1986 FINAL REPORT

on the

CHEMAINUS PROJECT

NTS 92B/13, 92C/16

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by

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SUMMARY

This report presents results of the 1986 geological and geochemical surveys on the Chemainus Joint Venture with Esso Resources Canada Ltd..

The project area consists of 15 claims (139 units) in two separate claim blocks located about 60km northwest of Victoria, B.C. on Vancouver Island. Kidd Creek Mines Ltd. (now a wholly owned subsidiary of Falconbridge Ltd.) earned a 50 percent interest in the property in 1985 and is the operator of this project.

The objective of the programme was to explore the Myra Formation volcanic rocks for polymetallic, Kuroko-type, massive sulphide deposits. The nearby 1 million ton Twin J and Lenora deposits at Mount Sicker (produced about 305 000 tons of ore grading 3.3% Cu, 7.5% Zn, 2.75 oz/t Ag, and 0.13 oz/t Au, S.G. Enns, pers. comm., 1987) and Westmin's Buttle Lake deposits (20 million tons averaging 2% Cu, 6% Zn, 2.5 oz/T Ag, and 0.06 oz/T Au) are examples of such deposits in the Sicker volcanic belt. Abermin Corporation has detected significant mineralization on adjacent claims. Geological reserves for the Lara deposit is currently 923 000 tons grading 0.61% Cu, 0.81% Pb, 3.59% Zn, 2.61 oz/t Ag, and 0.095 oz/t Au (N. von Ferson, pers. comm., 1987).

Fieldwork was carried out mainly on the Chip claims between May 16 and October 26, 1986. It consisted of geological mapping and rock sampling, soil sampling and a limited amount of trenching. A geophysical survey (Hendrickson, 1987) and diamond drilling (Enns, 1987) were also completed.

The claims are flanked to the northeast and southwest by chert, siltstone and quartzite of the "Sediment-Sill Unit". The southwest flank consists of symmetrically folded green and white bedded chert and black siltstone. The northeast flank consists of a broad antiformal flexure of impure quartzite and massive green chert. The core of the claims is underlain by a bi-modal assemblage of volcanic rocks. These

consist predominantly of felsic calc-alkalic volcaniclastic rocks with subordinate tholeiitic flows and sills. Possible quartz-phyric rhyolite hypabyssal intrusions were found on the Brent 1 and Chip 4 claims. The latter occurrence is morphologically and geochemically similar to the footwall rhyolite (dome?) which underlies Abermin Corporation's Coronation Zone.

Significant mineralization is hosted in felsic volcanics on the Chip claims. Presently known mineralization is restricted to the Anita Showing, in nearby drill hole Chem 86-18 on the west side of Chip 1 and in two 35m wide sulphide intersections encountered in drill holes Chem 86-14 and Chem 86-16 on the east Chip 1 claim (see Enns, 1987). At the Anita Showing a massive pyrrhotite lens with minor chalcopyrite is hosted in foliated, rhyolitic volcaniclastic rocks. The best mineralization assayed 0.90% Cu over a 0.9m interval. Pb, Zn, Ag, and Au was present in negligible quantities.

Lithogeochemical sampling defined nine significant alteration zones on the Chip and Holyoak 3 claims and at least one on the Brent 1 claim. Intensive alteration of the felsic volcaniclastic rocks is associated with mineralization at the Anita Showing.

Results of the soil geochemical survey over the Chip 3 and 4 claims were disappointing. Mineralization is not thought to subcrop on these claims.

Total exploration expenditures in 1986 were $326 992.76 .

CONCLUSIONS

1. The centre of the Chemainus Joint Venture claims are underlain by northwesterly trending Myra Formation volcanic rocks. The Myra rocks are flanked to the northeast and southwest by "Sediment-Sill Unit" stratigraphy. The Myra Formation consists predominantly of a complex assemblage of subaqueously deposited volcaniclastics with subordinate volcanic flows and sills.

2. "Purple pyroclastic rocks" are thought to mark the transition from a period dominated by volcanism to a period marked by sedimentation, ie. the change from Myra Formation stratigraphy to "Sediment-Sill Unit" stratigraphy.

3. A thin, intermittent, jasper horizon extending through the Chip 1 and Chip 3 claims is thought to represent an iron-rich chemical sediment deposited during the waning stages of volcanism.

4. Volcanic and sedimentary rocks on the Chip claims have undergone one major phase of tight, symmetrical folding. Widespread penetrative deformation related to the major period of folding in the Myra Formation has obliterated most volcano-sedimentary textures. Post-Nanaimo Group broad-open style folding has only slightly affected Sicker Group stratigraphy.

5. The massive sulphide lens at the Anita Showing dispays a very poorly defined metal banding. It is hosted within a sequence of hydrothermally altered felsic volcaniclastic rocks. This mineralization may be attributed to syngenetic volcanic processes.

6. Small hydrothermally altered quartz-phyric rhyolite domes? may indicate possible volcanic centres. The Chip 4 hypabyssal intrusion has an identical REE pattern to the Coronation Quartz Porphyry. These intrusions occur at widely spaced intervals along a probable structural feature within felsic volcanic rocks.

7. Rocks mapped as intermediate volcaniclastics and chlorite-sericite schists have been determined by rock chemistry to be rhyolitic in composition. Metasomatism does not appear to have affected original SiO_2 contents.

RECOMMENDATIONS

Results generated during the 1986 field season warrant continued exploration in the area. Drilling is recommended in the following four areas.

1. The Anita Showing contains significant mineraization, and is hosted by felsic volcanic lithologies which are pervasively altered (Alteration zone E). Drilling should be carried out at one-hundred metre spacings from Lines 24+00E to 29+00E in order to better define a zone of economic mineralization. Locations of drill holes should incorporate geophysics to optimize the testing of indicated sulphide mineralization.

2. Three relatively isolated "centres" of alteration (Alteration zone D) underneath the powerline on the Chip 1 claim should be tested. Drilling south from the gabbro at 32+50E through the centre of the zone of strongest alteration is recommended.

3. A 250m thick band of altered felsic volcaniclastic rocks between Line 12+00E 3+00 to 4+00N and Line 14+00E 1+50N (Alteration zone F) requires testing. A drill hole should be collared in the gabbro on Line 12+00E 4+00N and directed to the southwest to intersect the felsic unit as far as 2+00N. On Line 14+00N a drill hole should be collared at 1+00N and directed to the northwest to intersect the felsic unit as far as 3+00N.

Trenching is recommended for the following areas:

1. Alteration zone B on the Holyoak 3 claim consists of intensely altered mafic tuff and less intensely altered felsic composition quartz-feldspar crystal tuff. Zone B should be delineated by trenching 200m northeast and southwest of the baseline at 48+00W.

2. Two intensely altered metarhyolite tuffs exposures near the north boundary of the Holyoak 3 claim are interpreted to form part of a continuous 1000m long band. To expose more geology in the vicinity of this zone (Alteration zone C) two or three trenches should be dug across the zone equidistant from one another. The trenches should be placed at Line 46+00W 8+00N, Line 44+00W 7+00N, Line 42+00W 6+00N and run 400m in a northwest-southeast direction.

Further geological mapping is required in the following areas:

1. On the east side of Anderson Creek an intensely altered quartz-eye rhyolite (felsic hypabyssal intrusion?) has been identified. More detailed mapping and lithogeochemical sampling is required in this vicinity to define future drill targets.

2. The region between Line 32+00W and Line 30+00W at 6+00N (Alteration zone H) needs detailed mapping and then consideration for future drilling.

3. The adjacent Bedrock and Trek claims contain interesting alteration patterns and attractive volcanic lithologies. Exploration rights to the claims should be obtained.

4. The Brent 1 claim and adjacent Nugget claims have high potential for hosting favourable mineralization. The east half of the Brent 1 claim including the Sharron showing should be re-mapped and the Nugget claims should be optioned.

Geology favourable for hosting VMS mineralization with coincident intense alteration exists in the very southwest corner of the Holyoak 3 claim. Due to the proximity of competitor claim boundaries, any potential economic mineralization will probably exist on Abermin Corporation's Solly or Silver 2 claims. At present no further work is recommended for this area.

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INTRODUCTION

Location, Access and Physiography

The Chemainus project area is located in southeast Vancouver Island, about 8 km west of Chemainus, B.C. (Figure 1)

Access to the claims is gained via MacMillan Bloedel's main haulage road leading west from Chemainus. A network of infrequently maintained secondary and tertiary logging roads and abandoned railway grades provide access to most parts of the property (Figure 2).

The topography of the Chip claims (Figure 3) is moderate. Several creeks occupy incised canyons. The Brent-Holyoak claims (Figure 3) occupy areas of steep topography. Elevations on the property range between 500 and 1100m.

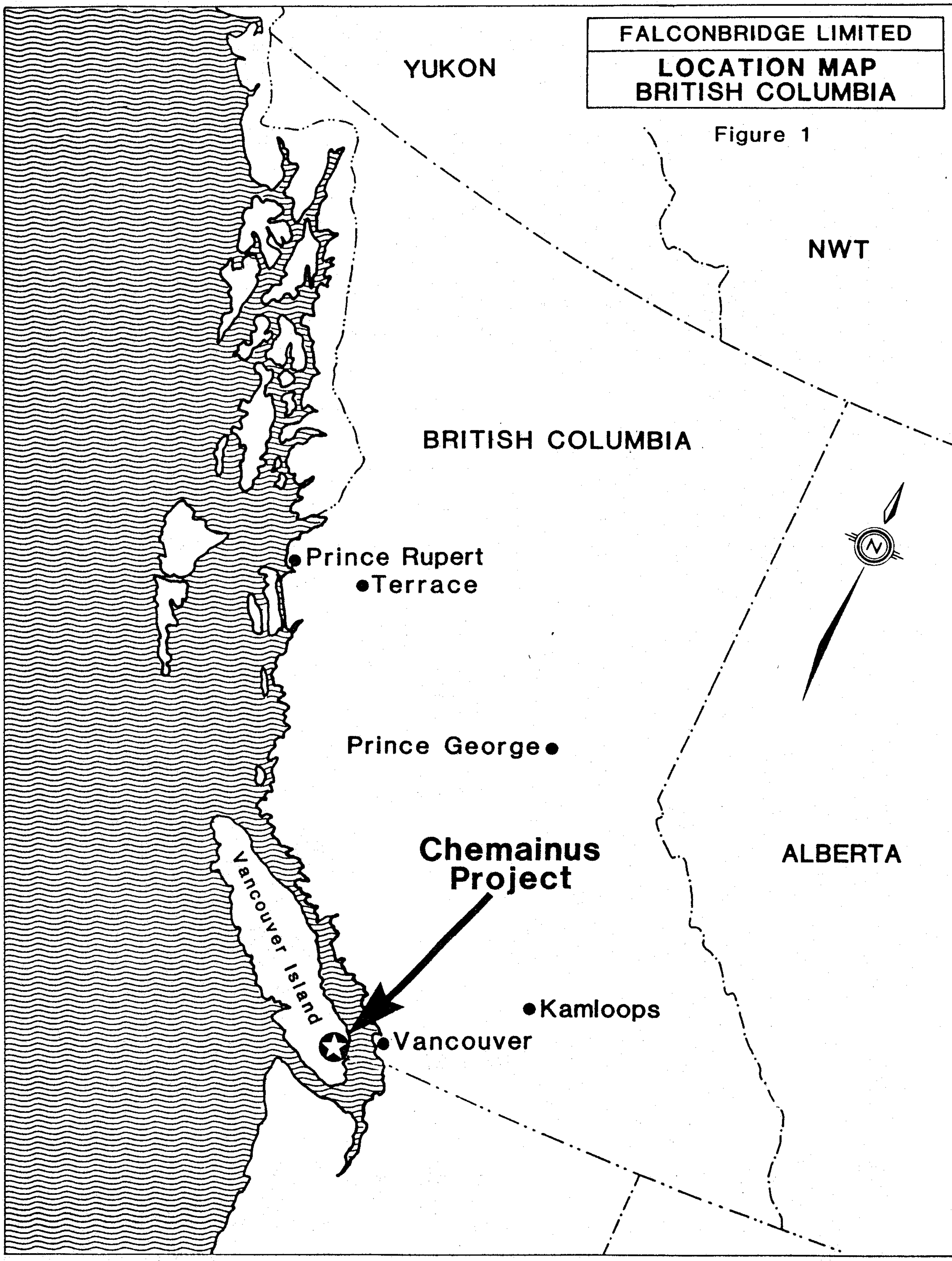
A mild climate prevails during much of the year. Summers are hot and dry and resulting forest fire hazards often forces partial or complete closure of the bush. Winters are wet. Elevations below 500m may be snow free throughout the year.

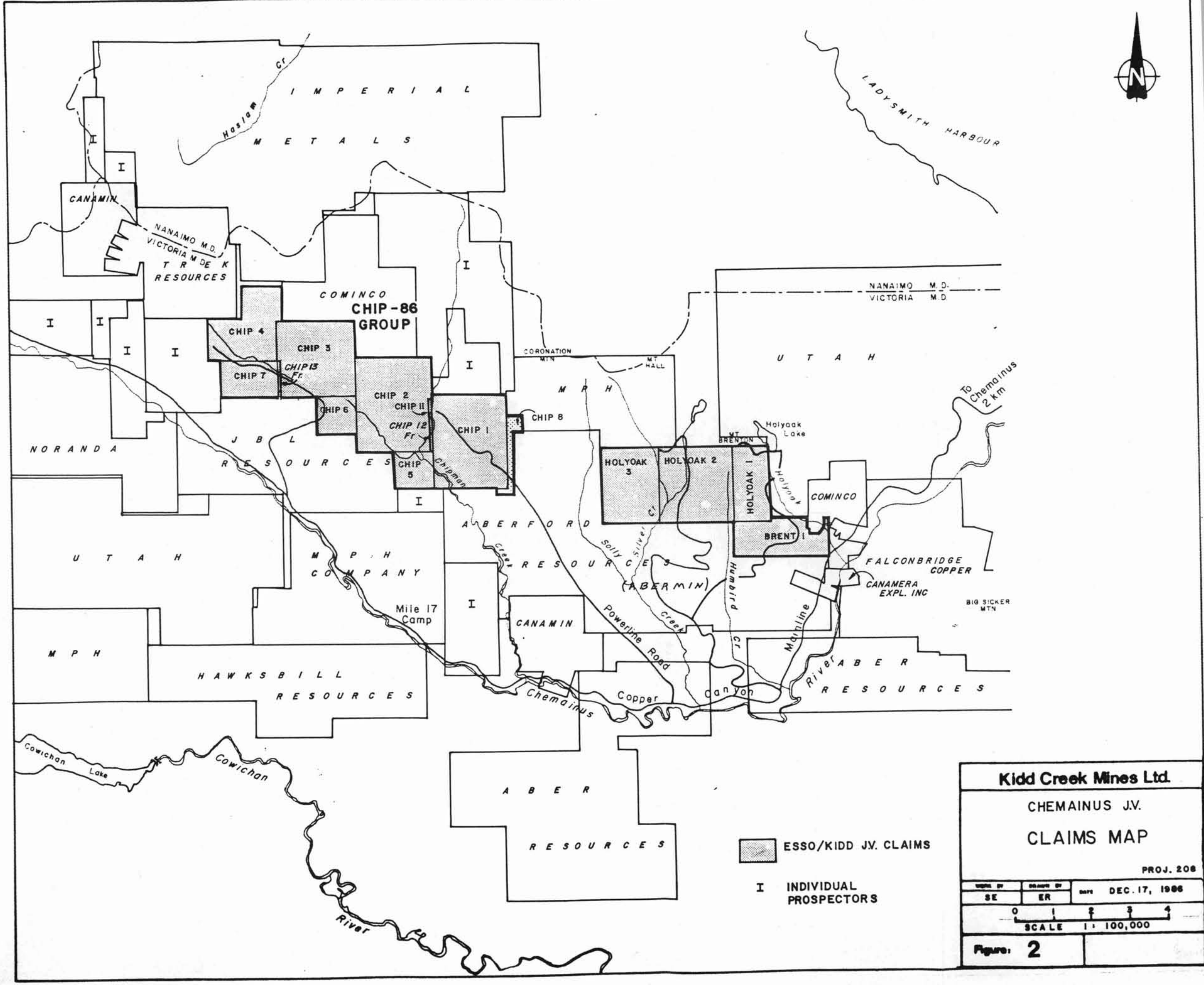
Property History

The reader is referred to Enns et al, (1986) for a concise review of the history of the Chemainus property.

Property Definition and Claims Status

The Chemainus property consists of 15 claims (139 units) in two separate blocks in the Victoria Mining Division (Table 1). Esso Resources Canada Ltd. currently holds title to all the claims. Kidd Creek Mines Ltd. earned a 50% interest in the property in 1985 and is presently the operator in the joint venture (Enns et al, 1986).


FALCONBRIDGE LIMITED
LOCATION MAP
BRITISH COLUMBIA
Figure 1
YUKON
NWT
BRITISH COLUMBIA
Prince Rupert
Terrace
Prince George
Chemainus Project
ALBERTA
Vancouver Island
Kamloops
Vancouver



Kidd Creek Mines Ltd.		
CHEMAINUS J.V.		
CLAIMS MAP		
PROJ. 208		
SE	ER	DATE DEC. 17, 1986
SCALE 1 : 100,000 (0 1 2 3 4)		
Figure: 2		

Mineral claim Chip 10, staked in May 1985, was found to be forfeit as it overstaked the Lucky Rose claim. The Lucky Rose claim has lapsed and open ground currently exists south of Chip 3.

Table 1 and Figure 2 summarize the claim data.

