

LOG NO:	1221	RD.
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FILE NO:		

ASSESSMENT REPORT ON THE

JERRY CLAIMS, DOC GROUP

SKEENA MINING DIVISION

British Columbia

LOG NO:	0403	RD. 2
ACTION:	<i>Date received back from amendment</i>	
FILE NO:		

Property Location:

Latitude 56.20 North

Longitude 130.25 West

GEOLOGICAL BRANCH

ASSESSMENT REPORT

NTS 104 B/8 WEST

DEC 18 1989

19,429

Report prepared by:

Arthur C. Freeze

December, 1989

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(1:7,500,000 scale)

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(1:20,000 scale)

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1. INTRODUCTION

This report describes work done on the Jerry 1 and 2 claims between July 20 and August 20, 1989 as part of a helicopter-supported geological mapping, prospecting and sampling program over the entire DOC property. This program was carried out by Echo Bay Mines Ltd. (Echo Bay) on behalf of joint venture partners, Silver Princess Resources Inc. (Silver Princess) and Magna Ventures Ltd. (Magna Ventures).

The objectives of the 1989 program were as follows:

1. To determine the geological setting, character, extent, grade and tonnage potential of known gold-bearing quartz veins on the DOC Property. Most of these, such as the Q17 and Globe veins, are located to the west of the South Unuk River, several kilometres south of the Jerry Claims.
2. To evaluate the potential for alternative targets over the entire property, in view of the abundance and diversity of neighbouring mineral deposits and occurrences, and the stratigraphic and lithologic similarities of their host rocks with those that underlie the DOC property.
3. To provide a geological data base, with emphasis on structure and stratigraphy for all mineral occurrences on the DOC property.

The program was conducted by a crew of seven people, comprising three geologists, a geological assistant, camp manager, cook and helicopter pilot. The crew was accommodated in the new 40-person camp that was built by Echo Bay during their 1988 program.

Geological mapping of the entire DOC property was conducted at a scale of 1:10,000 on an orthophotographic base map. Forty traverses were completed and 140 grab and rough chip rock samples were taken for analysis. One of these traverses was conducted on the Jerry Claims, but no mineralization nor alteration were found and consequently no samples were taken.

2. LOCATION AND ACCESS (FIGURE 1)

The Jerry Claims are located approximately 50 kilometres northwest of Stewart, B.C., immediately north of the confluence between the South Unuk River and Divilbliss Creek (NTS 104B/8). Access to the property is by helicopter from Stewart.

