121001

Aberfoyle Resources Limited

EXPLORATION DIVISION

90·3123R

CONSOLIDATED MINERAL LEASE 36M/81

QUEEN HILL

MINES
File Ref. 36m 81
-7 MAY 1990
Doc. Ref.
Action Officer | Initials
Refer to
Corres. 4.5.90.
Resubmit to | Date

PROGRESS REPORT

QUEEN HILL JOINT VENTURE

FOR YEAR ENDED

30TH APRIL, 1990

90-3123.R

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Appendix 2 Aberfoyle Resources Limited, Zeehan CML Tin Deposits, Technical Report, Geophysical Surveys 1989-1990, J. J. Read.

Appendix 3 DDH ZS92, detailed log, petrology reports and split core and core grind geochemistry location sheets and results.

Appendix 4 DDH ZS91, detailed log, petrology reports and split core and core grind geochemistry location sheets and results.

Appendix 5 DDH ZS90, detailed log.

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1. Summary of Exploration Activity

Exploration of CML 36M/81 for the year ended 30th April, 1990 involved 1320m of diamond drilling (2 holes) designed to test for a southern extension to the known Severn mineralisation. The target was generated from a recent structural re-interpretation of the Zeehan tin field by J. A. Anderson (PhD research in progress).

As a follow-up to the drilling programme an extensive geophysical programme of down hole and surface EM was undertaken.

Major results are:

i) The drilling programme successfully delineated a 900m southern extension to the previously known Severn ore position. The intersections in DDH's ZS92 and ZS91 were sub-economic in grade, 10.3m @ 0.38% Sn and 6.3m @ 0.44% Sn respectively.

ii) The initial down hole EM survey detected a long wave-length anomaly located off the western end of holes ZS91 and ZS92. Follow-up DHEM and UTEM surveys were undertaken to model these responses. It was concluded that the conductor detected during DHEM survey was due to the presence of two significantly conductive, large blocks of black shale located on the western flank of Queen Hill.

iii) The UTEM test survey over the known Severn ore position failed to clearly delineate the Severn ore body owing to masking affects of late time responses due to the lithological conductor to the west of Queen Hill and the presence of a highly conductive shallow cultural feature.

iv) The UTEM survey over the golf course area failed to detect any conductive responses attributable to the presence of a Renison style massive sulphide replacement body, hosted within the Poverty Point Beds. The survey does not sterilise potential for high grade cassiterite, low sulphide type mineralisation.

2. Introduction

Following the cessation of drilling within the Zeehan tin field in June 1982 an ongoing technical assessment of the data has been undertaken by Aberfoyle geologists. The study of the Zeehan tin field has formed the basis of J. A. Andersons' PhD.

A number of new conceptual targets were generated following a detailed re-assessment of all the Zeehan data accumulated since 1971.

The work programme over the last year has tested the most favourable target, a southern extension to the Severn body with the aim of increasing the Severn inferred resource to a 15 million tonne resource at >1% Sn.

This report outlines exploration conducted on the CML 36M/81 for the year ended 30th April, 1990.

3. Previous Work

An exploration joint venture between Cominco Exploration Pty. Ltd. and Gippsland Oil and Minerals N.L. was ratified on 27 March, 1972. Joint venture exploration had commenced in late 1970. Following the merging of Cominco Exploration into the Aberfoyle Group, member companies of the latter assumed management responsibility.

Early exploration concentrated on Queen Hill and continued there sporadically throughout the late 1970's and early 1980's. Following the realisation that the treatment of the Queen Hill ore would present major metallurgical difficulties, owing to the fine grained (less than 20 microns) nature of the cassiterite, the exploration programmes emphasis was shifted. Emphasis was then placed on expanding inferred resources of the Zeehan field to an economically viable size. The drilling effort concentrated on the expansion of the Severn and Montana resource.

Once it become apparent that the complex metallurgy of the Queen Hill ore would limit its processing by conventional flotation, a matte fuming study was commissioned. Between 1978-1982 the metallurgy of the Zeehan prospects was examined in detail. In June 1980 it was concluded that a bulk sample of Queen Hill ore would be required for test work at the Kalgoorlie matte fuming pilot plant and so a bulk sample of 2892.9 tonnes was extracted from the Queen Hill bench and Stormsdown pit for processing (Sise, 1981a).

In 1978 the existing data was reassessed, holes were re-logged, detailed surficial mapping commenced and a new series of 1:500 scale sections and R.L. plans were commissioned. It was concluded that only an inferred ore resource could be stated and that any subsequent drilling should aim to delineate the gross resources.

On 1st August, 1981 CML 36M/81 encompassing an area of 564 hectares was created through the amalgamation of seven previous leases over the Queen Hill area, the CML was granted for a period of 21 years (Sise, 1981b).

In June 1982 drilling on the CML ceased, with 89 diamond drill holes totalling 23004.56m of drilling completed to that point in time (Richardson & Sise, 1982). A data compilation was then undertaken prior to the preparation of the published resource. The total inferred resource using 0.1% Sn cut off was 7.3 million tonnes at 0.7% Sn which includes 1.8 million tonnes @ 0.8% Sn (Aberfoyle Limited, 1989).

From late 1982 until 1986 and the relinquishment of EL 47/71 surrounding the CML, exploration concentrated on the area outside the CML with work on the CML limited to data compilation, the production of R.L. plans and sections and computer data storage (Richardson & Rombouts, 1982), (Sise, 1986).

From 1983 to 1989 the major work on the CML has been the re-assessment of the data and relogging of drill holes by J. A. Anderson and accompanying petrographic and isotopic studies as part of his PhD research of the Zeehan tin field.

Results of this research formed the basis of the renewed exploration effort during 1989-1990.

4. Exploration Activity 1989-1990

4.1 Introduction

The area to the south of the known Severn mineralisation was recognised as having potential for hosting a substantial tin resource. The 1989/90 exploration programme was designed to test this potential. The target was generated following a recent structural re-interpretation of the area.

4.2 Geology

The surficial geology of the Severn area is summarised in plate QH 181 and Figures 1, 3 A and 5. The structural data and paragenetic sequence for the formation of the Zeehan deposits have been re-appraised.

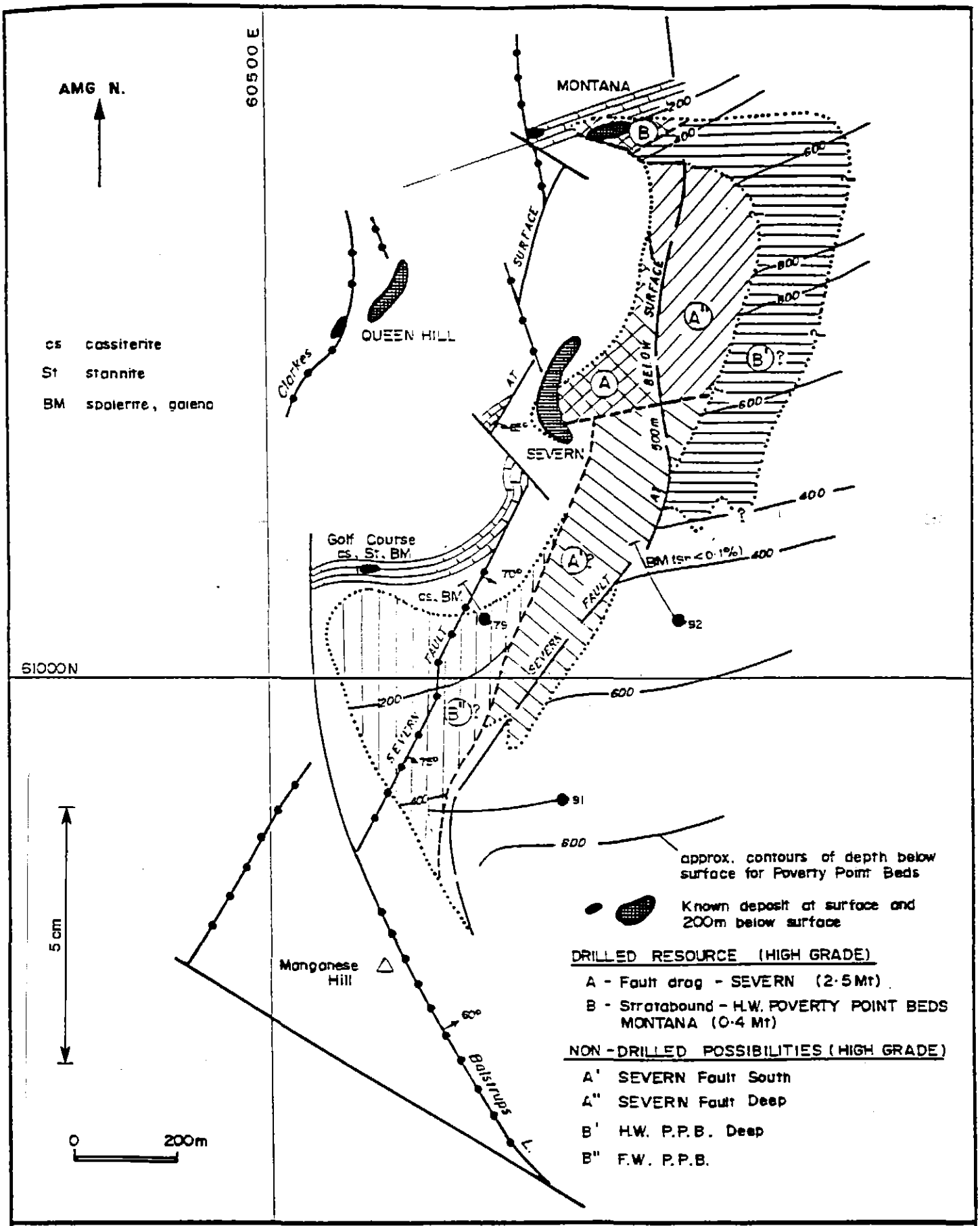
A number of points relevant to the concepts tested by the recent drilling programme are noted by Anderson, 1989a:

i) The source granitoid cupola lies some 900m below the present surface and the granitoid emplacement was controlled by northeast and northwest trending fracture sets (Figures 1, 3A and 3B), which subsequently became channel ways and a focus for hydrothermal mineralisation.

ii) There is a vertical and paragenetic sequence from deeper/earlier sellaite, chlorite, pyrrhotite, pyrite, cassiterite replacement or stockwork style mineralisation (e.g. Severn deposit) to pyrite, stannite $\pm$ cassiterite lodes (e.g. Taylors lode - Figures 3A, 7B) to slightly younger and shallower siderite/ankerite sphalerite galena lodes (e.g. McKays lode) (Figures 4 and 9). The zonation is supported further by the observed Rb, Sn halos and by S isotope studies.

iii) The observable mineral zonation suggests that further potential for higher grade, coarser, cassiterite mineralisation could realistically be expected at depth, up to 400m below the deepest drilling to date. (Figure 4).

iv) The Severn mineralisation occurs as several parallel and pseudoconformable lenses of bedding slip replacements and stockworks within a 130m wide drag zone in the hangingwall of the Severn Fault Zone (Figures 1, 6 and 7 A). The fault zone has an en echelon shape resulting from the intersection of the northwest and northeast trending fracture sets (Figures 1, 3A and 5). The Poverty Point Beds appear to be displaced 500m across the Severn Fault Zone by substantial strike slip movement (Figures 1 and 5).



Aberfoyle Resources Limited

EXPLORATION DIVISION

REVISIONS			
Init.	Date	Init.	Date

Location Code :

NORTH WEST TASMANIA

ZEEHAN DEPOSITS

SURFACE STRUCTURE & PROJECTION OF POTENTIAL MINERALISATION

Scale : 1: 10 000

Date : December, 1989

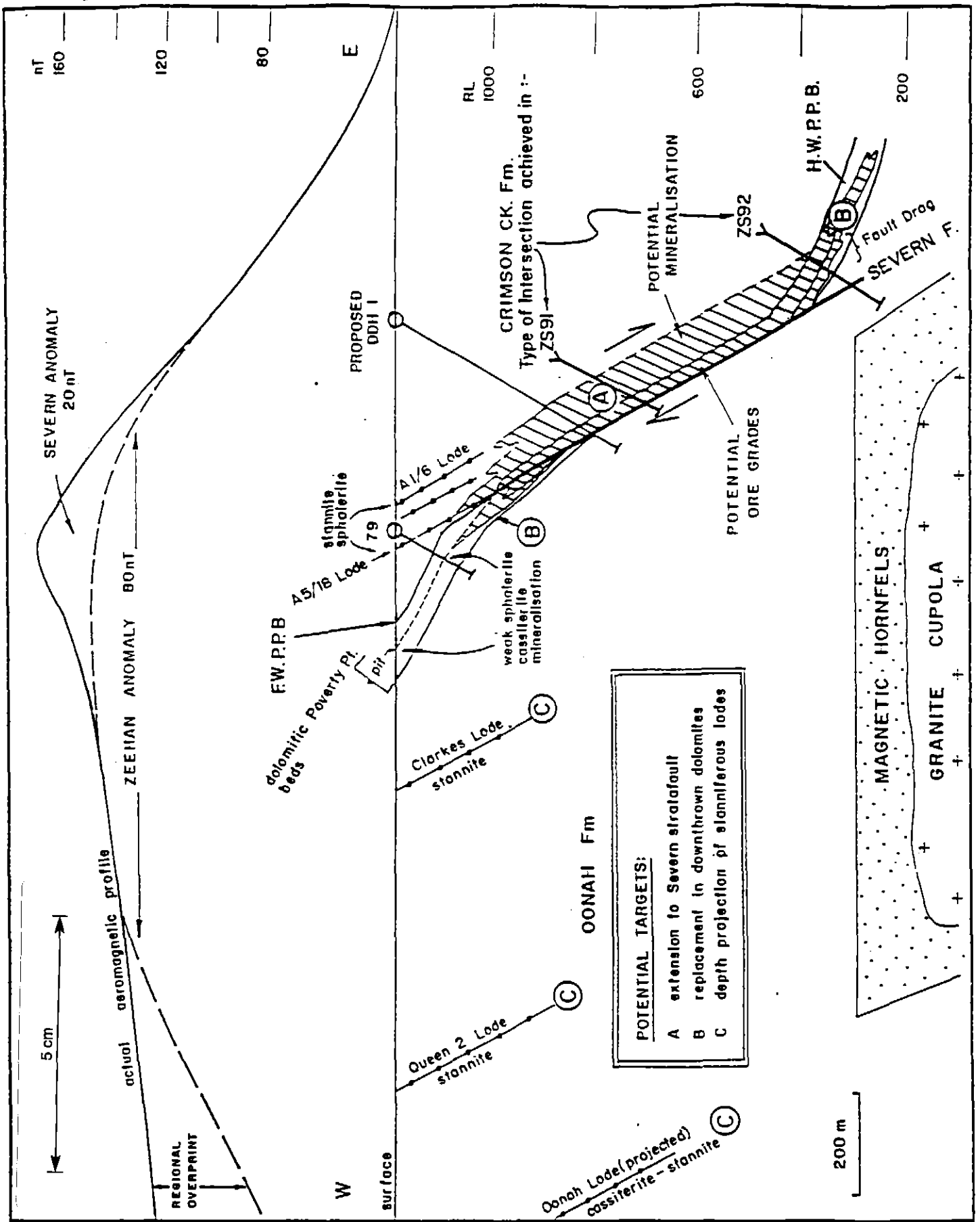
Compiled : JAA

Drawn : JAA

Traced : RJE

Checked :

FIGURE 1



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Location Code :

TASMANIA

ZEEHAN TIN DEPOSITS

SECTION THROUGH GOLF COURSE AREA

showing magnetic & structural interpretation & proposed drill hole

Scale : 1:10,000 | Date : JUNE 1988

Compiled :

Drawn : JAA

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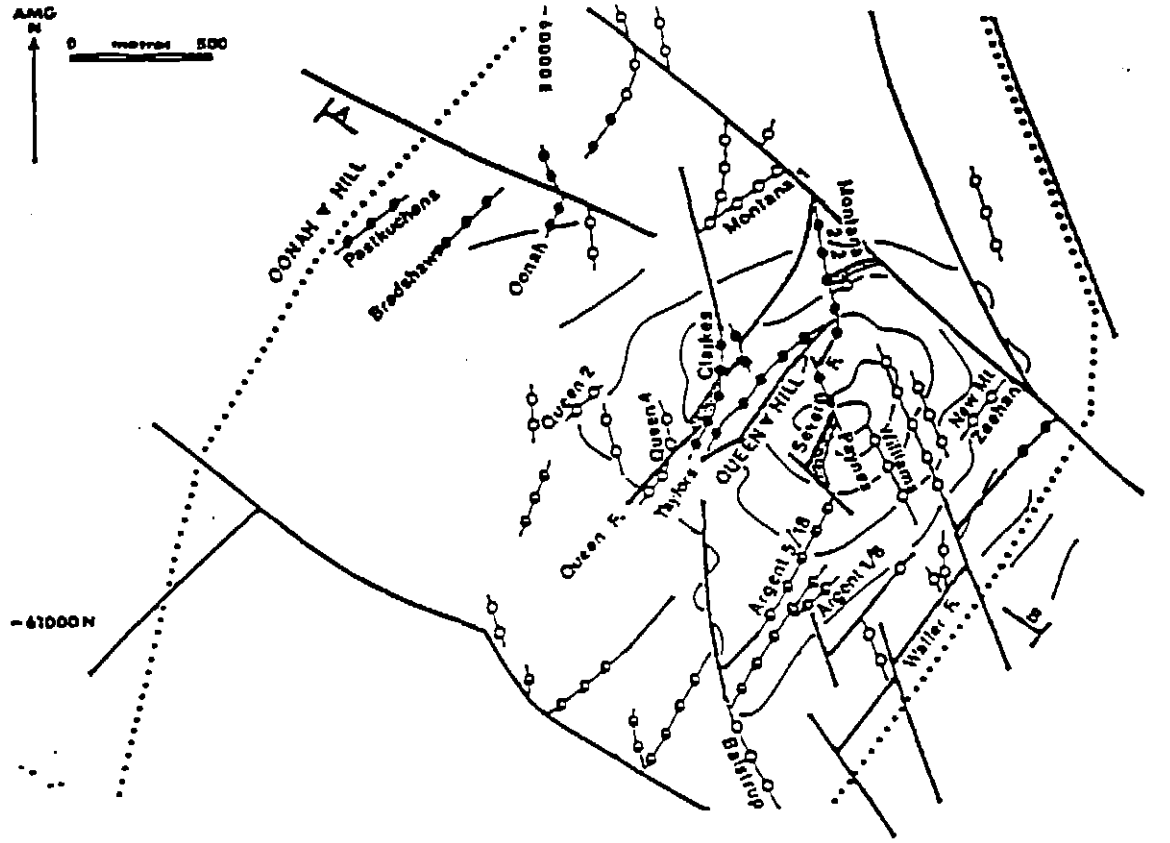
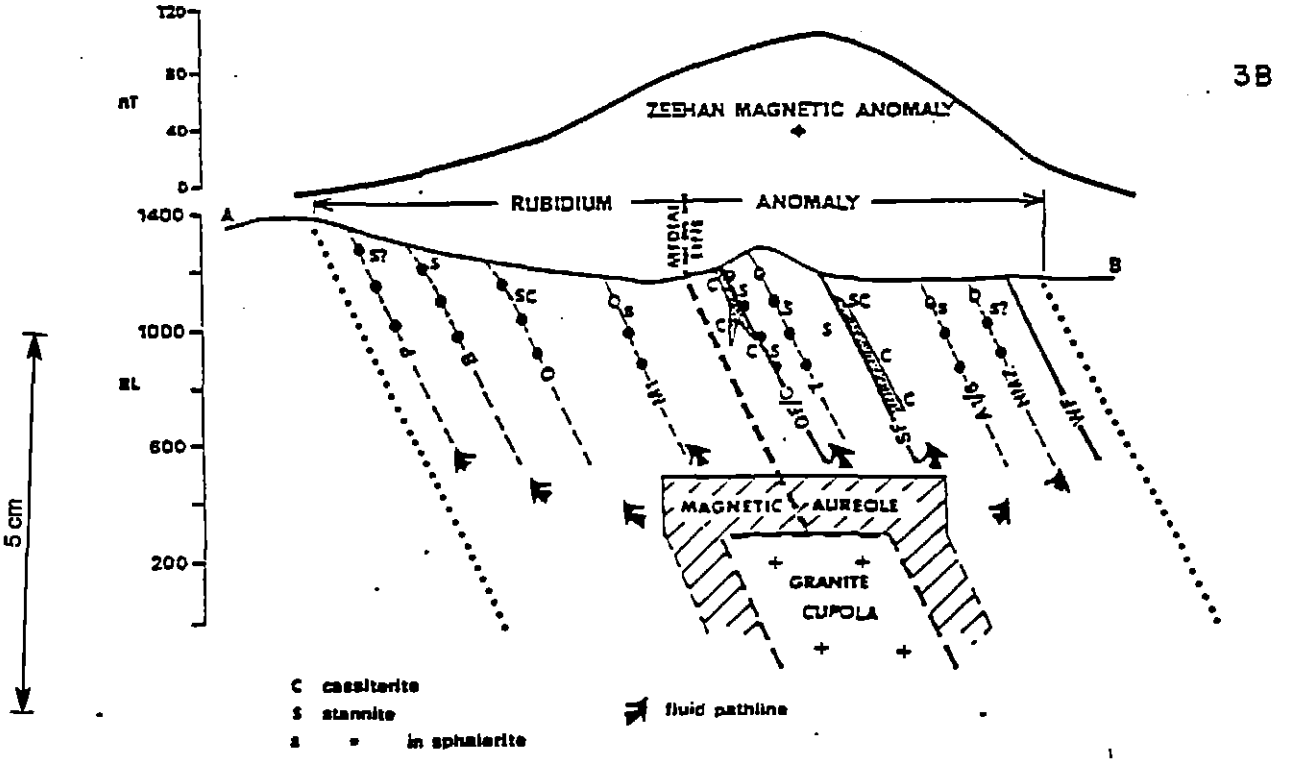
Checked :

FIGURE 2





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EXPLORATION DIVISION

REVISIONS			
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NORTH WEST TASMANIA

ZEEHAN DEPOSITS

SURFACE STRUCTURAL FEATURES AND CROSS SECTION A-B THROUGH Rb ANOMALY

Compiled : JAA

Drawn : JAA

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Location Code

Scale : As shown

Date : 1987

FIGURE 3

121013 Q12

Aberfoyle Resources Limited

EXPLORATION DIVISION

TASMANIA

SEVERN CASSITERITE BODY

SUMMARY LONG SECTION

SHOWING POTENTIAL ZONING, EXTENSION AND PROPOSED DRILLING

Locality Code :

Scale : 1:10,000

Date : MAY 1988

FIGURE 4

Compiled : JAA

Drawn : JAA

Traced : JB

Checked :

REVISIONS

Init.	Date	Init.	Date

Manganese Hill anomaly (60nT)

Magnetic Profile (1977 Airborne Survey)

Severn Anomaly (50nT)

Zeehan Anomaly (160nT)

200 nT

100

1200

1000 (S.L.) RL

600

1978 DDHs

sionite – sphalerite lode

O_{78}

sphalerite lode

82

Paynes Lode

sphalerite

stannite

interpreted faults

low grade chlorite envelope

interpreted position of high grade sellaite/pyrrhotite core

Balstraps Lode

PROPOSED DDH's

Astles Fault

5mT Inferred

81

84

600

Model indicates mineralisation extends to RL 300

POTENTIAL to 600m BELOW SURFACE — high grade core (circa 15mT at 1.2% Sn)

(≈50000t per vertical metre)

TEST — DRILL TWO DDH's at RL 800m

○ Barren intersection

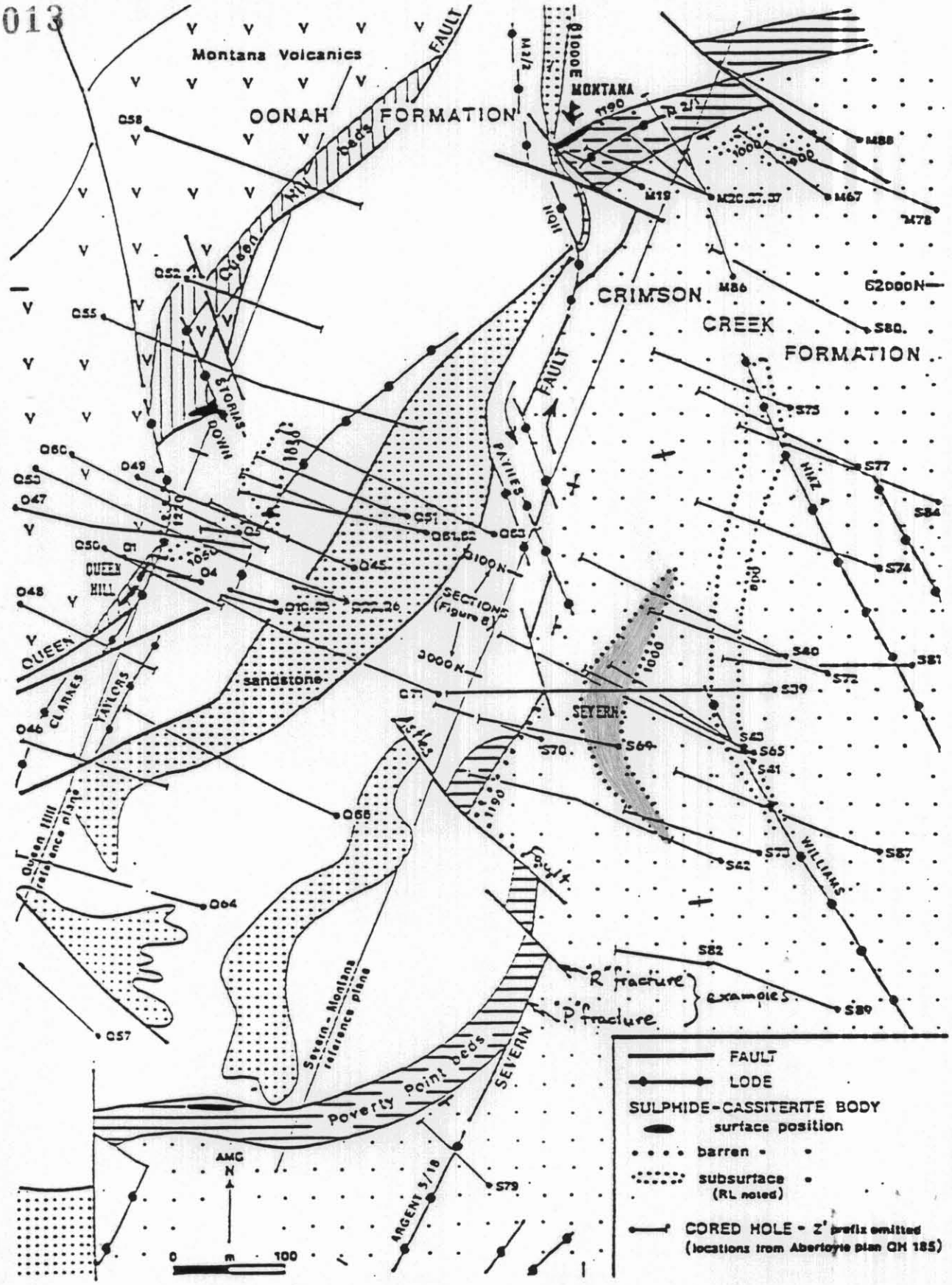
● Mineralised intersection

200m

5 cm

121014

013



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REVISIONS			
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NORTH WEST TASMANIA

ZEEHAN DEPOSITS

SUMMARY SURFICIAL GEOLOGY AND KEY STRUCTURES SEVERN/QUEEN HILL AREA

Compiled : JAA

Drawn : JAA

Traced :

Checked :

