REPORT ON THE

GEOLOGY AND MINERALIZATION

SUMMIT LAKE AREA, Y.T.-N.W.T.

for

VESTOR EXPLORATIONS LTD.

by

N. Badham

August, 1973

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INTRODUCTION

This report provides a background on the regional geology of the general Summit Lake area and is a compilation of information gained from detailed mapping of specific claim groups and from a number of strategic regional traverses. The general geology of the area is shown in Map 1 (pocket) and the location of Vestor's claim groups is shown in Map 2.

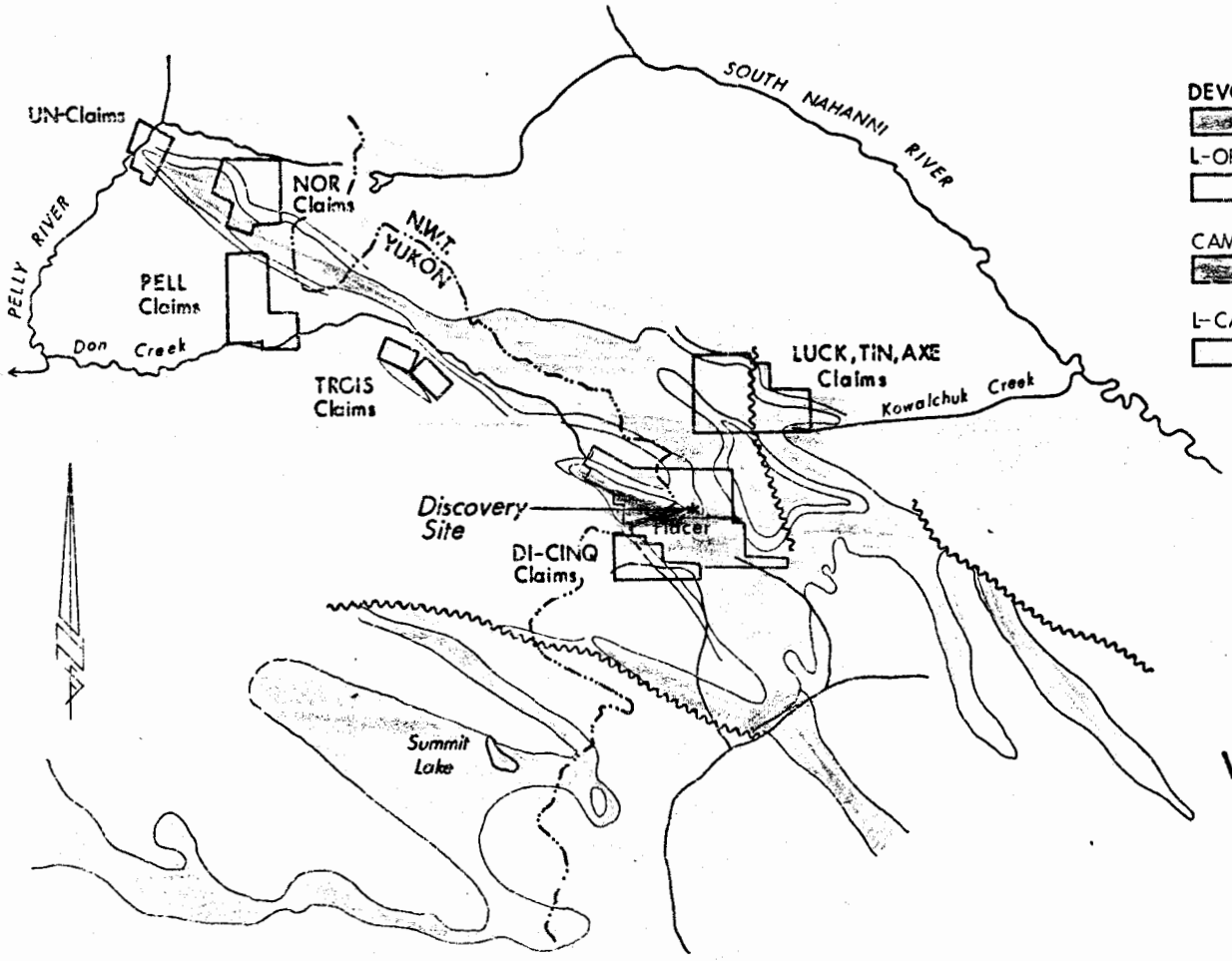
LITHOLOGIES

Cambrian (?) Grey Shales

The lowermost unit exposed in the general area is a grey, siliceous, non-graphitic, non-calcareous shale. It underlies the Cambrian limestone unit and is exposed in the cores of larger anticlines. The lithology is similar wherever exposed. The age is not known but it is apparently conformable with the overlying Cambrian limestones and therefore is tentatively assigned to the Cambrian.

Cambrian Limestones

This lithology is subdivided into an upper wavy banded facies and a lower clastic facies. The wavy banded limestone is thin bedded and has thin shaley partings which are displaced by widely spaced cleavage giving a wavy appearance. The lower clastic facies includes calc-arenites, shale chip conglomerates, quartzites and relatively pure limestones. These Cambrian limestones are underlain by an undetermined thickness of grey non-graphitic shale, and are overlain gradationally by Ordovician graphitic shales. It is apparently conformable with both older and younger units. The age is established as Cambrian by Protosponges. It is probably a shallow water deposit, shelf and back-reef. The lower clastic facies contains cross-bedded, ripple marked ortho-



MAP 2.

VESTOR EXPLORATIONS LTD.

GENERAL GEOLOGY SUMMIT LAKE AREA

Yukon Territory-Northwest Territories

SCALE 0 2 4 6 8 MILES

N. Badham · Sept. 1973

quartzites. The combined thickness of the wavy banded and clastic facies is in the order of 1000 feet. The clastic facies varies in thickness and is not always present.

Ordovician Graphitic Shales

This unit varies between 200 and 400 feet in thickness. In places it is apparently very thin, probably due to tectonic thinning on fold limbs. It is conformable with limestones below and with the siltstone turbidites above. It contains black fetid concretionary limestone beds. Sulphides, mainly pyrite, are ubiquitous and the zinc background is high. Gypsum and carbonate veinlets are common and rücken, up to 1 foot wide and a few yards long, contain quartz, carbonate, tetrahedrite and hematite, together with a host of zinc and copper alteration minerals.

The sequence was identified as L-M Ordovician on the basis of the graptolites, Tetragraptus and Phyllograptus. The absence of Monograptids indicates that the entire sequence is Ordovician.

These deposits probably accumulated in a starved basin and the whole section probably represents some 50 million years of deposition. Conditions were consequently ideal for the syngenetic or penesyngenetic accumulation of base metals, introduced by hydrothermal solutions (possibly volcanogenic). A possible zonation of sulphides is indicated, from lead-zinc in the center to copper-zinc at the margins.

Sparse chert beds near the top of the unit may be the deposits of volcanic emanations or may be congealed silica-gel from organic remains which accumulated in the almost complete absence of clastic sedimentation. Occasional syngenetic barite beds also occur near the top.

Siltstone Turbidites

These appear to be conformable with the underlying graphitic shales and overlying conglomerates. The predominant lithology is a finely bedded silvery-weathering, black siliceous siltstone of distal turbidite origin. Cross-bedding, scours,ripple marks, loading and very rarely preserved sole-markings were observed. The thickness is estimated to be between 200' and 300', and like the graphitic shales is locally thinned and thickened by tectonism. It is not fossiliferous. It contains some graphitic beds. A 10 foot fetid limestone occurs near the top and up to 50 feet of very graphitic shales occur at the top. The top graphitic unit is only present in the SE part of the belt and is missing in the NW part, probably through non-deposition as no unconformity was recognized. Barite beds occur in the lower part of the section.

The age is probably mainly Silurian. These distal turbidites likely represent incipient instability of the hinterland.

Devonian to Carboniferous Conglomerates, Sandstones and Shales

These are a cyclic sequence of conglomerates and grits, sandstones, siltstones and shales. They show many features of proximal turbidite and slump deposition. Pyrite is common. The age is presumed to be Devonian to Carboniferous. The conglomerate clasts are quartz, chert pebbles, shale chips and huge rip-up clasts of shales. There is little sign of continental detritus is these conglomerates. The grits and sandstones have the composition of greywacke. This sequence is believed to be a product of slumping off of an overloaded and unstable shelf.

A depositional model for the units is given in Figure 1, which incorporates data from Vestor's local mapping as well as regional mapping by the Geological Survey of Canada.

MINERALIZATION

Base Metals

Syngenetic or penesyngenetic zinc-lead and copper in an apparently zoned sequence, were deposited with the Ordovician graphitic shales. All the data gathered, indicates the existence of a typical euxinic restricted basin during the Ordovician, into which most of the deposition was the 'pelagic rain' of organic detritus. Very little clastic material reached the basin. Deposits of this type in other parts of the world, such as Mount Isa, MacArthur River, the Northern Rhodesian copper belt and the Cupferschiefer are usually pancake shaped, i.e. thin, relative to their wide extent. Iron, copper, zinc and lead zonation is typical. Metal concentrations within this type of deposit usually decrease gradually to background values with distance outward from the main center of deposition.

Barite

Thin, discontinuous syngenetic barite deposits are not uncommon throughout the area in the upper parts of the graphitic shales and lower parts of the siltstone turbidites. These are probably sea-floor chemical precipitates and may have originated from submarine hydrothermal springs.

STRUCTURE

The structure is dominated by the NW-trending South Nahanni Anticlinorium. To the NE structures are broad and open. To the SW (Summit Lake area), they are tighter and the intensity of deformation increases as shown in Figure 2A. The major folds (F_1) in the area are related to this anticlinorium. They strike at 300° ± 20° and have a regional penetrative cleavage (S_1). This

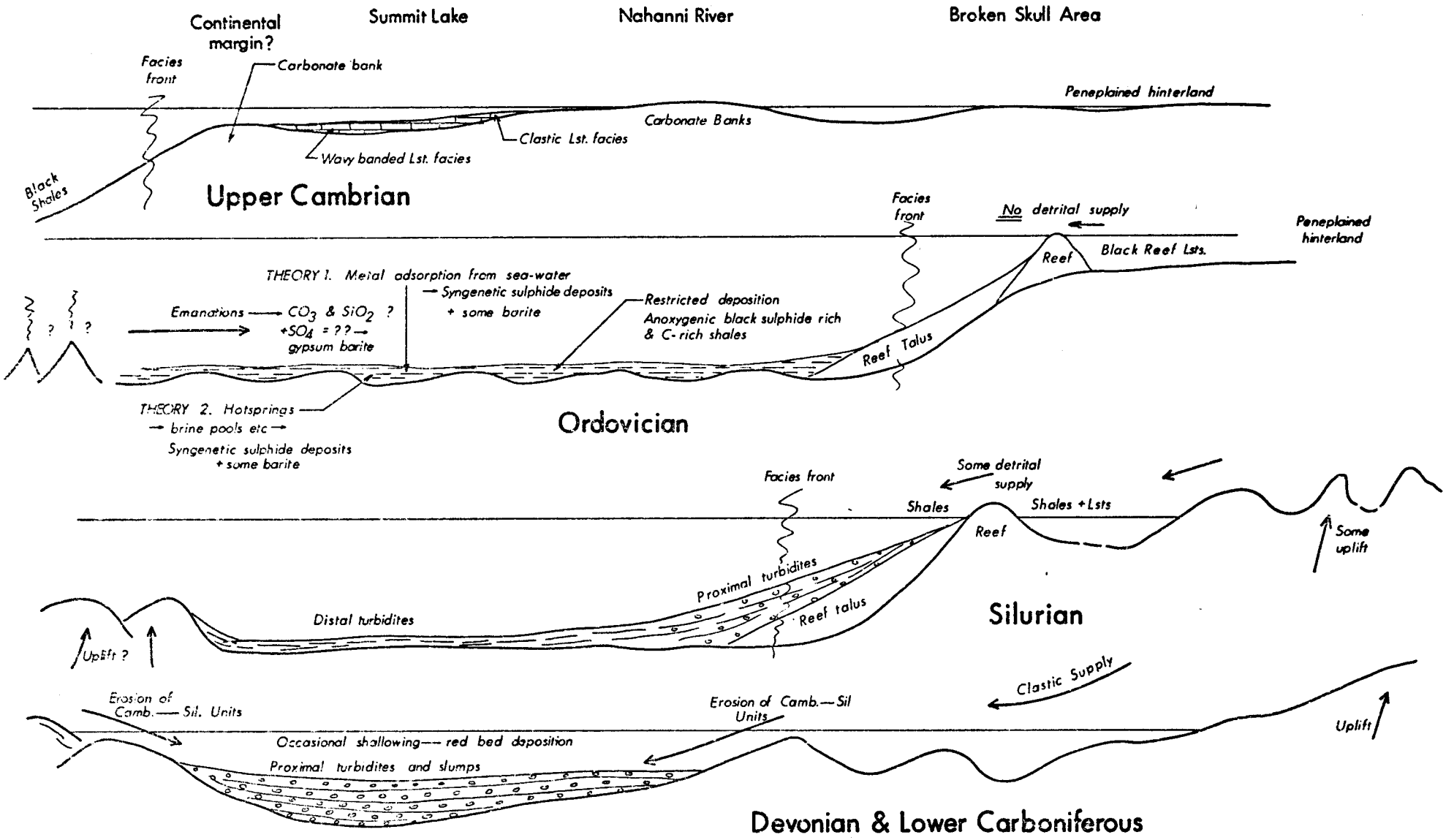
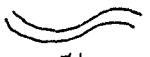
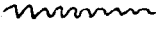
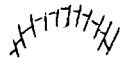

Continental margin?
Summit Lake
Nahanni River
Broken Skull Area
Facies front
Carbonate bank
Peneplained hinterland
Carbonate Banks
Clastic Lst. facies
Wavy banded Lst. facies
Black Shales
Upper Cambrian
Facies front
No detrital supply
Peneplained hinterland
Reef
Black Reef Lsts.
THEORY 1. Metal adsorption from sea-water
Syngenetic sulphide deposits
+ some barite
Restricted deposition
Anoxygenic black sulphide rich
& C-rich shales
Emanations
CO_3 & SiO_2 ?
$+SO_4$ = ??
gypsum barite
Reef Talus
THEORY 2. Hotsprings
brine pools etc
Syngenetic sulphide deposits
+ some barite
Ordovician
Facies front
Some detrital supply
Shales
Shales + Lsts
Reef
Some uplift
Proximal turbidites
Distal turbidites
Reef talus
Silurian
Uplift ?
Erosion of Camb.— Sil. Units
Clastic Supply
Erosion of Camb.—Sil Units
Uplift
Occasional shallowing— red bed deposition
Proximal turbidites and slumps
Devonian & Lower Carboniferous

FIG. 1.

cleavage fans across these folds, the fan width being some 20°. The major F_1 folds in turn contain two orders of parasitic meso folds and one order of microfolds as depicted in Figure 2B. The development of folding is dependent on lithology as tabulated below:-

Lithology	Major	1st Order	2nd Order	Microfolds
Conglomerate			Not developed	Not developed
Siliceous Shale				
Graphitic Shale		"	"	"
Limestones			Not seen	

The folding rarely symmetrical but is usually made up of tight syncline-open-anticline pairs, as shown in Figure 2C. All overturning observed is towards the NE. The folds all plunge at between 10° and 20° to the northwest, except in areas where cross-folds alter this plunge.

