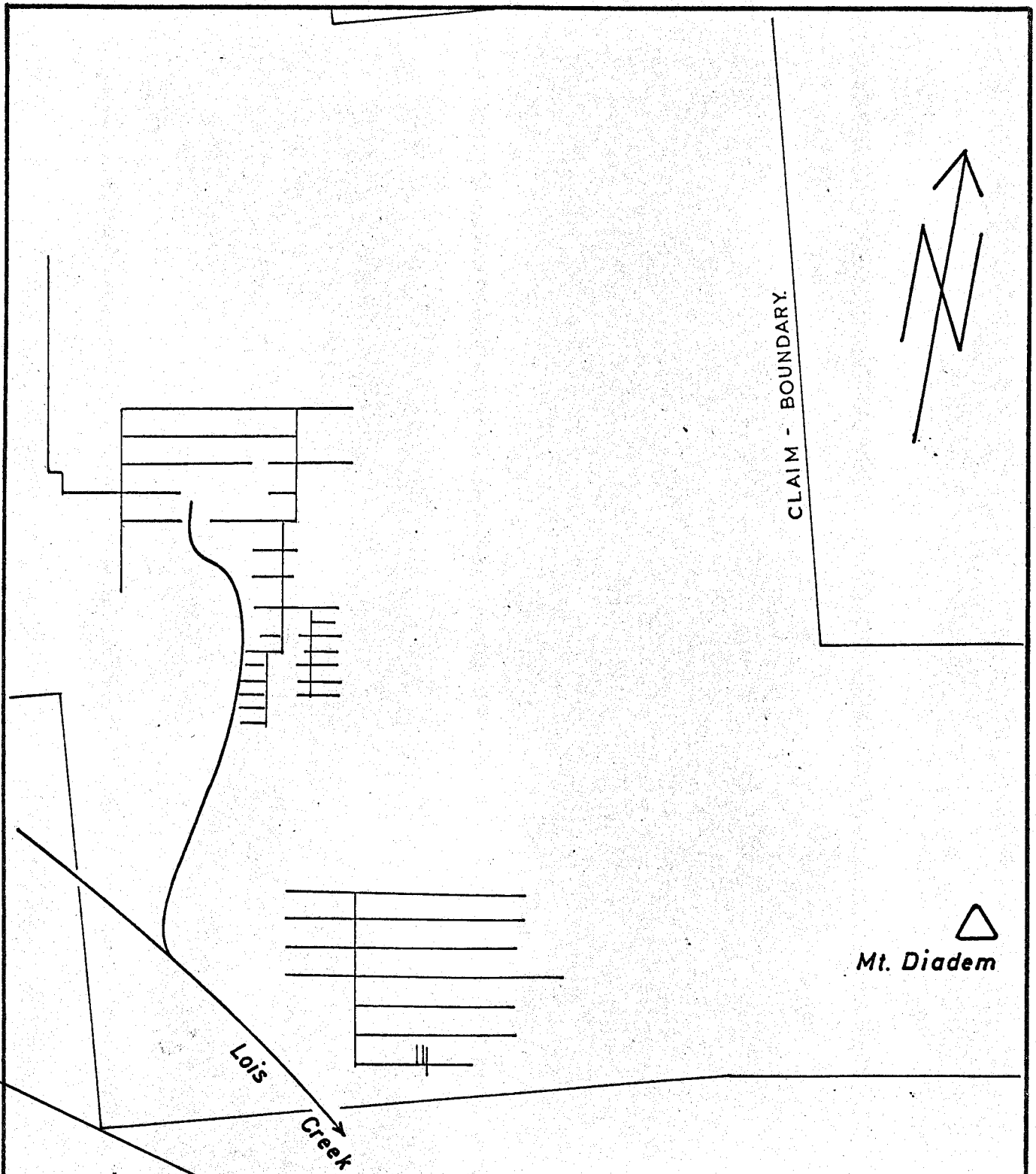


Legend:  
 Mapping,  
 Ronka EM 16, Crone JEM. ———  
 Sharpe Fluxgate Mag. : ———

Approximate Boundary of  
 Geological Mapping and  
 Geophysical Survey.

BRITAIN RIVER CLAIM GROUP.  
 Gridwork and Trenching 1971.  
 Scale: 1 in. = 1000 ft.

Department of  
 Mines and Petroleum Resources  
 ASSESSMENT REPORT  
 NO. 3329 MAP # 9



CLAIM - BOUNDARY.