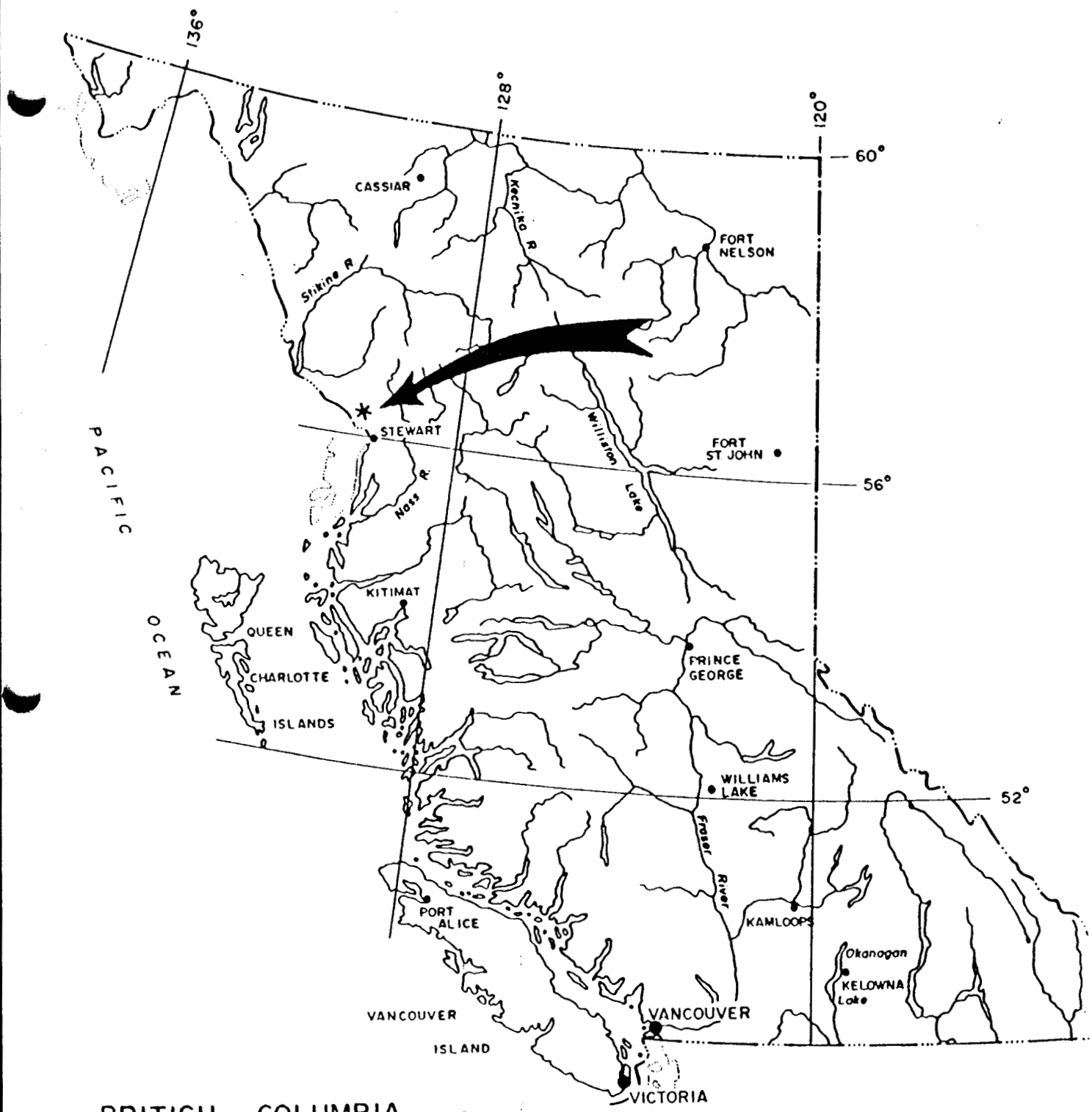
3. TOPOGRAPHY AND CLIMATE

The claims are situated in an area of extremely rugged terrain. Elevations vary from 400 metres to over 2,400 metres over the whole DOC property, but from about 450 metres to 750 metres on the Jerry Claims, which are entirely below treeline and heavily forested with spruce, hemlock, balsam fir and devil's club.

The climate in the region is characterized by short, generally wet summers and by heavy winter snowfall.

4. PROPERTY DESCRIPTION (FIGURE 2)

The Jerry Claims comprise two 1 by 3-unit claims, for a total of 6 units. They are part of the DOC property, under option to Echo Bay and owned jointly by Magna Ventures and Silver Princess.



BRITISH COLUMBIA

Scale 1: 7,500,000 approx.

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 Suite 354-200 Granville Street, Vancouver, B.C. V6C 1S4

GENERAL LOCATION MAP

FIGURE 1

Geology by:	Date:	N.T.S.:
Drawn by:	Scale:	No.:

VANCAL-48214

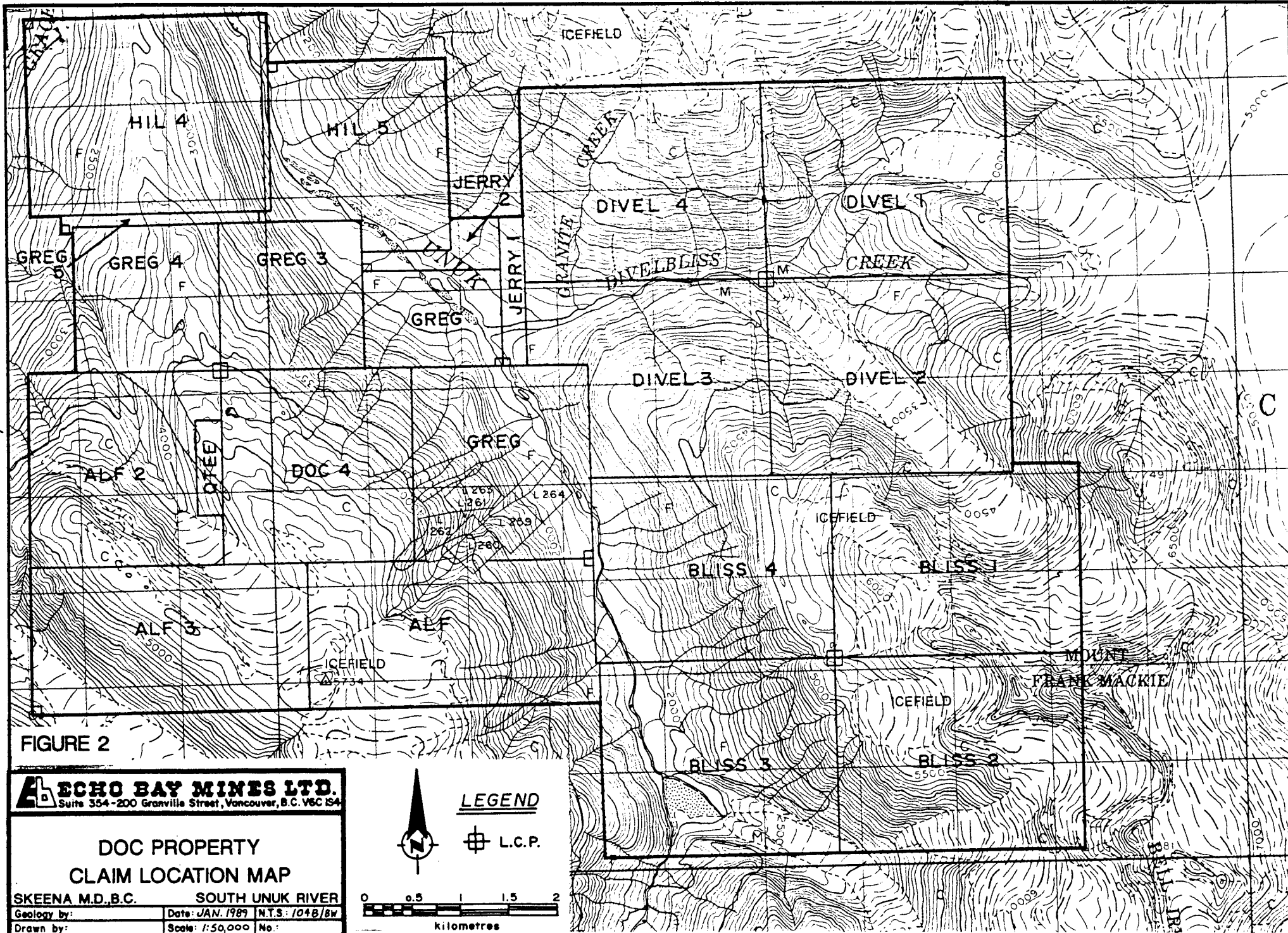


FIGURE 2

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**DOC PROPERTY
 CLAIM LOCATION MAP**

SKEENA M.D., B.C. SOUTH UNUK RIVER
 Geology by: Date: JAN. 1989 INT.S: /04B/8W
 Drawn by: Scale: 1:50,000 No.:

LEGEND

⊕ L.C.P.



