S. Richardson

Sorry you had to end up with the photo-copied plates/figures but I ran out of coloured ones.

ASPECTS

OF THE STRUCTURAL GEOLOGY

OF THE ZEEHAN DEPOSITS

June 1983

Distribution:
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ABSTRACT

1:500 structural mapping has been undertaken of an area on Queen Hill in the vicinity of the Zeehan Deposits. Two major deformations are recognised. Both are considered to be Devonian.

The first (D1) is expressed as moderately doubly plunging NE trending tight to isoclinal folds with weak fabric development. A layer parallel cleavage is folded implying a possible previous deformation. A disrupted macroscopic D1 anticline is considered to relate the Montana-Severn-Golf Course and Queen Hill horizons as well as correlate the Queen Hill Volcanics with the Cambrian Crimson Creek tuffs and wackes.

The second deformation (D2) produced upright generally SE plunging folds with moderate to strong fabric development. The southern end of a major D2 fracture zone between the D2 Zeehan Syncline and Heemskirk Anticlinorium appears to be the locus for a late intrusive phase of the Heemskirk Granite. Hydrothermal solutions eminating from or around this intrusive have migrated along possible Precambrian to Devonian faults, shears and zones of fracturing. Where these fractures cross reactive pyritic $\pm$ carbonate stratigraphy, the cassiterite sulphide bodies have formed.

Mineralisation associated with this phase is superimposed onto the overall zoning of the Zeehan field which is associated with Heemskirk Granite. A NE trending magnetic, gravity and Landsat Linear of unknown significance passes through the Zeehan Deposits.

1. INTRODUCTION

In October 1982, Dr. T. Hopwood visited the Zeehan Deposits with the purpose of reviewing the geological setting of the deposits and to suggest guidelines for further work.

The visit confirmed the structural/stratigraphic concept for the localisation of cassiterite-sulphide mineralisation at Zeehan. Although detailed lithological mapping has been completed in the past, little structural work has been undertaken at Queen Hill apart from a stereographic analysis by Lutley (1975).

It was recommended that 1:500 structural fact mapping be undertaken in the immediate prospect area. This structural data was to be viewed in context by examining the surrounding area using various means such as air-photo interpretation and ultimately by regional structural fact mapping.

This report describes the results of this work and recommends certain aspects for further follow up.

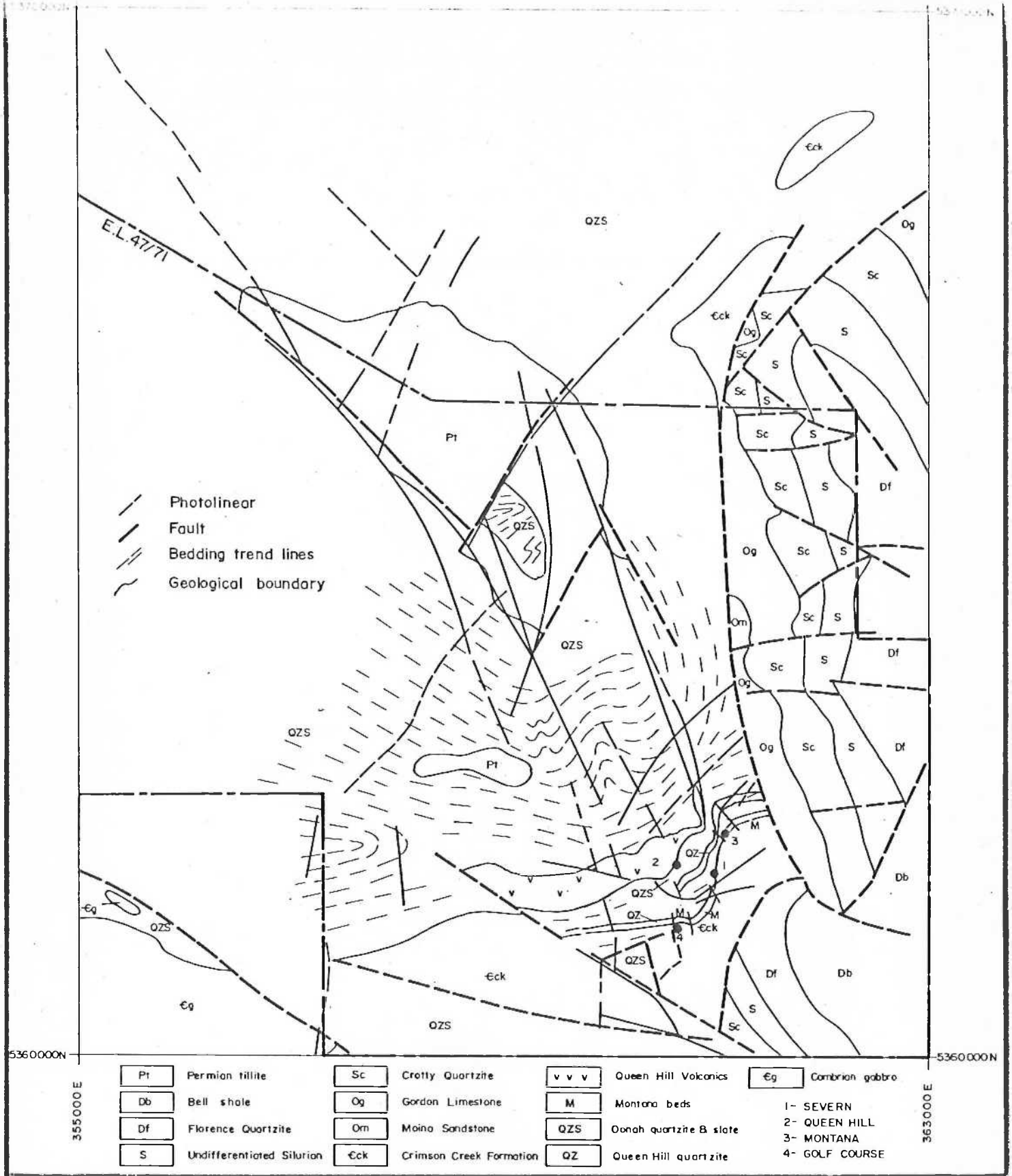
II. LITHOLOGIES

Rocks outcropping in the vicinity of the Zeehan Deposits range in age from Upper Proterozoic to Lower Devonian (Plate QH230). Host rocks to the mineralisation are Upper Proterozoic to Cambrian in age. The structural complexity at Queen Hill necessitates that a stratigraphic sequence will be dependent upon a structural interpretation. Two stratigraphic successions have been proposed for the Zeehan area.

A simple SE younging sequence is the traditional view with the resulting succession shown on Plate QH226(A). Detailed descriptions of units shown can be found in Blisset (1962) and Taylor (1980).

The recognition of an early deformation phase of mesoscopic tight to isoclinal folds on Queen Hill led Lutley (1975) to propose a model invoking structural repetition of all major units in the Precambrian-Cambrian rocks in the Queen Hill area; Fig 1. This leads to a simplified stratigraphic column; Plate QH226(B).

This succession is accepted for the purpose of this report for reasons explained in Section IV.