A consequence of this fold pattern is an intertongueing of older and younger units, the latter terminating to the east and the former to the west. This is shown on Map 2.

In areas of intense folding, the shales are tectonically thickened in the axial regions and thinned on the limbs. Dilatancies in the axial regions are commonly filled with remobilized quartz or carbonate and,in the case of mineralized beds are filled with sulphides. Much of the deformation in the shales is by cleavage-slip.

Only rarely is bedding recognizable. In some cases within the graphitic shale thin concretionary carbonate beds help to identify bedding.

In some areas a second period of folding, F_2 has been observed. This consists of small open,south plunging folds. The F_2 folding has only been observed on the Di-Cinq and Trois claims. The omnipresent regional jointing,

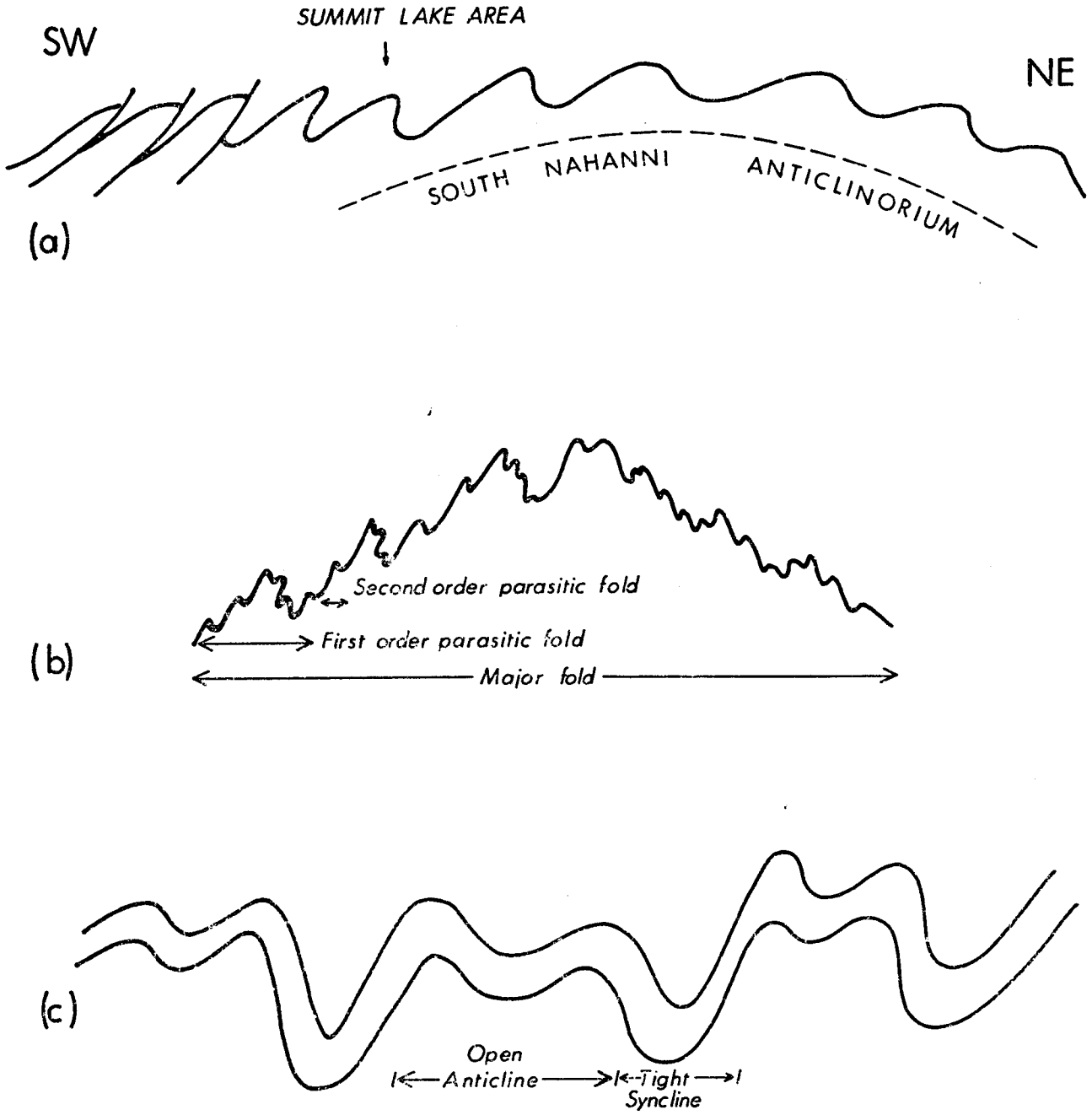


Fig. 2. Styles of Folding. Summit Lake Area, YT, NWT.

S_2, strikes northeast and dips steeply to the southeast. It is parallel to the axial planes of the F_2 folds. Rücken are common in these joints and contain remobilized quartz or carbonate and occasionally sulphides.

Faulting is not common in the area although there are a number of photo-lineations parallel to both S_1 and S_2.

Effects of Tectonics on Mineralization

The primary effect of the folding on the massive sulphides is to remobilize them into the axial region of folds. Recrystallization of sulphides into cleavage has also been observed. In areas of more gentle folding the sulphides remain predominantly on bedding.

On Placer's main showing, high-grade lead-zinc pods are predominantly parallel to S_1. In these high grade pods, bedding was seen to be nearly horizontal. The sulphides have obviously been remobilized into cleavage and also concentrated in the troughs and crests of folds, forming rodlike masses. Between these high grade sections the sulphide beds are likely to be thinner than they were prior to folding.

CONCLUSION

Field evidence supports the conclusion that lead-zinc mineralization in the Ordovician graphitic shales is syngenetic. Other deposits of this type are likely to occur elsewhere in the Ordovician graphitic shales. The individual sulphide bodies discovered to date are likely to be extensive in the third dimension. The highest grade lead-zinc sections are probably pod-like in form and are the result of remobilization of sulphides into cleavages and the crests and troughs of folds. The remobilization of sulphides is a result of tight isoclinal folding and thus, where folding is less intense, mineralized beds should be more uniform in grade.

J.P.N. Badham, B.Sc., Ph.D.(Geol.)

GEOLOGICAL REPORT

ON THE

UN CLAIMS

of

VESTOR EXPLORATIONS LTD.

SUMMIT LAKE AREA, Y.T. - N.W.T.

UN 1 - 19 Y71755-Y71773

Latitude 62°37'N - Longitude 129°45'W

Claim Sheet 105-I-12

by

N. Badham

August, 1973

INTRODUCTION

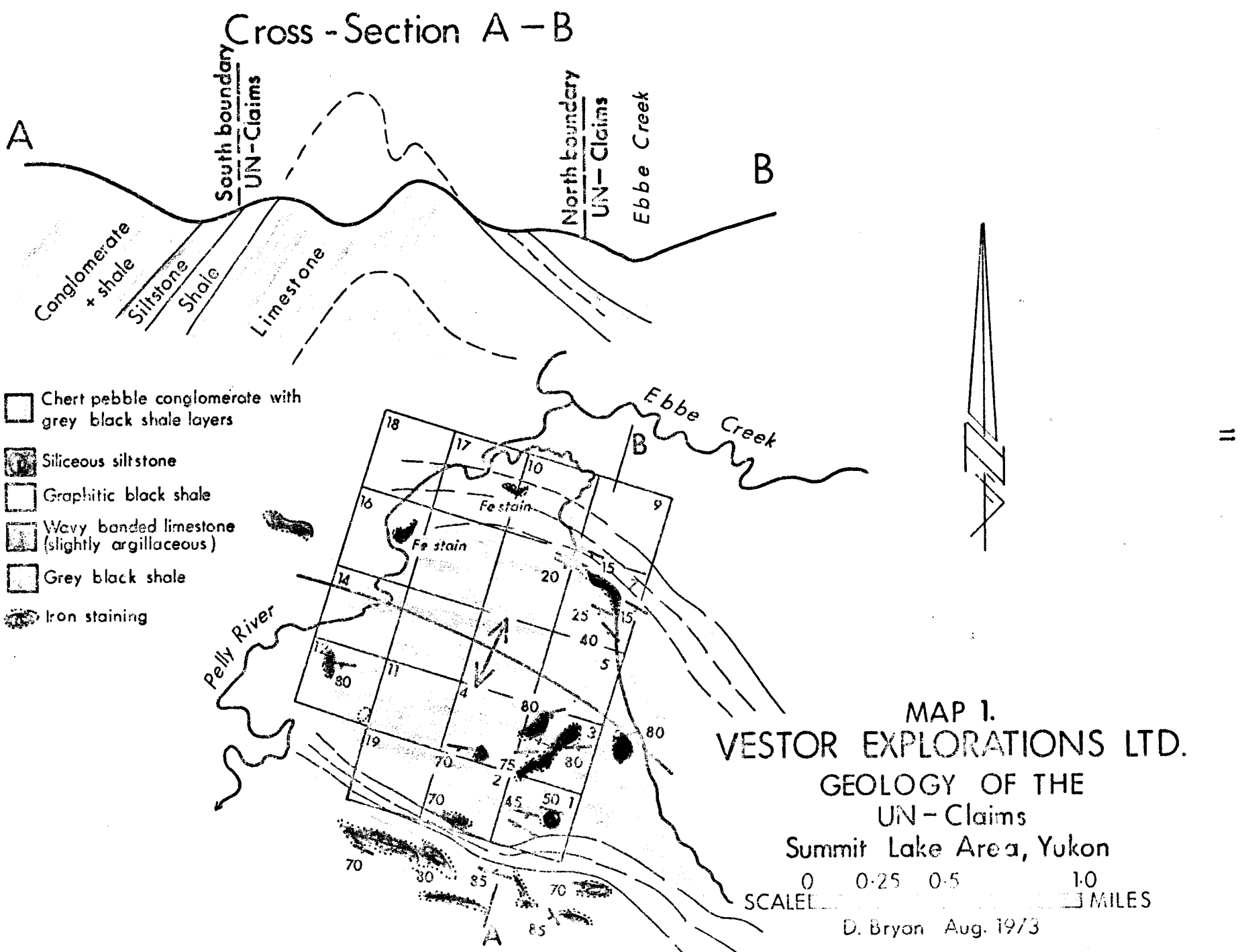
Exploration of the Un claims was carried out during the period July 8th to July 12th, 1973. The program consisted of geological mapping, soil sampling and stream silt sampling. The geology is presented in Map 1 and the geochemical results are presented on Maps 2 to 4.

GEOLOGY

Lithologies

In ascending order, the stratigraphic succession in the Summit Lake area is Cambrian, "wavy banded" limestone, Ordovician, black graphitic shale, Silurian siltstone turbidites and Devonian to Carboniferous conglomerate sandstone and shale. Most of the Un claim group is underlain by the wavy banded limestone unit which is exposed in the core of a major anticline, the axis of which strikes through the centre of the property. The conglomerate-sandstone-shale sequence is exposed immediately south of the claims. The graphitic shale and siltstone units do not outcrop in the area but by inference they subcrop beneath the north part of the property. The extreme southern edge of the group is also underlain by the graphitic shale.

The wavy banded limestone is typical of the unit everywhere in the Summit Lake area and a detailed description is given in the general report. The conglomerate grit-shale sequence as exposed south of the claims, consists of a 150 foot thickness of chert pebble and shale pebble conglomerate locally pyritic which is overlain by at least 100 feet of grey-black shale. The pebble size in the conglomerates decreases upward approaching the overlying shale, suggesting graded bedding.


Cross - Section A – B
A
B
South boundary UN-Claims
North boundary UN-Claims
Ebbe Creek
Conglomerate + shale
Siltstone
Shale
Limestone
Chert pebble conglomerate with grey black shale layers
Siliceous siltstone
Graphitic black shale
Wavy banded limestone (slightly argillaceous)
Grey black shale
Iron staining
Ebbe Creek
Pelly River
Fe stain
Fe stain
MAP 1.
VESTOR EXPLORATIONS LTD.
GEOLOGY OF THE
UN – Claims
Summit Lake Area, Yukon
0 0·25 0·5 1·0
SCALE
MILES
D. Bryan Aug. 1973

In terms of potential for lead-zinc mineralization, only the northern quarter of the group is underlain by the important Ordovician graphitic shale which is the host rock for all of the known lead, zinc mineralization regionally. Although a small fraction of the south side of the group is underlain by the graphitic shale, the dip of the shale is to the south away from the claims.

Bog iron accumulations (goethite) were observed at several localities on the claims and the largest of these are shown on Map 1. The origin of these is unknown but they may be derived by the weathering of pyrite in the conglomerates or the weathering of sulphide in the underlying graphitic shales. Significantly similar bog iron accumulations are spatially related to lead-zinc deposits in the graphitic shales of Placer's #2 and #3 showings.

Structure

As noted on other Vestor claim groups, there is a regional penetrative cleavage (S_1) which on the Un claims strikes between 290° and 320° and dips either vertically or steeply north. This axial plane cleavage is related to the dominant F_1 folding of the region. The structure is dominated by a major anticline which crosses the center of the property. Smaller scale folds cause local reversals of the general dip of bedding which is away from the anticlinal axis.

A joint system (S_2) generally strikes north and dips vertically to 80°E. These joints are normally veined with calcite.

GEOCHEMISTRY

Soil Sampling

Soil samples were collected at 100' intervals on north-south lines about 1500' apart. In general the samples were of good quality, most locations showing a well developed B horizon, except in the SW part where the B horizon

gives way to a sandy soil with rock chips. No soil samples were collected throughout the area of thick river alluvium in the Pelly River valley which covers the NW third of the property. All samples were analyzed for total lead and zinc at Loring Laboratories in Calgary. Sample locations and analyses are given on Map 4 and anomalous lead-zinc values are contoured on Maps 2 and 3.