Mt. Diadem

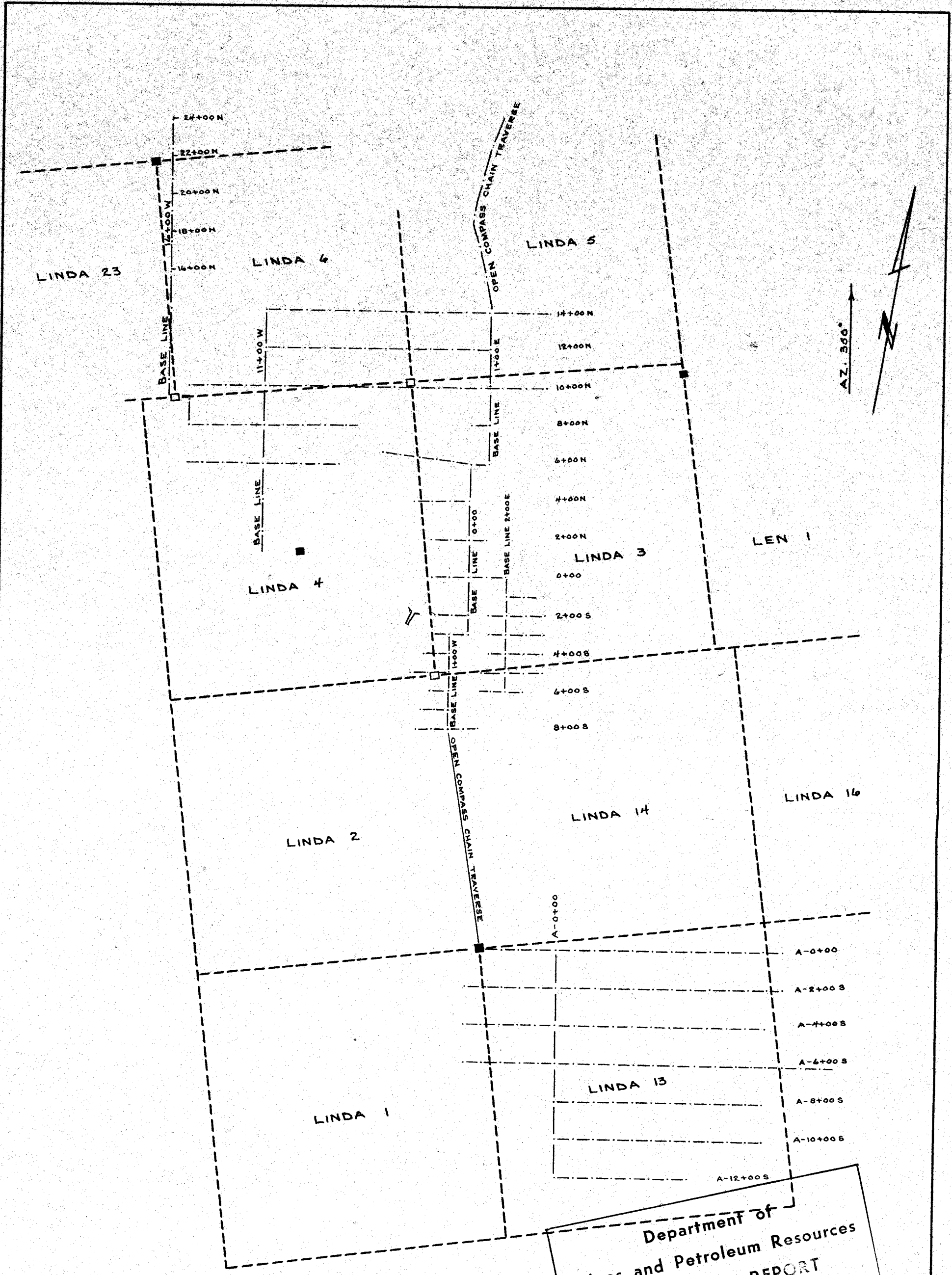
Lois  
Creek

Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. **3929** MAP **# 10**

BRITTAIN RIVER SYNDICATE.	
SURVEY GRID.	
Location Map.	
Scale: 1in. = 1000ft.	Date: October 1971.