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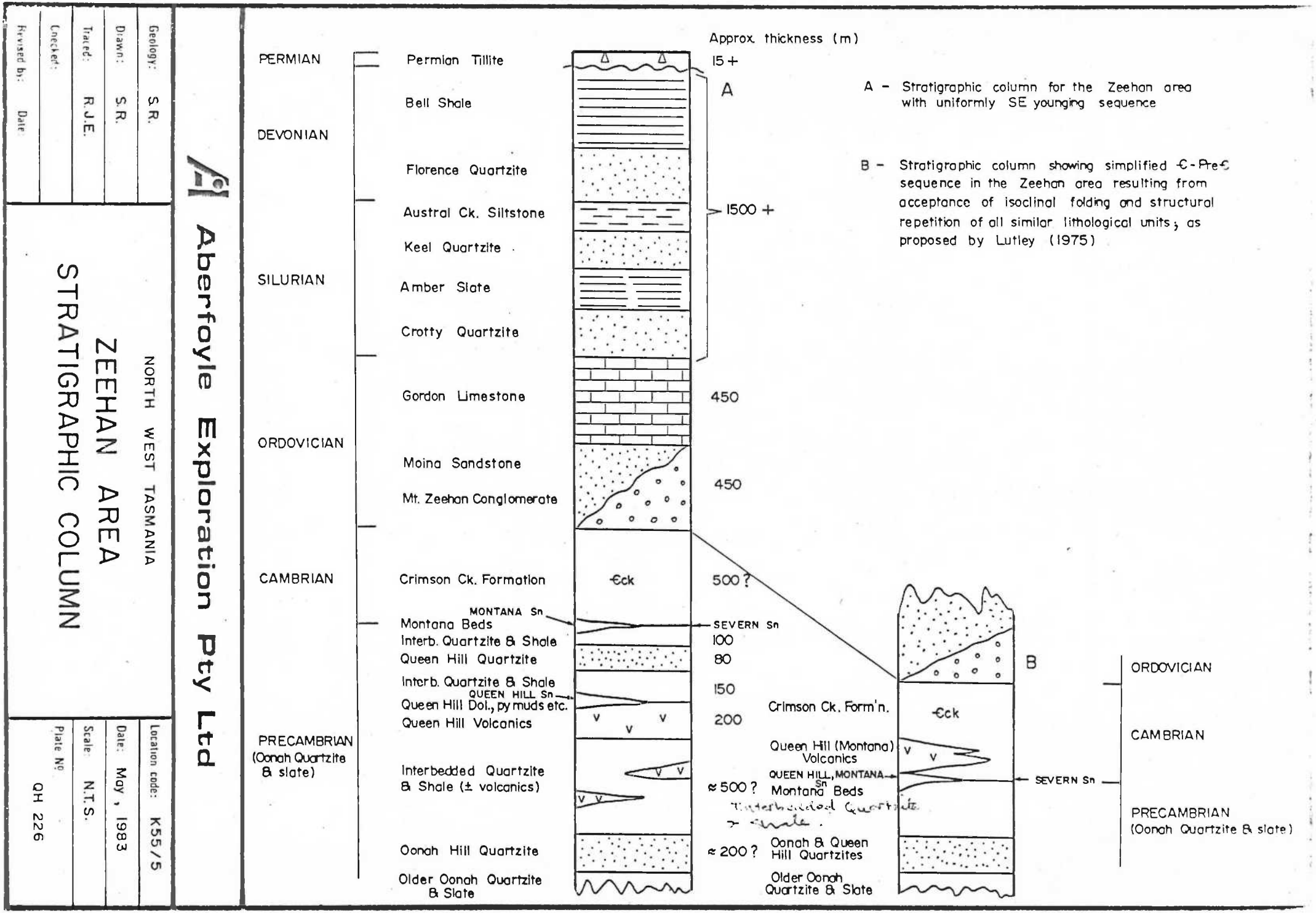
Geology:	NORTH WEST TASMANIA	Location code: K55/5
Drawn: S.R.	ZEEHAN AREA - SUMMARY GEOLOGY	Date: May, 1983
Traced: R.J.E.	PHOTOLINEARS & BEDDING TREND LINES IN PRECAMBRIAN ROCKS	Scale: 1:50,000
Checked:	(FROM QH86 & ZEEHAN 1 INCH TO 1 MILE SHEET)	Plate No QH 230
Revised by: Date:		


Aberfoyle Exploration Pty Ltd
ZEEHAN AREA
STRATIGRAPHIC COLUMN
NORTH WEST TASMANIA
Geology: S.R.
Drawn: S.R.
Traced: R.J.E.
Checked:
Revised by: Date
Location code: K55/5
Date: May, 1983
Scale: N.T.S.
Plate No: QH 226
Approx. thickness (m)
PERMIAN
Permian Tillite
15+
Bell Shale
A
DEVONIAN
Florence Quartzite
Austral Ck. Siltstone
>1500+
Keel Quartzite
SILURIAN
Amber Slate
Crotty Quartzite
Gordon Limestone
450
ORDOVICIAN
Moina Sandstone
Mt. Zeehan Conglomerate
450
CAMBRIAN
Crimson Ck. Formation
€ck
500?
MONTANA Sn
Montana Beds
SEVERN Sn
Interb. Quartzite & Shale
100
Queen Hill Quartzite
80
Interb. Quartzite & Shale
150
QUEEN HILL Sn
Queen Hill Dol., py muds etc.
Queen Hill Volcanics
200
PRECAMBRIAN
(Oonah Quartzite & slate)
Interbedded Quartzite & Shale (± volcanics)
Oonah Hill Quartzite
≈200?
Older Oonah Quartzite & Slate
A - Stratigraphic column for the Zeehan area with uniformly SE younging sequence
B - Stratigraphic column showing simplified €-Pre€ sequence in the Zeehan area resulting from acceptance of isoclinal folding and structural repetition of all similar lithological units; as proposed by Lutley (1975)
B
Crimson Ck. Form'n.
€ck
Queen Hill (Montana) Volcanics
QUEEN HILL, MONTANA Sn
SEVERN Sn
≈500? Montana Beds
Interbedded Quartzite + Shale.
Oonah & Queen Hill Quartzites
Older Oonah Quartzite & Slate
ORDOVICIAN
CAMBRIAN
PRECAMBRIAN
(Oonah Quartzite & slate)

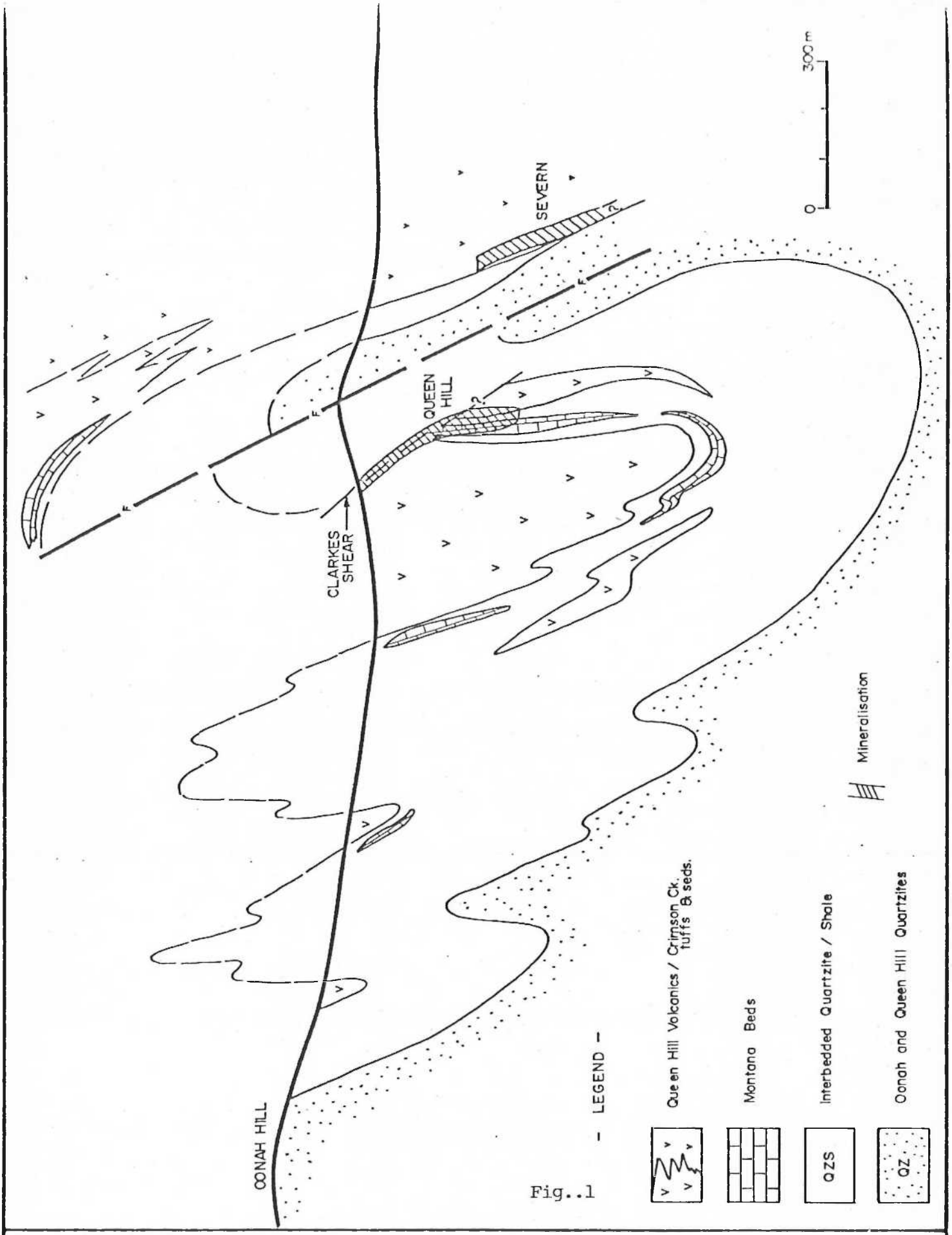


Fig..1

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Drawn: S.R.	NORTH WEST TASMANIA	Location code: K55/5/50
Traced: R.J.E.	ZEEHAN DEPOSITS	Date: June, 1983
Checked	INTERPRETIVE CROSS SECTION (3100)	Scale: 1:10,000
Revised by: Date	modified from Lutley (1975), Taylor (1980)	Plate No QH 231

III ASPECTS OF THE REGIONAL SETTING

1) INTRODUCTION

Information from numerous sources was compiled to examine the setting of the Zeehan Deposits. The Zeehan Deposits are an integral part of the Zeehan silver-lead field which extends to the south of the southern border of EL 47/71 and hence a weakness of the work was its limit to this boundary.

2) PHOTOLINEARS & BEDDING TRENDS

A photo-linear study was made of the area shown in Plate QH230. The most striking feature is the NW trending (145 MAG) corridor of linears which extends at least from the Pieman River and appears to terminate near Queen Hill. The western edge of this zone is a very strong photo-linear defined by drainage and abrupt changes in topography. The present outcrop pattern of Permian tillite on EL 47/71, except for a small outcrop on Oonah Hill, is confined to this zone.

The bedding trend lines in the Precambrian rocks around Queen Hill are shown on Plate QH230. This information was obtained from photo-interpretation and the Zeehan 1 mile sheet.

