TARGET PROJECT #117

ANNUAL REPORT

1977

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TARGET PROJECT

#117

ANNUAL REPORT 1977

J.C. Stephen Explorations Ltd.
1124 West 15th Street,
North Vancouver, B.C.

December 1977

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INTRODUCTION

Early in 1977 agreement was reached between Dome Exploration (Canada) Limited and J.C. Stephen Explorations Ltd. to finance re-analysis of soil and silt samples currently on file, and to carry out research into possible target areas in British Columbia.

Two target areas, the Heber River on Vancouver Island, and the LION claim group north of Takla Lake, were picked for further prospecting in search of copper mineralization.

Silt samples from several areas in central British Columbia were analyzed for a number of elements. Anomalous results were obtained in some cases but no distinct anomaly of high priority was detected.

Research into new areas was conducted, concentrating on possible uranium occurrences. Emphasis shifted from exploration for copper to exploration for uranium as a result of economic factors.

SUMMARY OF 1977 PROGRAMME

As indicated above the programme for 1977 consisted of three phases:

(1) re-examination of previously known targets,

(2) re-analysis of old silt and soil samples,

and (3) research into new areas and commodities.

The first of these phases led to prospecting and silt sampling on the Heber River, Vancouver Island. Areas anomalous for copper are indicated but no mineral showings were found. The copper mineralization is apparently in the Triassic volcanics rather than in the intrusive. Due to the depressed state of the copper market no further work is recommended at this time.

The LION claim group was staked to cover copper occurrences in volcanics. Geological mapping, limited hand trenching, sampling, and magnetometer surveying were done. Assay results are very low. No new showings of promise were located and no further exploration is proposed.

Re-analysis of silt samples was done for most areas south of Prince George from which samples were available. In addition, some samples from portions of the Babine and Takla Lake areas were run. No anomalies of apparent high priority were found. The most obvious benefit derived from this geochemical work was the confirmation of uranium content in samples from parts of the Topley intrusives south-east of Endako. This tended to confirm the possibility of uranium being present in Tertiary formations on the flanks of the Topley intrusives.

General research suggested two geological models for uranium deposition which seemed to be applicable to the region of the Nechako map area south of Endako and Burns Lake.

A programme of reconnaissance silt sampling was instituted, and with the early discovery of anomalous areas, additional crews were assigned to this work. Ultimately this uranium search became the primary effort of the Target exploration programme.

Three claim blocks were staked. Limited geological mapping, additional silt sampling, and some soil sampling were carried out. Significant uranium anomalies appear to be present under varied geological conditions. One claim group also has a significant molybdenum anomaly.

The following is a summary of results for individual prospect areas taken from field results. Descriptions of the claim groups are as reported by C.P. Harivel and C.Q. Barrie.

GENERAL PROGRAMME 1977

INVESTIGATION OF TARGET AREAS

HEBER RIVER, VANCOUVER ISLAND 92F/13

Map I 'Heber River' shows the geological and geochemical information gathered during May. Snow hampered work in some areas. No significant molybdenum or zinc anomalies are indicated. The histogram of copper values, Figure I, indicates the high background level for copper. Values in excess of 300 ppm may be considered anomalous and these are colored on Map I. High values are more or less restricted to the area south-west of the intrusive. The arithmetic means for the various parts of the area are:

(a)	volcanics north-east of the intrusive	13 samples	210 ppm Cu.
(b)	intrusive	24 samples	193 ppm Cu.
(c)	volcanics south-west of the intrusive	26 samples	311 ppm Cu.

No mineralized showings of any significance were found although minor molybdenite was found on fractures in the diorite. During prospecting in 1963 the writer located scattered bornite in the volcanics as well as chalcopyrite mineralization along fractures. These areas are quite high and were covered with snow during this seasons work.

A new park area has recently been defined by the British Columbia government immediately north of the prospect area and extending north beyond Gold Lake.

No further work is recommended at this time.

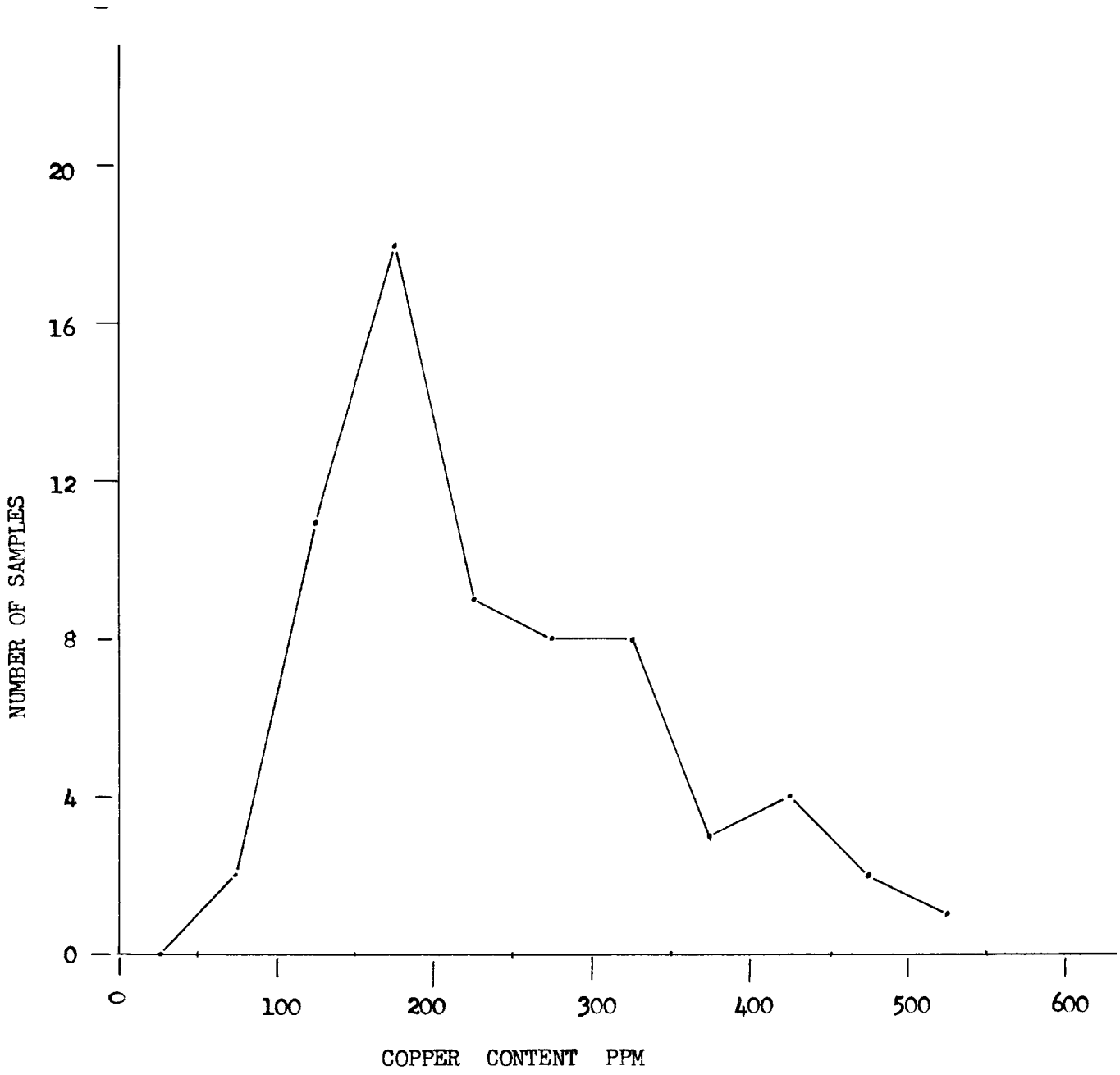


FIGURE I

FREQUENCY DISTRIBUTION

COPPER IN SILT SAMPLES

66 SAMPLES

J.C. STEPHEN EXPLORATIONS LTD.

