

STRUCTURAL AND STRATIGRAPHIC REPORT ON THE
SAINT 3 AND FLACO CLAIMS, LIARD MINING DIVISION

Latitude: ~~██████~~ 125° 59.5'

Longitude: 58° ~~██~~ 07.3'

NTS: 94L/1E & 94K/4W

by

M.W. Insley and K.R. McClay

FILMED

GEOLOGICAL BRANCH
ASSESSMENT REPORT

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14,904

Getty Canadian Metals, Limited (Owner)

and

Gataga Joint Venture (Operator)

April 24, 1986

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LIST OF CLAIMS

CLAIM	RECORD NUMBER	NUMBER OF UNITS	RECORD DATE	EXPIRY DATE
Saint 3	285	12	April 28, 1977	April 28, 1991
Flaco	1318	4	June 24, 1980	June 24, 1992

Expiry date provided this report is accepted for assessment credit applied for earlier.

STRUCTURAL AND STRATIGRAPHIC REPORT ON THE SAINT 3 AND FLACO CLAIMS

INTRODUCTION

The Saint 3 claim was staked for Gataga Joint Venture (GJV) by Castlemaine Exploration Ltd. in 1977 and transferred in 1981 to Getty mines, Limited, operator of the joint venture. The Flaco claim was staked for GJV by Welcome North Mines Ltd. in 1980 and transferred to Getty in 1981. The claims were located to cover soil and silt geochemical anomalies from a possible strike extension of the stratiform barite-lead-zinc mineralisation on the nearby Driftpile Creek property (P, D and Goof claims). Gataga Joint Venture, formed in 1977 to explore for lead-zinc in northeast British Columbia, is a syndicate composed of Kidd Creek Mines Limited, Chevron Canada Limited, Getty Mines Limited, Welcome North Mines Limited and Castlemaine Exploration Limited. The programme was managed by Archer Cathro & Associates (1981) Limited and field programmes directed by R.C. Carne. Fieldwork in 1985 was carried out by Dr. K.R. McClay and Mr. M.W. Insley.

Previous work by GJV on the claims and nearby areas is described in Assessment reports 2394, 6666, 6896, and 9396.

LOCATION AND ACCESS

The Saint and Flaco claim group is located 8 km northwest of Driftpile Creek on map sheets 94L/1E and 94K/4W (Fig. 1). The centre of the claim group is located at latitude 58 08' N and longitude 126 00'W.

Access is by wheel equipped fixed wing aircraft from Dease Lake or Smithers (approximately 200km), to an airstrip located at Driftpile Creek. The nearest large town is Fort Nelson, 200 km to the east. Base camp at Driftpile Creek was established using fixed wing aircraft from Dease Lake and supplies were ferried during the course of the programme by an Okanagan Helicopters Bell 206B based at Johansson Lake. Fieldwork was carried out from a permanent base camp in Driftpile Creek Valley and from fly camps located on the Saint claims. Support was provided by the Okanagan Bell 206B helicopter based at Johansson Lake.