Two generations of macroscopic folds can be recognised; one set with E-W trending axial planes and another with a NW-SE trend. The most prominent feature is the zone of intense NW fold development occuring at the end of and within the zone of NW trending photo-linears. The photo-linears are axial plane to these folds. When viewed together, this set of linears appears to represent a structurally active zone with ductile deformation in the

southern end whilst to the north the zone may be an expression of fracturing only.

3) ZONING OF ORE AND GANGUE MINERALOGY

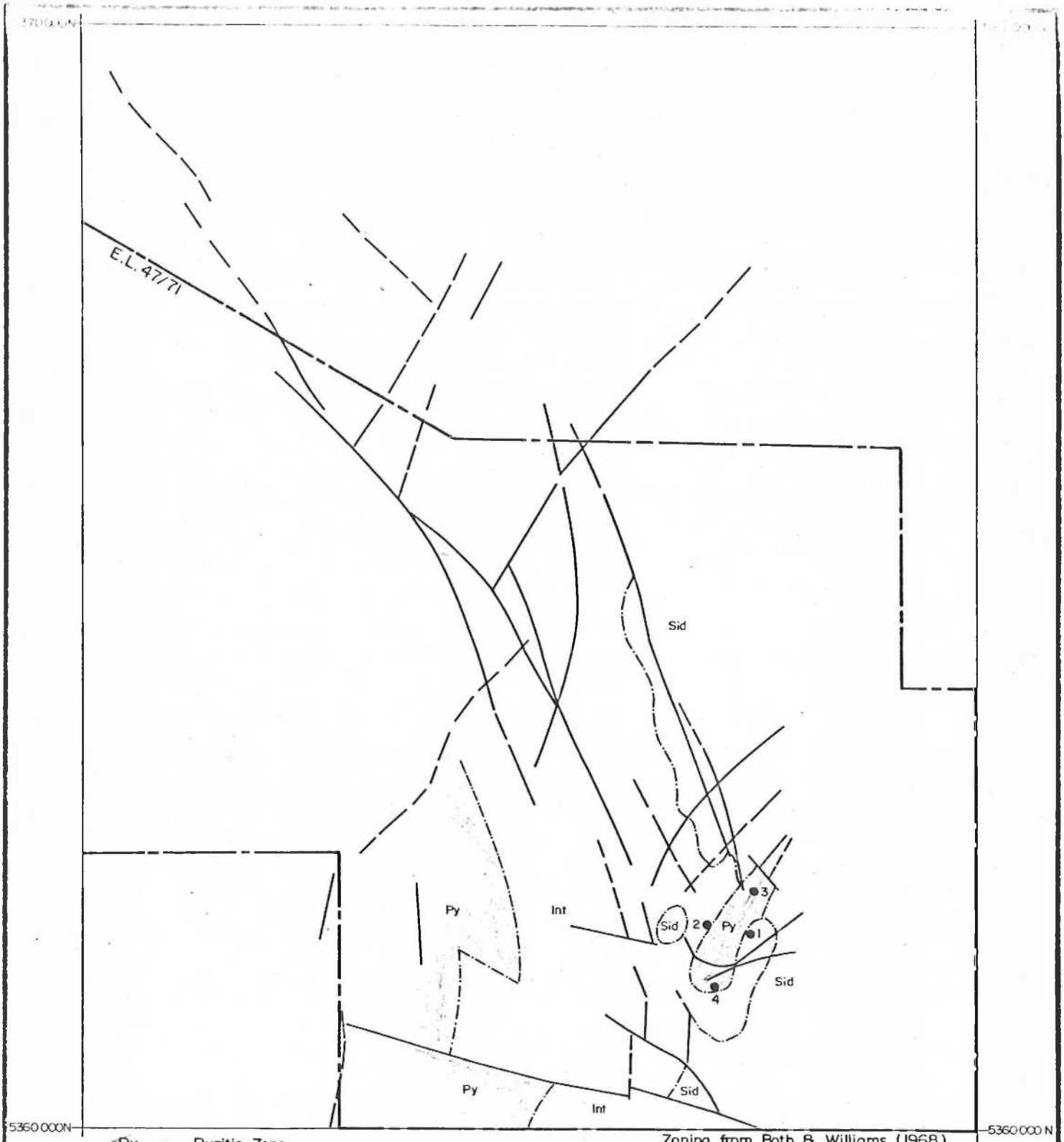
Both and Williams (1968) identified an essentially concentric pattern of mineralogical zoning of ore and gangue minerals of the Zeehan lodes around the SE margin of the Heemskirk Granite. From the margin of the granite passing to the east toward Zeehan, pyritic, sidero-pyritic and sideritic zones of gangue mineralogy were recognised.

In the Queen Hill area an anomalous pyritic zone was noted with which the Zeehan Deposits are associated. This zone is located at the southern end of the NW trending photo-linear zone; (Plate QH227). Both and Williams attributed this area of pyritic mineralisation to a later phase intrusion and associated mineralising event. The pyritic mineralisation is envisaged as being superimposed on to the overall regional zoning around the Heemskirk Granite.

4) MAGNETICS

The Zeehan Deposits are located and their individual magnetic responses (Severn and Queen Hill) are superimposed upon a broad magnetic high indicative of a deep seated source. This source is considered to be a magnetic aureole around a granitic cupola situated beneath Queen Hill as suggested by Both and Williams.

This currently hypothetical cupola would be located at the southern end of the NW trending photo-linear zone; (Plate QH229).



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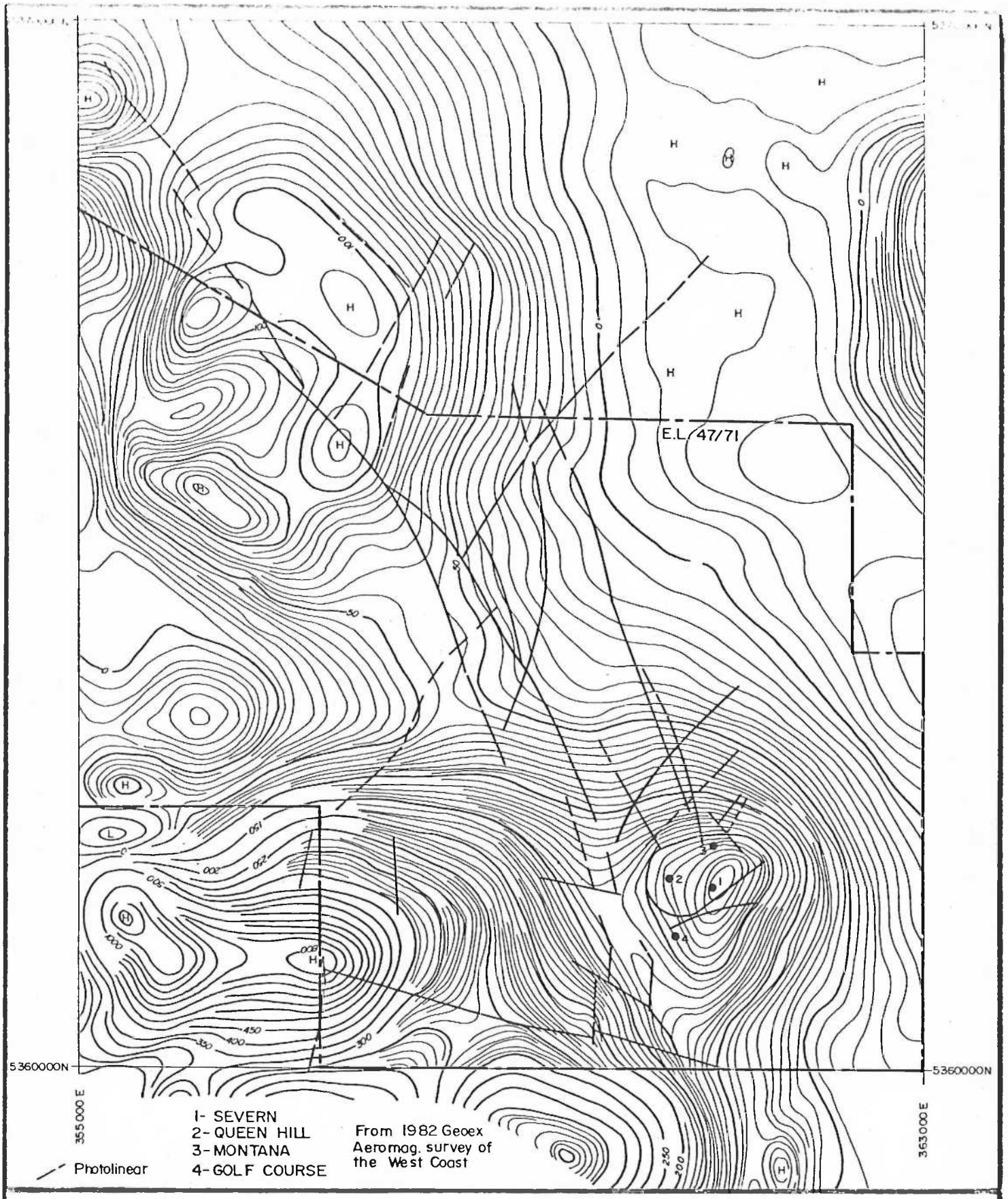
Geology:	NORTH WEST TASMANIA	Location code: K55/5
Drawn: S.R.		Date: May, 1983
Traced: R.J.E.	ZONING OF GANGUE MINERALOGY IN THE ZEEHAN LODES	Scale: 1:50,000
Checked:		Plate No QH 227
Revised by: Date:		