TARGET PROJECT

HEBER RIVER B.C.

92F/13

LION CLAIM GROUP
93M/16

INTRODUCTION

The following report describes the results of an investigation of LION claim units which were staked to cover copper showings in an environment believed to be favourable for enclosing a massive sulphide ore deposit in volcanic rocks.

Geological mapping was done by Colin Harivel, a 1972 Honours graduate in geology from U.B.C.

The magnetometer survey was conducted by field assistant Rob Larsen under supervision of Harivel. Lines were cut by Larsen and field assistant John Dwyer.

LOCATION AND ACCESS

LION claim units are located approximately 30 miles north of Takla Landing. The B.C. Railway is located in the Driftwood River valley, 21 kilometers south-west of the property. Access to the property for purpose of this work was by helicopter with supplies taken from Smithers to the airstrip at Driftwood River N.C.P. camp.

GEOLOGY

PROCEDURE

The published geological map of the area is 'Hazelton East Half' by T. Richards 1973. The local geology map prepared in 1973 by LUC Syndicate was available to Harivel. The assessment report 'Report on the LION I an II Claim Groups, Takla Lake Area', was available and extensive use was made of this report and the geological map therein.

A topography map prepared from air photos was available and geology was plotted on this map (1:6000 scale). In the area of major interest control was based on picket lines and assisted by use of an altimeter. See Map II.

Airphotos at 1"- $\frac{1}{2}$ mile scale were also used.

ROCK TYPES

(1) RHYOLITE - CHERT SEQUENCE

This sequence, believed to underlie the basic and intermediate volcanic sequence, is exposed in the stream course in the north-east quadrant of the map area. The sequence is locally folded, perhaps drag-folded, as a result of faulting, and is generally steeply dipping, trending south to south-east.

(2) UNDIFFERENTIATED ANDESITE SEQUENCE

These rocks are exposed here and there over much of the property. Agglomerates, flows, tuffs and breccias are included in the assemblage but attempts to separate this sequence into units failed.

In general the andesites are massive, dark green, fine grained rocks but in some areas they are altered to maroon and green with abundant hematite and epidote.

In the vicinity of some of the copper occurrences the volcanic rocks are pyritized and, especially around larger areas of pyrite gossan, are silicified and veined with quartz stockwork.

(2a) SILTSTONE, ARGILLITE

Locally small blocks of thin bedded siltstone and argillite are exposed in the grid area. These blocks, up to a few metres in large dimension are apparently chaotically arrayed in the enclosing volcanic rocks and are deemed to be fault chaos since they are located in inferred zones of faulting.

(3) LIGHT GREY-GREEN ANDESITE AGGLOMERATE

This unit crops out in the south-west quadrant of the map area. It is fresher and more blocky in its fracture habit than the undifferentiated sequence and is therefor placed here as a separate unit. The unit is locally hematized and locally pervasively saussuritized, but less so than other volcanic rock units in the map area.

(4) RED COBBLE CONGLOMERATE

This rock type is exposed in the main drainage stream in the north centre of the map area and in the east central part of the grid area. It overlies the volcanic rocks of unit (2) and probably of unit (3) but the contact is exposed in only one place and the nature of the unconformity was not determined.

These rocks crop out adjacent to faults and may represent fault blocks. However, they may be unconformably overlying the undifferentiated volcanic sequence as outliers in this map area.

(5) QUARTZ, HORNBLENDE FELDSPAR PORPHYRY

This intrusive rock crops out in the main drainage stream in the central part of the map area and in the area of pyrite gossan in the north-west corner of the picket line grid.

Pyrite is disseminated in this rock and makes up to 5% of the volume. In the area of gossan (above) chalcopyrite is present and is associated with vein pyrite and quartz. Alteration has locally rendered the rock chalky and crumbly in outcrop, where it is quartz-albite-chlorite rock. Locally this latter rock has been silicified and the resulting flinty, white, highly fractured rock is reminiscent of rhyolite.

(6) BIOTITE HORNBLENDE DIORITE

This is a coarse grained, dark grey to mottled grey and black diorite. Hornblende is generally somewhat chloritized. Magnetite is common as small disseminated specks and the intrusive is associated with a strong north to north-west trending aeromagnetic high.

The intrusive locally contains minor pyrite and rare chalcopyrite. Hematite and epidote alteration with minor sulphide mineralization occurs adjacent to the diorite contact.

MINERALIZATION

Chalcopyrite and malachite were observed here and there over much of the property. A known showing with chalcopyrite in fractures is exposed in the main drainage stream in the north-east quadrant of the map area. A LUC Syndicate assay, of picked material in fractured andesite and adjacent rhyolite over a width of 1.3 metres returned 3.21% Cu., 0.55 oz/ton Ag and Tr. Au.

Adjacent to the narrow mineralized andesite band, fractures in massive rhyolite are mineralized with pyrite for several metres. Disseminated pyrite is common. Rusty veins and fracture fillings of calcite and iron carbonates are exposed nearby.

A second showing about 1500 metres south of the first, exposes chalcopyrite and pyrite in a rusty curvilinear zone several tens of metres in length. Sampling by LUC Syndicate gave 0.17% Cu over 9.0m., 0.08% Cu over 12.2m., 0.17% Cu over 18.2m. The highest assay was 0.29% over 3.0m. At the top of this zone at the extreme north-west of the grid area blebs and pods of massive pyrite, and less commonly, chalcopyrite, were observed in green massive andesite. In this area, and to the north-west, for a few tens of metres the rock matrix texture becomes coarser than elsewhere on the property.

South-west of this last mentioned area is an extensive area of gossan. Within this zone small outcrops crop out through rusty talus. Two chip sample traverses were made through altered volcanics and altered quartz porphyry intrusive. Chips were taken at regular intervals over lengths of 3 metres. The highest assay returned 0.17% Cu with 0.02 oz/ton Ag.

Within the gossan areas shattered vein quartz with

associated pyrite and lesser chalcopyrite are exposed adjacent to small outcrops of quartz porphyry intrusive. The volcanic rocks are locally thoroughly altered.

South-east of this area, about 130 metres distant, and within the larger area of gossan, a sampling traverse was made in 100% exposure of quartz veined volcanics. Locally, chalcopyrite grains were noted in association with pyrite. The rock chip samples were collected in a similar manner to those mentioned above and were analyzed geochemically. The highest values were 625 ppm Cu., 75 ppm Zn., and 0.2 ppm Ag.