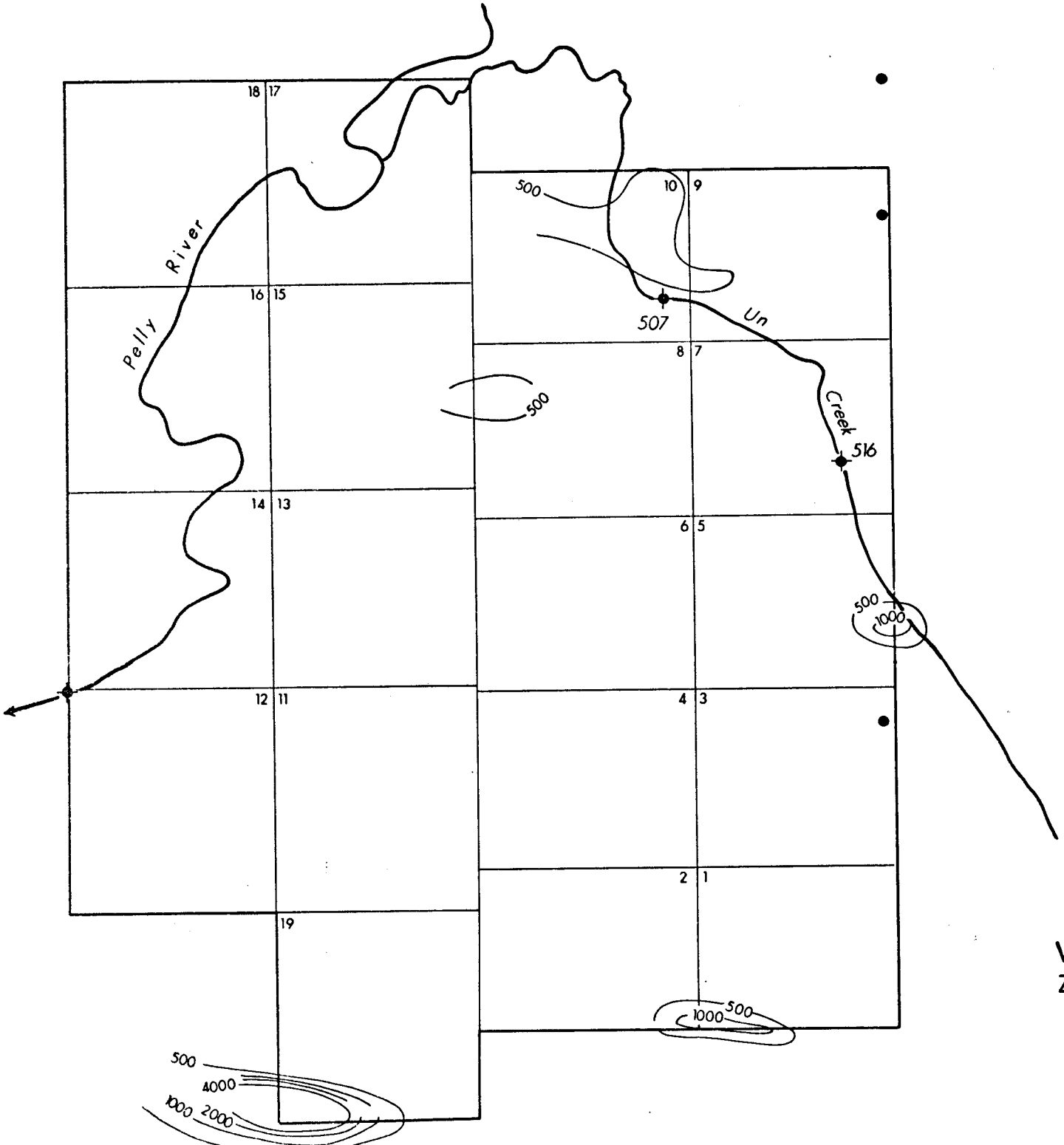
Silt Sampling

Only one active creek suitable for silt sampling exists on the property. The Pelly River is too large to provide meaningful results. Three samples were obtained, two of which yielded zinc values slightly greater than 500 ppm.

Results and Interpretation

Background for soils in the area is about 175 ppm zinc and about 22 ppm lead. Of the anomalies shown on Maps 2 and 3, the strong zinc anomalies up to 7880 ppm and moderate lead anomalies at the south end of the property are probably due to anomalous lead-zinc values in the graphitic shale unit which underlies the very southern edge of the property. The weaker anomalies in the north and northeastern parts of the property may be related to the graphitic shale which subcrops within this area. The remaining lead anomalies in the east-central and central parts of the property are unexplained but may be transported anomalies. These latter anomalies are almost certainly underlain by the wavy banded limestone. A spot zinc anomaly on the west boundary beside the Pelly River is 4530 ppm and this is not readily explainable. The silt samples (3) are too few in number to draw any conclusions.

The most significant single anomaly is that at the extreme SW corner of the property. Unfortunately any mineralized horizon within the black



Contours : 500 ppm
1000 ppm
2000 ppm
4000 ppm

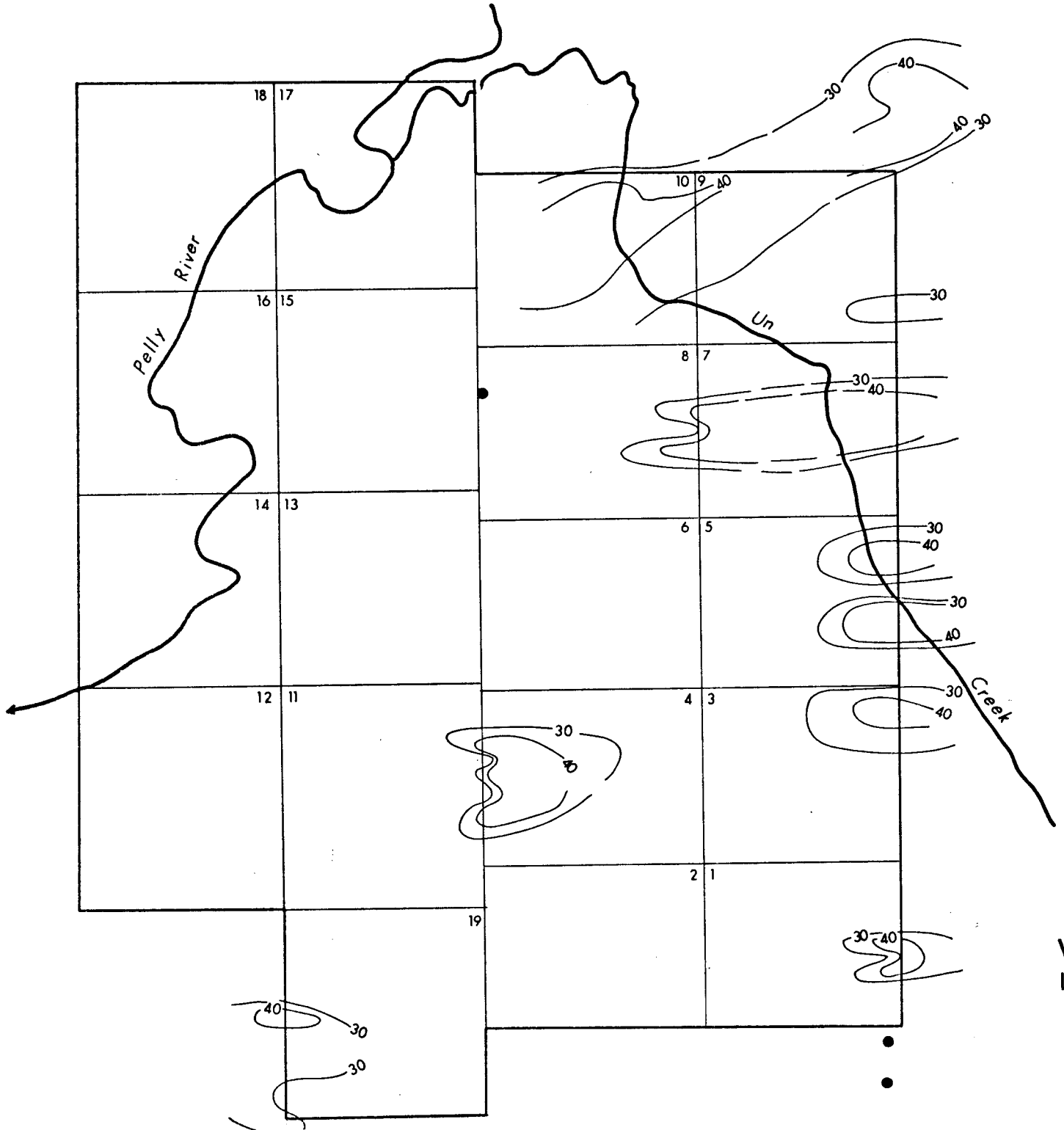
● isolated soils above 500 ppm

✦ anomalous silts (values in ppm)

MAP 2.
VESTOR EXPLORATIONS LTD.
ZINC GEOCHEM CONTOUR MAP
UN Claims
Summit Lake Area, Yukon

SCALE. 0 500 1000 1500 FEET

Oct. 1973



Contours : 30 ppm
40 ppm

● isolated soils above 30 ppm

MAP 3.

VESTOR EXPLORATIONS LTD.

LEAD GEOCHEM CONTOUR MAP

UN Claims

Summit Lake Area, Yukon

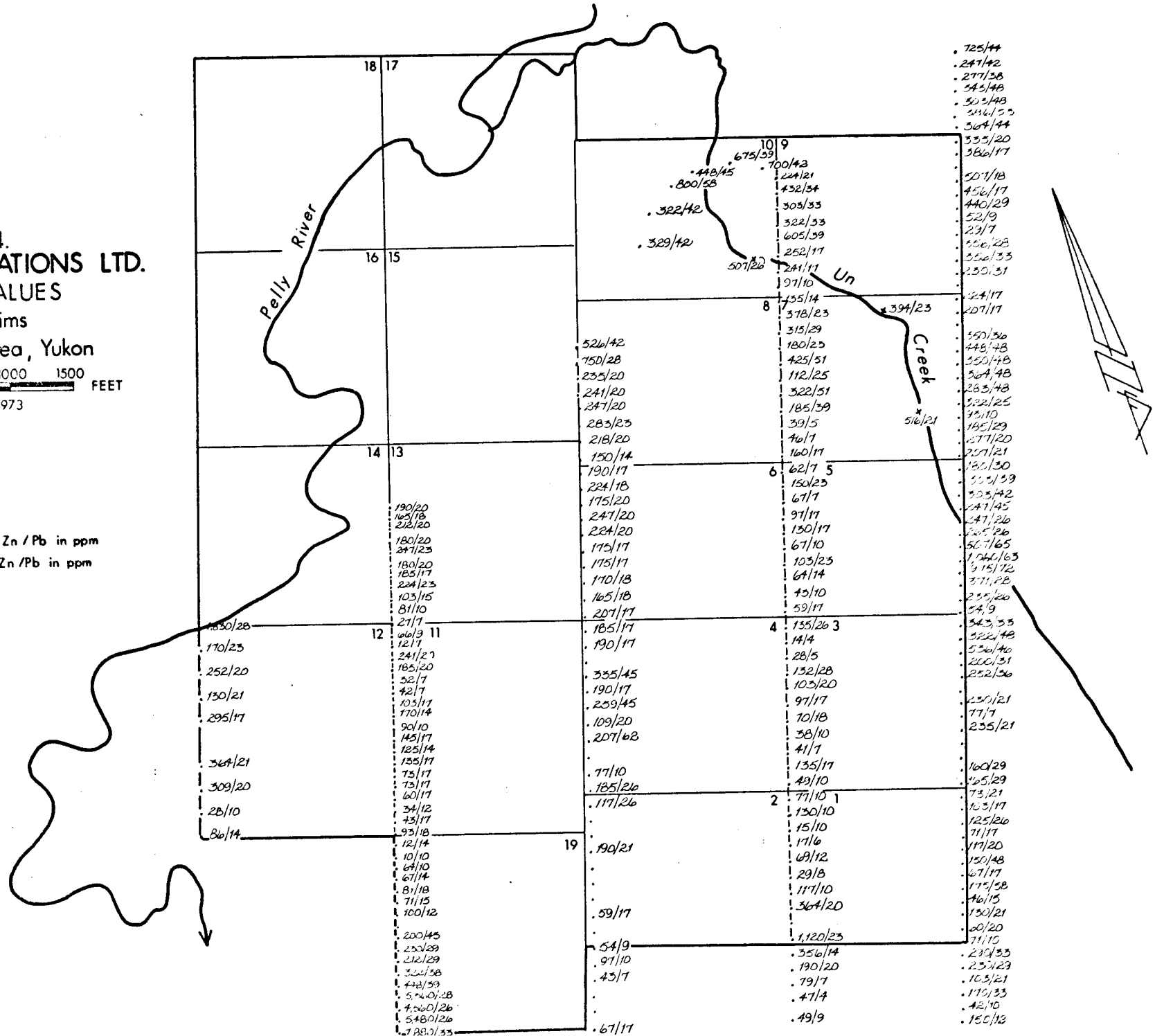
SCALE 0 500 1000 1500 FEET

Oct. 1973

MAP 4.
VESTOR EXPLORATIONS LTD.
GEOCHEM VALUES
UN Claims
Summit Lake Area, Yukon

SCALE 0 500 1000 1500 FEET

Oct. 1973



• 507/21 soil samples Zn / Pb in ppm

× 516/21 silt samples Zn /Pb in ppm

graphitic shales at the south end of the property would dip away from the property to the south. The greatest potential for mineralization, strictly on the basis of the size of area underlain by the graphitic shales, is the north part. Detailed soil sampling with closer line spacing should be undertaken and soil sampling should be attempted in the northwest part even though this area is covered by thick river alluvium.

CONCLUSIONS

The dominant geological feature of the Un claims is a major anticline, the axis of which strikes at 300° through the center of the property. The Cambrian wavy banded limestone occupies the core of this anticline and underlies about 2/3 of the property. The key graphitic shale horizon on the limbs of the anticline subcrops beneath the northern quarter and the extreme southern edge of the property. Strong zinc soil anomalies coincide with the shale subcrop at the south end of the claims, however any mineralized horizon which might exist would dip to the south, away from the property. In terms of the size of area underlain by the graphitic shale, the greatest potential exists in the northern part of the property.

J.P.N. Badham, B.Sc., Ph.D.(Geol.)

GEOLOGICAL REPORT

ON THE

NOR & PELL CLAIMS

of

VESTOR EXPLORATIONS LTD.

SUMMIT LAKE AREA, Y.T. - N.W.T.