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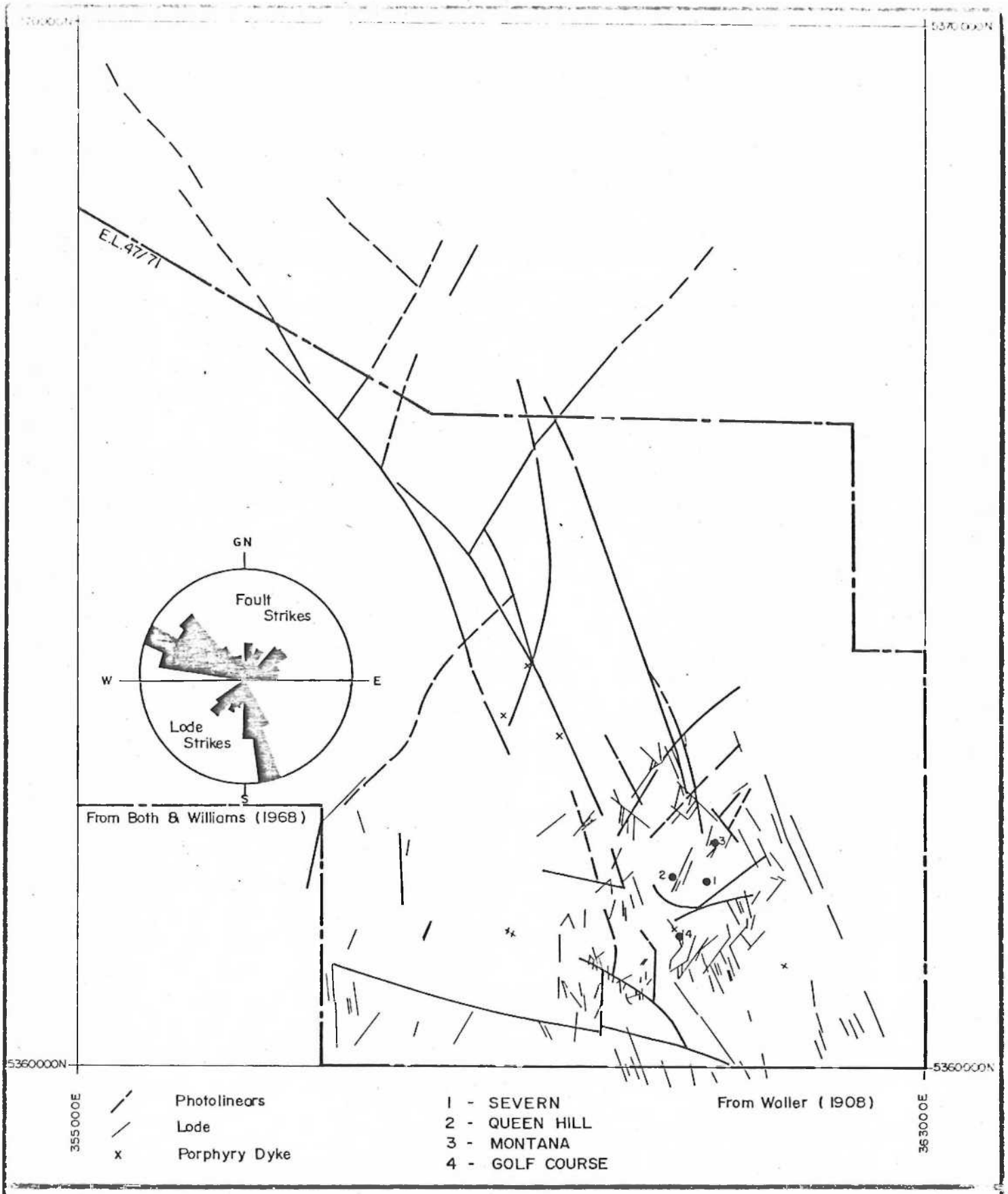
Geology:	NORTH WEST TASMANIA	Location code: K55/5
Drawn: S.R.		Date: May, 1983
Traced: R.J.E.	ZEEHAN AREA AEROMAGNETICS	Scale: 1:50,000
Checked:		Plate No QH 229
Revised by Date:		

5) LODE ORIENTATION

The orientation of the mineralised fissures of that part of the Zeehan Field covered by this work are shown on Plate QH228. Two dominant orientations are present. A NW orientation parallel to the photo-linear zone and a more variable NE trend.

6) NE LANDSAT, MAGNETIC AND GRAVITY LINEAMENT

A prominent NE trending magnetic, gravity and Landsat lineament (Laurasian Primary) of unknown significance passes through the Zeehan Deposits; see figs 2 & 3. This feature is orthogonal to the NW trending zone discussed above with the intersection of the two features occuring at the position of the Zeehan Deposits.



Aberfoyle Exploration Pty Ltd

Geology:	NORTH WEST TASMANIA	Location code: K55/5
Drawn: S.R.	ORIENTATION OF THE ZEEHAN LODES	Date: May, 1983
Traced: R.J.E.		Scale: 1:50,000
Checked:		Plate No QH 228
Revised by: Date		