Rock chips taken from outcrops in the creek where high values in copper in stream sediments had been reported, returned a high of 495 ppm copper and a low of 8 ppm copper, with zinc a high of 200 ppm, and with silver a high of 0.2 ppm.

TABLE I RESULTS OF ROCK CHIP SAMPLE TRAVERSES MAP II

TRAVERSE 1		TRAVERSE 2		TRAVERSE 3	
Metres	Assay % Cu	Metres	Assay % Cu	Metres	Cu, Zn ppm
0 - 3	0.01	0 - 3	0.06	0 - 3	450, 70
3 - 6	0.02	3 - 6	0.15	3 - 6	610, 75
6 - 9	0.01	6 - 9	0.11	6 - 9	565, 55
9 -12	0.02	9 -15	No Sample	9 -12	395, 60
12 -13	0.01	15 -18	0.07	12 -15	335, 70
13 -21	No Sample	18 -27	No Sample	15 -18	240, 45
21 -24	0.01	27 -30	0.12	18 -21	275, 40
24 -27	0.01	30 -42	No Sample	21 -24	625, 50
27 -30	0.02	42 -45	0.06		
30 -33	0.02	45 -48	No Sample		
33 -36	0.01	48 -51	0.07		
36 -39	0.01				
39 -45	No Sample				
45 -48	0.09				
48 -54	No Sample				
54 - 57	0.17				

ALTERATION

Alteration is of propylitic facies (hematite-albite-epidote-calcite). In the main drainage in the west central part of the map area extensively altered massive outcrops of andesite exhibit much epidote. This is believed to result from fluids channelled along NNE - SSW faulting mapped in this area.

Immediately east of the copper showing in the main stream, north of the grid area, a zone of extensive carbonate alteration is exposed and apparently is bounded by faults which trend SE - NW.

In the west central part of the grid area local gossans are exposed. In some places the associated alteration is of sulphateric type. Only areas of extensive or especially intense gossan are indicated on the map.

An area of intense quartz stockwork veining is noted on the map east of the camp site. This has no strong pyrite association.

STRUCTURE

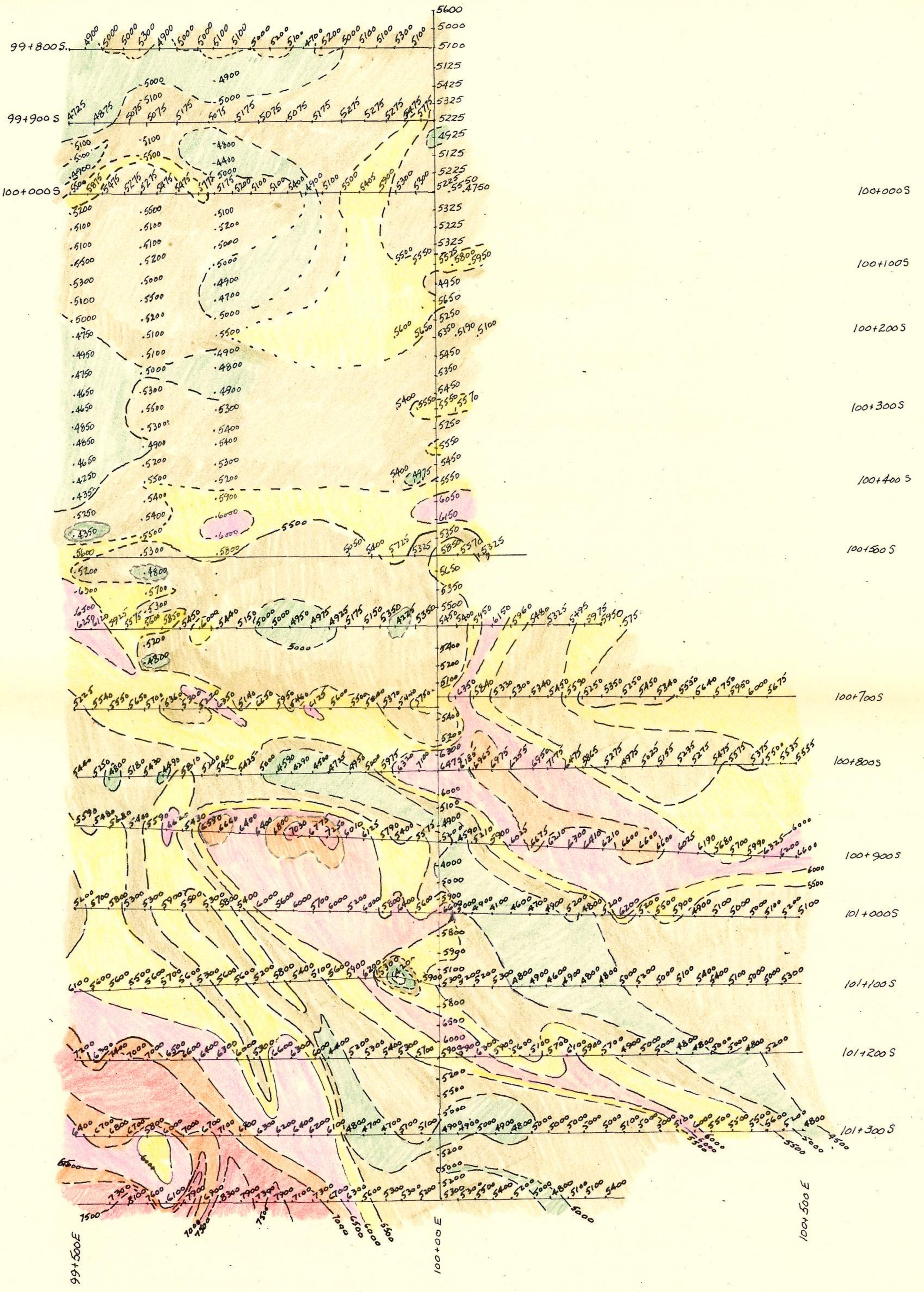
The Ominicetla valley to the north-east of the claim units is the site of a major north-west trending fault. Strong shearing in the main stream course in its NNE trend, together with air photo linears and mapping south-east of the claim units, suggest strong, south trending faults which separate the host rocks on the LION property from older sediments to the east. An east trending air photo linear running along the creek in the north-west corner of the map area suggest a transverse fault.

The most common fracture directions measured trended NW - SE with steep dips to the south. Flatter lying fractures which trend NE - SW were also measured.

MAGNETOMETER SURVEY

A McPhar fluxgate magnetometer was used and readings taken at 25 metre intervals along grid lines. The values used in the magnetometer survey map have been corrected for diurnal variation and adjusted to a base datum day's readings. See Map III.

The magnetometer survey indicates strong dislocations along SE and SSE trends. The location of faults plotted on the geology map were largely based on the confirmatory evidence supplied by interpretation of the magnetometer survey. West of the north end of the grid an extensive area of magnetic low is interpreted to represent an underlying intrusive and associated alteration apron.