ed



**LEGEND**

- BASE LINES
- - - PICKET OR RIBBONED LINES
- - - CLAIM LINES
- CLAIM POST ASSUMED
- CLAIM POST LOCATED

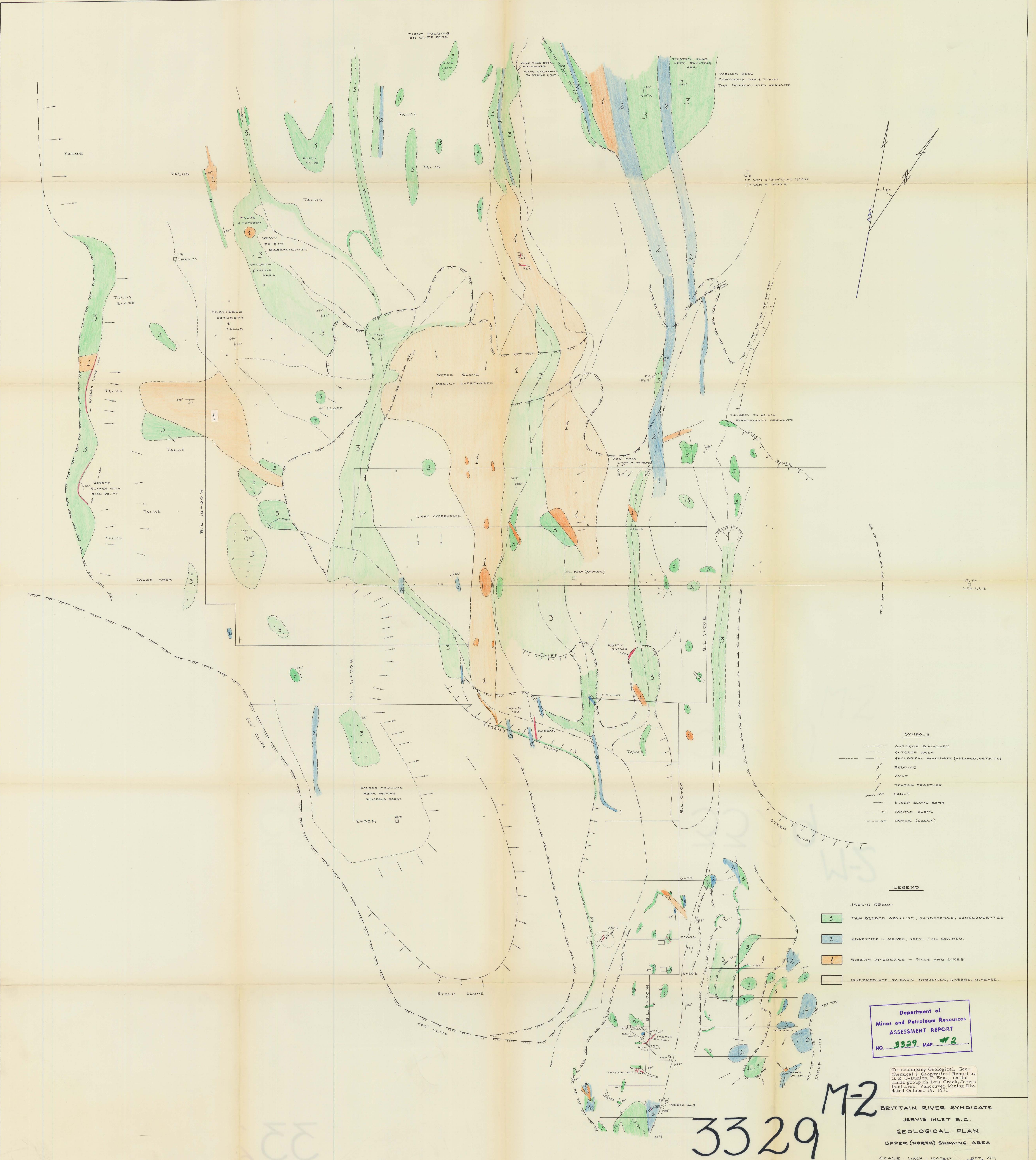
Department of  
 Mines and Petroleum Resources  
**ASSESSMENT REPORT**  
 NO. **3329** MAP **49**

To accompany Geological, Geo-chemical & Geophysical Report by G. R. C-Dunlop, P. Eng., on the Linda group on Lois Creek, Jervis Inlet area, Vancouver Mining Div. dated October 29, 1971

**BRITAIN RIVER SYNDICATE**  
 JERVIS INLET B.C.  
 GRID LAYOUT - UPPER AND LOWER SHOWINGS  
 SCALE : 1 INCH = 500 FEET  
 OCT., 1971

*G. R. C-Dunlop*





- SYMBOLS**
- OUTCROP BOUNDARY
  - OUTCROP AREA
  - GEOLOGICAL BOUNDARY (ASSUMED, DEFINITE)
  - BEDDING
  - JOINT
  - TENSION FRACTURE
  - FAULT
  - STEEP SLOPE DOWN
  - GENTLE SLOPE
  - CREEK (GULLY)

- LEGEND**
- JARVIS GROUP
- 3 THIN BEDDED ARGILLITE, SANDSTONES, CONGLOMERATES.
  - 2 QUARTZITE - IMPURE, GREY, FINE GRAINED.
  - 1 DIORITE INTENSIVES - BILLS AND DIXES.
  - INTERMEDIATE TO BASIC INTENSIVES, GABBRO, DIABASE.

Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 3329 MAP #2

To accompany Geological, Geochemical & Geophysical Report by G. R. C. Dunlop, P. Eng., on the Jarvis Inlet area, Vancouver Mining Div. dated October 29, 1971