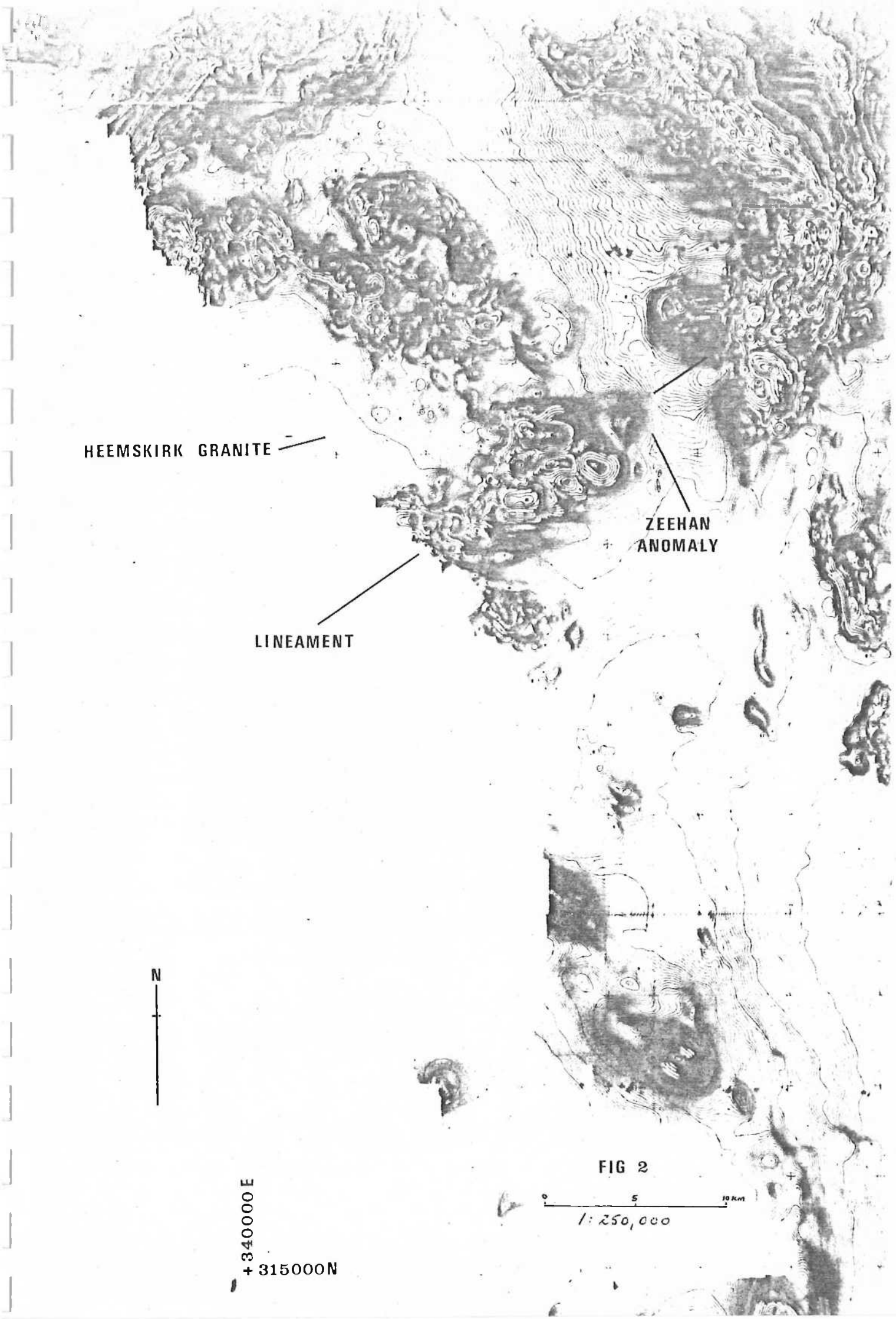
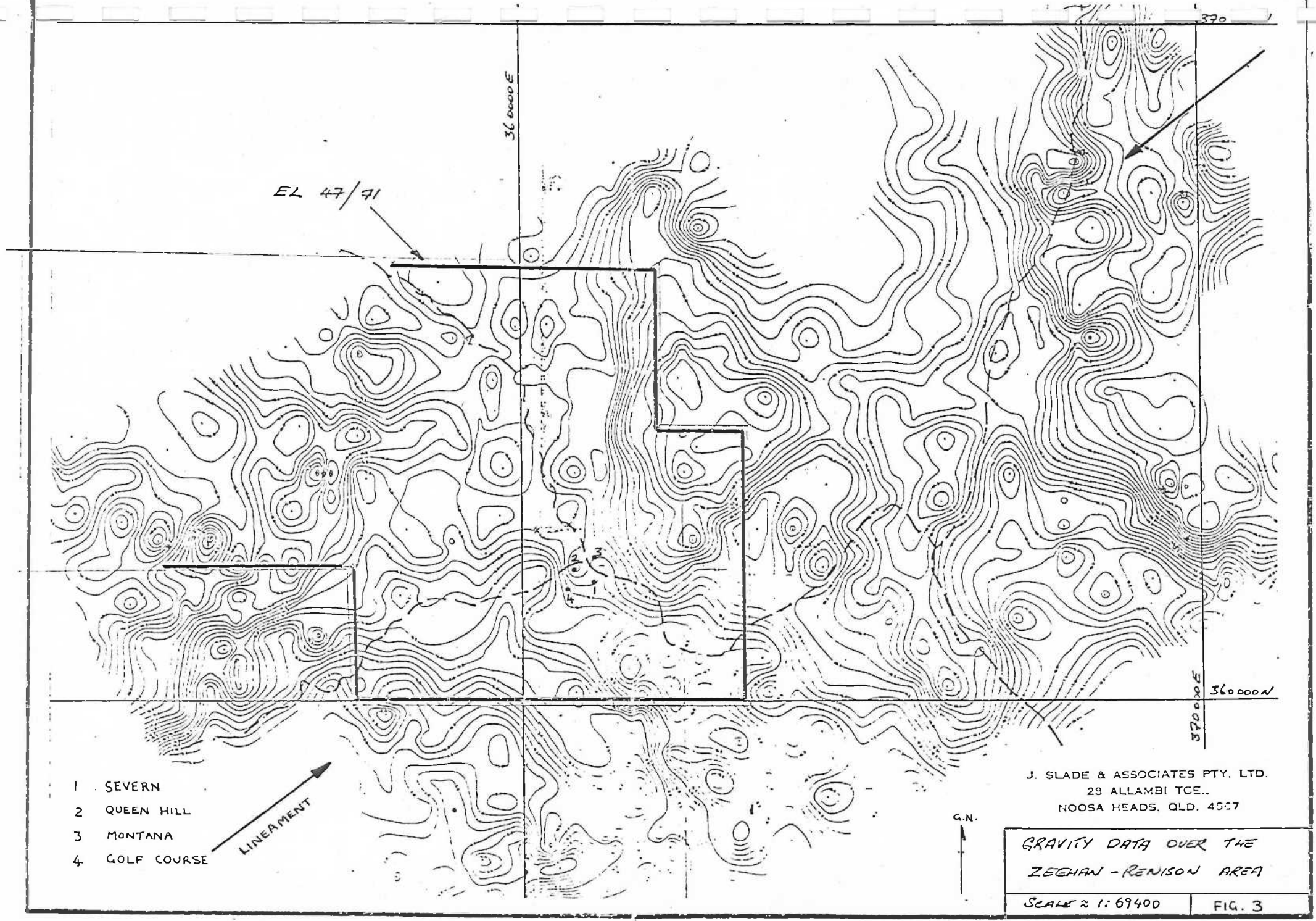

HEEMSKIRK GRANITE
ZEEHAN
ANOMALY
LINEAMENT
N
+340000E
+315000N
0
5
10 km
1: 250,000

FIG 2



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NOOSA HEADS, QLD. 4567

GRAVITY DATA OVER THE ZETHAN - RENISON AREA

SCALE ≈ 1: 69400 | FIG. 3

IV 1:500 STRUCTURAL MAPPING

1) INTRODUCTION

Structural mapping of Queen Hill 1:500 sheets 04/15, 04/17, 08/15 and 08/17 was undertaken with a view to determining the morphotectonic history of the Queen Hill area and to examine any association between structure and mineralisation.

At least two deformational events are recognised.

2) THE FIRST DEFORMATION

The first deformation (D1) produced upright to shallowly inclined tight to isoclinal folds with axes that generally have a moderate plunge to the NE or SW; (Plate QH220 08/15). D1 folds are not common and are only observed in the QZS where they fold the bedding and layer parallel cleavage. They were observed on the scale of a few centimetres up to a couple of metres.

Fabric development (S1) associated with D1 is generally weak but may be intense in the hinges of some folds. The tight to isoclinal nature of D1 folds means that S1 is at a low angle or parallel to bedding, except in D1 fold hinges.

Lutley (1975) recognised these mesoscopic D1 folds and inferred the presence of a D1 macro-structure from them. She correlated every similar lithological unit in the Precambrian-Cambrian of the Queen Hill area to arrive at a particular macro-structural interpretation (Fig 1). This interpretation has been supported by Hopwood (1982) and slightly modified by Taylor (1980).

The presence of mesoscopic D1 folds does not necessitate any locally significant D1 macro-structure and therefore does not invalidate a uniformly SE younging sequence. Evidence for either interpretation is required in the form of consistent younging and/or vergence data. Unfortunately neither are common on Queen Hill.

During the course of this mapping, no conclusive D1 sense of vergence consistent with either model could be established due to the scarcity of D1 folds. Recorded younging directions are shown on the 1:500 maps. Younging consistent with Lutley's model occurs as overturned graded beds in QZS above the Queen Hill bench and as possible NW younging flame? structures along the volcanic contact in the Queen Hill bench area. Younging in the Queen Hill quartzite is always to the SE which is not consistent with an F1 axial plane in the middle of this unit as proposed by Taylor (1980). It may however, be consistent with the westerly limb of this F1 anticline being sheared off by an F1 axial plane fault as suggested by Lutley (1975). Indeed in all drill holes this contact is faulted or the site of shearing; although not unexpectedly considering the competency contrasts and intensity of deformation.

Despite not being proved that part of Lutley's model which invokes an anticlinal closure over Queen Hill is accepted for the following reasons:

1) An early NE trending folding event capable of producing the structure exists.

2) Younging directions appear to be consistent.

3) A result of the interpretation is that Severn, Queen Hill, Montana and Golf Course are all located at the same

stratigraphic level. They are associated with pyrite/ carbonate rich stratigraphy developed in or between fault bounded basins prior to the eruption of texturally diverse Cambrian basic-intermediate volcanics.

3) THE SECOND DEFORMATION

The second deformation (D2) produced the most prominent structures evident on Queen Hill. Open to tight folds which are upright to steeply inclined to either side of vertical are common. D2 fold axes have a generally constant NW trend and usually plunge steeply to the SW (Point maxima on stereographic projection of 75° to 125° MAG).

D2 fabric development (S2) is variable in intensity. It is expressed as a crenulation cleavage in the QZS where a layer parallel fabric exists and as a slaty cleavage in rocks not exhibiting a pre-existing cleavage such as the Crimson Creek Formation. Often associated with S2 development, is the remobilisation of syngenetic pyrite into S2; best seen on the Queen Hill bench.

The extreme case of S2 development is the formation of shears parallel to S2 which are common at an outcrop scale and range up to large shears such as the one passing through the Stormsdown Pit. Hopwood (1982) claims that these structures indicate zones of high fluid flow and hence may be significant as pathways for the flow of metaliferous fluids.

Shearing along S2 is most pronounced on the southern end of Queen Hill; (sheet 04/12). In this area D2 folds commonly display a shallower SE plunge than elsewhere and S2 development is more intense. The Queen Hill Quartzite in this locality has been sheared along S2 into a number of partially

fault bounded blocks. The sense of shearing and morphology of the quartzite are not fully understood in this area due to structural complexity and lack of outcrop, although the large quartzite lens in the vicinity of ZG68 is not considered to represent the easterly faulting of the main quartzite unit.

4) SHEAR ZONES

Several major shears are developed in the QZS on the western side of Queen Hill. The age and sense of movement of each is generally not clear. Most are dominantly NE in orientation and are approximately comfortable to bedding, although the position of Clark's Shear at depth is conjectural. In two cases they show evidence that they may be early formed fractures.

On the Queen Hill bench at several localities along the sinistrally sheared contact between the volcanics and pyritic and graphitic shales, in and adjacent to Clarke's Shear, "flame" structures with an apparent wet sediment origin occur. These appear to indicate that the shear was active at a time when the sediments were still wet. Clarke's Shear may initially have formed as a growth fault, albeit at a very shallow angle to stratigraphy, during the development of dolomitic and pyritic stratigraphy (Montana Beds) in fault bounded basins prior to the eruption of the Queen Hill Volcanics/Crimson Creek tuffs. Rapid burial by these volcanics may mean that the shear does not extend to the north into the Queen Hill Volcanics.

