BILLITON CANADA LTD.

ASSESSMENT REPORT

GEOLOGICAL SURVEYS

TEE CLAIMS 1 TO 8

JULY 1981

115-P-15

63°47'N 136°44'W

Vancouver, B.C.
30 April, 1982.

Brian Paul
Daniel Rota

This report has been examined by the Geological Evaluation Unit under Section 53 (4) Yukon Quartz Mining Act and is allowed as representation work in the amount of $ 3200—.

P.Watson

for Regional Manager, Exploration and Geological Services for Commissioner of Yukon Territory.

TABLE OF CONTENTS

FIGURES

TABLES

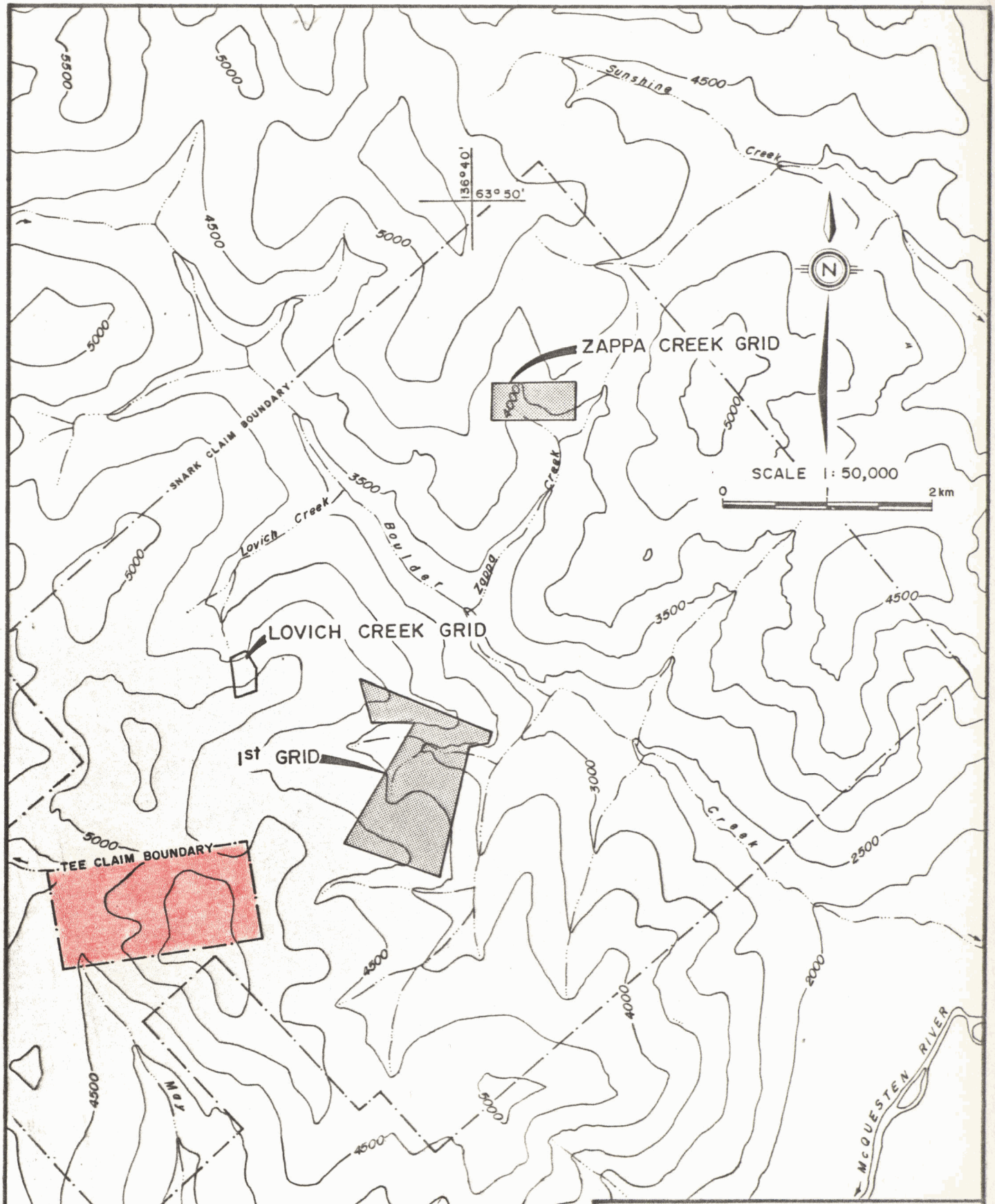
PLATES

INTRODUCTION

The TEE claim group is located in the Mayo Mining District, central Yukon, some 45 kilometres northwest of the town of Mayo. It consists of eight claims, covering an area of 167 hectares along East Ridge, near the headwaters of May Creek. The claims are owned in their entirety by CCH Minerals Ltd. of Toronto, Ontario.
During July of 1981, a number of tin soil anomalies within the boundaries of the TEE group were prospected in conjunction with a larger program of prospecting, geological mapping and soil sampling on the surrounding SNARK claim group. An amount totalling $22,533.45 was expended during the course of these surveys, of which $3,200.00 has been claimed for assessment purposes on the TEE group.

EXPLORATION HISTORY

The general area occupied by the TEE group has been the focus of much exploration activity over the past sixty years. As early as 1922, local prospectors had staked a lead-silver showing on the east side of May Creek, on which an adit was reportedly driven. This occurrence was restaked in 1931 and again in 1962 as the TED group by Zulco Exploration Ltd. By this time, the copper and zinc potential of the area had been recognized and an extensive program of bulldozer trenching was carried out from 1963 to 1965. The MAY and HOPE claims were tied on to the above group by J. Strebchuck in 1963 and restaked as the ORE group in 1967. They were eventually optioned by Coin Canyon Mines Ltd. and Silver Springs Mines Ltd., who carried out geochemical surveys as well as additional trenching in 1970. The TED group was optioned to Quintana Minerals Ltd., who conducted geochemical, geological and magnetometer surveys in 1971 and 1972. These claims were restaked as the BONNIE group in 1975 by J. Anderson, and the TEE group by A. Triggs in 1976.



