

83-#302 - #11395

GEOLOGICAL REPORT ON PARTS OF THE
STAR 1 - 13 MINERAL CLAIMS,
HACKETT RIVER AREA, ATLIN MINING DIVISION,
BRITISH COLUMBIA

58° 13' N, 131° 41' W

NTS 104 - J - 4

for

UNITED CAMBRIDGE MINES LTD.

by

ERIK A. OSTENSOE, geologist

VANCOUVER, B.C.

July 19, 1983.

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

11,395

Erik A. Ostensoe

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SUMMARY

During June and July 1983 United Cambridge Mines Ltd. completed geological mapping of grid lines on Star 1 claim in an area with dimensions 2400 m by 1000 m. Andesitic volcanic rocks with a range of textures from coarsely porphyritic through dense, fine grained are dominant. These are interbedded with small amounts of cherty tuff. Diorite and other crystalline intrusive rocks are present, frequently accompanied by pyritization and other alteration effects that also pervade the adjacent rocks. Bedded arenaceous sedimentary rocks are present in the southwestern portion of the grid. Formational trends are strongly northwesterly.

In addition to an abundance of pyrite, smaller quantities of chalcopyrite, sphalerite and galena were found, mostly in the area southwest of the grid baseline. No assay samples were collected.

INTRODUCTION

During the period June 23 through July 9, 1983 at the request of Mr. Norman Thompson, President of United Cambridge Mines Ltd, the writer carried out geological mapping of parts of the Star claims located in Atlin Mining Division near Sheslay, northwest of Telegraph Creek, B.C. During 1976, 1977 and 1980 similar geological studies and other exploration methods were employed by Mr. T. E. Lisle, P. Eng., geologist, elsewhere on the claims in defining the geological setting of "porphyry-type" copper occurrences. The property has a long history of mineral exploration.

The 1983 project was in part an attempt to complete geological mapping of a cut-line grid established in 1968 and/or 1969 for geophysical and geochemical survey purposes. This grid had been reslashed, metric chained and partially mapped during 1980. Had the present phase of work been delayed until 1984 it is highly likely that decay of pickets combined with new growth of poplar trees and berry bushes would have overwhelmed the flagging and pickets and have necessitated expensive re-cutting and re-measurement of the grid.

This report presents a brief history of mineral exploration in the area of the Star claims and describes results obtained from recent 1:5000 scale geological mapping of a 240 hectare portion of the property.

PROPERTY, LOCATION, LOGISTICS

The subject property is comprised of 13 Star claims a total of 92 modified grid system units (Table 1. page 2.) It is located in northwestern British Columbia, 100 km west of the settlement of Dease Lake and 40 km northwest of Telegraph Creek (Figures 1, 2 and 3). The Telegraph Trail, a relic of the Collins Overland Telegraph Line, crosses the claims and Sheslay, formerly a line-station and now abandoned, is 10 km west of the claims.

Access to the Star property is by helicopter from either Dease Lake or Telegraph Creek, both of which are serviced by scheduled fixed wing aircraft operated by Trans-Provincial

TABLE 1. STAR CLAIMS, ATLIN M. D., BRITISH COLUMBIA

<u>CLAIM NAME</u>	<u>NO. OF UNITS</u>	<u>RECORD NO.</u>	<u>ANNIVERSARY DATE</u>
STAR 1	20	98(7)	July 5
STAR 2	15	99(7)	"
STAR 3	6	100(7)	"
STAR 4	2	101(7)	"
STAR 5	2	102(7)	"
STAR 6	9	141(9)	Sept. 30
STAR 7	6	142(9)	"
STAR 8	1	143(9)	"
STAR 9A	9	1192(10)	Oct. 27
STAR 10	4	145(9)	Sept. 30
STAR 11	6	146(9)	"
STAR 12	8	147(9)	"
STAR 13	4	148(9)	"

Note: Claims are beneficially owned by United Cambridge Mines Ltd. subject to a 15% carried interest.



FIGURE 1. LOCATION MAP - STAR CLAIMS
Northwestern British Columbia

Scale: 1:20,000,000

To accompany report by E. Ostensoe, geologist
July 19, 1983.



FIGURE 2. LOCATION MAP - STAR CLAIMS
Northwestern British Columbia

Scale: 1: 2,000,000

To accompany report by E. Ostense, geologist
July 19, 1983.