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TARGET PROJECT

LION CLAIM GROUP MAGNETOMETER SURVEY

SCALE 1:6000

SEPTEMBER 1977

MAP III

DISCUSSION AND CONCLUSIONS

Two features of the property viz., the presence of podiform massive sulphide mineralization and, an interpreted rhyolite breccia, justified investigation of the area for presence of a massive sulphide ore body.

The "rhyolite breccia" has been mapped, for this report, as shattered quartz and silicified volcanic rock associated with intrusive rocks exposed nearby. The podiform mineralization is believed to be caused by the relatively substantial thickness of the flow in which the pyrite occurred. That is, in other thinner units the pyrite is disseminated in small grains but in the thicker flows sulphide rich solutions remain unfixed for longer times making pod formation possible. The relative thickness is also believed to result in the coarser textures of the andesite in the area of podiform sulphides.

The distribution of most significant copper mineralization in the grid area and environs is at least curvilinear and is probably structurally related. There is permissive evidence for this in the magnetometer survey in that, within the area surveyed, the copper mineralization crops out over an area of broad, flat, magnetic low.

It is concluded that the most significant copper mineralization, in terms of greatest possible tonnage, is associated with intrusive rocks. The areas of indicated intrusive activity within the grid area is open to the west. However the assay results do not offer much encouragement for extending the grid area. The relatively rapid fall off in this area of the anomalous copper results in soils should not be given too much weight as negative evidence for extension. The high proportion of pyrite in the

intrusive area results in effective leaching of copper in exposed areas but this effect may be masked and neutralized by overburden.

In the far north-west of the map area high copper soil geochemical results made investigation of this area worth while. No outcrop was discovered and no explanation of the high results was gained through examination of the float or in the soil holes. The rocks in the extreme north-west of the map area offer no good source of high total-rock copper geochemistry. It is suggested that high geochemistry in the area, as well as the redder coloration of the soils are the results of mineralizing fluids associated with east trending faulting along the creek in this area. A magnetic survey would probably confirm this suggestion.

The area of high copper results in stream sediment analysis was examined and duplication of this high result was attempted. No reasonable replication of this result was made but one rock chip result was 495 ppm copper. This suggests that the original result was caused by detrital chalcopyrite.

C.P. Harivel

SUMMARY

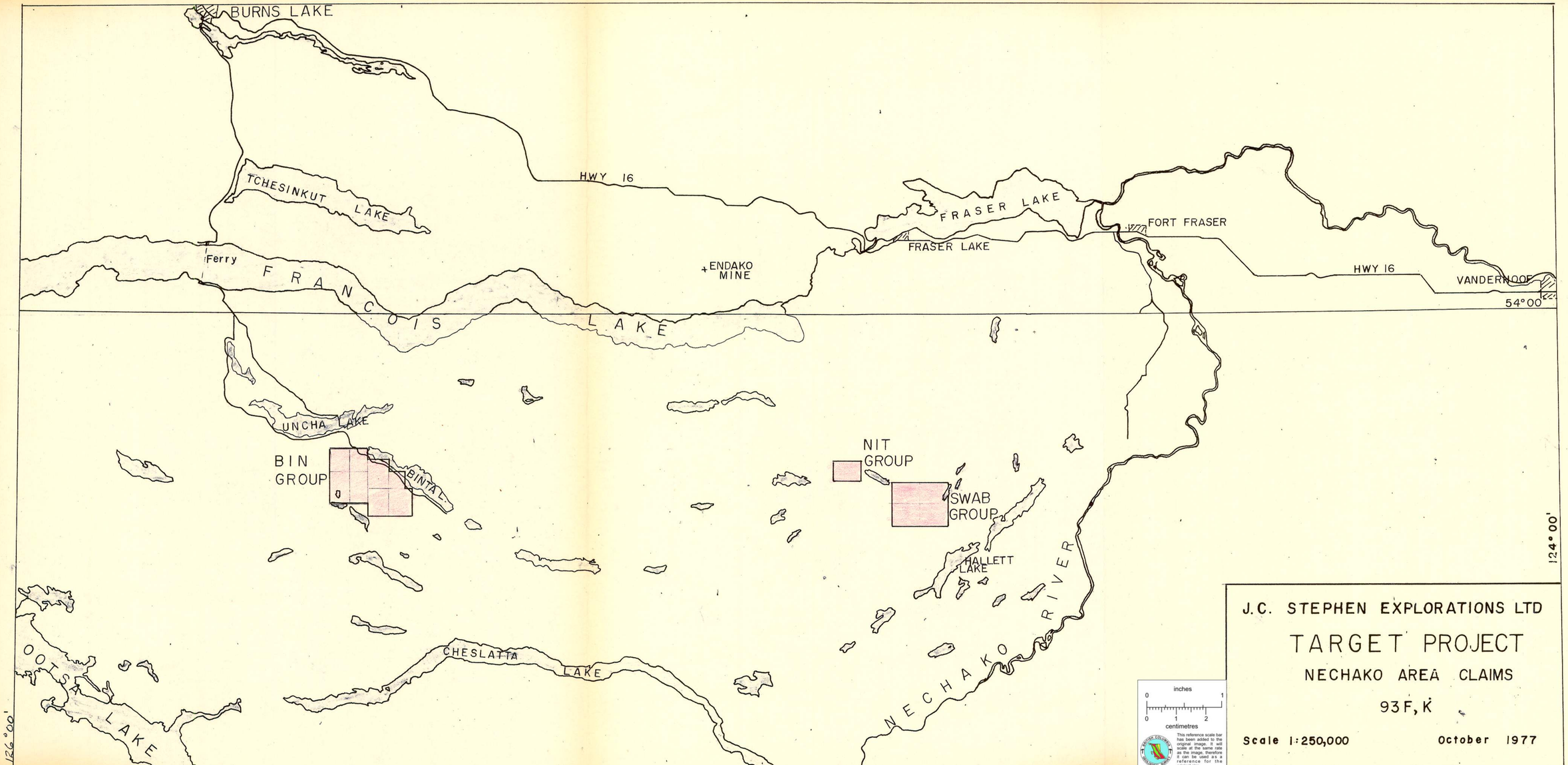
The mapping and magnetometer work conducted this summer did not succeed in providing a definite picture of the origin or structure for the copper mineralization on these claims.

A volcanogenic origin for this copper cannot be entirely ruled out. However, soil samples from this, as well as two other prospects, were run for elements such as Ag, As, Zn. Values were generally very low and mineralization appears to be primarily pyrite and chalcopyrite in all three cases. Results point to porphyry related deposition.

Since assay results from the LION group are very low in grade, and as no new significant showings were located, no further work is presently recommended.

Work done during 1977 is probably insufficient to hold all the LION claim units for another year. The exact situation is uncertain until the new Mineral Act Regulations are made public and come into effect January 1, 1978. It is likely that submission of all data, including assays, would be required for acceptance of the work done.