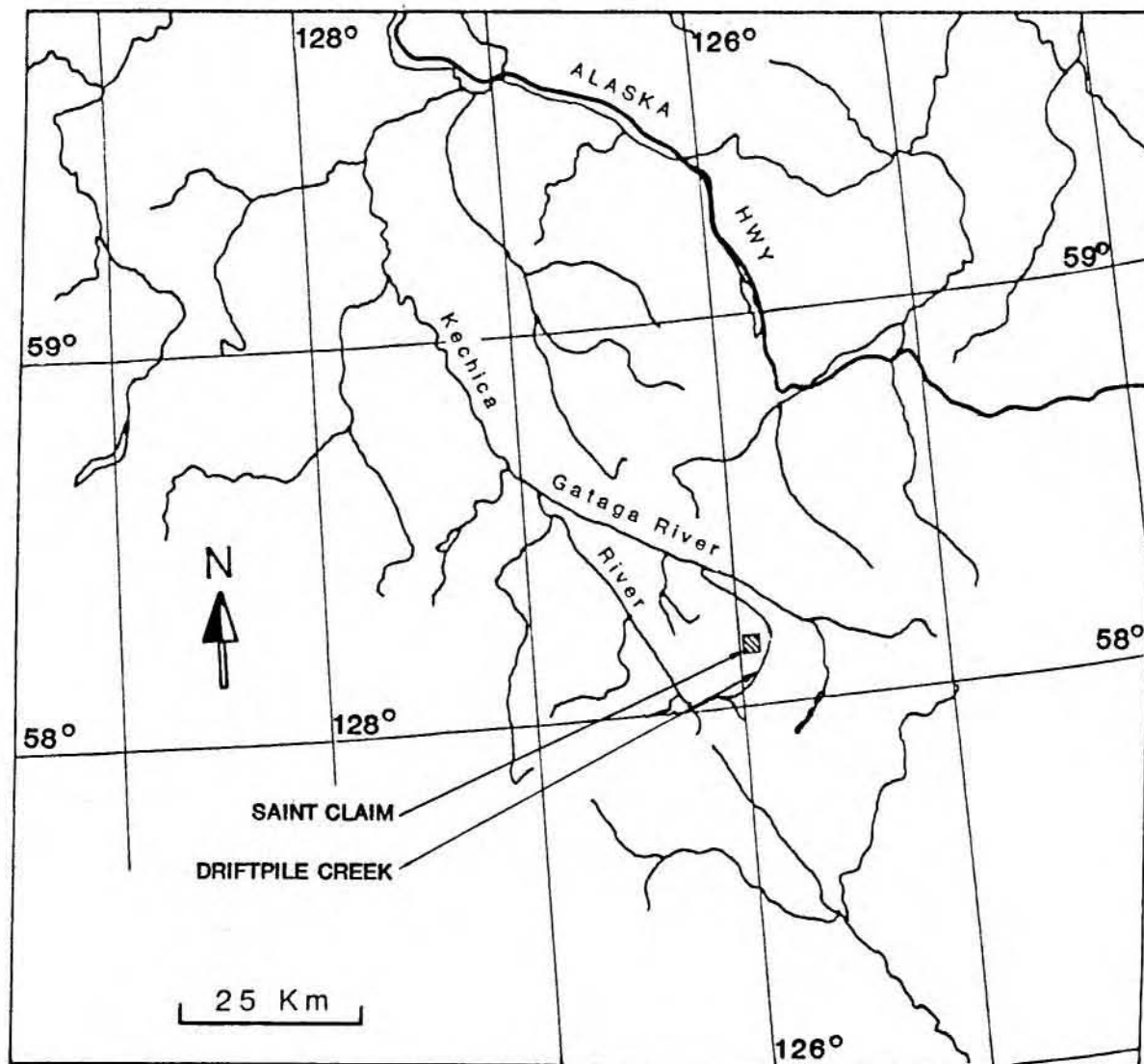
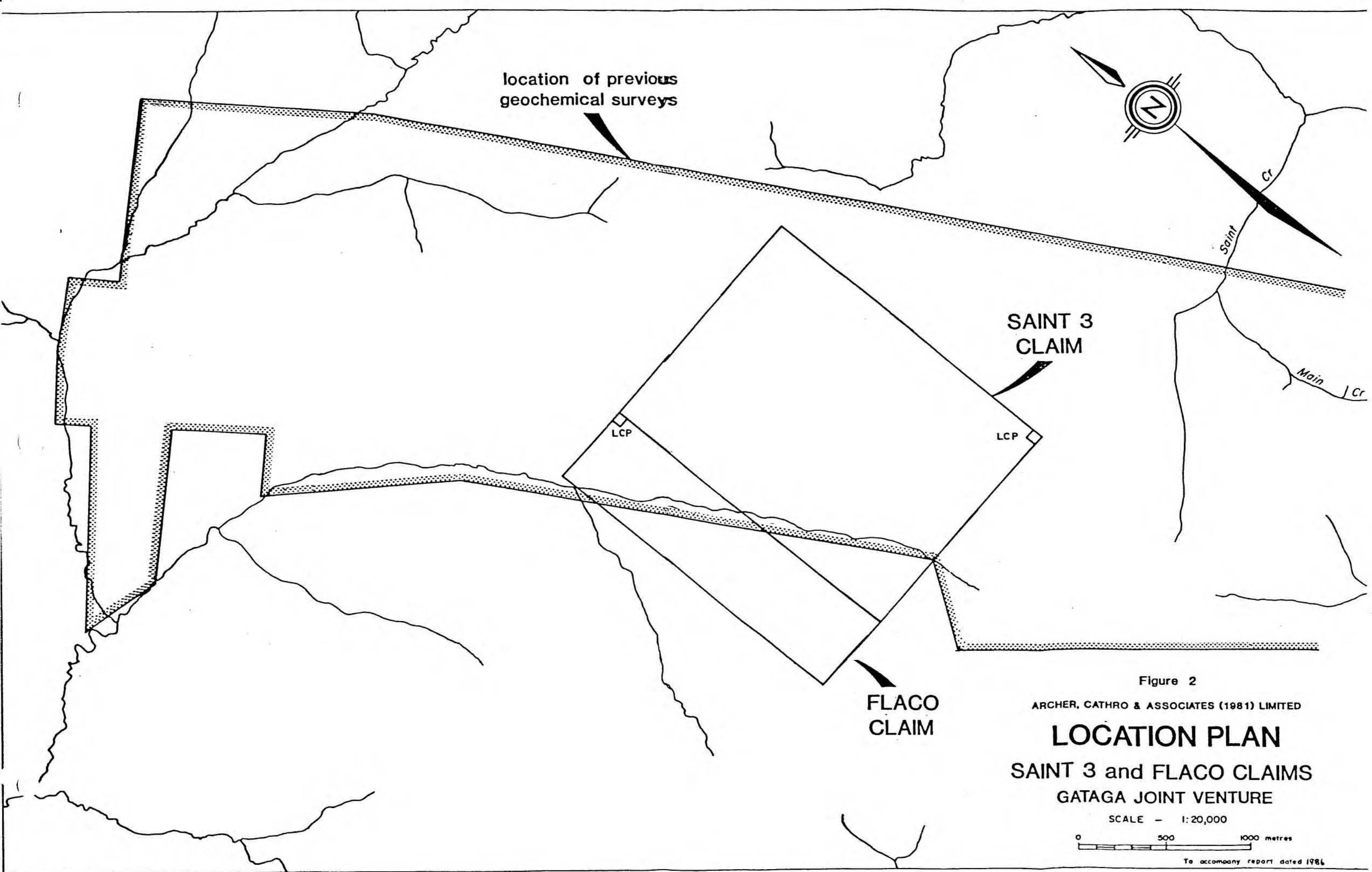


Figure 1 LOCATION MAP OF THE SAINT CLAIM DRIFTPILE CREEK, NORTHEAST BRITISH COLUMBIA, CANADA.