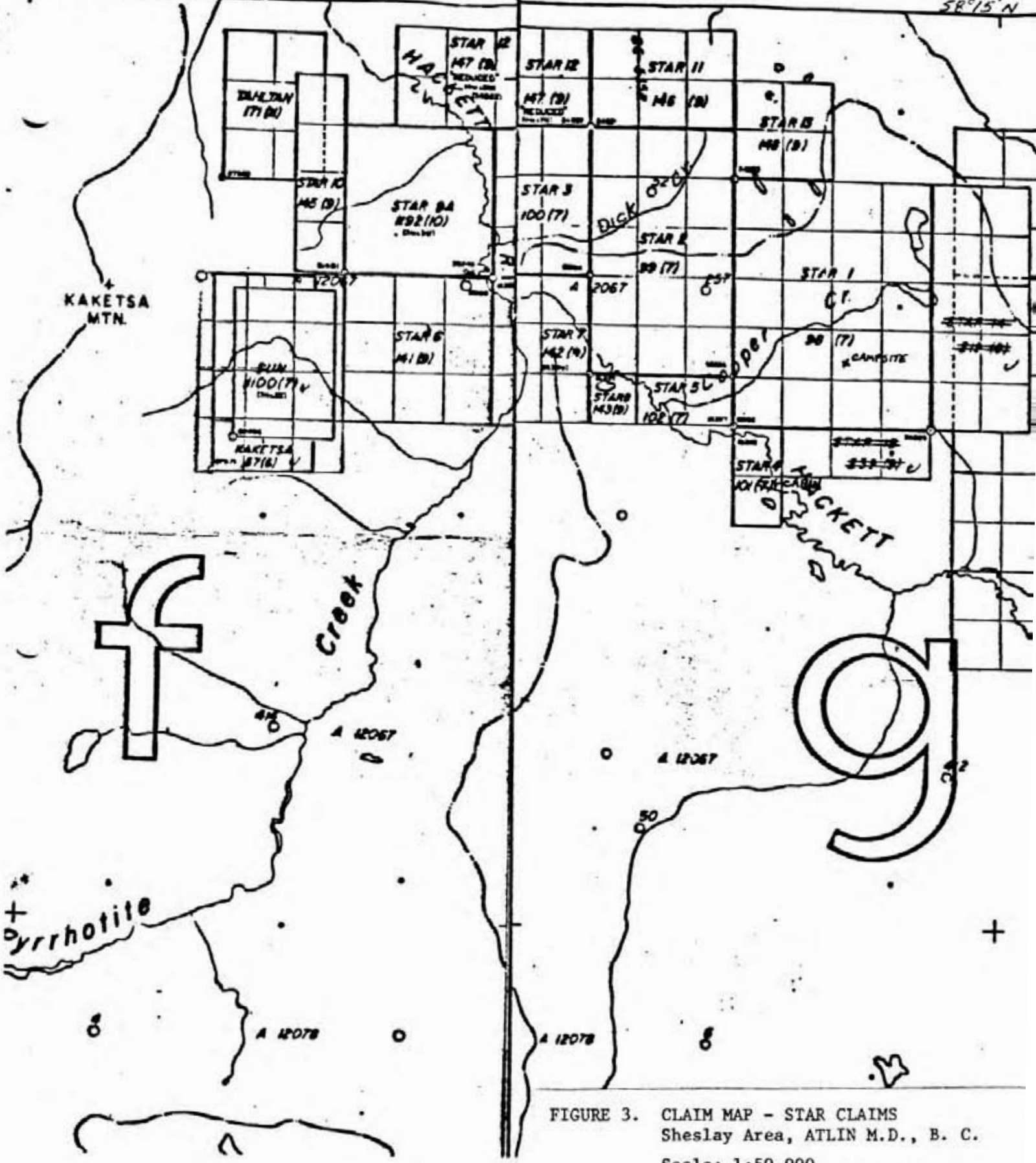


FIGURE 3. CLAIM MAP - STAR CLAIMS
 Sheslay Area, ATLIN M.D., B. C.
 Scale: 1:50,000
 From: Mineral Titles Reference
 Maps 104J/4W and 104J/4E
 To accompany report by E. Ostensoe, geologist
 July 19, 1983.

Airlines Ltd. of Terrace, B. C. An airstrip built at Sheslay in 1972 is believed to be serviceable and would be an important convenience if substantial exploration of the Star claims were resumed.