NOR 1 - 13 Y71023-Y71035
NOR 20 - 33 Y71042-Y71055
NOR 40 - 50 Y71062-Y71072

Latitude 62°36'N - Longitude 120°38'W

PELL 1 - 56 Y70453-Y70508

Latitude 62°33'N - Longitude 129°38'W

Claim Sheet 105-I-12

by

N. Badham

August, 1973

INTRODUCTION

The Nor and Pell groups were investigated during the period June 26th to July 13, 1973. Because the lithologies on the two groups are grossly similar they are considered together in one report. The geology is presented on Map 1 and results of the geochemical surveys are presented on Maps 2 to 7. Two sketch sections are given in Fig. 1.

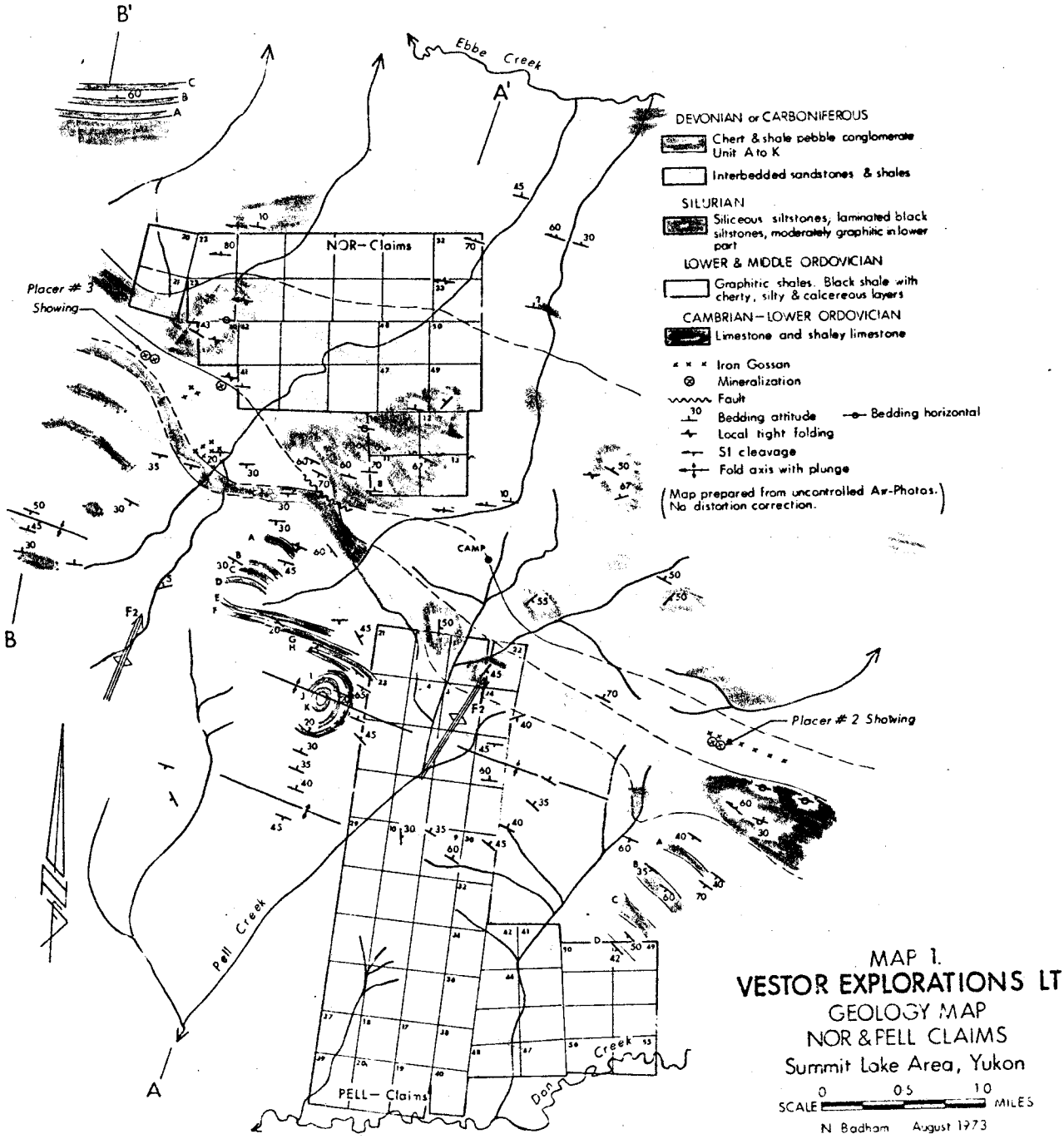
GEOLOGY

Lithological Descriptions

Conglomerates and Grits

Outcrop is sparse on both groups, especially the Nor. The conglomerates and grits unit is a variable sequence of conglomerates interbedded with alternating arenaceous and argillaceous rocks. In detail these rocks are a cyclic sequence, each cycle consisting of conglomerate overlain by interbedded sandstone and siltstone. In any one section the sequence is unique, because of variations in the thickness of individual units and because of sporadic unexpected massive sandstone units. In one section, 11 such cycles were noted and labelled A - K (Map 1).

The conglomerate consists of chert pebbles, usually well-rounded in an argillaceous matrix. The pebble to matrix ratio varies widely. In addition there are shale-chips, boulders of sandstone and large clasts, either of black shale or interbedded shale and sandstone. Clasts up to 10' long and 2' thick were observed. The beds are massive and rarely graded. Contacts between the individual conglomerate sandstone and shale lithologies are sharp. They are overlain by either alternating sandstone and shale or by sandstones.



MAP 1.
VESTOR EXPLORATIONS LTD.
GEOLOGY MAP
NOR & PELL CLAIMS
Summit Lake Area, Yukon
SCALE 0 0.5 1.0 MILES
N. Badham August 1973

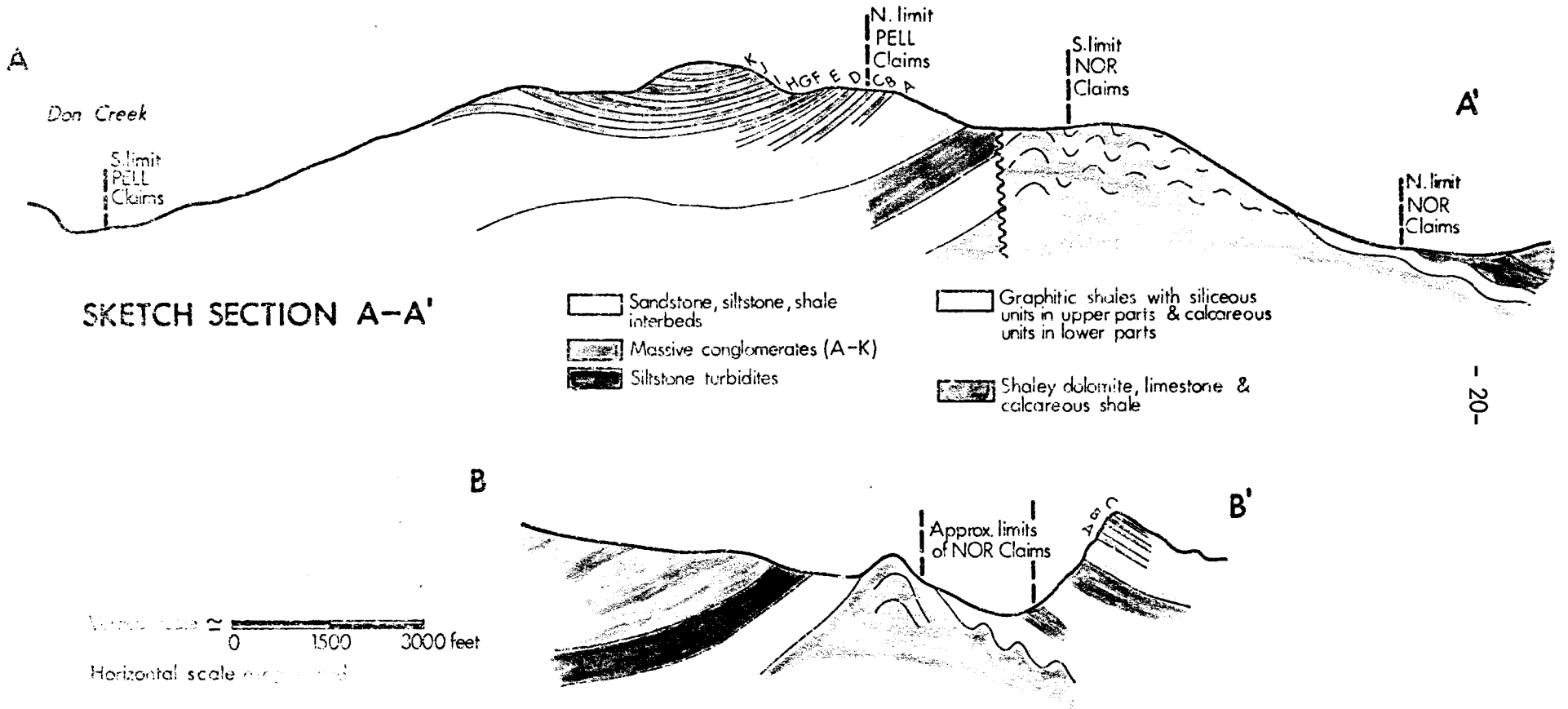


FIG. 1.
(refer to Map 1.)

All the sediment is concluded to be autochthonous and the conglomerates are clearly massive slump deposits.

The sandstones vary in grain size and texture and normally have the composition of greywacke. They contain scattered shale chips and occasional small chert pebbles. Locally they are cross-bedded and ripple marked. The bases are sharp and often scour underlying beds and the tops are normally sharp. The massive units consist of beds up to 10' thick. Where interbedded with shales, the beds vary from a few inches to 2' in thickness. In general,in any one interval the beds are of fairly uniform thickness. The shales are interbedded with the sandstones. They are weakly graphitic and are strongly cleaved.

All the lithologies in the 'conglomerates and grits' unit contain blebs of recrystallized pyrite. The pyrite is often weathered out and may be the source for the abundant Fe-gossans found in topographically lower areas.

The sequence as a whole is clearly of slump - proximal turbidite origin. Parts of Bouma sequences were identified. Cleavage has masked other current features. A few beds of highly contoried black shale containing scattered rounded boulders (up to 3' across) of underlying sandstone were found and are good evidence for the slump hypothesis.

About 100' above the base of the conglomerate and grit unit there is a well defined thick massive sandstone unit which varies between 50 and 500' in thickness. The total thickness of the conglomerate grit unit has not been measured, but exceeds 2500 feet.

The Geological Survey of Canada considers the age of the sequence to be Devonian to Carboniferous.

Siltstone Turbidites

Beneath the conglomerates-grits sequence is a well-bedded fissile black siltstone with rare sand interbeds. The unit is estimated to be about 200

feet thick on the average. Apparently thicker sections may be the result of faulting or thickening related to folding. Submarine channel scouring related to turbidity currents at the time of deposition of the conglomerate-grits, may have caused local thinning although this has not been observed in the field. The uppermost part of the unit has more sandstone interbeds and is very siliceous. Some beds are almost cherty. In it's lower parts the unit becomes more graphitic and less well-bedded. Grading, ripple-marks, cross-bedding, scouring and loading, identify these rocks as the deposits of fast-flowing currents. Very small scale Bouma sequences are common and consequently the rocks are interpreted as distal turbidites. Some coarser turbidites consisting of convoluted pebbly sandstone invade the sequence.

On the basis of a definite Ordovician age of the underlying graphitic shales and the presumed Devonian-Carboniferous age of the conglomerates and grits, the siltstone turbidites are believed to be Silurian.

Graphitic Shales

Underlying the siltstones with apparent conformity, are graphitic shales. The thickness is estimated to be about 200 feet. At the top these shales contain a few cherty siltstone beds, but in general the only variations are in graphite content. More massive beds are found to be the most graphitic. In the lower 100 feet, black graphitic calcareous units up to 10' thick appear and these are believed to be correlative with similar calcareous beds observed on other Vestor properties to the SE. Other black limestone units up to 2' thick occur at other levels in the section. An excellent graptolite collection obtained from these shales on another property establish a definite L-M Ordovician age.

Limestone

The graphitic shale unit is underlain by wavy-banded argillaceous

limestone of unknown thickness. Although the contact is nowhere observed, the gradual increase in calcareous content of the shales and the apparent conformity of bedding suggest that the sequence of deposition is uninterrupted. Protosponges observed elsewhere suggest a Cambrian age for the unit.