STRUCTURAL AND STRATIGRAPHIC MAPPING

Detailed (1:5,000 scale) structural and stratigraphic mapping was carried out on the Saint and Flaco claims in order to investigate the relationships between soil geochemical anomalies found in previous surveys, bedrock structure and stratigraphy, inferred faults and limonitic spring deposits. Mapping was carried out on the Saint and Flaco claims and adjacent areas from 19th July 1985 to 7th August 1985. Outcrops and scree were mapped. Each bedrock outcrop was assigned a location number, a lithological description was compiled and measurements of bedding, cleavages, bedding/cleavage intersections and minor fold orientations were taken. Limestone and strongly calcareous beds and nodules were sampled for conodont biostratigraphic analysis. Several stratiform barite horizons are found in the area and were mapped and sampled in detail.

The results are presented in Fig. 3 which is a detailed structural map of the significant parts of the claims and adjacent areas and in Fig. 4 which is a detailed cross-section through the claims. Stratigraphic boundaries are based upon lithostratigraphy constrained by conodont analysis.

TECTONO-STRATIGRAPHIC SETTING

The Saint and Flaco claims are located in the Gataga Fold and Thrust Belt. This forms part of the northwest trending long, narrow Kechika Trough - the southern extension of the Mid-Upper Palaeozoic Selwyn Basin. Sedimentation is dominated by black, fine-grained siliciclastics reflecting a starved and restricted basin environment. The Kechika Trough also hosts the Cirque, Elf and Fluke Pb-Zn-Ba deposits south of the Gataga area. These stratiform barite-sulphide deposits are considered to have formed from metalliferous fluids discharged into local basins along contemporaneous extensional faults related to crustal extension during the Middle to Late Devonian.

STRATIGRAPHY

In the Saint and Flaco claims, Silurian through Upper Devonian strata are deformed into a northwest trending fold and thrust belt (Fig. 3). The rocks represent the basinal facies of the Kechika Trough and are flanked to the east and west by Cambrian - Early Ordovician platformal carbonates. The stratigraphy for the Saint and Flaco claims area is shown in Fig. 5.