TABLE 1

CLAIM STATUS

Claim	Units	Record No.	Location Date	Expiry Date
Brent 1	10	163	78-05-05	96-05-11
Holyoak 1	8	1598	85-10-22	96-10-31
Holyoak 2	16	1599	85-10-23	96-10-31
Holyoak 3	12	1560	85-10-24	96-10-31
*+ Chip 1	20	720	82-11-11	91-12-07
*+ Chip 2	20	721	82-11-13	91-12-07
*+ Chip 3	16	722	82-11-13	91-12-07
*+ Chip 4	16	723	82-11-15	91-12-07
*+ Chip 5	4	920	83-05-16	91-05-24
*+ Chip 6	4	921	83-05-17	91-05-24
*+ Chip 7	6	922	83-05-18	91-05-24
*+ Chip 8	4	1424	85-02-22	91-02-27
*+ Chip 11	1	1526	85-05-31	91-06-17
*+ Chip 12FR	1	1608	85-12-11	92-12-12
*+ Chip 13FR	1	1609	85-12-11	92-12-12

* Comprise the Chip-86 Group

\+ Pending acceptance of assessment work (Hendrickson, 1987) by Gold Commissioner's office

Total: 15 claims, 139 units, approximately 3,425 Hectares (8,424 Acres)
The claims lie within the Victoria Mining Division on NTS sheets 92B/13W and 92C/16E.

1986 Work Programme

The objective of the 1986 work programme was to evaluate, through geology, geochemistry and geophysics, the potential of the Chip claims (Figure 2) for hosting polymetallic massive sulphide deposits.

Field work started in early May and lasted into late November.

Assessment of the Brent-Holyoak claims had lower priority as they were investigated in 1984 and 1985 (Enns et al, 1986; Britten, 1984).

The reader is referred to Table 2 for a compilation of work carried out in 1986.

Work was temporarily halted in mid-August due to extreme forest fire hazard in the bush.

A rented house in the town of Chemainus provided accomodation for a crew of four to ten. Transportation consisted of two GMC four wheel drive pick-up trucks.

TABLE 2

1986 WORK PROGRAMME

Date	Contractor	Work
May 16-Aug 5 1986	Bill Chase & Associates, White Rock, B.C.	61.8km line cutting, secant chaining at 20m intervals
" "	Delta Geoscience Ltd., Delta, B.C.	40km gradient array induced polarization survey 72km Schlumberger array induced polarization survey 72km magnetometer and VLF survey
" "	In-house	Soil sampling B_f horizon along cut lines at 25m intervals. Approximately 1100 samples collected
May 15-Aug 15 1986	In-house	Geological mapping and rock sampling on the Chip claims and a limited amount of mapping and sampling on the Brent claim
July 15 - 20 1986	Matthews and Associates, Richmond, B.C.	Survey locations of LCP for Chip 1/5 (common), Chip 8, Wimp,TL and Holyoak 2/3 (common)
Oct 22 - 26 1986	George Ballegeer Bulldozing and Trucking Ltd., Lake Cowichan, B.C.	300m of trenching in four localities
Oct 15-Nov 20 1986	Burwash Enterprises Ltd., Cobble Hill, B.C.	Diamond drilled 1854m of NQ core in 6 holes

GEOLOGY

Regional Setting

The geology of Vancouver Island consists of two allochthonous terranes separated by the San Juan and Leech River Faults , these are the Insular and the Pacific Belts (Figure 4). The Pacific Belt occupies the southwestern rim of the Island. The belt is made up of Mesozoic sedimentary-volcanic melange and schist and Eocene ocean floor basalt and overlying younger sediments. The Insular Belt forms the main part of the Island. It is composed of a highly varied assortment of volcanic, sedimentary, metamorphic and plutonic rocks varying in age from Paleozoic to Tertiary (Muller, 1981).

The allocthonous nature for the Insular Belt proposed by several authors (Jones et al, 1977; Monger and Price, 1979; Monger and Irvine, 1980) has been widely accepted.

The Chemainus Project area occurs in lower Paleozoic Sicker Group rocks. The geology of the Sicker Group has been described extensively by Muller (1977,1980,1981), Fleming et al, (1983), Mallalieu et al, (1984), Enns et al, (1985), and Booth (1985). A brief description of the Group follows.

The Sicker Group can be subdivided into four gross statigraphic sequences (Table 3). The Nitinat Formation is the oldest sequence of rocks in the Group. It is composed of massive mafic flows , breccias and minor pillowed lavas. Muller (1980) considered it to be Ordovician to Silurian in age. Conformably overlying the Nitinat Formation is the Late Silurian to Devonian Myra Formation. It consists of a bi-modal sequence of well-bedded andesitic to rhyolitic tuff and breccia with variable thicknesses of black siltstone and chert. The "Sediment-Sill unit" consists of a succession of pelitic sedimentary rocks with intercalated diabase sills/dykes and gabbro plutons. The unit may be coeval with the Buttle Lake Formation or slightly older.

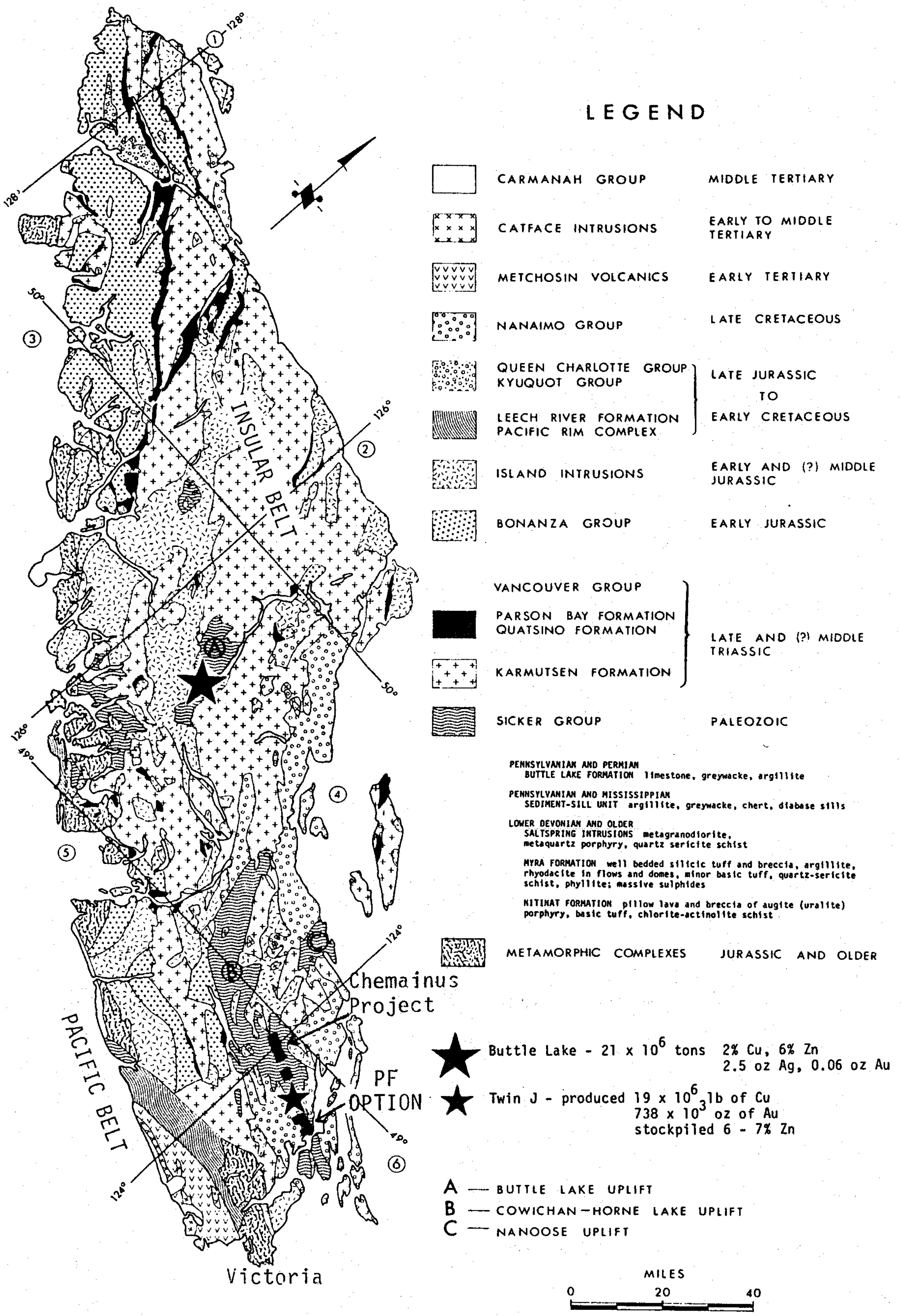


FIGURE 4

REGIONAL GEOLOGY MAP
(modified after Muller, 1980)

TABLE 3

TABLE OF FORMATIONS OF VANCOUVER ISLAND

SEQUENTIAL LAYERED ROCKS

ERA	PERIOD	STAGE	GROUP	FORMATION	SYMBOL	AVE. THICK. (m)	LITHOLOGY
CENOZOIC				late Tert. volc's of Port McNeill	Tvs		
CENOZOIC				SOOKE	mpTSB		conglomerate, sandstone, shale
CENOZOIC		EOCENE to OLIGOCENE	CARMANAH	HESQUIAT	eoTc	1,200	sandstone, siltstone, coglomerate
CENOZOIC		EOCENE to OLIGOCENE	CARMANAH	ESCALANTE	eTE	300	conglomerate, sandstone
CENOZOIC		early EOCENE		METCHOSIN	eTM	3,000	basaltic lava, pillow lava, breccia, tuff
MESOZOIC	LATE	MAESTRICHTIAN	NANAIMO	GABRIOLA	uKGA	350	sandstone, conglomerate
MESOZOIC	LATE		NANAIMO	SPRAY	uKS	200	shale, siltstone
MESOZOIC	LATE	CAMPANIAN	NANAIMO	GEOFFREY	uKG	150	conglomerate, sandstone
MESOZOIC	LATE	CAMPANIAN	NANAIMO	NORTHUMBERLAND	uKN	250	siltstone; shale, sandstone
MESOZOIC	LATE	CAMPANIAN	NANAIMO	DE COURCY	uKDC	350	conglomerate, sandstone
MESOZOIC	LATE	CAMPANIAN	NANAIMO	CEDAR DISTRICT	uKCD	300	shale, siltstone, sandstone
MESOZOIC	LATE	CAMPANIAN	NANAIMO	EXTENSION - PROTECTION	uKEP	300	conglomerate, sandstone, shale, coal
MESOZOIC	LATE	SANTONIAN	NANAIMO	HASLAM	uKH	200	shale, siltstone, sandstone
MESOZOIC	LATE	SANTONIAN	NANAIMO	COMOX	uKC	350	sandstone, conglomerate, shale, coal
MESOZOIC	EARLY	CENOMANIAN ALBIAN	QUEEN CHARLOTTE	Conglomerate Unit	lKQC	900	conglomerate, greywacke
MESOZOIC	EARLY	APTIAN ?	QUEEN CHARLOTTE	Siltstone–Shale Unit	lKQP	50	siltstone, shale
MESOZOIC	EARLY	VALANGINIAN BARREMIAN	KYUQUOT	LONGARM	lKL	750	greywacke, conglomerate, siltstone
MESOZOIC	JURASSIC MID. LATE	TITHONIAN	KYUQUOT	ONE TREE	lKOT	500	siltstone, argillite, conglomerate
MESOZOIC	JURASSIC MID. LATE	CALLOVIA	KYUQUOT	KAPOOSE	uJK		
MESOZOIC	JURASSIC EARLY	TOARCIAN?	BONANZA	Volcanics	lJB	1,500	basaltic to rhyolitic lava, tuff, breccia, minor argillite, greywacke
MESOZOIC	JURASSIC EARLY	PLIENSBACHIAN SINEMURIAN	BONANZA	HARBLEDOWN	lJH		argillite, greywacke, tuff
MESOZOIC	TRIASSIC LATE	NORIAN	VANCOUVER	PARSON BAY	uTrPB	450	calcareous siltstone, greywacke, silty-limestone, minor conglomerate, breccia
MESOZOIC	TRIASSIC LATE	KARNIAN	VANCOUVER	QUATSINO	uTrQ	400	limestone
MESOZOIC	TRIASSIC LATE	KARNIAN	VANCOUVER	KARMUTSEN	muTrK	4,500	basalic lava, pillow lava, breccia, tuff
MESOZOIC	TRIASSIC MID	LADINIAN		Sediment - Sill Unit	Tds	750	metasiltstone, diabase, limestone
PALEOZOIC	PENN. and ? PERM.		SICKER	BUTTLE LAKE	CPBL	300	limestone, chert
PALEOZOIC	PENN. and ? PERM.		SICKER	"NANOOSE"	CPSS	600	metagreywacke, argillite, schist, marble
PALEOZOIC	PENN. and ? PERM.		SICKER	Sediment- Sill Unit	PTds	500	metagreywacke, argillite diabase
PALEOZOIC	DEV. or EARLIER		SICKER	MYRA	PM	1,000	silicic tuff, breccia argillite
PALEOZOIC	DEV. or EARLIER		SICKER	NITINAT	PN	2,000	basic breccia, tuff, lava, greenschist

CRYSTALLINE ROCKS, COMPLEXES OF POORLY DEFINED AGE

NAME	SYMBOL	ISOTOPIC AGE Pb/U	ISOTOPIC AGE K/Ar	LITHOLOGY
SOOKE INTRUSIONS silicic	Tg		32–59	quartzdiorite, trondhjemite, agmatite, porphyry
SOOKE INTRUSIONS basic	Tgb		31–49	gabbro, anorthosite, agmatite
METCHOSIN SCHIST, GNEISS	TMn		47	chlorite schist, gneissic amphibolite
LEECH RIVER FM.	JKL		38–41	phyllite, mica schist, greywacke, argillite, chert
PACIFIC RIM COMPLEX	JKP			greywacke, argillite, chert, basic volcanics, limestone
ISLAND INTRUSIONS	Jg		141–181	granodiorite, quartzdiorite, granite, quartz monzonite
WESTCOAST COMPLEX silicic	PMns	264	163–192	quartz-feldspargneiss, metaquartzite, marble
WESTCOAST COMPLEX basic	PMnb			hornblende-plagioclase gneiss, quartz diorite, agmatite, amphibolite
diabase sills	PTrb			
metavolcanic rocks	PMmv			metavolcanic rocks, minor metasediments; limestone, marble
SALTSPRING INTR / TYEE QTZ. PORPHYRY	Pg	>390		metagranodiorite, metaquartzdiorite, metaquartz porphyry
COLQUITZ GNEISS	Pns	>390		quartz feldspar gneiss
WARK DIORITE GNEISS	Pnb	>200	163–182	hornblende-plagioclase gneiss quartz diorite, amphibolite

(after Muller, 1981)

The Buttle Lake Formation marks the top of the Sicker Group. It is composed dominantly of limestone with associated chert, greywacke and argillite. Palaeontological dating has placed it as Middle Pennsylvanian and Early Permian.

Sicker Group rocks are best exposed in three structural uplifts (Figure 4) , the Buttle Lake Uplift, the Cowichan-Horne Lake Uplift and the Nanoose Uplift. The Chemainus Project area occupies part of the Cowichan-Horne Lake Uplift.

The Buttle Lake deposit(s) are found in the upper Myra Formation of the Buttle Lake Uplift. Myra Formation rocks exposed in the Cowichan-Horne Lake Uplift host the Twin J deposit and underlie the claims currently being explored (Enns et al, 1986).

Property Geology

Introduction

Middle Sicker Group geology ie. Myra Formation and Sediment-Sill Unit of the Cowichan-Horne Lake Uplift dominates the Chemainus project area. These stratigraphic sequences are unconformably overlain by the Cretaceous Nanaimo Group sandstones and conglomerates.

1:5 000 scale geological mapping was conducted over approximately 48 square km of the property, predominantly on the Chip claims (Figures 5a-d). All grid lines, road exposures and stream beds were mapped. Additional coverage was obtained by carrying out traverses between control lines cut at 200m intervals.

Lithology and Stratigraphy

The geology of the Chemainus project-area is shown at a scale of 1:5 000 on Figures 5a-d and on a 1:20 000 scale compilation map.(Figure 3).

As a result of more extensive geological coverage during the 1986 field season, the terminologies describing lithological units was revised.

The legend included in Figures 5a-d lists the stratigraphic groups recognized in the Chemainus project-area in an inferred time-stratigraphic progression. Units within the stratigraphic groups are thought to reflect their true position.

Three stratigraphic sequences were recognized on the Chip-Holyoak claims. From oldest to youngest these sequences consist of the Myra Formation, Sediment-Sill Unit and Nanaimo Group.

Greenschist metamorphism and penecontempoaneous? deformation has affected all Sicker Group stratigraphy in the Chemainus project-area. Myra Formation volcanic rocks have often had original textures obliterated. In many cases the volcanic rocks have been converted to schists.

The Myra Formation has been subdivided into eleven units. The major divisions reflect changes in composition of the volcanic rocks. Individual lithologies have had further descriptive modifications applied to them in order to reflect their degree of coarseness and proximity to venting areas. Crystal tuffs and lithic tuffs in which fragments are fine grained and subordinate to matrix are referred to as volcaniclastics. Block-ash tuffs and lithic tuffs in which the fragments are coarse grained ,display reaction rims and account for greater than 25% of the mode are referred to as pyroclastics. These terms do not rigorously adhere to AGI definitions but they do provide an additional descriptive modifier which is useful in mapping.

Few modifications have been made to the descriptions/number of lithologies composing the "Sediment-Sill Unit" and no alterations have been made to the Nanaimo Group.

Sicker Group rocks trend northwesterly through the claims. Myra Formation stratigraphy generally occupies the centre of the claims and is flanked to the northeast and southwest by "Sediment-Sill Unit" stratigraphy. The two flanking "Sediment-Sill Unit" successions will be referred to in the future as northeast SSU and southwest SSU. Nanaimo Group sedimentary rocks unconformably overlie the southwestern flanking SSU.

The Myra Formation consists of a complex assemblage of predominantly volcaniclastic rocks with subordinate volcanic flows and sills.

Volcaniclastic/pyroclastic rocks (map-units 1-3) range in composition from mafic to felsic. The volcaniclastic rocks are typically fine grained, moderately to highly foliated to mildly schistose and range in colour from dark green to silver white. Colour index of the rock generally reflects increasing/decreasing white mica/chlorite content.