CORTIN JOINT VENTURE

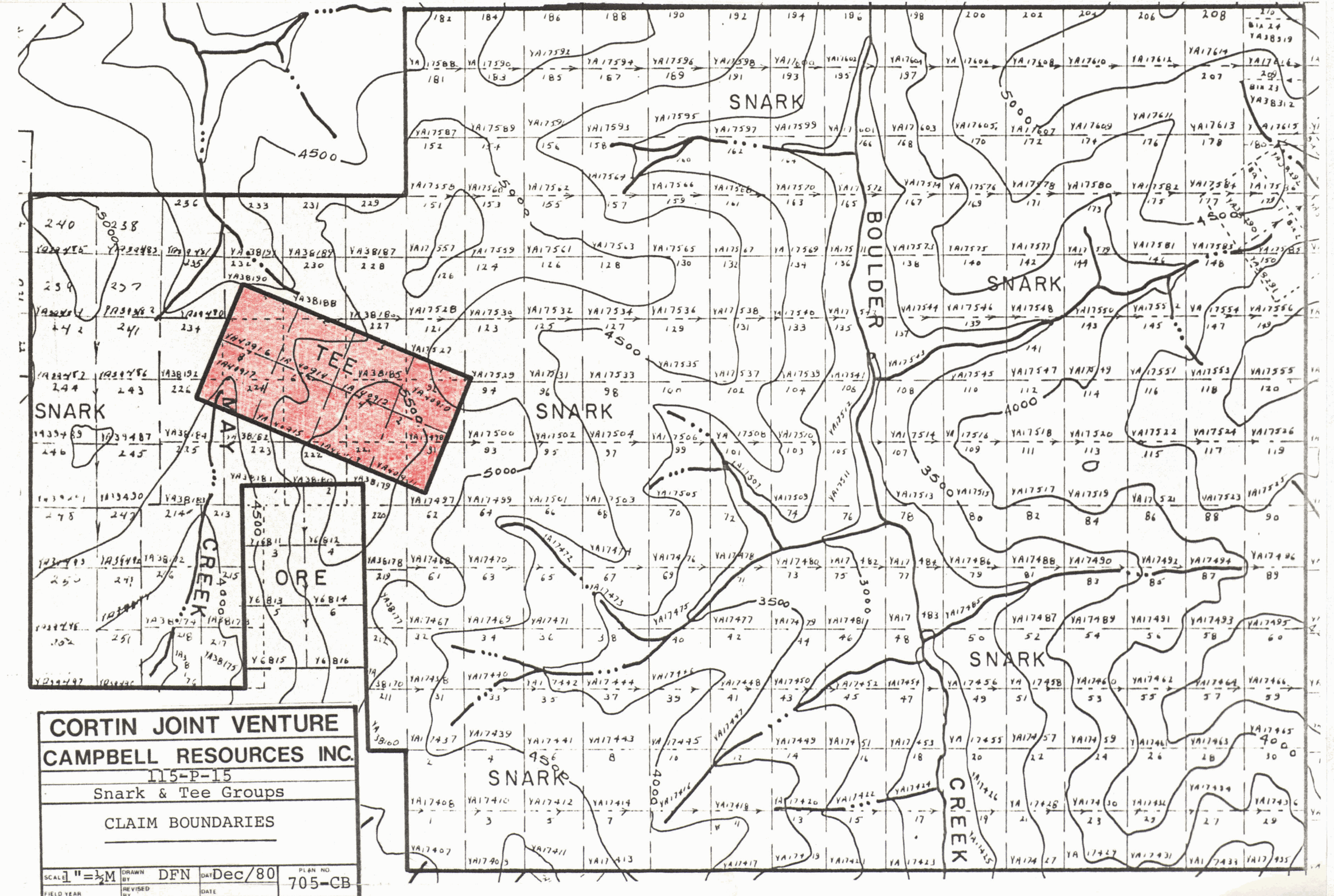
CAMPBELL RESOURCES INC.

115 P/10.15

SNARK & TEE GROUPS

GRID LOCATIONS 1981

SCALE 1:50,000	DRAWN BY SG	DATE DEC. 1981	PLAN NO.
FIELD YEAR 1981	REVISED BY	DATE	



CORTIN JOINT VENTURE

CAMPBELL RESOURCES INC.

I15-P-15

Snark & Tee Groups

CLAIM BOUNDARIES

SCALE	DRAWN BY	DATE	PLAN NO.
1" = ½M	DFN	Dec/80	705-CB
FIELD YEAR	REVISED BY	DATE	

Tin, in the form of cassiterite, was reported in panned concentrate samples from Boulder Creek by Aho (1949) and was identified, perhaps incorrectly, as an accessory in calc-silicate skarn during work on the aforementioned TED group (Archer et al, 1972). Cassiterite was also reported as a constituent of quartz veins in the vicinity of May Creek by D. Templeman-Kluit (pers. comm., 1979).