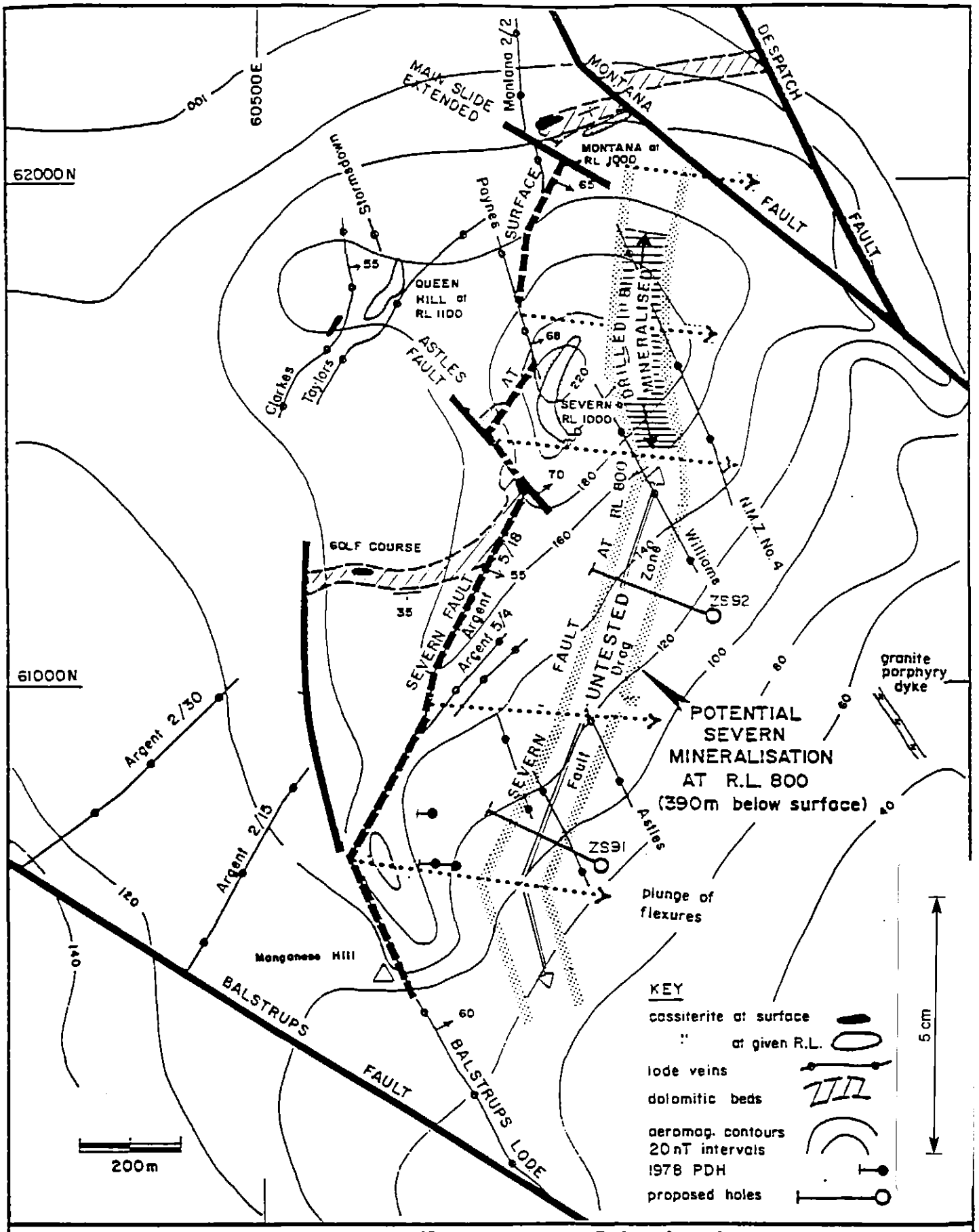
Location Code :

Scale : As shown

Date : 1987

FIGURE 5

1511



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EXPLORATION DIVISION

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TASMANIA
ZEEHAN CASSITERITE DEPOSITS
KEY INGREDIENTS AND
PROPOSED DRILLING OF SEVERN EXTENSION

Compiled :	JAA
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Traced :	JB
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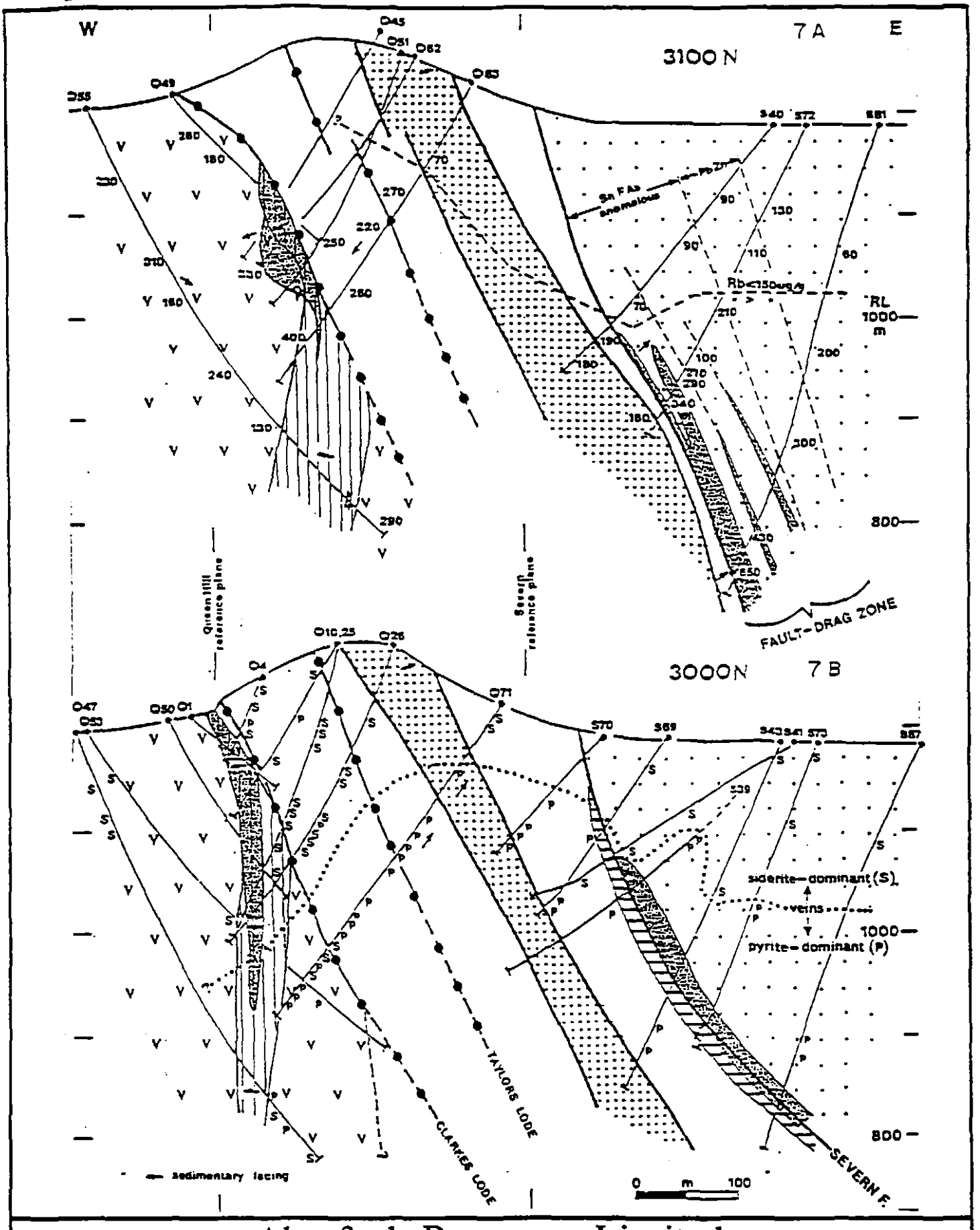

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EXPLORATION DIVISION

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Init.	Date	Init.	Date

NORTH WEST TASMANIA

ZEEHAN DEPOSITS

INTERPRETIVE SUMMARY SECTIONS

3000 N - 3100 N

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Further potential exists for replacement style mineralisation, where the Poverty Point Beds are dragged into contact with the Severn Fault to the south of the previously known mineralisation.

vi) The Severn Fault can be recognised to the south as a stannite-sphalerite lode (Argent 5/18) similar to lodes intersected during shallow drilling over known mineralisation at Severn (Figures 2, 5, 6). The Argent 5/18 lode has been displaced eastwards from the main Severn Fault Zone along northwest trending fracture sets (e.g. Astles fault) (Figures 3A and 5).

4.3 Diamond Drilling

4.3.1 Introduction

A two hole diamond drilling programme, was completed for a total of 1320m. The drilling programme was designed to test the potential of a southern extension to the Severn deposit at a depth of 350 - 400m below surface. The aim being to extend the limits of known mineralisation a further 900m to the south and expand the high grade resource to 15 million tonnes.

4.3.2 DDH ZS90 Severn

Geology

Exploration drill hole ZS90 commenced on 17th July and was abandoned on 21st July, 1989. DDH ZS90 was designed to test the Severn fault position 250m to the south of the known severn deposit and across the Astles fault disjunction. The hole was collared at AMG 361305.3mE 5361214.4mN at -70° and with a azimuth 300° T.N. The unconsolidated nature of the drill pad lead to a degree of rig subsidence, this coupled with the nature of the ground drilled resulted in a substantial hole deviation which was considered unsatisfactory and the hole was abandoned at 82.5m.

A detailed log is included as Appendix 5, while a 1:500 scale section of the hole is included as plate QH 247/92 (see Appendix 1 for legend). A summary log is outlined below:

0 - 14.5m	Tricone pre-collar.
14.5 - 82.5m	Interbedded green grey lithic greywacke and lesser grey black shale of the Crimson Creek Formation. A minor siderite/ankerite lode with lesser associated galena and sphalerite mineralisation occurs from 76.6-80.7m.

The major feature within the hole is the intersection of the ankerite lode from 76.6-80.7m which is interpreted as McKays' lode.

017

4.3.3 DDH ZS92 Severn

Geology

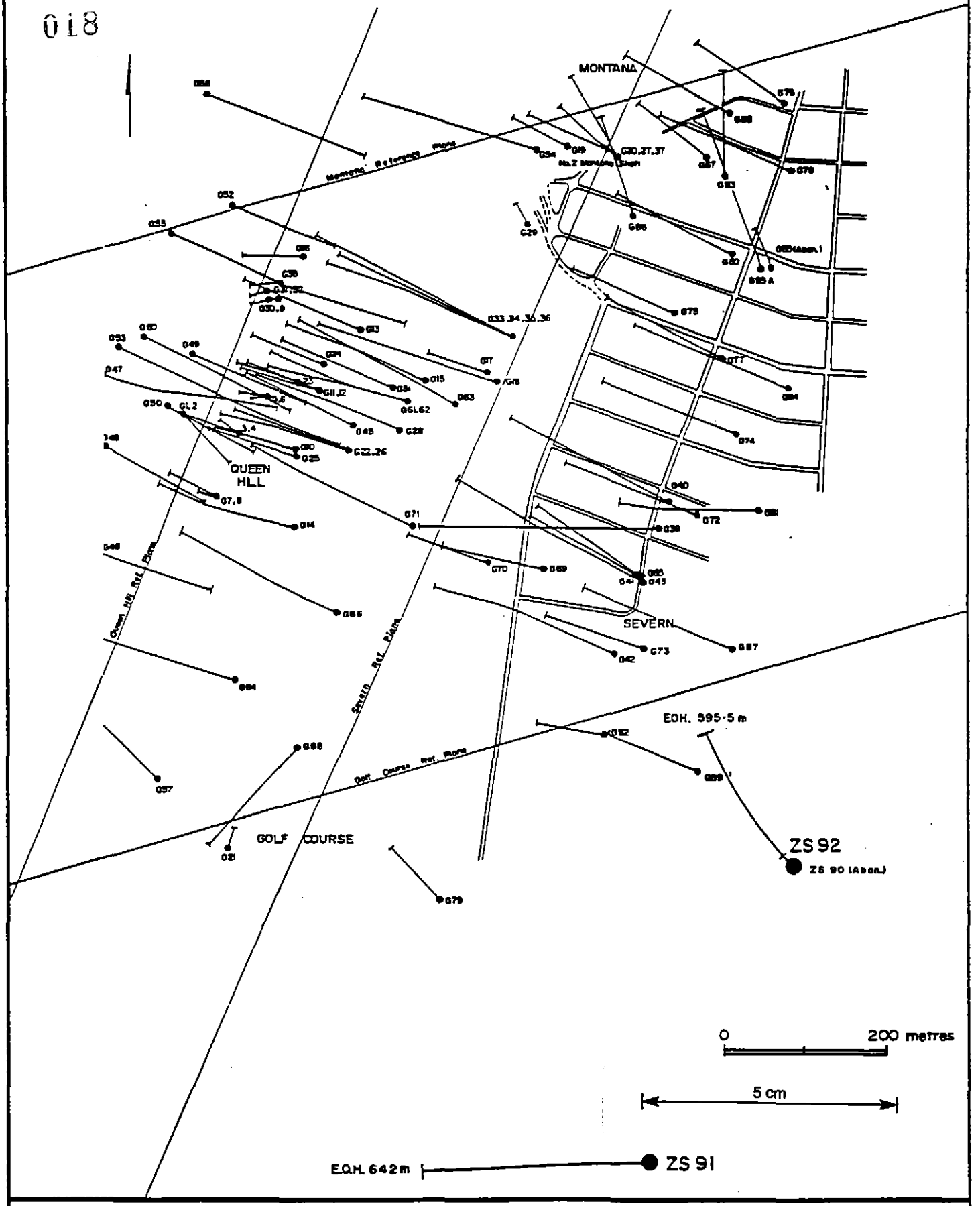
Following the abandonment of ZS90 on 21st July, the rig was stepped back 3m on section (300°T.N.) and the hole was recollared at AMG 361308.2mE 5361212.7mN and at a dip -75° (Figures 8 and 9). Drilling commenced on 24th July and was completed on 29th August at a depth of 595.5m. An oversize chrome barrel was used to minimise hole deviation. The hole was successfully controlled and intersected the Severn Fault Zone at 520.4-557.3m.

A detailed log, petrographic description, split core and core grind assay results are included as Appendix 3. A 1:500 scale section is included as plate QH 247/92 and a summary interpretative section is also included as Figure 9 (see Appendix 1 for legend).

A summary log is as follows:

0 - 8.0m	Tricone precollar.
8.0 - 392.8m	A typical sequence of Crimson Creek Formation carbonaceous shales and interbedded green grey lithic greywackes. McKays lode was intersected from 90.3 to 94.6m
392.8 - 459.1m	Poverty Point Beds characterised by the onset of more oxidised depositional conditions with the appearance of white-red/brown siltstones with intercalated limestones and dolomites. 420.1-421.0m is the interpreted position of the finely laminated Montana Marker Bed? Minor disseminated and vein style pyrite, quartz mineralisation occurs within the dolomites in particular within recrystallised dolomites.
459.1 - 520.4m	A sequence of grey black laminated arenaceous siltstones interbedded with fine grained sandstones.
520.4 - 557.3m	Interpreted position of the Severn Fault Zone the limits of which are marked by quartz sealed fractures and pug lining at the upper and lower margins respectively. The interpreted Severn position 542.1-552.4m is characterised by moderate to intense vein stockwork of chlorite, pyrite and quartz with minor associated pyrrhotite both as veins and blebs throughout the tectonically broken and brecciated interval. A broader mildly veined (quartz/pyrite/chlorite) zone envelopes the main ore zone from 532.1-553.5m.

018



Aberfoyle Resources Limited

EXPLORATION DIVISION

REVISIONS			
Init.	Date	Init.	Date

NORTH WEST TASMANIA

ZEEHAN DEPOSITS

DRILLING SUMMARY

Compiled : RJE

Drawn : RJE

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Checked :

Location Code :

Scale : As shown

Date : Sept. 1989

FIGURE 8

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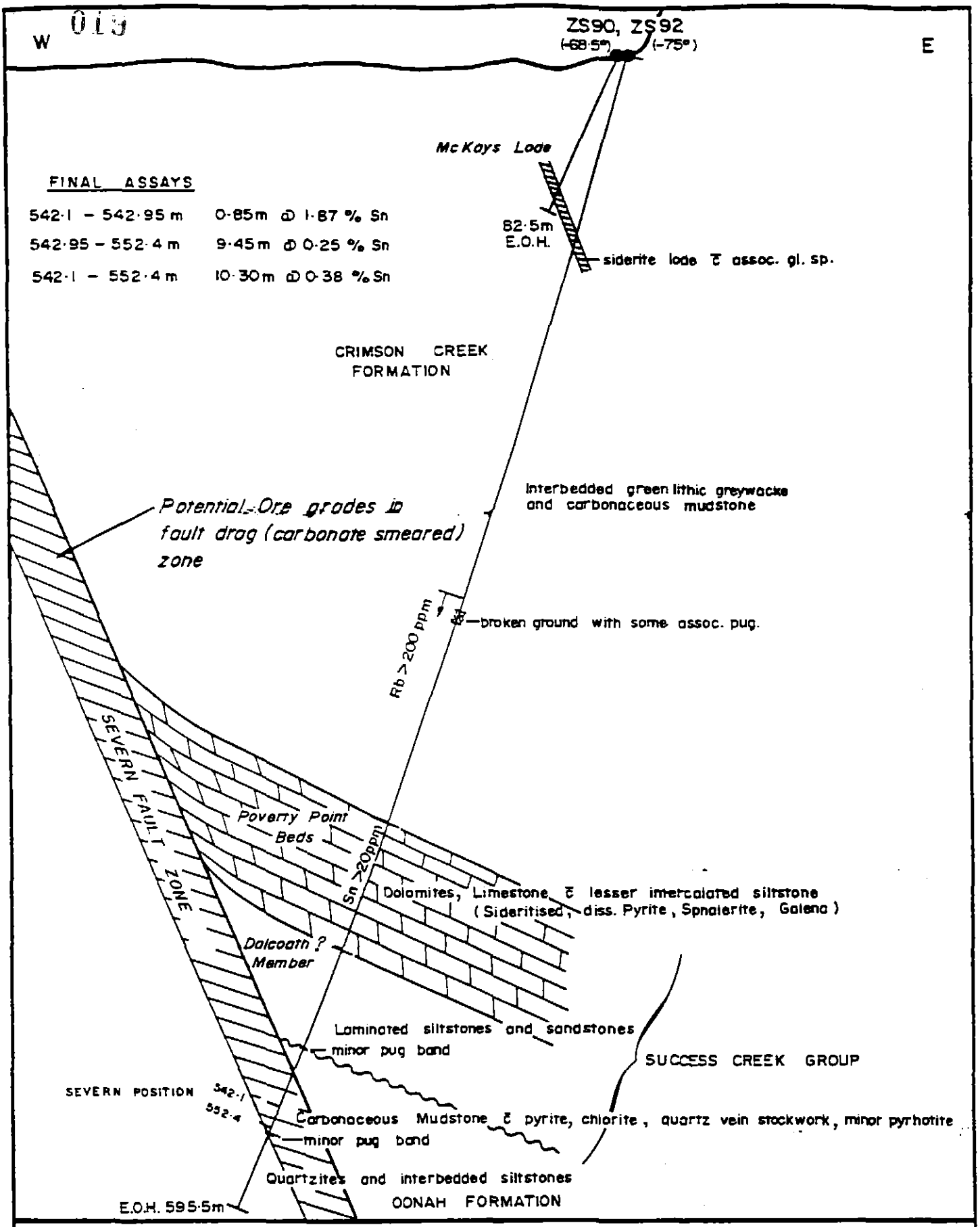

Aberfoyle Resources Limited

EXPLORATION DIVISION

REVISIONS			
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DJN jms	14-11-89		
DJN rje	11-12-89		

NORTH WEST TASMANIA

ZEEHAN DEPOSITS

SUMMARY CROSS SECTION - ZS 92

Compiled : JAA

Drawn : DJN

Traced : RJE

Checked :

Location Code

Scale : 1 : 2500

Date : September, 1989

FIGURE 9

557.3 - 595.5m A sequence of interbedded shales, grey arenaceous siltstones/sandstones and quartzites of the Oonah Formation.

Several major stratigraphic and structural features are evident from this hole:

i) The hole confirms the extension of the Severn position a further 250m to south of previous drilling and across disjointing cross faulting structures such as Astles fault.

ii) The hole is the first one drilled at Severn to intersect the down thrown block of Poverty Point Bed sediments on the hangingwall side of the Severn Fault.

iii) Severn mineralisation has been located within the Oonah Formation away from the Crimson Creek/Oonah Formation contact. This highlights the importance of the structural preparation afforded by the Severn Fault. This suggests that it is the Severn Fault drag zone and not the unconformable contact that is important in the deposition of the main Severn body.

iv) The hole outlines the potential for Renison style replacement mineralisation occurring where the Poverty Point Beds are dragged into contact with the footwall of the Severn Fault Zone.

Geochemistry

The mineralised intervals include pyrite, minor chalcopyrite, sphalerite and galena from 454.8-458.5m within the Poverty Point Beds and pyrite, pyrrhotite and minor cassiterite from 532.1-553.5 in the Severn position. These intervals were quartered for assay. The rest of the hole was core ground using geological intervals of 2-15m. The samples were analysed for Cu, Pb, Zn, Ag, Sn and Rb. The results are included as Appendix 3 with significant zones of Sn mineralisation outlined on plate QH 247/92.

The tin mineralisation occurs in association with the Severn Fault but is sub-economic in grade (10.3m @ 0.38% Sn including 0.85m @ 1.87% Sn). The drilling shows that the Severn Fault and associated mineralisation does extend beyond previously known southern limits, but at sub-economic grades.

The base metal spikes particularly in Pb and Zn indicate the positions of the ankerite lode structures, notably McKays' lode 90.3-94.6m.

The Rb and Sn results help outline the limits of the hydrothermal halo in this area, with increases in the Rb, and to a lesser extent Sn content, marking halo boundaries down the hole. (Appendix 3, Figure 9).

There is a notable Rb depletion in association with the zones of mild Pb, Zn mineralisation and within the zone of Sn mineralisation.

Geophysics

DDH ZS92 was read with DHEM in two separate programmes on 7th September and 19th October. The results of the DHEM are given in the section on EM in Appendix 2.

The initial single loop (Sirotem) survey detected a short wavelength response below 500m which extended beyond the base of the hole and the source was thought to lie above or beyond the hole. A second long wavelength response was detected over the holes entire length. Subsequently a second DHEM (EM-37 TDEM System), three loop survey was undertaken to more accurately model these responses.

The second survey revealed that the short wavelength response was due to the mineralisation intersected within the hole and indicated that the mineralisation becomes more conductive above the hole.

The long wavelength response was further enhanced by the follow-up survey indicating the presence of large and significantly conductive body located to the west of the hole.

Following the encouraging results arising out of the DHEM survey it was decided to proceed to a surface EM (UTEM) survey to help explain the long wavelength response. The results of the UTEM survey are discussed more fully in section 4.4 and Appendix 2.

Petrology

A series of 13 petrographic sections were prepared for DDH ZS92 the location of the samples and detailed descriptions are included as Appendix 3 and outlined in plate QH 247/92.

Petrography was used as an aid to core logging, in particular delineating the arenaceous siltstone from the Crimson Creek and Oonah Formations. (samples 564115 and 564132) Petrography was also used to outline typical Crimson Creek Formation characteristics (564110 and 564111).

Staining of the carbonates (564112 and 564114) with potassium ferricyanide indicated that on iron rich ankerite/siderite is prevalent. Petrology indicates that the quartz and lesser sulphide species are pervasive either as a replacement phase or as space filling veins.

Sample 564119 is a deformed silty shale more typical of the Oonah Formation, with at least two clearly defined schistosities evident indicating multiple phases of deformation.

Samples 564120 and 564130 were taken from the interpreted marker bed. Both samples bear a striking resemblance to the arenaceous siltstone, samples 564115 and 564132. All four samples appear to have a similar craton derived detrital input with a carbonate overprint. Some samples show evidence of a minor second schistosity, but appear to lack the high degree of deformation exhibited by the Oonah Formation sample 564119.

Samples 564116-118 and 564131 are all samples of Severn mineralisation. Sample 564131 was submitted for detailed petrographic description. The petrography indicated the complex array of minerals forming the gangue and ore. The gangue is composed of carbonate, fluorite, quartz and clay (chlorite?). Pyrite occurs as the dominate sulphide mineral with lesser arsenopyrite crystals, cross cutting late stage stannite layers/veins and minor chalcopyrite. Accessory needles of cassiterite with some pyrite after pyrrhotite, are present.

δS^{34} Sulphur Isotope Study

A series of three samples were chosen at varying depths down hole ZS92 for sulphur isotope analysis. Analytical results, sample descriptions and locations are included as Appendix 6 and shown on plate 247/92.

The sulphur isotope study suggests that the mineralisation in ZS92 is proximal to the axis of the hydrothermal system but still somewhat remote with average δS^{34} values of 4-5 compared to 2-3 in the main Severn and Queen Hill bodies (Anderson pers. comm.).

Some grading of the results in ZS92 uphole away from the deep seated hydrothermal source is observed with a gradation in the sulphur isotope number from 4.5-7.1.

4.3.4 DDH ZS91 Severn

Geology

Exploration drill hole ZS91 was collared on 31st August and was completed on 9th October at a depth of 642m. The hole is located at AMG 361114.7mE 5360850.3 mN and collared at -67° with an azimuth of 270° T.N. (Figure 8). The drill hole was designed to test for a remake of economic grades in the Severn Fault position a further 650m to the south of ZS92. The drill hole also aimed to test the local elevation in regional magnetics in the Manganese hill/Balstrups lode area (Figure 6).

A detailed log, petrographic description, split core and core grind assay results are included as Appendix 4. A 1:500 scale section is attached as plate QH 247/91 and a summary interpretative section is also included as Figure 10 (See Appendix 1 for legend).

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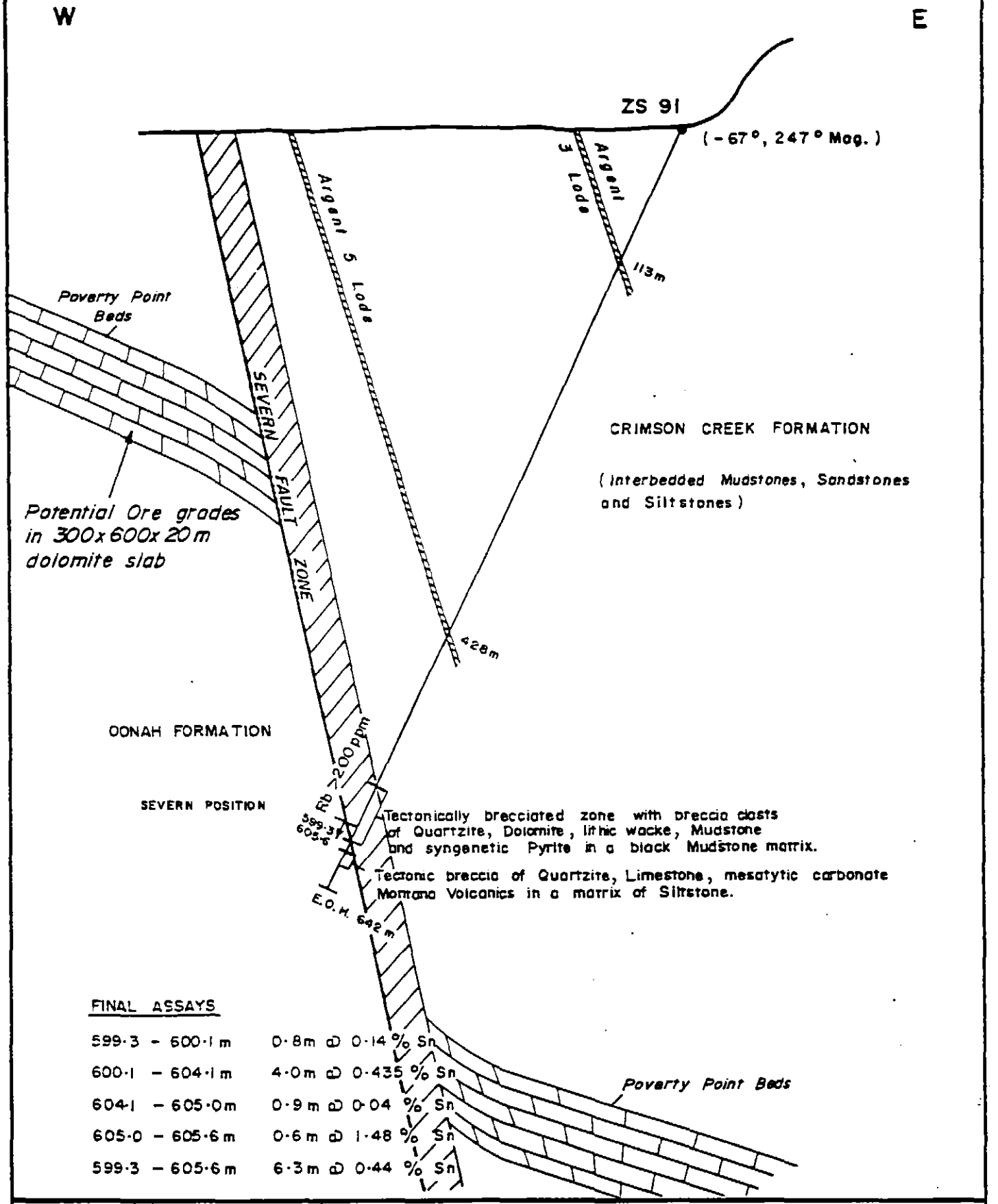

FINAL ASSAYS

599·3 - 600·1 m	0·8m @ 0·14 % Sn
600·1 - 604·1 m	4·0m @ 0·435 % Sn
604·1 - 605·0m	0·9 m @ 0·04 % Sn
605·0 - 605·6 m	0·6 m @ 1·48 % Sn
599·3 - 605·6 m	6·3m @ 0·44 % Sn

Aberfoyle Resources Limited

EXPLORATION DIVISION

REVISIONS			
Init.	Date	Init.	Date
DJN jms	14-11-89		
DJN rjs	11-12-89		

NORTH WEST TASMANIA

ZEEHAN DEPOSITS

SUMMARY CROSS SECTION ZS 91

Compiled : JAA

Drawn : DJN

Traced : J. M. S.