STRATIGRAPHY FLACO & SAINT CLAIMS

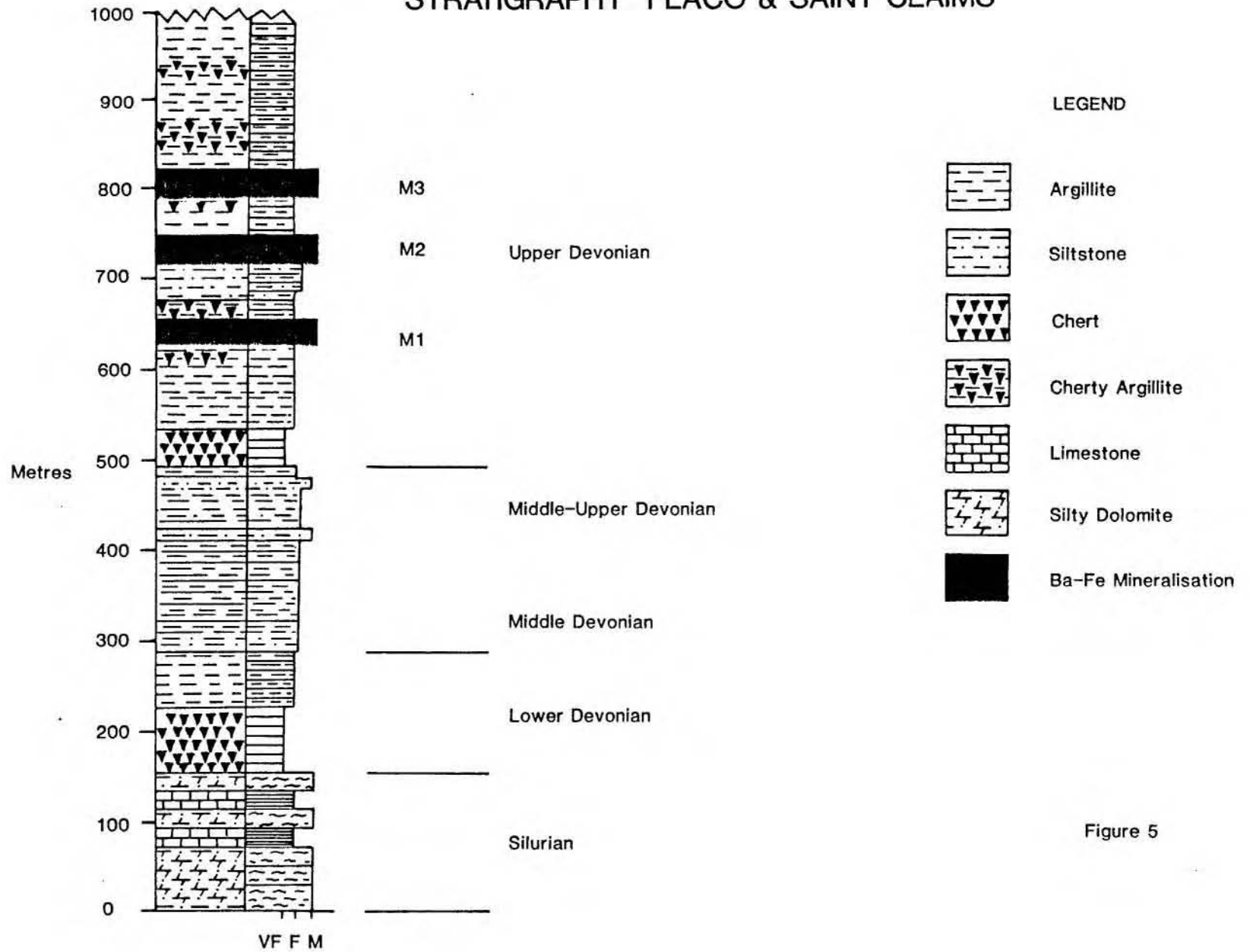


Figure 5

A basal sequence of Silurian through Lower Devonian siltstones and shales has been assigned to the Road River Group and this is overlain with apparent conformability by a sequence of Mid to Late Devonian fine-grained laminated siltstones, shales, cherty shales and cherts which have been assigned to the Lower Earn Group (Gordey et al. 1982). In the Saint and Flaco claims area the shales and cherts of the Lower Earn group contain three stratiform barite horizons $M_1 - M_3$ (Figs. 3 & 5).

ROAD RIVER GROUP (Silurian - Early Devonian)

The lowermost strata exposed in the Saint and Flaco claims area are 130m of resistant, distinctly orange weathering thin bedded dolomitic micaceous siltstones found in the southwestern corner of the claims where they are imbricated by a series of northeasterly verging thrust faults (Figs. 3 & 4). The siltstones occasionally contain Silurian graptolites. Two 3m thick cryptalgal laminated micritic limestone bands are present towards the top of this unit. The Silurian forms a distinct marker in the Gataga area. A recessive, silver-grey weathering package of black argillites, thin bedded black chert of Early Devonian age, overlies the Silurian siltstone and represents the top of the Road River Group in the claims area.

LOWER EARN GROUP (Middle - Late Devonian)

The Road River Group strata are conformably overlain by a sequence of 'black clastics' of the Lower Earn Group. In the Saint - Flaco area the base of the Lower Earn Group is characterized by a sequence of fining upward cycles of thin-medium bedded laminated siltstones and silt banded argillites. Beyond the south-western part of the map area (Fig. 3) these interdigitate with thick-bedded chert pebble conglomerates. This sequence is succeeded by a minimum of 450m of recessive, unlaminated to thinly laminated silver-grey weathering black argillites, cherty argillites, thin-bedded cherts and barite horizons. These strata range in age from Frasnian to Famennian (M. Orchard pers. comm. 1985). The Late Devonian sequence contains at least three horizons ($M_1 - M_3$) of stratiform barite (+/- pyrite-galena-sphalerite mineralization) (Figs. 3 & 4).

FLACO CLAIM

The exposure is extremely poor on this claim with only Silurian through to mid-Devonian rocks found in the southern corner (Figs. 3 & 4). The Silurian siltstones occur as four imbricate slices (Fig. 4), with the lowermost slice carrying early to mid-Devonian black argillites and cherty argillites. These units have been dated using conodonts (M.Orchard pers. comm. 1986) but do not however contain any baritic, pyritic or gossanous horizons. In the northern part of the Flaco claim the upper stratigraphic units are projected through (late Devonian - map units uD and mineralised horizon M₂ (Fig. 3) but no surface expression was found due to excessive scree movement downslope.

SAINT 3 CLAIM

The Saint 3 claim contains considerable prospective stratigraphy and although the exposure is limited to isolated outcrops surrounded by thick felsemeer and scree deposits, a detailed structural and stratigraphic analysis has been possible. In particular mapping along strike to the southeast has provided valuable data (Fig. 3).

The Saint 3 claim comprises a number of tightly chevron folded and thrust bounded panels of map unit uD (late Devonian) with isolated outcrops of mineralised horizons M₁ - M₃ in the northeast corner of the claim and repetitions of horizon M₂ in the central part of the claim (Figs. 3 & 4). In all cases the mineralised horizons are deformed massive to blebby barite commonly associated with grey weathering coarsely crystalline carbonate nodules. Limonitic spring gossans described in previous assessment reports are not associated with the mineralised horizons nor their projections along strike.

Map Unit 5 - Silurian Siltstone

The Silurian Siltstone forms a distinctive orange weathering ridge at the southern edge of the Saint and Flaco claims (Fig. 3). Measured thicknesses show 130 metres of thin to thick bedded, plane laminated grey calcareous and dolomitic siltstones that weather a distinctive orange. Two thin grey limestone bands, 2 - 3 metres thick, occur towards the top of the unit. In the Saint 3 and Flaco claims the siltstone is repeated in four imbricate slices (Fig. 4).

Map Unit ID - Lower Devonian

A thin (< 50 metres) unit of silver-grey weathering cherty argillites with several 30cm thick black chert beds overlies the Silurian Siltstone. Elsewhere in the Driftpile creek area this unit yields early Devonian conodont dates (M.Orchard pers. comm. 1985). In the Saint and Flaco claim area this unit does not outcrop but is found in a thin imbricate slice to the south of the claim boundaries.

Map Unit mD - Middle Devonian

The Lower Devonian unit is overlain by an poorly defined unit of laminated black argillites, cherty argillites and calcareous argillites. The only outcrops are on the southern portion of the Flaco claim and a mid-Devonian conodont date has been obtained from these rocks. The boundaries of this unit are not defined but it is interpreted to occur within an imbricate slice of the fault system at the southern boundary of the claims (Figs. 4 & 5).