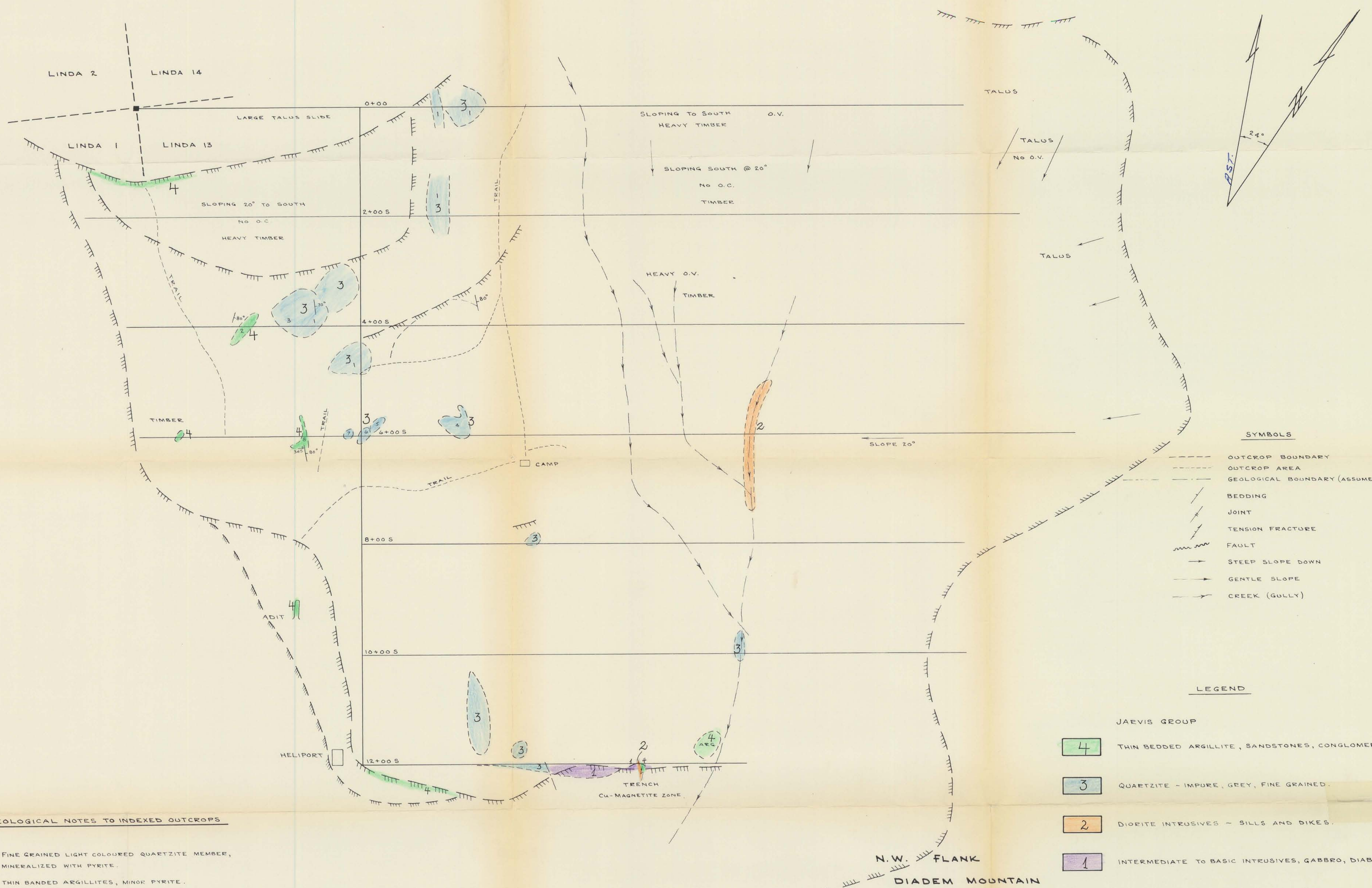
BRITAIN RIVER SYNDICATE  
JERVIS INLET B.C.  
GEOLOGICAL PLAN  
UPPER (NORTH) SHOWING AREA

SCALE: 1 INCH = 100 FEET OCT. 1971

3329

M-2





- SYMBOLS**
- OUTCROP BOUNDARY
  - - - - - OUTCROP AREA
  - - - - - GEOLOGICAL BOUNDARY (ASSUMED, DEFINITE)
  - /// BEDDING
  - /// JOINT
  - /// TENSION FRACTURE
  - /// FAULT
  - STEEP SLOPE DOWN
  - GENTLE SLOPE
  - CREEK (GULLY)

- LEGEND**
- JARVIS GROUP
- 4 THIN BEDDED ARGILLITE, SANDSTONES, CONGLOMERATES.
  - 3 QUARTZITE - IMPURE, GREY, FINE GRAINED.
  - 2 DIORITE INTRUSIVES - SILLS AND DIKES.
  - 1 INTERMEDIATE TO BASIC INTRUSIVES, GABBRO, DIABASE.

**GEOLOGICAL NOTES TO INDEXED OUTCROPS**

- 1 FINE GRAINED LIGHT COLOURED QUARTZITE MEMBER, MINERALIZED WITH PYRITE.
- 2 THIN BANDED ARGILLITES, MINOR PYRITE.
- 3 FINE GRAINED QUARTZITE OR POSSIBLE INTRUSIVE WELL FRACTURED, MINERALIZED WITH PYRITE.
- 4 LARGE QUARTZITE MASS, CHLORITIZED, WITH PYRITE.
- 5 MASSIVE FINE GRAINED SEDIMENTS, SOME PYRITE.
- 6 QUARTZITE, INCLUDING CONGLOMERATE MEMBER WITH SMALL MAFIC PEBBLES.
- 7 WELL BANDED WHITE QUARTZITE.
- 8 FINE GRAINED BANDED ARGILLITES.