The felsic volcaniclastic rock (map-unit 3a) forms a band about 250m wide that extends from the eastern Chip 1 to eastern Chip 3 claim boundaries. The rocks are crystal poor. Quartz and feldspar contents are generally less than 7 % of the mode. The best exposures of quartz crystalline felsic tuffs exist near Line 22+00W in a road-metal quarry south of W-8 haulage road and in the Anita Showing excavation on Line 27+00E (Figures 5d and 5c respectively). Quartz crystal contents appear to be lower on the Chip claims than on the Brent claims.

Intermediate volcaniclastic rock (map-unit 2a) dominates the map-area. It forms a band extending from the eastern Chip 3 claim boundary through the Holyoak 3 claim. The rock is grey-green to silver-green and often quartz and feldspar crystal-rich; however it is predominantly feldspar crystal-rich. Feldspar crystals account for up to 10% of the rock whereas quartz can account for up to 4% of the rock.

Excellent exposures occur immediately east of Watson Creek, north of the Watson Creek road and on the switchback road passing through the TL and Jennie claims (Figure 5c and 5b respectively). Bedding is recognized locally. In one locality near Watson Creek road, grading of feldspar crystals was observed over a single 7cm bedding interval. Younging direction was found to be to the north. Along the switchback through the TL and Jennie claims a spectrum of vertical facies changes are present. The tuffs vary from intermediate to felsic composition and locally grade out of intermediate composition pyroclastic rocks.

Mafic volcaniclastic rock (map-unit 1a) is grey-green to dark green, mildly to highly foliated and chlorite-rich. They are most often recognized as chlorite schists. On the Chip claims and Holyoak 3 claim they are relatively rare. They form narrow "interbeds" within the felsic tuff sequences and are gradational to the mafic pyroclastic rock unit (map-unit 1) found on the north end of Lines 28+00 to 32+00 E. The mafic pyroclastic rocks (map-unit 1) mentioned above are dark green, massive to moderately foliated. Chloritized euhedral to subhedral hornblende crystals and mafic fragments have been flattened in the plane of the foliation. The crystals (1x2cm) and fragments (2x5cm) account for up to 30% of the rock.

Intermediate pyroclastic rock (map-unit 2) is dominant near the north end of Lines 14+00 to 32+00 E. The matrix is fine grained light green, intermediate to felsic in composition. Clasts are heterolithic and can account for 40% of the mode. Light green, massive, dacitic composition clasts up to 15 by 70cm dominate the rock. Sausseritized, pyritized, feldspar phyric/crystal rich clasts are subordinate (3%).

No felsic pyroclastic rock (map-unit 3) has presently been recognized in the map area.

Volcanic flows (map-units 4-6) are relatively rare on the Chip claims. Mafic flows (map-unit 4) are mostly restricted to Watson Creek, south of the trestle (Line 0+00). The flows are black to dark green, fine grained, moderately chloritic and feldspar-phyric (<1mm, <5%). The rock is well preserved and displays a mild foliation.

As noted in the course of the 1985 mapping, on the northern part of the Chip 1 claim is a dark green slightly foliated mafic composition rock which contains spherical structures up to 6mm in diameter. The spheres or "pisolitic structures" account for <10% of the rock. They form isolated bands up to 3cm in thickness. The features have been attributed by Enns (1986) to the possible degassing of pumice rubble. The author suggests that the "pisolitic structures" could have been formed by accretionary processes in a subaqueous environment.

Intermediate flows (map-unit 5) are most prevalent immediately east of Anderson Creek and north of W-8 road (Figure 5d). The flows are massive, medium green. Matrix accounts for greater than 80% of the mode. Subhedral feldspar and hornblende phenocrysts (10-12 and <7% respectively) are randomly distributed throughout.

Felsic flows/hypabyssal intrusions (map-unit 6) are present at three localities in the Chemainus project-area, one immediately east of Anderson Creek (Figure 5d), the second on the Solly claim west of the Holyoak 3 claim boundary (Figure 5b), and the third immediately east of Holyoak Creek on the Brent 1 claim (Figure 5a). The rock is massive, grey, fine grained. Matrix accounts for 90% by volume. Clear to grey vitreous, equant to elliptical quartz eyes range in size from 1-6mm, but average 3-4mm. They account for >7% of the rock. Narrow grey quartz veins (2-3mm, <5%) parallel the mild lineation formed by the elliptical quartz phenocrysts. Limonite staining is present locally.

The Solly claim hypabyssal intrusion? is similar to the exposure on Chip 4 and the Holyoak Creek occurrence on the Brent 1 claim; however the matrix is silver-white and the rock displays a slightly better developed penetrative fabric.

The rock type termed "Green Sill" (map-unit Gsl) is only found near the north end of Anderson Creek (Figure 5d). It is a medium green to pistachio green, aphyric, fine to medium grained, andesitic composition hypabyssal intrusion. It is commonly veined with epidote and quartz, and less often with jasper. "Green Sills" are always found in association with "Purple pyroclastic rocks"(PPR).

"Purple pyroclastic rocks" (PPR) (map-unit 8) are thought to mark the transition from a period dominated by volcanism to a period dominated by sedimentation ie. the change from Myra Formation stratigraphy to "Sediment-Sill Unit" (SSU) stratigraphy. PPR's are exposed east of the Chip 8 claim boundary to west of the Chip 4 claim (Figure 5b and 5d respectively). The best exposures are found north of the Chip 1 claim, east of Powerline Creek and also as a series of exposures along the B.C. Hydro access road beneath the powerline west of Powerline Creek (Figure 5c). In the best outcrops, the rock is fine grained, mauve coloured and has a distinctive slatey cleavage. Parallel to the plane of schistosity, grey, irregularly shaped volcanic clasts ranging from 1 to 30cm in diameter can be recognized. Clasts can account for up to 30 per cent of the mode. In less well preserved exposures detrital grains of jasper within purple-green schist indicate the prescence of the PPR unit.

The SSU consists dominantly of chert, siltstone, and quartzite. Jasper occurs as chemical sediments and as veins.

On the southwestern flank of the Myra Formation black siltstone (map-unit 5b) and thinly bedded green and grey cherts (map-unit 5c) dominate. Facing directions are difficult to identify as bedding is rhythmic. On the northern flank of the Myra Formation the Sediment-Sill Unit is largely comprised of dirty sandstone (map-unit 5g), massive green chert (map-unit 5c), greywacke (map-unit 5g) and black siltstone (map-unit 5b). Biotite hornfels and pyrrhotite disseminations are common in the dirty sandstone. A poorly exposed gabbro stock north of the Chip 3 claim is the likely heat source. Jasper with variable amounts of magnetite has only been detected in the northern part of the Chemainus project-area. Three significant localities are present: 1) North of the Chip 1 claim in proximity to the Lady A deposit (360 000 tons of 25% Fe); 2) in Watson Creek north of the Chip 2 claim (Figure 5c); and 3) immediately west of Watson Creek in the northeast quadrant of the Chip 3 claim (Figure 5c). In most cases the jasper is thought to represent iron-rich chemical sediments deposited during the waning stages of volcanism. The jasper occurs as whispy bands associated with hematitic-manganitic siltstone or buff-white chert. The jasper occurrence on the Chip 3 claim (Figure 5b) is epigenetic in origin. It is intimately associated with "Green Sills" and quartz veining.

Gabbro (map-unit G) is a medium to dark green, massive to poorly jointed, fine to locally pegmatitic rock. Nowhere on the Chip claims was a magnetite phase of the gabbro encountered. At Silver Creek on the Holyoak 2 claim (Figure 5a) both non-magnetic and magnetic phases were recognized (Enns et al, 1986). Gabbro in the Chemainus project-area was likely introduced syn and post Myra Formation and SSU deposition.

Post-Sicker Group gabbroic intrusions are common. Intrusions range from narrow sills and dykes less than a metre wide to large irregular bodies several square kilometres in size (Enns et al, 1986). Biotite hornfels and contact metamorphic pyrrhotite was recognized in the sedimentary rocks surrounding the Mt. Brenton stock (Enns et al, 1986) and as very conspicuous features in the dirty sandstone north of the Chip 3 claim. Similar intrusive-country rock effects are also present on the Chip 7 claim.

It is difficult to estimate the time of introduction of the gabbro body which occupies the northern part of the Chip 1,2, and 3 claims. The lack of any readily identifiable contact metamorphic features at the margins of this gabbro and the volcanic rocks on the Chip 1 claim perhaps indicates that the gabbro was introduced before the lithification of the volcanics. The presence of thermal biotite in felsic volcaniclastic rocks at the Anita showing (Figure 6) and at the Line 48+00E Trench (Figure 7) indicates the introduction of another gabbro body post-Myra Formation.

Syn-SSU introduction of gabbro was recognized in one locality near the western boundary of the Chip 2 claim in Chipman Creek (Figure 5c). Black siltstone and white chert beds (1-3cm) alternate with 30cm thick massive, medium to dark green mafic sills. The sills (<50%) display distinctive thin cooling margins (2cm). The interior of the sills contain concentrations of anhedral, white feldspar phenocrysts (3mm, <7%). The lack of any evidence indicating intrusion into a lithified sedimentary rock ie. intrusion breccia/contact metamorphic aureoles, gives credence to the hypothesis that some gabbro sills were introduced pre-lithification.

doubt this

Cretaceous Nanaimo Group (map-unit N) sedimentary rocks in the Chemainus project area consist of polymictic conglomerate, arenite, and black shale. An angular unconformity separates Nanaimo Group from Sicker Group stratigraphy (Table 3). The contact between groups is most evident in the southwestern part of the Chip claims (Figure 5c). Chipman Creek has eroded through the Nanaimo Group cover in places to expose Sediment-Sill Unit stratigraphy.

Structure

The structure of Sediment-Sill Unit and Myra Formation stratigraphy in the Chemainus project-area is neither well exposed nor well understood.

The stratigraphic successions trend northwesterly through the property. In the Brent-Holyoak claims and eastern Chip claims the rocks strike about 124°. The strike gradually warps to 135° in the western part of the Chip claims.

Widespread penetrative deformation has resulted in strong development of a well defined foliation. Subtle volcano-sedimentary textures have mostly been obliterated by deformation; however where bedding is present it is parallel to foliation.

Bedding/cleavage-foliation intersections were recognized at several localities. Reliable measurements on line 10+00W and at the road-metal quarry near Line 22+00W (Figure 5d) give plunges of 16° to the northeast and 29° to the southeast respectively. Enns et al, (1986) found that over much of the Brent-Holyoak claims kink bands were a prevalent feature. Kinked gabbro contacts indicate a weak, post-gabbro period of deformation. Kink bands and crenulation cleavages were not found to be common on the Chip claims.

Folding is observed only occasionally in the project-area. Tight folding of the southwestern SSU was recognized on Line 10+00W (Figure 5d). One synformal and two antiformal structures were identified over

45m. Rhythmic bedding prevented the younging direction from being ascertained. A broad antiformal flexure was recognized north of the Chip 3 claim (much of this data is not presented on Figures 5c and 5d as information was gathered off the map-sheets) in grey-green chert and black siltstone. Extreme variations in strike directions indicates proximity to the inferred fold hinge. The northeastern SSU succession occupies the gently dipping southern limb of the fold.

Folding is more difficult to define in Myra Formation stratigraphy. Incomplete parasitic folds are observed locally, as in Bowman Creek (Enns et al, 1986) and near the southwest corner of the Holyoak 3 claim (Figure 5b).

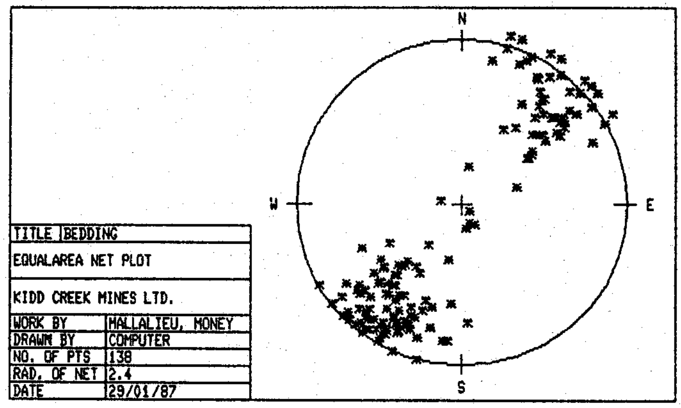
The Schmidt plots of beddings, foliations and cleavages and linear features (Figures 8a-d) illustrate that subequal numbers of poles occur in the northeast and southwest quadrants. The Schmidt plot of bedding (Figure 8a) displays a mildly developed girdle passing through the centre of the net. The diagrams indicate that the volcanic and sedimentary rocks on the Chip claims underwent one phase of tight, symmetrical folding. There is no evidence to suggest that there has been polyphase folding.

Poor and discontinuous exposure throughout the map-area limits the definition of faults to exposures found in stream channels, trenches and diamond drill core. Faults have been encoutered infrequently during the course of mapping the Chip claims.

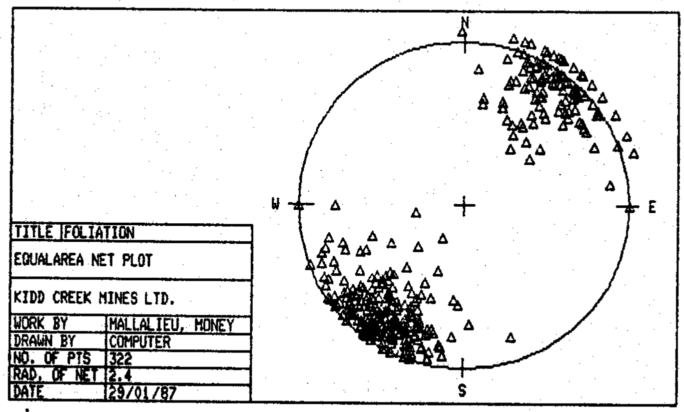
At least two periods of faulting have taken place in the project-area. The first is post-Sicker Group but pre-Nanaimo Group and the second is post-Nanaimo Group in age.

The excavation at the Anita Showing (Figure 6) has indicated the frequency of faulting in the Myra Formation. In an area of 400 m^2, two sinistral strike-slip faults are present. Associated splay faults are orthogonal to the strike of the felsic volcaniclastic rocks.

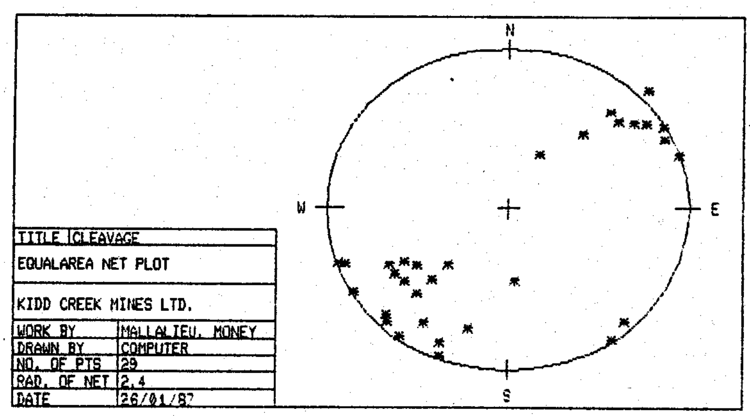
Near the confluence of Watson Creek and Chipman Creek (Figure 5c) a major southwest dipping thrust fault marks the contact between Myra Formation and Nanaimo Group stratigraphy.



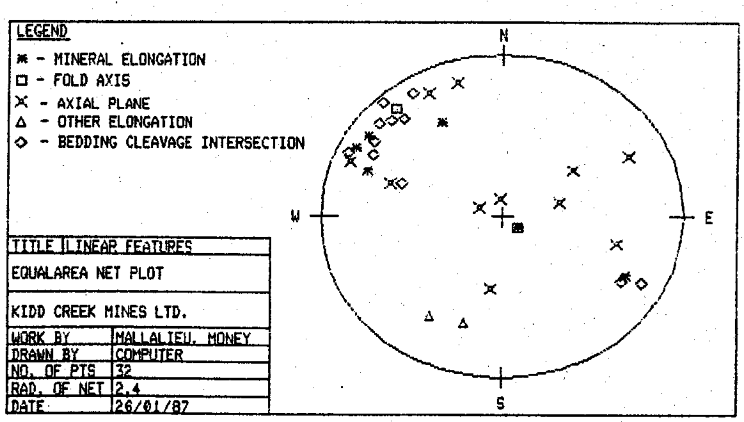
a. Bedding



b. Foliation



c. Cleavage



d. Linear Features

Figures 8 a-d - Schmidt π Plots

On the Solly and Jennie claims Abermin Corporation has found that the Nanaimo Group underlies Myra Formation strata. The fault plane dips to the northeast (R.L. Moore, pers. comm., 1986).

Figures 9a and 9b illustrate structural sections through the Myra Formation and "Sediment-Sill Unit" along Bowman Creek and Line 32+00E.

Relation of Folding and Faulting to Stratigraphy

Apart from fold repetitions observed in the southwestern SSU, on a gross scale no repetition of major lithological units are readily apparent in the Chemainus project area. Figures 10a and 10b will hopefully provoke ideas as to the stratigraphic relationships in the project-area.

Mineralization

Mineral prospects and occurrences on the Chip-Holyoak-Brent claims have been mentioned by Enns et al, (1986) and Everett et al, (1984). Detailed discussion of the Sharron copper prospect is provided by Holbeck (1980) and Bower (1986). The reader is referred to these sources for further information.

The Anita Showing (Figure 5c,6) was examined in detail during the course of a trenching programme in the late fall (see 1986 Work Programme).