Map Unit muD - Middle-Upper Devonian

This poorly defined map unit occurs at the southern edge of the Saint 3 claim and is defined by mid-Devonian and late Devonian conodont dates. It is dominantly plane laminated to unlaminated black argillites and siliceous black argillites that are indistinguishable from the overlying uD unit. It probably represents a transition between mD and uD units and further research in a better exposed area is needed to define it.

Map Units M₁, M₂, M₃ - Mineralised Horizons

Fig. 6 shows a 145 metre logged section through baritic mineralised horizons M₁ to M₃ as they are exposed in Saint Creek approximately 1Km south of the Saint 3 claim. The section has undergone a considerable shortening due to intense cleavage development (an estimated minimum of 30% from deformed carbonate nodules). The host stratigraphy for the mineralised units is unlaminated, silver-grey weathering, black siliceous argillites of map unit uD.

Mineralised horizon M₁ is typically 5 - 6 metres thick consisting of 5 - 12cm thick beds of massive-laminated barite intercalated with 5 - 10cm beds of siliceous black unlaminated argillites. Thin pyrite laminae (0.5cms max.) are found in the basal argillites of this horizon.

Mineralised horizon M_2 consists of approximately 30 metres of thinly interbedded barite and black siliceous argillites. In places the barite beds attain 10cm thicknesses of massive-laminated barite.

Mineralised horizon M_3 occurs approximately 40 metres above M_2 and consists of blebby - laminated barite at the base with interbedded barite and siliceous black argillites towards the top of the unit (Fig. 6). The upper contact of this unit is not exposed in Saint Creek.

Where exposed on the Saint 3 claim the mineralised units are identical but thicknesses vary due different components of structural shortening and due to possible original thickness variations. In all cases the only visible sulphide found in the mineralised units was thinly laminated pyrite (< 5% by volume).

Map Unit uD - Upper Devonian

Most of the Saint and Flaco claims comprise map unit uD with a minimum thickness of 450 metres (Fig. 5) and containing mineralised units M_1 - M_3 . Best exposure is found in stream sections with the ridges exhibiting isolated outcrops and extensive scree development. The base of this unit is a distinctive sliver-grey weathering unlaminated to faintly plane laminated cherty argillites overlain by siliceous argillites and mineralised units M_1 to M_3 interbedded with siliceous and chery argillites and occasional thinly laminated silty argillites (Fig. 5). The apparent stratigraphic separations between the three barite units varies from 30 metres to approximately 100 metres. Exact thicknesses are difficult to determine due to the lack of stratigraphic markers and to the strong thrusting, folding and cleavage development. The top of map unit uD is not exposed in the Saint-Flaco claims or in the immediate area.

MEASURED SECTION SAINT CREEK MINERALISED UNITS M1, M2, M3.