Department of  
 Mines and Petroleum Resources  
**ASSESSMENT REPORT**  
 NO. 3337 Map 73

To accompany Geological, Geochemical & Geophysical Report by G. R. C. Dunlop, P. Eng., on the Linda group on Lois Creek, Jarvis Inlet area, Vancouver Mining Div. dated October 29, 1971

**BRITAIN RIVER SYNDICATE**  
 JERVIS INLET B.C.  
**GEOLOGICAL PLAN**  
 LOWER (SOUTH) SHOWING

SCALE: 1/4 INCH = 100 FEET      OCT. 1971

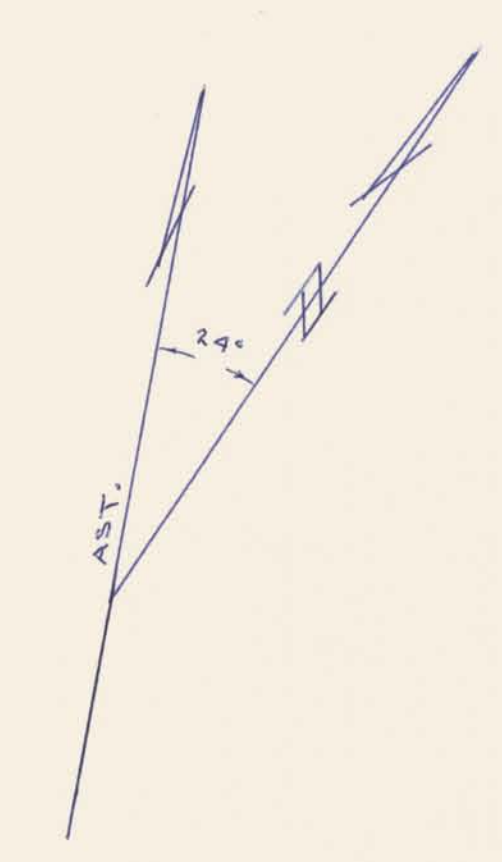
*G.R.C. Dunlop*



B.L. 16+00 W

B.L. 11+00 W

1+00 E



**NOTES**  
 SHARPE MF-1 FLUXGATE MAGNETOMETER  
 VALUES SHOWN IN GAMMAS, DIURNAL CORRECTIONS APPLIED  
 CONTOUR INTERVAL 100 GAMMAS