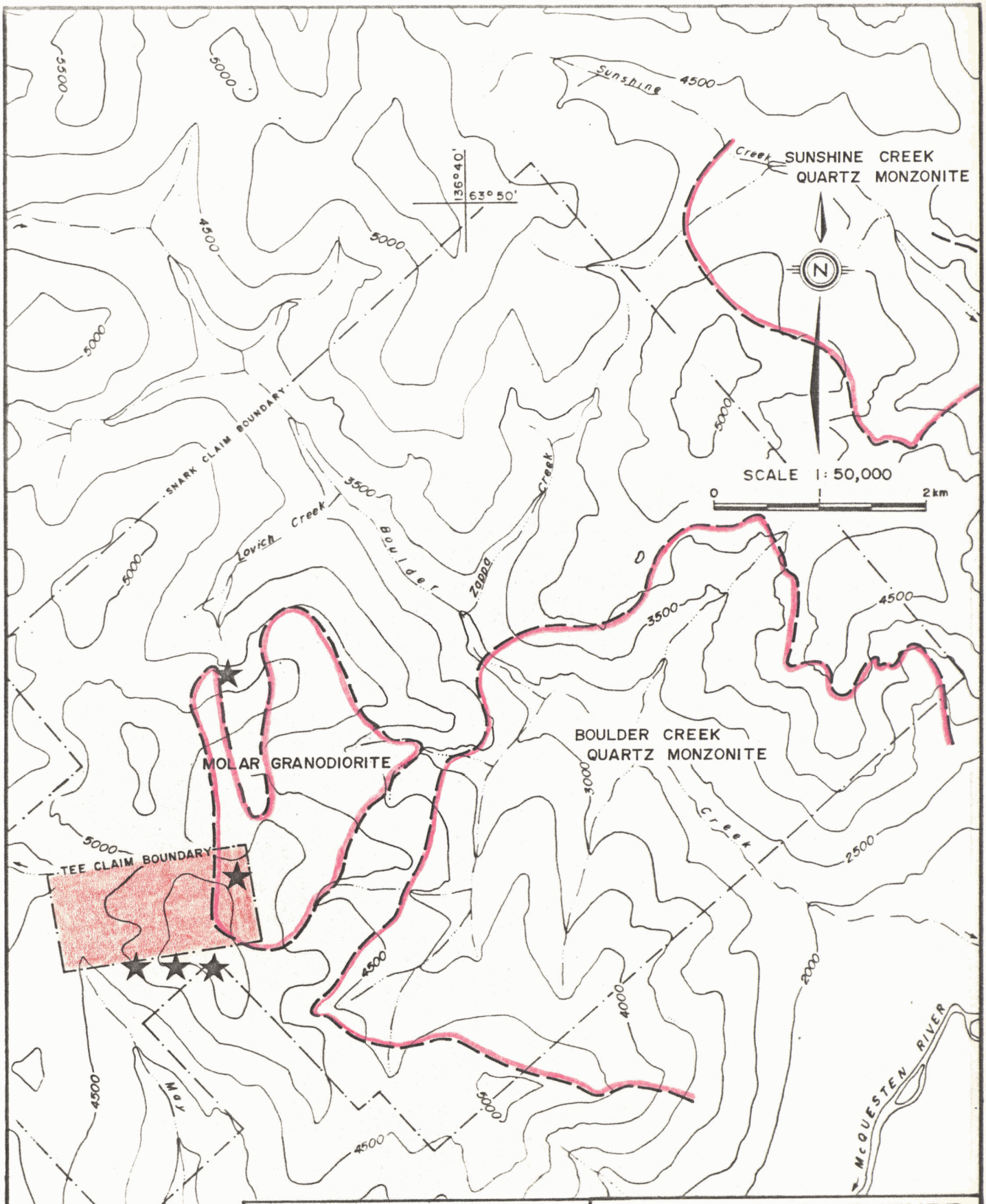
During 1977, very high tin and tungsten values were confirmed in panned concentrate samples collected along Boulder Creek by CCH Resources Ltd. The SNARK group was staked for the company in December of the same year, and subsequently extended. The TEE group was optioned from A. Triggs of Whitehorse in 1978 and is presently owned in its entirety by CCH Minerals Ltd. Only a limited amount of work was carried out by the company in 1978, but reconnaissance scale geochemical surveys did outline several areas of potential interest. During 1979, expanded geological and geochemical surveys in the vicinity of May Creek outlined an area of anomalous silver in soils on the west side of the creek, as well as a broadly anomalous zone of tin, zinc and copper on the slopes east of the creek. Despite nearly three weeks of detailed mapping and prospecting, no primary tin minerals were identified.