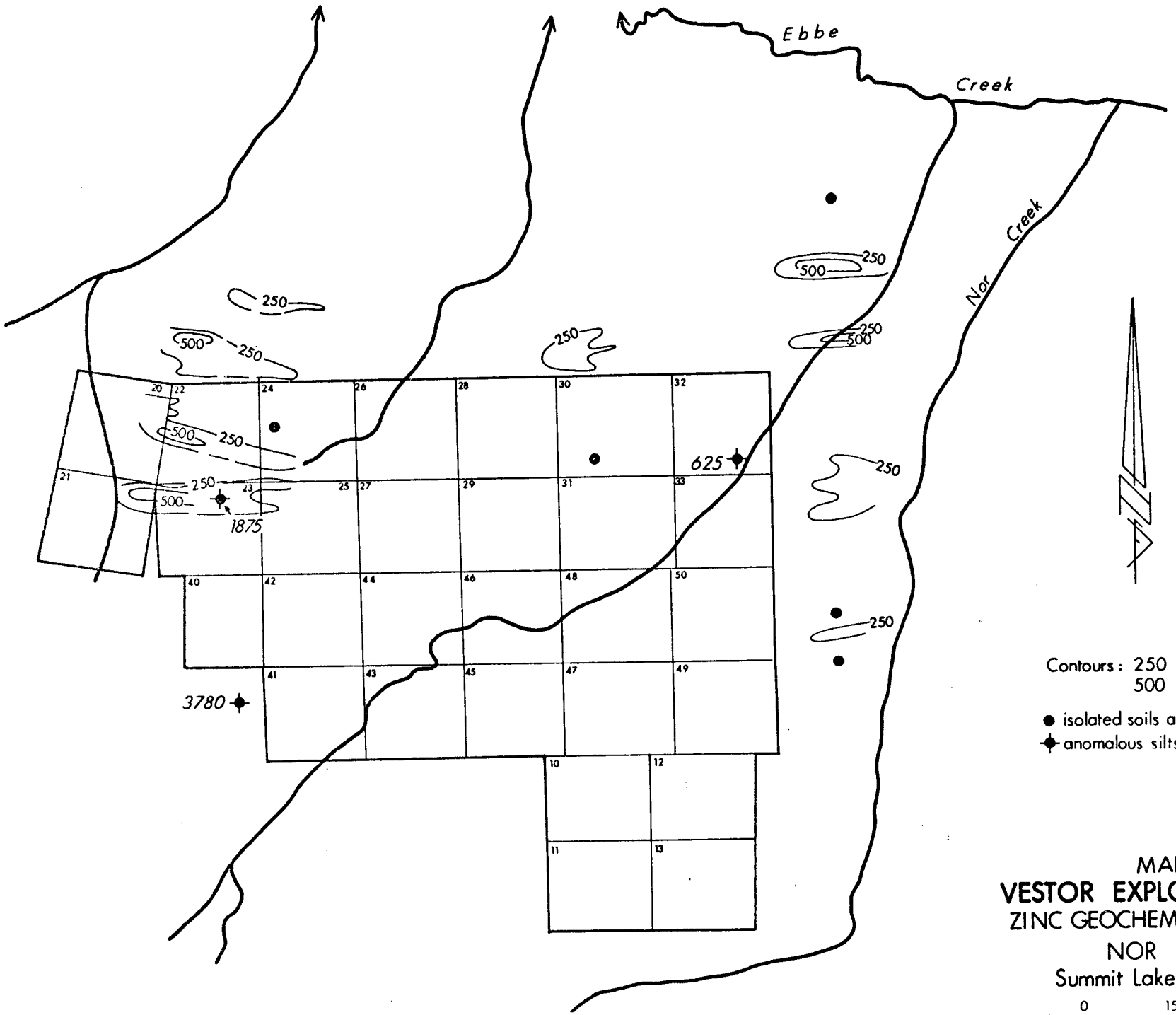
Structure

All the rocks are more or less affected by a regional penetrative cleavage that strikes 300° - 320° and is near vertical. This cleavage, S_1, is axial-planar to regional folding F_1. The F_1 folds themselves are observed on all scales. In the conglomerates, the folding is broad and open. Mesofolds affect the shale/sandstone units within the conglomerate grit sequence but not the conglomerates themselves. Similarly, folding in the limestones is not intense. The argillaceous units are more tightly folded between the more competent beds. Where cherty beds are present, the siltstones are folded into broken chevrons with axial angles in the 40° - 60° range. In the shales where tops can be distinguished, very tight folding is indicated. Usually, bedding is only observable where the cleavage is least intense such as in the troughs and crests of folds.

Many of the F_1 folds appear to change their degree of plunge; although this remains generally westward. There is a prominent joint set (S_2). This joint set strikes 20° - 30° and is vertically dipping. It is concluded that S_2 is the axial plane cleavage of broad-open, NE trending monoclines (F_2).

GEOCHEMISTRY

Soil samples were taken at 100' intervals on lines running perpendicular to strike. Line spacing is about 1000' on the Pell group and 2000' on the Nor. In places it was not possible to obtain samples such as where there was thickly matted juniper. Soil sampling covered all of the Pell group and on the Nor group, sampling was limited to the north part which is underlain by the



Contours : 250 ppm
500 ppm

● isolated soils above 250 ppm

✦ anomalous silts (values shown in ppm)

MAP 2.

VESTOR EXPLORATIONS LTD

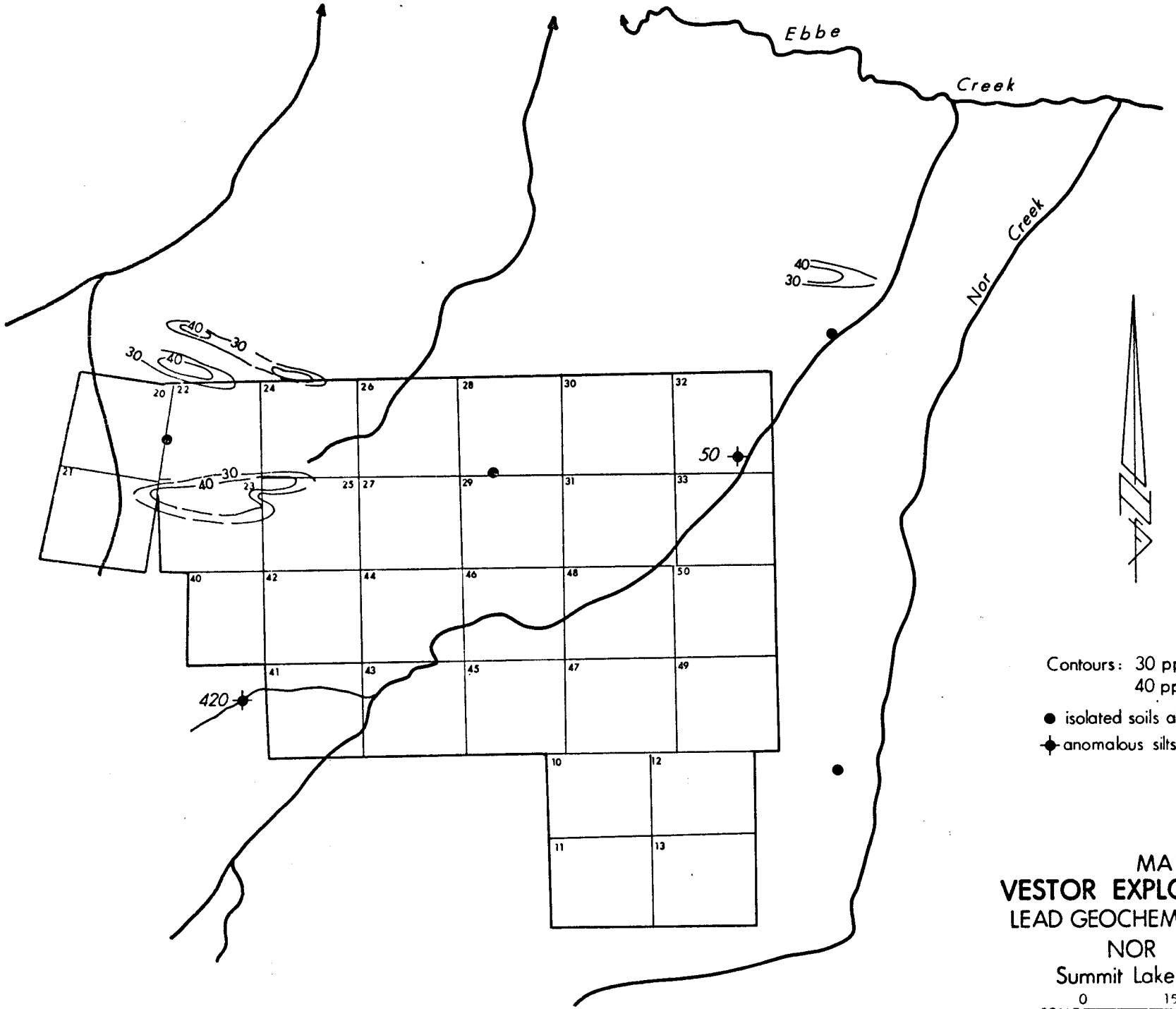
ZINC GEOCHEM CONTOUR MAP

NOR Claims

Summit Lake Area, Yukon

SCALE 0 1500 3000 FEET

Oct. 1973.



Contours: 30 ppm
40 ppm

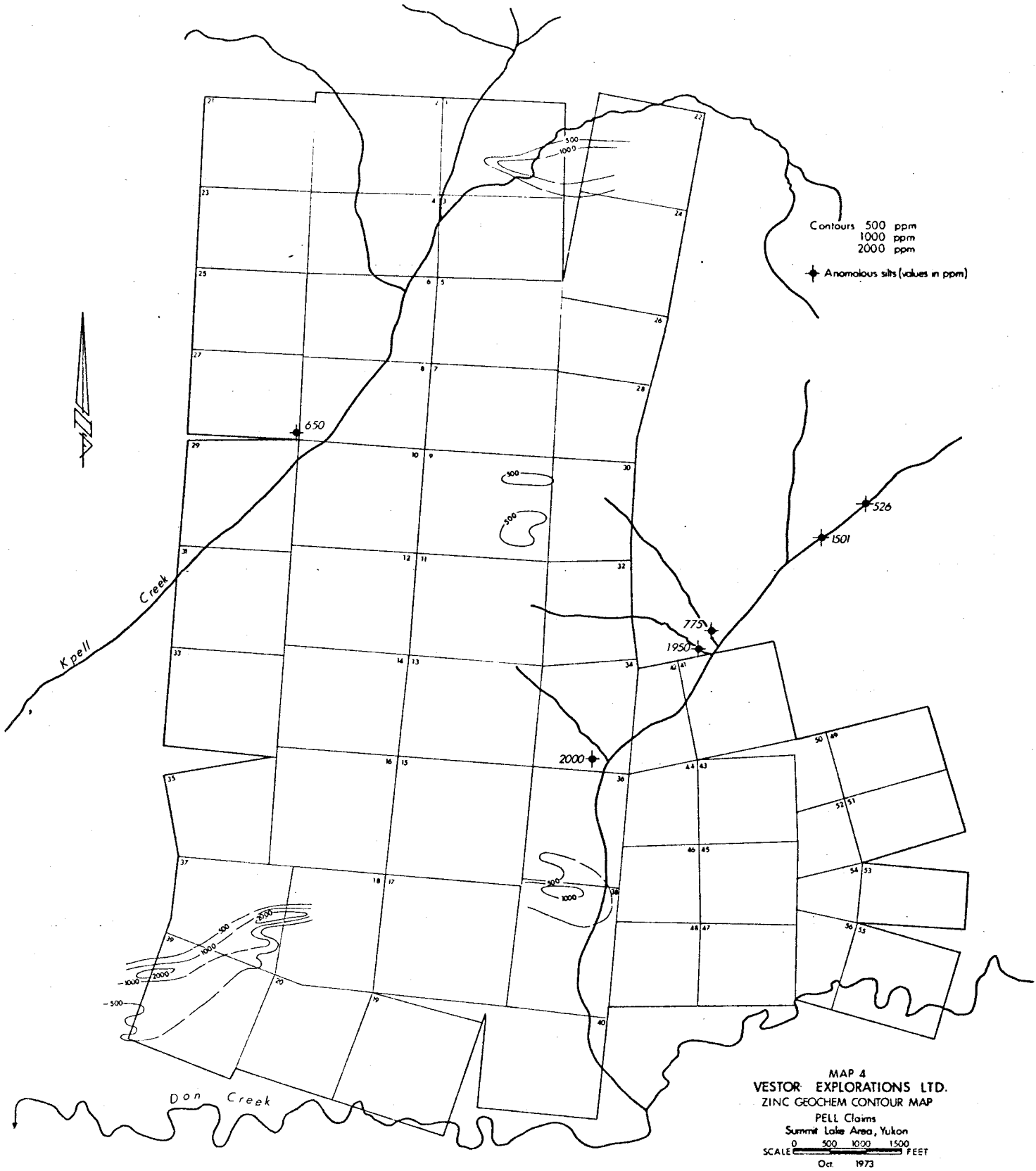
● isolated soils above 30 ppm

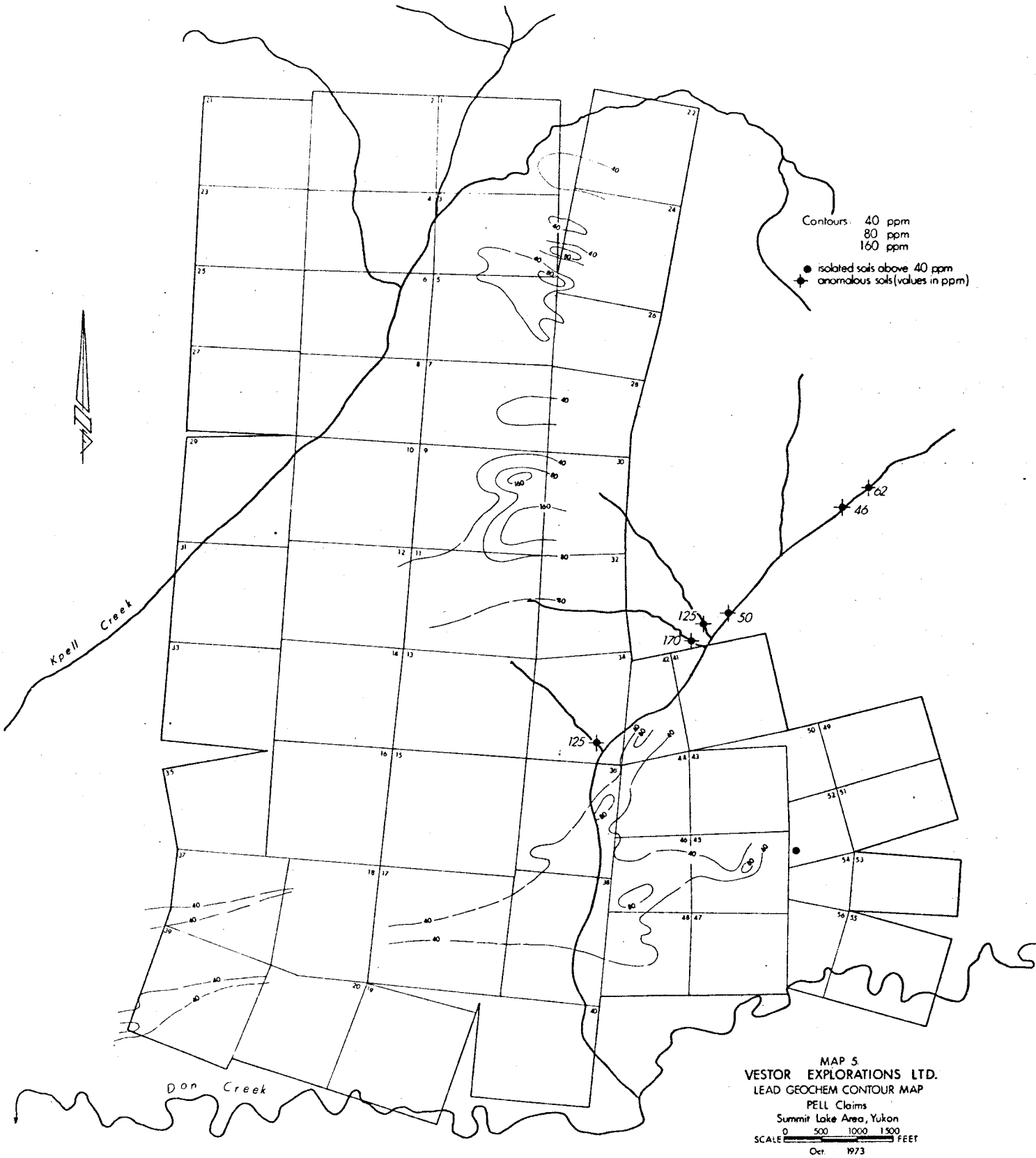
✦ anomalous silts (values shown in ppm)

MAP 3
VESTOR EXPLORATIONS LTD
LEAD GEOCHEM CONTOUR MAP
NOR Claims
Summit Lake Area, Yukon

SCALE 0 1500 3000 FEET

Oct. 1973


Contours 500 ppm
1000 ppm
2000 ppm
Anomalous silts (values in ppm)
650
526
1501
775
1950
2000
Kpell Creek
Don Creek
MAP 4
VESTOR EXPLORATIONS LTD.
ZINC GEOCHEM CONTOUR MAP
PELL Claims
Summit Lake Area, Yukon
SCALE 0 500 1000 1500 FEET
Oct. 1973


Contours 40 ppm
80 ppm
160 ppm
isolated soils above 40 ppm
anomalous soils (values in ppm)
62
46
125
50
170
125
Kpell Creek
Don Creek
MAP 5
VESTOR EXPLORATIONS LTD.
LEAD GEOCHEM CONTOUR MAP
PELL Claims
Summit Lake Area, Yukon
SCALE 0 500 1000 1500 FEET
Oct. 1973

graphitic shale unit. Silt sampling was limited because the streams are too fast flowing and the detritus in the seeps is mostly humic. On the Pell group 23 silts were obtained and on the Nor only 4.