Most of the Star claims lie along the north side of the Hackett River. Several small streams, notably Dick Creek and Copper Creek, flow southerly across the claims. Except for the river bottom most of the area has been burned by forest fires and only scattered pockets of mature evergreen trees are present. Aspens (populus tremuloides), "jack" pine (pinus contorta), and various berry bushes and dwarf birch (betula glandulosa) thickets are dominant ground cover. As described in a later section, bedrock outcrops are scattered or, in large parts of the area, totally lacking.

HISTORY

Areas close to the Telegraph Trail in northern British Columbia were once the most accessible in that part of the province. Consequently it is believed that copper occurrences near Sheslay were first located during the last century. It is certain that claims were staked at Copper Creek in 1955 and that Brikon Exploration drilled 140 metres (490 feet) in 1956 while exploring mineralization on the present Star 1 mineral claim (Sevensma, 1977). During the 1960's several major mining companies explored the Hackett River region in search of porphyry-type deposits. From 1968 through 1972 Skyline Explorations Limited, the Colorado Corporation and Newconex among others, financed large scale mineral searches that included geophysical, geochemical and geological surveys, bulldozer trenching and road building, and diamond drilling operations. Most of that work is well documented in assessment work reports on file with the provincial Ministry of Energy, Mines and Petroleum Resources. The Copper Creek portion of the area was explored by 1050 m of diamond drilling in 6 holes.

The present Star claims were staked during 1976 on behalf of United Cambridge Mines Ltd. That company sponsored field programs during 1976, 1977 and 1980 and discovered the Dick Creek copper zone. During June and July 1983 United Cambridge provided funds to enable geological mapping of the easternmost portion of its claims.

AREA SURVEYED

In the period June 28 through July 8, 1983 the writer, assisted in the field by Mr. Melvin Jack of Atlin, B.C., geologically mapped portions of the Star #1 mineral claim. Working from camps located beside Hackett River and at elevation 1065 m east of Copper Creek (Figure 3), several reconnaissance traverses were directed to the east and north part of the claim. The "Copper Creek grid" of slashed and picketed lines spaced at 122 m (400 foot) intervals with pickets at 50 m spacings on the lines, was mapped in greater detail. This grid, which was cut during 1969 and re-cleared and metric chained in 1980 is rapidly becoming obscure. The useable portion includes the base-line (oriented 135°) and cross lines (oriented 045°) that extend 500 or 550 metres on either side thereof.

Expenditures are summarized in Appendix 1 of this report. Charges necessitated by the use of helicopters and small charter aircraft, are relatively high and reflect the burden of transportation costs incurred in short duration mineral exploration projects in all remote areas of the province.

REGIONAL GEOLOGY

The Star claims are located a short distance east of the Coast Ranges in an area dominated by Triassic age andesitic volcanic and volcanoclastic sedimentary rocks (Figure 4). These have been intruded by stocks and dykes of granodioritic and dioritic composition and are partially overlain by remnants of once-extensive Tertiary basalt flows. Glaciation and the effects of meltwater streams have greatly modified the topography of the area and have left extensive deposits of silts, clays and gravels. In particular the Hackett River and lower portions of its tributary streams are deeply incised below the level of the surrounding plateau surface.

Several gossans are present in the Hackett River area, developed on concentrations of sulphide minerals, dominantly pyrite and/or pyrrhotite. Occasionally important quantities of chalcopyrite are present as, for instance,