Follow-up programs were carried out on the existing tin and silver anomalies in the vicinity of May Creek during 1980, which resulted in the discovery of cassiterite in the form of vug fillings and also as an accessory with sphalerite in actinolite skarn. Prospecting of previously unexamined soil anomalies in the vicinity of Lovich Creek and May Creek resulted in the discovery of several additional occurrences of cassiterite, including one showing in outcrop, during 1981.

GEOLOGY

Much of the area encompassing the SNARK and TEE claims is underlain by "Grit" Division metasedimentary rocks, mainly psammitic, of Precambrian or Cambrian age. The remaining areas are underlain by a large stock of biotite quartz monzonite and a smaller satellite body of granodioritic composition, both of Cretaceous age, as indicated on the plan on the following page. The easternmost end of the TEE claim block is underlain by the granodiorite, which extends beneath East Ridge to reappear near the southern boundary of the claim block (Map TY-35). Several intermediate to felsic dykes have been located along the ridge crest, lying immediately above the granodiorite.

The metasedimentary rocks are moderately to gently dipping in a variety of orientations, being folded in the north-eastern sector of the SNARK group about an (F_3) antiformal axis related to the Cretaceous intrusive rocks. Small scale (F_2) nappe folding related to regional overthrusting is generally well-developed within the metasedimentary sequence. Brecciation, fracturing and minor faulting, possibly related to the (F_3) fold event, have been locally important in the concentration of ore fluids. Of note on the TEE group is the large area of vuggy quartz breccia lying above the granodiorite, which is sporadically mineralized with sphalerite and argentiferous galena. Sphalerite and chalcopyrite occur in accessory amounts within amphibole-chlorite skarn and calc-silicate hornfels, while scheelite is found in quartz veins along the margins of the granodiorite stock. Cassiterite has been identified as a constituent of amphibole-chlorite skarn, and occurs as a fracture-filling mineral in both the metasedimentary and intrusive rocks.



LEGEND

GRANITIC ROCKS

Cassiterite in float and/or outcrop

CORTIN JOINT VENTURE

CAMPBELL RESOURCES INC.

115 P/10, 15

SNARK & TEE GROUPS

CASSITERITE OCCURRENCES

SCALE 1:50,000	DRAWN BY BJP/SG	DATE DEC. 1981	PLAN NO
FIELD YEAR 1981	REVISED BY	DATE	

GEOCHEMISTRY

To date, most of the ground within the SNARK and TEE groups outside of the Boulder Creek stock has been explored with soil geochemistry. During 1981, an area of "Grit" Division metasedimentary rocks lying in between the Boulder Creek stock and Molar granodiorite was sampled for the first time and additional samples were taken in an area above Lovich Creek to close a gap in the 1979 and 1980 coverage. Detailed (25 x 25 metre) geochemical surveys were also carried out along Zappa Creek. The surveys took place outside the boundaries of the TEE group, and are not discussed in the present report.

1981 PROGRAM

A wide area of anomalous (>50 ppm) tin in soils was outlined on the slopes east of May Creek in 1979 (Map TY-36), only certain portions of which were followed up with detailed prospecting during the subsequent field season. Cassiterite was identified for the first time as a constituent of chlorite-actinolite skarn, and also as vug-fillings within the quartzose metasediments. Four additional occurrences of cassiterite were discovered during the most recent field season, all of which are tabulated on the following page. An attempt was made to examine all soil anomalies with greater than 50 ppm tin, with the exception of those anomalies outside the limits of the claim group which were unflagged and impossible to locate on the ground. All of the occurrences located to date appear spatially related to the Molar granodiorite. This is somewhat surprising in that the Molar granodiorite is not a particularly attractive intrusive, being far less differentiated than the larger Boulder Creek quartz monzonite (Paul and Rota, 1982). The outcrop occurrence within the TEE group is notable in being the first example of endogranitic tin mineralization within the Mayo-McQuesten area. The