Checked :

Location Code :

Scale : 1 : 4 000

Date : October 1989

FIGURE 10

A summary log is outlined below:

0 - 53.0m	Tricone precollar.
53.0 - 211.1m	A sequence of green grey to red brown lithic greywacke interbedded with grey black mudstone -siltstone. A minor ankerite/siderite lode, with minor galena and sphalerite occurs at 111.3-114.7m and is interpreted to represent the Argent 3 lode position.
211.1 - 276.9m	An interval dominated by grey marly limestone interbedded with grey siltstone and carbonaceous shale.
276.9 - 390.75m	An interval more typical of the Crimson Creek Formation with grey to green siltstone in places well laminated with interbedded black shale and grey green lithic greywacke.
390.75- 428.05m	A sequence of red brown siltstone interbedded with green siltstone tending to lithic greywacke. A narrow ankerite/siderite lode was intersected from 412.4-414.55m and is interpreted as the Argent 5 lode position.
428.05- 554.3m	A sequence of green grey siltstone interbedded with black shale and minor green grey lithic greywacke. Minor mineralisation is developed from 535.85-537.45m expressed as chlorite, quartz, pyrite vein development becoming more intensely mineralised from 537-537.95m. Minor quartz-arsenopyrite-pyrite veining occurs at 536.35m.
554.3 - 599.0m	A tectonically fractured and brecciated zone dominated by a highly deformed black mudstone of the Crimson Creek Formation. Breccia clasts of grey green lithic greywacke, grey quartzite, Poverty Point dolomite clasts and clasts of syngentic pyrite occur throughout the mudstone matrix. The zone limits are marked by siderite/ankerite vein seal at 554.3m and white quartz vein fracture seals at 599m.
599.0 - 642.0m	A generally more competent interval composed of Oonah Formation shales and interbedded siltstones. In places the interval is tectonically deformed and sheared with breccia fragments of grey quartzite, limestone -dolomite and vesicular basalt Montana Volcanics. Minor fragments of mesatytic carbonate and some syngentic pyrite clasts and veins are also present.

The interval From 599.3 - 605.6m is interpreted as the Severn ore position. An intensely fractured zone dominated by a matrix of puggy black mudstone with an intense network of calcite, quartz and lesser siderite veins, with blebs and veinlets of pyrite throughout. An intense chlorite alteration zone with associated pyrite veins and blebs along with calcite, quartz and siderite veins occurs from 605-605.6m. Some cassiterite is evident at 604.25m.

Stratigraphic and structural features evident from this hole are:

i) The hole confirms the position and mineralised nature of the Severn Fault Zone a further 650m to the south.

ii) Despite the intensely deformed nature of the Crimson Creek/Oonah Formation contact only a narrow mineralised zone was intersected. This coupled with the narrow Rb halo and higher δS^{34} isotope values suggest the intersection has a distal relationship to the main hydrothermal system.

iii) The presence of tectonic breccia clasts of dolomite derived from the Poverty Point Beds (possibly?) within the fault zone suggests a proximity to a carbonate mass. Potential exists for an increase in the resource at depth as the volume of carbonates dragged into contact with the fault zone increases.

Geochemistry

Geological intervals over 2.5m in length were core ground to produce a 100 gm representative sample of the interval. Intervals less than 2.5m were quartered to produce sufficient sample volume for analysis. The samples were analysed for Cu, Pb, Zn, Ag, Sn and Rb. The results are included as Appendix 4 with the significant zones of tin mineralisation outlined on plate QH 247/91.

The tin mineralisation is hosted by highly fractured and brecciated shales and siltstones of the Oonah Formation. Mineralisation occurs over an interval of 6.3m grading 0.44% Sn, including 0.6m @ 1.48% Sn. The drilling programme has successfully delineated the Severn position some 900m to the south of the main Severn body but the intersection is sub-economic.

The base metal spike at 113.9-114.7m is associated with the poorly mineralised ankerite/siderite lode interpreted as the Argent 3 lode. The interpreted Argent 5 position 412.4-414.55m failed to register any elevation in base metal values.

The narrowness of the Rb and Sn halo 587.25-642m (Figure 10, Appendix 4) indicates that the mineralised interval is towards the southern extremity of the hydrothermal system.

Geophysics

DDH ZS91 was read with single loop DHEM (EM37 TDEM) survey on 17th October, 1989. The results of the DHEM programme are summarised in section on EM Appendix 2.

The survey detected a long wavelength response similar to that recorded from the first survey conducted in ZS92. A large and significantly conductive mass was interpreted to persist between and lie some distance to the west of holes ZS91 and ZS92.

Petrology

Petrographic slides were prepared for 7 samples from DDH ZS91 with 4 slides described in detail. The location of the samples and detailed descriptions are included as Appendix 4 and shown on plate QH 247/91.

Petrography was used to aid the description of tectonic features observed in association with the Severn Fault Zone. Samples 564126, 564127 and 564129 are all tectonically brecciated samples.

Sample 564126 has a graphitic shale matrix hosting carbonate blocks possibly derived from the Poverty Point Beds? The carbonate contains what are interpreted as pyritic nodules, associated with quartz veins and with minor inclusions of pyrrhotite, sphalerite and chalcopyrite.

Sample 564129 is an aggregate of tectonic fragments including quartzite, graphitic and pyritic-sericitic slates, vesicular basalt fragments (Montana volcanics) and dolomite fragments. In places slate clasts have been severely deformed and compressed to form the matrix between more competant fragments.

Sample 564127 is a breccia composed of slate, siltstone and sandstone within which veins of quartz, chlorite and carbonate are well developed.

Petrographically all three samples resemble the Crimson Creek Formation sediments with an input from the underlying Oonah Formation. From a detailed examination of the hole, sample 564127 would appear to be derived almost exclusively from fragments of the Oonah Formation.

Sample 564125 represents hydrothermal alteration and dolomitisation of a carbonaceous sediment. This compares with the previously interpreted view of dolomitic replacement of an evaporite breccia clast now hosted by Oonah Formation sediments.

Samples 564122, 564123 and 564124 were all samples taken from the mineralised zone 599.3-605.6m. A petrographic summary for these sections is in progress.

δS^{34} Sulphur Isotope Study

Three samples were selected from varying depths within DDH ZS91 for δS^{34} sulphur isotope analysis. A summary of analytical results, sample descriptions and locations are included as Appendix 6 and outlined on plate QH 247/91.

The figures obtained from the δS^{34} isotope study are consistant with a southwesterly hydrothermal gradient. A reverse grading evident from 6.29 at the Severn ore position to somewhat lower and almost identical figures of 5.16 and 5.17 for the Argent 5 and Argent 3 lode positions. The result of 6.29 suggests that the mineralisation intersected in ZS91 is distal to the main hydrothermal system, but may also reflect a degree of later stage remobilisation. The similarity of the lode isotopic numbers suggests that both lodes may have formed during the same mineralising phase.

4.4 Geophysics

4.4.1 DHEM

The results of the DHEM survey are summarised in sections 4.3.2 and 4.3.3 as part of the discussion on holes ZS92 and ZS91. A more detailed discussion is included in the Technical Report by J. J. Read on the Zeehan Geophysical Surveys, 1989-90. (Appendix 2).

4.4.2 UTEM

A detailed technical report of the UTEM survey results and interpretation is included with this report as Appendix 2.

The UTEM survey was designed firstly to test responses due to known mineralisation, with an orientation survey conducted over Severn. The aim was to apply this knowledge to the main survey over the Zeehan golf course. The golf course survey was designed to test the potential of the interpreted south easterly dipping wedge of Poverty Point Bed dolomites. These potentially host Renison style replacement mineralisation along the footwall contact of the Poverty Point Beds and the Severn Fault drag zone.

The orientation survey over known Severn mineralisation was inconclusive, as any EM response attributable to Severn would have been overprinted by the late time responses detected. These masking late time responses were interpreted as due to a cultural conductor at shallow depth located over the Severn body. A further late time reponse was attributed to a conductor located on the western flank of Queen Hill.

The Zeehan Golf Course survey was designed to test for flat lying conductive sulphides hosted within the Poverty Point Beds. The failure of the survey to detect any response attributable to a flat lying or vertical conductive sulphide body downgrades the potential prospectivity of the golf course area for Renison style massive sulphide cassiterite deposits.

The detection of a conductive body along the western flank of Queen Hill lead to an extended UTEM survey over Queen Hill. This survey clearly detected the conductor outlined in the earlier survey. The anomaly was explained as two approximately parallel block conductors interpreted to be conductive shale. The response due to the conductive shale explains clearly the long wavelength anomaly detected in the earlier DHEM surveys.

The conclusion from the UTEM survey is that it is unlikely that any massive sulphide style mineralisation is hosted within the Poverty Point Beds beneath the Zeehan golf course.

5. Conclusions and Recommendations

The recently completed drilling and EM programmes have reduced the potential for major expansions in the Severn resource towards the south. Although the potential for a smaller expansion of the resource, has not been sterilized.

The conclusion from the Zeehan EM survey is that the potential for high grade massive sulphide mineralisation (pyrite, pyrrhotite) in the Queen Hill/Severn area is limited. Importantly, the potential for high grade non-conductive (cassiterite rich, disseminated sulphide) mineralisation has not been sterilised.

The 1989/90 drilling programme enhanced the prospectivity of the Poverty Point Beds as a host for replacement style (Renison Bell) tin mineralisation. High grade mineralisation is envisaged to occur at the point of maximum structural preparation where the carbonates are dragged into contact with the footwall of the Severn Fault Zone (Figure 2). The extent and location of the fault is now verified over an additional strike length of 900m.

The area between previous shallow drilling in the vicinity of the golf course pit, ZG79 and ZS91 to the southeast remains untested by diamond drilling (Figure 8). The failure of the UTEM programme to detect any sizeable sulphide body underlying the golf course, though downgrading does not sterilize the areas potential.

The possibility exists that the Severn style of mineralisation is not particularly conductive. Alternatively the depth to top of any massive sulphide mineralisation hosted within the Poverty Point Beds, may be beyond the limits of the UTEM survey. Further, the later sulphide mineralising phase may not have been superimposed upon the earlier greisenisation phase, resulting in a sulphide deficient system (Anderson pers. comm.) Alternatively the main sulphide accumulation may be remote (fault bounded?) from the main cassiterite deposit.

Consideration should be given to drilling a further hole to test the potential of the golf course area.

A number of areas remain prospective for ore grade mineralisation:

i) Golf course area (B") (Figures 11, 12) discussed above.

ii) The Severn Fault Zone between the recently completed drill holes ZS91 and ZS92 (A') (Figures 11, 12).

iii) Potential exists for mineralisation within the hydro-thermal axis at depth beneath Queen Hill (below 300m).

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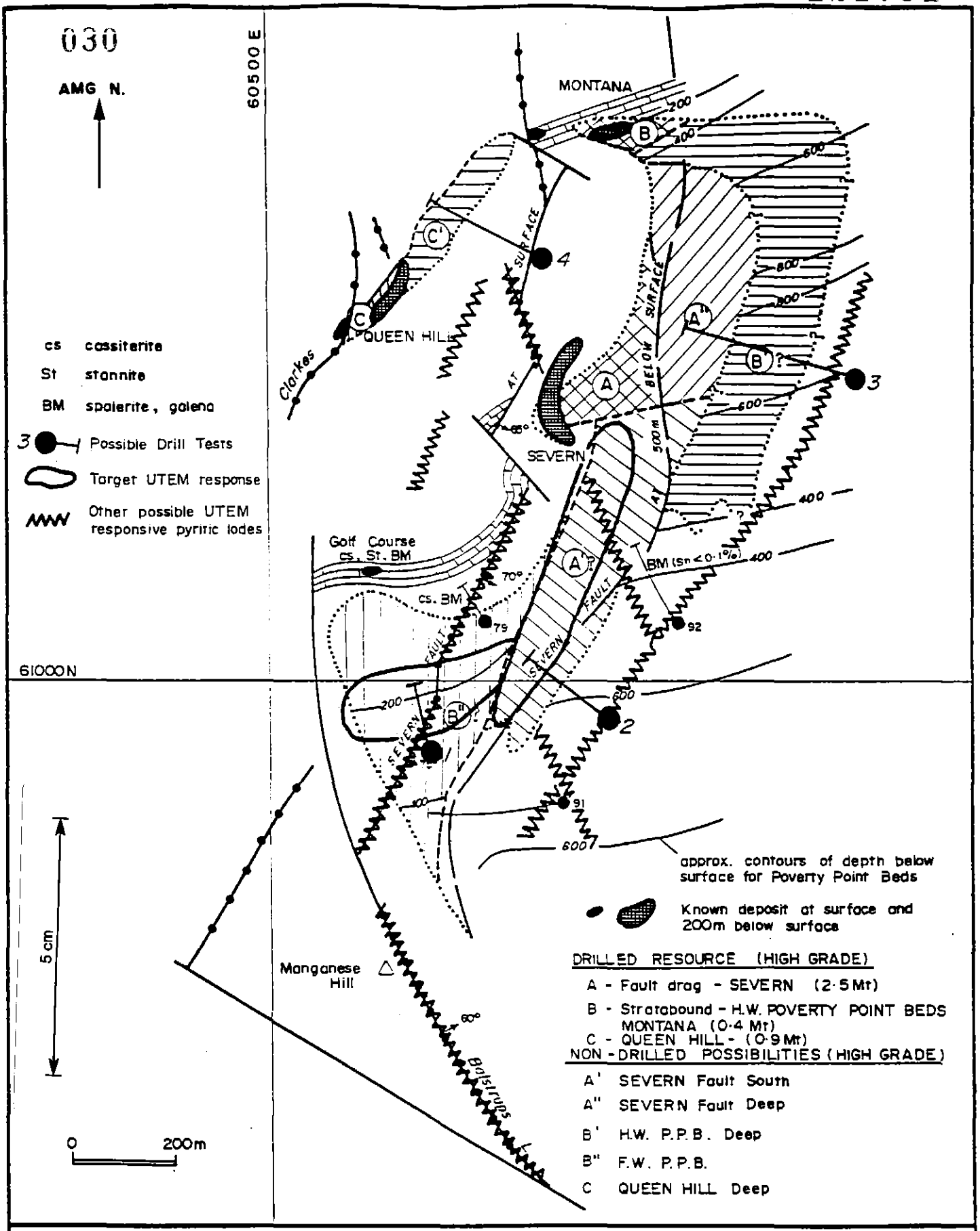

Aberfoyle Resources Limited

EXPLORATION DIVISION

REVISIONS			
Init.	Date	Init.	Date

Location Code :

NORTH WEST TASMANIA

ZEEHAN DEPOSITS

SURFACE STRUCTURE & PROJECTION OF POTENTIAL MINERALISATION

Scale : 1: 10 000

Date : December, 1989

Compiled : JAA

Drawn : JAA

Traced : RJE

Checked :

FIGURE 11

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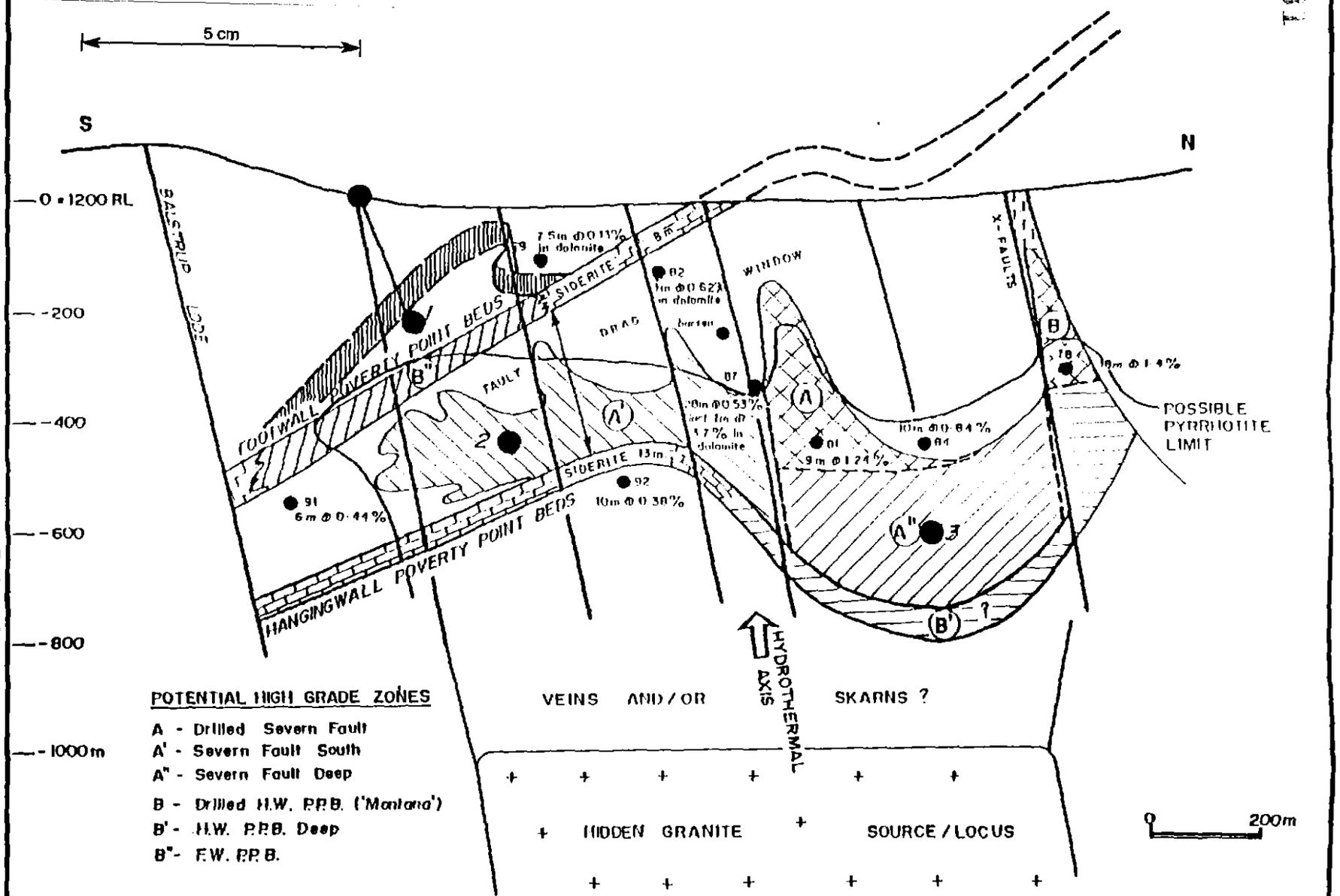

Aberfoyle Resources Limited

EXPLORATION DIVISION

SUMMARY LONG SECTION ON SEVERN FAULT

showing Exploration Potential

ZEEHAN DEPOSITS

NORTH WEST TASMANIA

Location Code		REVISIONS			
		Init.	Date	Init.	Date
Scale 1:10000	Date : December, 1989	Compiled : JAA			
		Drawn : JAA			
		Traced : RJE			
		Checked :			
FIGURE 12					

iv) Potential exists for higher grade, coarser, cassiterite mineralisation between the limits of deepest drilling (-500m) at Severn and the interpreted skarn development over the granitoid (-900m), a potential 500m vertical zone (A") (Figures 3B, 11 and 12).

v) Similar potential exists at depth beneath the Queen Hill Deposit (C') (Figure 13).

vi) Potential exists in the northeast of the licence for replacement style mineralisation within the sub-cropping-outcropping Gordon Limestone. The limestone occurs within the limits of the Zeehan Rb drainage anomaly and hence the limits of the hydrothermal system (Figure 3A).

The comprehensive drilling and EM programme undertaken during 1989/90 failed to produce the desired increase in the economic strike length of the Severn body.

Future programmes should endevour to explore the full potential of the golf course area (B") (Figures 11 and 12). Additional potential exists for a remake of the Severn position between DDH's ZS91 and ZS92 (A') (Figures 11 and 12). The depth potential (below 500m) A". B' and C' has not been fully explored (Figures 11, 12 and 13).

A reduced potential of +10 Mt remains untested to a depth limit of 500m and +20 Mt potential to 900m in the Severn/Queen Hill area.

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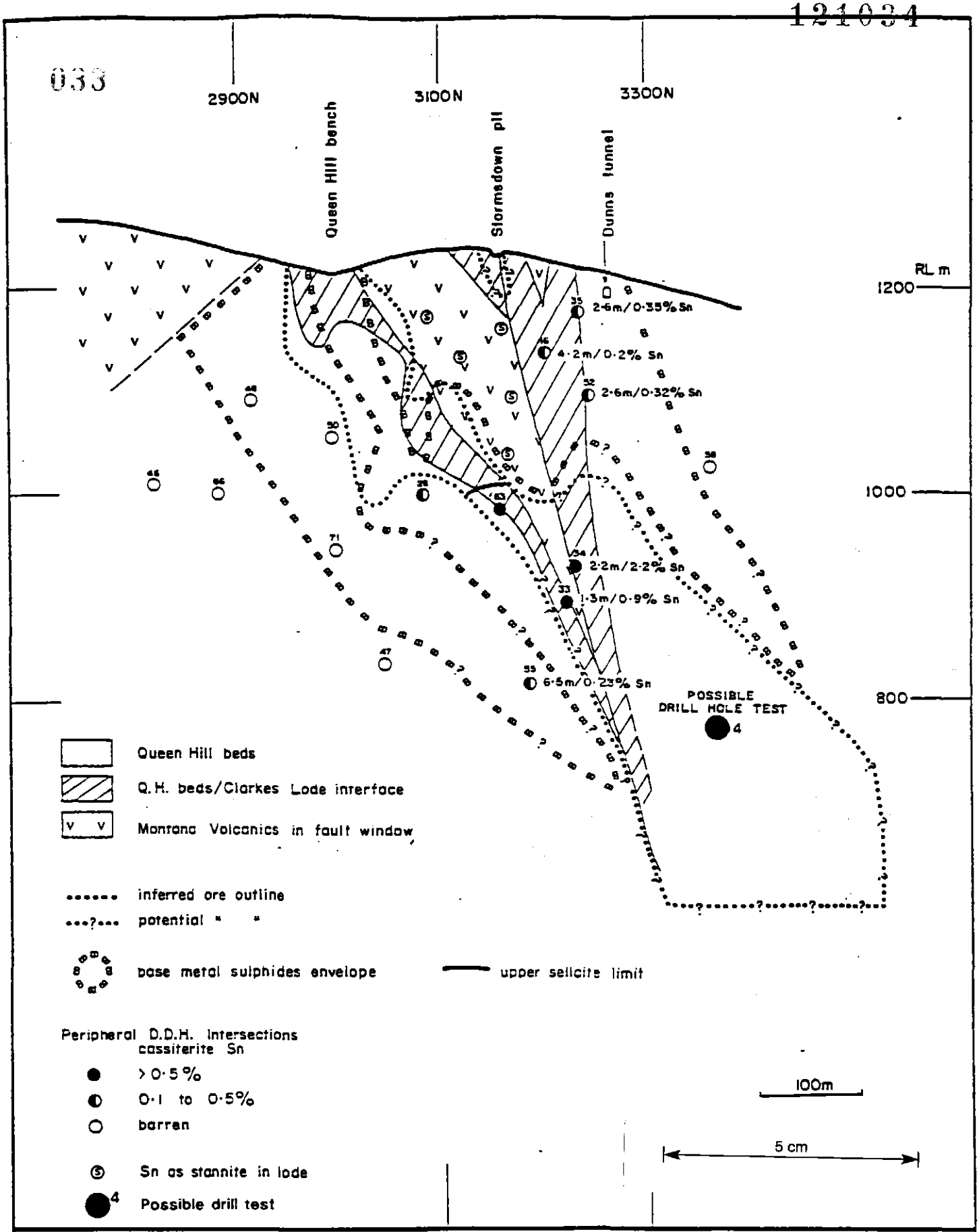
033



Aberfoyle Resources Limited

EXPLORATION DIVISION

REVISIONS			
Init.	Date	Init.	Date

ZEEHAN, NW TASMANIA

QUEEN HILL DEPOSIT

LONGITUDINAL PROJECTION

ONTO QUEEN HILL REFERENCE PLANE

Compiled : JAA

Drawn : JAA

Traced : JB

Checked :

Location Code :

Scale : 1:5000

Date : February 1989

FIGURE 13

6. References

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APPENDIX 1

GEOLOGICAL ABBREVIATIONS

Abundant	abn
Adularia	Adl
Agglomerate	agg
Albite	Ab
Alkali feldspar	Afd
Altered	alt
Amphibolitic	amb
Amphibole	Amb
Amygdaloidal	amg
Andalusite	An
Andesite	A
Angular	ang
Ankerite	An
Aplite	Ap
Approximate	apx
Arcuate	ar
Arenaceous	arn
Argillaceous	arg
Argillite	Arg
Arkose	Ak
Arkosic	ak
Arsenopyrite	Ap
Ash volcaniclastic	av
Autobrecciated	aub
Average	ave
Banded	bnd
Barite	Ba
Basalt	B
Bedded	bd
Biotite	Bio
Black	bk
Black shale	Bsh
Blue	bl
Boulder	bld
Breccia	b
Breccia volcaniclastic	bv
Bright	brt
Brown	br
Calcareous	cc
Calcite	Cc
Carbonaceous	carb
Carbonate	Co
Cassiterite	Cass
Cavernous	cav
Cemented	cem
Chalcopyrite	Cp
Chert	Ch
Chlorite	Cl
Chromite	Cr
Chromitiferous	cr
Clay	cy
Coarse	c
Coarse grained	cg
Colloform	coll
Colour	col
Common	com
Conglomerate	Cg
Conglomeratic	cg
Crimson	cm
Crystal	x
Crystal volcaniclastic	xv
Dark	dk
Dense	dns
Devitrification	dv
Diorite	Di
Disseminated	dis
Dolerite	Dol
Dolomite	Dm
Dyke	dy
Elongated	el
Emphasised	emp
Epiclastic (adj.)	e
Epiclastic (noun)	E
Epidote	Ep
Euhedral	euh
Eutaxitic	eux
Fabric	fab
Fault	F
Fault zone	FZ
Feldspar	Fd
Feldspar phyric	fp
Felspathic	fel
Ferruginous	fer
Fibrous	fb
Fine	f
Fine grained	fg
Fissile	fis
Flowbanded	fbn
Fluorite	Fl
Foliated	fo
Fragments	fr
Fuchsite	Fu
Galena	Gn
Glass	Gl
Glassy	gl
Gossan	Gos
Granular	glr
Graphite	Gt
Graphitic	gt
Green	gn
Grey	gy
Greywacke	Gw
Groundmass	gm
Haematite	Hmt
Hornblende	Hb
Ignimbrite	Ig
Illite	Ill
Interbedded	ibd
Intercalated	icl
Intrusive	int
Jurassic	Ju
K-Feldspar	Kfd
Khaki	kh
Laminated	lm
Lapilli volcaniclastic	lv
Lava	l
Lava breccia	lb
Leached	lch
Limonitic	Lim
Light	lgt
Limestone	Lst
Lithic	lh
Magnetite	Mt
Manganese	Mn
Matrix	mtx
Matrix dominated	md
Medium	med
Medium grained	mg
Metamorphosed	meta
Mica	Mic
Micaceous	mic
Mineralised	min
Minor	mnr
Mixed	mxd
Mottled	mtl
Mudstone	Mst
Nodule	nd
Off white	ow
Olivine	Ol
Oolitic	oo
Orange	or
Ordovician	O
Oxidised	ox
Pale	pl
Patchy	pat
Peperitic	pep
Perlitic	prl
Pervasive	per
Phenocrysts	phn
Phyllite	phyl
Phyric	p
Picrite	Pic
Pillow lava	pl
Pink	pk
Polymict	Y
Porphyritic	por
Predominantly	pred
Pumice	Pu
Pumiceous	pu
Purple	pp
Pyrite	Py
Pyritic	py
Pyroxene	Px
Pyrrhotite	Po
Quartz	Q
Quartzite	Qtz
Quellite	Qll
Questionable	?
Recrystallised	rx
Red	rd
Rehealed	rhd
Reworked	rw
Rhyodacite	RD
Rhyolite	R
Ripple marks	rmk
Round	rnd
Rubble	rbb
Sandstone	Ss
Schist	Sch
Schistose	sch
Sediment	sed
Selected fragments	sfr
Sericite	Se
Serpentine	Srp
Shale	Sh
Sheared	shd
Sheeted	sht
Silica	Si
Siliceous	sil
Siltstone	Slt
Slickenside	slk
Sphalerite	Sp
Spotted	spt
Spotty	spt
Stockwork	stw
Stratabound	stb
Strong	str
Structure controlled	stc
Syngenetic	syn
Talc	Tc
Tertiary	T
Tourmaline	Tm
Trace	tr
Trachyte	Tr
Tuff	Tf
Tuffaceous	tf
Variable	var
Variolitic	vr
Vein	vn
Vein concordant to bedd	cV
Vein discordant to bedd	dV
Very	v
Vesicular	ves
Vitric	vtr
Volcanic	vlc
Volcaniclastic	vlcl
Weak	wk
Weathered	wth
White	wh
Yellow	yw

12103?