Fifteen rock samples from the Pell group were analyzed for lead and zinc on a portable X-Ray Fluorescence Spectrometer instrument. All were below the detectable limit of about 1500 ppm for lead and zinc. Most of the samples were of the black graphitic shale, however a few samples of shale from within the 'conglomerate-grit' sequence were checked.

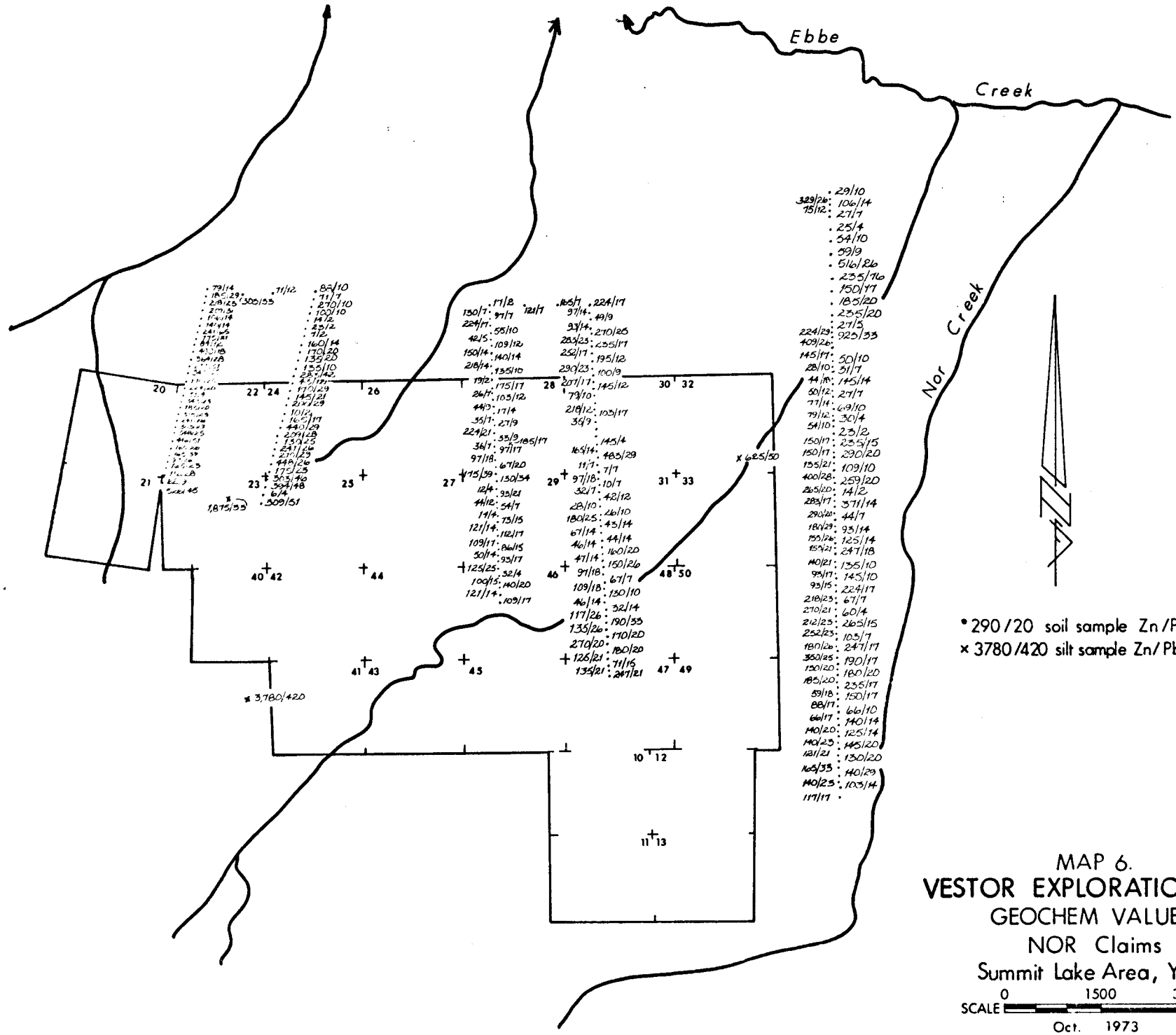
All soil and silt samples were analyzed for total lead and zinc at Loring Laboratories in Calgary. Contoured results are presented on Maps 2 to 5. Sample locations and analyses are given on Maps 6 and 7.

NOR Claims

A number of weak lead and zinc anomalies exist within the subcrop belt of the graphitic shale which crosses on the north side of the Nor group. Background in soils for lead is about 18 and for zinc is about 200 ppm. Highest lead values range between 55 and 75 ppm and highest zinc values between 800 and 900 ppm. Of 4 silt samples obtained, all are very anomalous and one isolated silt sample just off the SW corner of the Nor group analyzed 3780 ppm zinc and 420 ppm lead. Overburden on the Nor claims, except immediately adjacent to creeks or near outcrop, is quite thick and even weak anomalies such as those obtained through this program could be significant.

PELL Claims

A number of sizeable anomalies exist on the Pell claims. The entire group is directly underlain by the conglomerate-grit unit and therefore these anomalies are not considered as significant as if they were within a graphitic shale subcrop belt. Background soil values for lead are about 22 ppm and for zinc about 175 ppm. The highest individual lead and zinc values in soils are in



• 290/20 soil sample Zn/Pb in ppm

× 3780/420 silt sample Zn/Pb in ppm

MAP 6.

VESTOR EXPLORATIONS LTD.

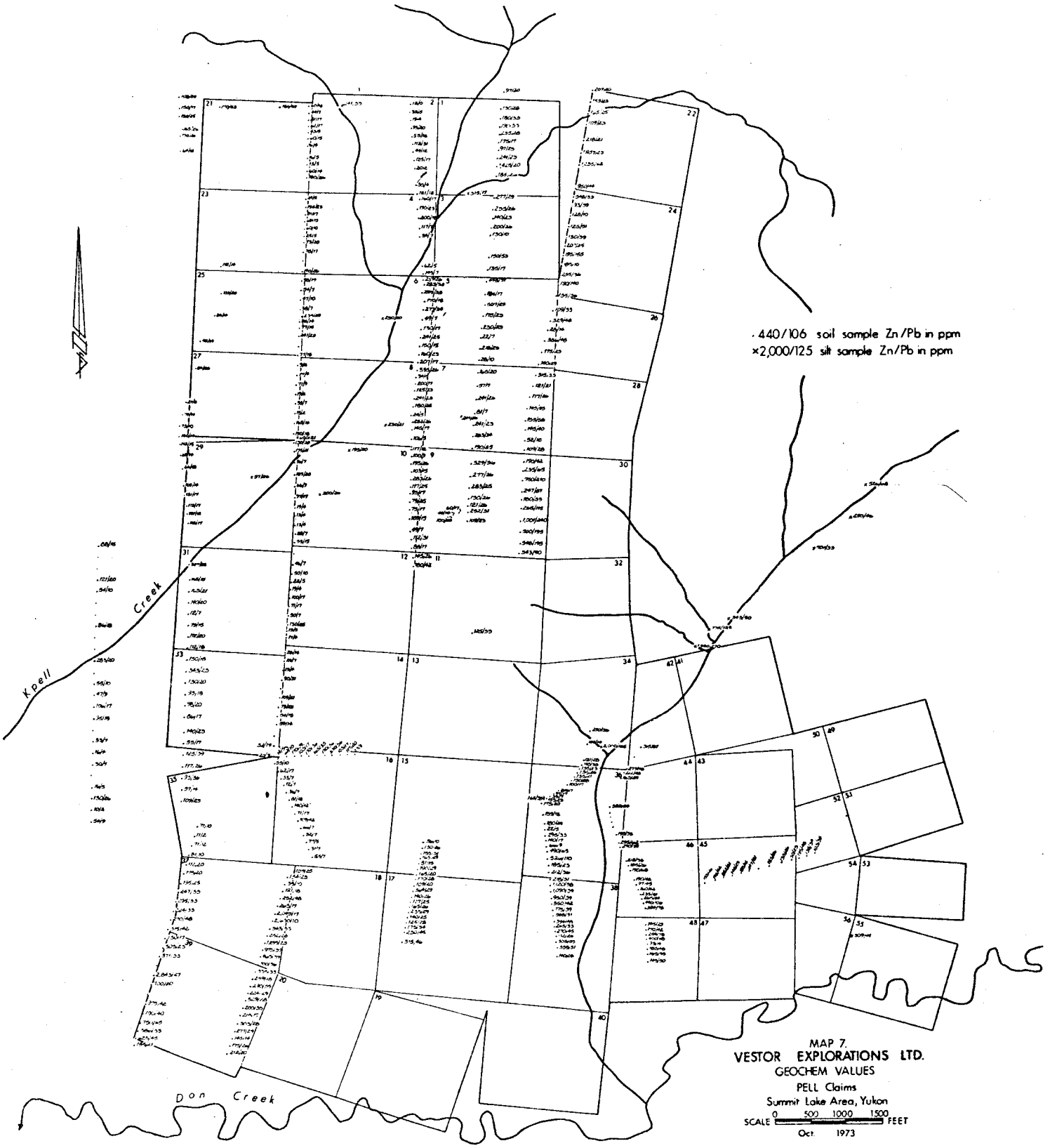
GEOCHEM VALUES

NOR Claims

Summit Lake Area, Yukon

SCALE 0 1500 3000 FEET

Oct. 1973


· 440/106 soil sample Zn/Pb in ppm
×2,000/125 silt sample Zn/Pb in ppm
Kpell Creek
Don Creek
MAP 7.
VESTOR EXPLORATIONS LTD.
GEOCHEM VALUES
PELL Claims
Summit Lake Area, Yukon
SCALE 0 500 1000 1500 FEET
Oct. 1973

the range 200 to 240 ppm and 2600 to 2800 ppm respectively. A total of 23 silt samples were collected. All samples from the creek which drains from the east side of the property into Don Creek were found to be anomalous in zinc and/or lead.

The most obvious source of the anomalies is in the conglomerate-grit sequence, however lead-zinc mineralization as veins or in some other form may exist in the conglomerate-grit units and an origin of such mineralization by remobilization of lead-zinc along faults or fractures upwards from the underlying graphitic shales cannot be discounted. No lead-zinc mineralization was observed on the Pell group. No soil anomalies exist in the graphitic shale subcrop belt immediately to the north of the Pell group even though outcrop is fairly abundant and overburden is thin. Therefore it seems fairly conclusive that no mineralization exists in the shale there.

CONCLUSIONS

Ordovician graphitic shales underlie approximately the northern third of the Nor group and a very narrow fringe just off the south boundary of the property. In each case the shale dips away from an anticlinal core of older (Cambrian) limestone which occupies the middle and southern parts of the Nor group. On the basis of the size of the area underlain by shale, the north part of the claims has the most potential. Several weak lead-zinc anomalies exist in this shale subcrop area. Overburden is generally thick and even the weak geochemical anomalies that exist may be significant. Only 4 silt samples were obtained; too few to draw any conclusions.

The entire Pell group is directly underlain by the Devonian - Carboniferous conglomerate-grit sequence. The Ordovician graphitic shales underlie the whole of the claim group but are probably everywhere more than

200' below surface. A number of weak to moderate anomalies exist on the Pell claims and their source is unexplained.

The proximity of the Placer #2 and #3 lead-zinc showings proves that mineralization exists in the graphitic shales nearby and therefore there is potential for mineralization in these shales on the Pell and Nor groups. The lack of any strong indication of mineralization on the shale subcrop belts suggests that the key graphitic shales are not mineralized when they come to surface, however there is every probability for economic mineralization in the shales subsurface.

J.P.N. Badham, B.Sc., Ph.D.(Geol.)

GEOLOGICAL REPORT

ON THE

TROIS CLAIMS

of

VESTOR EXPLORATIONS LTD.

SUMMIT LAKE AREA, Y.T. - N.W.T.