TABLE 1

<u>Claim Name</u>	<u>Record No.</u>	<u>Units</u>	<u>Expiry Date</u>
Jerry 1	6476	3	Oct. 23, 1989
Jerry 2	6477	3	Oct. 23, 1989

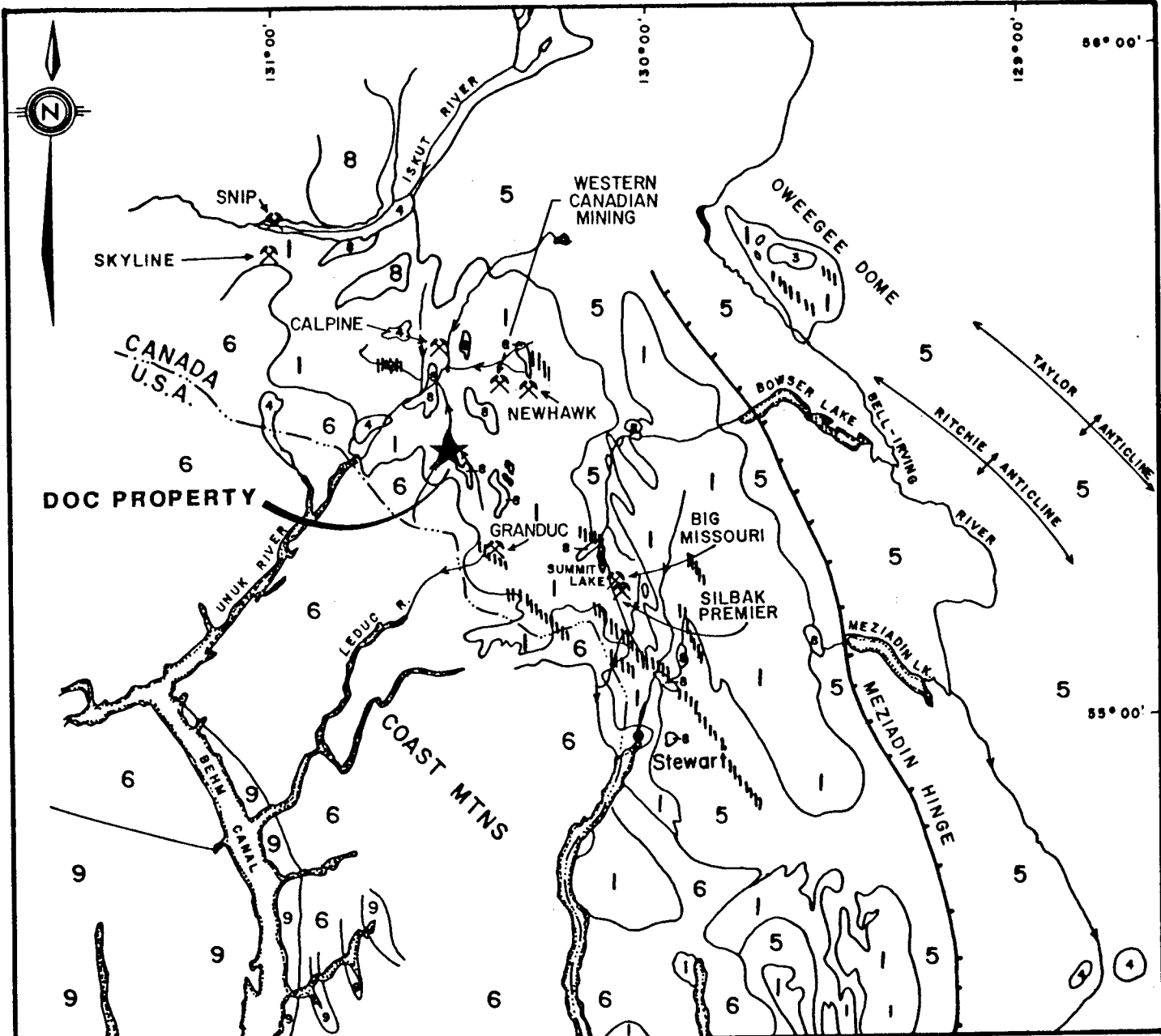
5. HISTORY

Although the general area has a mining history dating back to the 1890's, the only previous work on the Jerry Claims was completed in 1987 by Magna Ventures as part of a prospecting and sampling program of the entire DOC property (Aelicks et al, 1988). During this program a traverse was conducted close to the 500 metre topographic contour in the eastern part of the claim block. Soil samples were taken from the B horizon every 25 metres wherever possible. In all, nine samples were collected and analysed for Au, Ag, Pb, Zn, Cu, As and Sb. No anomalous values were obtained from any of these samples in this area.

6. REGIONAL SETTING

6.1. Geology

The DOC property is located along the western margin of the Intermontane Belt, close to the eastern limit of the Coast Plutonic Complex. It is underlain by Mesozoic volcanic, volcanoclastic and sedimentary rocks that form part of a north-northwesterly trending belt extending from Stewart in the south to the Iskut River in the north (Figure 3). These rocks were deposited in an island arc setting along the western flank of Stikine terrane. They are bounded to the east by the Bowser Basin, comprising an onlap assemblage of Middle to Upper Jurassic sedimentary rocks.