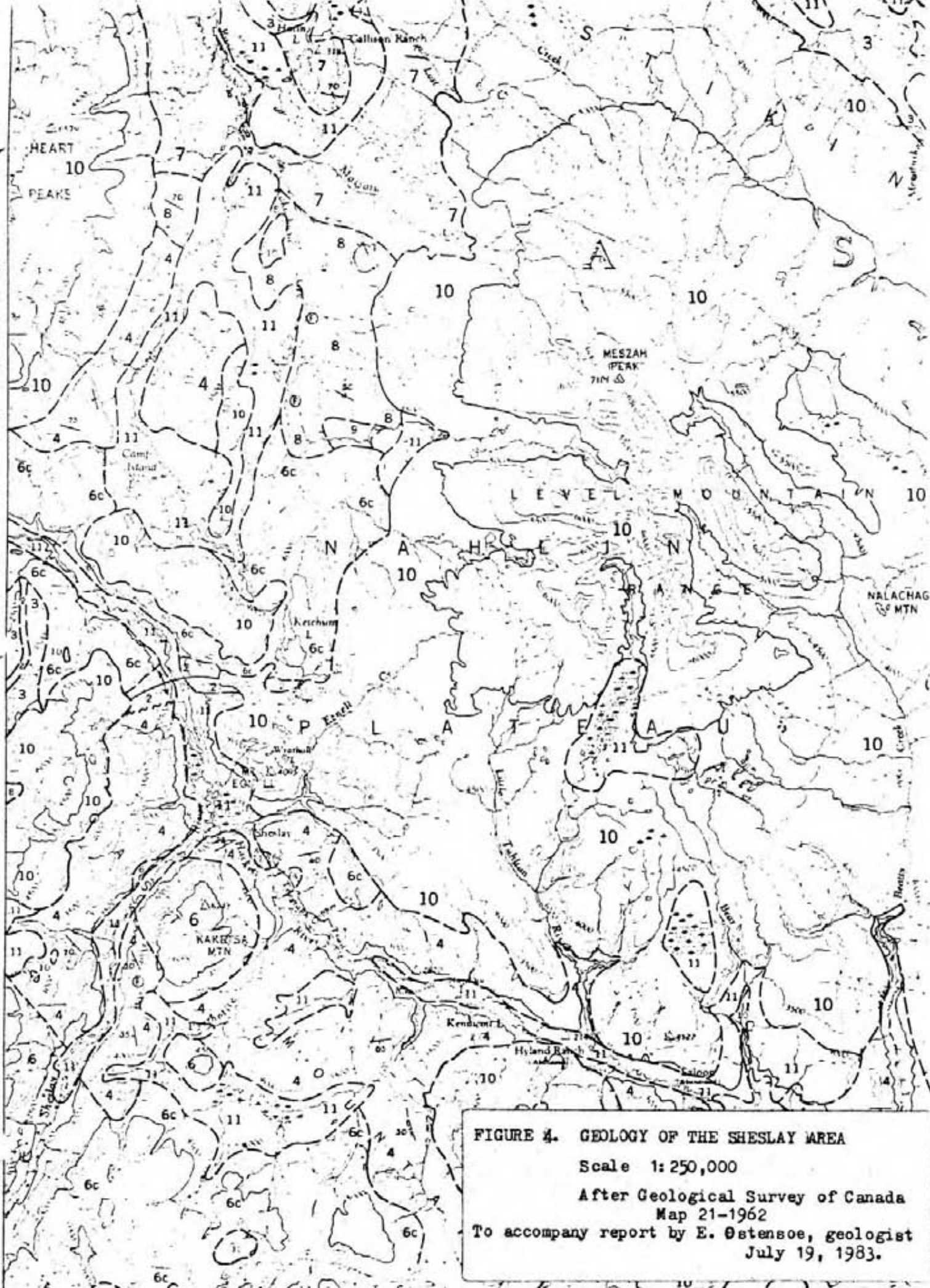


FIGURE 4. GEOLOGY OF THE SHESLAY AREA
Scale 1:250,000
After Geological Survey of Canada
Map 21-1962
To accompany report by E. Østensøe, geologist
July 19, 1983.