TABLE 1: CASSITERITE OCCURRENCES, EAST RIDGE

ANOMALY LOCATION	SAMPLE NUMBERS	DESCRIPTION
Ridge E of May Ck	13178-13180	- float/outcrop occurrence - cassiterite in thin limonite chlorite-filled fractures within the Molar granodiorite
Lovich Ck	13598 13600-13602	- float occurrence - cassiterite in thin fractures within the granodiorite and adjacent hornfels - abundant sphalerite in skarn - quartz veins containing arseno-pyrite
E of May Ck	17275, 17290 17291	- float occurrence, 1980 - cassiterite in chlorite-actinolite skarn, also as vug-filling within quartz-sericite schist - rock samples assayed up to 0.41% Sn, 1.30% Zn
E of May Ck	17366, 17367	- float occurrence - cassiterite in thin fractures within quartz-veined granodiorite
E of May Ck	17617, 17618	- float occurrence - coarse cassiterite crystals to several mm on fracture within talus block of intrusive breccia

PLATE 1: The contact, near Lovich Creek, between "Grit" Division metasediments and the Molar granodiorite. To the right of the gossanous slide area are blocky outcrops characteristic of the granodiorite. Cassiterite occurs here as fracture fillings within the intrusive rocks.

granodiorite body may serve as a suitable host rock, with fractures within this intrusive acting as depositional loci for mineralizing fluids emanating from the quartz monzonite.

None of the mineralization, of either the skarn or fracture-filling variety, is considered of any immediate economic importance. The showings are adequate, however, to explain the soil and stream geochemical anomalies in the May Creek/Lovich Creek area.

RECOMMENDATIONS FOR FUTURE WORK

A limited amount of work is recommended on the SNARK and TEE groups during the 1982 season, most of this removed from the immediate vicinity of the TEE claims. The most important area on the two claim groups, however, remains the ground immediately east of May Creek centred on the TEE claims. Tin, Zinc and copper soil anomalies occur here in a wide swath on the slopes east of the creek, in an area of extensive brecciation, granodioritic intrusive rocks and highly altered "Grit" Division meta-sediments. Although not an economic proposition on surface, the area is an intriguing one from a geological point of view, and could well lie above a more substantial mineralized system at depth. Most of the adjoining SNARK group comes due in 1983, meaning that a decision to continue exploration by diamond drilling will have to be made by the end of the 1982 season.

REFERENCES

Aho, A.E. (1949): Mineralogy of some heavy sands from the McQuesten River area, Yukon Territory: Unpubl. B.Sc. thesis, University of British Columbia.

Archer Cathro and Associates Ltd. (1972): Northern Cordillera Mineral Inventory-Yukon and Northwest Territories: in 5 volumes

Paul, Brian and Rota, D. (1982): Assessment Report. Geological/Lithogeochemical Studies, Jabberwock Claims 40, 42, 44, 46, 47 and 49 to 52. Mayo Mining District, Yukon Territory: 22 pp.

STATEMENT OF QUALIFICATIONS

The work described in the present report was carried out under the direction of D. Rota of Toronto, Ontario. Mr. Rota, a Project Geologist with Billiton Canada Ltd., was seconded to the Cortin Joint Venture during the 1981 season. He holds a B.Sc. degree in geology from Laurentian University in Sudbury, Ontario and has practiced his profession continuously for a period of twelve years in a variety of geological environments within Canada.

The field work on this project was carried out by Brian Paul, also an employee of Billiton Canada Ltd. Mr. Paul has been associated with the Cortin Joint Venture since May of 1979. He holds a B.Sc. (Hons) degree from the University of Western Ontario and is currently completing the requirements for an M.Sc. degree in geology from the University of Manitoba. He is a member of the Canadian Institute of Mining and Metallurgy, the Geological Association of Canada and the Mineralogical Association of Canada.