One lens of massive pyrrhotite with minor chalcopyrite is hosted in foliated, rhyolitic composition volcaniclastic rocks. Faults have broken the original lens into five pods. The main lens is 5.5m in length and up to 1m in width. The four other "pods" are likely faulted-off parts of the main lens. Two metres north of the main lens is the contact with fine to medium grained gabbro. Four metres into the gabbro intrusion the rock is coarse grained, locally micropegmatitic. The

NANAIMO GROUP

Sandstone, shale, conglomerate, coal

ISLAND INTRUSIONS

Granodiorite

BONANZA GROUP

Mafic Lavas

VANCOUVER GROUP

QUATSINO FORMATION

Limestone

KARMUTSEN FORMATION

Pillow basalt

SICKER GROUP

"SEDIMENT-SILL UNIT"

Gabbro

Green, grey chert

Black argillite, siltstone

Jasper

Purple pyroclastic rocks

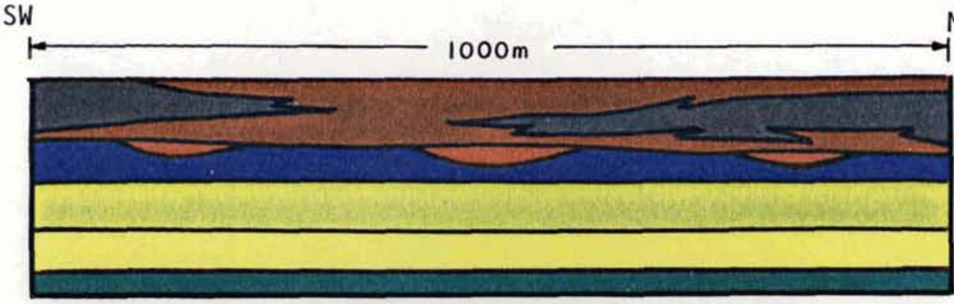
MYRA FORMATION

Intermediate pyroclastics/volcaniclastics

Felsic pyroclastics/volcaniclastics

NITINAT FORMATION

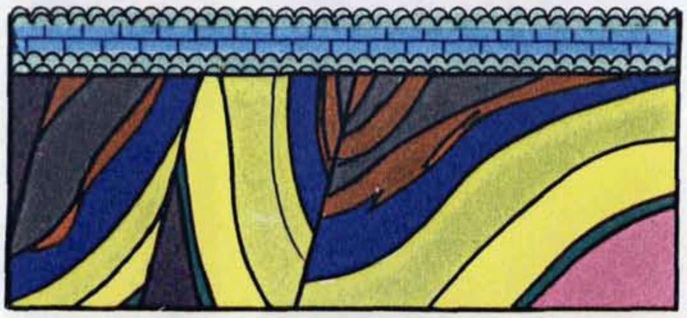
Mafic Lavas



"Layercake" stratigraphy consisting of Myra Formation volcanics and "Sediment-Sill Unit" sediments. Deposition of purple pyroclastic rocks and jaspillites in a shallow water environment. Deposition of chemical and clastic sediments in a deep water environment.

Compressional deformation

Compressional deformation continues. Reverse and normal faulting occurs along axial planes of folds.

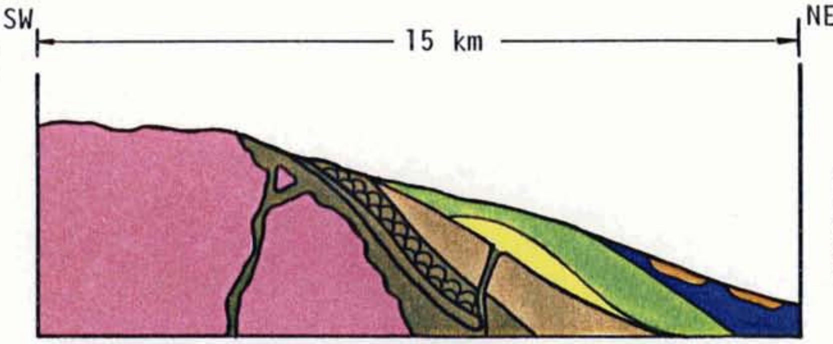


Intrusion of gabbro stocks along fault planes, followed by deposition of Karmutsen Formation pillow basalt, Quatsino Formation limestone and Bonanza Group lavas and interflow sediments. Granodiorite etc. of Island Intrusions intrude underneath the northern Sicker Group strata. Glaciation and weathering remove most Mesozoic volanics and sediments

Local uplift and submergence of Sicker Group during the late Mesozoic. Nanaimo Group derives detritus from Sicker Group. Nanaimo Group talus breccias formed in areas of uplift. Coal beds, arenites, formed in later stages of deposition. Thrusting of Nanaimo Group over and locally under Sicker Group stratigraphy.

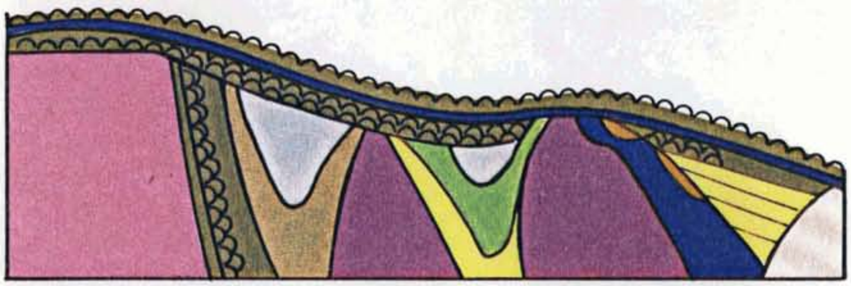
Figure 10a Palinspastic Map - Sicker Group Stratigraphy - Paleozoic to Recent

Model #1

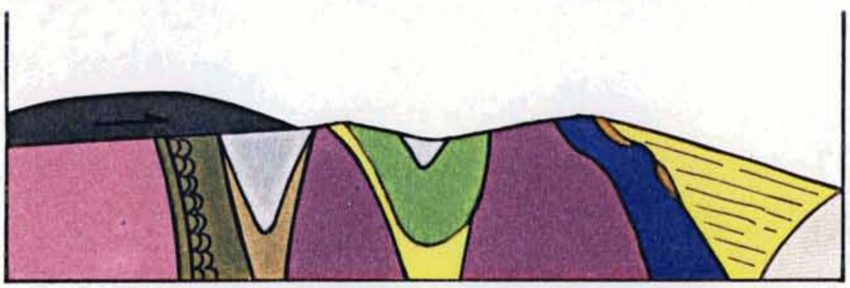


Colquitz Gneiss and Wark Gneiss form lower Paleozoic basement. Deposition of Nitinat Formation mafic lavas, Sediment-Sill Unit black siltstone, Myra Formation volcanics of varying composition.

Intrusion of gabbro stocks causes folding of black siltstones and volcanics. Deposition of bedded green and white cherts continues in the troughs and green chert is deposited at depth.



Deposition of Karmutsen Formation pillow basalts, Quatsino formation limestone and Bonanza Group lavas and interflow sediments. Granodiorite etc. of Island Intrusions intrude underneath the northern Sicker Group strata.



Local uplift and submergence of Sicker Group during the late Mesozoic. Nanaimo Group derives detritus from Sicker Group. Nanaimo Group talus breccias formed in areas of uplift. Coal beds, arenites, formed in later stages of deposition. Thrusting of Nanaimo Group over and locally under Sicker Group stratigraphy.

Figure 10b Palinspastic Map - Sicker Group Stratigraphy - Paleozoic to Recent
Model #2

Anita quartz vein has a 1 to 4 metre true width, trends 285' and dips 85' to the south. A 40m strike length has been defined, with the structure being lost in overburden east of the Anita Showing and to the west within Powerline Creek (Everett et al, 1984). At the Anita Showing the vein has a width of 1m. Chip samples across the vein gave values of 0.16% Cu and 2.1ppm Ag (Everett et al, 1984).

The massive sulphide is dominantly pyrrhotite. Chalcopyrite is locally present as 1cm diameter patches (<1%) and as discontinuous bands (<1%) 3 to 4mm in width by 10cm (or less) in length in the main lens. Disseminated chalcopyrite, not readily visible upon inspection of massive sulphide samples accounts for up to 4.3% by weight (Table 4). The best interval was 0.9m which assayed 0.90% Cu.

The Anita Showing massive sulphide lens has features which may be attributeable to syngenetic processes. The sulphide lens has a superficial base metal banding, and it is hosted within a sequence of hydrothermally altered felsic volcaniclastic rocks.

Bands and disseminations of pyrite were encountered on Lines 38+00W, 36+00W and in Anderson and McIvor Creeks (Figure 5d). The four occurrences are part of a northwesterly bearing structure about 500m north of the baseline. The best exposure exists in Anderson Creek where alternating bands of green and white volcaniclastic rocks (chlorite and quartz-sericite schists) host disseminated pyrite (3%) and locally 2 to 3cm thick bands/seams of massive pyrite (90%). The reader is referred to Table 5 for a review of the base-precious metal results from the above occurrences.

Geology of the East Brent 1 Claim

A minor amount of geological work was undertaken in the Holyoak Creek area in the eastern part of the Brent 1 claim. The region is characterized by steep terrain.Several short traverses were run in the area resulting in interesting and significant discoveries.

TABLE 4

ANITA SHOWING EXCAVATION - COMPILATION OF BASE AND PRECIOUS METAL RESULTS

SAMPLE NUMBER	Channel Sample Number	Interval (cm)	Cu PPM	Pb PPM	Zn PPM	Mo PPM	Ag PPM	Fe PCT	Mn PPM	Cd PPM	Co PPM	Ni PPM	As PPM	Au PPB	Ba PPM	Remarks
AB17951	2	0-15	15000	10	301	<1	8.5	>10.00	110	16	127	39	15	640	1400=	Massive Po
AB17952	2	15-30	7128	10	191	<1	7.1	>10.00	112	13	66	41	<5	95	2000=	Massive Po w. diss. Cpy(<1%)
AB17953	2	30-45	8157	14	132	<1	6.6	>10.00	49	11	59	36	<5	160	600=	Massive Po w. minor "seam" of Cpy (1x4mm, <1%)
AB17954	2	45-60	5322	12	39	2	6.9	>10.00	33	7	33	20	5	45	1500	Semi-massive Po w. limonitic felsic tuff
AB17955	2	60-75	635	8	21	<1	1.3	5.96	119	3	6	<1	10	15	1800	Highly limonitic felsic tuff
AB17956	1	30-45	5489	14	45	<1	4.8	>10.00	196	11	51	32	<5	160	300=	Massive Po
AB17957	1	15-30	8188	15	84	<1	4.9	>10.00	71	13	56	37	11	130	800=	Massive Po
AB17958	1	0-15	6352	20	87	<1	4.9	>10.00	57	12	57	38	9	600	1300=	Massive Po
AB17959	1	45-60	13440	18	160	<1	8.4	>10.00	178	15	53	43	<5	120	750=	Semi-massive Po w. minor blebs of Cpy
AB17960	1	60-75	4185	7	80	2	5.1	>10.00	132	13	57	39	<5	75	650=	Massive Po w. minor blebs of Cpy
AB17961	3	0-15	8243	<5	175	<1	5.5	>10.00	93	14	66	31	18	340	1300=	Massive Po w. minor dissem. of Cpy
AB17962	3	15-30	8626	7	156	<1	4.7	>10.00	50	12	64	30	<5	160	550=	Massive Po w. minor dissem. and blebs of Cpy
AB17963	3	30-45	7419	13	98	1	4.9	>10.00	34	9	44	24	10	360	1100	Massive Po w. minor blebs of Cpy
AB17964	3	45-60	4576	14	35	1	5.2	>10.00	38	9	39	16	19	180	1300	Highly pyrrhotitic and pyritic felsic tuff
AB17965	3	60-75	3171	13	30	1	4.2	>10.00	221	5	17	10	6	60	1700	Highly limonitic, pyritic felsic tuff
AB17966	4	150-165	111	<5	30	2	1.1	2.62	152	<1	5	3	<5	5	2000	Non-mineralized felsic tuff
AB17967	4	135-150	891	6	25	1	1.6	9.11	65	4	9	5	<5	30	2100	Goethitic? felsic tuff
AB17968	4	105-135*	8847	16	50	<1	6.1	>10.00	81	7	26	15	15	50	1700	Goethitic? felsic tuff
AB17969	4	90-105	14100	10	158	<1	8.8	>10.00	86	8	24	12	<5	180	1800	Stringers of Cpy, Po dissem. throughout felsic tuff
AB17970	4	60-90 *	9746	9	304	<1	6.2	>10.00	89	11	27	25	12	130	900=	Massive Po w. dissem. and blebs of Cpy
AB17971	4	45-60	12720	7	294	4	11.5	>10.00	236	13	44	43	11	100	2500=	Massive Po w. dissem Cpy
AB17972	4	30-45	1264	9	79	4	1.5	6.91	124	4	9	9	<5	55	2000	Non-mineralized felsic tuff
AB17973	4	15-30	1847	<5	59	3	1.6	6.28	115	2	19	23	11	45	1900	Goethitic? felsic tuff
AB17974	4	0-15	759	<5	56	4	1.1	4.81	204	3	9	10	<5	20	1500	Non-mineralized felsic tuff
AB17975	4	60-75	14790	11	499	<1	8.9	>10.00	93	14	33	31	10	520	800=	Massive Po
AB17976	5	200-240	4015	8	90	3	1.7	7.56	194	4	14	10	<5	380	1600	Felsic tuff w. local patches of Cpy
AB17977	5	100-200	331	<5	70	2	1.1	4.39	82	2	5	7	6	35	1800	Slightly pyritic felsic tuff
AB17978	5	0-100	219	6	105	1	0.6	3.86	139	2	6	9	14	35	2200	Slightly pyritic felsic tuff
AB17979	6	0-150	85	16	60	2	<0.5	1.89	91	1	7	6	<5	<5	1300	Non-mineralized felsic tuff
AB17980	6	150-300	47	18	38	3	<0.5	2.49	84	2	7	5	<5	5	1800	Felsic tuff w. Py dissem.
AB17981	6	300-450	58	16	28	2	0.9	2.65	94	1	6	6	<5	10	2100	Non-mineralized felsic tuff
AB17982	6	450-600	23	9	25	1	<0.5	2.14	102	<1	4	<1	14	10	3000	Non-mineralized felsic tuff
AB17983	6	600-750	36	7	28	2	0.9	1.91	108	2	3	5	8	5	2500	Non-mineralized felsic tuff

* indicates change in interval
= indicates interference noted due to Fe

METHOD OF ANALYSIS

Element	Detection Limit	Extraction	Method
Cu	1 ppm	HNO_3-HCl Hot extr.	D.C. Plasma
Pb	5 ppm	HNO_3-HCl Hot extr.	D.C. Plasma
Zn	1 ppm	HNO_3-HCl Hot extr.	D.C. Plasma
Mo	1 ppm	HNO_3-HCl Hot extr.	D.C. Plasma
Ag	0.5 ppm	HNO_3-HCl Hot extr.	D.C. Plasma
Fe	0.05%	HNO_3-HCl Hot extr.	D.C. Plasma
Mn	1 ppm	HNO_3-HCl Hot extr.	D.C. Plasma
Cd	1 ppm	HNO_3-HCl Hot extr.	D.C. Plasma
Co	1 ppm	HNO_3-HCl Hot extr.	D.C. Plasma
Ni	1 ppm	HNO_3-HCl Hot extr.	D.C. Plasma
Ar	5 ppm	HNO_3-HCl Hot extr.	D.C. Plasma
Au	5 ppm	Fire Assay	Fire Assay
Ba	20 ppm		X-Ray Flour.

TABLE 5

ANDERSON CREEK OCCURRENCES - BASE AND PRECIOUS METAL ANALYTICAL RESULTS

SAMPLE NUMBER	Cu PPM	Pb PPM	Zn PPM	Ba PPM	Ag PPM	Au PPB	Remarks
AB15961	50	80	160	890	<0.5	NA	McIvor Creek. Sample as at pyritic horizon in Anderson Creek. Pyrite averages 4% (ranges from 3-8%). Occurs in bands of chlorite-sericite and sericite schists. Kinked and rusty.
AB15506	34	16	43	850	<0.5	0.0	Line 38+00W Pyritic sericite schist. Extremely well foliated. Pyrite disseminations account for 1% of the mode.
AB15507	41	12	280	700	6.0	0.0	Line 38+00W Highly schistose sericite-chlorite schist. In plane of schistosity, elliptical green, chloritized mafic crystals (3-4mm) account for greated than 75% of the mode.
AB15907	144	131	226	911	0.90	30.0	Line 36+00W. Very rusty, sheared, schistose zone. Sample of weathered bedrock-talus-soils mixture. Very red soils.
AB15908	54	28	294	817	0.20	4.0	Line 36+00W. As at AB15907 but 10m north. Gossanous or ferricrete.
AB15584	14	10	520	490	<0.5	6.0	Anderson Creek. Alternate bands of chlorite schist and quartz-sericite schist with pyrite and minor chalchopyrite concentrated in felsics. Bands of sulphide up to 90%.

The traverse along Holyoak Creek revealed minor chalcopyrite, magnetite and pyrite mineralization in very old pits. The mineralization occurs as small, pods, parallel to the strong foliation of pale grey felsic tuffs which are most common in the area. Farther up the creek, fine grained exhalite float was found. The exhalite is light grey, aphyric, complexly folded with fine to medium grained pyrite beds up to 1cm thick. Several samples (AB 15939, 15945, 15946, 15947, 15949) contain 1000 to 1400 ppm Ba.

A strong fault zone trending northwest was noted further up the creek. The strike of the fault is about 280° and dips 80° to the northeast.

A coarse, massive quartz porphyry outcrop was discovered on the 10+00S tie line at station 7+40E just west of Holyoak Creek. The rock is composed of 12 to 15%, 4 to 6mm glassy quartz eyes set in a massive to weakly foliated aphyric quartz-sericite matrix. Nearby rusty felsic schists exhibit strong hydrothermal alteration (with Ishikawa Index values which range from 85 to 92 for two samples).

The limited mapping on the east half of the Brent 1 claim indicates that large, cliff-forming gabbroic bodies are present which give the impression of thick, south-dipping bodies instead of large deep-rooted vertical igneous plutons. Large talus fields obscure much of the geology but narrow felsic "schist" pieces were found as attached to gabbro cliffs at several localities. Due to its recessive nature, the felsic schist may be far more abundant than outcrops suggest in this region.

The presence of the quartz porphyry rock (subvolcanic intrusion) surrounded by hydrothermally altered rocks and the presence of weak sulphide mineralization and exhalite float all indicate that this area and the adjacent Nugget claims are underlain by favourable geology which have the potential to host significant mineralization.

LITHOGEOCHEMISTRY

Introduction

Lithogeochemical sampling was carried out during the 1986 field season in order to: 1) define areas of hydrothermal alteration and 2) more precisely characterize rock types according to their major oxides and where possible obtain lithological signatures from the rock's trace and rare earth element contents.