EN HI L HOLI RENCE

CAMBRIAN
- 61 / 33 — m/s | D — Shales, mudstones, siltstones & greywacke; Dolomite (Dolomitic Siltstone)
- 44 — T — Tuffaceous greywacke

- 47 — Vt | Vb — Volcanic tuff; Volcanic lava

PROTEROZOIC
- 46 — Ts — Tuffaceous shale
- 63 — Sh — Shale (carbonaceous)
- 33 — D — Dolomite
- 36 — Ch — Chert
- 59 — S — Siltstone & pyritic mudstone
- 70 — QS — Thinly bedded quartzites / shales & slates
- 3 — Q — Massive quartzites

- 29 — Py > 5% bedded
- 12 — Py > 5% as veins, disseminated
- 21 — Po with or without Py, disseminated to massive
- 22 — Gn and / or Sph and / or Stn. with or without Py as veins.

ABBREVIATIONS

Carbon rich, locally carbonaceous	(carbon)
Sericite rich, locally sericitic	ser (ser)
Chlorite rich, locally chloritic	chlor (chlor)
Carbonate rich, locally carbonated	carb (carb)
Silicified, locally silicified	silic (silic)
Vesicular, amygdaloidal	vesic
Probable original character	siliceous
Bedding	
Cleavage, foliation	
Fault, unmeasured orientation	
Fault, measured orientation	
Fault Zone, unmeasured orientation	
Fault Zone, measured orientation	
Recrystallisation	
Sedimentary breccia	

Drill hole trace

SULPHIDE CONTACT

Py 5 (50)	Pyrite 5%, locally 50 %
Py 5 - 10	Pyrite 5 - 10 %
Gn 2	Galena 2%
Sph 5	Sphalerite 5%
Cpy 15	Chalcopyrite 15 %
Ba 5	Barite 5 %
q vein	quartz vein
c vein	carbonate vein
Si vein	Siderite vein

Drill hole trace

Petrological Sample 230453

ROCK TYPES illustrated by code and colour on left side of drill hole plots

Contact shown thus — Q

Internal variations shown

Drill hole trace

QUI LICEN RENCE

QUATERNARY
- 3 / 8 — Qa | DQ — Alluvium; Dolerite Talus

TERTIARY
- 51 — Tb — Basalt
- 27 — Tc — Conglomerate & grit
- 71 — Tg — Gravels
- 34 — Ts — Sand, silt, clay & limestone

JURASSIC
- 10 — Jd — Dolerite

PERMIAN
- 23 — Pz — Zeehan Glacial Formation

DEVONIAN
- 14 — Dg — Heemskirk Granite / Adamellite
- 41 — Db — Bell Shale
- 40 — Df — Florence Quartzite

SILURIAN
- 18 — Sc — Crotty Quartzite

ORDOVICIAN
- 28 — Og — Gordon Limestone
- 65 — Om — Moina Sandstone

CAMBRIAN
- 64 — Cc — m/s 61 — Crimson Creek Formation; Shales, mudstones, siltstones & greywacke
- T 44 — Tuffaceous greywacke

Oonah Quartzite and Slate

PROTEROZOIC — Puo 58
- Vt 47 — Vb 47 — Volcanic tuff; Volcanic lava
- dom 33 — Dolomite
- m/s 61 — Mudstone (pyritic mudstone)
- ch 36 — Chert
- slt 38 — Siltstones, locally calcareous, carbonaceous, pyritic
- Q/sst 3 — Massive light grey-buff quartzite (sandstone)
- sh/sl 70 — Shales & slates (locally carbonaceous, calcareous, pyritic)

RAL / TIONS

MINERAL

Py	-	Pyrite
Cpy	-	Chalcopyrite
Sph	-	Sphalerite
Gn	-	Galena
Po	-	Pyrrhotite
Sl	-	Siderite
Mag	-	Magnetite
Ma	-	Marcasite
Ar	-	Arsenopyrite
Stn	-	Stannite
musc	-	muscovite
graph	-	graphite
lim	-	limonite
hem	-	hematite
tm	-	tourmaline
K spar	-	K feldspar
fd	-	feldspar
bi	-	biotite
plag	-	plagioclase
serp	-	serpentine
chi	-	chiastolite
calc	-	calcareous
q	-	quartz
cord	-	cordierite
chlor	-	chlorite
trem	-	tremolite
diop	-	diopside
pyrox	-	pyroxene
carb	-	carbonate
dom	-	dolomite
Fl	-	fluorite
Am	-	amphibole

ROCK TYPES

Sediments

sst	-	sandstone
qtz	-	quartzite
sh	-	shale
sl	-	slate
slt	-	siltstone
a	-	argillite
ch	-	chert
lst	-	limestone
dom	-	dolomite
gw	-	greywacke
cong	-	conglomerate
ms	-	mudstone

Igneous

Vt	-	tuff
Vb	-	lavas
Va	-	agglomerate
um/ub	-	rocks of ultrabasic affinity
dol	-	dolerite
A	-	adamellite
G	-	granite
serp	-	serpentinite

TEXTURE

xeno	-	xenocrysts
mic	-	micaceous
sacch	-	saccharoidal
tuff	-	tuffaceous
homog	-	homogenous
porph	-	porphyry
phen	-	phenocrysts
brec	-	breccia
rx	-	recrystallised
dissem	-	disseminated
interb	-	interbedded
nod	-	nodules
frag	-	fragments
alt	-	altered
lam	-	laminated
abund	-	abundant
weath	-	weathered
undiff	-	undifferentiated
fg	-	fine grained
mg	-	medium grained
cg	-	coarse grained
st	-	staining

STRUCTURE

fol	-	foliation / foliated
ax. pl.	-	axial plane
cr. cl.	-	crenulated cleavage
vert	-	vertical
f. a.	-	fold axis
80 —>63° M	-	dip / dip direction magnetic

Folding

Fo^1	-	F1 fold deforming bedding plane
Fo^2	-	F2 fold deforming bedding plane

Deformation history

So	-	bedding
S1	-	first deformation
S2	-	second deformation

Lineations

L1	-	lineation produced by S1
L2	-	lineation produced by S2

GENERA BOLS

- 0-2 — Outcrop boundary
- Float
- 0-4 — Contact known
- Contact interpreted
- Contact inferred
- Fault definite (known dip) — 70° F
- Fault inferred — F
- Bedding strike & dip
- Schistosity with dip
- Joint with dip
- Minor folding showing plunge & trend
- Fold axis showing plunge & trend
- DDH — Diamond drill hole, with projected trace of hole (collar location accurate)
- DDH — Diamond drill hole, with projected trace of hole (collar location not accurate)
- PD — Percussion drill hole
- Shaft
- Trig station
- Lease corner peg
- Building
- Costean or trench
- Pit
- Dump
- Scarp, cliff or breakaway
- River or creek
- Railway or tram track
- Adit
- 2200 — Topographical contours & interval
- Cleared area
- Swamp
- Alluvial deposits
- Track
- Road (unsealed)
- Highway (sealed)
- E.L. 47/71 — Licence boundary & number
- Dam on stream
- T/S — Thin section
- Mine

Aberfoyle Exploration Pty Ltd

Geology: C.H.Y., R.M.J.	QUEEN HILL GEOLOGICAL LEGEND Surface Geology & Cross Sections	Date: AUGUST, 1980
Drawn: R.J.E.		Scale:
Traced:		Plate No: QH 138

APPENDIX 2

121040

033

ABERFOYLE RESOURCES LIMITED

ZEEHAN CML TIN DEPOSITS

TECHNICAL REPORT

GEOPHYSICAL SURVEYS 1989-1990

Prepared By:

J J Read
Geophysicist

Distribution

1. Aberfoyle Resources Limited, Adelaide
2. Aberfoyle Resources Limited, Burnie
3. Aberfoyle Resources Limited, Hawthorn

Issued By:

J Silic
Chief Geophysicist

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2. Introduction

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   3.2 EM-37 Survey DDH's ZS-91, ZS-92

   3.2.1 EM-37 Survey DDH ZS-92
   3.2.2 EM-37 Survey DDH ZS-91

4. Aberfoyle UTEM Surveys

   4.1 Severn Survey
   4.2 Golf Course Survey
   4.3 Queen Hill Survey

5. Conclusions

6. References

Appendices

Appendix 1- Sirotem Data DDH ZS-92
Appendix 2- EM-37 Data DDH ZS-91, DDH ZS-92
Appendix 3- UTEM Survey Data

Plate

Plate No.	Title	Scale
QH-250	Zeehan Tin Deposits, Geophysical Surveys 1989-1990	1:2500

1. SUMMARY

Drill holes ZS-92 and ZS-91, drilled to test for extensions of the Severn tin resource, were read with five loops of DHEM data. The interpretation of this data suggested a large conductor persisted between these holes, the location of which could not be determined from the DHEM data. Consequently a three loop UTEM survey was undertaken to locate the interpreted conductor. An orientation loop of UTEM data read over Severn failed to characterise its EM response. A significant conductor was identified from this loop and interpreted to occur beneath Queen Hill. A follow-up loop of UTEM data revealed this conductor to be two wide blocks of conductive shale.

The UTEM data obtained over the Zeehan Golf Course failed to detect any EM response due to conductive mineralisation occurring within the Poverty Point Beds. The southerly extension of the Queen Hill shale conductor is interpreted to explain the long wavelength DHEM response of DDH ZS-91 and DDH ZS-92.

No further geophysical work is recommended for Zeehan CML.

2. Introduction

The Zeehan tin deposits occur between the eastern flanks of Queen Hill and the western outskirts of the Zeehan township. The deposits comprise three currently unexploited bodies of cassiterite-sulphide mineralisation: Queen Hill, Montana, and Severn, representing a geological resource of 7.3 million tonnes averaging 0.7% Sn (Aberfoyle Limited, 1989).

The Queen Hill and Montana bodies were discovered in 1965-1971, when cassiterite was recognised in massive pyrite mineralisation exposed by old silver-lead mines. Drilling of a magnetic anomaly, displaced 500m from the Queen Hill and Montana bodies, led to the discovery of the larger Severn body in 1976 .

In 1989 the drilling of two deep drill holes ZS-91 and ZS-92, was undertaken with the aim of expanding the Severn high grade resource by a further 15 million tonnes.

This report presents the results of DHEM surveys conducted in DDH's ZS-91 and ZS-92, and the interpretation of a UTEM survey instigated as a follow-up to the DHEM surveys.

3. Aberfoyle DHEM Surveys

The Severn mineralisation exhibits a vertical paragenetic sequence from deeper (earlier) sellaite chlorite pyrrhotite pyrite cassiterite stockwork-style mineralisation, to shallower pyrite stannite +/- cassiterite lodes. The higher grade core of the deposit comprising sellaite pyrrhotite mineralisation. Consequently, EM provided a sensitive technique for locating developments of pyrrhotite and associated sellaite mineralisation away from DDH's ZS-91 and ZS-92. The occurrence of shale units within the Poverty Point Beds and overlying Oonah Formation, meant any off-hole conductors identified in the DHEM data could not immediately be assumed as pyrrhotite associated with tin mineralisation.

3.1 Sirotem Survey DDH ZS-92

The initial survey in DDH ZS-92 comprised one loop (loop one) of Sirotem data collected by McSkimmings Geophysics on the 7th September 1989. Twenty channels

121044

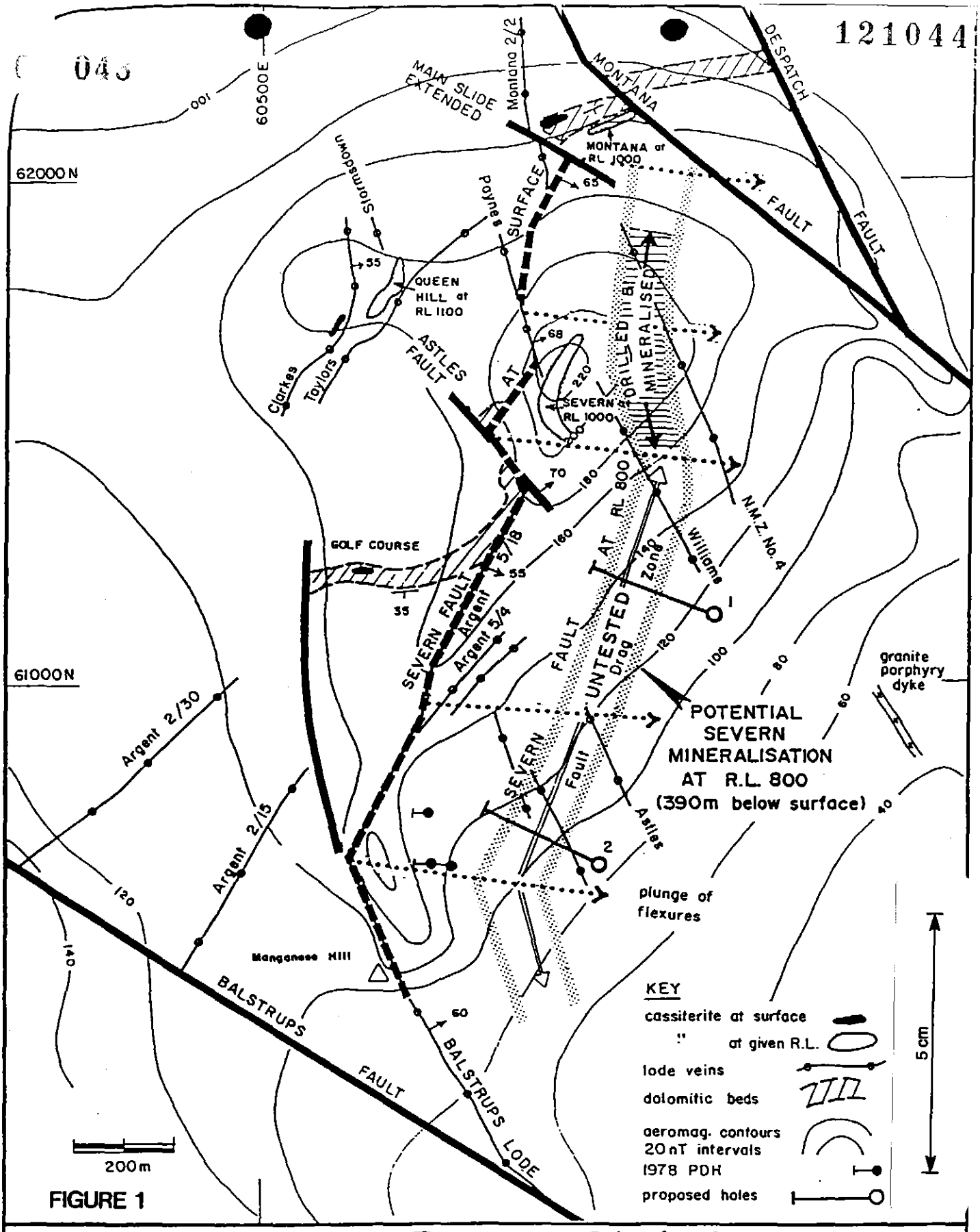


FIGURE 1

Aberfoyle Resources Limited

EXPLORATION DIVISION

REVISIONS			
Init.	Date	Init.	Date

TASMANIA
ZEEHAN CASSITERITE DEPOSITS
KEY INGREDIENTS AND
PROPOSED DRILLING OF SEVERN EXTENSION

Compiled : JAA
Drawn : JAA
Traced : JB
Checked :

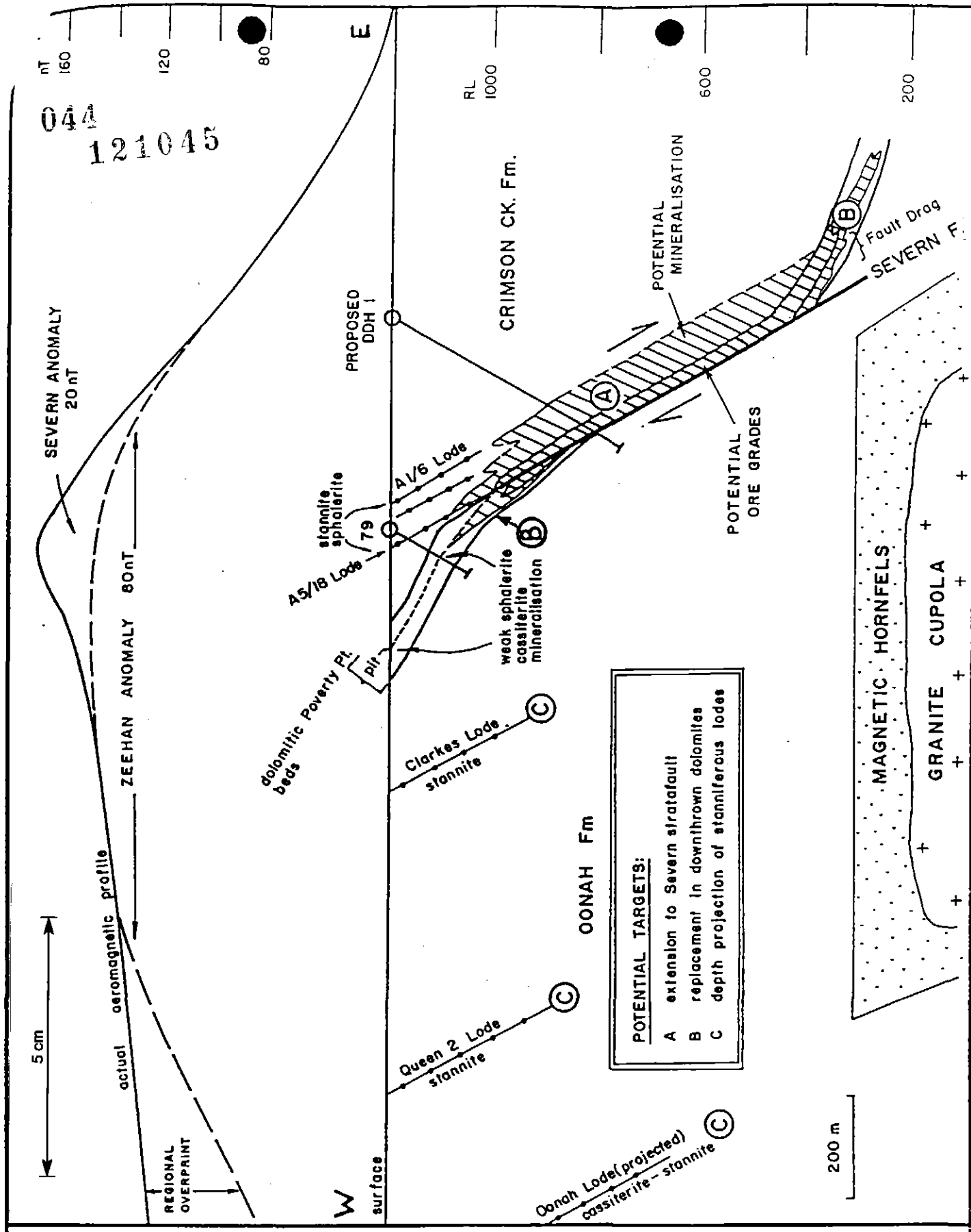
Location Code :

Scale : 1:10,000

Date : MAY 1988

Plate No. : QH 238

044
121045



Aberfoyle Resources Limited

EXPLORATION DIVISION

FIGURE 2

REVISIONS			
Init.	Date	Init.	Date

TASMANIA

ZEEHAN TIN DEPOSITS

SECTION THROUGH GOLF COURSE AREA

showing magnetic & structural interpretation & proposed drill hole

Compiled :

Drawn : JAA

Traced : JB

Checked :

Location Code :

Scale : 1:10,000

Date : JUNE 1988

Plate No. : QH 240

of early and standard delay-time EM data were obtained, with a medium power Sirotem MK II receiver, covering a delay-time period of 0.049-28.123 ms.

Interpretation of this data identified a short-wavelength anomaly extending from 500m to the end of DDH ZS-92. The full anomalous response was not obtained, as the anomaly extended beyond the end of DDH ZS-92. Consequently, it was not possible to determine if the anomaly source occurred above, or in front of, the drill hole.

The second anomalous feature revealed by the ZS-92 DHEM data was a long wavelength anomaly, of positive sign, that produced a monotonic increase down the hole in the measured DHEM response. This response was interpreted as indicative of a large secondary current system produced by material of significant size and conductivity. To produce the observed positive response, the conductor was interpreted to occur at a significant distance in front of DDH ZS-92.

In order to better define the location of the major conductor interpreted from the loop 1 data, three additional loops of data were collected (see section 3.2).

3.2 EM-37 Survey DDH's ZS-91 and ZS-92

The three loop follow-up DHEM survey in DDH ZS-92 and a one loop reconnaissance survey in DDH ZS-91, was conducted by Geoterrex Pty Ltd using the EM-37 TDEM system, on the 17th and 19th of October 1989. The DDH ZS-92 surveys were conducted with a transmitter frequency of 25Hz, covering a delay-time interval of 0.089-7.157 ms. Considering the possibly high conductivity of the pyrrhotite target, the one loop survey for DDH ZS-91 was conducted at 6.25 Hz covering a larger delay-time interval of 0.354-28.628 ms.

3.2.1 EM-37 Survey DDH ZS-92

The geological sequence intersected by DDH ZS-92 is illustrated in figure 3. The following interpretations of the three follow-up loops of DHEM data were made:

1) The short wavelength anomaly at 550m was found to change sign, from a positive response at early time to a negative response at late-

121047

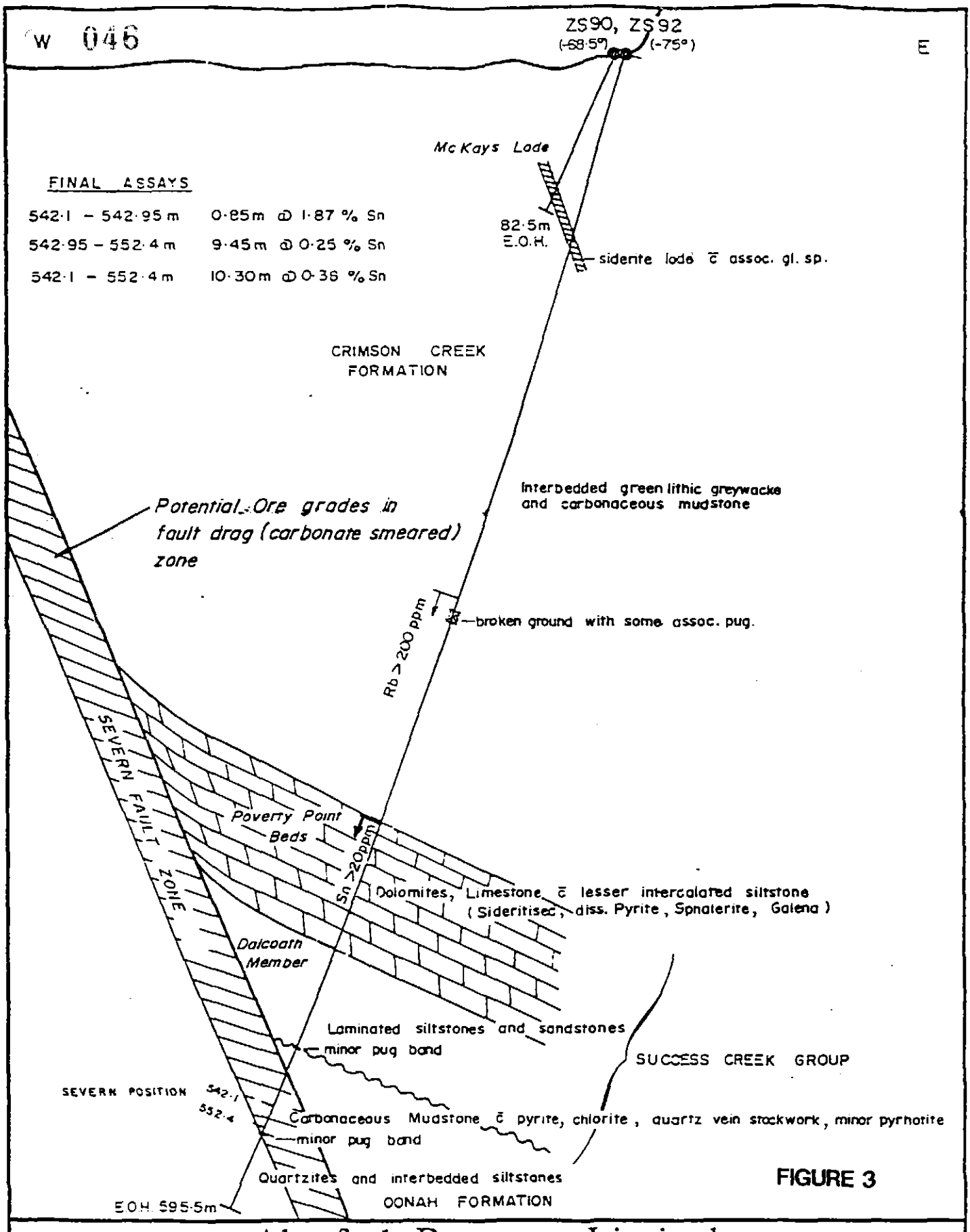


FIGURE 3

Aberfoyle Resources Limited

EXPLORATION DIVISION

REVISIONS			
Init.	Date	Init.	Date
DJN jmc	14-11-89		
DJN rje	11-12-89		

NORTH WEST TASMANIA

ZEEHAN DEPOSITS

SUMMARY CROSS SECTION - ZS 92

Compiled : JAA

Drawn : DJN

Traced : RJE

Checked :

Location Code :

Scale : 1 : 2500

Date : Seprember, 1989

Plate No. : FIG.

time, from loop 4. The opposite sign reversals occurred from loop 2, indicating the conductor producing this response occurred between these two loops. A far smaller anomalous response was recorded from loop 3, indicating poor coupling existed between the conductor and loop 3. These features were interpreted as indicating the anomaly source was located near the centre of loop 3 and hence close to DDH ZS-92. The sign change of the anomaly, with increasing time, indicated the conductor occured above DDH ZS-92. The anomalies half width suggested the conductor occurred only 30-40m from the drill hole. A component of the anomaly was interpreted to be due to conductive material intersected within the Severn Fault Zone.

This interpretation suggested that the mineralisation intersected between 538-552m becomes more conductive above the drill hole. The conductor was interpreted to be of limited size and was not recommended for further drilling.

2. Three loops of data were collected in ZS-92, in the aim of recording a sign change of the long-wavelength response, hence locating the axis of the conductor. No sign change was detected from loops 2, 3, and 4, thus the anomalies source must have occurred west of the centre of loop 4. This implied the conductor was large and significantly conductive as it was detected at greater than 300m from the drill hole.

3. A broad early-time anomaly at 350m downhole was detected from loops 2, 3 and 4. This anomaly remained positive for each loop, indicating no loop crossed over the axis of the current system producing this anomaly. The anomaly source was interpreted to occur west of the centre of loop 4 at a position 200-250m from DDH ZS-92. The likely source of this anomaly is conductive shale within the Oonah Formation.

4. A moderate wavelength anomaly was identified at 120m downhole. This anomaly was negative response from loops 3 and 4, but did not occur from loop 2, suggesting this loop

was null-coupled with the causative source. Consequently the anomaly source was interpreted to occur within loop 2 and be due to an increase in the conductivity of McKays Lode below ZS-92.

3.2.2 EM-37 Survey DDH ZS-91

The DHEM data recorded in DDH ZS-91 (see figure 4) from loop 5 exhibited a monotonic increase in the measured DHEM response similar to that recorded in DDH ZS-92 . This indicated a major conductor persists between ZS-91 and ZS-92. Unfortunately the lateral position and nature of this large conductor could not be determined from the DHEM data.