TROIS 1 - 16 Y71774-Y71789

Latitude 62°32'N - Longitude 129°27'W

Claim Sheet 105-I-11

by

N. Badham

August, 1973

INTRODUCTION

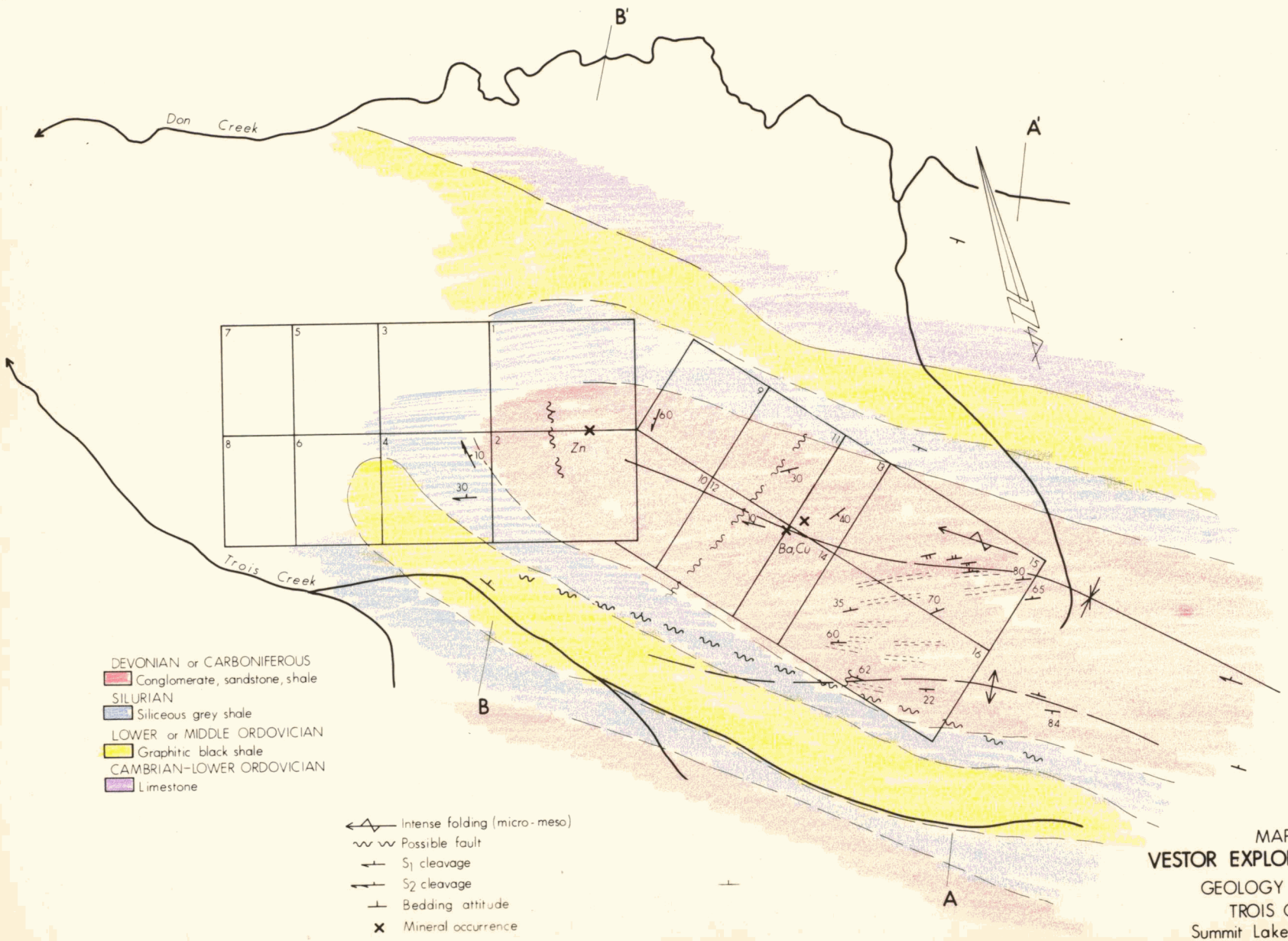
The Trois claims were examined three times during the course of the season. The first examination consisted of reconnaissance geological mapping. The second examination consisted of further mapping and reconnaissance geochemical sampling. Highly anomalous geochemical values were obtained and this prompted the third examination. A large and very significant geochemical anomaly has now been delineated on these claims and the most part of this anomaly coincides with the upper part of the favourable graphitic shale unit.

GEOLOGY

Apart from the ridge top there is very little outcrop on the claims, however the slopes of the ridge are covered with rock fragments which are obviously not far removed from their point of origin. A few traverses were run on the ridge to the east of the claims where outcrop is more abundant. Using the observations of all of the above and considering the rather simple structure in this area, it was quite easy to deduce the general geology of the claims. (Map 1)

The wavy banded limestone was not observed on the claims but it does outcrop north of Don Creek on the Placer claims which lie to the north of the Trois. This limestone should shallowly underlie the graphitic shale at Trois Creek.

The lowest unit observed on the claims was the black graphitic shale (Ordovician). The top of this unit was observed in sporadic outcrop in Trois Creek. It is this unit which hosts the Placer mineralization to the southeast.



MAP 1.

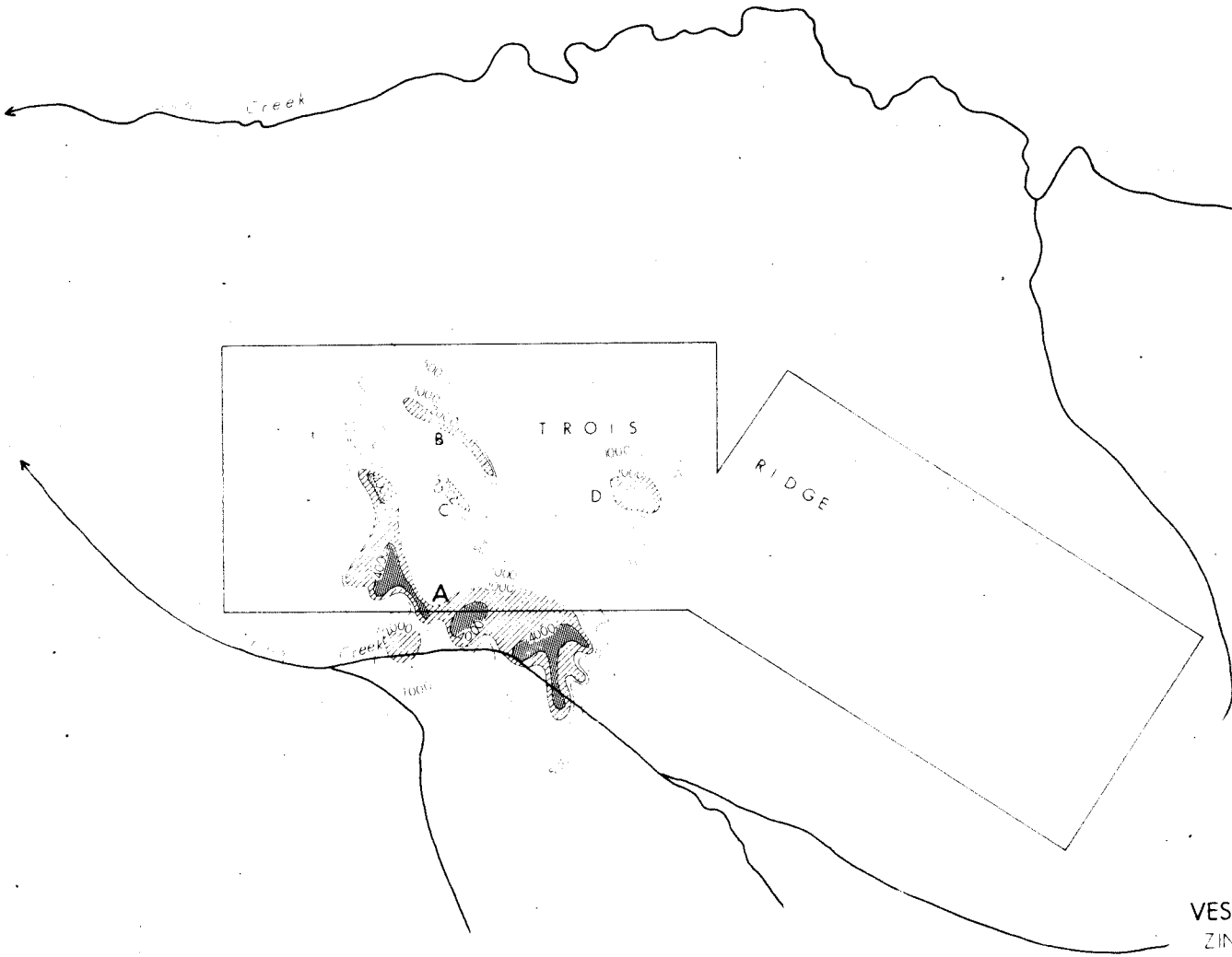
VESTOR EXPLORATIONS LTD.

GEOLOGY OF THE
TROIS Claims
Summit Lake Area, Yukon

0 500 1000 1500
SCALE FEET

Goble, Kenyon, Badham

Sept 1973



MAP 2.

VESTOR EXPLORATIONS LTD.

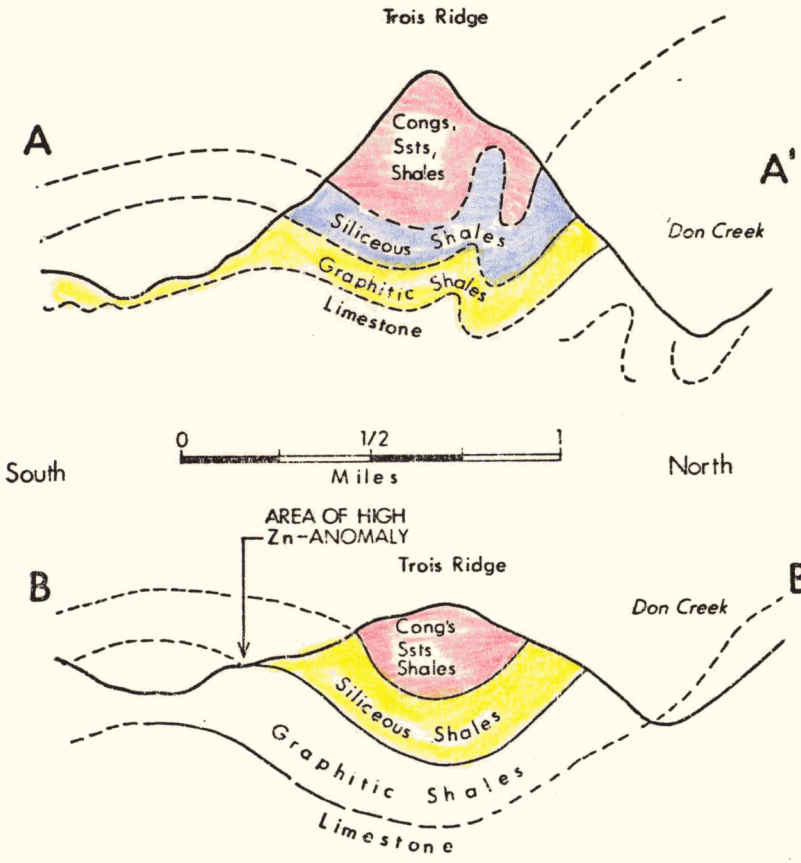
ZINC GEOCHEM CONTOUR MAP

TROIS Claims

Summit Lake Area, Yukon

SCALE 1" = 500' 1000' 2000'

OCT. 1973



SKETCH SECTION A-A'
(East end Trois Ridge) TROIS-Claims
(refer to Map 1)

SKETCH SECTION B-B'
(West end Trois Ridge) TROIS-Claims

FIG. 1.

The graphitic shale is overlain by the siltstone turbidite unit which is a sequence of grey siliceous shales, argillites and interbedded siltstones. The total thickness of this unit is about 200 feet on the Trois claims.

The top of Trois ridge comprises the conglomerate-sandstone-shale unit. Four distinct conglomerate units were observed near the top of the ridge. The bulk of the unit is composed of black, non graphitic shale with some sandstone and siltstone.

The overall structure of the ridge underlying the Trois claims is synclinal. The axis is parallel to the crest of the ridge and the plunge is very gentle to the northwest.

No major faults were observed on the claims although some minor faulting was mapped. These faults were largely inferred from lineations on the air photos.

MINERAL OCCURRENCES

During the course of staking, a sample was taken from outcrop on the ridge on the claim line between Trois #1 and #2. This sample assayed 1.7% zinc. No zinc mineral was observed in the sample, which is loosely described as a breccia with quartz and shale fragments, partially filled with quartz and quite rusty on the weathered surface.

Further to the east on the same ridge, were found some frost-heaved boulders of black shale which were malachite stained and which contained barite on the cleavage planes.

Although the third trip to the area was made with the knowledge of the first anomalous geochemical results, nothing was located in the region of the anomaly due to apparently deep overburden.

GEOCHEMICAL PROGRAM

Sampling and Laboratory Techniques

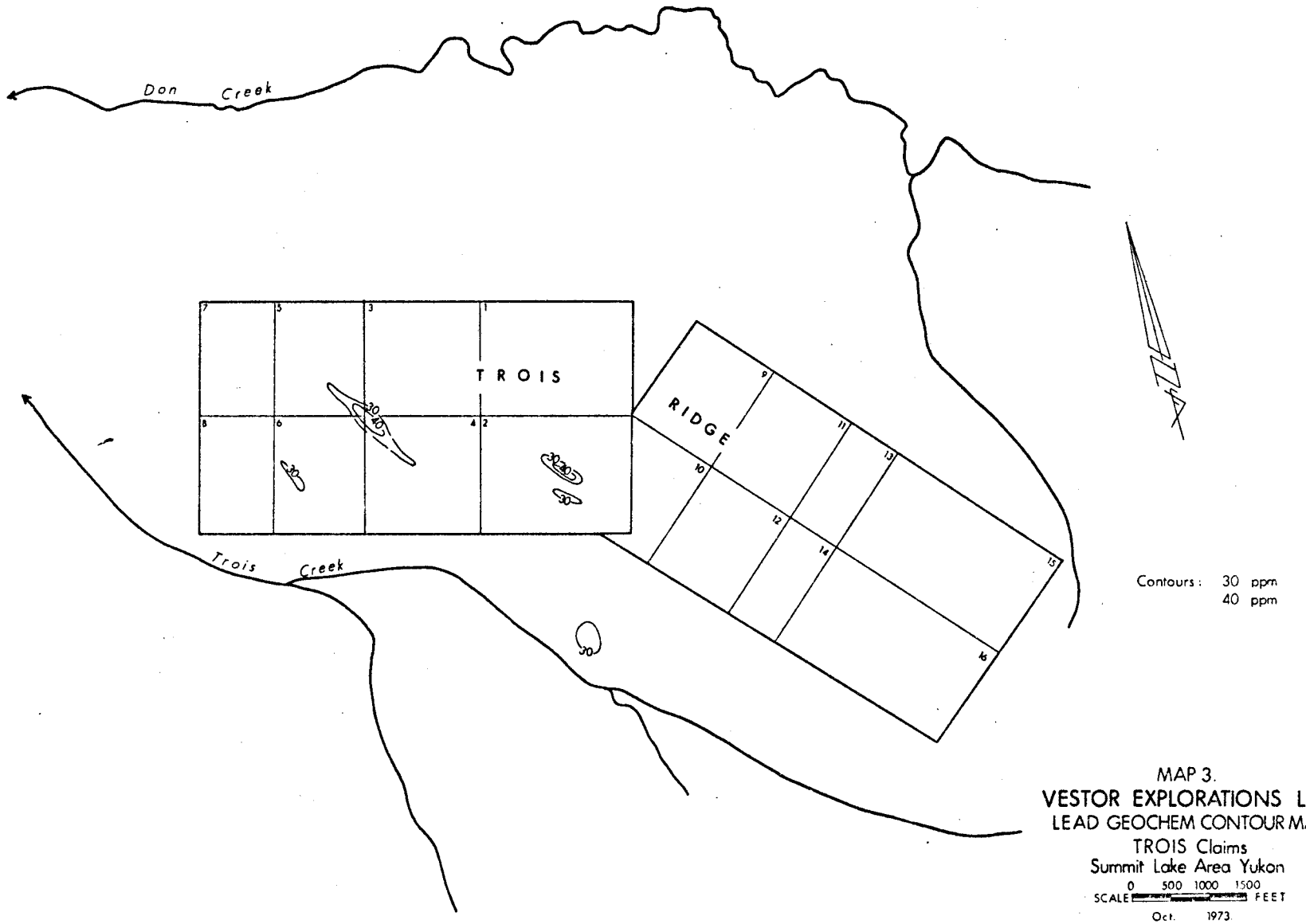
Soils were taken at an average depth of about 10 inches. The soils in this area are not well developed. Many have a high percentage of rock chips. Near the top of the ridge, rock chips comprised most of each sample. Organic content varies from less than 5% to no more than 40%.