STATEMENT OF EXPENDITURES

588 soils analyzed for Sn-W-Cu-Pb-Zn-Ag and As @ $13.75/sample	$ 8085.00
477 soils analyzed for Sn and Zn @ $5.35/sample	2551.95
25 Geologist days @ $95.00/day	2375.00
49½ Assistant days @ $45.00/day	2227.50
Food and supplies 74½ man days @ $12.00/day	894.00
10 hours Helicopter @ $440.00/hour	4400.00
Drafting and interpretation	2000.00
	$22533.45
8 claims, each for four years, or 32 claim years	3200.00
	$19333.45

The above work was completed during the period July 6 - July 30, 1981.

Vancouver, B.C.

Brian Paul

Brian Paul,
Geologist,
Billiton Canada Ltd.,
Cortin Joint Venture.

LIST OF CLAIMS

CLAIM NUMBERS	GRANT NUMBER	LOCATION	RENEWAL DATE
TEE 1 to 8	YA40910 - YA40917	EAST RIDGE	December 6, 1987

Assessment work has been filed on TEE claims 1 to 8 sufficient to hold these claims until December 6, 1987, for which this report is representation.

N
5000
5200
4000
3000
3500
3600
4500
2500
2000
5882
Boulder Creek
Creek
SNARK CLAIM BOUNDARY
LAMB CLAIM BOUNDARY
ADRA CLAIM BOUNDARY
LEGEND
RHYOLITE / APLITE (FG GRANITE ?)
DACITE - RHYODACITE
BIOTITE GRANITE: MIXED WITH METASEDIMENT IN SCREE
CHLORITIC SKARN: MIXED WITH METASEDIMENT IN SCREE
CHERT
QUARTZITE, INCLUDES ≥50% LIMESTONE
QUARTZITE, MICACEOUS QUARTZITE, ARGILLACEOUS QUARTZITE, SCHIST; WITH APPRECIABLE SKARN, GRITSTONE
T15 TRENCH 15 (etc.)
TRENCHES
CAMP CAMPSITE
CLAIMPOSTS: SNARK, OTHER
BASELINE LOCATION
(12) HAND SPECIMEN (SK-79-12, etc.)
(075) SOIL SAMPLE (13075, etc.)
SCHISTOSITY
TREND OF CONTACT
X x FLOAT
BEDDING (SCHISTOSITY)
JOINTING, FRACTURING
PORPHYRY
SCREE EXTENT
OUTCROP EXTENT
CONTACT: KNOWN, ASSUMED
FAULTING, SHEARING
CAT ROADS
EXTENT OF VUGGY QUARTZ BRECCIATION
EXTENT OF SKARN FORMATION
EXTENT OF GOSSAN (LIMIT 1% PYRITE ?)
APPROXIMATE LIMIT INTRUSIVE BRECCIAS
CAIRNS
ADIT
CORTIN JOINT VENTURE
CCH RESOURCES LTD.
115-P-15
SNARK GROUP
091018
GEOLOGY
DRAWN BY DFN
DATE NOV. 14, '79
PROJECT NO. 703
PLAN NO. TY-35
REVISED BY
DATE
SCALE 1:10,000


5000
5000
4000
3500
5200
3000
3600
4500
4000
2500
3000
5000
5000
4000
4500
2000
5882
4500
5000
4500
LAMB CLAIM BOUNDARY
LEGEND
SOIL GEOCHEMISTRY
Anomalous Sn Values; 20ppm, 100ppm
Anomalous Ag Values; 5.0ppm, 10.0ppm
Anomalous Zn Values; 500ppm
Sn Anomaly (1978 Reconnaissance)
Recce Soil Sample Location (not shown in Detail Area)
STREAM GEOCHEMISTRY
O41 Sn value in ppm (except where indicated)
Claim Boundary; CORTIN, Other
ADIT
Detail Soil Sample Area (50×50m spacing)
CORTIN JOINT VENTURE
CCH RESOURCES LTD.
115-P-15
SNARK GROUP
091018
COMPILATION, GEOCHEMISTRY
Sn, Ag, Zn
DRAWN BY: DK
SCALE: 1:10,000
DATE: Nov. 79
No. TY-36