A second, short wavelength, anomaly was recorded in DDH ZS-91. This response occurs from 560m to the end of the hole and was interpreted to be due to conductive material smeared out along the Severn Fault Zone (see Figure 4).

4. Aberfoyle UTEM Surveys

From the DHEM data collected in DDH's ZS-91 and ZS-92 it was not possible to accurately determine the position of the large conductor interpreted to persist between the two holes. Only a zone could be estimated within which the conductor should occur (see plate QH-250). Within this zone a new geological target, developed independently of the DHEM results, was suggested to occur (Anderson pers. comm.). This target comprised Rension style carbonate hosted tin mineralisation occurring at the intersection of the Poverty Point Beds and the Severn Fault, beneath the Zeehan Golf Course.

The newly developed Poverty Point Beds target and the need to locate the source of the long wavelength DHEM anomaly, provided the impetus for a planned 3 loop UTEM survey. The interpretation of the UTEM survey is presented in plate QH-250.

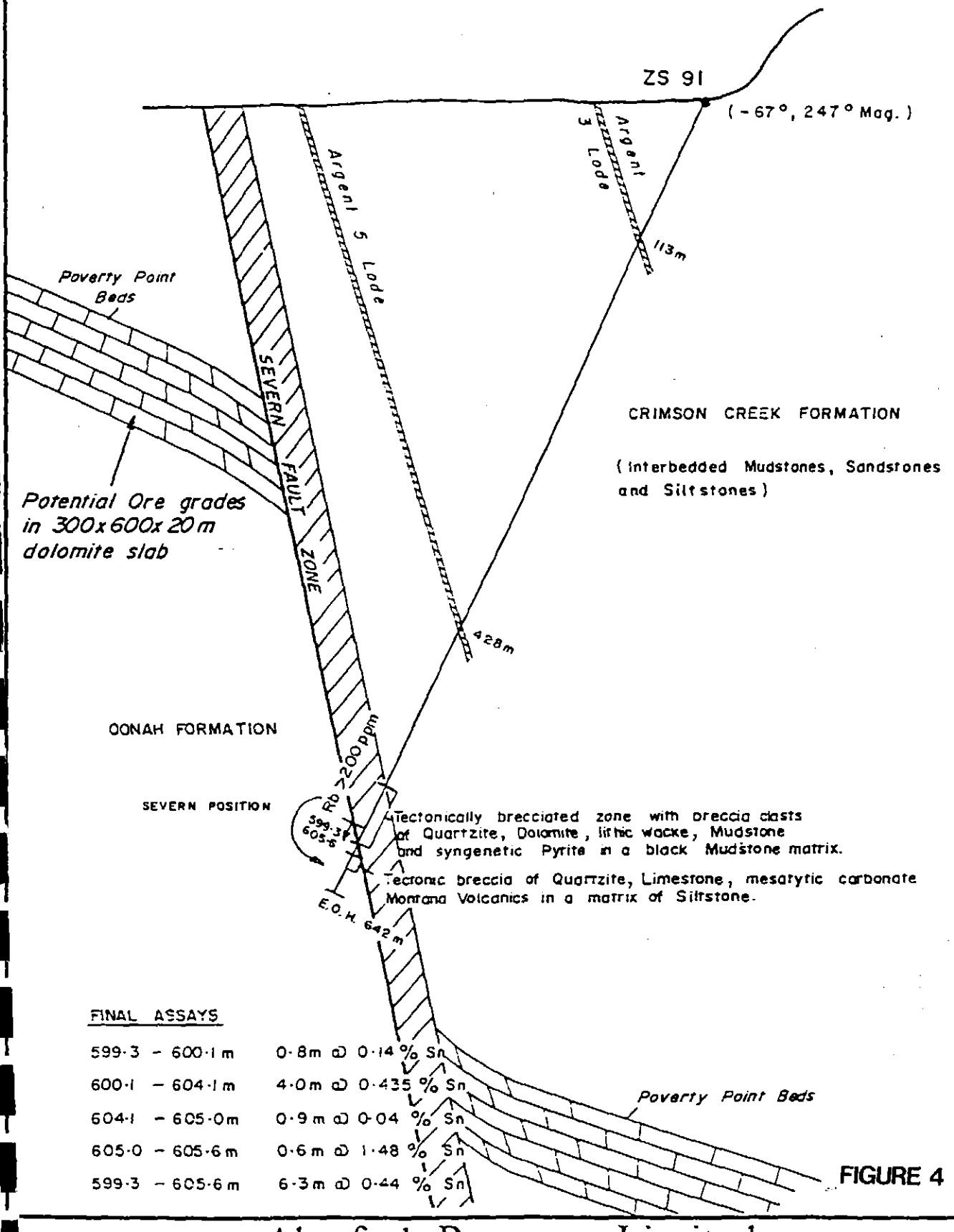
4.1 Severn Survey

One loop (loop 6) of UTEM data was collected on four lines over the known Severn mineralisation. This survey provided orientation data for the following Golf-Course survey and was undertaken by Lamontagne Geophysics Australia on the 18/12/89.

121050

W 043

E



FINAL ASSAYS

599·3 – 600·1 m	0·8m @ 0·14 % Sn
600·1 – 604·1 m	4·0m @ 0·435 % Sn
604·1 – 605·0m	0·9 m @ 0·04 % Sn
605·0 – 605·6 m	0·6 m @ 1·48 % Sn
599·3 – 605·6 m	6·3m @ 0·44 % Sn

FIGURE 4

Aberfoyle Resources Limited

EXPLORATION DIVISION

REVISIONS			
Init.	Date	Init.	Date
DJN jmc	14-11-89		
DJN rje	11-12-89		

Location Code :

NORTH WEST TASMANIA

ZEEHAN DEPOSITS

SUMMARY CROSS SECTION ZS 91

Scale : 1 : 4000 | Date : October 1989

Compiled : JAA
Drawn : DJN
Traced : J. M. S.
Checked :
Plate No. : FIG 4

The loop 6 UTEM data revealed a high amplitude late-time anomaly occurring on all lines surveyed. This anomaly was interpreted as due to a cultural conductor, (Eg. Phone cable, pipeline, buried tram track) occurring at shallow depth.

A late-time response was partially detected off-end of lines 2000N - 2500N, on the western side of Queen Hill. The exact position of the causative source of this anomaly, could not be determined from the loop 6 data and a further loop of UTEM data (loop 9) was recommended (see section 4.3).

The two responses discussed above effectively overprinted any EM response due to the Severn mineralisation. Consequently, it is not possible to state that the Severn mineralisation did actually produce a surface EM response, although due to the presence of significant amounts of pyrrhotite with the tin mineralisation, it appears unlikely that it did not.

4.2 Golf Course Study

The Zeehan Golf Course UTEM survey aimed to detect the EM response of any flat lying conductive mineralisation occurring within the carbonates of the Poverty Point Beds, at their intersection with the Severn Fault (see figure 4). To test this model lines 500E to 900E were read with UTEM data inside loop 7.

Using the method of interpretation outlined in Silic (1989) a UTEM anomaly persisting on all lines read inside loop 7, was interpreted as due to a broad shallow conductor, likely to be a shale horizon. The shallow cultural anomaly located from loop 6, was also located on lines 900E, 800E and 700E from loop 7.

No UTEM responses were detected from loop 7 that could be attributed to conductive sulphide mineralisation. As loop 7 was designed to energise shallowly dipping mineralisation, loop 8 was read to detect any moderately to steeply dipping mineralisation potentially not detected by loop 7. From loop 8, a conductor interpreted to be due to a lithological unit, was found to occur at the northern end of lines 400E - 700E. This conductor was located in the loop 9 data and is discussed in Section 4.3.

4.3 Queen Hill Survey

Following up the discovery of a conductor off-end of lines 2000N-2585N a further loop of UTEM data (loop 9) was collected over Queen Hill.

The loop 9 UTEM data revealed the off-line response to be due to two approximately parallel, block conductors, upto 150m wide. These conductors are interpreted as blocks of conductive shale, producing late-time EM responses lasting until 7.15ms delay time.

The eastern block conductor is the northern extension of a formational conductor located from loop 7 on lines 400E - 700E.

5. Conclusions

DHEM data collected in DDH's ZS-91 and ZS-92 suggested a significant conductor occurred to the NW of these holes. This interpretation provided support for a newly developed target of Renison style tin mineralisation occurring at depth below the Zeehan Golf Course. The long wave-length DHEM responses detected in DDH ZS-91 and DDH ZS-92, are explained by the presence of two significantly conductive large blocks of shale, occurring on the flanks of Queen Hill and extending in a SW direction.

The loop of orientation UTEM data collected over the Severn tin resource failed to characterise the bodies EM response. Despite this negative result, it is unlikely that tin mineralisation occurs at the Zeehan Golf Course, due to the lack of EM conductors. If mineralisation does occur in the Poverty point Beds it must be non-conductive. Such mineralisation would have to be different to the known Severn mineralisation which DHEM showed to be conductive.

The areas of likely extensions to the Severn and Queen Hill mineralisation have been effectively explored with UTEM and DHEM. Further extensions to the known mineralisation are interpreted as unlikely to occur and no further geophysical work is recommended on the basis of the results presented in this report.

6. References

Anderson, J.A, 1989a,	The Geology Of the Zeehan Cassiterite-Sulphide Deposits, Tasmania, Geol. Soc. Aust. Spec. Publ. 15: 434-438.
Anderson, J.A, 1989b,	Zeehan Drilling Proposal, Aberfoyle Resources Limited File Zeehan 14.
Anderson, J.A, 1986,	Zeehan Case History For The Tasmanian Volume, Aberfoyle Resources Report No. Zeehan 58
Palmer, K. G., 1983,	Zeehan Project Pre Feasibility Study Report, Aberfoyle Resources Limited, Report No. Zeehan 45.
Silic, J., 1989,	Interpretation of TDEM Data Using First and Second Spatial Derivatives and Time Decay Analysis, Explor. Geophys., Vol 20, No 1/2, 57-64.

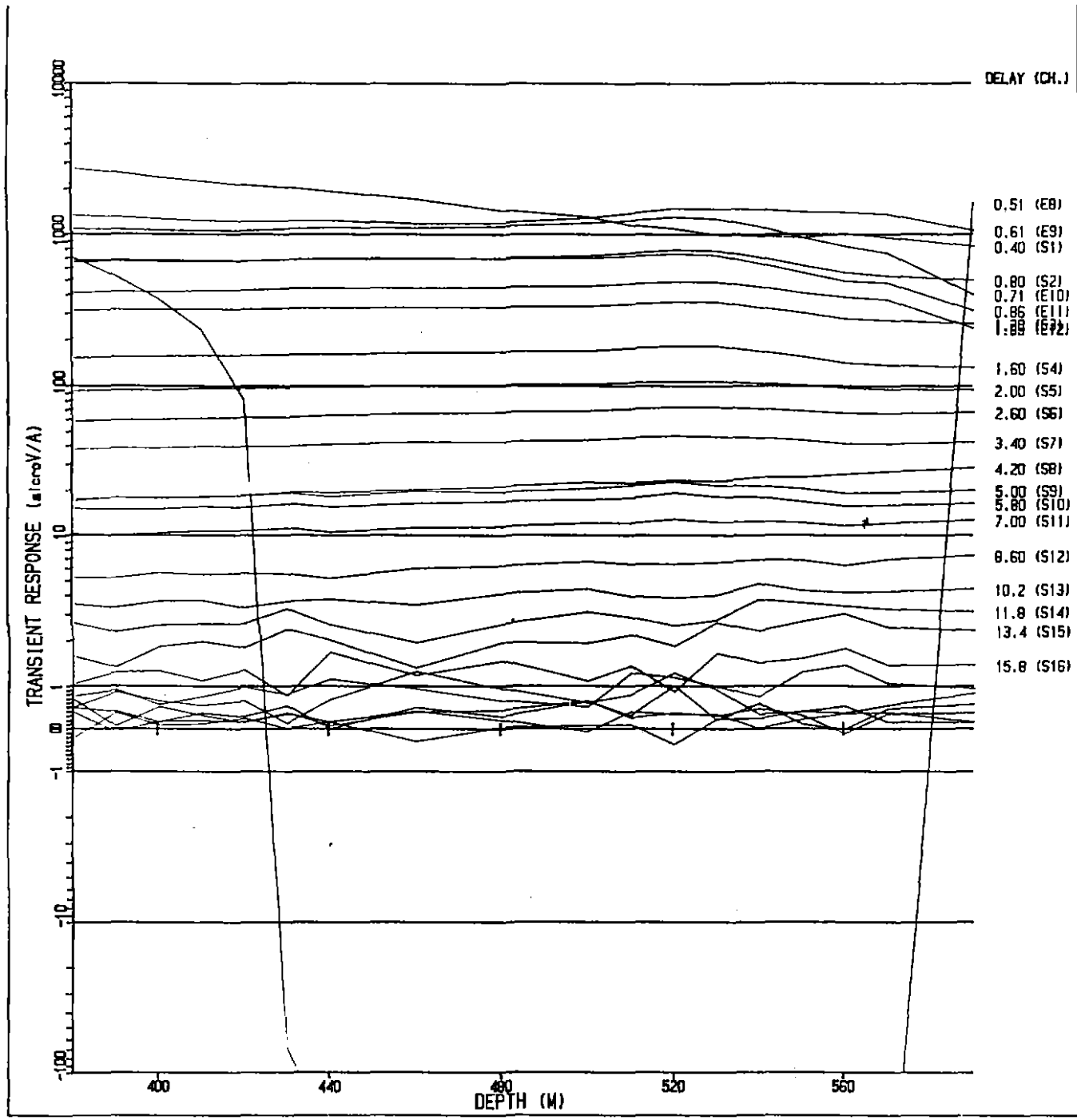
6. References

Aberfoyle Limited — 1989 Annual Report

Silic, J., 1989, — Interpretation of TDEM Data Using First and Second Spatial Derivatives and Time Decay Analysis, Explor. Geophys., Vol 20, No 1/2, 57-64.

APPENDIX 1

Sirotem Data DDH ZS-92



SURVEY SPECIFICATIONS

DATA ACQUIS'N : McSKIMMING GEOPHYSICS

SURVEY DATE : 05-09-89
CONFIGURATION : 500M SQUARE TX. LOOP, DRILL HOLE SURVEY
READING INT. : 40 METRES
NO. OF STACKS : 1024
TRANSMITTER : MEDIUM POWER
RECEIVER : SIROTEM II S/N 1237
CURRENT : 11.4 AMPS
OPERATOR : MICHAEL ROSE

PLOT SPECIFICATIONS

HORIZONTAL SCALE - 1:1000
VERTICAL SCALE - LOGARITHMIC 4CM. PER DECADE LINEAR BETWEEN -1 AND +1

TIME DELAYS IN MILLISECONDS
E - EARLY TIME WINDOW
S - STANDARD TIME WINDOW

ABERFOYLE EXPLN

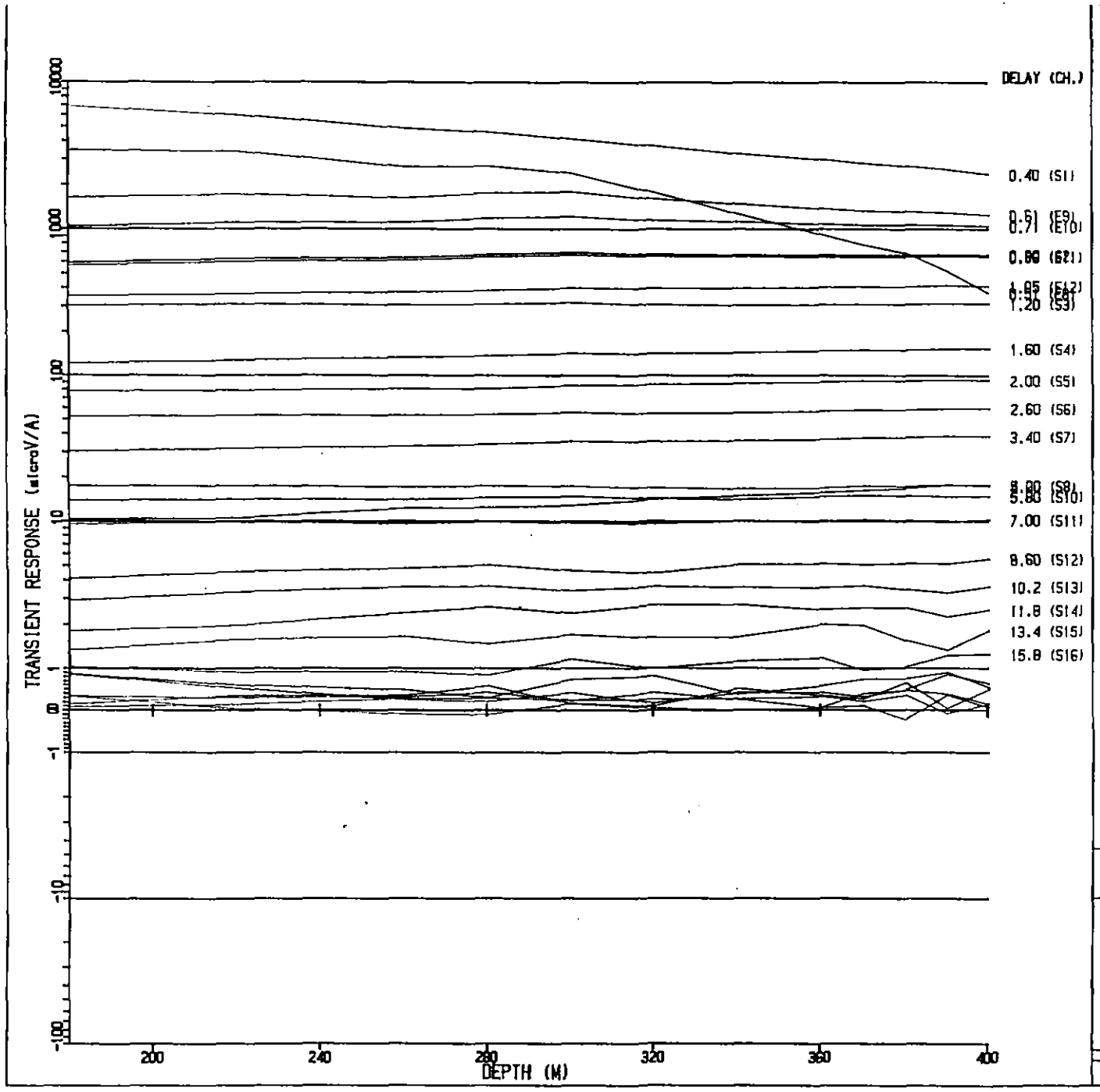
TASMANIA
ZEEHAN

SIROTEM PROFILE

LINE HOLE 92 LOOP1

SCALE - 1:1000

121056



SURVEY SPECIFICATIONS

DATA ACQUIS'N : McSKIMMING GEOPHYSICS

SURVEY DATE : 05-09-89
CONFIGURATION : 500M SQUARE TX. LOOP, DRILL HOLE SURVEY
READING INT. : 40 METRES
NO. OF STACKS : 1024
TRANSMITTER : MEDIUM POWER
RECEIVER : SIROTEM II S/N 1237
CURRENT : 11.4 AMPS
OPERATOR : MICHAEL ROSE

PLOT SPECIFICATIONS

HORIZONTAL SCALE - 1:1000
VERTICAL SCALE - LOGARITHMIC 4CM. PER DECADE LINEAR BETWEEN -1 AND +1

TIME DELAYS IN MILLISECONDS
E - EARLY TIME WINDOW
S - STANDARD TIME WINDOW

ABERFOYLE EXPLN

TASMANIA
ZEEHAN

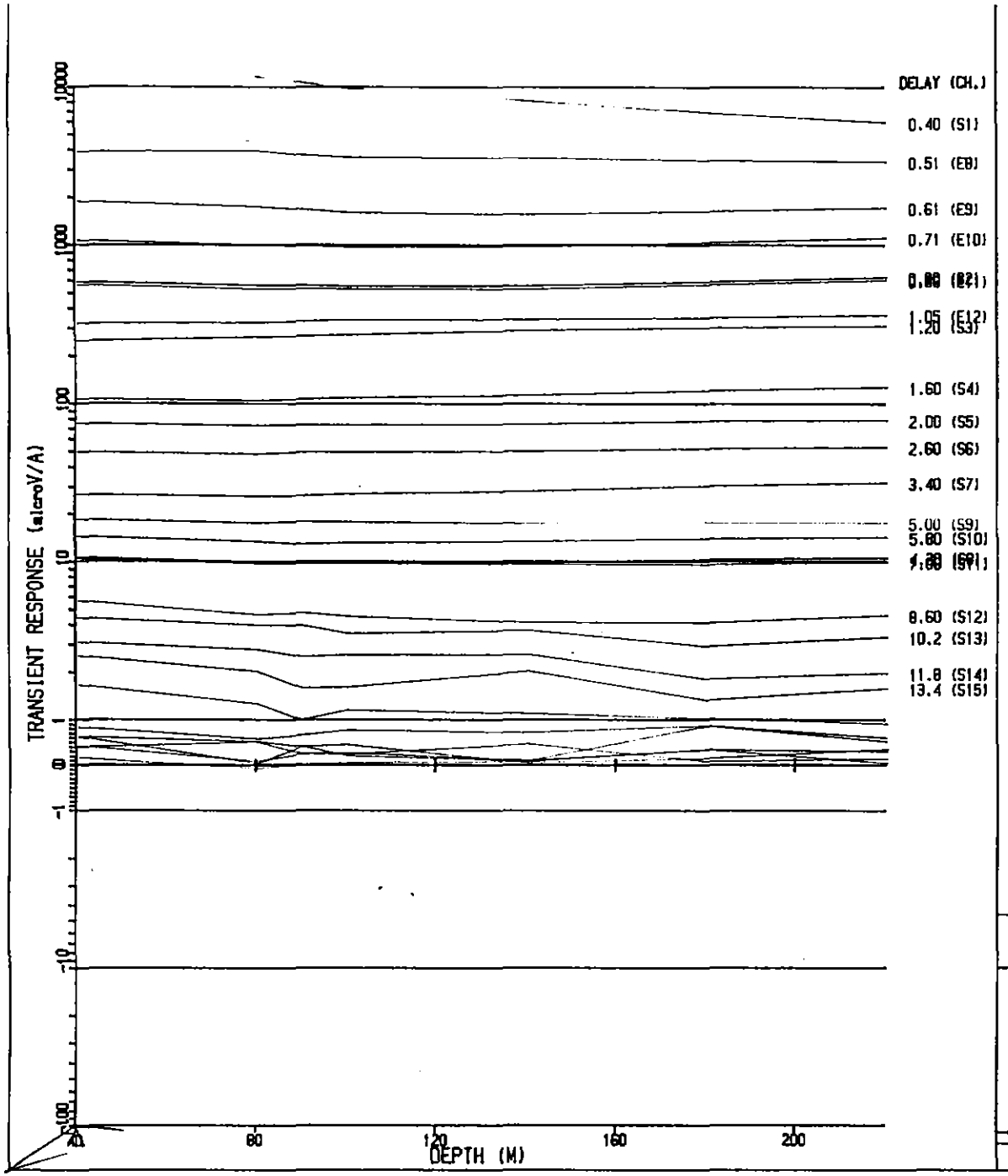
SIROTEM PROFILE
LINE HOLE 92 LOOP1

SCALE - 1:1000

12103?

0556

121058



SURVEY SPECIFICATIONS

DATA ACQUIS'N : McSKIMMING GEOPHYSICS

SURVEY DATE : 05-09-89
CONFIGURATION : SOON SQUARE TX. LOOP, DRILL HOLE SURVEY
READING INT. : 40 METRES
NO. OF STACKS : 1024
TRANSMITTER : MEDIUM POWER
RECEIVER : SIROTEM II S/N 1237
CURRENT : 11.4 AMPS
OPERATOR : MICHAEL ROSE

PLOT SPECIFICATIONS

HORIZONTAL SCALE - 1:1000
VERTICAL SCALE - LOGARITHMIC 4CM. PER DECADE LINEAR BETWEEN -1 AND +1

TIME DELAYS IN MILLISECONDS
E - EARLY TIME WINDOW
S - STANDARD TIME WINDOW

ABERFOYLE EXPLN

TASMANIA
ZEEHAN

SIROTEM PROFILE
LINE HOLE 92 LOOP1

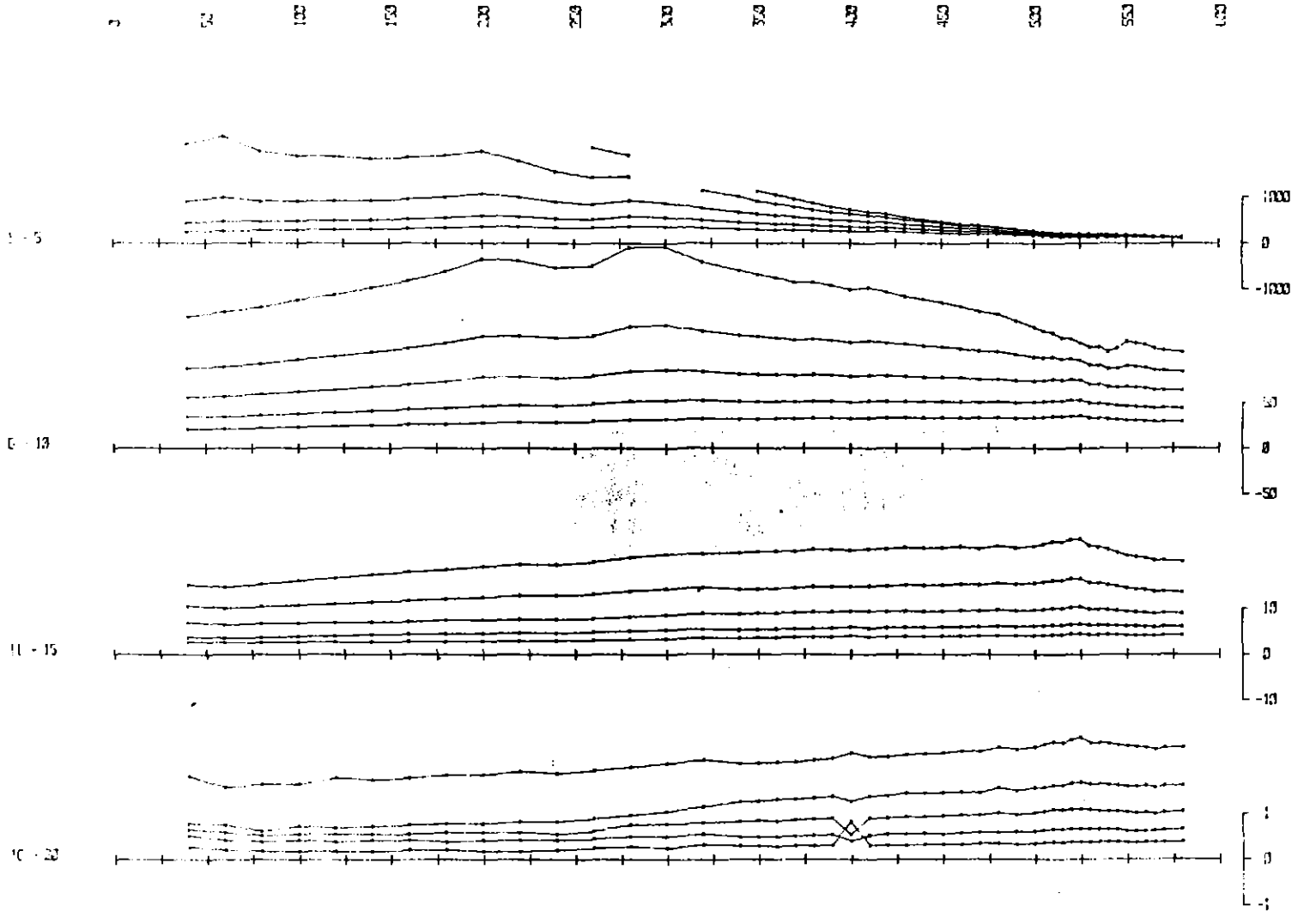
SCALE - 1:1000

Appendix 2

EM-37 Data DDH ZS-91, DDH ZS-92

121060

AXIAL COMPONENT B (Z)



BOREHOLE SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

TX LOOP SIDES	:	1000N 1000E
	:	1200N 1200E
TX LOOP SIZE	:	200 m X 200 m
TX TURN OFF TIME	:	150 microsecs.
FIRST GATE TIME	:	88.5 microsecs.
CURRENT	:	12.5 amps
FREQUENCY	:	25 Hz.
INTEGRATION TIME	:	1024 cycles
SYNC MODE	:	
HORIZONTAL SCALE	:	1:2500
SURVEYED BY	:	PE
DATE	:	13/10/1989