- CENOZOIC**
- TERTIARY AND QUATERNARY**
LATE TERTIARY AND PLEISTOCENE
- 10 Basalt, olivine basalt; minor trachyte and rhyolite; in part younger than 11
- TERTIARY**
PALEOCENE AND (?) LATER
- 9 Lacustrine sandstone, siltstone, conglomerate, and tuff; contains coalified wood and thin coal seams
- MESOZOIC**
- JURASSIC**
LOWER JURASSIC
- 8 Granite-boulder conglomerate, chert-pebble conglomerate, greywacke, quartzose sandstone, siltstone and shale; 8a, metamorphosed equivalents of 8 and including abundant sills and dykes of quartz-feldspar porphyry
- 7 Well bedded greywacke, graded siltstone and silty sandstone, slate; minor volcanic sandstone and pebbly mudstone; 7a, metamorphosed equivalents of 7 and including abundant sills and dykes of quartz-feldspar porphyry
- TRIASSIC AND LATER**
- 6 Undifferentiated granitic rocks, mainly granodiorite; 6a, granite and granodiorite; 6b, quartz monzonite; 6c, diorite and monzonite; 6d, syenite; 6e, diorite and gabbro
- TRIASSIC**
UPPER TRIASSIC
- 5 Limestone; minor sandstone, argillite, and chert
- 4 Andesite, basalt, tuff, breccia, volcanic sandstone and conglomerate; minor greywacke, argillite, and shale; many small stocks, dykes, and sills of porphyritic andesite and basalt; 4a, andesite and basalt porphyry
- TRIASSIC AND EARLIER**
PRE UPPER TRIASSIC
- 3 Undivided, fine-grained clastic sediments and intercalated volcanic rocks, largely altered to greenstone and phyllite; chert, jasper, greywacke, and limestone; 3a, chert, slate, argillite, greywacke, greenstone, and limestone; mainly pre-Permian but probably includes younger rocks; 3b, mainly greenstone; age uncertain; 3c, greenstone, jasper, slate, chert, greywacke, fine-grained clastic rocks, conglomerate; mainly post-Permian, in part older than ?
- PALAEOZOIC**
- PERMIAN**
- 2 Chiefly limestone and dolomitic limestone; minor chert, argillite, and sandy limestone; may locally include limestone older than ?
- PERMIAN (?)**
- 1 Peridotite, serpentinite, and small irregular bodies of meta-diorite and meta-gabbro; age uncertain, may be pre-Permian or Triassic
- METAMORPHIC ROCKS**
- A Diorite-gneiss, amphibolite, migmatite
- B Biotite-muscovite-quartz gneiss and schist; minor crystalline limestone, greenstone, and quartzite; probably Devono-Mississippian and (?) Pennsylvanian

- Geological boundary (defined, approximate and assumed)
- Limit of geological mapping
- Bedding (inclined, vertical)
- Bedding (direction of dip known, upper side of bed unknown)
- Schistosity, gneissosity, (inclined, vertical)
- Anticline

Legend to accompany
 Figure 4.

After Geological
 Survey of Canada
 Map 21-1962

at Copper Creek, Dick Creek and, south of the river, at several locations near the Kaketsa Mountain pluton. Small quantities of sphalerite and galena are present east of Copper Creek in arenaceous sedimentary rocks and veins and masses of both magnetite and hematite have been reported (Sevensma, 1971 and Darney and Guttrath, 1971).

Near Kaketsa Mountain a potash feldspar, epidote and calcite alteration suite was reported whereas at Dick and Copper Creeks Lisle and Seraphim (1977) recognized pervasive pink alteration due to hematite staining of feldspar as well as selective biotitization in and at the fringes of relatively fresh intrusive rocks. Chlorite is erratically present throughout the entire district and may represent a regional metamorphic "grade" rather than a specific episode of alteration. Pyrite is similarly almost universally present as a component of the volcanic rocks but also appears to form a halo near certain intrusive masses. Quartz is seldom present in significant amounts.

Little is known about the structural geology of the Hackett River - Sheslay area. Strong fracture patterns are readily recognized on air photographs of the area with northwest (i.e. Hackett River Valley) and northeast (Pyrrhote, Dick and Copper Creeks) orientations dominant. Youngest crystalline intrusions are vaguely oriented in a northwesterly direction, perhaps indicating preferential erosion and thus their exposure along the Hackett River Valley rather than a fundamental "beads-on-a-string" alignment.

LOCAL GEOLOGY

The writer mapped the geology in an area with dimensions 2400 m by 1000 m and checked a much larger area in reconnaissance fashion (Figure 5). In general geological features of lower slopes of Hackett River Valley are obscured by clay and gravel deposits and higher elevation areas are marshy or thickly overgrown with brush. Best outcrop occurrences are near the transition from Hackett River valley to the plateau surface where overburden is light and numerous low cliffs and drumlin ridges are exposed.

Geological details are presented in Figure 5 of this report. Some data regarding rock types and the geology of nearby areas was taken from maps by T. E. Lisle, P. Eng. and from core logs prepared in 1970 by P. H. Sevensma Consultants Ltd. Rock classifications are based on visual observations rather than petrographic studies.