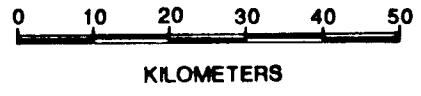


SEDIMENTS - VOLCANICS

- 1 STEWART COMPLEX - TRIASSIC & JURASSIC
- 2 SUSTUT ASSEMBLAGE - CRETACEOUS & TERTIARY
- 3 PALEOZOIC
- 4 TERTIARY & RECENT VOLCANICS
- 5 BOWSER ASSEMBLAGE - MIDDLE JURASSIC TO UPPER JURASSIC

INTRUSIVES

- 6 COAST
- 7 OMINECA - TOPLEY
- 8 SKEENA
- ||||| DYKE SWARMS
- WRANGELL - REVILLAGISED METAMORPHICS



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DOC PROPERTY		
REGIONAL SETTING OF THE STEWART MINING CAMP		
SKEENA M.D. - SOUTH UNUK RIVER AREA		
N.T.S. 104B/8W	SCALE: 1:1,000,000	FIG.
DATE: JAN. 1988	DRAWN: J.R./dw	3

AFTER: GROVE, 1970

Volcanic and sedimentary rocks on the DOC Property fall into two distinct groups of contrasting lithologic, structural and metamorphic character (Figure 4). These units are separated by the north-northwest trending South Unuk River fault. This fault lies approximately 1.5 kilometres east of the South Unuk River. Lithologies of Unit 1 that lie to the west of the fault are assigned to the Upper Triassic Stuhini Group, whereas those of Unit 2, to the east of the fault, are assigned to the Lower to Middle Jurassic parts of the Hazelton Group.

Polydeformed metavolcanic and metasedimentary rocks of Unit 1 that outcrop to the west of the South Unuk River fault were originally defined as part of the Lower Jurassic Unuk River formation and correlated with the lower part of the Hazelton Group (Groves, 1986). However, a uranium-lead date of 221 million years before present was obtained on zircons from a sample of gneissic hornblende-biotite quartz diorite that intrudes these rocks along the northeast margin of the Bucke Glacier (R.G. Anderson, personal communication, August, 1989). Thus, this date gives a minimum age of Late Triassic (Norian) for unit 1, while its lithologic character indicates that it is correlative of the Upper Triassic Stuhini Group.

East of the fault, Unit 2 comprises a westerly facing but locally overturned sequence of sub-greenschist intermediate to felsic volcanic and volcanoclastic rocks with lesser sediments. A distinctive unit comprising andesitic pillow lava and pillow breccia occurs at the base of this sequence. This unit is regionally correlated with the Lower Jurassic Betty Creek Formation, in the upper part of the Hazelton Group (Britton et al, 1989). Felsic rocks that locally overlie this unit on the DOC Property, discovered during the course of this program, are believed to occupy the same stratigraphic position as similar strata