Decision by Domex regarding holding of these claims, in conformance with Section 15 of the Target agreement, would be appreciated prior to February 1, 1978.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TCHESINKUT LAKE
HWY 16
FRASER LAKE
FORT FRASER
Ferry
FRANCOIS LAKE
ENDAKO MINE
FRASER LAKE
HWY 16
VANDERHOOF
54°00'
UNCHA LAKE
BIN GROUP
BINTAL
NIT GROUP
SWAB GROUP
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NECHAKO RIVER
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J.C. STEPHEN EXPLORATIONS LTD
TARGET PROJECT
NECHAKO AREA CLAIMS
93F,K
Scale 1:250,000
October 1977

MAP IV

SWAB CLAIM GROUP
93F/15

INTRODUCTION

The SWAB Group consists of four claims of 20 units each. It is located approximately half way between Nithi Mountain and Hallett Lake 83 miles west of Prince George. Staking was done as a result of obtaining anomalous uranium values from a number of silt samples. See Map IV for location.

Stream silting and geological mapping were done on air photos at a scale of 4 inches to 1 mile. Results are shown on Map V accompanying this report.

Twelve lines of soil sampling were done on a 100 metre grid on SWAB 1 as shown on Map V. These soil samples have not yet been analyzed due to shortage of funds.

ROCK UNIT DESCRIPTIONS

GRANITE, GRANODIORITE

Granodiorite boulders were observed in the extreme north-east corner of the SWAB group. No actual outcrop was seen on the claims. However there was a high density of granitic boulders and fragments suggesting a nearby source. Outcrop to the north-east of the property, in an area mapped as granite to granodiorite by Tipper, was mapped here as melanodiorite.

Pyrite was observed in several samples as (a) up to 5% disseminated small crystals and (b) rarely as massive pyrite along fracture planes.

ALASKITE

The alaskite rock unit was mapped from the eastern portion of SWAB 1 to beyond the claim group in the west. The western contact was assumed only in the north-western corner of the SWAB group. The eastern boundary was mapped according to rubble except north of the claims.

The rock is characterized by:

(i) a miarolitic texture often possessing minute dog's tooth quartz crystals,

(ii) abundant manganese staining on fracture surfaces and throughout weathered rock,

(iii) minute specks of magnetite (<1%),

(iv) very small quartz crystals in a feldspathic matrix,

(v) in some localities, pyrite as

- (a) small veinlets
- (b) small crystals grown within biotitic zones
- (c) in float, rarely as small massive coatings on fracture surfaces.

Often, at the top of hills the alaskite displays, closely spaced, subhorizontal fractures (approx. 1 cm. apart) that have resulted probably from unloading, suggesting that this represents the top of the intrusion.

The alaskite is usually medium grained and weathers to an angular state similar to granitic weathering. Elsewhere the alaskite is finer grained and appears to possess a bedding with units approximately 10 cm. thick. These, however, could actually be jointing or fracture patterns. The overall texture and intrusive relations seen in a rubble outcrop warrant labelling this rock unit as a shallow intrusive as opposed to a thick intrusive. From

the intrusive relationship it appears that the alaskite intruded the diorite, that is, the melanodiorite, to the north-east

DIORITE

This unit occurs as two outcrops on the property as well as several to the north-west of the property. The small outcrop at 4N, 1.9W, and the huge outcrop making up the hill at 3N, 3W, are of a massive dark rock with small white phenocrysts of plagioclase. The rock tends to fine upwards, losing its porphyritic character and becoming similar to an andesite or dacite. The rock unit may possibly be a porphyritic andesite or dacite. The rock is weakly magnetic and is stained with manganese on fracture surfaces.

CONGLOMERATE (VOLCANIC)

This was observed in one outcrop at about 3,6N, 2.6W in a north-east trending hill, and again to the north-east at the claim boundary. It is matrix supported, the matrix being about 40% of the composition. The matrix is light coloured, most likely volcanic ash. The clasts are sub-angular, poorly sorted, and range in size from about 0.5 to 6 mm. Bedding or tops could not be determined.

CHERT (RHYOLITE)

The chert (or rhyolite) was observed in outcrops west of the conglomerate. The chert is generally medium to dark grey, contains small quartz crystals (2%) and rarely possesses small pyrite crystals. One sample contains shards, making it a tuffaceous chert. A yellow earthy stain occurs on some samples.

MINERALIZATION

Intra-formational breccia of alaskite was noted at 4W, 0N. They possess abundant black manganese staining, quartz crystals and a green, soft, plate like mineral in the cavities. The brecciation appears to be the result of a fracture-shear system that possibly resulted in the draw, or valley, cutting the outcrop.

Abundant crystals of magnetite were seen locally in the diorite.

Scintillometer values ranged from 3 to 4 times background on outcrops over the whole of the property. No anomalous areas were located.

DISCUSSION

(a) URANIUM

Uranium silt values suggest that the alaskite unit is uraniferous to the extent of being a possible source rock. Thus a model of transported uranium to surrounding rock must be envisaged. Along this train of thought, it is necessary to investigate the overlying rocks and the lower valleys surrounding the alaskite where the transported uranium could be deposited.

(b) MOLYBDENUM

Very good molybdenum values were obtained from the silts in SWAB 1. The assumed contact between the alaskite and the granitic rocks to the east appears in the middle of SWAB 1 trending north - south. However, rubble outcrop south-west of the legal post in SWAB 3 shows an intrusive relationship. Thus the contact may be sub-horizontal, or at least close to the surface. A possible model

envisages the molybdenum along the contact between the alaskite and the older diorite to the east. Structurally, the alaskite may be intruded as a thin shell around the diorite. This model could also explain the relatively high molybdenum values to the east, however no alaskite was observed in that area on a preliminary investigation.

C.Q. Barrie

SUMMARY

GEOLOGY

Mapping has been conducted, more or less, as an adjunct to prospecting. Except for the central main ridge of alaskite, outcrop is quite limited. Stratigraphic relationships and the true nature of the rock types are still in considerable doubt.

The oldest rock type is apparently the granodiorite in the north-east portion of the claim group. The rubble examined by the writer could best be described as a medium grained granodiorite. Barrie describes more basic varieties in outcrop further north.

These intrusives are almost certainly phases of the Topley intrusives which host the Endako mine to the north.

The diorite, described by Barrie, was not observed in place by the writer. If it is an intrusive it may be part of the Topley intrusives. If it is extrusive it is most probably part of the Tertiary sequence of volcanics.

The chert, conglomerate, and andesite are almost certainly part of the Tertiary sequence although their relationships are presently obscure.

The alaskite appears to be a young intrusive emplaced at relatively shallow depth. It is in intrusive contact with the granodiorite, and presumably intrudes the Tertiary sedimentary-volcanic sequence. An abrupt change in topography along the south margin of the alaskite outcrop area suggests this may be the south margin of the intrusive.

GEOCHEMISTRY

On a regional basis the SWAB group is distinctly anomalous for both molybdenum and uranium. It was this anomaly which prompted staking before any geological investigation had been made. Values for both elements range up to 300 ppm and their spatial distribution suggests both elements may be derived from the alaskite.

Molybdenum values extend to the north-east beyond the apparent alaskite sub-outcrop and into the area of Topley intrusives. They extend a considerable distance beyond significant uranium values and may also be derived from mineralization other than that directly associated with the alaskite.