Petrogenesis

Petrogenetic interpretations concerning the nature of the volcanic suite of rocks on the Chip claims are based on a compilation of the whole rock analytical data from the 1983, '85, and '86 field seasons. Data from 322 rock samples were processed using the Kidd Creek Mines Ltd. computing system. Rock analytical data and header data is presented in Appendices A-D.

Lithologies have been divided into an "altered" and "unaltered" subset according to individual rock sample locations in the Hughes "igneous spectrum" and alteration index (Table 6 in Appendix A). More weight was given to the Ishikawa Alteration Index in these qualitative decisions.

Alkali-silica variation diagrams (Figure A 1-5) were used to distinguish between alkaline and subalkaline volcanic suites. Altered and unaltered samples generally plot within the same fields. Rocks are subalkaline composition.

An AFM diagram (Figure A 6-10) indicates that all rocks save unaltered intermediate composition flows and gabbros are calc-alkaline. The latter two lithologies are tholeiitic in composition. The SiO_2 vs FeO/MgO diagram (Figure A 11-15) advocated by Miyashiro (1974) confirms conclusions drawn from the AFM diagram. Most volcanic rocks sampled have strong calc-alkaline affinities; however the mafic volcanic rocks often straddle the boundary between the differentiation trends. Unaltered mafic flows/schists, unaltered mafic volcaniclastics, altered and unaltered chlorite schists, unaltered intermediate composition volcaniclastics and gabbro(Figure A 11-15) are all strongly tholeiitic.

Using data generated from Archaean volcanic and modern volcanic suites rare earth element (REE) patterns were used to classify the volcanic rocks sampled on the Chip claims into petrogenetic trends (Figure A 16-23). Most of the sampled volcanic rocks appear to have calc-alkaline affinities.

Alteration

The primary function of lithogeochemical sampling was to assist in the discrimination of "altered" from "unaltered" rock and thereby permit a degree of focussing of attention to certain areas.

Three alteration "screens" or "filters" using major oxide analyses were used. A fourth filter, using REE's was used in only a few cases due to the expense involved in analysis. The primary filter, Hughes' modified "igneous spectrum" (HMIS) (Hughes, 1972; Stauffer et al, 1975; Kemp, 1982) provided a broad indication as to what areas within the Chip-Brent-Holyoak claims did not have similar alkali oxide contents as compared to selected Cenozoic volcanics and volcanics from ensimatic magmatic arcs (see Appendix A). These samples are indicated on Figures 11b to 11d by a solid star.

The Spitz-Darling (SD) alteration index is the secondary filter. It compares the relatively immobile oxide Al_2O_3 to the relatively mobile oxide Na_2O. The SD index gives a measure of confidence to the accuracy of decisions derived from the HMIS. It is indicated on Figures 11b to 11d by an open triangle. The size of the triangle is proportional to the magnitude of the index.

The Ishikawa alteration index is the ternary filter. It incorporates the alkali and alkali earth oxides in calculating an index. It invariably "sees through" SD indices or HMIS interpretations which may give contradictory results. It can also be used to downgrade those samples which have coincident SD indices and HMIS interpretations. It is indicated on Figures 11b to 11d as an open square. The size of the square is proportional to the magnitude of the index.

Masuda-Coryell diagrams (Figures A 16-23) are the superlative measure of relative alteration within the volcanic rocks in the Chemainus project-area. Given that primary REE patterns are recognized as being smooth, except for the possibility of Eu anomalies and perhaps Ce anomalies (Whitford, 1985) the author recognized fluctuations from the norms (Figure A 16-23) to be indicative of the effects of hydrothermal alteration. Samples which show "anomalous" patterns have been indicated on Figures 11b to 11d by a solid circle.

Zones of Alteration

The intention of this section to identify areas of more intensive hydrothermal alteration which are coincident with prospective volcanic lithologies.

The zones of hydrothermal alteration are indicated by shaded patterns on Figures 5b to 5d, and 11b to 11d, and are listed in Table 7. The stippled pattern indicates areas of intensive alteration, ie. Ishikawa alteration indices which are generally 80 or more. The hatch pattern indicates areas of less intensive alteration, ie. Ishikawa alteration indices of 60 to 80. Table 7 lists significant anomalous whole rock geochemical samples by zone and gives each samples Ishikawa and Spitz-Darling alteration index.

TABLE 7

TABULATION OF SIGNIFICANT ANOMALOUS WHOLE ROCK GEOCHEMICAL SAMPLES BY ALTERATION ZONE, WITH LISTINGS OF RESPECTIVE ISHIKAWA AND SPITZ-DARLING ALTERATION INDICES

ZONE	ANOMALY	ISHIKAWA INDEX	SPITZ-DARLING INDEX
A	AB15688	79.47	8.09
A	AB15689	62.45	5.16
A	AB15692	70.91	5.70
A	AB15698	84.78	16.68
A	AB15928	96.06	75.33
A	AB15929	97.19	66.32
A	AB17850	40.41	7.04
B	AB17912	81.70	28.90
B	AB17913	57.33	6.17
C	AB15694	83.42	32.86
C	AB18642	85.91	36.47
C	AB18643	59.19	10.51
D	AB15515	60.88	18.22
D	AB15518	69.94	9.17
D	AB15519	86.65	28.44
D	AB17617	82.92	20.14
D	AB17618	68.47	18.03
D	AB17620	72.70	8.02
D	AB17826	72.61	8.02
D	AB17827	82.13	11.47
D	AB17828	70.48	7.72
D	AB17830	78.85	12.79
E	AB13608	22.08	67.33
E	AB15627	67.98	12.26
E	AB15976	92.76	80.00
E	AB17985	86.45	28.12
E	AB17986	85.81	42.12
E	AB17988	72.53	18.17
E	AB17989	84.40	34.36
E	AB17990	88.10	41.58
E	AB17991	69.46	18.05
E	AB17996	65.95	7.82
E	AB17999	69.12	11.95
F	AB15544	83.56	20.72
F	AB17873	77.59	15.00
F	AB17874	77.15	8.60
F	AB17876	80.31	28.11
F	AB17878	75.33	9.52
G	AB15586	79.87	8.67
G	AB15672	92.71	25.00
H	AB15677	71.57	10.28
H	AB17930	90.97	32.26
I	AB15924	95.83	90.71

Zone A

Anomalies: AB15929, AB15928, AB17850, AB15698, AB15692, AB15688, AB15689

Zone A (Figure 5b, 11b) forms a band of outstanding lithogeochemical anomalies through the southwest corner of the Holyoak 3 claim. It extends 900m to the northwest onto Abermin Corporation's Solly claim and 600m to the southest onto Abermin's Silver 2 claim. The rock is a slightly pyritic quartz-sericite schist to chlorite-sericite schist, most likely a metarhyolite tuff. This band of altered rhyolite tuffs is approximately 200m north of Abermin's Coronation Zone.

If the extensive zone of hydrothermal alteration is attributeable to processes generating VMS deposits three options to explain this phenomenon are available. They are as follows:

1) According to Abermin geologists (S.G. Enns, pers. comm., 1986) the footwall rocks to the Coronation and Coronation Extension Zones are to the south. If this is the case, then Zone A represents a volume of rock which has experienced alteration post deposition of sulphides.

2) It may represent the footwall of a second mineralized layer in a stacked VMS system.

3) If folding has been as intense as is suspected Zone A could represent the repetition of the stratigraphic sequence that is encountered south of the Coronation Zone(s). In this case younging direction would be to the north and massive sulphide mineralization would be to the south.

Given the paucity of outcrop south and north of the alteration zone in the corner of the Holyoak 3 claim it is difficult to be confident of facing direction. Intensely altered rocks are in the south part of the zone, less intensely altered rocks are in the north part of the zone. VMS mineralization could be present at the interface of the two zones if there was a re-initiation of hydrothermal alteration during deposition of felsic volcaniclastic rocks after the mineralizing episode.

Zone B

Anomalies: AB17912, AB17913

This zone (Figure 5b, 11b) has been selected because it contains one intensely altered mafic tuff and one less intensely altered felsic composition quartz-feldspar crystal tuff within a sequence of intermediate volcaniclastics.

The hydrothermal alteration in this locality is not extensive as sampling north and south of the zone did not reveal any anomalous results.

Zone C

Anomalies: AB18643, AB18642, AB15694

This zone (Figure 5b, 11) was chosen because of the high magnitude of the alteration indices (Table 7) in similar felsic volcanic outcrops over 1000m apart. The rock is a slightly pyritic quartz-sericite schist (metarhyolite tuff) interbedded with black siltstone.

The rhyolite tuff is interpreted to have been deposited in a low energy subaqueous environment. Although the SSU has been interpreted to lie immediately north of the zone; poor exposure in this vicinity leaves room for re-interpretation. If the rhyolite tuff is subordinate to sedimentary rocks as presently interpreted then it indicates that it acted as the most permeable channel-way for local hydrothermal fluids during the waning phases of volcanism. If the interpreted contact with the SSU lies much farther to the north than shown in Figure 5b then hydrothermal alteration in a thicker volcanic sequence may have more significance. The alteration may be associated with a mineralizing event in a volcanic regime.

Zone D

Anomalies: AB15515, AB15518, AB15519, AB17830, AB17617, AB17618, AB17828, AB17620, AB17827, AB17826

This series of anomalies (Figure 5c, 11c) lies underneath the powerline on the Chip 1 claim. The zone consists of three relatively isolated "centres" of alteration. From west to east they occur at Line 30+00E 4+00N, Line 32+00E to Line 34+00E 4+50N and Line 38+00E to Line 43+00E 3+00N. Felsic volcaniclastic rock dominates the "centres".

The anomalous samples between Lines 32+00 and 34+00E have the largest alteration indices (AI=86 ,SD=28). These samples are flanked to the east and west by less intensely altered rocks.

Sample AB17827, a strongly altered mafic volcaniclastic, likely has a high Ishikawa alteration index because of a MgO content that is four times higher and often 20 times higher than the encompassing altered rocks. The eastern zone of anomalies (Line 38+00E to Line 43+00E) is downgraded because of the above reason.

Zone D is immediately south of a massive gabbro body. The gabbro is interpreted to have had little effect on the major oxide content of the felsic volcaniclastic rocks. The alteration indices are real.

Zone E

Anomalies: AB15627, 1B13608, AB15976, AB17985, AB17986, AB17988-AB17991, AB17996, AB17999

The above samples (Figure 6, 5c, 11c) were taken at or around the Anita Showing (see Mineralization). Felsic volcaniclastic rock, hosting a massive pyrrhotite pod, is strongly altered.

The presence of massive sulphide contained within intensely altered felsic volcaniclastic rocks at the Anita Showing is a strong indication of proximal sulphide deposition.

Zone F

Anomalies: AB17876, AB17878, AB17873, AB17874, AB15544

Zone F (Figure 5c, 11c) is located on Line 12+00E 3+00 to 4+00N and Line 14+00E 1+50N. This zone was selected because it contains strongly and moderately altered felsic volcaniclastic rocks (see Table 7).

Felsic volcaniclastic rocks in this locality form a band up to 250m thick. The anomalous samples lie at the southern and northern margins of the sequence.

Providing there has been no duplication of stratigraphy, each anomalous area represents a different episode of hydrothermal alteration. Both areas have potential to be in the vicinity of mineralization. If there has been duplication of stratigraphy due to tight symmetrical folding the altered samples of both areas may belong to the same lithological subunit.

Zone G

Anomalies: AB15672, AB15586

Zone G (Figure 5d, 11d) contains an excellent lithogeochemical anomaly (AI=92 ,SD=25). Sample AB15672 shows correlation of Ishikawa and Spitz-Darling alteration indices and the HMIS. A Masuda-Coryell diagram of chondrite normalized REE's illustrates an identical pattern to AB15926 (Figure A 18), which is a sample of Abermin Corporation's Coronation Quartz Porphyry (CQP) or footwall rhyolite.

The areal extent of Zone G is unknown. Only two outcrops within this area were sampled and they display anomalous major oxide contents. It is possible that the anomalous zone may extend from the west side of Anderson Creek to Line 30+00W.

Geology and geochemistry suggest that Zone G is unique. Quartz-eye rhyolite was observed at only two other localities in the Chemainus project-area, (the footwall of Abermin Corporation's Coronation Zone and in the Brent 1 claim east of Holyoak Creek). The similarity of lithology, REE geochemistry and the presence of impressive major oxide alteration indices near quartz-eye rhyolite indicates good potential for VMS mineralization.

Zone H

Anomalies: AB17930, AB15677

Zone H (Figure 5d,11d) is a moderately interesting area. It extends from Line 32+00 to 30+00W 6+00N and incorporates moderately altered mafic to intermediate tuffs(Table 7). Banded pyrite in felsic and mafic composition volcaniclastic rocks are present in the immediate vicinity .

The presence of sulphide mineralization in close proximity to rocks which have been hydrothermally altered suggests that there may be potential for more extensive mineralization along strike or down dip.

Zone I

Anomalies: AB15924

Zone I (Figure 5d, 11d) is very poorly defined. It is located near the north boundary of the adjacent Bedrock 2 claim and immediately west of the Chip 4 claim boundary. One outcrop of extremely altered felsic tuff is interbedded with intermediate volcaniclastic rocks.

Variation diagram interpretations as applied to field terminologies

The variation diagrams of major and minor oxides and trace elements (Figure A 1 to 15, 24 to 35) indicate that rocks in the Chemainus project-area display a bi-modal distribution consisting of basaltic and rhyolitic compositions (Figure A 34).

TiO_2-SiO_2 diagrams (Figure A 24 to 28) show a large clustering of points in the upper right corner. In the case of felsic composition volcaniclastic rocks and the sericite and chlorite-sericite schists, TiO_2 and SiO_2 contents are essentially the same. The rocks mapped in the field as intermediate volcaniclastics have median SiO_2 contents of about 72%. Altered and unaltered varieties of intermediate volcaniclastics have similar SiO_2 contents. Metasomatism appears to have little affected this major oxide. Chlorite-sericite schist (altered and unaltered varieties) have median SiO_2 values of about 72%.

Error in the recognition of intermediate volcaniclastics and chlorite-sericite schists as rhyolitic volcaniclastic rocks is believed to be due to a slightly higher MgO content (resulting in a greater colour index) and perhaps to a minor sedimentary component. To maintain consistency within the report and to preserve a mapping system based on colour indices, hardnesses etc. the author suggests the terms intermediate volcaniclastic and chlorite-sericite schist be preserved. These terms, although not rigorously adherent to tne classification of Goodwin (1967) are convenient in that they represent rock types consistently recognized in the field.

TRENCHING

Introduction

Trenching was carried out in four localities to expose the bedrock over anomalous induced polarization values and to generate more exposure in geologically interesting areas such as the Anita Showing.

A Hitachi UH08LC excavator was used to strip overburden. A Wajax Mark 26 fire pump was used at the Anita Showing Excavation (Figure 6) to remove remaining soil and detritus. Trench 48+00W (Figure 7)(Enns et al, 1986) was cleaned out using a Honda Trash pump and subsequently mapped.

Three of the four trenches created in 1986 have been backfilled.

Results

Trenches 30.31 (Figure 12) and Trench 39+00E (Figure 13) did not intersect Myra Formation volcanic rocks or sufficient sulphide mineralization to explain the induced polarization geophysical anomalies.

Trench 30.31 (Figure 12) contained gabbro and translucent greenish white to green chert, black cherty mudstone and subordinate greywacke. Chert was locally rhythmically bedded. Facing directions could not be ascertained. Minor pyrite (<<1%) exists on fracture surfaces and very thin bands (<1mm) parallel to bedding planes.

Trench 39+00E (Figure 13) intersected gabbro, Nanaimo conglomerate and greywacke of the SSU. Mineralization was restricted to disseminated pyrite (2 to 2.5%) in a quartz pebble-rich quartzite. A Pelecypod fragment was found in greywacke near the north end of the trench. The trench could not be mapped in its entirety as overburden exceeded 7m in depth and bedrock was not encountered. A second trench indicated on

Figure 5c revealed a white mica-rich gumbo and black siltstone. The gumbo could perhaps represent fault gouge through Myra Formation felsic volcaniclastic rocks.

The northern part of Trench 48+00E (Figure 7) consists predominantly of rhyolitic composition feldspar crystal tuffs with very local limonite-coated fractures. The southern part of the trench is comprised of fine to medium grained gabbro with the occasional randomly oriented quartz vein.

The Anita Showing Excavation (Figure 6) is centred around the Anita shaft. Five pods or lenses of massive pyrrhotite +/- chalchopyrite are hosted in rhyolitic volcaniclastic rocks and flows? Feldspar-crystal rhyolite tuff is in contact with fine to medium grained gabbro on the north side of the excavation. The reader is referred to the section on mineralization for further information.

SOIL GEOCHEMISTRY

Introduction

The soil geochemical survey over the Chip claims in 1986 was conducted to test for the presence of near-surface mineralization.

Sampling of the B_f horizon was carried out at 25m intervals over lines 38+00W to 2+00E inclusive. 1109 soil samples were collected in 1986. 18 samples were collected on lines 48+00 and 49+00E in 1985. All samples have been compiled for statistical analysis. 1152 samples of B_f horizon were collected at 20m intervals over the Holyoak and Brent claims in 1985. Some of the samples collected over the southwest part of the Holyoak 3 claim were not analyzed until 1986. Results of the soil geochemical survey over the Oak Group were discussed in a previous report (Enns et az, 1986).

Samples were collected in Kraft paper envelopes, partially dried in the field and shipped to Bondar-Clegg & Company Ltd., Vancouver, B.C.. To ensure analytical control, internal standard SB-B was submitted with every 45 samples.

The samples were dried at 125°C, sieved to -80 mesh and analyzed. Analysis is as follows: a 0.500g sample was digested with 2.5mls of a HNO_3-HCl (1.5:1) solution at 90°C and then diluted to 10mls with water. The solution was then analysed by Atomic Absorption Spectrometry (AAS) for Cu, Pb, Zn, and Ag.