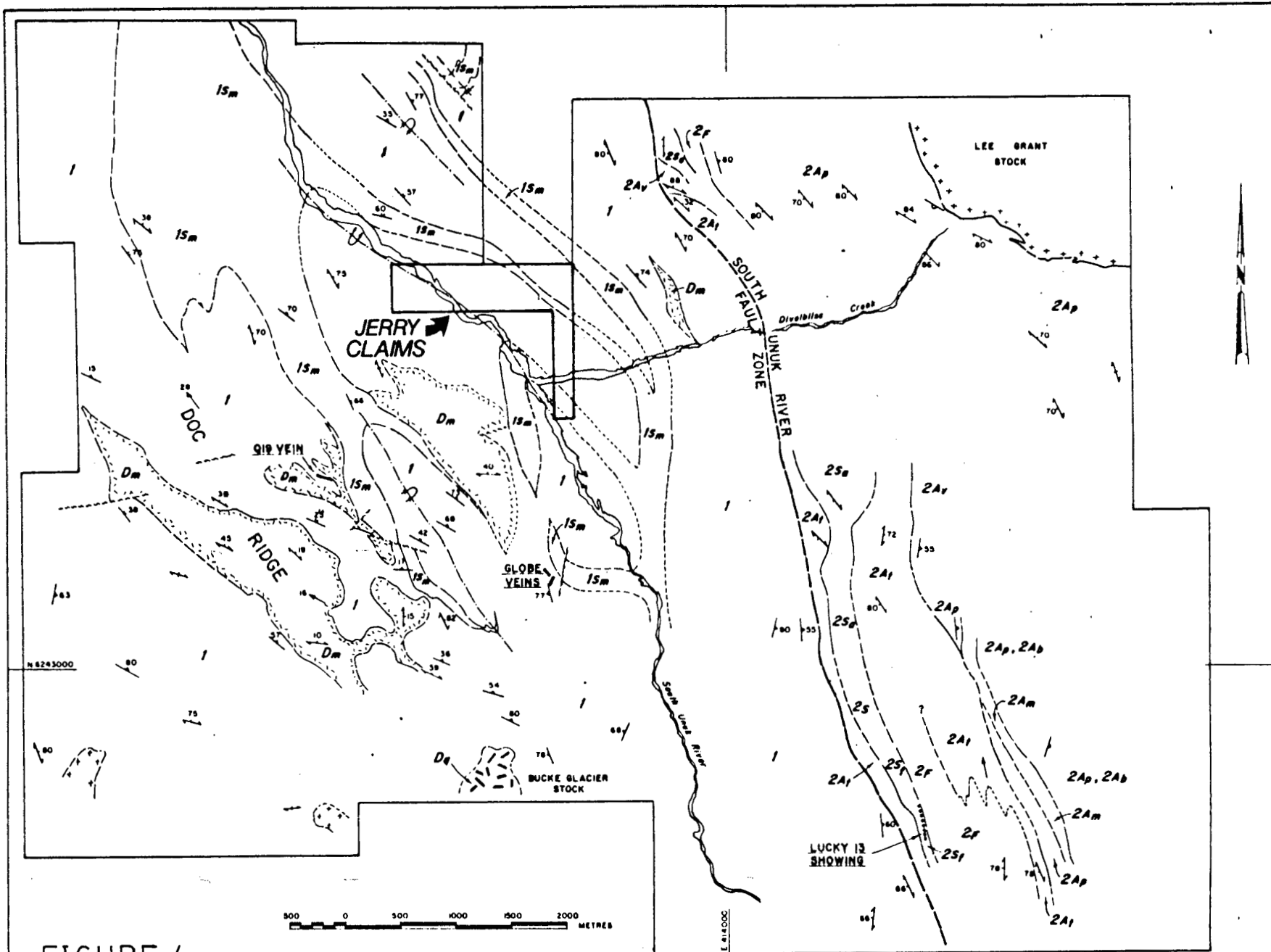



FIGURE 4

GEOLOGY MAP OF THE DOC PROPERTY & LOCATION MAP OF THE JERRY CLAIMS

LEGEND

INTRUSIVE ROCKS

CRETACEOUS (?) TO TERTIARY COAST PLUTONIC COMPLEX AND
RELATED SATELLITIC STOCKS AND DYKES:

 QUARTZ MONZONITE TO GRANODIORITE WITH MINOR MICRODIORITE

UPPER TRIASSIC INTRUSIONS

Dq GNEISSIC META-QUARTZ DIORITE

Dm GNEISSIC METADIORITE

VOLCANIC AND SEDIMENTARY ROCKS

2 LOWER (?) TO MIDDLE JURASSIC HAZELTON GROUP

2_S SEDIMENTARY SEQUENCE

- 2s₀* DARK GREY ARGILLITE; LIGHT GREY SERICITIC ARGILLITE
- 2s₁* ARGILLACEOUS FRAGMENTAL WITH ALTERED FELSIC LAPILLI IN ARGILLACEOUS MATRIX
- 2s₂* CHERTY SEDIMENTS
- 2s₃* LIGHT GREY TO BUFF WEATHERING MASSIVE TO THINLY BEDDED LIMESTONE

2_F FELSIC SEQUENCE

- 2f₁* RHYOLITIC TO DACITIC LAPILLI TUFF AND BRECCIA
- 2f₂* RHYOLITIC TO DACITIC FLOWS

2_A ANDESITIC SEQUENCE

- 2a₁* ANDESITIC LAPILLI TUFF WITH MINOR ASH AND CRYSTAL TUFFS
- 2a_m* MASSIVE VARIABLY FELDSPAR-PHYRIC ANDESITIC FLOWS AND/OR SUBVOLCANIC INTRUSIVES
- 2a_v* MASSIVE APHANITIC AND APHYRIC ANDESITIC VOLCANICS
- 2a_p* PILLOW LAVA
- 2a_b* PILLOW BRECCIA

1 UPPER TRIASSIC STUHINI GROUP

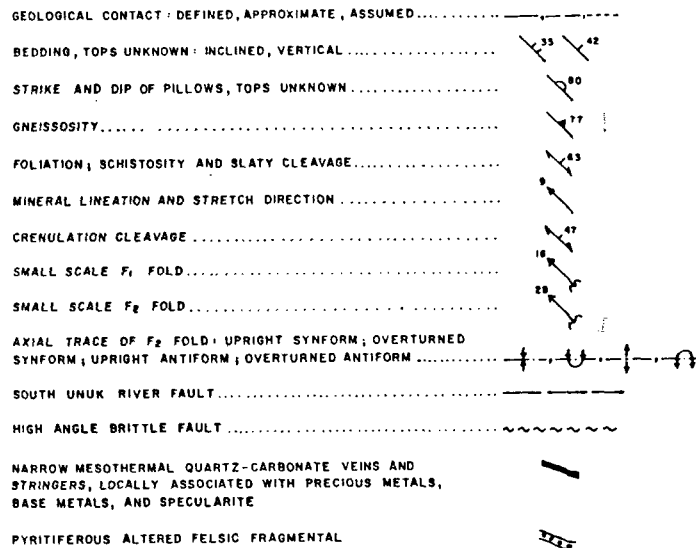
1_m MAFIC TO INTERMEDIATE METAVOLCANIC AND METAVOLCANICLASTIC ROCKS

- 1m_v* MAFIC TO INTERMEDIATE METAVOLCANICS
- 1m_f* GNEISSIC MAFIC TO INTERMEDIATE TUFF AND TUFFACEOUS SEDIMENTS

1_S METASEDIMENTARY ROCKS

- 1s₂* GNEISSIC THIN BEDDED, FINE GRAINED SILICEOUS SEDIMENTARY ROCKS
- 1s₃* GNEISSIC THIN BEDDED, FINE GRAINED CALCAREOUS SEDIMENTARY ROCKS
- 1s_m* MASSIVE TO THIN BEDDED MARBLE; LOCALLY CHERTY

SYMBOLS



assigned to the Mount Dilworth Formation, at the top of the Hazelton Group. This regionally extensive unit may be laterally equivalent to the sequence which hosts the Eskay Creek deposit 30 kilometres to the north; alternatively, several felsic horizons may be discontinuously developed within the Hazelton Group in the Iskut-Unuk River area (Alldrick, personal communication, August 1989).