Taylor's Shear also shows signs of an early history. In Taylor's Pit (1790N, 720E)) contorted finely laminated pyritic muds and pyritic clasts in and adjacent to the shear indicate that this fracture may have been active and a source of

fumarolic sulphides at the time of QZS deposition.

The apparently sinistral NW shear passing through the Stormsdown Pit based on orientation is considered to be associated with D2.

Despite the possible Pre or early Cambrian origin of some of these shear zones, they have remained open during the Devonian as Clarke's and Taylor's Shears at least are the loci for Devonian fissure lode mineralisation.

5) THE AGE OF DEFORMATION RECOGNISED AT QUEEN HILL

The structures and tectonics of Western Tasmania have been described by Carey (1953), Solomon (1962), Blisset (1962), Campana and King (1963) and Williams (1978) The nature of Precambrian-Cambrian tectonism (Penguin Orogeny) on the West Coast does not appear to be properly understood. Devonian (Tabberabberan) deformation has produced the most prominent structures.

Two phases of Devonian deformation are recognised. Macroscopic first phase folds have been recognised paralleling the margins of the Tyennan Geanticline. Carey (1953) and Solomon (1962) noted that the grantitoids of western Tasmania tend to lie within postulated macroscopic first phase anticlinoria, (Fig 4). These first phase Devonian folds in the Zeehan area trend NE (Fig 5) and therefore the NE trending D1 folds mapped on Queen Hill are ascribed to this event. However, this correlation is based entirely on orientation. D1 structures are noticeably absent from the Crimson Creek argillites which may indicate the association of D1 folding with the Penguin Orogeny. This would invalidate the concept of a macroscopic D1 isocline on Queen Hill and the correlation of

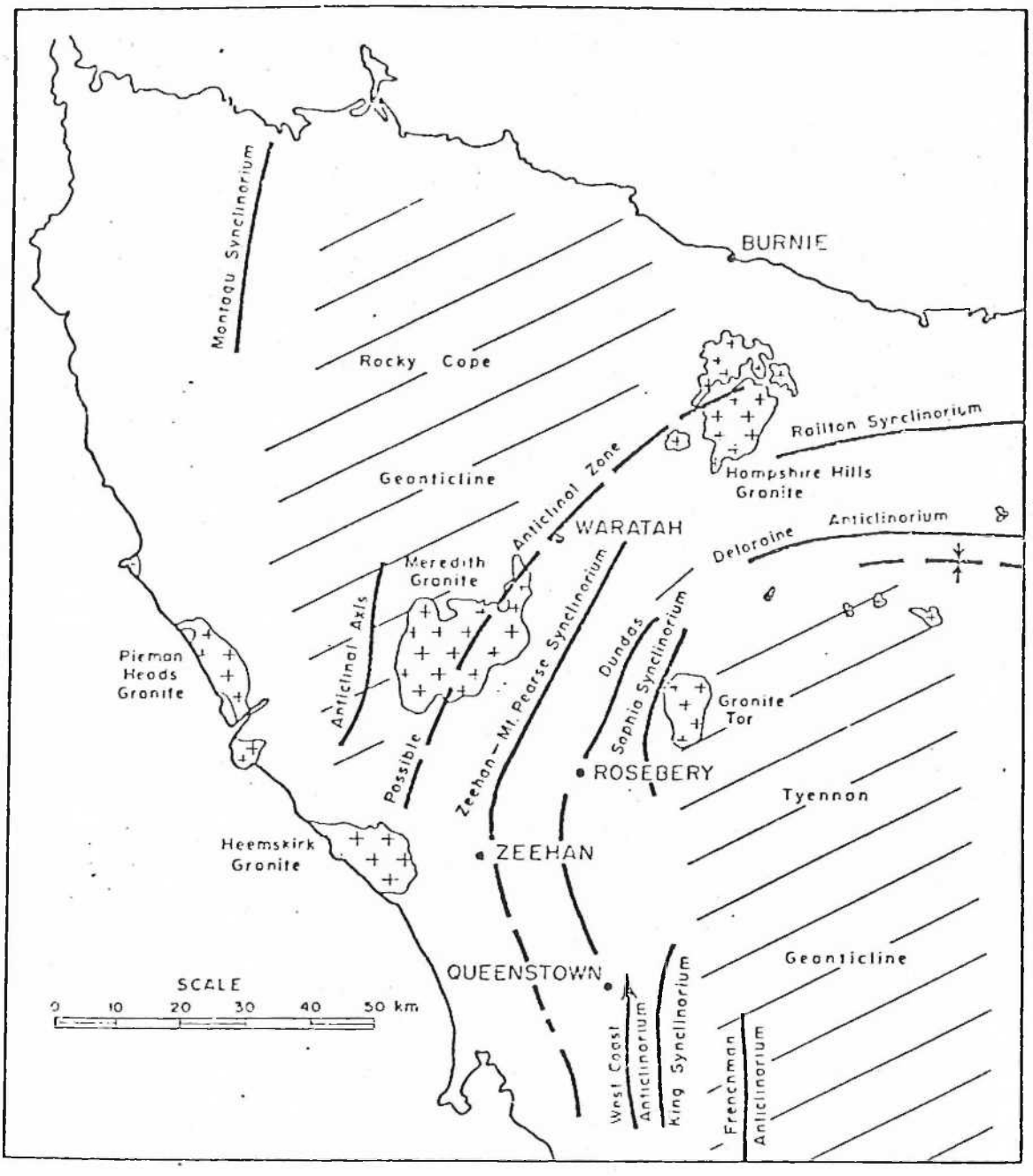

Figure 4: Early Folds of the Tabberabberan Orogeny in North West Tasmania

after Solomon (1965) From Lutley (1975)

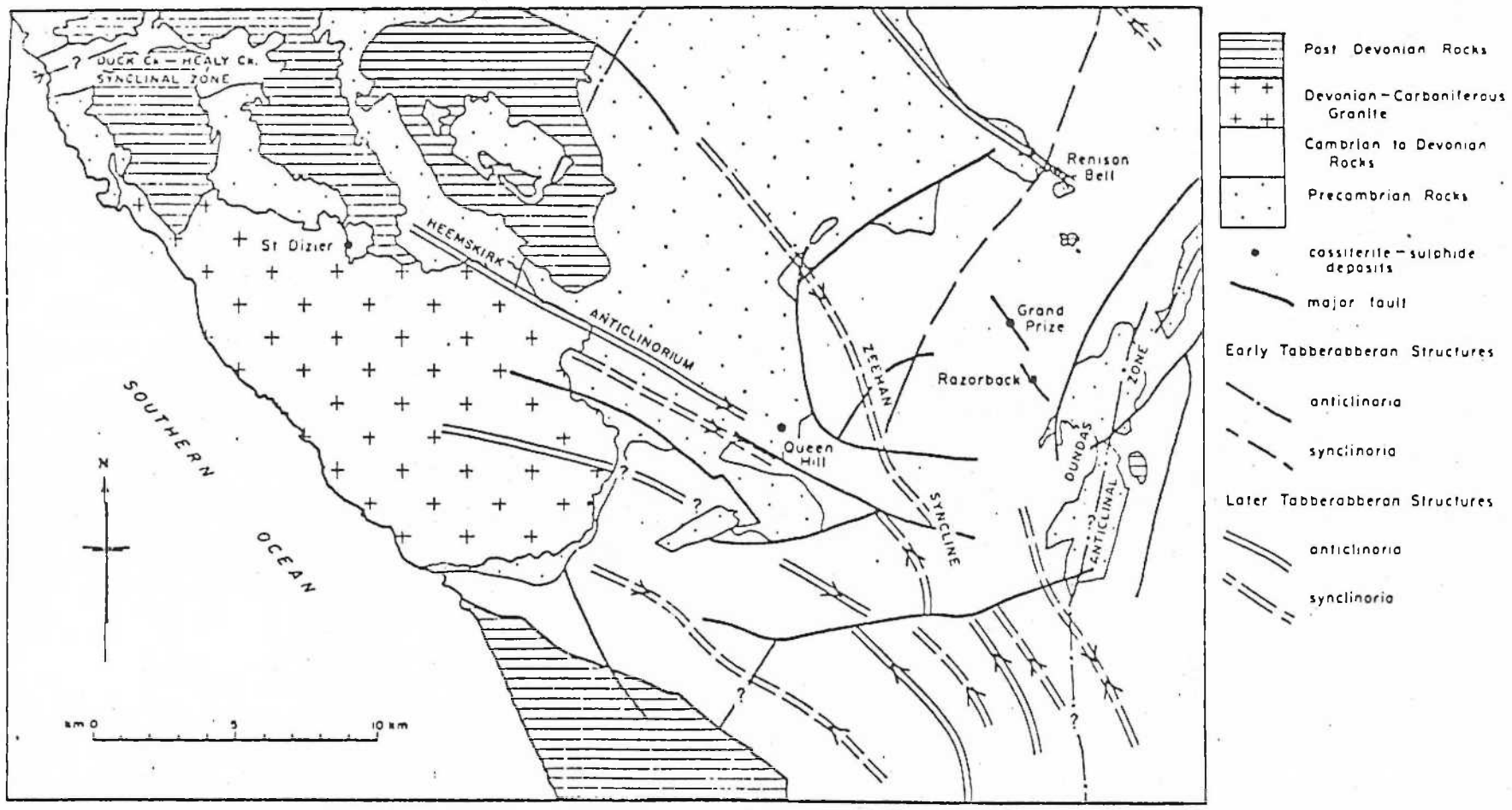

Figure 5: The Structure of the Zeehan Quadrangle

after Blissett (1962) with information from Klominsky (1972) and Solomon (1965).