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD. | PROJECT NO. 1

CLIENT : Sherritt Resources Ltd

PROJECT : Severn

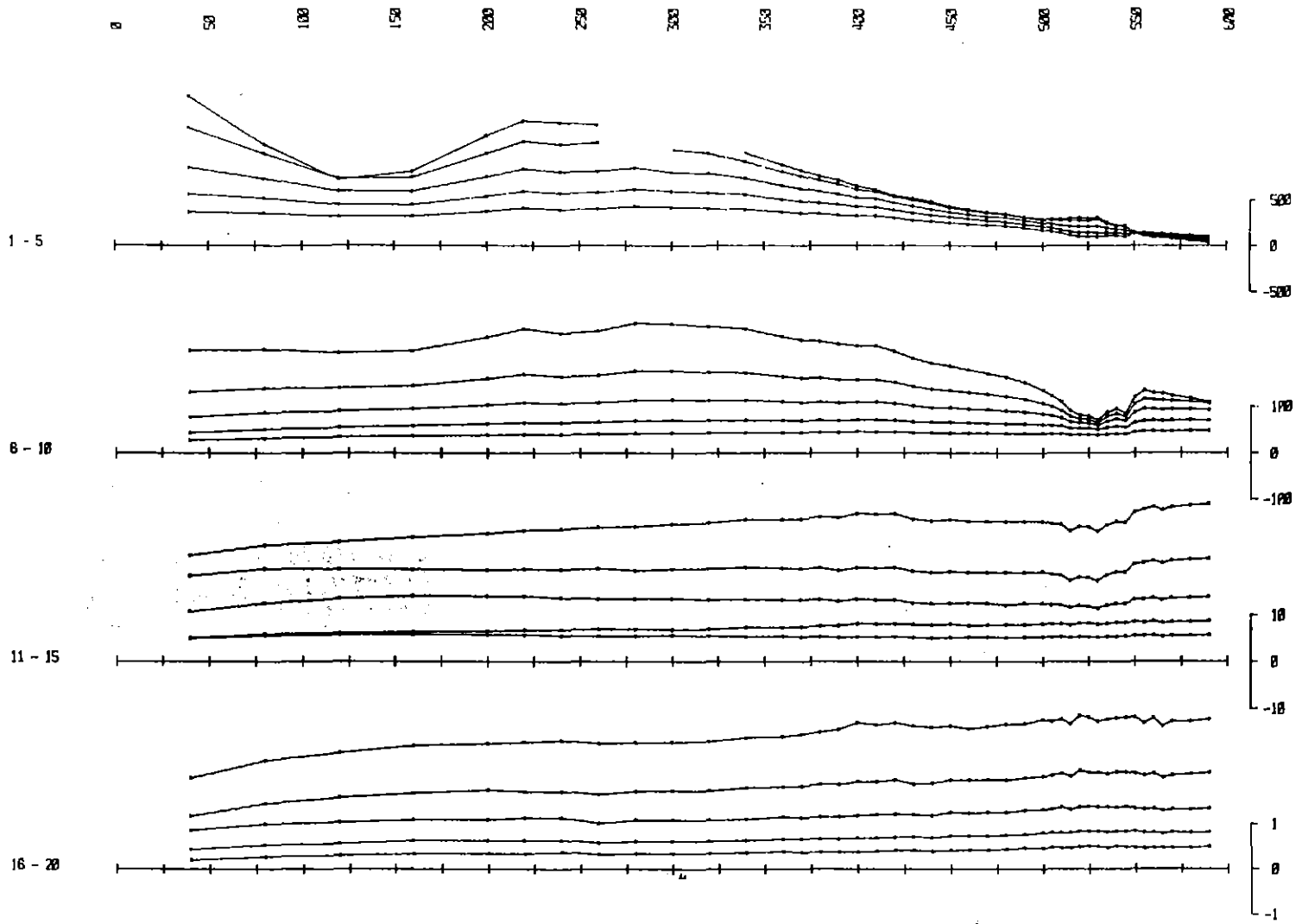
AREA : Ashton

EXTENSION : 2000 S

LOOP : 1

121061

AXIAL COMPONENT B (Z)



EM-37

BOREHOLE SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

TX LOOP SIDES	: 1200N 1000E
	: 1400N 1200E
TX LOOP SIZE	: 200 m X 200 m
TX TURN OFF TIME	: 150 microsecs.
FIRST GATE TIME	: 88.5 microsecs.
CURRENT	: 10.0 amps
FREQUENCY	: 25 Hz.
INTEGRATION TIME	: 1024 cycles
SYNC MODE	:
HORIZONTAL SCALE	: 1:2500
SURVEYED BY	: t
DATE	: 17/10/1989

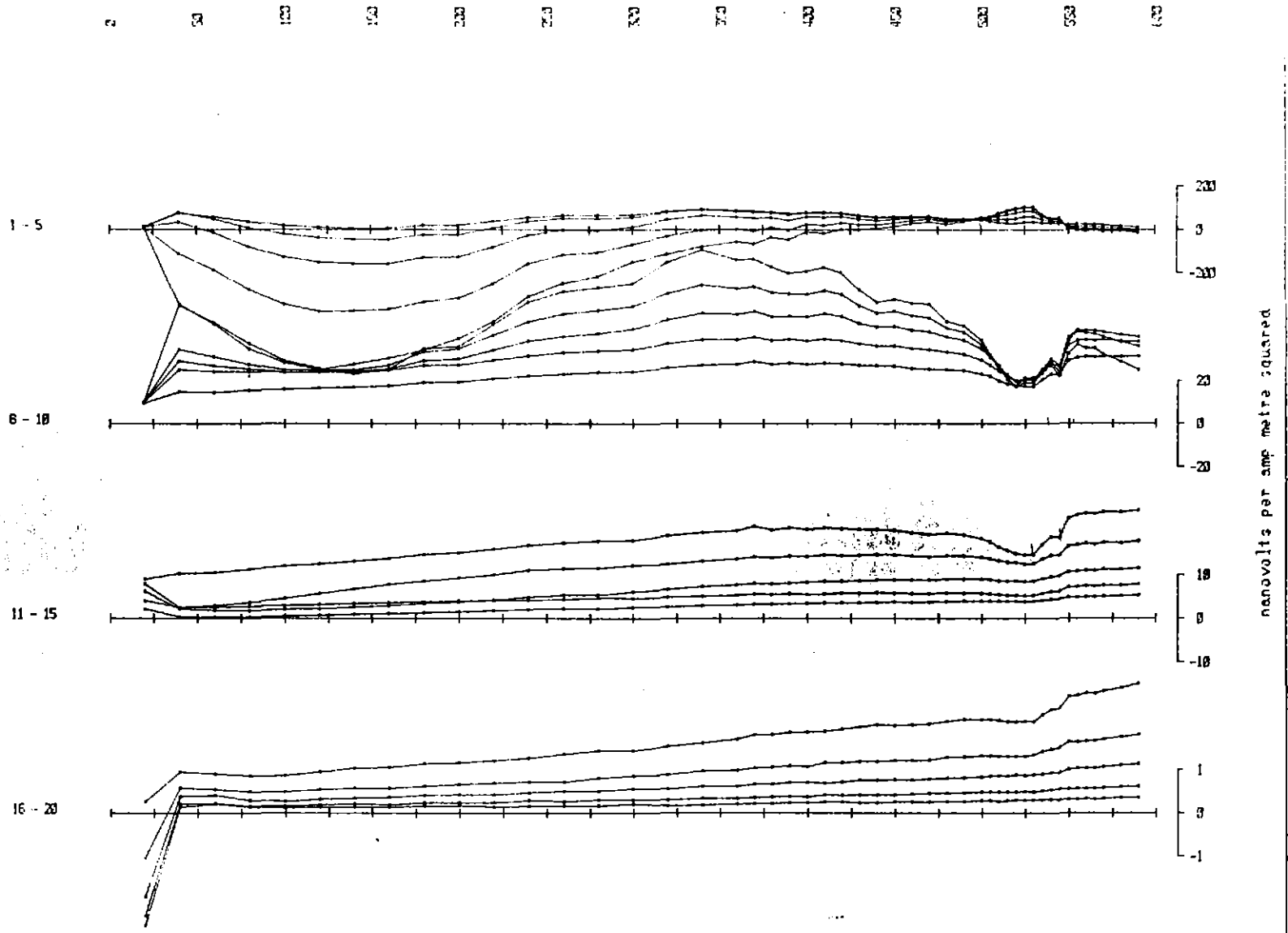
SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.

PROJECT NO. :

CLIENT	: Aberfoyle Resources Lt
PROJECT	: t
AREA	: Leehan
BOREHOLE	: ZS92 A
TX LOOP	: 3

121062

AXIAL COMPONENT B (Z)



(ch)

BOREHOLE SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

TX LOOP SIDES	:	1400N 1000E
	:	1000N 1200E
TX LOOP SIZE	:	200 m X 200 m
TX TURN OFF TIME	:	140 microsecs.
FIRST GATE TIME	:	88.5 microsecs.
CURRENT	:	10.0 amps
FREQUENCY	:	25 Hz.
INTEGRATION TIME	:	1024 cycles
SYNC MODE	:	
HORIZONTAL SCALE	:	1:2500
SURVEYED BY	:	
DATE	:	17/10/1990

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD. | PROJECT NO. 1

CLIENT : Aberfoyle Resources Ltd

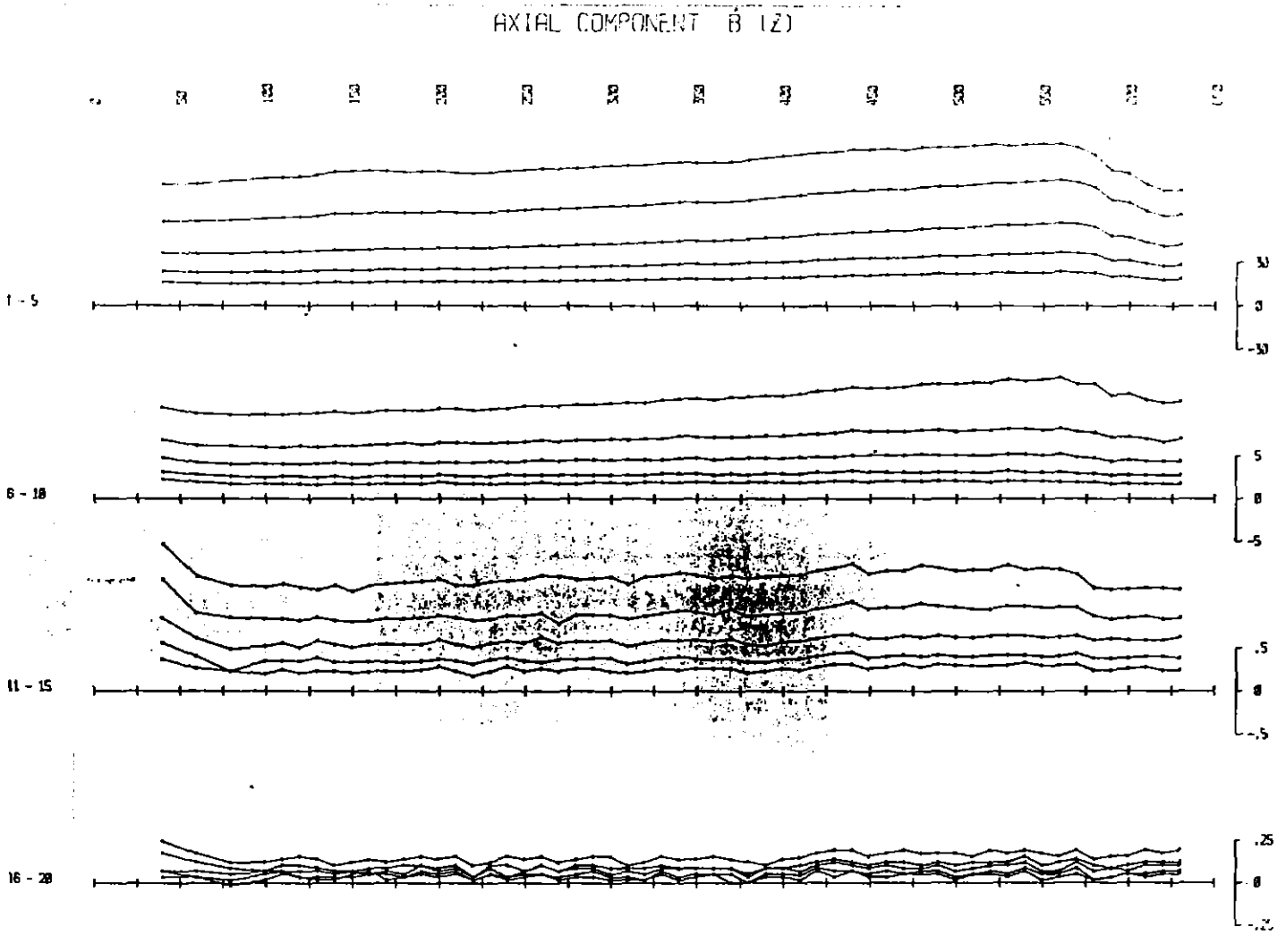
PROJECT :

AREA : Zeehan

BOREHOLE : Z032 S

TX LOOP : 4

121063



BS-5?

BOREHOLE SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (dB/dt)

TX LOOP SIDES	:	8800N	8000E
	:	4800N	5000E
TX LOOP SIZE	:	400 m X 500 m	
TX TURN OFF TIME	:	412 microsecs.	
FIRST GATE TIME	:	88.5 microsecs.	
CURRENT	:	17.2 amps	
FREQUENCY	:	6.25 Hz.	
INTEGRATION TIME	:	1024 cycles	
SYNC MODE	:		
HORIZONTAL SCALE	:	1:2500	
SURVEYED BY	:	PF	
DATE	:	19/10/1989	

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD. | PROJECT NO. 1

CLIENT : Aberfoyle Resources Ltd

PROJECT : Severn

AREA : Zeehan

BOREHOLE : 2501 5

TX LOOP : 5

0602

063

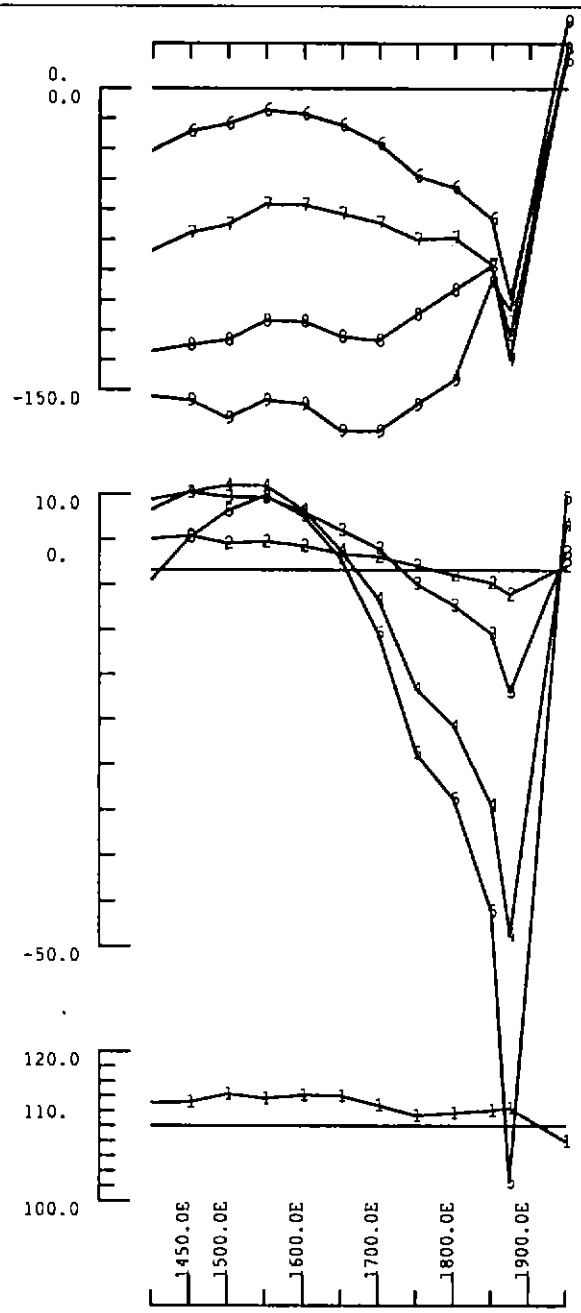
121064

Appendix 3

UTEM Survey Data

(Single Vertical Hz Component, loops 6,7,8, and 9)

121065

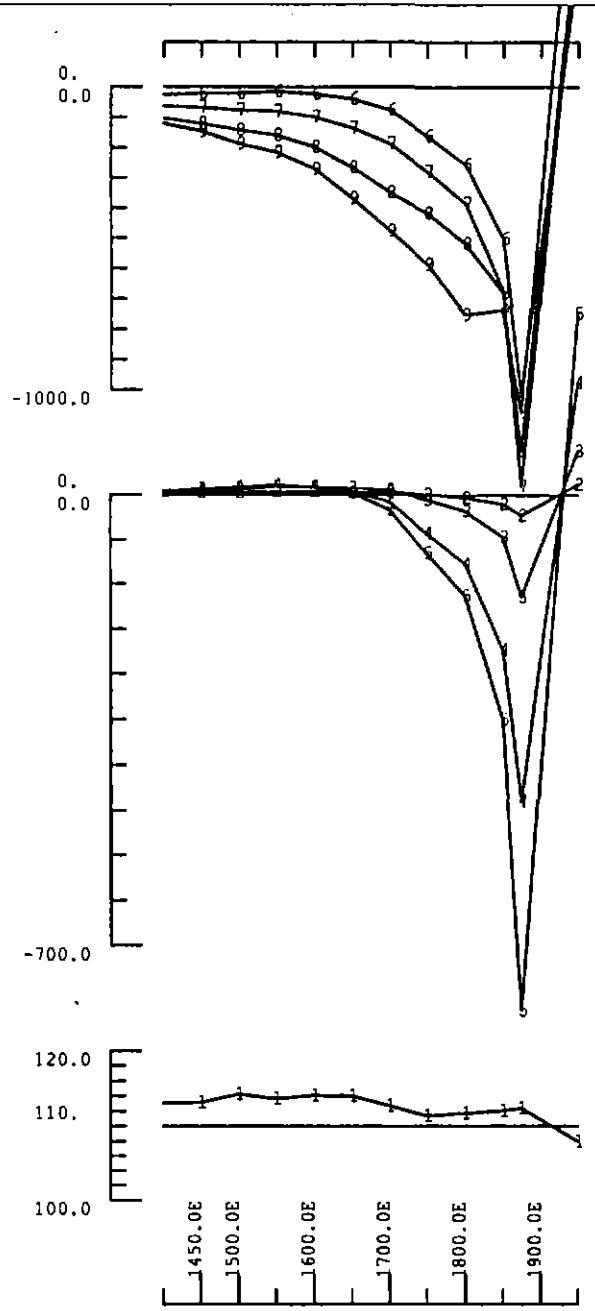


SEVERN PROSPECT ZEEHAN
LINE 2000N LOOP 6
(out of loop data)
Continuously Normalized
UTEM Survey Febuary 1990
Secondary Magnetic Field
Hz Component
Freq. 26.23Hz

Aberfoyle Resources Ltd
March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121066



SEVERN PROSPECT ZEEHAN

LINE 2000N LOOP 6

(out of loop data)

Point Normalized

2000N 1400E

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

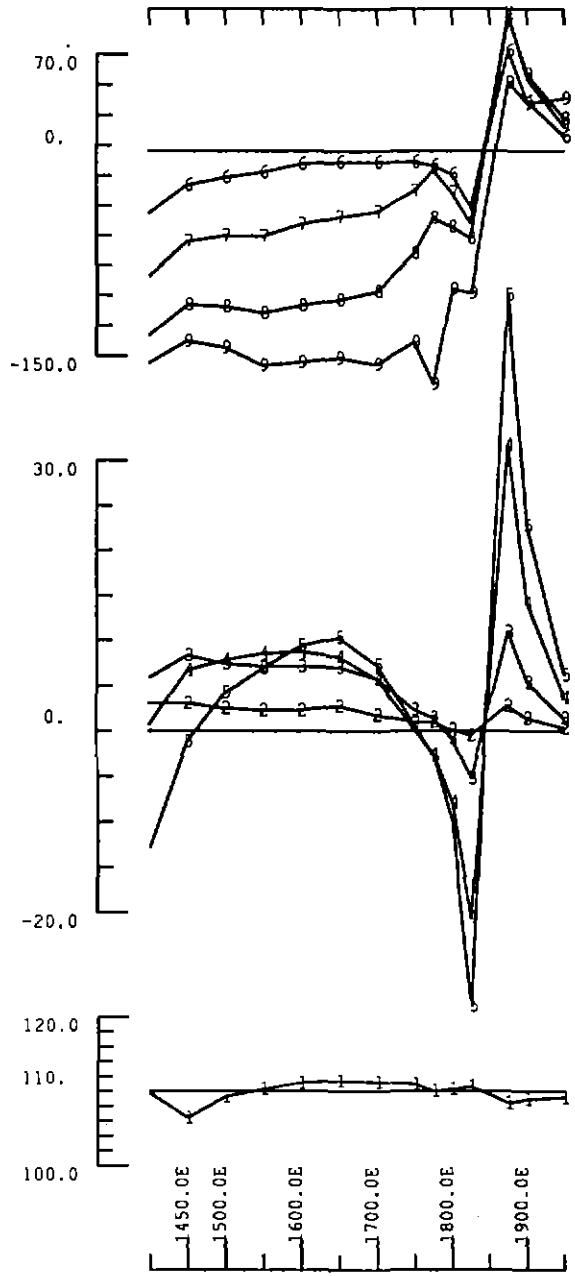
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121067



SEVERN PROSPECT ZEEHAN

LINE 2200N LOOP 6

(out of loop data)

Continuously Normalized

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

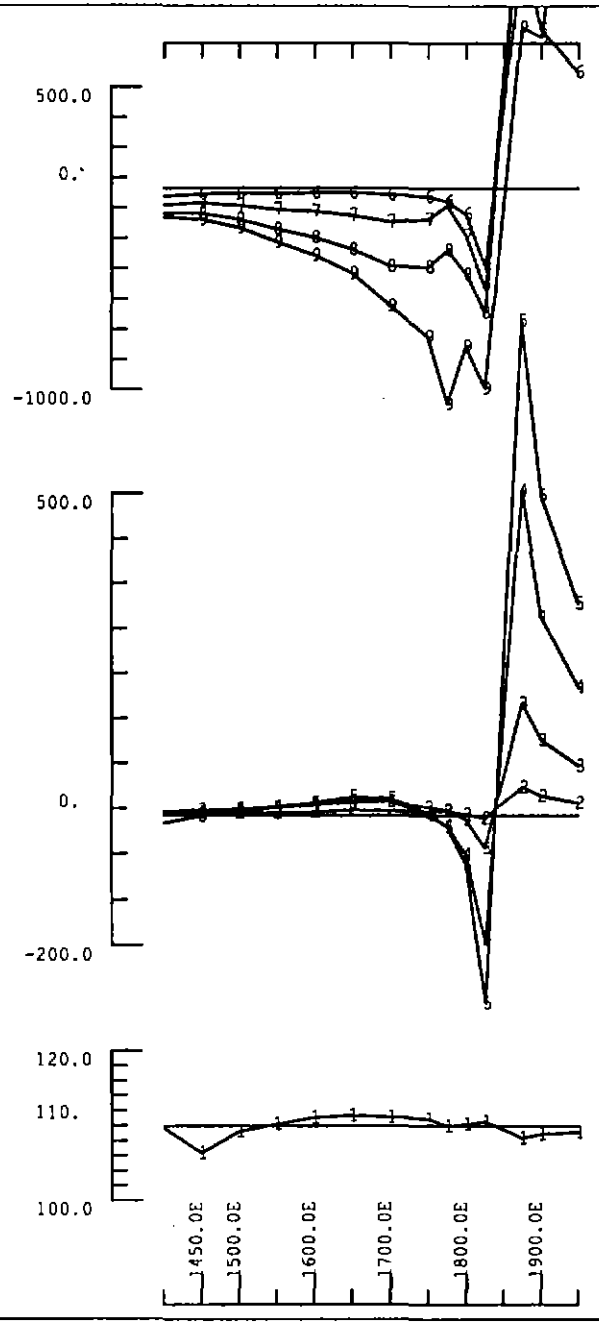
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121068



SEVERN PROSPECT ZEEHAN

LINE 2200N LOOP 6

(out of loop data)

Point Normalized

2200N 1400E

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

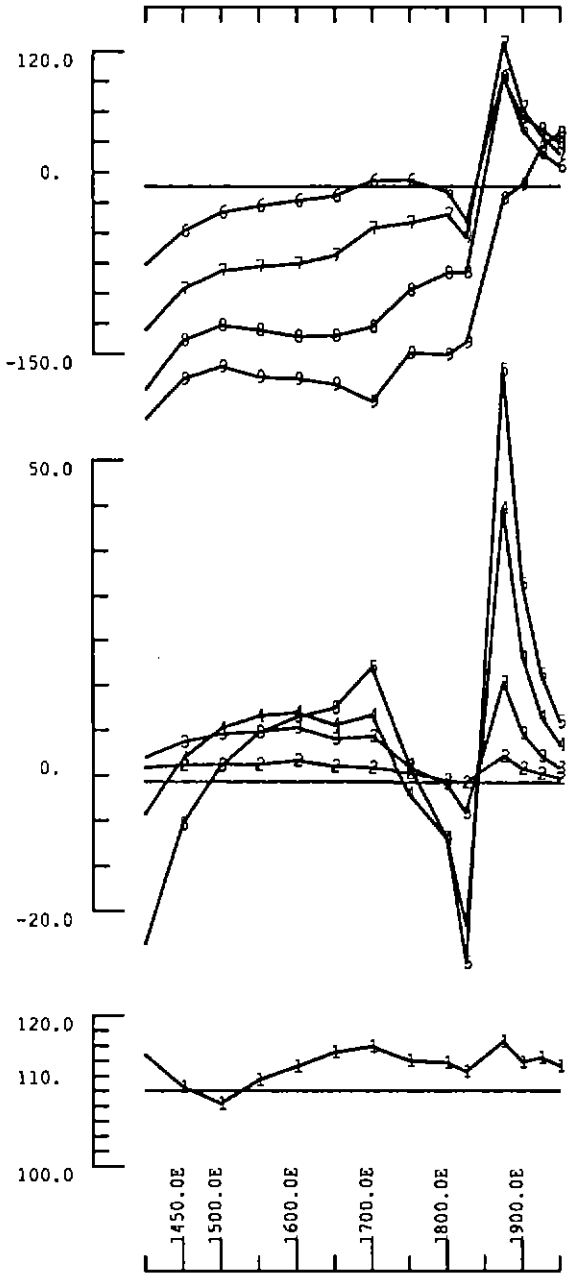
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121069



SEVERN PROSPECT ZEEHAN

LINE 2400N LOOP 6

(out of loop data)

Continuously Normalized

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

Freq. 26.23Hz

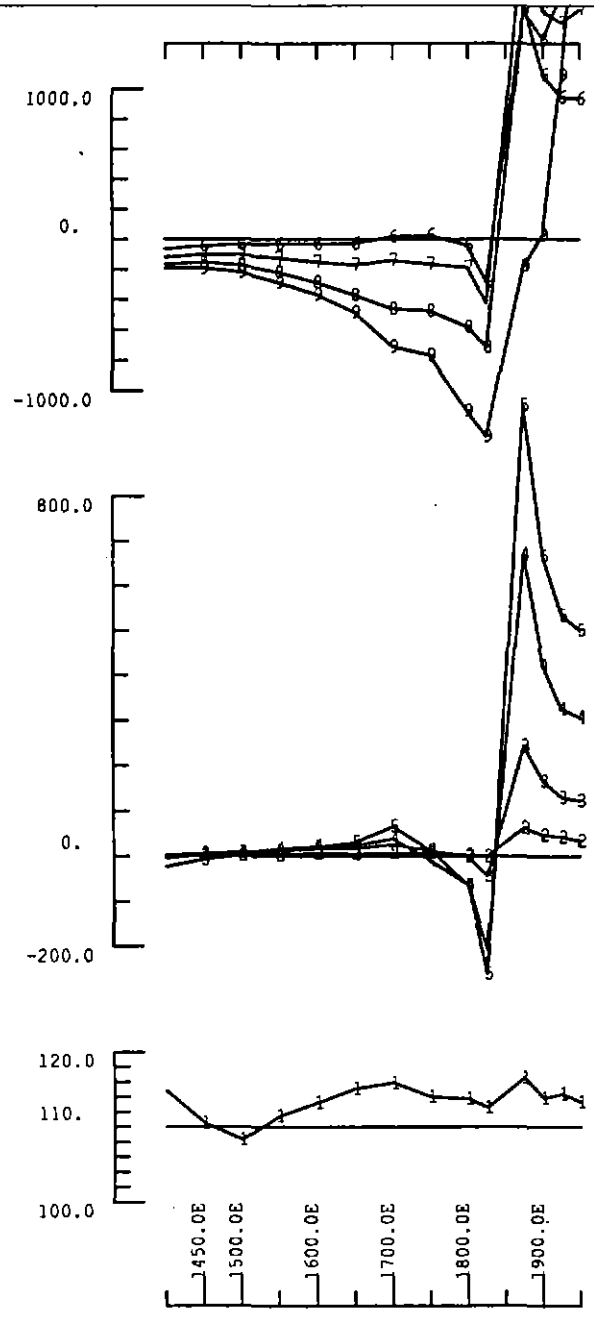
Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121070