Stratigraphic offset along the South Unuk River Fault gives an apparent sense of displacement of east side down, although unequivocal kinematic indicators, recorded during the 1989 program, demonstrate an important dextral component of movement. This major fault extends from the vicinity of the Granduc deposit, south of the Doc Property, to west of Tom McKay Lake, in the northern part of the Unuk River map area (Groves, 1986; Alldrick et al, 1989).

6.2. Mineralization

The DOC Property lies within the "Golden Triangle", a major metallogenic province that extends from the Stewart area in the south, to the Sulphurets and McKay Lake areas in the north, and to the Snippaker Creek area in the northwest. This region contains a diverse suite of deposits that range from mesothermal precious metal deposits such as the Snip, to porphyry-style copper-gold deposits such as Newhawk, and the more recently discovered enigmatic Eskay Creek deposit, with affinities to both epithermal and volcanogenic-style mineralization.

Three distinct styles of mineralization were observed and documented on the DOC Property during the 1989 program:

(a) Q17/Globe-style vein mineralization

The Q17 vein, located along Doc ridge, 3 kilometres to the south of the Jerry Claims, represents the principal showing and most thoroughly explored example of this style of mineralization (Freeze et al., 1989). However, there are numerous veins of this type elsewhere on the property, many of which occur in clusters, mostly to the east of the South Unuk River (Aelicks et al. 1988).

These veins are narrow and discontinuous, with widths that range from 0.2 to 2.0 metres and strike lengths up to 100 metres. They generally strike toward the west-northwest, with variable dips. They cross-cut the regional foliation and, for the most part, post-date second phase folding of strata assigned to the Stuhini Group. They occupy dilatant zones associated with minor brittle to semi-brittle shears, and commonly occur close to altered felsic plugs, dykes or sills that are thought to be spatially and temporally related to the nearby Coast Plutonic Complex.

Mineralogically, the veins consist of bull quartz, with subordinate calcite and sparse clots of dark green to black chlorite. Concentrations of sulphides locally occur as bands, aggregates and disseminations within the veins. These include pyrite, galena, chalcopyrite and trace sphalerite. Specularite is also present in minor amounts, generally on fractures and joints. Analytical results from this and previous programs indicate that the highest gold values are associated with the sulphides. Wall rock alteration is limited to narrow sericitic selvages that commonly contain finely disseminated pyrite.

(b) Magnetite-pyrite-pyrrhotite skarn mineralization

Along Doc ridge, to the south of the Jerry Claims, zones of silicification and propylitic alteration occur within a deformed metadioritic stock that intrudes Unit 1 strata. The most extensive surface expression of this alteration has a strike length of 700 metres and a maximum width of 200 metres, although shallow dips indicate that the true thickness is much narrower. These zones locally contain magnetite-pyrite-pyrrhotite skarn mineralization with trace chalcopyrite and sphalerite. Skarn phases include diopside, epidote and possibly hedenbergite. This skarn assemblage is overprinted by regional metamorphism which it therefore predates.

Skarn occurrences appear to be developed exclusively within the metadiorite (endoskarn), and no metasomatic alteration of the country rock is evident, despite the close proximity of marble interbeds within the metasediments.

No significant precious metal or base metal values were obtained from samples taken from these zones. Consequently, it is unlikely that these zones contain economically significant gold-bearing skarn systems.

(c) Volcanogenic exhalative mineralization and associated stockwork mineralization

Ten kilometres south of the Jerry Claims, along the southeastern portion of the DOC property, locally altered and weakly mineralized felsic to intermediate volcanic rocks assigned to the Hazelton Group (Unit 2) occur to the east of the South Unuk River fault.

Within this sequence there is a 10 to 20 metre thick, laterally discontinuous black argillaceous tuff horizon

containing pyritiferous altered felsic fragments, up to 30 centimetres in diameter (Lucky 13 showing). This zone has a minimum strike length of about 200 metres. The sulphidic fragments within it may represent ejecta from a nearby hydrothermal vent. Float samples of probable exhalative origin collected from this area include massive banded pyrite and pale grey to greenish grey bedded chert with trace pyrite.

Coarse feldspar porphyry sills and dykes that occur within this sequence appear to be related to a moderate to locally intense episode of stockwork mineralization comprising quartz, calcite, chlorite, ankerite, pyrite, chalcopyrite, galena and sphalerite. Examples of this style of mineralization are found locally cutting the porphyries, but the most impressively altered and mineralized samples collected to date from this area are all float.

Although gold values so far obtained from this felsic sequence are uneconomic and of doubtful significance in themselves, elevated silver and base metals values, mostly obtained from float, together with the favourability of the environment, indicate that this area has the potential to host a significant precious-base metal deposit of a volcanogenic massive sulphide type. The similarity of its stratigraphic setting with that of the Eskay Creek deposit lends support to this interpretation, although, unlike Eskay Creek, no significant molybdenum, arsenic, mercury or antimony values have been obtained from this area.

7. PROPERTY GEOLOGY

The Jerry Claims lie entirely to the west of the South Unuk River Fault, within that area of the DOC Property underlain by complexly deformed schistose and gneissic volcanic and sedimentary rocks of unit 1 (Figure 4).

7.1 Lithologic Units

Mapping of the entire DOC property has facilitated the following lithologic divisions of Unit 1:

Mafic to intermediate volcanics (1Mv)

These rocks comprise dark green, massive, fine grained chlorite-hornblende-feldspar schist of probable andesitic composition.

Mafic to intermediate tuff and tuffaceous sediments (1Mt)

This sub-unit consists of 1 to 2 cm. thick alternating light and dark green gneissic layers that are rich in epidote and chlorite, respectively.