Results

Sample locations and results are shown on Figures 14 to 17. The methods used for the determination of anomalous, possibly anomalous and background soil geochemical values are discussed in Appendix F. Soil geochemical thresholds are given in Table 8. Statistics, and histograms for base and precious metals in soils and standards are given in Appendix F. A compilation of statistics for soil geochemical results is presented in Tables 9 and 10. Statistics on Reference Sample SB-B are given in Table 11 and 12. Insufficient data was available for Mn in soil to determine threshold values. Statistics for 18 samples are given in Figure F 5. A compilation of analytical results is given in Appendix G.

On the basis of a statistical analysis of selected elements analysed in soils on the Chip claims no obvious mineralized population was evident. Using semi-quantitative methods described in Appendix F, three threshold values were determined for Cu, Zn, Pb, and Ag. These are referred to as anomalous, possibly anomalous and background.

TABLE 8

Definition of Soil Geochemical Anomalies - Chip Claims

Element	Anomalous	Possibly Anomalous	Background
Cu (ppm)	150	100	41
Zn (ppm)	200	150	76
Pb (ppm)	30	19	7
Ag (ppm)	0.8	0.7	0.1

Inspection of the soil geochemical maps (Figures 14 to 17) shows that "major" anomaly trends occur over the intermediate and felsic volcaniclastic rocks or immediately downslope of the intermediate flows. A compilation of these anomalies is presented in Table 13 (Appendix F).

There is a good correlation between anomalous Pb and Ag contents in soil along a one-hundred metre wide band (4+00-5+00N) extending from Line 26+00W to Line 12+00W. The soil samples are all taken from an area of poor outcrop. Subcrop is interprted to be intermediate flows and felsic volcaniclastic rocks.

There is a weak correlation between anomalous Cu and Zn contents is soil. Anomalous/possibly anomalous Cu values are more prevalent and do not always reflect contents of prospective lithologies. Most anomalous Cu, Zn values in soil are associated with intermediate and felsic volcaniclastic rocks.

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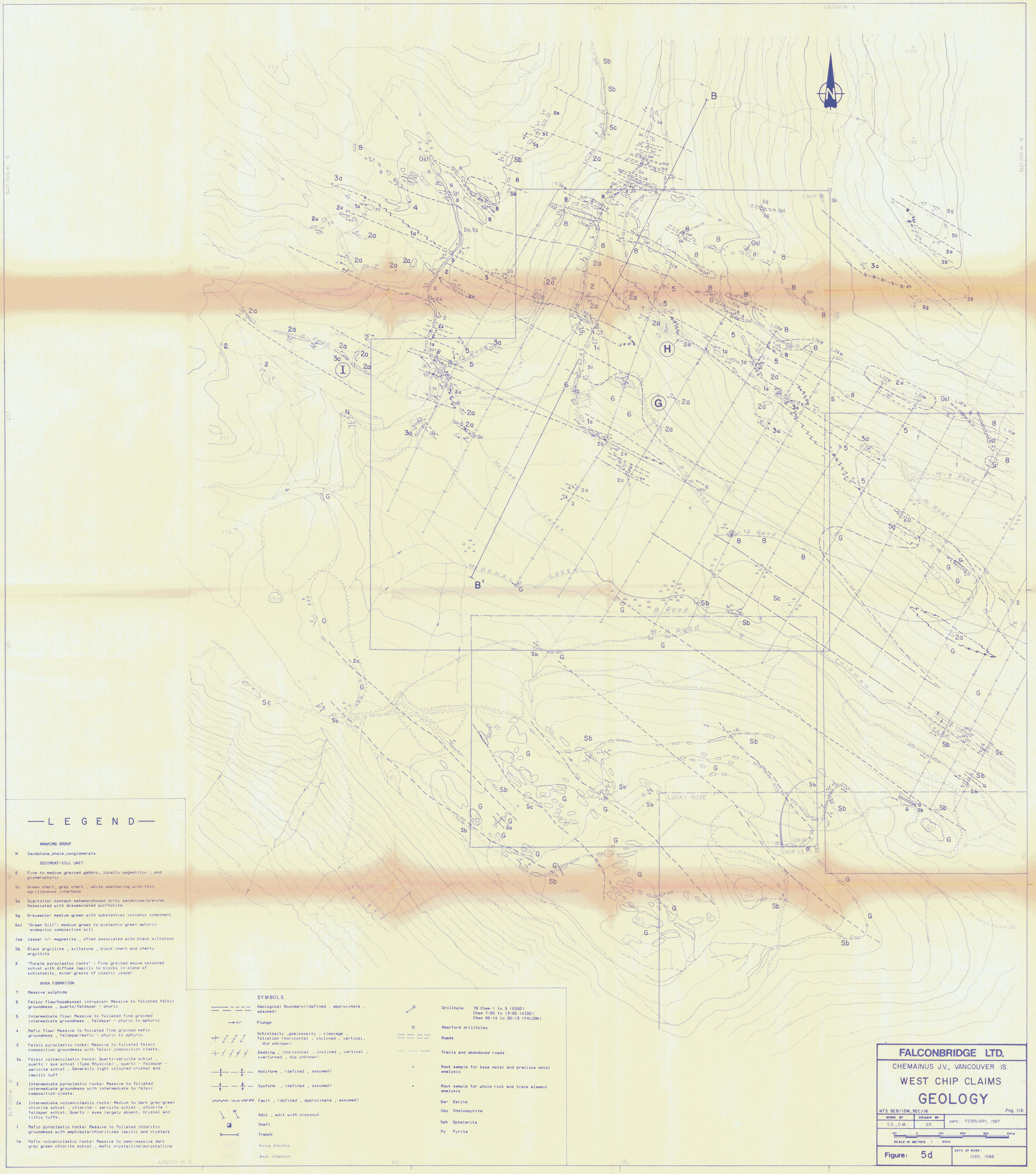
423|000 m E
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B
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LUCKY ROSE
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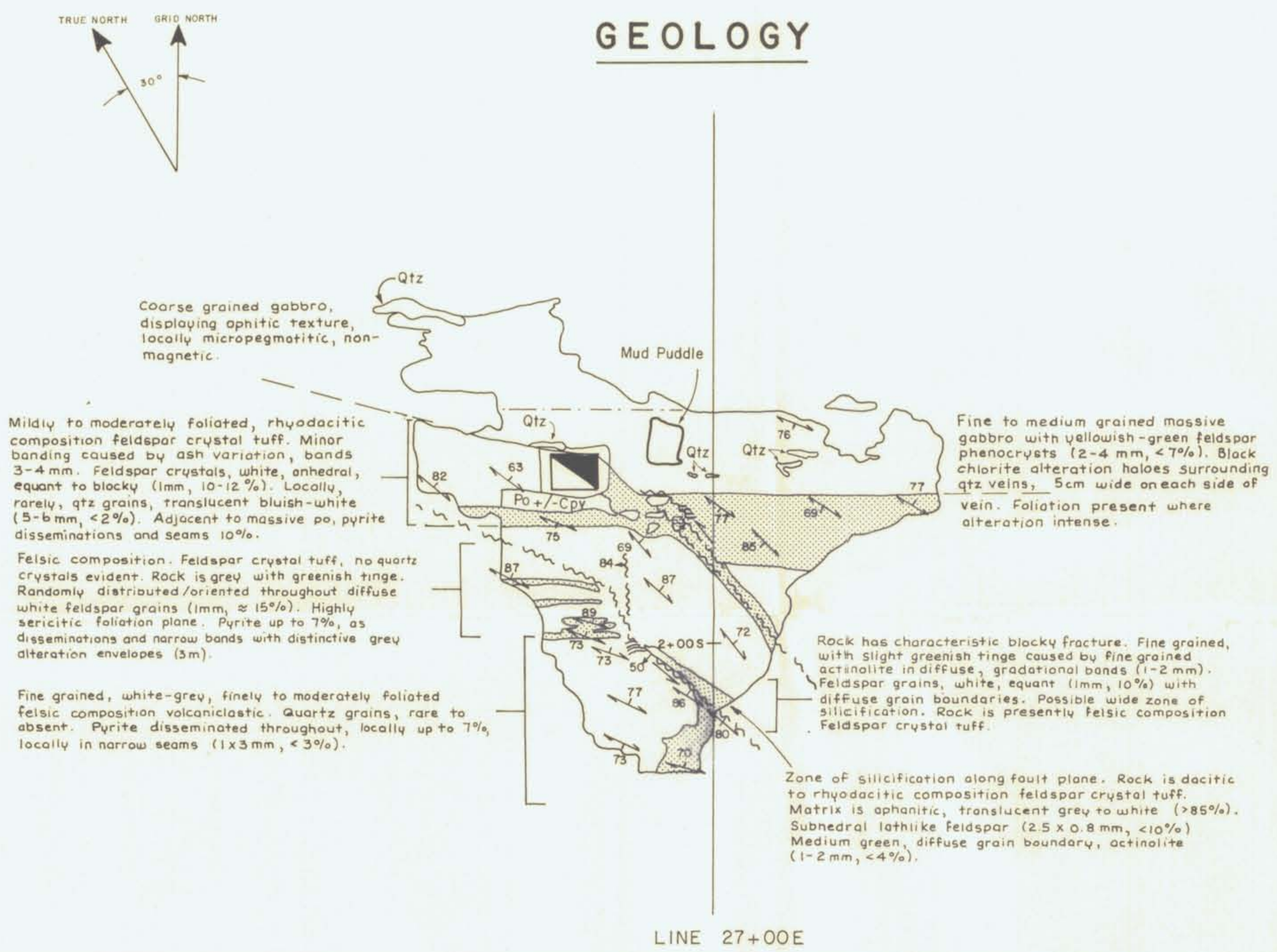
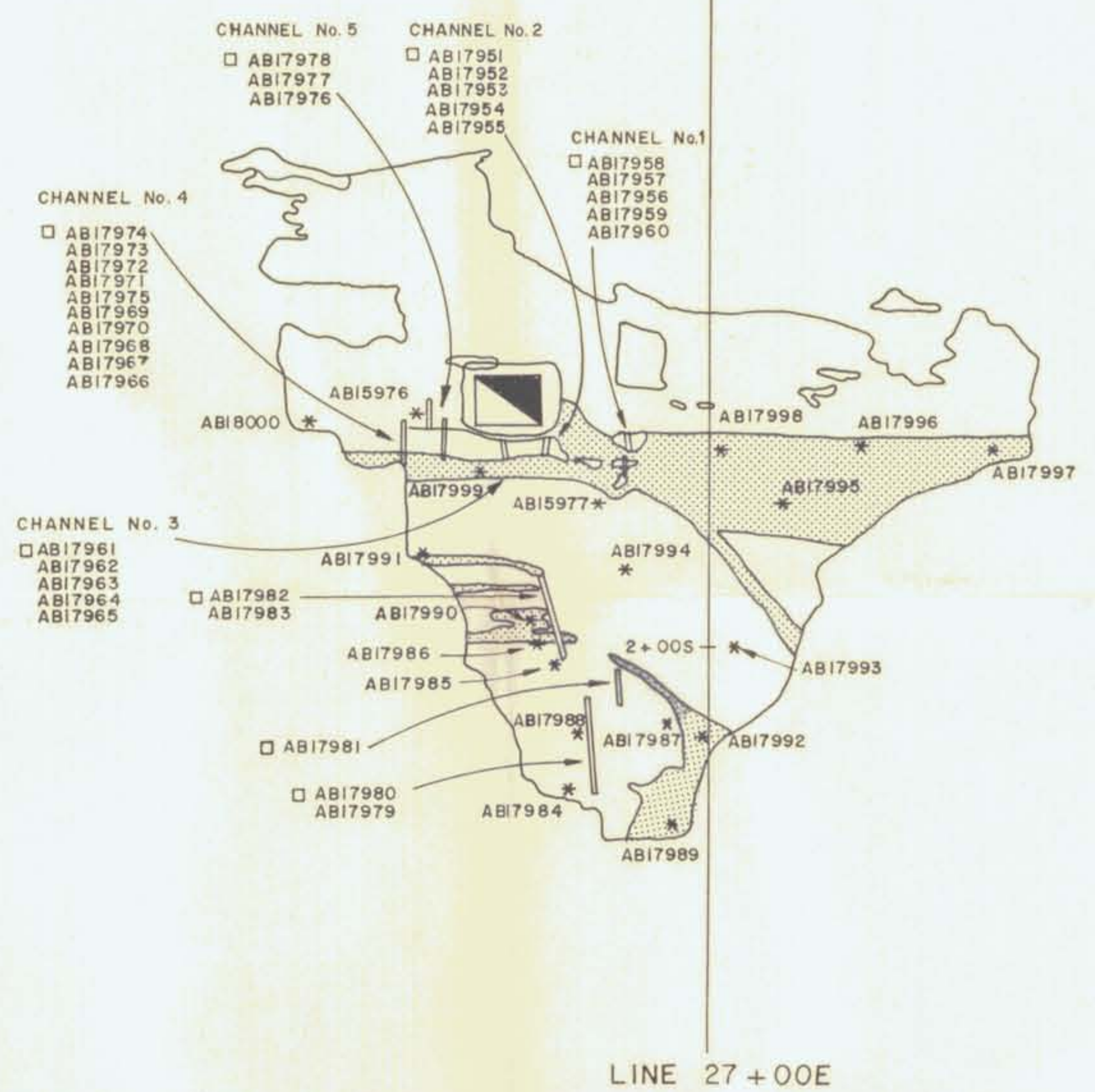
CHIP 13
B Road
W-8 Road
12 Road
McDONALD CREEK
CHIPMAN
SCRUB
— L E G E N D —
NANAIMO GROUP
N Sandstone,shale,conglomerate
SEDIMENT-SILL UNIT
6 Fine to medium grained gabbro, locally pegmatitic , and glomerophyric
Sc Green chert, grey chert , white weathering with thin agrillaceous interbeds
Sq Quartzite: contact metamorphosed dirty sandstone/arenite. Associated with disseminated pyrrhotite
Sg Greywacke: medium green with substantial volcanic component
Gsl "Green Sill": medium green to pistachio green aphyric andesitic composition sill
Jsp Jasper +/- magnetite , often associated with black siltstone
Sb Black argillite , siltstone , black chert and cherty argillite
8 "Purple pyroclastic rocks" : Fine grained mauve coloured schist with diffuse lapilli to blocks in plane of schistosity, minor grains of clastic jasper
MYRA FORMATION
7 Massive sulphide
6 Felsic flow/hypabyssal intrusion: Massive to foliated felsic groundmass , quartz/feldspar - phyric
5 Intermediate flow: Massive to foliated fine grained intermediate groundmass , feldspar - phyric to aphyric
4 Mafic flow: Massive to foliated fine grained mafic groundmass , feldspar/mafic - phyric to aphyric.
3 Felsic pyroclastic rocks: Massive to foliated felsic composition groundmass with felsic composition clasts.
3a Felsic volcaniclastic rocks: Quartz-sericite schist , quartz - eye schist (Tyee Rhyolite) , quartz - feldspar - sericite schist . Generally light coloured crystal and lapilli tuff
2 Intermediate pyroclastic rocks: Massive to foliated intermediate groundmass with intermediate to felsic composition clasts.
2a Intermediate volcaniclastic rocks: Medium to dark grey-green chlorite schist , chlorite - sericite schist , chlorite - feldspar schist. Quartz - eyes largely absent. Crystal and lithic tuffs.
1 Mafic pyroclastic rocks: Massive to foliated chloritic groundmass with amphibole/chloritized lapilli and crystals
1a Mafic volcaniclastic rocks: Massive to semi-massive dark grey green chlorite schist , mafic crystalline/acrystalline
SYMBOLS
Geological Boundary:(defined , approximate , assumed)
90° Plunge
Schistosity ,gneissosity , cleavage , foliation (horizontal , inclined , vertical , dip unknown)
Bedding , (horizontal , inclined , vertical , overturned , dip unknown)
Antiform , (defined , assumed)
Synform , (defined , assumed)
Fault , (defined , approximate , assumed)
Adit , adit with crosscut
Shaft
Trench
Strong Alteration
Weak Alteration
Drillhole 78 Chem 1 to 5 (ESSO)
Chem 7-85 to 13-85 (KIDD)
Chem 86-14 to 86-19 (FALCON)
Aberford drillholes
Roads
Trails and abandoned roads
Rock sample for base metal and precious metal analysis
Rock sample for whole rock and trace element analysis
Bar Barite
Cpy Chalcopyrite
Sph Sphalerite
Py Pyrite
FALCONBRIDGE LTD.
CHEMAINUS J.V., VANCOUVER IS.
WEST CHIP CLAIMS
GEOLOGY
NTS 92B/13W, 92C/16
Proj. 116
WORK BY S.E., D.M.
DRAWN BY ER.
DATE: FEBRUARY, 1987
100 0 100 200 300 400m
SCALE IN METRES 1 : 5000
Figure: 5d
DATE OF WORK: 1985, 1986