Glaciation may, however, have attenuated this molybdenum train to the north-east if we assume the lack of associated uranium values to be due to leaching of uranium from the soils by rain water.

Molybdenum values drop off rapidly away from the south contact of the alaskite and are relatively low and erratic in areas to the west, distant from the Topley intrusives, but also 'up ice'.

Uranium values are associated with the alaskite and, probably,also with the Tertiary volcanics and sediments as suggested by values of 15 and 29 ppm in north-west SWAB 4.

An isolated uranium anomaly occurs south of the large creek, near the south margin of the map area and off the south boundary of the staked claim group. Values of 22 and 60 ppm uranium appear to originate in an area of volcanics.

Soil sampling was started on SWAB 1 to test the region of highest combined uranium and molybdenum values. These samples have yet to be forwarded to the lab for analysis.

Note that uranium values do not appear to be necessarily related to swampy or organic conditions as uranium is not anomalous along Smith Creek nor in the swamps south-east of the alaskite on SWAB 2.

POTENTIAL STRUCTURES

High values for molybdenum were obtained in silts near the south and east contacts of the alaskite, as well as to the north-east over the Topley intrusives. The intrusive contact zone and possible fractured areas in the Topley intrusives may be favourable for molybdenum deposition.

The alaskite has been glaciated and as a result no residual concentration of uranium in weathered intrusive can be expected. However, deposition is possible:

(1) in fracture zones cutting the alaskite. (source - alaskite)
(2) in breccia contact zones (source - alaskite)
(3) in channels of pre-Tertiary age on the older granite surface beneath Tertiary formations (source - older granites)
(4) in conglomeratic Tertiary horizons (source - tuff and rhyolite)

RECOMMENDATIONS

Soil sampling should be continued over areas indicated as anomalous by silt sampling and this programme should be conducted concurrently with geological mapping and a scintillometer survey. Some rock geochemistry would be desirable.

The programme would be conducted by a crew of four on the property with the following estimated costs.

Soil sampling - 2 men @ $1000 each for 2 months	$ 4000
Mapping - 1 geologist @ $1600 for 2 months	3200
Cook, helper - 1 @ $1000 for 2 months	2000
Soil sample analysis - 2000 samples @ $3.45	6900
Food and supplies - 4 men x 60 days x $8	1920
Vehicle operation and rental @ $900 for 2 months	1800
Overhead and supervision	1380
Total Estimated Direct Cost	$21,200

NIT CLAIM GROUP
93F/15

INTRODUCTION

The NIT Group has one claim containing a total of 20 units. It is located east of Cabin Lake and south-east of Francois Lake, (see Map IV). The property is accessible by a southern extension of the Nithi River road which runs south-east from Francois Lake. The claim is located one claim north-west of the SWAB group.

To date geological mapping and silt sampling has been done on a reconnaissance basis and plotted on air photos at 4 inches to one mile. At the time of writing this field report only a few of the geochemical results had been received. (See Map V)

ROCK UNIT DESCRIPTIONS

Only one rock unit, a conglomerate, was observed and no subdivisions could be made on a reasonable basis. The formation appears uniform from one end of the property to the other. Outcrops appear along a ridge trending north-north-east.

The conglomerate is matrix supported, 70% matrix, 30% clasts. It is poorly sorted, less than 2 mm. to 4 cm., and possesses no observable stratification. Clasts vary in composition from cherty pebbles to volcanic rock fragments. Recrystallized quartz and squashed cavities lined with quartz suggest minor metamorphism, possibly due to burial.

REMARKS

No mineralozation was observed. The property was staked on the basis of two high reconnaissance silts running 41 and 50 ppm uranium. Scintillometer readings ranged from 2 to 4 times background on outcrop areas.

Some hypothesis include:

(a) the conglomerate as a unit is uraniferous to the extent that it may act as a source rock.

(b) the conglomerate may possess areas enriched in uranium undetected by prospecting thus far.

(c) an underlying unit may be enriched in uranium and ground water may carry uranium to enrich stream silts.

Two aspects should be investigated further:

(i) stream silting should be carried out west of the property.

(ii) geological mapping of the surrounding area should be done to correlate the conglomerate with other formations, particularly with formations in the north-west portion of the SWAB group.

C.Q. Barrie

SUMMARY

Uranium results, received subsequent to Barries report, for silt samples taken on this claim confirm anomalous conditions. However, insufficient regional work has been done to define the limits of the anomalous area. There is about 600 feet of topographic relief in the anomalous area and more detailed mapping and prospecting is warranted.

RECOMMENDATIONS

Regional silt sampling - 2 men @ $1000/m for 2 weeks	$ 1,000
Grid soil sampling - 2 men @ $1000/m for 1 week	500
Geological mapping - 1 geologist @ $1600/m for 3 weeks	1,200
Cook, helper - 1 @ $1000/m for 3 weeks	750
Silt and soil sample analysis - 500 samples @ $3.45	1,725
Food and supplies - 4 men x 21 days x $8	675
Vehicle rental and operation - 3 weeks @ $900/m	675
Overhead and supervision	775
Total Estimated Direct Cost	$ 7,300