Siliceous sedimentary rocks (1Ss)

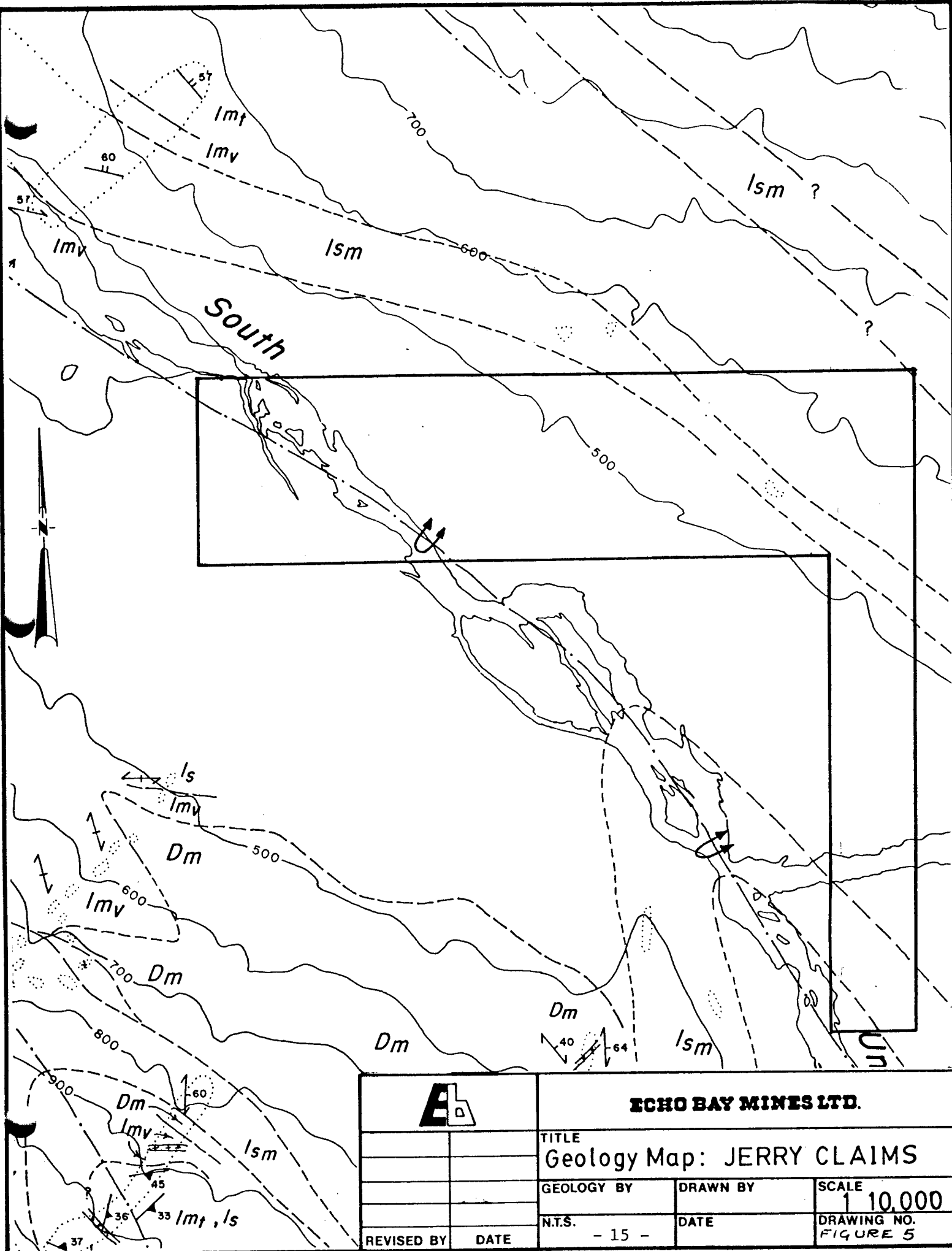
These light grey-brown siliceous sediments are fine grained and generally thin bedded, although medium to thick bedded sections occur locally. Minor biotite-rich layers are present in places.

Calcareous sedimentary rocks (1Sc)

This sub-unit is generally buff weathering and comprises thin interbeds of calcareous siltstone or marble. Regional metamorphism of these rocks has produced calc-silicate mineral assemblages that include garnet, epidote and possibly diopside. This sub-unit is most commonly intercalated with sub-unit 1Ss, and in many places they cannot be differentiated.

Marble (1Sm)

Light grey to buff weathering cliffs of massive to thinly bedded, variably cherty marble occur along the northern part of Doc Ridge and intermittently along the lower slopes of the South Unuk River valley (Figure 5). These rocks commonly display small-scale isoclinal folds wherever bedding is evident.



A northwesterly trending line of isolated marble outcrops, assigned to sub-unit 1Sm, was traced from the Jerry Claims toward the west, onto the Hill Claims (Figure 5). Here, this horizon is intercalated with mafic volcanic and volcanoclastic rocks of sub-units 1Mv and 1Mt, respectively, which are therefore inferred to occur below the overburden over much of the Jerry Claims.

Sub-unit 1Sm appears to be the only laterally continuous lithologic unit, although whether it represents a unique stratigraphic horizon or several is not known. All other sub-units have both lateral and vertical gradational contacts with each other. This, together with the complexity of the structure, makes differentiation of an internal stratigraphy within Unit 1 extremely difficult.

7.2 Structure

The DOC property can be divided into two structural domains the boundary between which is marked by the South Unuk River Fault. To the west of the fault, volcanic and sedimentary rocks of Unit 1 are characterized by a pervasive schistosity or gneissosity that is subparallel to bedding. The minerals that define this tectonic fabric were developed during upper greenschist to lower amphibolite facies regional metamorphism, whereas to the east of the fault, rocks of Unit 2 have undergone significantly less deformation and a lower grade of regional metamorphism.