690



SEVERN PROSPECT ZEEHAN

LINE 2400N LOOP 6

(out of loop data)

Point Normalized

2200N 1400E

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

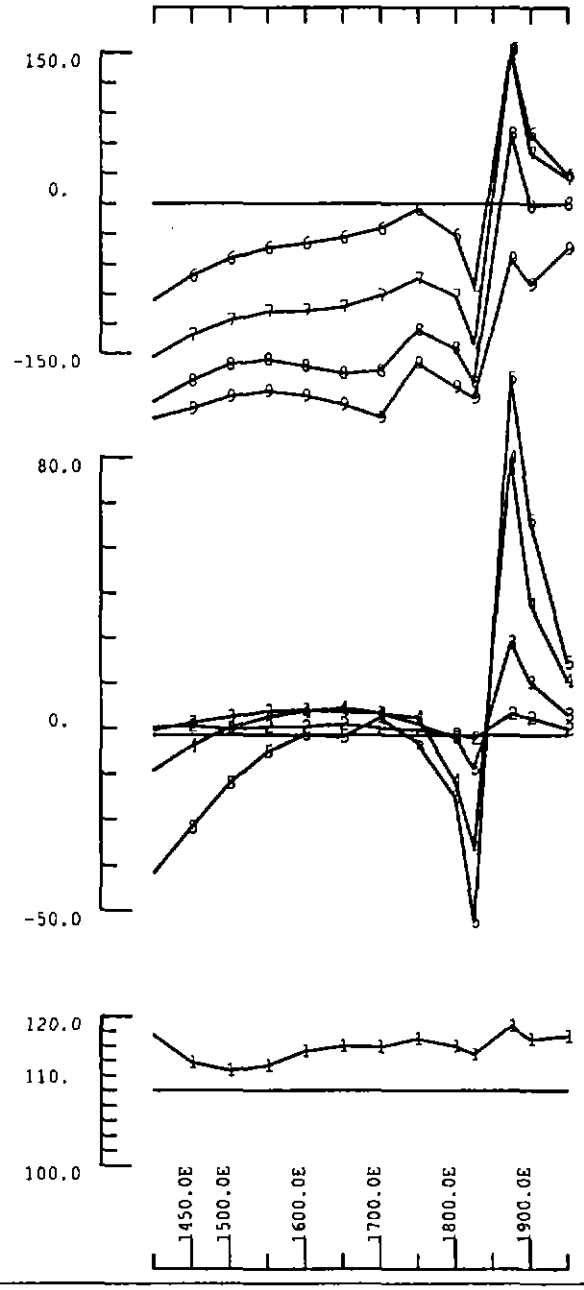
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121071



SEVERN PROSPECT ZEEHAN

LINE 2585N LOOP 6

(out of loop data)

Continuously Normalized

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

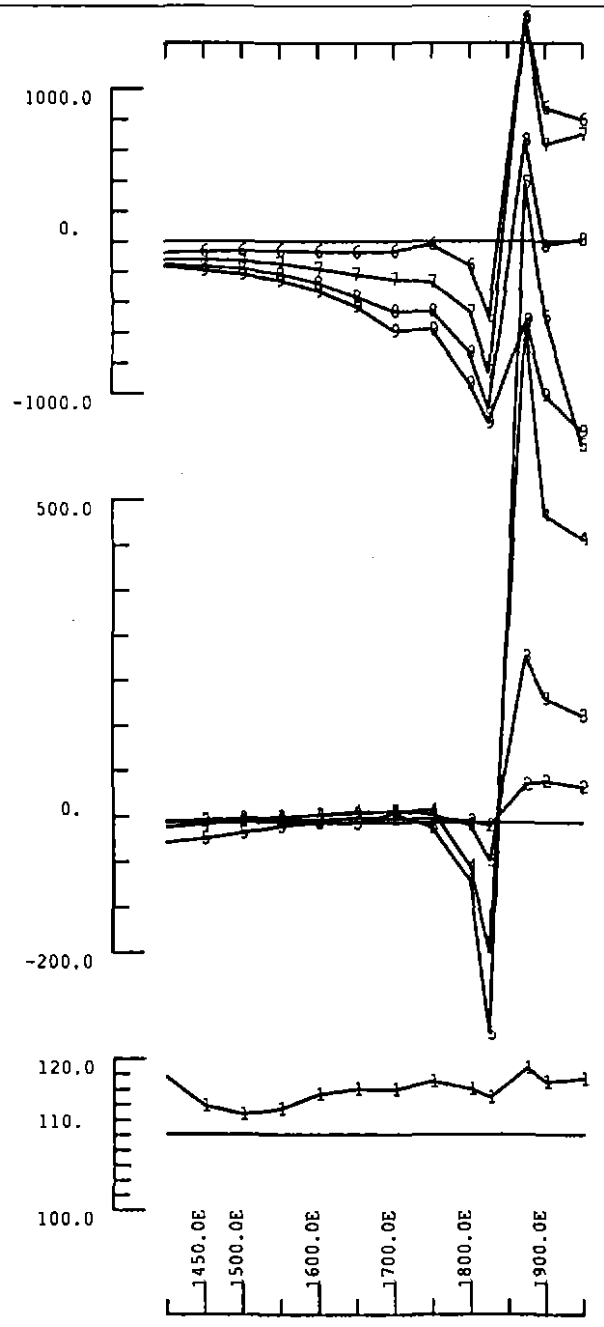
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121072



SEVERN PROSPECT ZEEHAN

LINE 2585N LOOP 6

(out of loop data)

Point Normalized

2200N 1400E

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

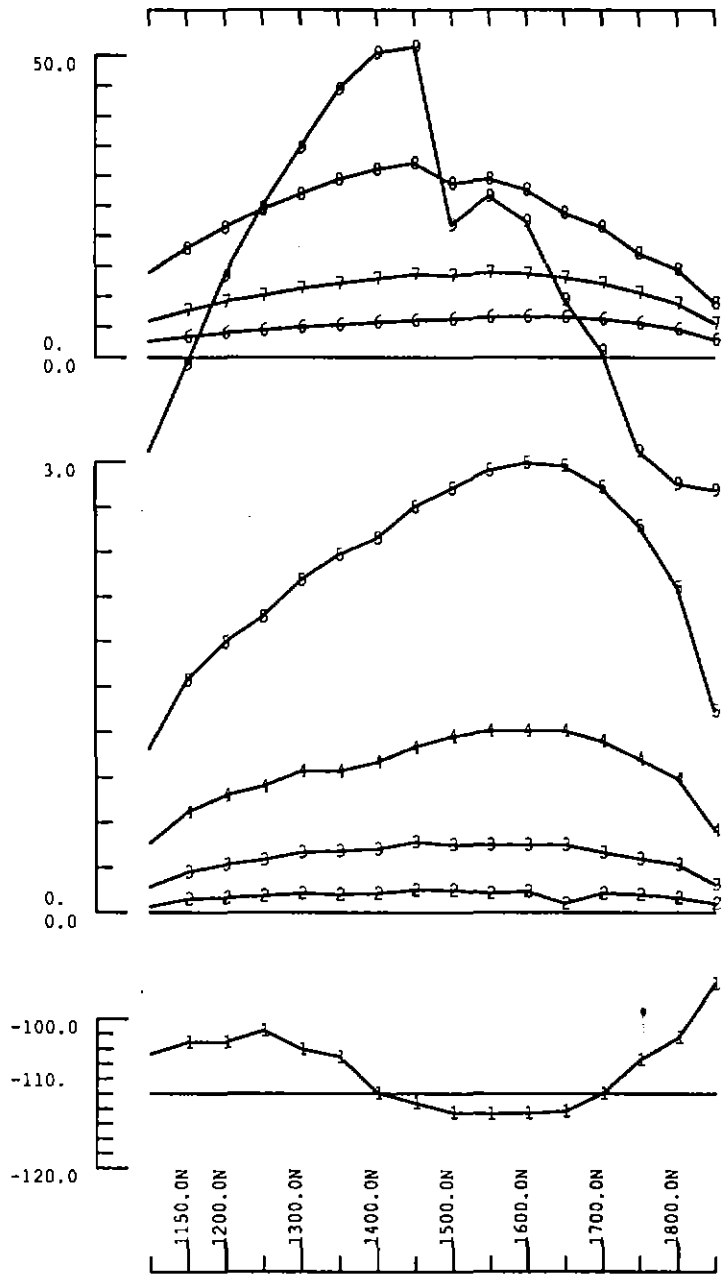
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121073



ZEEHAN GOLF COURSE

LINE 500E LOOP 7

(in loop data)

Continuously Normalized

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

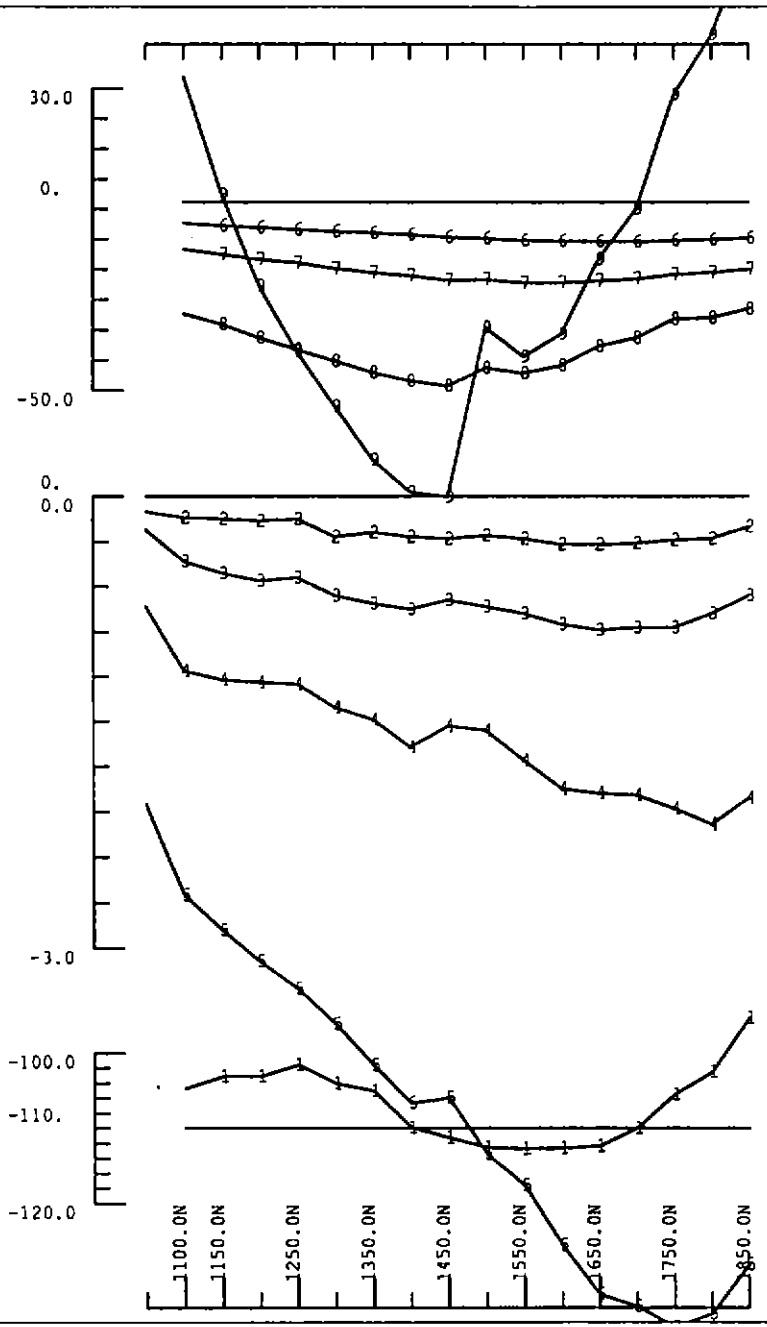
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121074



ZEEHAN GOLF COURSE

LINE 500E LOOP 7

(in loop data)

Point Normalized

700E 1400N

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

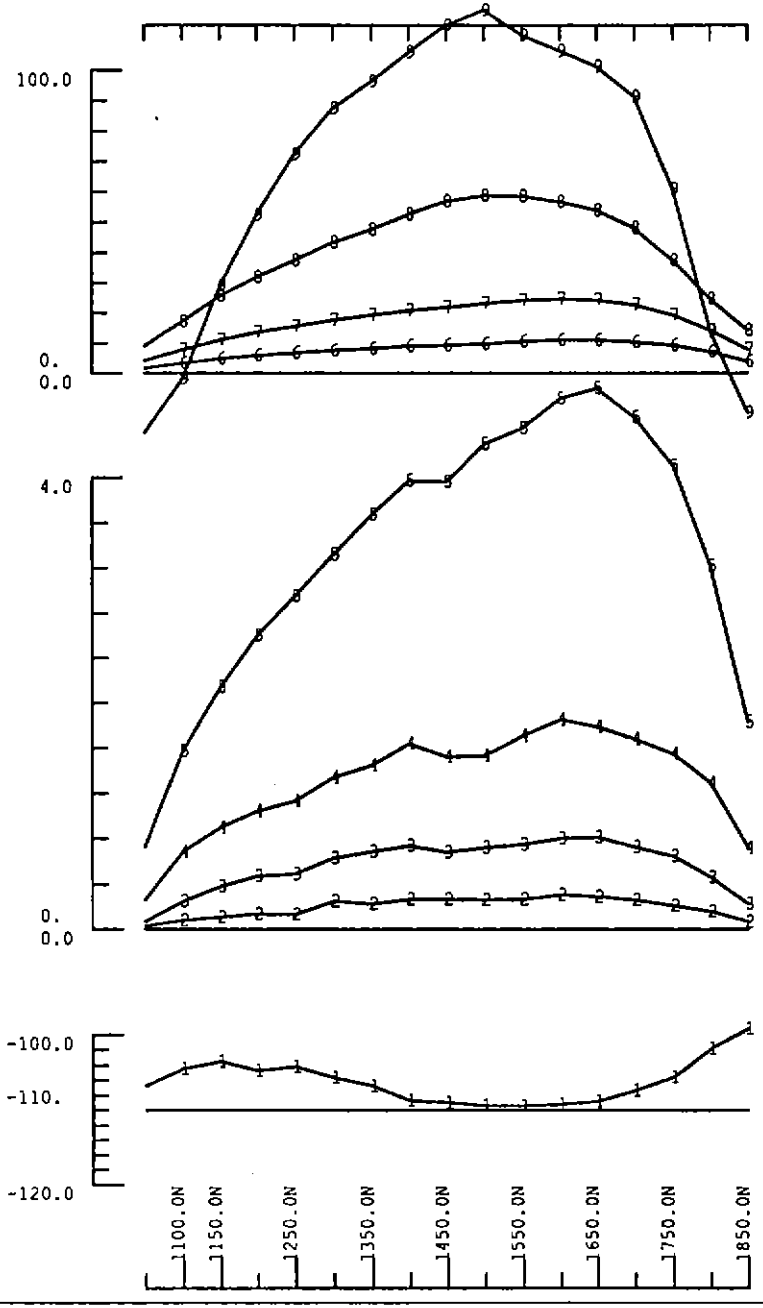
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121075



ZEEHAN GOLF COURSE

LINE 600E LOOP 7

(in loop data)

Continuously Normalized

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

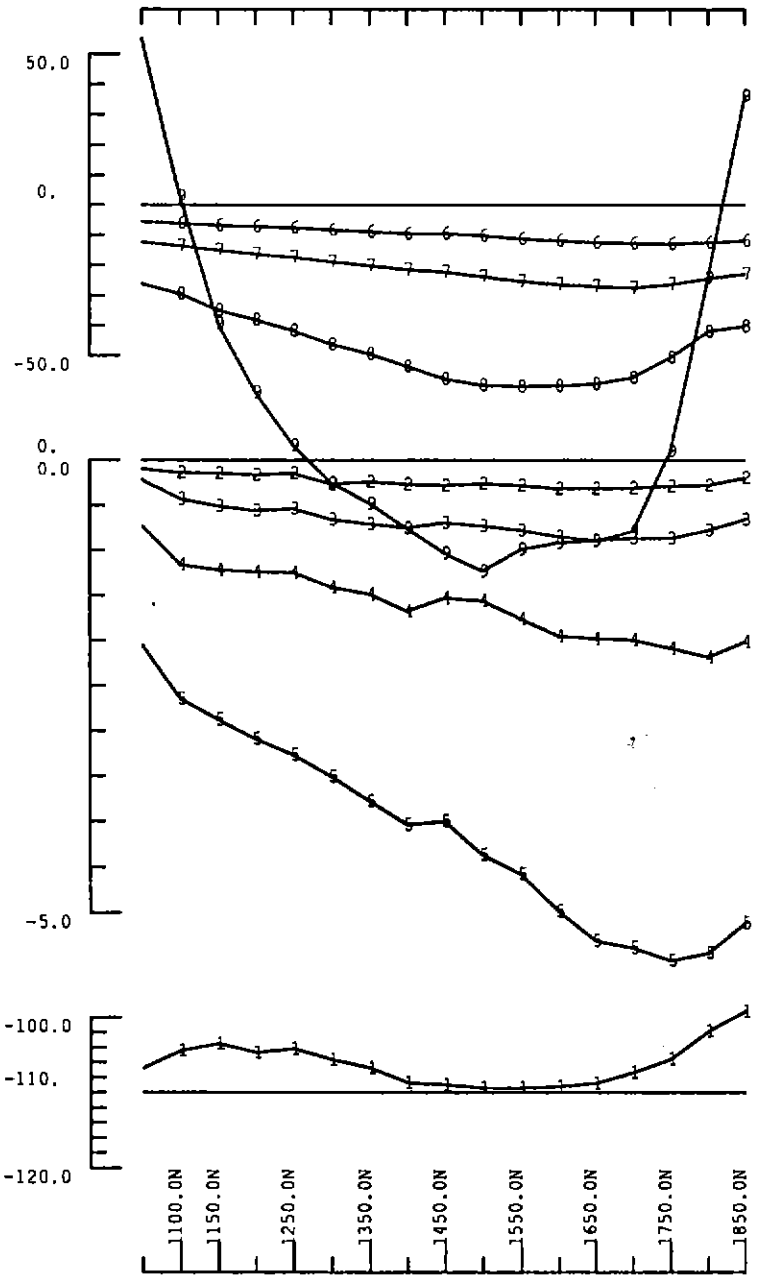
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121076



ZEEHAN GOLF COURSE

LINE 600E LOOP 7

(in loop data)

Point Normalized

700E 1400N

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

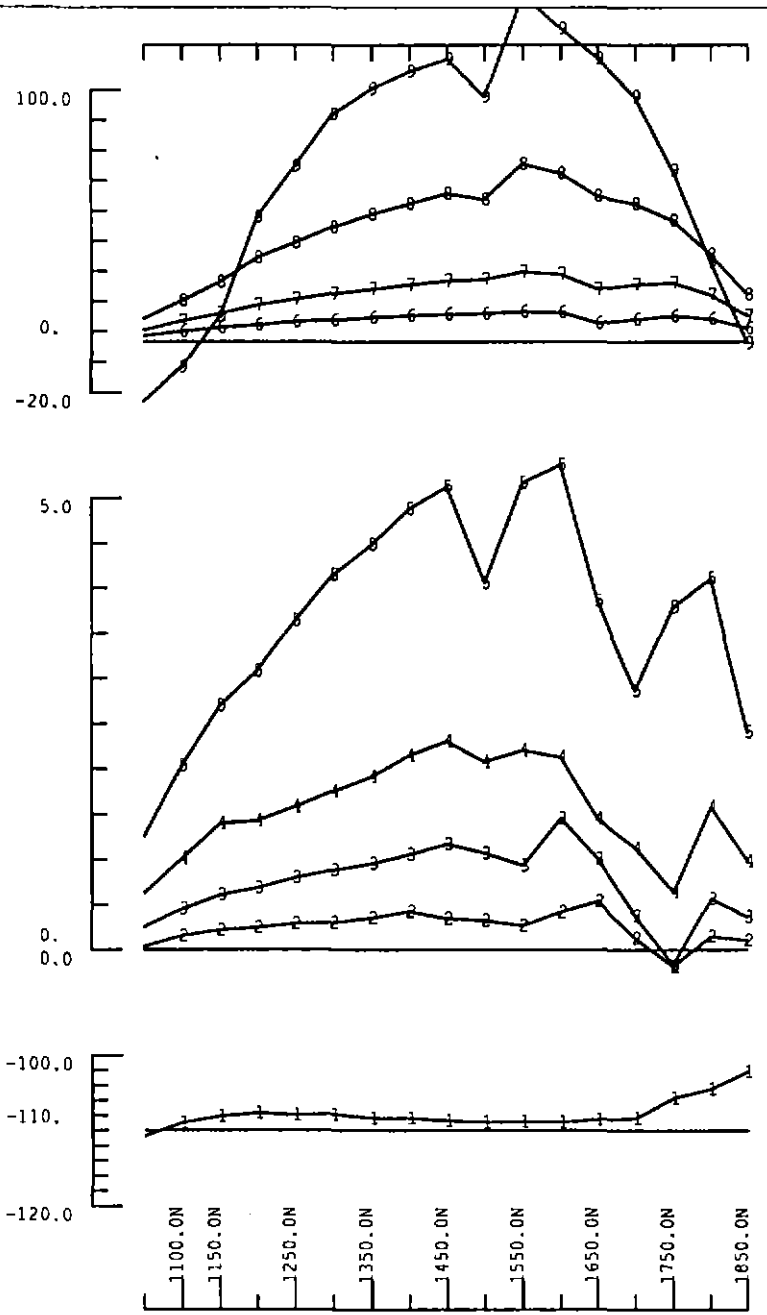
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121077



ZEEHAN GOLF COURSE

LINE 700E LOOP 7

(in loop data)

Continuously Normalized

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

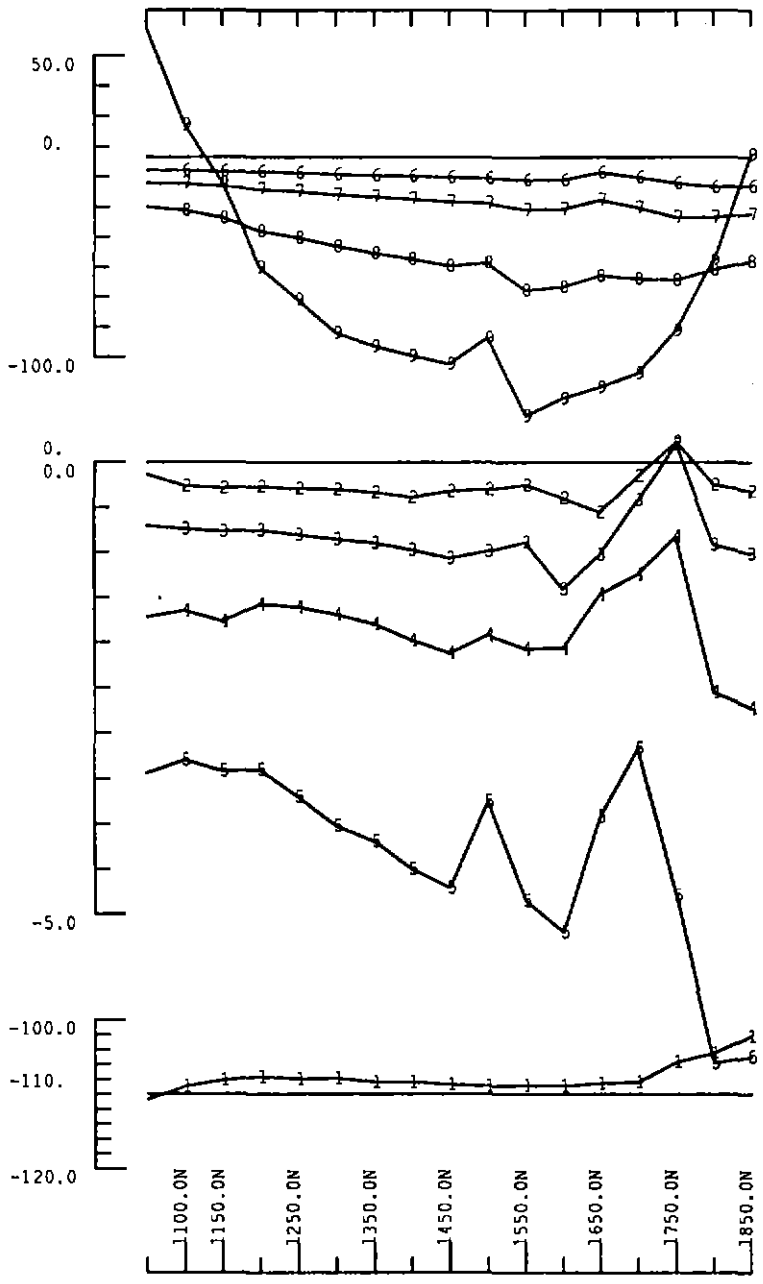
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121078



ZEEHAN GOLF COURSE

LINE 700E LOOP 7

(in loop data)

Point Normalized

700E 1400N

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

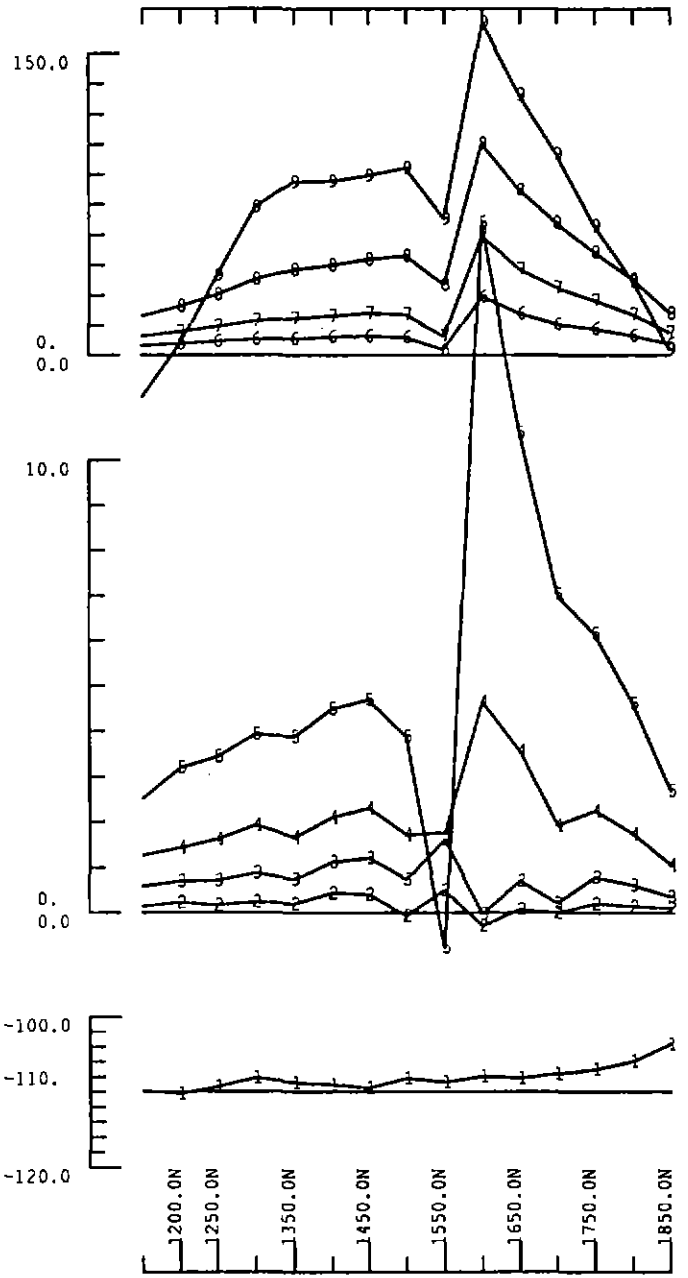
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121079