BIN CLAIM GROUP
93F/13,14

INTRODUCTION

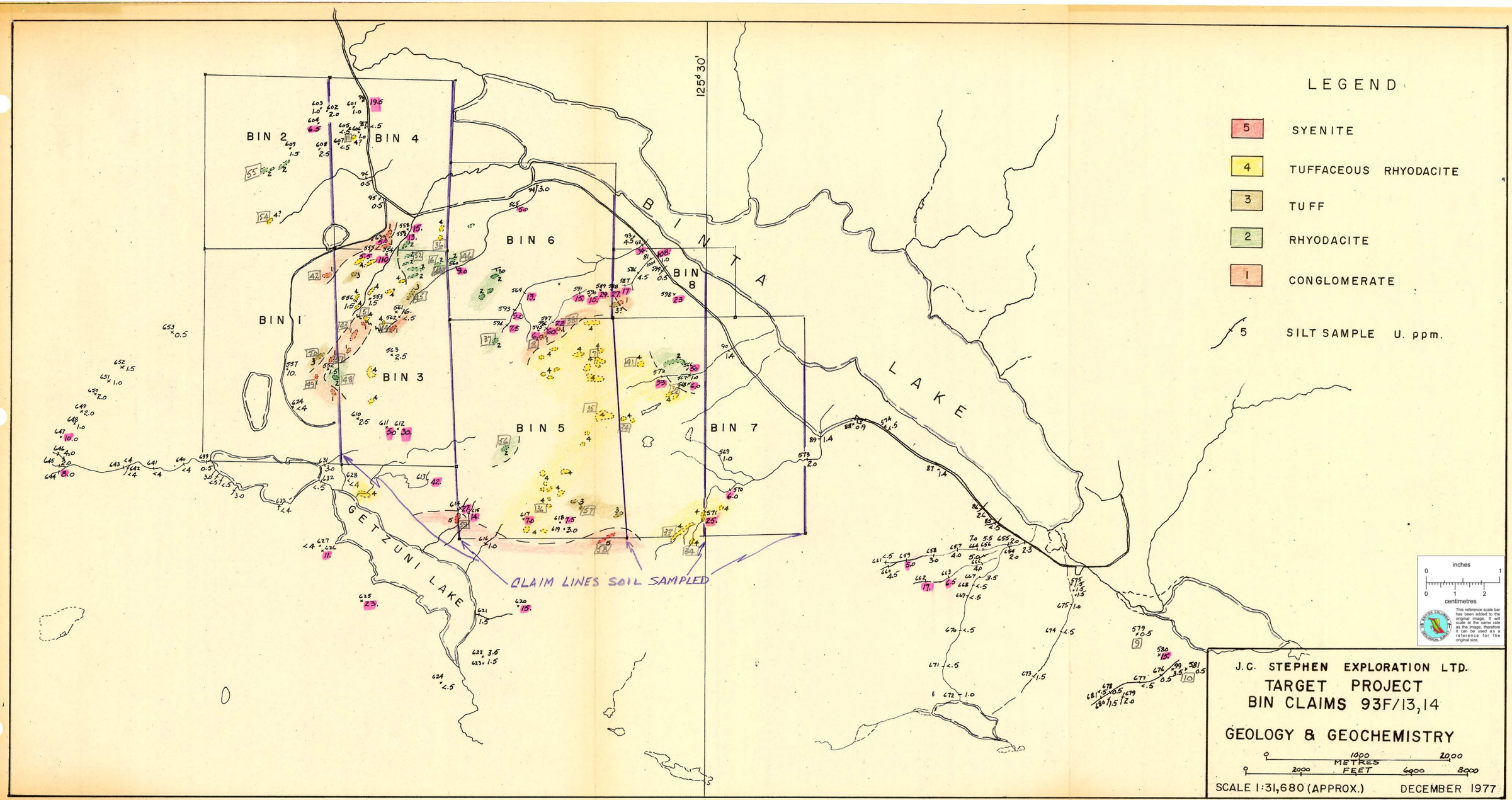
The BIN Group contains eight claims comprising a total of 116 units. They are located south-west of Binta Lake and north of Getzuni Lake approximately 25 miles south of Burns Lake. The property can be reached either by following a gravel road west from the west end of Fraser Lake, or travelling south from Burns Lake, across the ferry at Francois Lake and following a gravel road past Uncha Lake. Access within the property is facilitated by two logging trails. The western trail requires a 4x4 all summer and the eastern trail is passable only in late summer.

The claims were staked to cover possible source areas for silts with anomalous levels of uranium content. Geology has been partially mapped on air photos at 1" to $\frac{1}{2}$ mile. Five lines of soil samples have been taken along north-south claim lines at wide intervals. (See Map VI)

ROCK UNIT DESCRIPTIONS

SYENITE

The syenite appears at the southern edge of the BIN group in two outcrops. The eastern outcrop forms a ridge trending north-east. Here the rock is medium grained with about 10% quartz crystals and about 30% large (2 cm.) phenocrysts of orthoclase. Since the matrix probably contains more quartz, this particular outcrop would be better described as a quartz-syenite.


LEGEND
5 SYENITE
4 TUFFACEOUS RHYODACITE
3 TUFF
2 RHYODACITE
1 CONGLOMERATE
5 SILT SAMPLE U. ppm.
BIN 1
BIN 2
BIN 3
BIN 4
BIN 5
BIN 6
BIN 7
BIN 8
BINTA LAKE
GETZUNI LAKE
125° 30'
CLAIM LINES SOIL SAMPLED
inches
centimetres
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.
J.C. STEPHEN EXPLORATION LTD.
TARGET PROJECT
BIN CLAIMS 93F/13,14
GEOLOGY & GEOCHEMISTRY
METRES 1000 2000
FEET 2000 4000 8000
SCALE 1:31,680 (APPROX.)
DECEMBER 1977
MAP VI

The second outcrop, about 2000 metres west, near Getzuni Lake, is much finer grained and has fewer orthoclase crystals. Thus this particular outcrop would be better described as a trachyte.

RHYODACITE

This rock unit is fine grained and varies in composition (according to color index) from a rhyolite to a dacite. The actual color varies from a faint greenish to reddish color. Generally it is relatively massive and homogeneous except near the eastern side of the property (BIN 7, 2E, 1S) where plagioclase phenocrysts are abundant (15%).

Some samples display abundant manganese staining, producing thick lustrous encrustations.

The rock may be extensively sheared or brecciated locally.

TUFF (CRYSTAL)

This rock unit is scattered throughout the BIN group, probably between the rhyodacite and tuffaceous rhyodacite units. It is characterized by its massive earthy texture and whitish to cream color. Within it are small (1 cm.) clasts (pyroclasts) of feldspar and quartz. These are generally well rounded and make up about 5% of the rock.

TUFFACEOUS RHYODACITE

This rock unit represents a mix of the tuff and rhyodacite units to produce thin alternating layers. Judging from the number

of outcrops this unit is most voluminous surficially. Typically the rock is characterized by thin (5 mm.) bands of reddish rhyodacite and white ash (pyroclast ?) spherules. These spherules appear to be alterations from a crystalline or glassy substance, and often, appear to amalgamate to form coninuous ash layers.

Occasionally the reddish rhyodacite portions far exceed the tuffaceous portion by as much as 9 to 1. In these cases the rhyodacite acquires the spherulitic texture.

(As informed by Dr. Watson, this is probably not a tuffaceous rhyodacite but a spherulitic glass unit with layers of devitrified glass representing the white layers).

CONGLOMERATE

This unit is far more complex and varied. The clasts are of a wide composition; from volcanic, to intrusive, to cherty, to conglomeratic. The proportions vary from clast supported with about 10% matrix, to matrix supported with about 80% matrix. The clasts vary from angular to rounded, and in size from 5 mm. to 10 cm.

(Again, as informed by Dr. Watson, the unit is a volcanic. The clasts could either be xenolithic in nature, or clasts as in an agglomerate. The green matrix is glass, the dark green grains being centres of devitrification. Perlitic texture is abundant on the western outcrops. Some obsidian was found, but generally the glass is of a rhyolitic composition).

STRUCTURE

On a gross scale, it appears as though the lithologies are nearly horizontal with a slight dip to the south-east. However the devitrified glass layers in the 'tuffaceous rhyodacite' horizon, and the laminations in the crystal tuff exhibit steeply dipping to vertical dips. Thus, either the gross structure is much more complex than envisaged, or these steep dips are on an outcrop scale only.

MINERALIZATION

No mineralization was observed. However, reconnaissance silt samples, follow-up silt samples and scintillometer values suggested the presence of uranium. The highest silt sample value was 110 ppm. A reconnaissance scintillometer survey was unable to detect any major differences between lithologies. All were about 3 times background. The range of values for this particular scintillometer were:

normal background	60 cps
BIN background (swamp & overburden)	90 - 120 cps
BIN outcrop (held at hip)	150 cps
BIN outcrop (held against rock)	150 - 280 cps

Note that the majority of the outcrops may have extensive leaching and therfore,a totally fresh outcrop may respond with higher counts. Hand samples did not change the reading unless they were quite large. The highest values obtained were from an outcrop of tuffaceous rhyodacite which is peculiar in that it is brecciated

with a purplish coloured matrix. The tuffaceous rhyodacite may be xenoliths in the purplish intrusive. Hand samples are able to effect the scintillometer about 10 - 40 cps higher than background.