The Jerry Claims lie exclusively within the western domain. On Doc Ridge, to the southwest of the Jerry Claims, shallow, northwesterly plunging small-scale F1 isoclinal folds are well exposed within the metasediments. Here, the axes of these folds are parallel to a well-defined mineral lineation and stretch direction. This first phase of

deformation occurred contemporaneously with regional metamorphism.

Southwesterly verging chevron folds overprint these early structures and post-date the metamorphism. The axes of these F2 folds are subparallel to L1 lineations.

The orientations of S1, measured from Unit 1 lithologies, together with the distribution of sub-unit 1Sm, in the northern part of the DOC property, indicate that the axial trace of a large-scale northwesterly plunging overturned antiform occurs close to the South Unuk River. Thus, the Jerry Claims occur on the northeast limb of this fold.

7.3 Mineralization

Prospecting and soil sampling by Magna Ventures (Aelicks et al., 1988), and geological mapping and prospecting by Echo Bay (this report) have failed to define any mineralization on the Jerry Claims. However, these programs have been severely handicapped by overburden and vegetation cover.

8. CONCLUSIONS AND RECOMMENDATIONS

The Jerry Claims are underlain by volcanic and sedimentary rocks of probable Late Triassic age assigned to the Stuhini Group. These rocks have undergone upper greenschist to lower amphibolite facies regional metamorphism, which occurred synchronously with the development of a schistosity that is axial planar to small-scale, northwesterly plunging isoclinal folds. These structures are overprinted by southwesterly verging F2 chevron folds, the axes of which are subparallel to F1 folds.

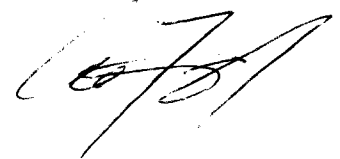
Although no mineral occurrences nor alteration zones were found in the immediate area of the Jerry Claims, the proximity of gold-bearing quartz veins, hosted by rocks in a similar structural and stratigraphic setting to those that underlie the Jerry claims, requires that these claims be retained as part of the DOC property.

Report by:


A.C. Freeze

9. STATEMENT OF EXPENDITURES

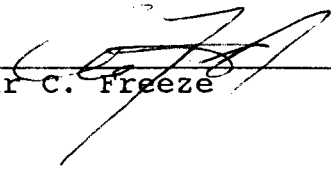
Geologist: 1 day field mapping	200.00
Accommodation: Doc camp (all inclusive)	150.00
Helicopter charter: (1.0 hour - fuel included)	700.00
Report preparation:	150.00
	<hr/>
TOTAL	\$1,200.00



10. STATEMENT OF QUALIFICATIONS

I, Arthur Charles Freeze of the City of Vancouver, in the Province of British Columbia, do hereby certify that:

- 1) I am a graduate of the University of New Brunswick (1971) with a Bachelor of Science Degree in Geology (BSc.)
- 2) I have practised my profession as an exploration geologist/production geologist since graduation and have been employed by such mining companies as Cominco Ltd., Echo Bay Mines Ltd.
- 3) I am a fellow of the Geological Association of Canada.
- 4) The information in this report is based on fieldwork supervised by the author during the months of July and August 1989, and upon a review of the available literature.



Arthur C. Freeze

11. REFERENCES

- Aelicks, B.T., Cooke, B.J., Robins, J.E., and Sandberg, T., 1988:
1987 Report of Exploration work on the DOC Property for Magna Ventures Ltd. and Silver Princess Resources Inc.; internal company report, January, 1988.
- Alldrick, D.J., Britton, J.M., Webster, I.C.L., and Russell, C.W.P., 1989:
Geology and Mineral Deposits of the Unuk River; British Columbia Ministry of Energy, Mines and Petroleum Resources, Open File Map 1989-10.
- Britton, J.M., Webster, I.C.L., and Alldrick, D.J., 1989:
Unuk Map Area; British Columbia Ministry of Energy, Mines and Petroleum Resources, Geological Fieldwork, 1988, Paper 1989-1.
- Freeze, A.C., Glover, J.K., and Scott, B.M., 1989:
Report on the DOC Project, Skeena Mining Division, British Columbia; Echo Bay Mines Ltd. company report, February, 1989.

ECHO BAY MINES LTD.

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March 27, 1990

Mr. T. Kalnins
Ministry of Energy, Mines
and Petroleum Resources
Mineral Resources Division
Parliament Buildings
Victoria, B.C.
V8V 1X4

Dear Mr. Kalnins:

**Re: Jerry 1, Jerry 2 Mineral Claims
Statement Number 000312
Assessment Report Number 19429**

Thank you for your letter of March 9th. I understand that Dr. Keith Glover, one of the geologists who worked on this property, phoned you last week to discuss the apparent deficiencies in this assessment report.

The Jerry 1 and 2 claims are two small claims which are part of a larger property but because of grouping limitations it was not possible to group them with other claims in the property. Outcrop on the claims, which lie mainly in the Unuk River valley, is extremely limited and consists of some isolated marble outcrops (as described on page 16 of the report). Geological mapping within the claim boundaries is therefore limited. In order to contribute to the knowledge of the geology of these claims the results of geological mapping and mineralization studies of the surrounding claims have been presented. I emphasize that all work described in the report is original work carried out in the 1989 field season - it is not a compilation and does not appear in any other assessment report or publication.

I am returning the assessment reports to you herewith and trust that you will find these acceptable. Please contact me if you have any further concerns regarding this report.

Yours sincerely,

ECHO BAY MINES LTD.



Nigel Cawthorn
Senior Geologist

/mm
Encl.