That part of Star 1 claim located east of the canyon of Copper Creek is dominated by rocks of volcanic derivation including several porphyritic andesite members, and a variety of fine grained tuffs. Intrusive rocks are of dioritic to syenitic composition and as a consequence of their grossly similar chemical constitutions may be confused with their volcanic counterparts. Arenaceous sedimentary rocks, also modified by metamorphism, are interbedded with volcanic members and appear to underlie parts of the lower slopes but are not recorded in drill core logs. Where weathered all rocks may be strongly coloured and original textures obliterated. Alteration is diffuse and as described in core logs, variously includes potash feldspathization (pink colours), epidotization and chloritization. Pyrite is ubiquitous but seldom exceeds 5% by volume. Prominent secondary minerals are limonite, calcite and gypsum. Malachite, azurite and a black mineral, believed to be chalcocite or tenorite, occur irregularly, reflecting the apparently erratic distribution of chalcopyrite, primary copper mineral. Close to Copper Creek gossans are intensely coloured with yellow hues whereas farther to the east more weathered exposures have dark reddish colours.

Diorite - Syenite (Unit 1) This rock type exhibits a medium grained crystalline granitic fabric with 5 to 10% chloritized amphibole and traces of pyrite. Colour varies from orange-grey to grey-purple and magnetite content is variable, up to perhaps 2%. These intrusive rocks are present in strongly coloured and strongly fractured outcrops in the upper steep slope of the Hackett River "break" and similar units are reported from the Dick Creek mineral zone. Evidence from elsewhere in the region suggests that Unit 1 members are variously small stocks and dyke-like bodies.

Andesite (Unit 2) Rocks of widely varying appearance but andesitic composition are present in all but the southmost parts of the grid. The most abundant phase is dark green and strongly porphyritic: white feldspar euhedra, up to 5 mm length and randomly oriented in an aphanitic groundmass, form up to 20% of the rock; chloritized amphibole grains up to 2 mm diameter are sometimes present. Dense andesite (2b)

is also common: it is notably homogeneous and usually contains trace amounts of very finely divided pyrrhotite. Lighter coloured fine grained andesite (2c) with 3% pyrite cubes was found on line 8 east close to outcroppings of cherty tuff. Dark reddish brown andesite mapped south of the baseline on line 4NW is believed to be biotitized.

Tuffaceous Rocks (Unit 3) Very fine grained to cherty textured massive to finely banded rocks were mapped in several parts of the grid area. These have been classified as tuffs even though it is likely that in some areas these rocks represent fine clastic sediments and elsewhere they are comprised of ash falls and other granular particles of volcanic origin. Colours vary from light grey to grey-black and bands from 1 mm to 1 cm in thickness.

Cherts, Argillite, Sandstone (Unit 4) Well bedded cherty sedimentary rocks are present in the southwestern portion of the area that was mapped. Colours are brown to grey and both coarse and fine textures were recognized. Bedding observations indicate northerly to northeasterly trends and moderate to steep east to southeast dips.

Sulphide Mineralization Pyrite is almost universally present in the Copper Creek area. Galena and sphalerite are found near line 12 SE as disseminations and as coatings on fracture planes: Sevensma (1971) reported assays of several percent lead and zinc in this area. Copper minerals are only sporadically present in the area mapped: they occur in strongly fractured syeno-dioritic intrusive rocks and in iron-stained and altered andesitic volcanic rocks close to the intrusions. Secondary minerals, particularly malachite, are present and significant leaching of copper values from outcrops may have occurred.

No samples were taken for purposes of assays or geochemical analyses.

DISCUSSION

Recent mapping of the Star 1 claim has extended geological coverage 2400 metres east of Copper Creek. No significant geological variations were recognized but in general copper values appear to be weaker than in the

Dick Creek to Copper Creek part of the property. The presence of zinc sulphides may have significance in terms of porphyry deposit metallogenic zoning theories.

The extensiveness of strongly gossaned volcanic and intrusive rocks from Dick Creek to east of Copper Creek is unusual and creates a very large area that may host porphyry copper-type deposits. Further exploration using drilling techniques in search of such deposits is recommended.