In the laboratory, samples were dried and screened to minus 80 mesh. In the case of samples which were entirely rock chips, these were crushed and screened to the same mesh. The samples were digested in nitric-perchloric acid mixture. Lead, zinc and copper determinations were made by atomic absorbtion spectrometry. The values obtained are total values in lead, zinc and copper. The entire analytical operation was performed by Loring Laboratories of Calgary.

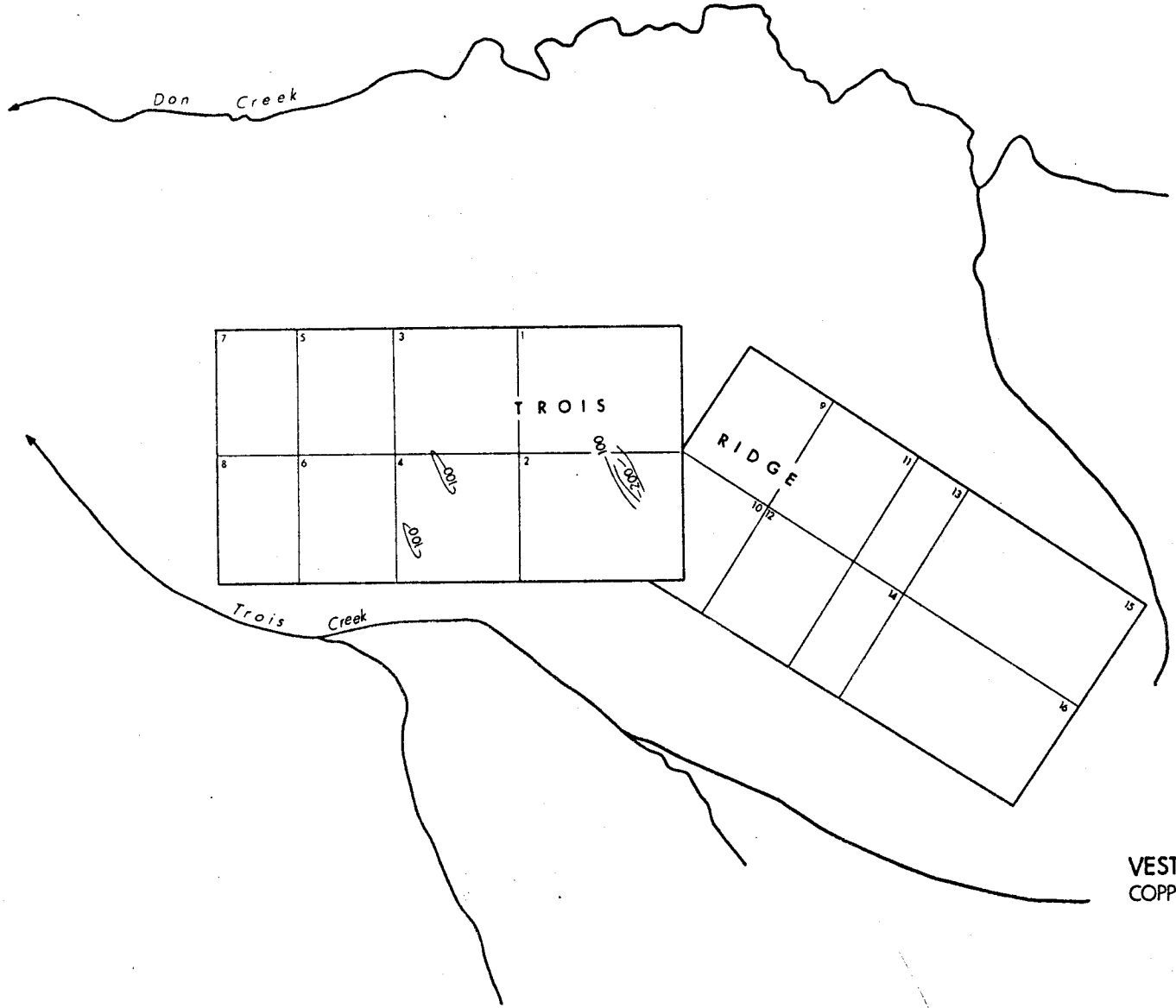
Field Program

On the first trip to the claims, a single line of geochemical samples was taken along the base of Trois ridge, to the north of and roughly parallel to Trois Creek. These samples were taken at 200 foot intervals. Samples were taken in this area first, since it is underlain by the favourable graphitic shale unit.

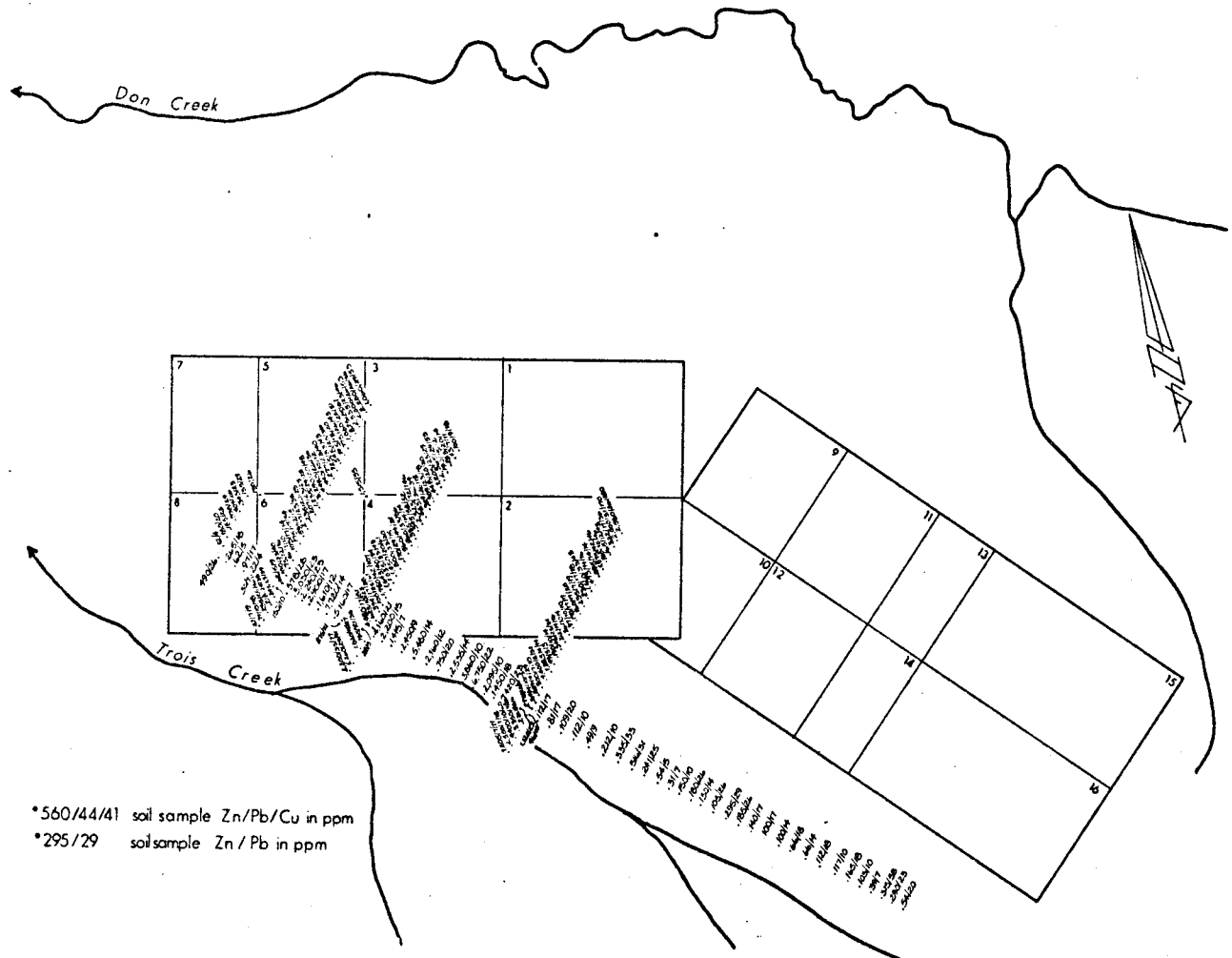
Highly anomalous zinc values were obtained over a considerable length of this sample line (see Maps 2 & 5). A second sampling program obtained samples at 100 foot spacings over three lines at right angles to this original line. Many of these samples were highly anomalous in zinc. The values were contoured.



MAP 3.
VESTOR EXPLORATIONS LTD.
LEAD GEOCHEM CONTOUR MAP
TROIS Claims
Summit Lake Area Yukon
0 500 1000 1500
SCALE FEET
Oct. 1973.



MAP 4.
VESTOR EXPLORATIONS LTD.
COPPER GEOCHEM CONTOUR MAP
TROIS Claims
Summit Lake Area, Yukon
0 500 1000 1500
SCALE FEET
Oct. 1973.



MAP 5.
VESTOR EXPLORATIONS LTD
GEOCHEM VALUES
TROIS Claims
Summit Lake Area, Yukon
SCALE 0 500 1000 1500 FEET
Oct. 1973.

Results

The values in ppm of copper, lead and zinc are plotted on Map 5. Sample spacings were short but line spacings wide, so the geochemical program must still be considered a reconnaissance one. The values were contoured however and the contoured results are very significant.

Although some small areas of anomalous values were obtained, contoured lead and copper results show no significant anomalous trends (Maps 3 & 4). The zinc results yield very many anomalous areas when contoured, the anomalies exhibit strong and continuous trends.

Anomaly A, Map 2, is probably the most significant of the anomalies obtained on the claim group in that it is confined to an area of subcropping graphitic shale, the same unit which hosts the Placer mineralization to the southeast. Part of the anomaly is situated outside the boundary of the Trois claims, but allowing for some downhill migration of the anomaly (zinc is particularly vulnerable to migration), and the fact that the graphitic shales dip to the north and under the main body of the claims, any mineralization which may be causing the anomaly will, for the most part be contained within the claims.

The main part of the A anomaly is also coincident with the extension of a fault (Map 1) and occurs where this fault cuts the graphitic shale. This fault could also be a contributing factor to mineralization in this area. At this point it should be noted that although the Placer mineralization is confined to the black graphitic shale, it is also in part controlled or modified by the dominant NW-SE structure in the area.

The apparently sharp cut-off of anomaly A on the east may be false, in that the anomaly could continue off the claims to the southeast. No samples were taken in this region to prove or disprove this.

Anomalies B, C and D are all confined to the upper conglomerate-sandstone-shale unit. These anomalies are not thought to be so significant as anomaly A as they do not have the same strength or areal extent. They could be reflecting minor mineralization similar to that already found near the top of Trois Ridge.

CONCLUSIONS

The geochemical values obtained are of obvious importance, particularly in the light of the geology of the claims. The claims clearly warrant further intensive examination. Since the chances are remote that the mineralization causing anomaly A will be found in outcrop, the geochemical results should be supplemented with closer sampling. Due to interference produced by graphitic units in most electrical surveys, geophysics may be of little use in delineating targets. The detailed geochemical survey will probably need be followed immediately by trenching or drilling.

J.P.N.Badham, B.Sc., Ph.D.(Geol.)

I, Nicholas Badham, of the City of Southampton, England, hereby declare:

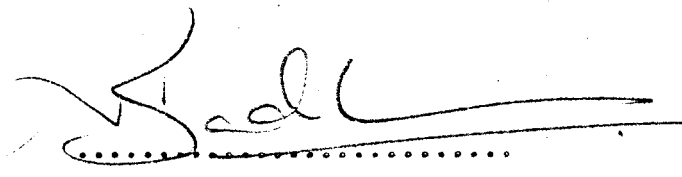
1. That I am a graduate of the University of Oxford, England, with the degree of Bachelor of Arts (Honours Geology) 1969, and of the University of Alberta, with the degree of Doctor of Philosophy (Geology) 1973.

2. That I hold the position of Lecturer in Economic Geology at the University of Southampton, and also serve the mining industry as a Consulting Geologist.

3. That I have no interest, either direct or indirect in the properties described in this report, owned by Vestor Explorations Ltd. of Edmonton.

4. That this report is based upon sources of information cited and on personal knowledge of the properties, and of similar properties elsewhere in the Canadian Cordillera.

Dated at Southampton, this 8th day of April, 1974.



N. Badham, B.A., Ph.D.
Consulting Geologist

MAP 1.

VESTOR EXPLORATIONS LTD.

GEOLOGIC MAP OF THE SUMMIT LAKE AREA, Yukon Territory - Northwest Territories

SCALE 0 2000 4000 6000 8000 10,000 FEET

N. Badham August 1973

DEVONIAN or CARBONIFEROUS ?

Interbedded conglomerate, sand, grit and shale, of slump-turbidite origin, at least 2500' thick with 11 or more major conglomerate units. Great lateral facies variation.

SILURIAN ?

Siliceous siltstones. Between 150 & 400 ft. Contains graphitic & calcareous units near the base and, in places, a highly graphitic unit at the top. Local cherts at base.

LOWER & MIDDLE ORDOVICIAN

Graphitic shales. 200-400 ft. of highly graphitic black shale, locally with abundant graptolites; some siliceous and many calcareous units near the base and local chert layers near the top.

CAMBRIAN-LOWER ORDOVICIAN

Limestone 200 ft. of banded argillaceous limestone including an unknown thickness of lower clastic calcargillites and calcarenites with some limestone breccia.

LOWER CAMBRIAN or EARLIER

Grey-black shale, non graphitic and unfossiliferous

Detailed traverses (not on Vestor's ground)

Intense folding

Fold axis & plunge

Bedding attitude

Cu Fe Showing / gossan

Fossil locality

Fault