ANITA SHOWING EXCAVATION

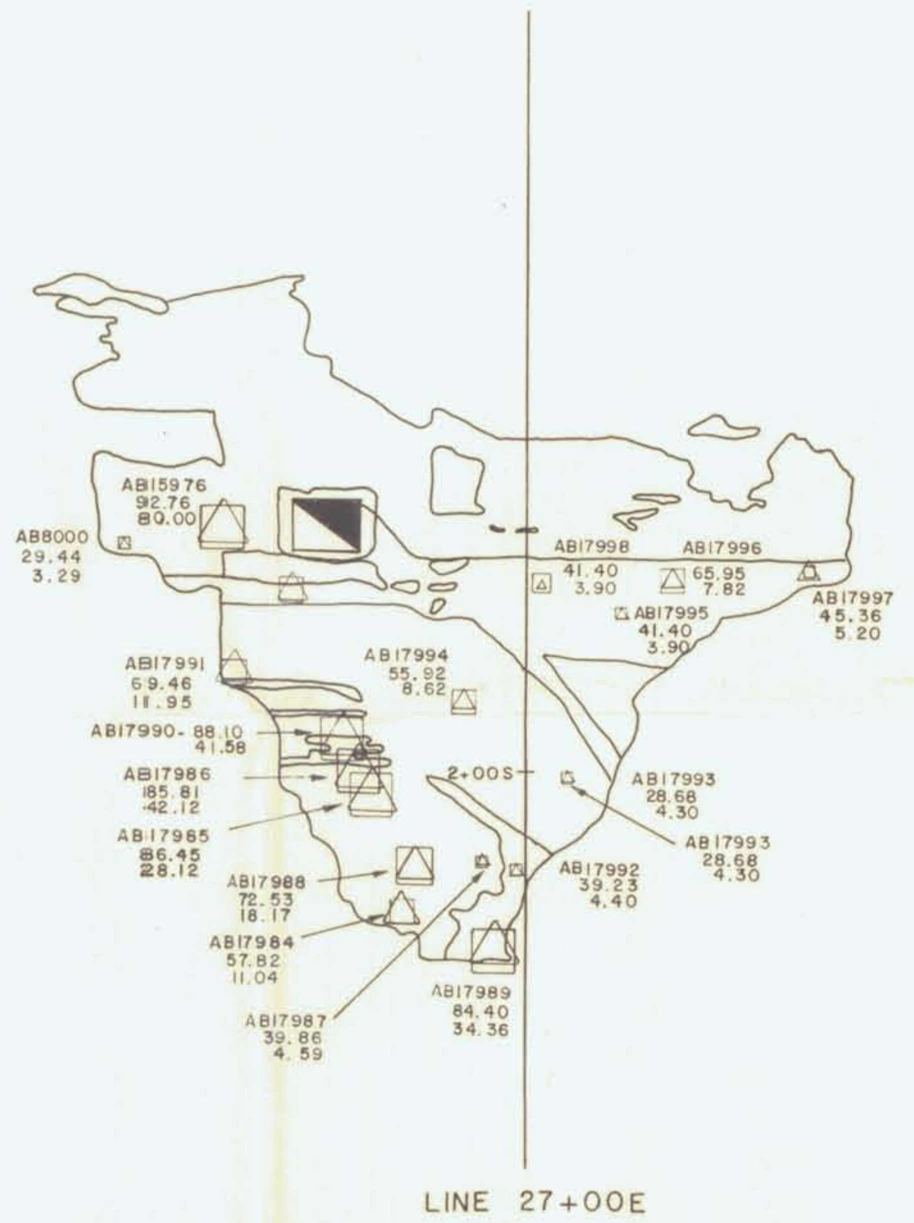
GEOLOGY



SAMPLE LOCATIONS



ALTERATION



L E G E N D

(bar)	Channel Sample
*	Whole Rock Geochemical Analysis
□	Base and Precious Metal Analysis
(stippled)	Zone of Limonite Staining
(line)	Fault (defined, approximate)
(line)	Fault - inclined
(lines)	Geological Boundary (defined, approximate gradational)
(symbol)	Foliation - inclined
Po	Pyrrhotite
Cpy	Chalcopyrite
Qtz	Quartz vein
(symbol)	Drag Structures

AI

- 80.00 - 99.00
- 70.00 - 80.00
- 60.00 - 70.00
- 50.00 - 60.00
- 0.00 - 50.00

SD

- 20.00 - 500.00
- 15.00 - 20.00
- 10.00 - 15.00
- 5.00 - 10.00
- 0.00 - 5.00

$$AI = \frac{MgO + K_2O}{Na_2O + K_2O + CaO + MgO}$$

$$SD = \frac{Al_2O_3}{Na_2O}$$

FALCONBRIDGE LTD.

CHEMAINUS J.V.

ANITA SHOWING EXCAVATION

PROJ. 116

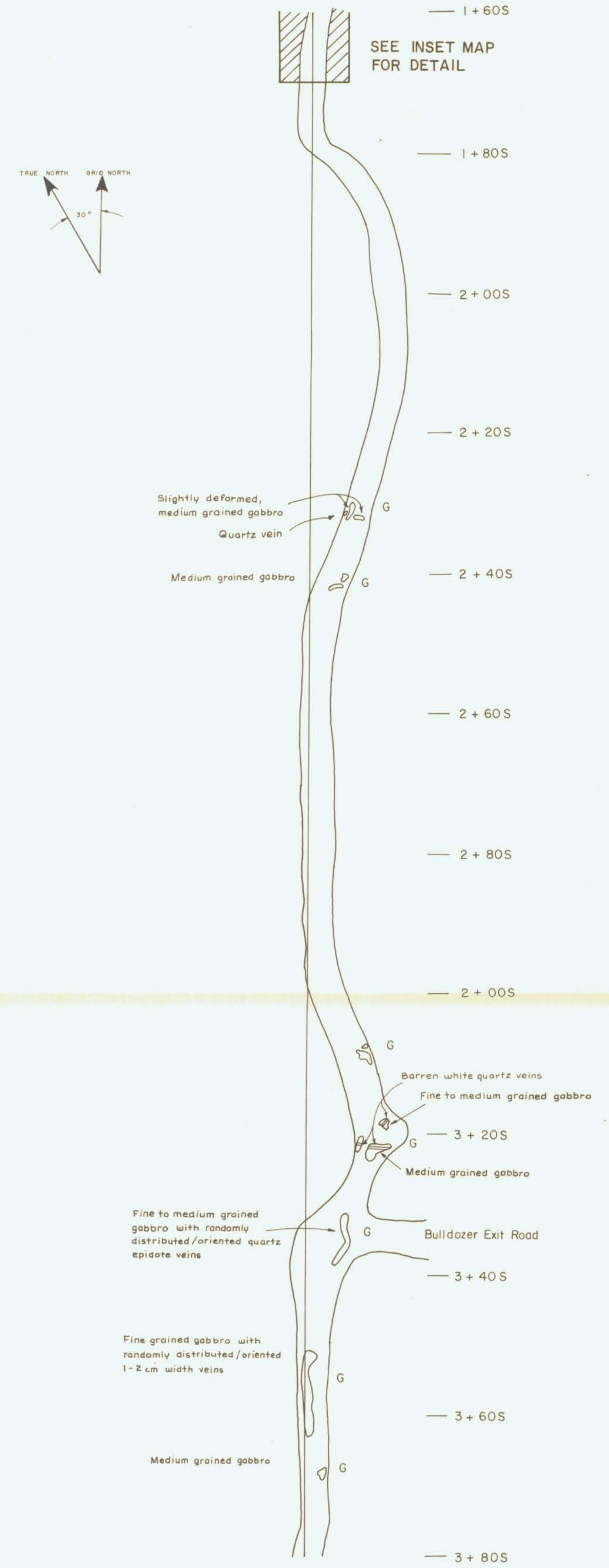
WORK BY	DRAWN BY	DATE: FEBRUARY 25, 1987
D. M.	ER	

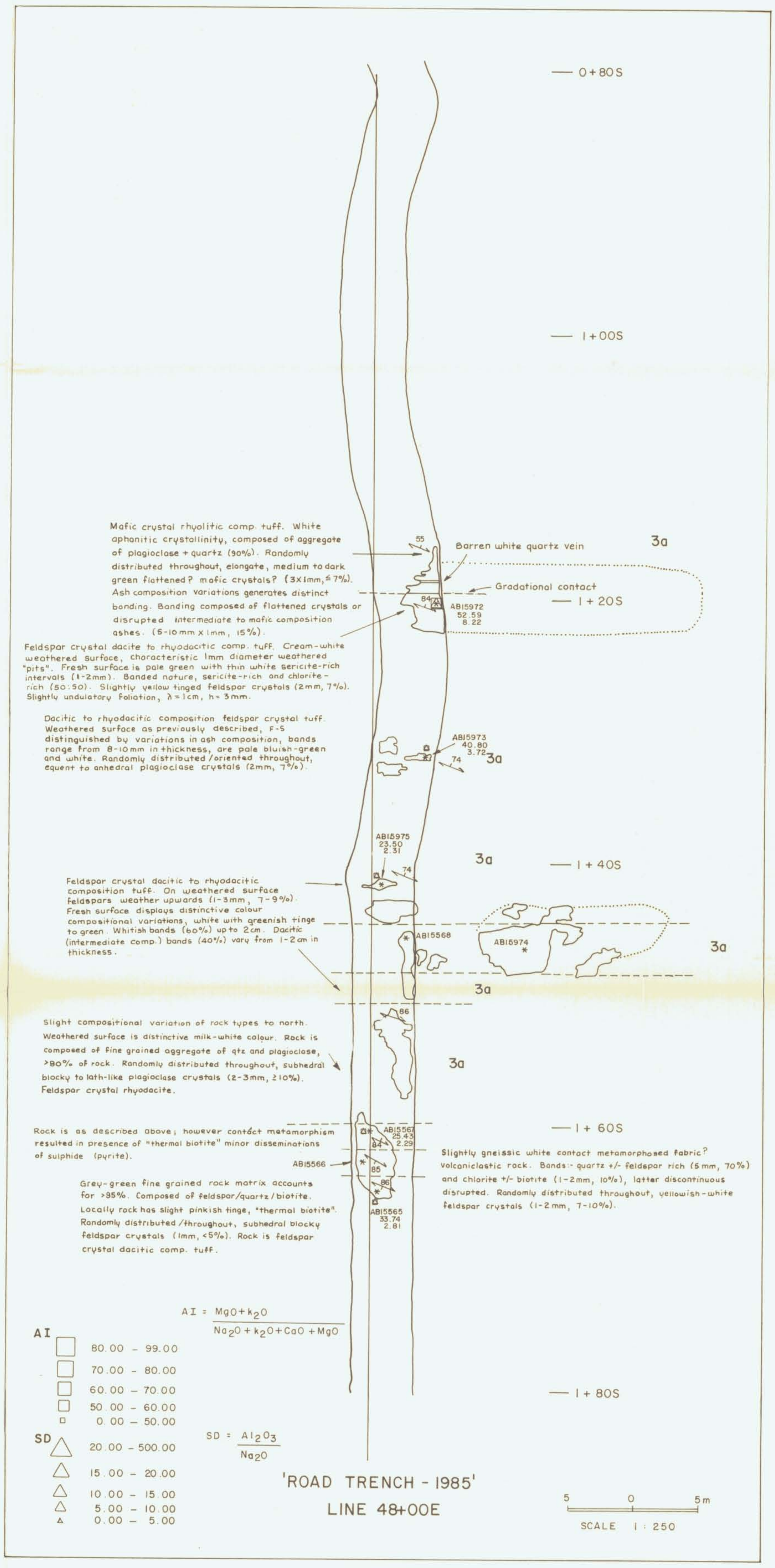
5 0 5

SCALE IN METRES 1 : 250

Figure: 6

"ROAD TRENCH - 1985"
LINE 48+00E





LEGEND

SEDIMENT - SILL UNIT

G — Fine to medium grained gabbro, locally pegmatic and glomerophyric.

MYRA FORMATION

3a — Felsic volcaniclastic rocks: Quartz-sericite schist, quartz-eye schist (Tyee Rhyolite), quartz-feldspar-sericite schist. Generally light coloured crystal and lapilli tuff.

—— - - - - · - · - Geological boundary (defined, approximate, gradational)

* Whole Rock Geochemical Analysis

74 Foliation – inclined

FALCONBRIDGE LTD.

CHEMAINUS J.V.

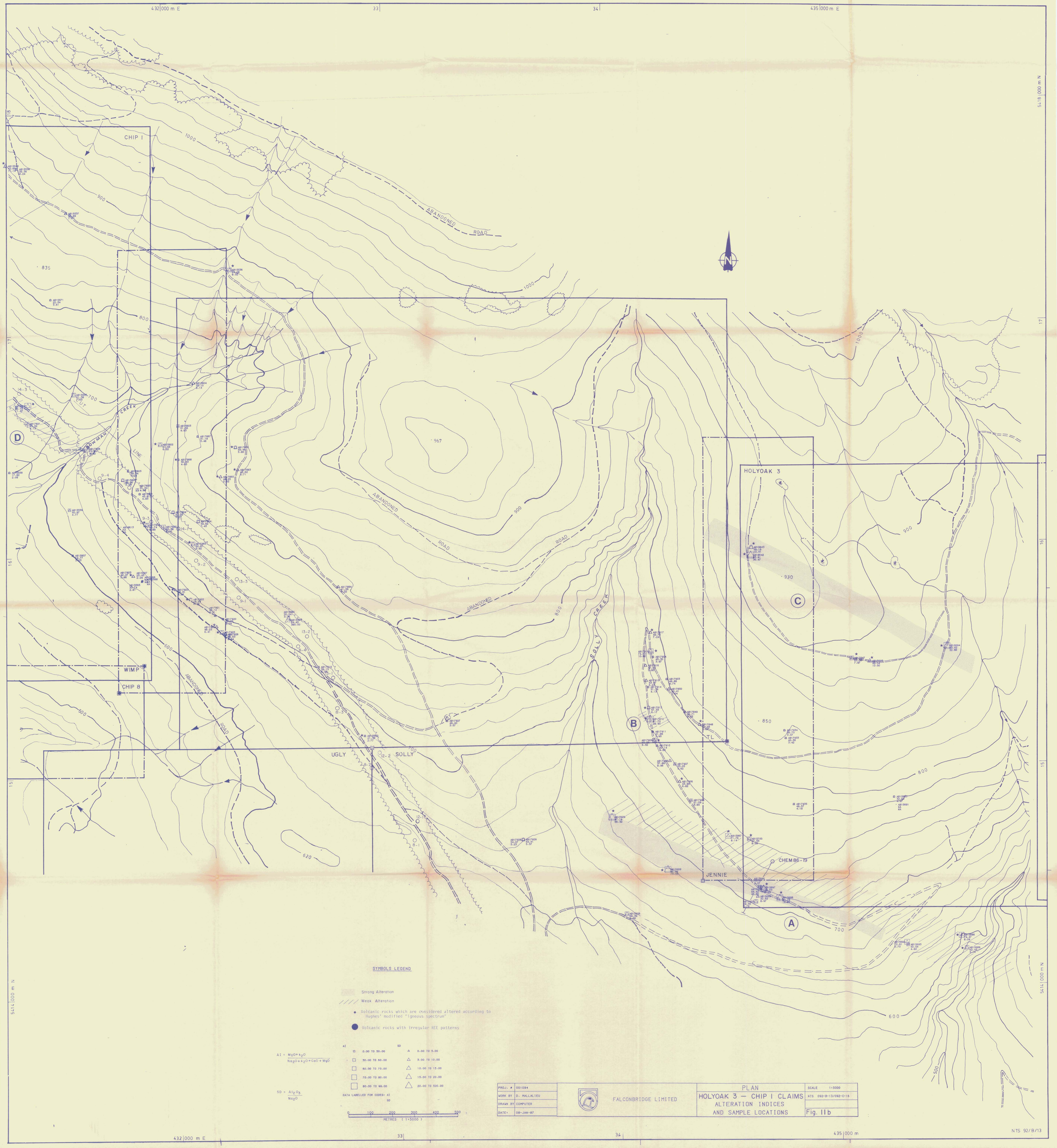
'ROAD TRENCH - 1985' LINE 48+00E

PROJ. 116

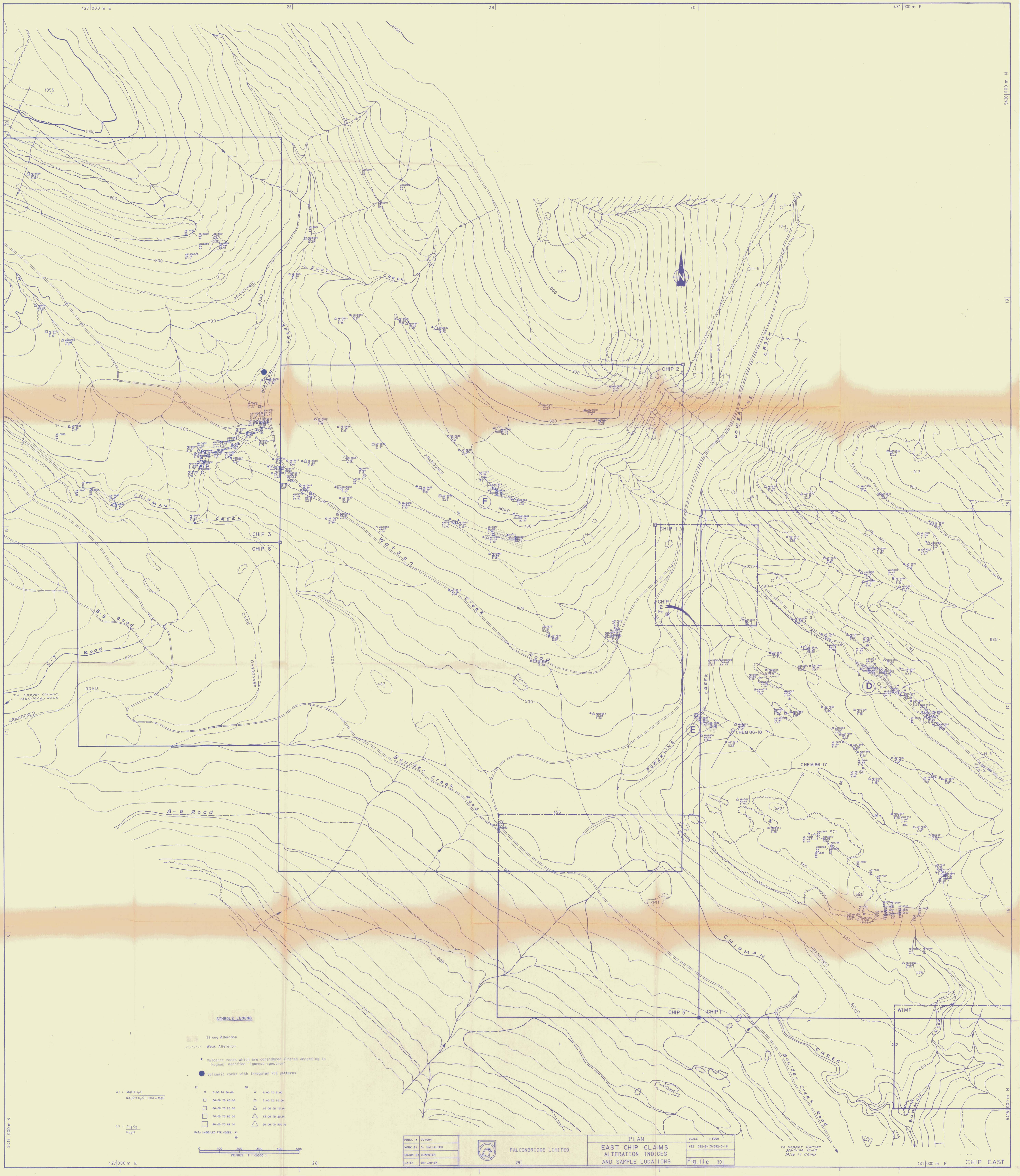
WORK BY	DRAWN BY	DATE:
D.M.	ER	FEBRUARY, 1987