REFERENCES

- Darney, R. J. and Gutrath, G., Geological and Geochemical Report on the Pyrrhotite Creek Project for Skyline Explorations Ltd., November, 1971, Assessment Report No. 3515.
- Lisle, T. E. and Seraphim, R. H., Report on Star Copper Prospect, Atlin M. D. for United Cambridge Mines Ltd., November 14, 1977.
- Lisle, T. E. and Walcott, P. E., Geochemical and Geophysical Report on the Star 1, 2, 3, 11, 13 Mineral Claims, Atlin M. D., January 6, 1981, Assessment Report.
- Sevensma, P. H., Copper Creek Project report for Skyline Explorations Ltd., November 22, 1971.
- Sevensma, P. H., Star Group, Atlin M. D., B.C. report for United Cambridge Mines Ltd., May 3, 1977.
- P. H. Sevensma Consultants Ltd., Diamond Drill Geological Logs, Drill Holes G-1-70 to G-6-70 inclusive, prepared for The Colorado Corporation, 1970.

APPENDIX I. Statement of Expenditures, Star Mineral
Claims, Sheslay Area, ATLIN MINING DIVISION,
BRITISH COLUMBIA.

	Sub-totals	Totals
<u>Wages</u>		
Melvin Jack 11 days, June 28 - July 8, 1983	\$1010.64	
Erik Ostensoe, 14½ days June 23, 27-30, July 2, 4- 9, 12-14, 1983	<u>3625.00</u>	\$4635.64
<u>Camp Costs, Supplies</u>		339.10
<u>Transportation Costs</u>		
Scheduled airlines - Ostensoe - Vancouver to Dease Lk, June 27	300.40	
Terrace to Vancouver July 12	140.40	
Chartered aircraft Jack - Atlin to Kennecott Lk, June 28	434.00	
Dease Lake to Atlin, July 8	525.00	
Helicopter Service - from Dease Lake base June 28 - 1.3 hrs - Hughes 500c A/C	686.92	
July 3 - 3.3 hrs - Hughes 500c A/C	1743.72	
July 8 - 1.3 hrs - Hughes 500d A/C	760.50	
Freight and baggage charges	236.40	
Taxis - Terrace and Vancouver	<u>27.80</u>	
		4855.14
<u>Accommodation and Meals</u>		<u>128.46</u>
<u>Total</u>		<u>\$9958.34</u>

Note: \$6287.11 of the above itemized costs were incurred prior to the July 5, 1983 anniversary date of the Star 1 (20 units) and Star 3 (6 units) claims - reference Statement of Exploration Expenditures recorded at Vancouver, B.C. on July 5, 1983.

Erik A. Ostensoe

APPENDIX II. Statement of Qualifications

Erik A. Ostensoe, B.Sc., Geologist

Education: Completed B.Sc. (Honours) course at University of British Columbia, Vancouver, B.C. in May, 1960.

Completed course requirements for M.Sc. degree at Queen's University, Kingston, Ontario in 1966. Thesis incomplete.

Professional Associations: Member: Canadian Institute of Mining and Metallurgy; Association of Exploration Geochemists; Geological Association of Canada.

Work History: May 1960 through August 1964 - employed by Newmont Mining Corporation of Canada Ltd. as geologist in Granduc Mine area, Stewart, B.C. under direction of D.M. Cannon, P.Eng. and G.W.H. Norman, Ph.D., P. Eng.

Summer 1965 - employed as geologist by Mount Billings Venture, a southern Yukon prospecting syndicate.