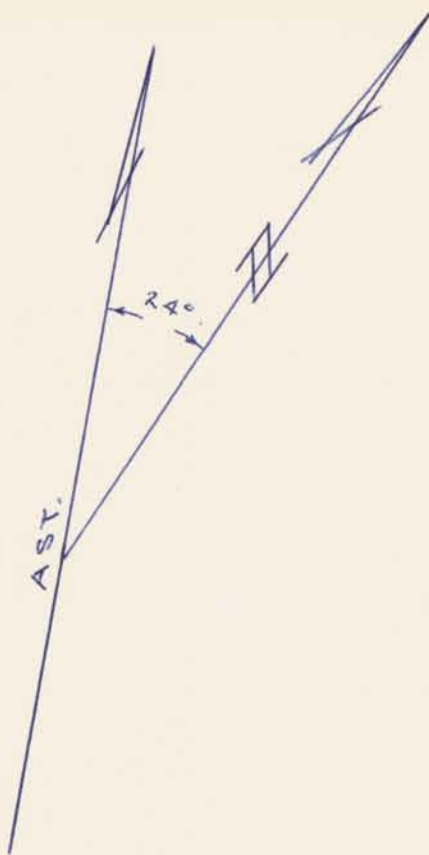
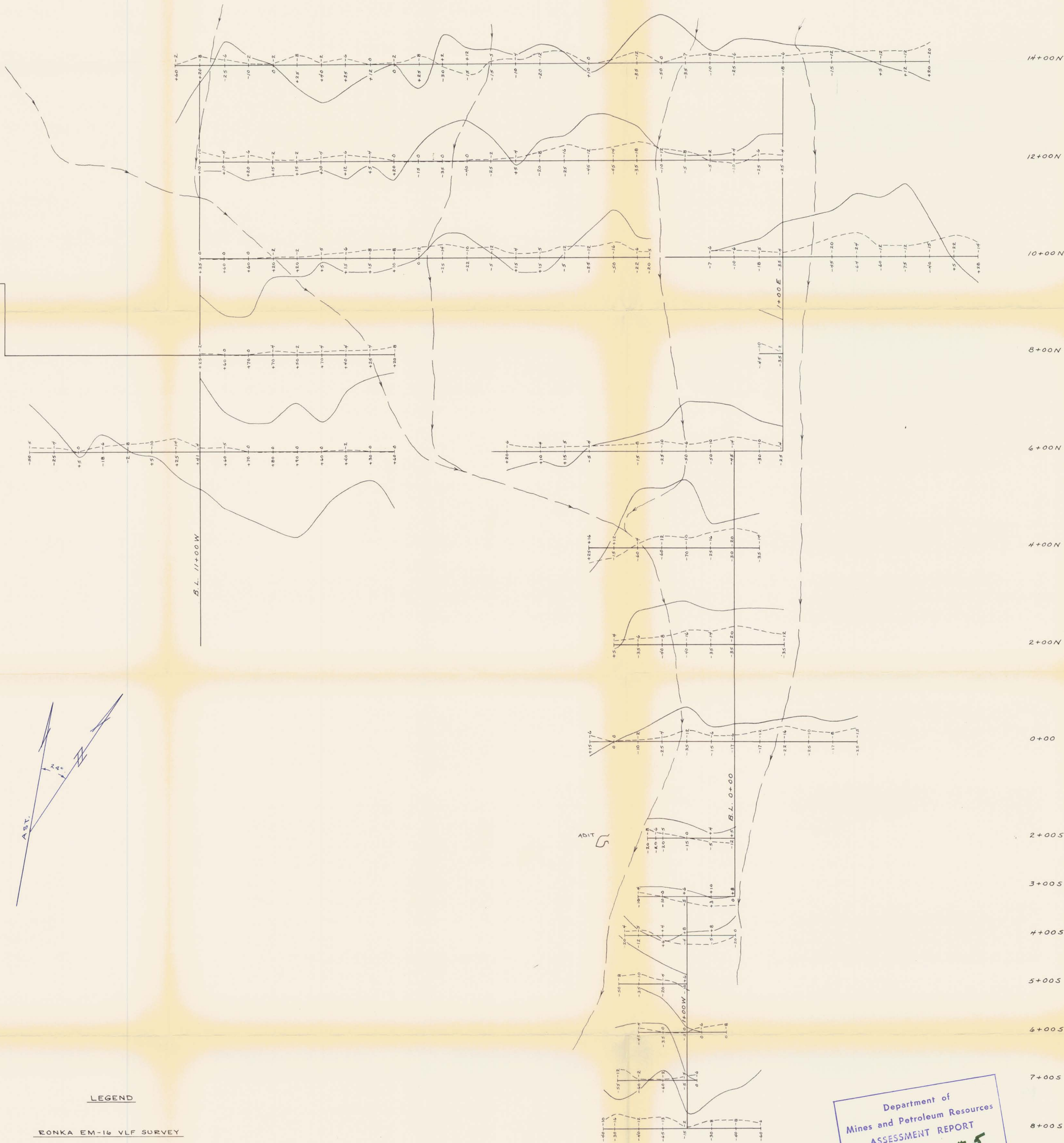
Department of  
 Mines and Petroleum Resources  
**ASSESSMENT REPORT**  
 NO. 3829 MAP #4

To accompany Geological, Geo-chemical & Geophysical Report by G. R. C. Dunlop, P. Eng., on the Linda group on Lois Creek, Jervis Inlet area, Vancouver Mining Div. dated October 29, 1971

**BRITAIN RIVER SYNDICATE**  
 JERVIS INLET B.C.  
**MAGNETOMETER SURVEY**  
 UPPER (NORTH) SHOWING  
 SCALE: 1 INCH = 100 FEET  
 OCT. 1971

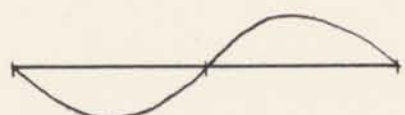


B.L. 16+00 W



LEGEND

RONKA EM-16 VLF SURVEY



IN-PHASE TILT ANGLE



OUT OF PHASE (QUADRATURE) TILT ANGLE



CONDUCTOR AXIS

PROFILE SCALE 1" = 50'

Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 3329 MAP # 5

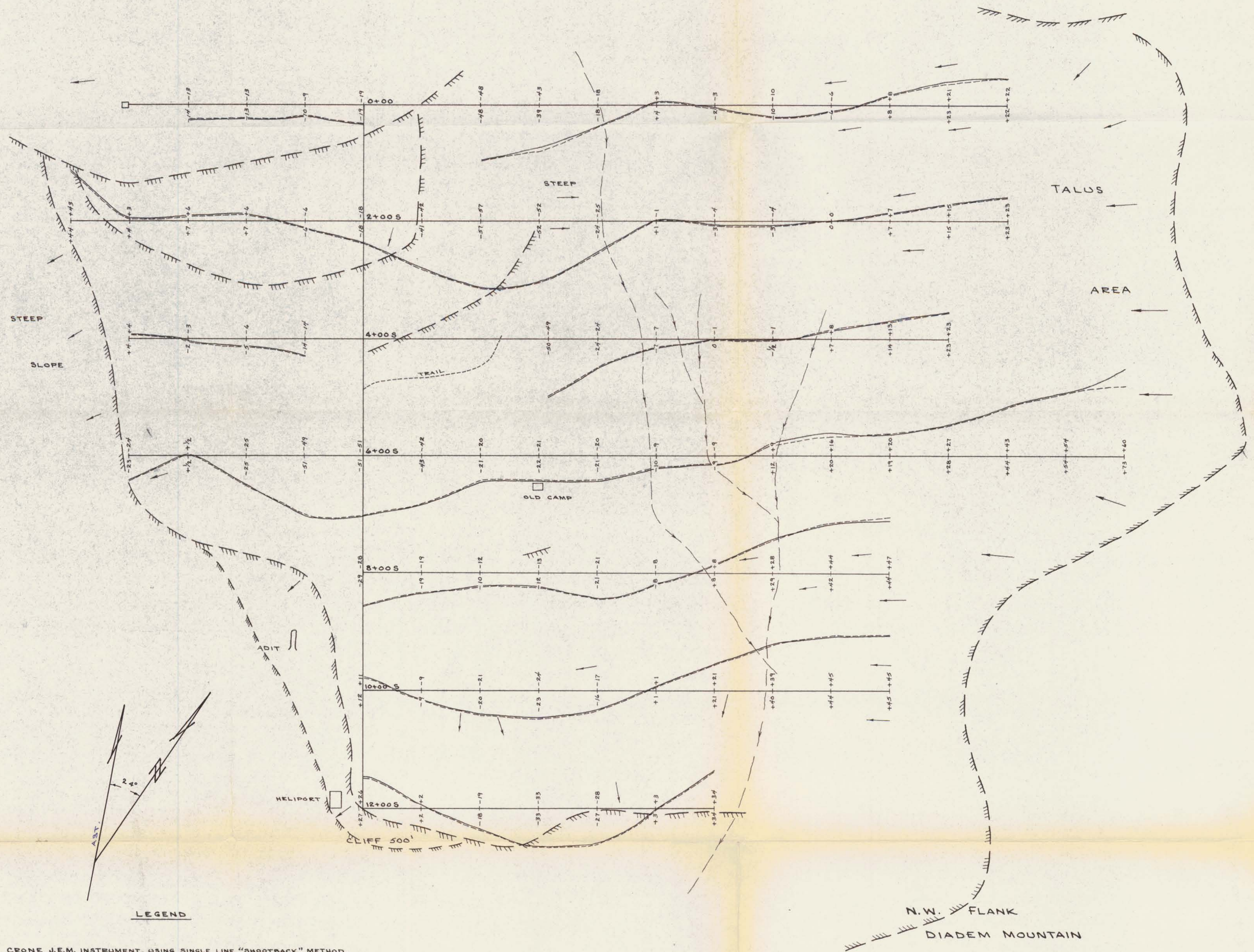
To accompany Geological, Geochemical & Geophysical Report by G. R. C. Dunlop, P. Eng., on the Linda group on Lois Creek, Jervis Inlet area, Vancouver Mining Div. dated October 29, 1971

BRITANNIA RIVER SYNDICATE  
JERVIS INLET B.C.  
ELECTROMAGNETIC SURVEY  
UPPER (NORTH) SHOWING

SCALE: 1 INCH = 100 FEET OCT. 1971

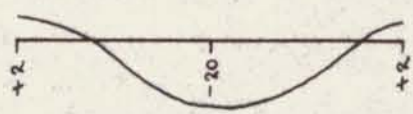
*G.R.C. Dunlop*



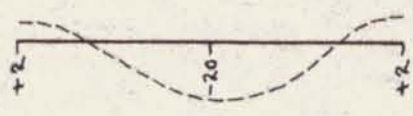


**LEGEND**

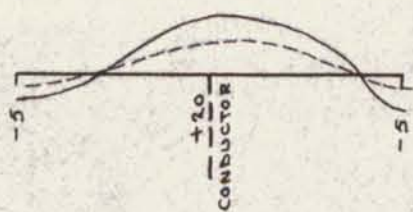
CRONE J.E.M. INSTRUMENT, USING SINGLE LINE "SHOOTBACK" METHOD, TWO FREQUENCY RECORDING, COIL SEPARATION OF 200', STATION AT MID-POINT BETWEEN COILS.



HIGH FREQUENCY PROFILE, 1" = 50', 1800 CPS.



LOW FREQUENCY PROFILE, 1" = 50', 480 CPS.