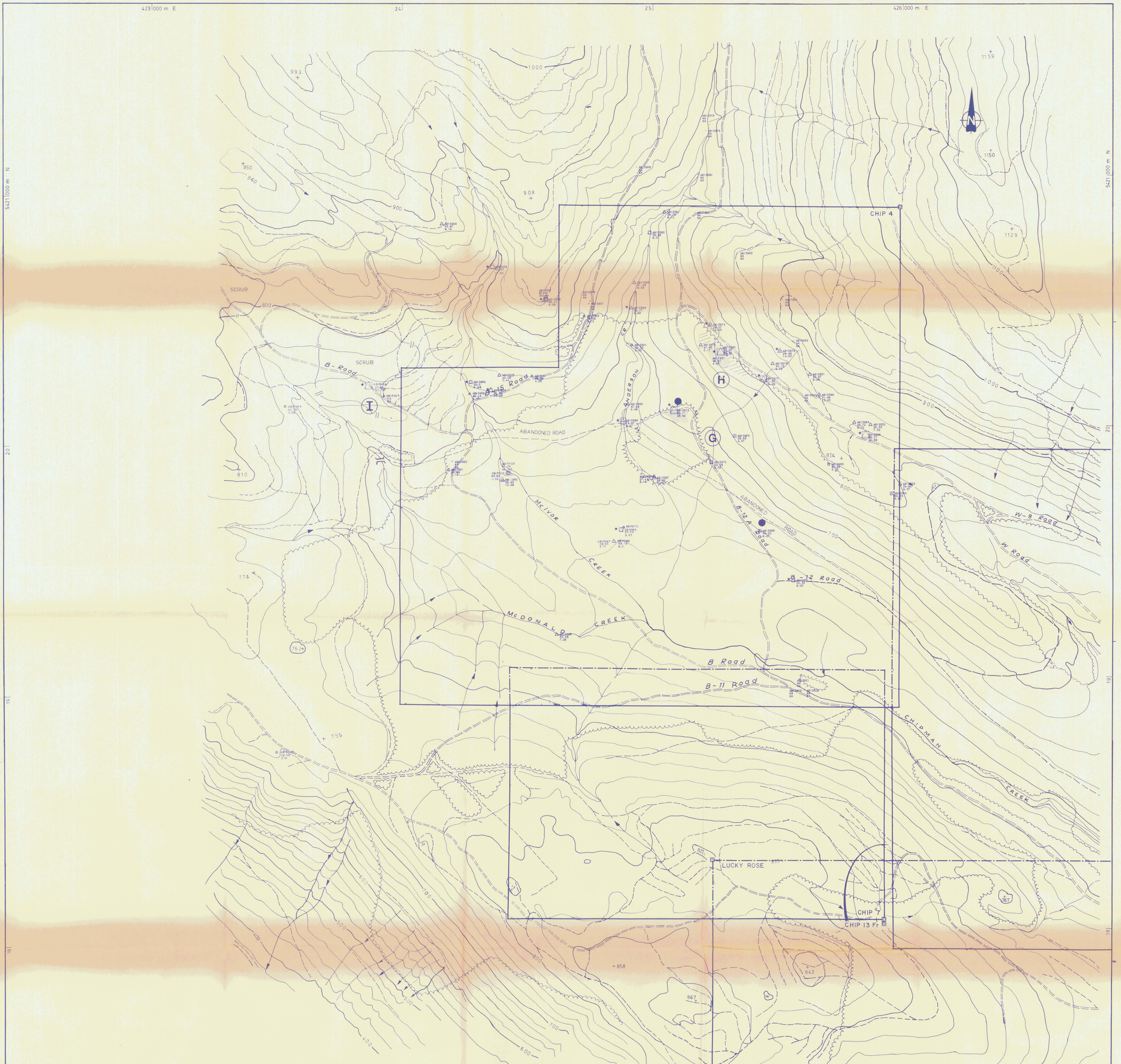
SCALE IN METRES 1 : 500 (5 0 5 10 15 m)

Figure: 7



432 000 m E
33
34
435 000 m E
5418 000 m N
CHIP I
1000
900
ABANDONED
ROAD
835
800
700
BOWMAN CREEK
LINE
D
967
ABANDONED
ROAD
900
ROAD
ABANDONED
800
SOLLY CREEK
B
HOLYOAK 3
C
930
850
TL
800
WIMP
CHIP 8
600
ABANDONED
ROAD
500
UGLY
SOLLY
620
JENNIE
CHEM 86-19
A
700
600
500
5414 000 m N
SYMBOLS LEGEND
Strong Alteration
Weak Alteration
Volcanic rocks which are considered altered according to Hughes' modified "igneous spectrum"
Volcanic rocks with irregular REE patterns
AI = (MgO + K2O) / (Na2O + K2O + CaO + MgO)
SD = Al2O3 / Na2O
AI
0.00 TO 50.00
50.00 TO 60.00
60.00 TO 70.00
70.00 TO 80.00
80.00 TO 99.00
SD
0.00 TO 5.00
5.00 TO 10.00
10.00 TO 15.00
15.00 TO 20.00
20.00 TO 500.00
DATA LABELLED FOR CODES: AI
SD
0 100 200 300 400 500
METRES (1:5000)
PROJ. # 001094
WORK BY D. MALLALIEU
DRAWN BY COMPUTER
DATE: 08-JAN-87
FALCONBRIDGE LIMITED
PLAN
HOLYOAK 3 — CHIP I CLAIMS
ALTERATION INDICES
AND SAMPLE LOCATIONS
SCALE 1:5000
NTS 092-B-13/092-C-16
Fig. 11b
432 000 m E
33
34
435 000 m
NTS 92/B/13


427|000 m E
28
29
30
431|000 m E
5420|000 m N
5415|000 m N
SCOTT CREEK
WATSON CREEK
Watson Creek Road
ABANDONED ROAD
CHIPMAN CREEK
CHIP 2
CHIP 3
CHIP 6
CHIP II
CHIP 12 Fr.
CHIP 5
CHIP 1
WIMP
CHIP EAST
POWERLINE
CREEK
CUT LINE
B-9 Road
C-7 Road
B-6 Road
Boulder Creek Road
BOWMAN CREEK
To Copper Canyon Mainland Road
To Copper Canyon Mainline Road Mile 17 Camp
CHEM 86-18
CHEM 86-17
PIT
SYMBOLS LEGEND
Strong Alteration
Weak Alteration
Volcanic rocks which are considered altered according to Hughes' modified "igneous spectrum"
Volcanic rocks with irregular REE patterns
AI = MgO+K2O / Na2O+K2O+CaO+MgO
SD = Al2O3 / Na2O
AI
0.00 TO 50.00
50.00 TO 60.00
60.00 TO 70.00
70.00 TO 80.00
80.00 TO 99.00
SD
0.00 TO 5.00
5.00 TO 10.00
10.00 TO 15.00
15.00 TO 20.00
20.00 TO 500.00
DATA LABELLED FOR CODES: AI SD
METRES (1:5000)
PROJ. # 001094
WORK BY D. MALLALIEU
DRAWN BY COMPUTER
DATE: 08-JAN-87
FALCONBRIDGE LIMITED
PLAN
EAST CHIP CLAIMS
ALTERATION INDICES
AND SAMPLE LOCATIONS
SCALE 1:5000
NTS 092-B-13/092-C-16
Fig. 11c



SYMBOLS LEGEND

Strong Alteration

Weak Alteration

* Volcanic rocks which are considered altered according to Hughes' modified "igneous spectrum"

● Volcanic rocks with irregular REE patterns

$$AI = \frac{MgO + K_2O}{Na_2O + K_2O + CaO + MgO}$$

$$SD = \frac{Al_2O_3}{Na_2O}$$

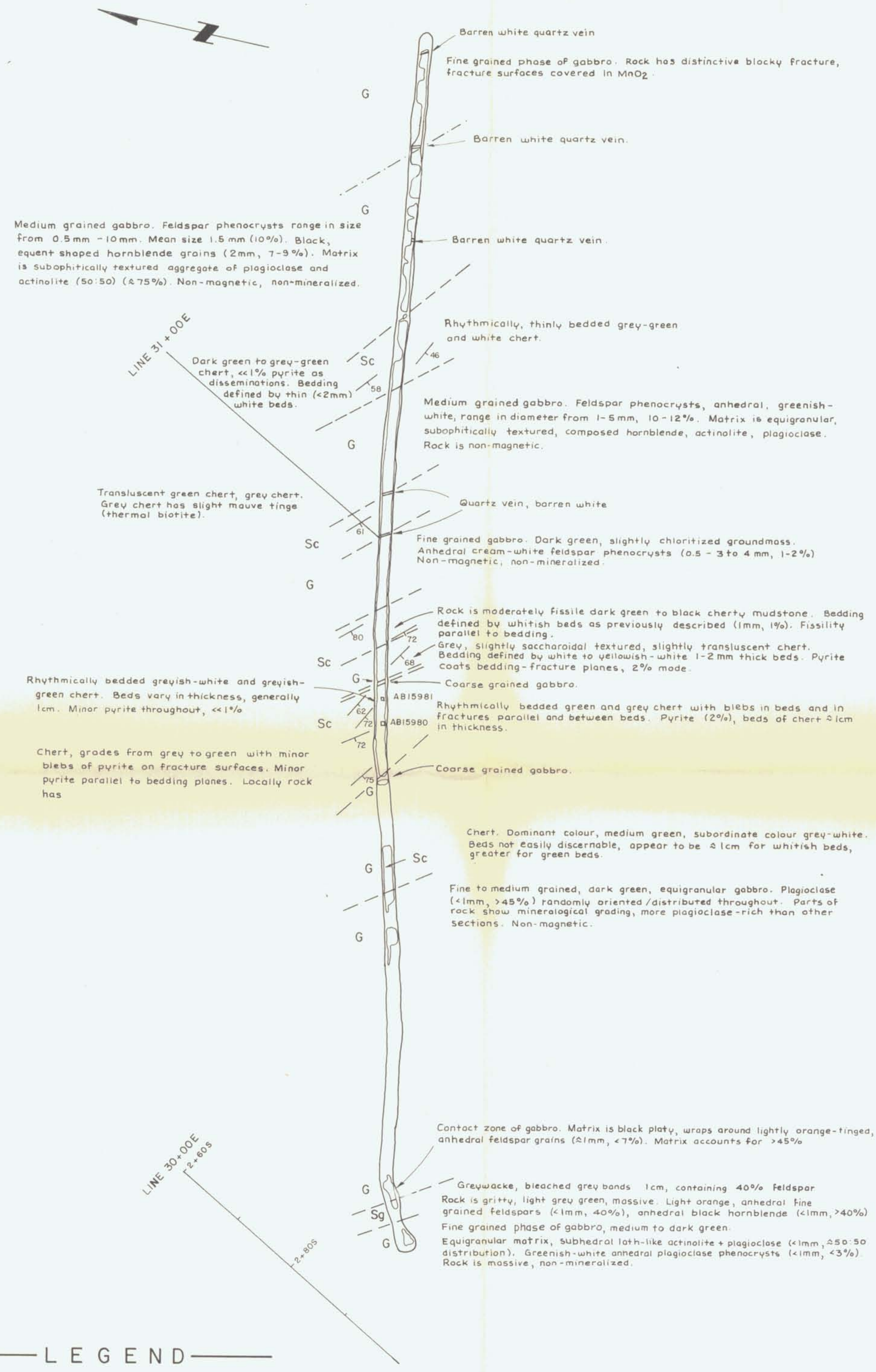
AI		SD	
□	0.00 TO 50.00	△	0.00 TO 5.00
□	50.00 TO 60.00	△	5.00 TO 10.00
□	60.00 TO 70.00	△	10.00 TO 15.00
□	70.00 TO 80.00	△	15.00 TO 20.00
□	80.00 TO 99.00	△	20.00 TO 500.00

DATA LABELLED FOR CODES: AI
SD

0 100 200 300 400 500
METRES (1:5000)

PROJ. #	001094	FALCONBRIDGE LIMITED	PLAN	SCALE 1:5000
WORK BY	D. MALLALIEU		WEST CHIP CLAIMS	NTS 092-B-13/092-C-16
DRAWN BY	COMPUTER		ALTERATION INDICES	
DATE:	08-JAN-87		AND SAMPLE LOCATIONS	Fig. 11d

TRENCH 30.31



LEGEND

SEDIMENT-SILL UNIT

G	Fine to medium grained gabbro, locally pegmatitic and glomerophyric.
Sc	Green chert, grey chert, white weathering with thin argillaceous interbeds.
Sg	Greywacke medium green with substantial volcanic component
— — — / —·—·—	Geological boundary (defined, approximate gradational)
▫	Base and precious metal analysis
⁄80	Bedding - inclined

FALCONBRIDGE LTD.

CHEMAINUS J.V.

TRENCH 30.31

PROJ. 116

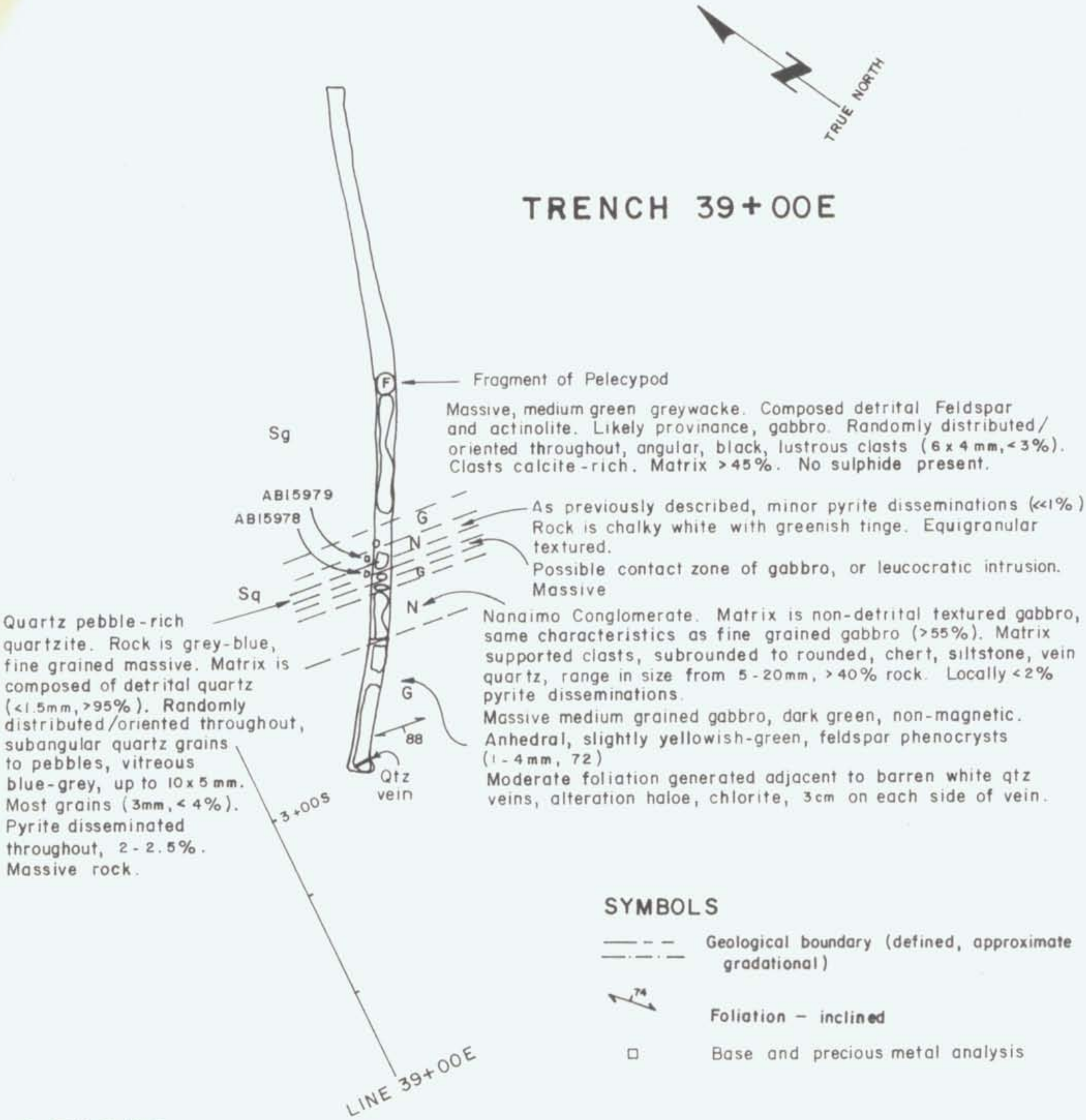
WORK BY	DRAWN BY	DATE
D.M.	ER	FEBRUARY 23, 1987

10 5 0 10 m

SCALE IN METRES 1 : 500

Figure: 12

TRENCH 39+00E



SYMBOLS

- Geological boundary (defined, approximate gradational)
- 74 — Foliation – inclined
- □ Base and precious metal analysis

LEGEND

NANAIMO GROUP

- N — Sandstone, shale conglomerate

SEDIMENT-SILL UNIT

- G — Fine to medium grained gabbro, locally pegmatitic and glomeropyritic
- Sg — Greywacke: medium green with substantial volcanic component
- Sq — Quartzite: contact metamorphosed dirty sandstone/ arenite. Associated with disseminated pyrrhotite

FALCONBRIDGE LTD.		
CHEMAINUS J.V.		
TRENCH 39 + 00E		
PROJ. 116		
WORK BY: DM	DRAWN BY: ER	DATE: FEB., 1987
SCALE 1 : 500 (10 – 0 – 10 m)		
Figure: 13		

NCI-556