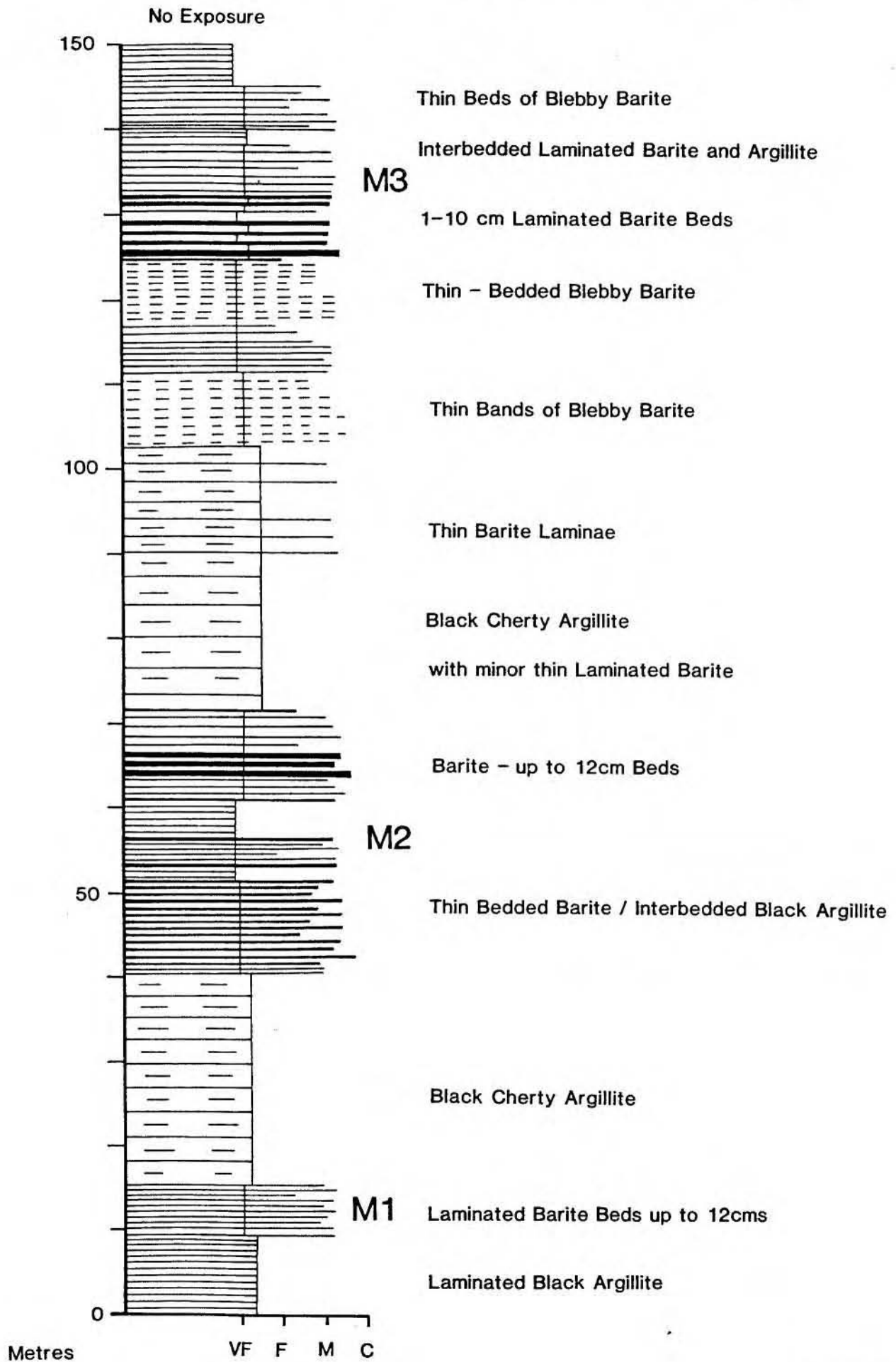


Figure 6

STRUCTURE

The Saint and Flaco claims lie within a northwest-southeast striking belt of tightly folded and thrust, recessive weathering Lower Earn Group strata (Fig. 3). In the Saint - Flaco area, packages of generally upright to steeply dipping, strongly cleaved and chevron folded strata are bound by steep westerly and easterly dipping thrust faults (Figs. 3 & 4). The western limit of this belt is marked by the Mount Waldemar Thrust (Fig. 3) which brings Silurian and Early Devonian strata over the highly folded Middle - Late Devonian Lower Earn Group. In the east of the map area the position of a 'pop-up' structure of Silurian siltstone (Figs. 3 & 4) indicates the first change in thrust vergence from northeasterly vergence to southwesterly vergence. This structure marks the eastern edge of the belt of dominantly Middle - Late Devonian Lower Earn Group rocks.

Detailed structural studies have enabled three phases of deformation to be established:-

Phase 1 deformation has produced asymmetric folding on northeast trending axes (Fig. 3). Phase 1 folds are associated with an early fanning axial planar cleavage that is only locally developed.

Phase 2 deformation is related to major Mesozoic compression resulting in a complex array of generally northeast verging thrusts and folds. An intense penetrative cleavage (S2), is developed throughout the belt. This cleavage may accommodate at least 30-40% shortening due to pressure solution along the cleavage planes. Fold axes and L2 lineations have generally horizontal to shallow plunges, although the presence of steep zones (where the S2 foliation has been superposed on earlier steeply orientated bedding surfaces), indicates the position of the steep limbs of folds related to Phase 1 deformation.

Phase 3 deformation developed local steep - vertically plunging kink folds superposed on the general northwest Phase 2 structural trend. These folds are interpreted as dextral kinks probably related to late stage movement along the Kechika and Gataga dextral strike-slip faults.

Although these three phases of deformation have been identified within the area the dominant structures are the folds and thrusts of phase 2. These produce an intense steeply dipping cleavage and shallow (5 - 15) south easterly fold plunges in the Saint - Flaco area (Figs. 4 & 5).

Both east and west verging thrusts have been identified (Fig. 5) but generally poor exposure hampers correlation along strike. Mineralised unit M_2 is repeated three times across the Saint - Flaco claims (Fig. 5).

MINERALIZATION

In the Saint - Flaco area three intervals of stratiform barite mineralization have been identified within the fine-grained black argillites, cherty argillites and cherts of the Lower Earn Group. The mineralized intervals are located in poorly exposed panels of highly folded and sheared rocks (Figs. 3 & 4) which fact hampers correlation between different thrust bound packages. Data has been collected from detailed examination of surface exposures and logging mineralized intervals in stream sections which are outside the immediate Saint - Flaco claim boundaries in the south and southeastern part of Fig. 3. Preliminary conodont dating has shown that the M_1 horizon is Frasnian in age whereas M_2 and M_3 appear to be Famennian in age (M. Orchard pers. comm. 1985).

The Ba mineralized intervals vary from 8 - 45m in thickness. They typically consist of beds of fine-grained massive-laminated barite, laminated fine-grained pyrite with rare sphalerite and galena, 10 to 100 cms thick and intercalated with un-mineralized black cherty argillite and chert beds 10 to 100 cms thick. The sulphide content of the barite beds varies from zero to 5% by volume.

The intense folding and shearing has locally produced strong transposition fabrics.

Detailed logging has revealed that distinct cycles of mineralization can be identified within any one mineralized interval. These cycles are characterised by thick bedded barite units at the base and these decrease in thickness toward the top of a cycle. Massive barite and laminated pyrite concentrations also decrease upwards within a cycle and the proportion of laminated and blebby barite increases toward the top of the depositional cycle. This cyclicity is used to identify tops of barite units and to correlate units in the map area.

In the Saint-Flaco area the bedded barite units appear to be almost totally barren of sphalerite and galena although earlier geochemical surveys have detected Pb and Zn anomalies. The structural interpretations (Fig.4) allow considerable tonnage potential down dip in the thrust bound packages and the thicknesses and nature of the barite units should be tested by drilling.

CONCLUSIONS AND RECOMMENDATIONS

The detailed structural and stratigraphic mapping of the Saint 3 and Flaco claims has shown that there are three units of barite mineralisation that occur in thrust bounded packages largely on the Saint 3 claim (Fig. 4). Unit M_2 is interpreted to underlie the central part of the Saint 3 claim (Fig. 4) and should be tested by drilling. Units M_1 and M_2 occur in the northeastern corner of the Saint 3 claim and also warrant testing by drilling. The Flaco claim is not regarded as having significant mineralisation potential and drilling is not recommended.