TYPICAL PROFILE OVER NARROW VERTICAL CONDUCTOR

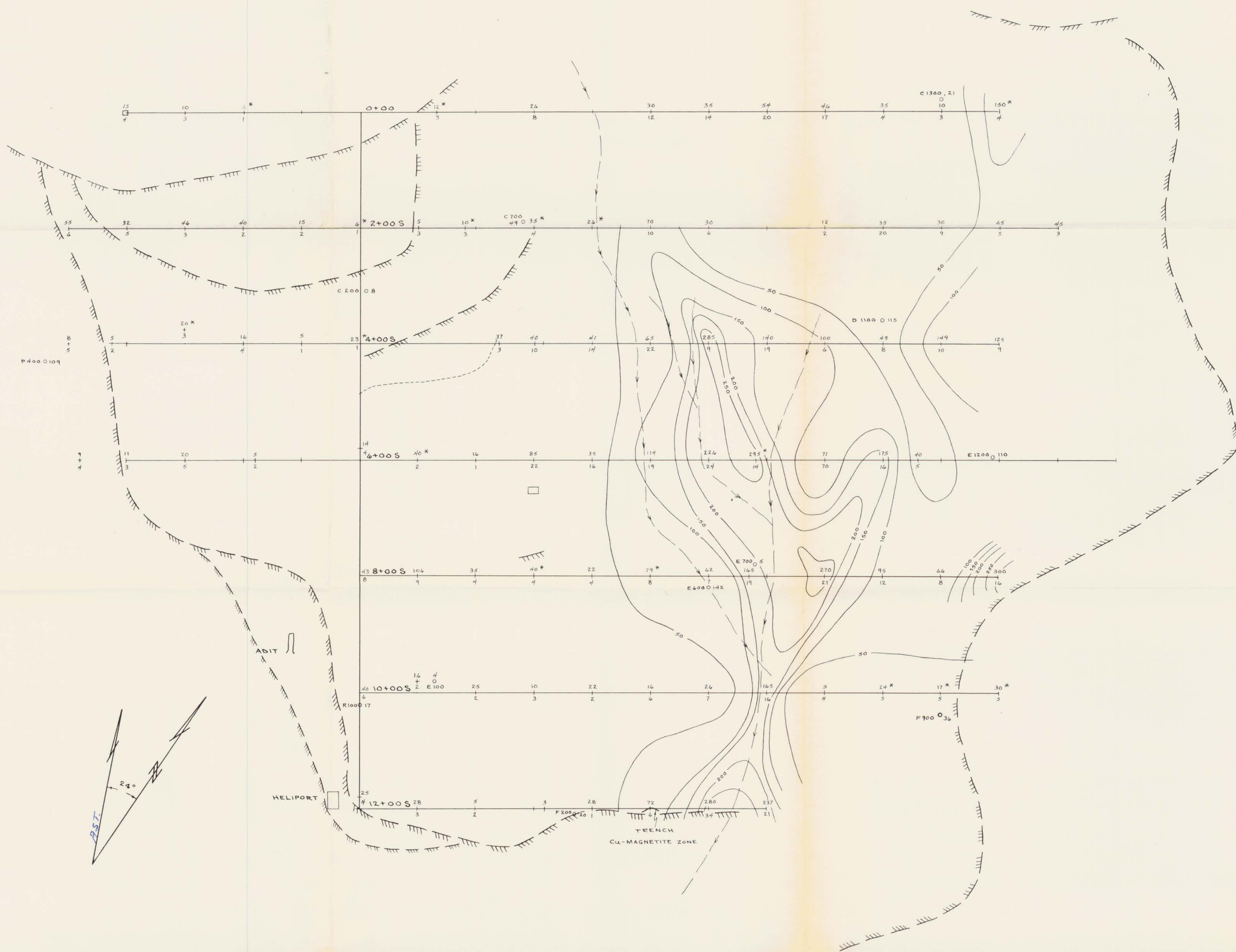
→ DIRECTION OF SURFACE SLOPE  
 // TOP OR BOTTOM OF CLIFF

Department of  
 Mines and Petroleum Resources  
 ASSESSMENT REPORT  
 NO. 3329 MAP #6

BRITAIN RIVER SYNDICATE  
 JEEVIS INLET B.C.  
 ELECTROMAGNETIC SURVEY  
 LOWER (SOUTH) SHOWING  
 J.E.M. "SHOOTBACK" METHOD  
 SCALE: 1 INCH = 100 FEET OCT., 1971

*[Handwritten signature]*





NOTES

SOIL SAMPLES TAKEN AT DEPTHS OF 12"-18"  
FROM "B" HORIZON WHERE POSSIBLE.

ANALYSIS - HOT ACID EXTRACTION OF -80M FRACTION,  
ATOMIC ABSORPTION ANALYSIS OF 0.5 GM. SAMPLE.

\* WHERE NOTED, ORGANIC MATERIAL PRESENT

CONTOUR INTERVALS  
COPPER 50 PPM  
MOLYBDENUM

LEGEND

80 ——— COPPER ANALYSIS IN PPM.  
80 ——— MOLYBDENUM ANALYSIS IN PPM.

Department of  
Minas and Petroleum Resources  
ASSESSMENT REPORT  
NO. 3329 MAP # 7

To accompany Geological, Geo-  
chemical & Geophysical Report by  
G. R. C. Dunlop, P. Eng., on the  
Linda group on Lois Cr., Jarvis  
Inlet area, Vancouver M. D. dated  
October 29, 1971

BRITAIN RIVER SYNDICATE  
JERVIS INLET B.C.  
GEOCHEMICAL SURVEY  
LOWER (SOUTH) SHOWING  
SCALE: 1 INCH = 100 FEET      OCT. 1971

*Handwritten signature*