From Lutley (1975)

the Queen Hill Volcanics and Crimson Creek tuffs.

More prominent second phase Devonian structures overprint these earlier structures and are described by Carey (1953) as "NW Trending folds, parallel shears and normal tension faults". The Zeehan Deposits occur between two macroscopic folds termed the Zeehan Syncline and the Heemskirk Anticlinorium.

The D2 structures mapped on Queen Hill and those associated with the NW trending photo-linear zone are consistent in orientation and style with this event and are attributed to it.

6) POSSIBLE PRE-D1 STRUCTURES

Most of the structural information collected is from rocks considered to be Precambrian in age (Oonah Formation). Workers mapping rocks of equivalent age, Williams (1982) and Brown (1980) report up to three deformational events associated with the Precambrian Penguin Orogeny. A structural break exists at the top of the Oonah and these structures are not found in younger rocks. At Queen Hill there is only minor evidence of Precambrian tectonism.

Folds ascribed to D1 can be seen to deform not only bedding but also a layer parallel cleavage. This layer parallel cleavage is defined by the prefered orientation of micas and is not present in similar bedded sediments of the Crimson Creek Formation. It may be a well developed bedding compaction foliation but may also be associated with an earlier isoclinal folding event. Rare isoclinal folds have been observed at surface and in drill core in the QZS which display a well developed layer parallel cleavage.

V STRUCTURAL - STRATIGRAPHIC ASSOCIATIONS OF MINERALISATION

1) INTRODUCTION

Hopwood (1982) states that the geological environments of ore deposits can be analysed in terms of:

1) Sulphur source - The structural model accepted in this report locates Severn, Queen Hill, Montana and Golf Course at the same stratigraphic level. Cassiterite - sulphide mineralisation is associated with pyrite ± carbonate rich stratigraphy developed at this level.

2) Metal source - Mineralisation at Zeehan is associated with hydrothermal fluids derived from or circulated by the Devonian Heemskirk Granite or an associated later phase underlying Queen Hill.

3) Concentrating mechanism - Pre-existing or Devonian shears/ faults or zones of fracturing have allowed the flow of metal bearing fluids into zones of reactive pyrite-carbonate rich stratigraphy. Physical-chemical changes in this environment have induced metal precipitation.

The Zeehan Deposits can be viewed in the above context.

2) QUEEN HILL

It has long been recognised that the Queen Hill body is located at the intersection of a major mineralised shear (Clarke's Shear) with carbonate and pyrite rich stratigraphy at the transition from graphitic shales to andesitic volcanics.

3) STORMSDOWN

The mapping has indicated that the Stormsdown mineralisation

is located at the intersection of a weakly mineralised sinistral NW trending D2 shear with an approximately ten metre thick pyrite rich sequence near the top of the QZS. The pod on the southern side of the shear has been drill tested. However, hole ZQ52 has intersected the mineralised stratigraphy (7.3m @ 0.89% Sn) on the northern side of the shear but has not been followed up. This area offers immediate potential for a small resource.

4) MONTANA

The mapping did not cover the Montana area. However a major NW trending sinistral fault is known to cross the carbonate and pyrite rich Montana Beds at the known northerly limit to the mineralisation. The fault appears to correlate with the No 1 slide intersected in the Montana No 1 and Western Mines where it is described as a weakly mineralised major shear up to fifty metres wide. Inferred length would be of the order of 800 metres.

This fracture is suggested as a feeder for the Montana body. As yet, only sideritic alteration of the host carbonate has been found on the northern side of the fault.

5) SEVERN

Early drilling indicated that the contact between the Oonah Formation and the Crimson Creek Formation was a fault but hole ZS81 has shown that the boundary is transitional with a pyritic, cherty, conglomeratic mundstone often defining the contract. This unit may represent an erosional surface formed at the time of Montana Bed deposition in fault bounded basins as it overlies Oonah Formation sediments ranging in age from the top of the Queen Hill Quartzite to the upper QZS. Tim Hopwood (pers. comm.) recognises syngenetic pyrite within the ore zone and cites the pyrite rich transition from the Precambrian

to the Cambrian as the reason for the preferential localisation of subsequent mineralisation near this contact.

The Severn mineralisation is fracture controlled occuring as net-veins with disseminations and local replacement, yet no known structure is associated with this body.

However, at the southern end of the known mineralisation, the basal Cambrian contact and associated mineralisation swings to the east resulting in a level plan morphology of the low grade envelope similar to that of Queen Hill (ie V-shaped). In addition this planar NW trending "limb" of mineralisation marks the incoming of the Montana Beds to the south with an associated apparent flattening of the stratigraphy. A significant fracture may be located in this vicinity although no evidence for one exists at surface.

Alteration assemblages at Severn vary downhole from chloritic to phlogopitic to tourmaline and tourmaline-topaz indicating a proximal granitic source. This combined with the lack of an identifiable structure, may indicate that fracturing at Severn is granite induced.

VI GEOLOGICAL MODEL

The preceding discussion appears to suggest the following as a model for the formation of the Zeehan Deposits.

Tight to isoclinal first phase (D1) Devonian? folding has produced a disrupted anticline at Queen Hill which correlates the Queen Hill Volcanics and the Crimson Creek tuffs and wackes together with the pyrite-carbonate rich stratigraphy underlying these volcanics on either side of Queen Hill.

The Heemskirk Granite was emplaced into the core of a postulated first phase Devonian (D1?) anticlinorium and hydrothermal fluids were circulated depositing mineralisation in pre-existing fractures producing the overall zoning of the Zeehan Mineral Field.

Second phase Devonian deformation (D2) presumably overlaps this mineralising event as silver-lead mineralisation is found in fractures paralleling and apparently related to the NW trending D2 fracture zone that has been recognised. Associated with D2 is the intrusion of a late phase of the Heemskirk Granite at the southern end of this zone beneath Queen Hill. High water flow associated with this intrusion may have allowed shearing along S2 and the intense D2 fold development on all scales within this area.

Hydrothermal solutions eminating from or around this intrusion have migrated along possible Precambrian to Devonian faults, shears and zones of brecciation. Precipitation of mineralisation within some of these fractures has produced the anomalous pyritic zone recognised by Both and Williams.

Where these fractures cross pyrite ± carbonate stratigraphy precipitation of cassiterite-sulphide mineralisation has been induced and the Zeehan Deposits have formed.

VII RECOMENDATIONS

Silver-lead and stanniferous fissure lode mineralisation identical to that of the Zeehan Field is present in the Dundas Mineral Field approximately eight kilometres east of Zeehan. Host rocks are of an equivalent age to those associated with the Zeehan Deposits.

An aerial photo study and compilation of available data should be prepared to determine if areas within this field show coincidence of features indicative of the setting of the Zeehan Deposits as described in Section III.

The 1:500 mapping has indicated two localities worthy of follow up. As mentioned previously, follow up drilling is required in the vicinity of ZQ52 to determine the potential for a small resource.

At 1972N, 629E laminated pyritic mudstones were observed. This outcrop is in the vicinity of the possible strike extension of Clarke's and the Stormsdown Shears. The association of cassiterite-sulphide mineralisation with pyritic stratigraphy and cross-cutting structures, indicates that this area requires costeaning, mapping and sampling.

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QUEEN No 4 SHAFT

ZQ 48

ZQ 46

ZQ3,4

ZQ7,8

ZQ 10
ZQ 25

ZQ26
ZQ22

ZQ14

ZQ66

SHEAR

CLARKES

QUEEN HILL REFERENCE PLANE

YOUNGING (Scour)

YOUNGING (cross bed)

breccia volc.

breccia tuff ?

sheared BSH

stumped SH

Py (syngenetic ?) in sheared BSH

sheared QZS

numerous massive QZ outcrops

light grey QZS

light grey SH

interbedded grey & BSH

Py, sph

Pug

1200 1210 1220 1230 1240 1250 1260 1270 1280

360400 E 450 E 500 E 550 E 600 E 650 E 700 E 750 E 360800 E

5361750 N 1700 N 1650 N 1600 N 1550 N 5361500 N

REFER SHEET 08/15 FOR LEGEND

State GN | Mag N | Rel Time

MAG 12°

00/17	04/17	08/17
00/15	04/15	08/15
00/12	04/12	08/12

Index to adjoining sheets

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Geology: S.R.	NORTH WEST TASMANIA	Location code: K55/5
Drawn: S.R.	CONSOLIDATED LEASE 36M/81	Date: May, 1983
Traced: R.J.E.	ZEEHAN DEPOSITS	Scale: 1:500
Checked:	STRUCTURAL GEOLOGY	Plate No QH 220 – 04/15
Revised by: Date:		