The limonitic spring gossans described in earlier reports have no association with mineralised units and do not warrant further investigation.

Outside the Falco and Saint claims drilling is also recommended to test the baritic mineralised units at depth.

APPENDIX 1**STATEMENT OF QUALIFICATIONS**

I, Martin W. Insley, Geologist, with a business address in Whitehorse, Yukon Territory and a residential address in London, UK., hereby certify that:

1. I graduated from the University of London in 1982 with a BSc.(Hons) in Geology and in 1985 with an MSc DIC in Structural Geology and Rock Mechanics.
2. I am a Fellow of the Geological Society of London.
3. From 1981 to the present I have been engaged in research on the structure of stratiform Lead-Zinc deposits and have carried out field mapping programmes in the Canadian Cordillera from 1981 to the present.
4. I have personally carried out and participated in the field work reported herein and have participated in the interpretation of all data presented in this report.



Martin W. Insley, B.Sc. (Hons), M.Sc., DIC, FGS.

STATEMENT OF QUALIFICATIONS

I, Kenneth R. McClay, Geologist with a business address in Whitehorse, Yukon Territory, and residential address in London, UK., hereby certify that:

1. I graduated from the University of Adelaide, South Australia in 1971 with a BSc (Hons) in Economic Geology, in 1973 from the University of London with an MSc. & DIC in Structural Geology and Rock Mechanics and from the University of London with a PhD in Structural Geology in 1978.

2. I am a Fellow of the Geological Society of London and an Associate Member of the Institution of Mining and Metallurgy.

3. From 1971 to the present I have been actively engaged on research on the deformation of stratiform sulphide deposits in Australia, Greenland and Canada. Since 1979 to the present I have been actively involved in field mapping and structural programmes in British Columbia and the Yukon Territory.

4. I have personally participated in and supervised the fieldwork reported herein and have interpreted all data resulting from this work.



Kenneth R. McClay. B.Sc.(Hons), M.Sc. & DIC, PhD, FGS, AIMM.

APPENDIX 11 - SUMMARY OF COSTS

SUMMARY OF COSTS FOR WORK PERFORMED ON THE SAINT 3 AND FLACO CLAIMS FROM JULY 19TH TO AUGUST 7TH, 1985.

CAMP MOBILISATION

2 Fixed wing flights Dease Lake to Driftpile Creek and shipment of equipment from Whitehorse. (Total \$1299.96)

Charged at 30% total mobilisation - \$ 389.99

SUBSISTENCE - Food Supplies \$ 841.89

CAMP MAINTENANCE

Repair of Base Camp frame tents, new tarpaulins, Coleman lanterns and general repairs.

\$ 416.70

HELICOPTER COSTS

Okanagan Bell 206B

9.5 hours at \$450.00 hour

Fuel 245 gals @ \$5.00 gal.