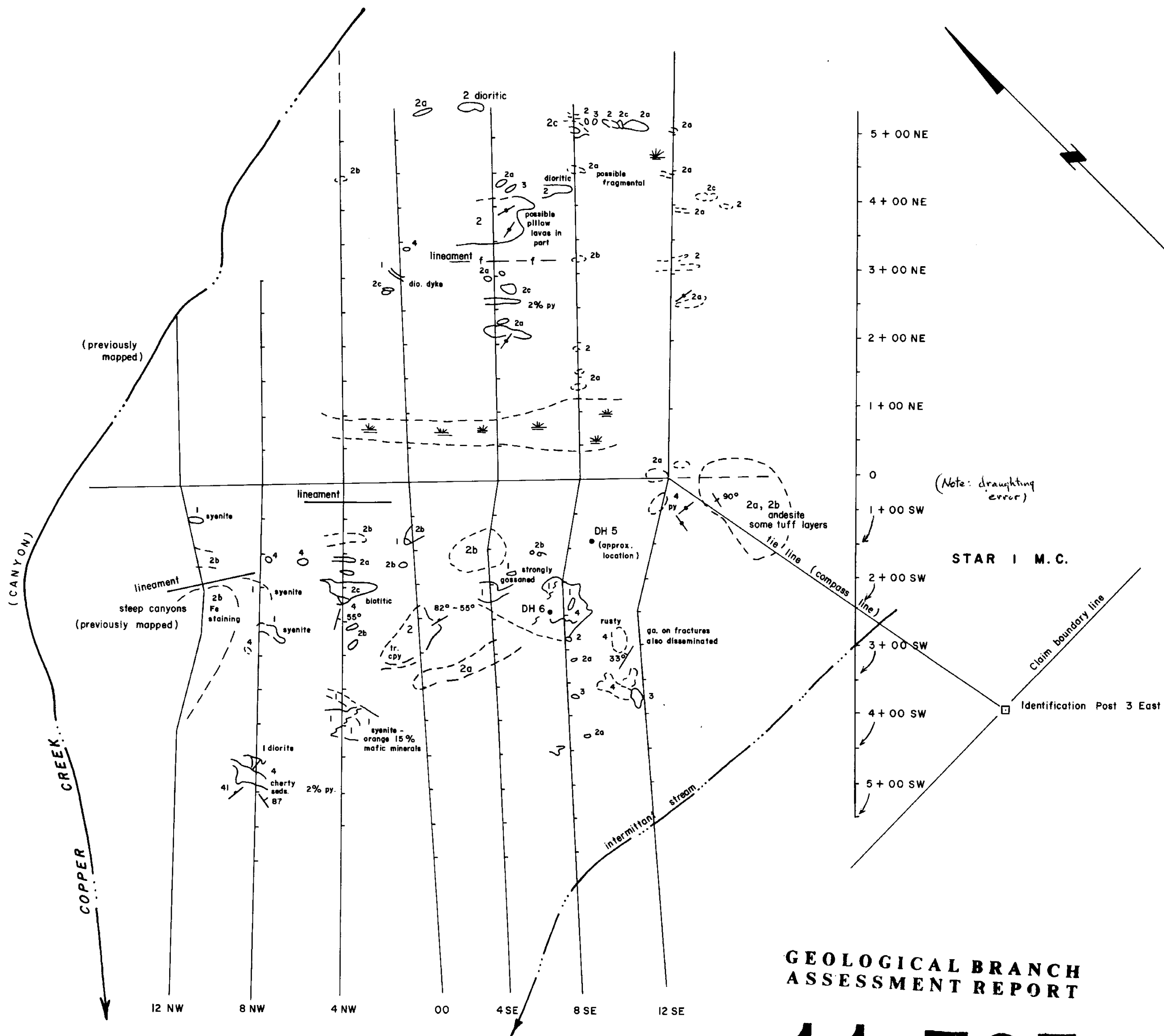
Summer 1966 - employed as geologist by Scud Venture, a northwestern British Columbia prospecting syndicate.

October 1966 to June 1978 - employed by Hecla Mining Company of Canada Ltd. and Granduc Mines Ltd. (N.P.L.) as exploration supervisor and chief geologist, respectively, under the direction of P.I. Conley, P.Eng.

August to November, 1978 - employed on contract basis by Union Oil Company of Canada Ltd. as geologist in charge of field program at Beaverdell, B.C.

April 1979 to September 1982 - employed by Armco Mineral Exploration Limited as geologist, assigned to projects in north-central British Columbia and Yukon under the direction of P.I. Conley, P.Eng.

September 1982 to present - employed as geologist on casual basis in Nevada, Yukon and British Columbia.



- Legend
- 1 Diorite - syenite usually gossaned
 - 2 Andesite (see text)
 - 3 Tuffaceous rocks - may include agglomerate
 - 4 Arenaceous to cherty sedimentary rocks

py - pyrite
 po - pyrrhotite
 cpy - chalcopyrite
 ga - galena

— fault
 — vertical fracture
 35° — inclined fracture
 75° — inclined bedding

N. B. Grid lines plotted from data gathered by Skyline Exploration Ltd.

**GEOLOGICAL BRANCH
 ASSESSMENT REPORT**

11,395

UNITED CAMBRIDGE MINES LIMITED
 STAR MINERAL CLAIMS - ATLIN M. D.

GEOLOGY

Scale: 1: 5000

0 50 100 200 300 400 METRES

Figure 5

To accompany report by
 E. Ostensoe.

Date: July, 1983
 Drawn by: c. l. c.