REFER SHEET 08/15 FOR LEGEND

04/20	08/20	12/20
04/17	08/17	12/17
04/15	08/15	12/15

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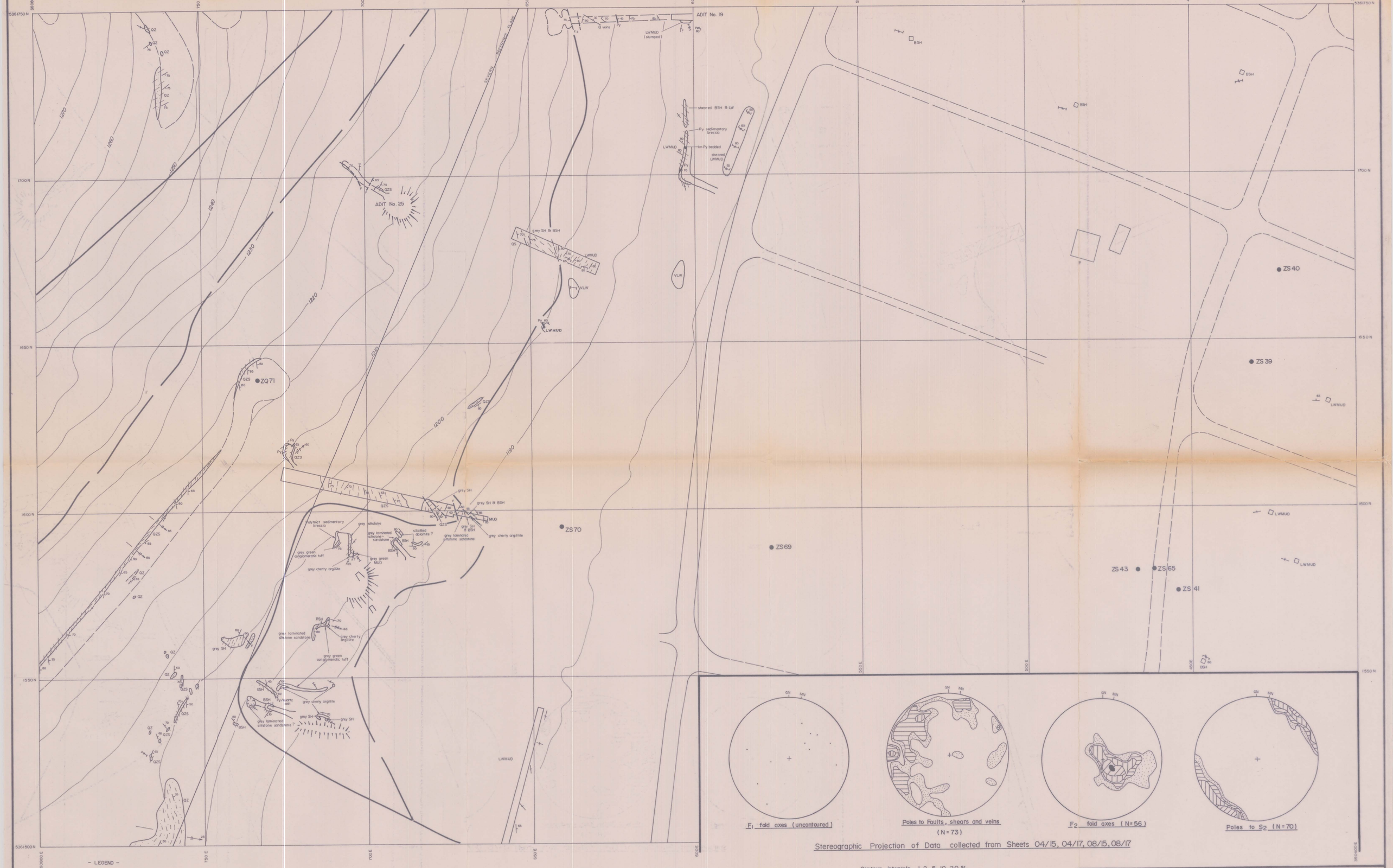
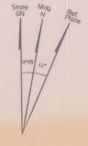
Passed by: Date:	
Location code: K55/5	
Date: May, 1983	
Scale: 1:500	
Plate № QH 220 - 08/17	



- LEGEND -

- Trend of bedding (So)
- Dip and strike of bedding (So)
- Dip and strike of cleavage (S1)
- Dip and strike of cleavage (S2)
- Vertical cleavage
- D1 fold showing vergence and plunge
- D2 fold showing vergence and plunge
- Fault showing dip, Fault zone
- Outcrop boundary
- Adit portal
- Shaft
- Trench, pit
- ZS70 DDH Collar & number
- Pyrite lode

MUD	Mudstone
VLW	Volcanoclastic lithic wacke
LWMUD	Lithic wacke & interbedded mudstone
SH	Shale
BSH	Carbonaceous shale
AN	Andesitic pyroclastics
QZS	Interbedded quartzite & shale
QZ	Massive to bedded quartzite



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04/15	08/15	12/15
04/12	08/12	12/12

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F_1 fold axes (uncontoured)

Poles to Faults, shears and veins (N=73)

F_2 fold axes (N=56)

Poles to S_2 (N=70)

Stereographic Projection of Data collected from Sheets 04/15, 04/17, 08/15, 08/17

Contour intervals 1, 2, 5, 10, 20 %

- >1 %
- >2 %
- >5 %
- >10%
- >20%

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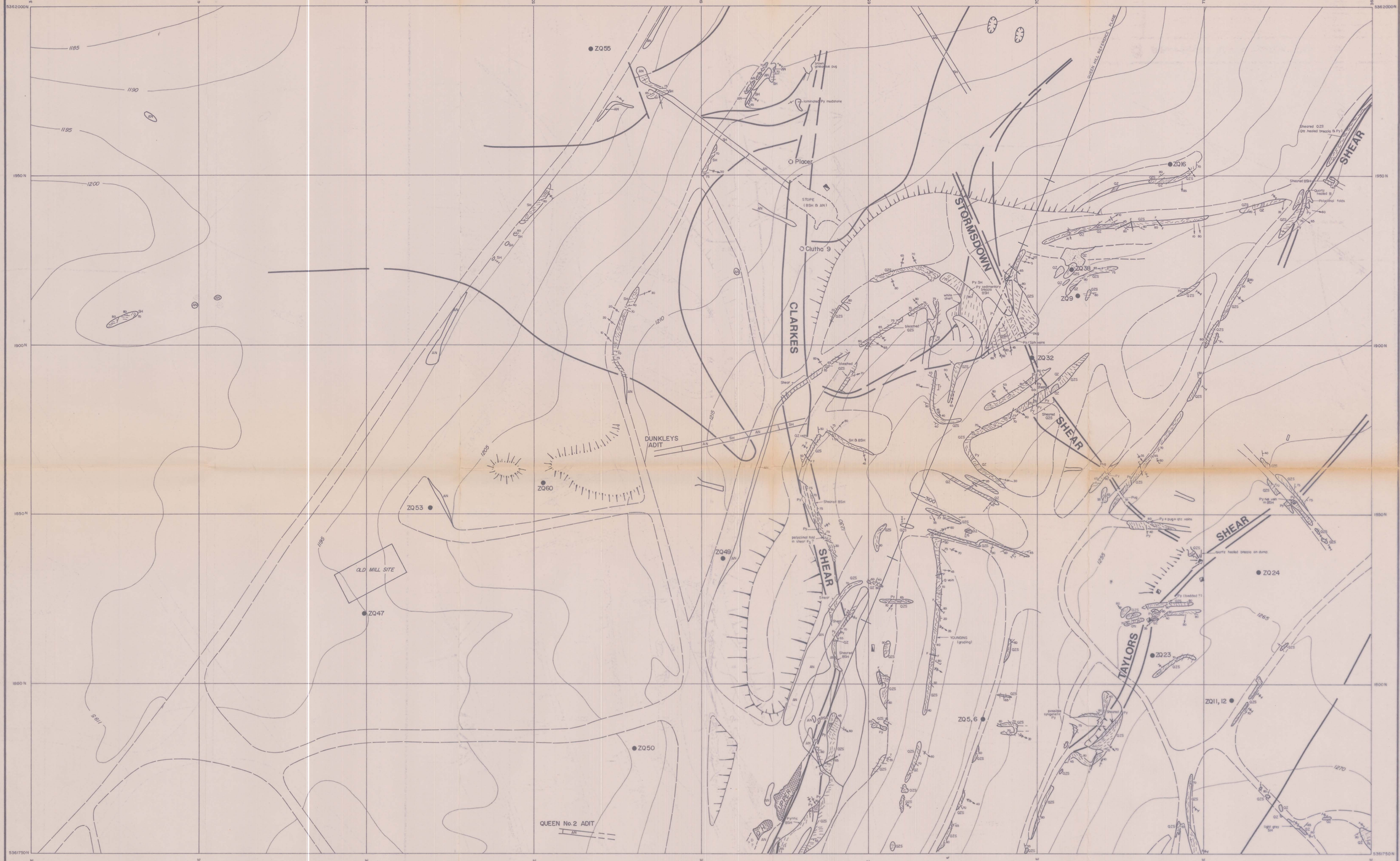

REFER SHEET 08/15 FOR LEGEND

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