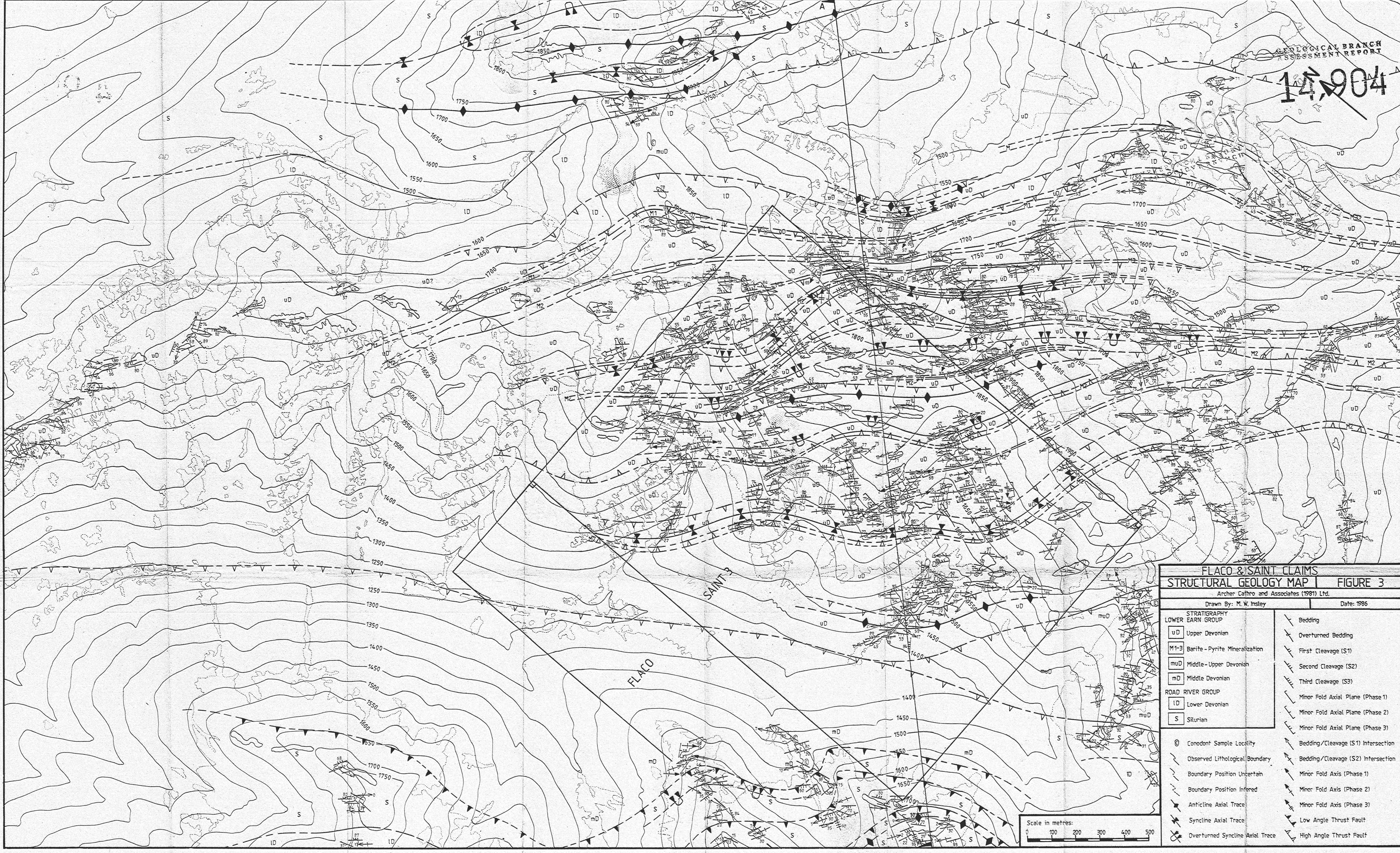
9.5 hours oil @ \$1.00 hour

\$5509.50

REPORT PREPARATION -

\$ 400.00

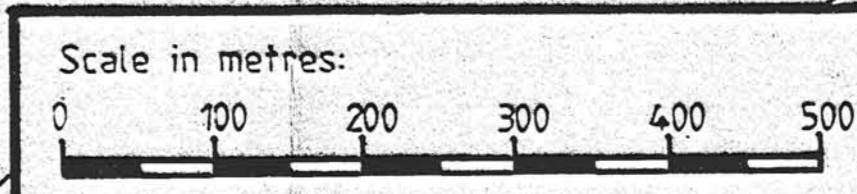
Total \$7558.08



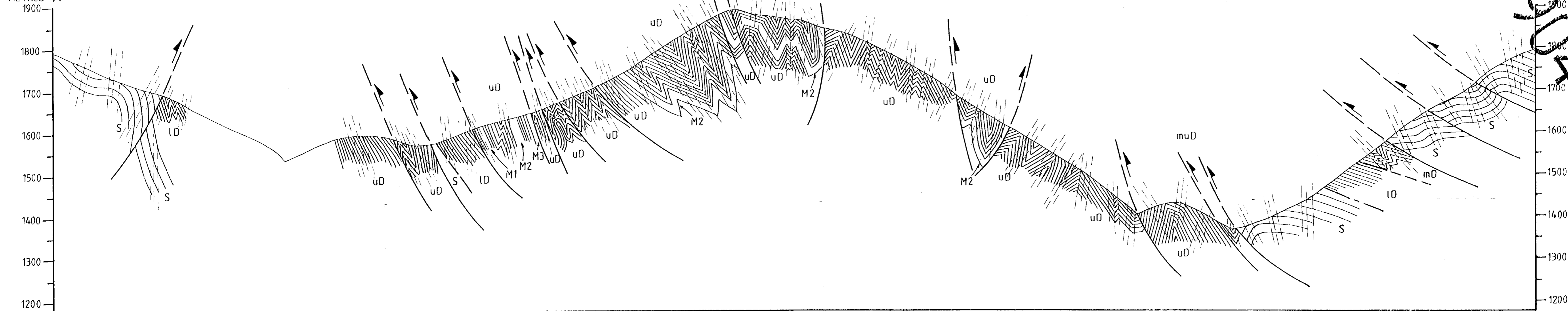
FLACO & SAINT CLAIMS
STRUCTURAL GEOLOGY MAP | **FIGURE 3**
 Archer Cathro and Associates (1981) Ltd.
 Drawn By: M. W. Insley | Date: 1986

STRATIGRAPHY	
LOWER EARLY GROUP	
uD	Upper Devonian
M1-3	Barite - Pyrite Mineralization
muD	Middle-Upper Devonian
mD	Middle Devonian
ROAD RIVER GROUP	
LD	Lower Devonian
S	Silurian

⊙	Conodont Sample Locality
—	Observed Lithological Boundary
- - -	Boundary Position Uncertain
- · - · -	Boundary Position Inferred
▲	Anticline Axial Trace
▼	Syncline Axial Trace
⊗	Overturned Syncline Axial Trace
—	Bedding
—	Overturned Bedding
—	First Cleavage (S1)
—	Second Cleavage (S2)
—	Third Cleavage (S3)
—	Minor Fold Axial Plane (Phase 1)
—	Minor Fold Axial Plane (Phase 2)
—	Minor Fold Axial Plane (Phase 3)
—	Bedding/Cleavage (S1) Intersection
—	Bedding/Cleavage (S2) Intersection
—	Minor Fold Axis (Phase 1)
—	Minor Fold Axis (Phase 2)
—	Minor Fold Axis (Phase 3)
—	Low Angle Thrust Fault
—	High Angle Thrust Fault



METRES A



LEGEND

- Bedding Form Lines
- S2 Cleavage
- Thrust Fault

FLACO & SAINT CLAIMS

STRUCTURAL CROSS-SECTION AA'

FIGURE 4

Archer Cathro and Associates (1981) Ltd.

Drawn By: M. W. Insley

Date: 1986

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