DISCUSSION

These acid volcanics are rich in uranium, not as a host rock but as a source rock. This property appears to fit a possible leaching model whereby uranium may be leached from the acid volcanics either by circulating ground water or by surface water. The model envisages a possible host rock unit either beneath or in proximity to the acid volcanics. Ideally the host rock would be high in organics which would precipitate the uranium circulated by water.

With this model in mind the following procedures are suggested:

(1) an investigation of unit 10 (GSC map 1131A) to the south-east of the BIN group. This is a Tertiary unit of volcanics plus some sediments including conglomerate, greywacke and lignite. This could provide an ideal host rock.

(2) a relatively deep valley passes through the central region of the property in which no outcrop was observed. Further detailed mapping is suggested in an attempt to find some underlying rocks. Geophysics and more detailed geochemistry may be useful.

(3) investigation of surrounding areas;

(a) north beyond Binta Lake in unit 9 (GSC map 1131A). No prospecting has been done here.

(b) west and south of the low areas, two high geochem values were obtained south of Getzuni Lake

(c) unit 11 (GSC map 1131A) especially to the south in the vicinity of Llgitiyuz Mountain and the hills to the east. A high value was obtained south of Alaska Mountain in unit 11.

C.Q. Barrie

SUMMARY

Mapping thus far has been of a prospecting nature and many small outcrops have yet to be located. Some better mapping control will be necessary than the 1" to ½ mile air photos used so far. Dr. Watson's visit this summer was timely and valuable in helping to show the true nature of the rock formations.

The soil sampling so far done is indicated by colored lines on Map VI. Only one soil sample had a significant uranium content, 13 ppm, and was from the vicinity of the anomalous creek on the boundary between BIN 6 and 8.

Detailed grid sampling and prospecting with a scintillometer should be done in the vicinity of silt anomalies.

RECOMMENDATIONS

The following expenditures on a mapping, soil sampling, scintillometer survey programme to assess anomalous areas is proposed.

Soil sampling - 2 men @ $1000/m for 6 weeks	$ 3000
Mapping - 1 geologist @ $1600/m for 6 weeks	2400
Cook, helper - 1 @ $1000/m for 6 weeks	1500
Soil sample analysis - 1200 samples @ $3.45	4150
Food and supplies - 4 men x 46 days x $8	1475
Vehicle rental and operation - 6 weeks @ $900/m	1350
Overhead and supervision	1225
Total Estimated Direct Cost	$15,100

REGIONAL PROSPECTING - NECHAKO AREA

Our 1977 programme consisted of silt sampling streams accessible by road and staking the more prominant anomalies. In the latter part of the season this regional sampling was continued at the same time as soil sampling was conducted on SWAB 1. Due to shortage of funds when work was terminated, some of these samples have not yet been analyzed.

The programme has demonstrated the existence of uranium silt anomalies of a magnitude comparable with published results of regional programmes in other parts of B.C. and Yukon. Large areas of similar geology have not been sampled and no work has been done, as yet, on favourable horizons such as the Red Bed unit in the Takla Group. A major regional uranium prospecting programme could be conducted in this area.

At present, pending discussion of budget arrangements, the following steps are proposed.

(1) The regional silt sample results presently plotted on 1:50,000 scale topographic maps will be checked and replotted on a new series of mylar base maps in a reproducible form.
(2) When funds are available the approximately 300 silt and soil samples now in storage will be analyzed for uranium and molybdenum.
(3) Selected samples will be checked for elements such as selenium, which form an insoluble compound with uranium, and vanadium which might help the search for the source of the uranium anomalies.
(4) A separate 2 man crew would institute follow-up on new anomalies as early as possible in the 1978 season.

Estimated costs of these steps are:-

(1)	Geological draftsman - 2 months @ $750	$1,500
(1a)	Commercial preparation of base maps	300
(2)	Analysis of samples - 350 @ $3.45	1,200
(3)	Research on selected samples	500
(4)	Field follow-up on anomalies - 2 men plus vehicle and support for one month	5,750
	Estimated Total Direct Cost	$9,250

1978 PROGRAMME

Suggested expenditures on the SWAB, NIT and BIN claim groups, in search of uranium and molybdenum, entails the following estimated expenditures.

CLAIM GROUP		ESTIMATED EXPENDITURE	ASSESSMENT REQUIREMENTS
SWAB Group	80 units	$21,200	$16,000
NIT Group	20 units	7,300	4,000
BIN Group	116 units	15,100	23,200
Total		$43,600	$43,200

In addition, analysis of 1977 samples and early follow-up on anomalies is estimated to cost $9,250 for a total proposed expenditure of $52,850.

These expenditures are proposed to constitute the Target 1978 programme. No further re-analysis of old silt and soil samples, or systematic research of other areas, is included as part of the programme.

Respectfully submitted,
J.C. Stephen Explorations Ltd.,

J.C. Stephen

J.C. STEPHEN EXPLORATIONS LTD.

TARGET PROJECT
HEBER RIVER
92F/13

1" - 1320' 1: 15840

SILT SAMPLE

113/2/50 = Cu/Mo/Zn p.p.m.

LEGEND

1 BASALT (KARMUTSEN)

2 DIORITE

MAP I

PP | A23557
114

LEGEND

4	Red Cobble Conglomerate
3	Light Grey-green Agglomerate
2	Undifferentiated Andesite Sequence
1	Rhyolite - Chert Sequence
5	Quartz Hornblende Porphyry
6	Biotite Hornblende Porphyry

limit of outcrop
area of alteration
geologic contact
fault trace
8-5-1 rock sample number

Scale and elevation datum based on limited ground control resulting in good relative, but uncertain absolute map accuracy.
Compiled from aerial photography at an approximate scale of 1 inch equals 600 feet flown in 1973

J. C. STEPHEN EXPLORATIONS LTD.

TARGET PROJECT No. 117

LION CLAIM GROUP GEOLOGY

McElhanney Surveying & Engineering Ltd.
1200 West Pender Street, Vancouver B.C. Canada

Scale	1 : 6000
Contour Interval	7.62 Metres
Date	Sept. 1977
Job No.	
Sheet No.	

MAP II

124° 50'

SMITH CREEK

NIT 1
29108

SWAB 4

SWAB 3

SWAB 2

SWAB 1

SOIL SAMPLE LINES 2E-13E

LOGGED AREA

LEGEND

6 ALASKITE

5 ANDESITE

4 CHERT PEBBLE CONGLOMERATE

3 CHERT, TUFF (RHYOLITE)

2 GRANODIORITE

1 DIORITE

5,7 SILT SAMPLE U,Mo ppm.

J.C. STEPHEN EXPLORATIONS LTD.
TARGET PROJECT
SWAB 1-4 & NIT 1 CLAIMS
93F/15
GEOLOGY & GEOCHEMISTRY
SCALE 1:15,840 (APPROX) DECEMBER 1977

MAP V