ZEEHAN GOLF COURSE

LINE 800E LOOP 7

(in loop data)

Continuously Normalized

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

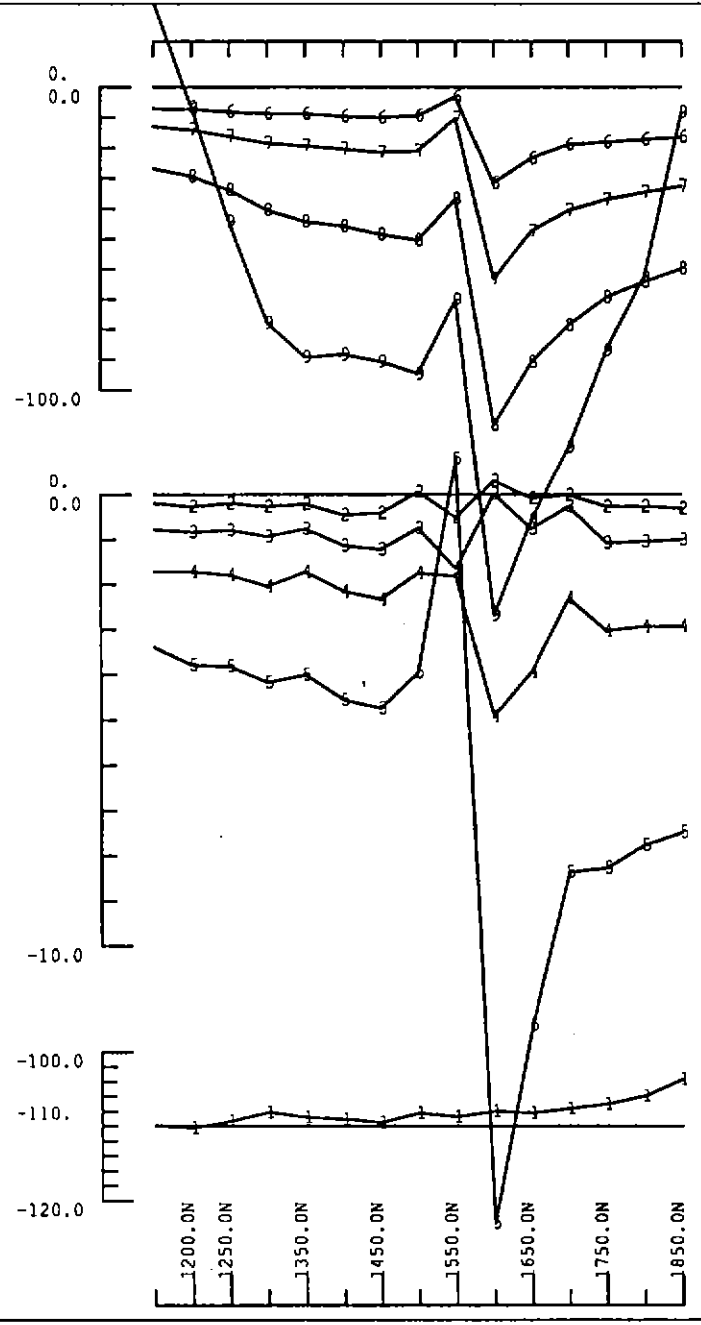
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121080



ZEEHAN GOLF COURSE

LINE 800E LOOP 7

(in loop data)

Point Normalized

700E 1400N

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

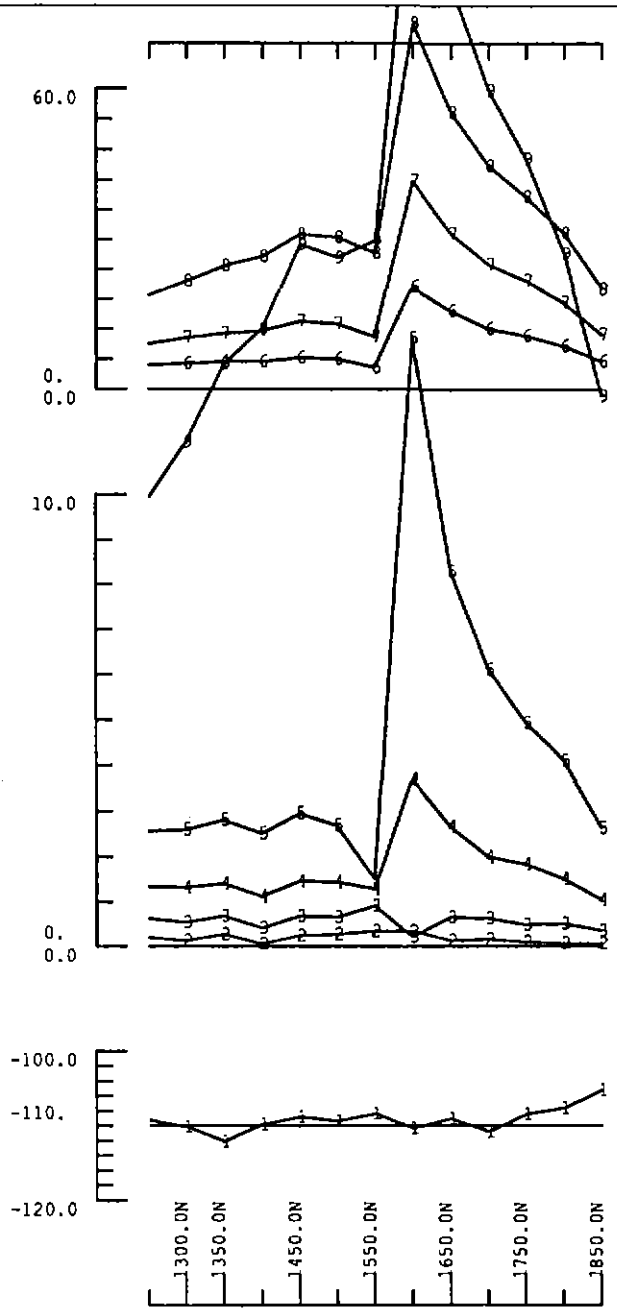
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121081



ZEEHAN GOLF COURSE

LINE 900E LOOP 7

(in loop data)

Continuously Normalized

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

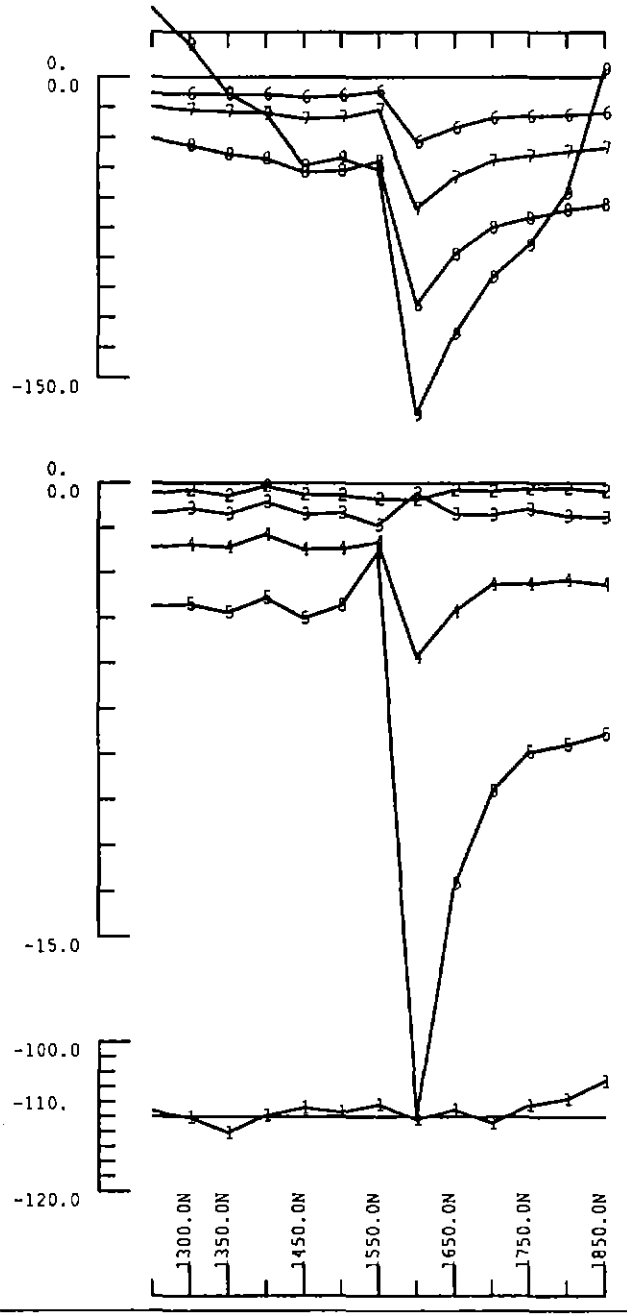
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121082



ZEEHAN GOLF COURSE

LINE 900E LOOP 7

(in loop data)

Point Normalized

700E 1400N

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

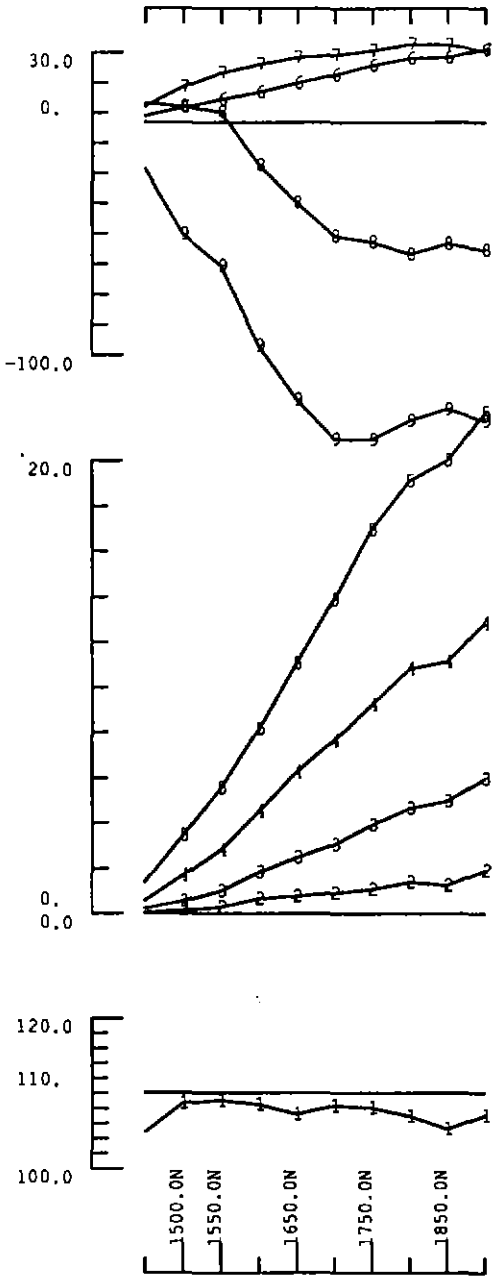
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121083



ZEEHAN GOLF COURSE

LINE 400E LOOP 8

(out of loop data)

Continuously Normalized

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

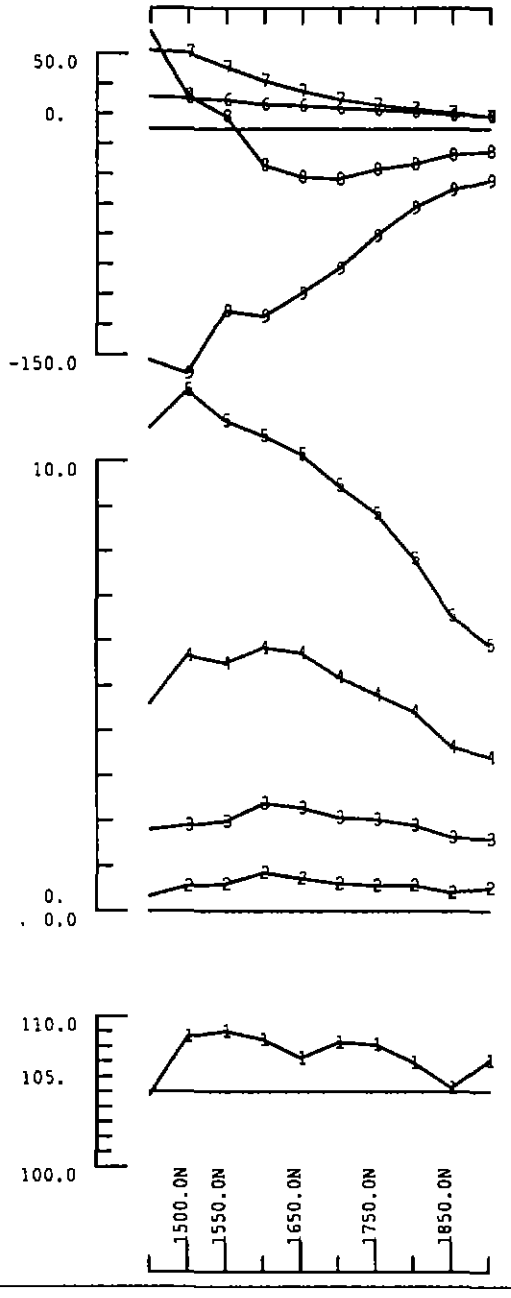
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121084



ZEEHAN GOLF COURSE

LINE 400E LOOP 8

(out of loop data)

Point Normalized

600E 1700N

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

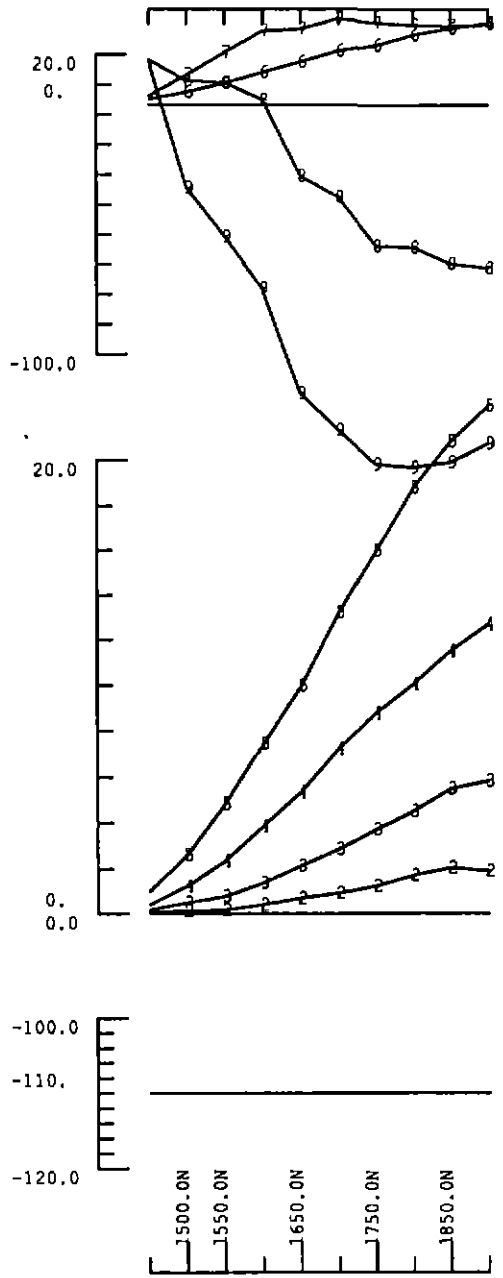
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121085



ZEEHAN GOLF COURSE

LINE 500E LOOP 8

(out of loop data)

Continuously Normalized

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

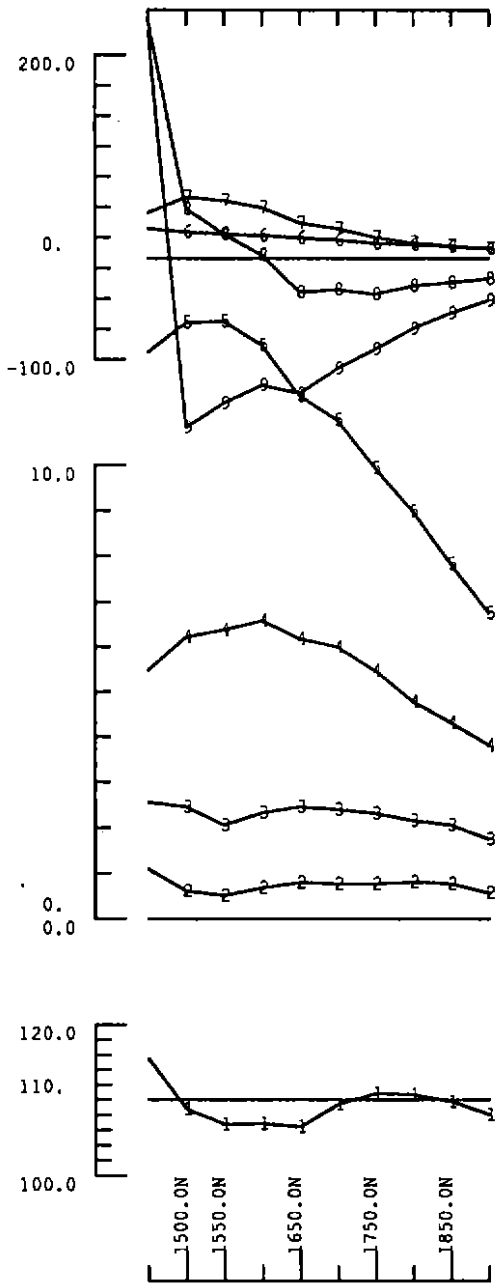
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121086



ZEEHAN GOLF COURSE

LINE 500E LOOP 8

(out of loop data)

Point Normalized

600E 1700N

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

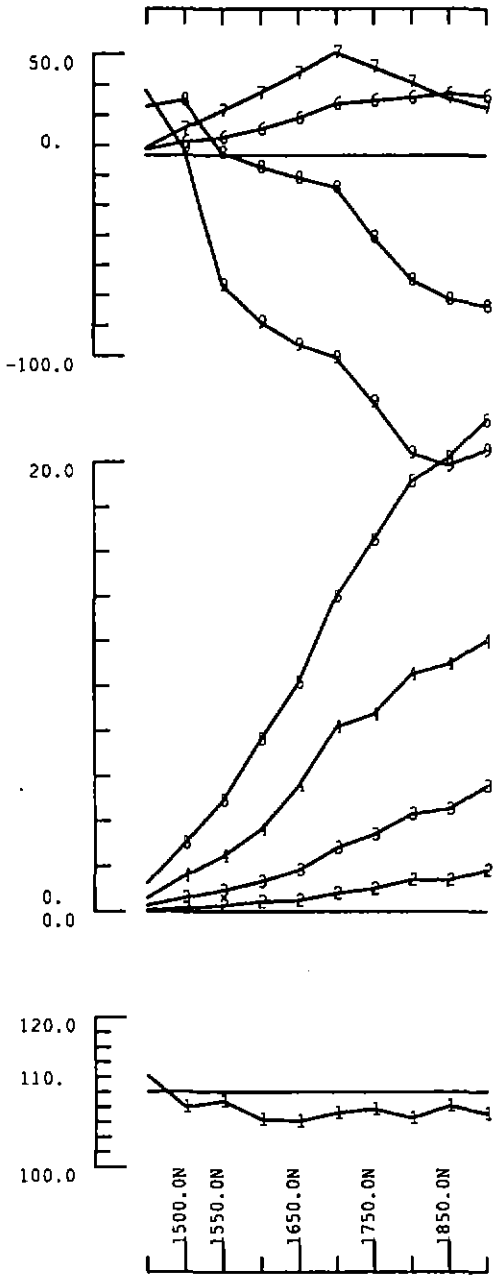
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121087



ZEEHAN GOLF COURSE

LINE 600E LOOP 8

(out of loop data)

Continuously Normalized

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

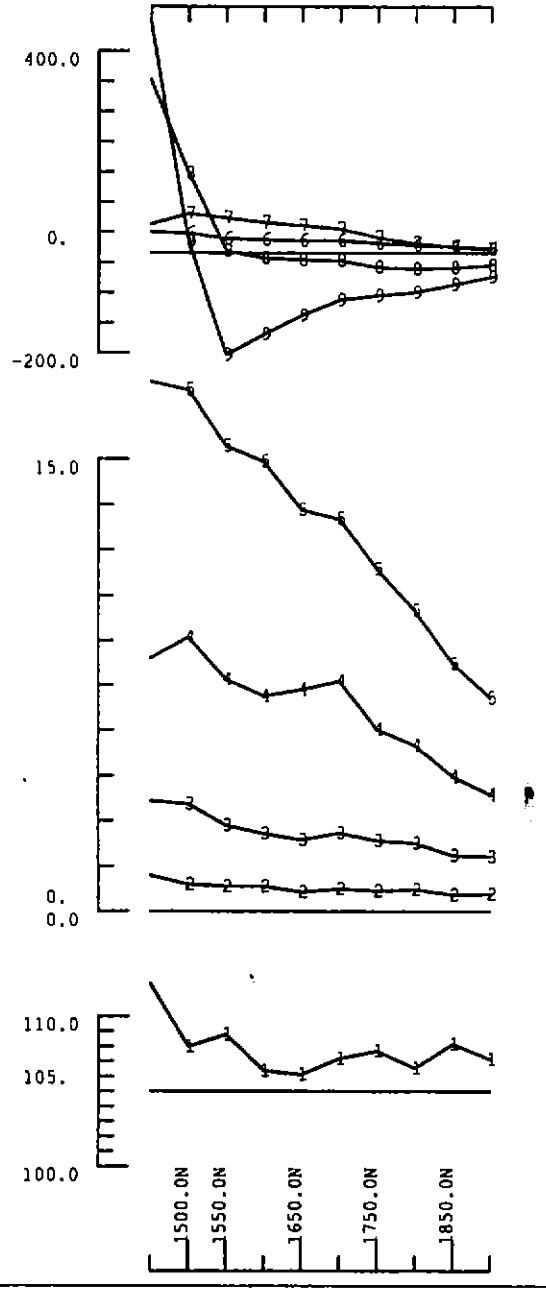
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121088

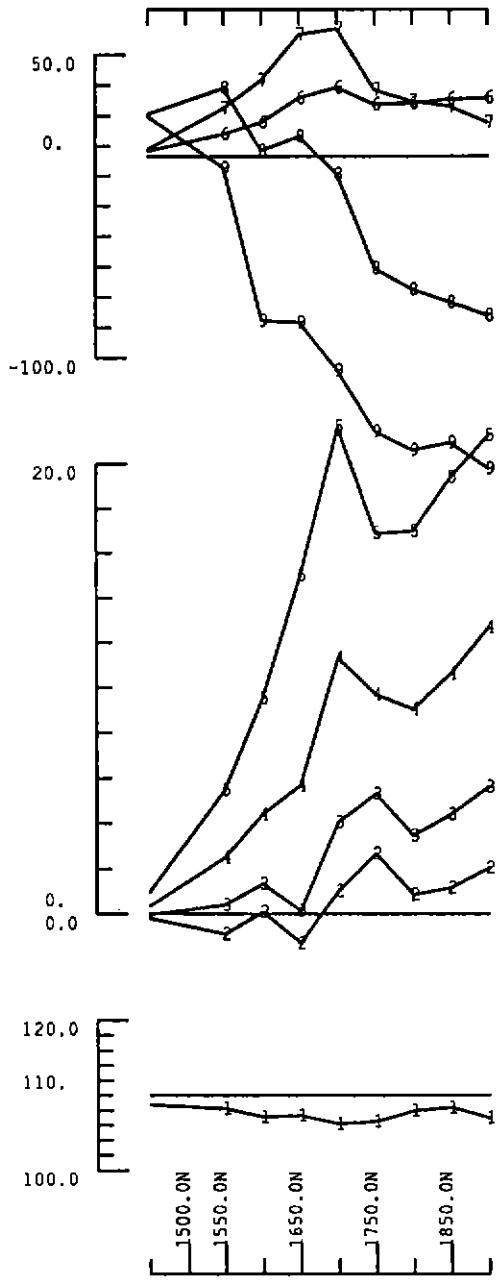


ZEEHAN GOLF COURSE
LINE 600E LOOP 8
(out of loop data)
Point Normalized
600E 1700N
UTEM Survey Febuary 1990
Secondary Magnetic Field
Hz Component
Freq. 26.23Hz

Aberfoyle Resources Ltd
March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121089



ZEEHAN GOLF COURSE

LINE 700E LOOP 8

(out of loop data)

Continuously Normalized

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

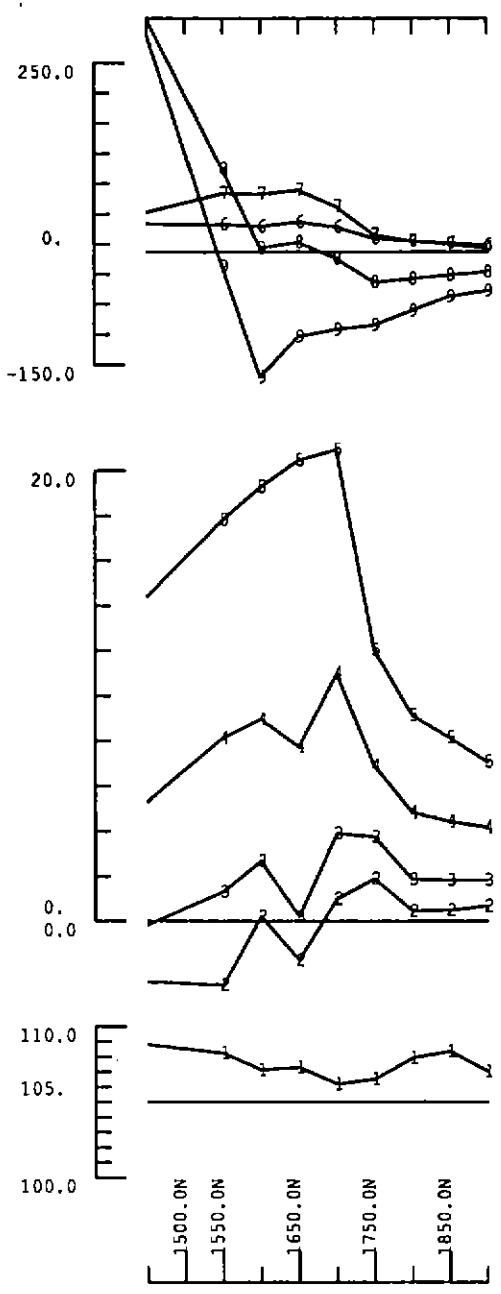
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121090



ZEEHAN GOLF COURSE

LINE 700E LOOP 8

(out of loop data)

Point Normalized

600E 1700N

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

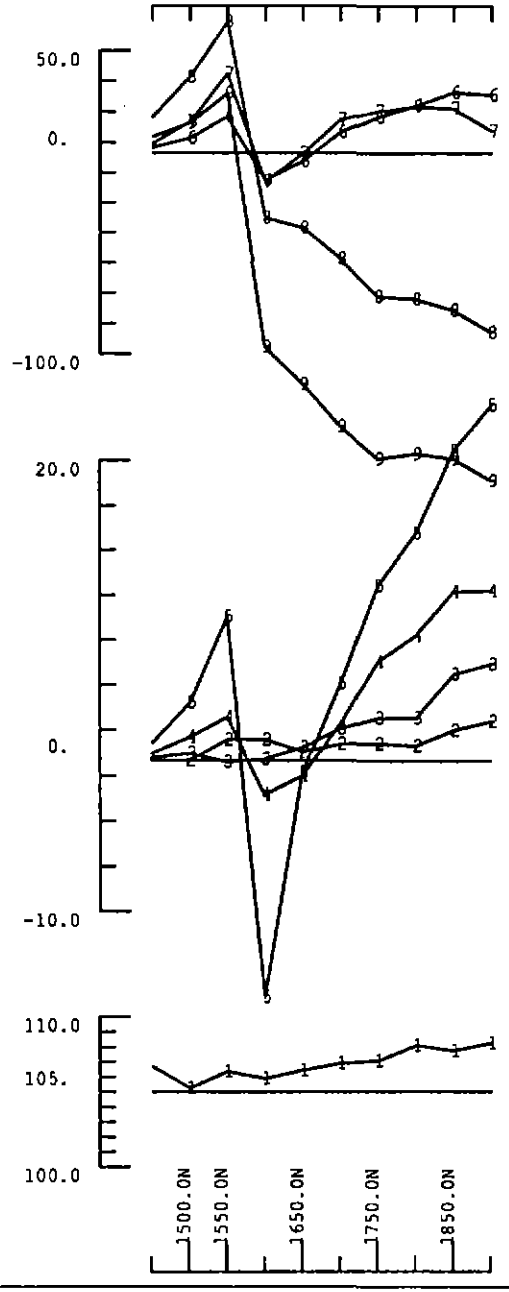
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121091



ZEEHAN GOLF COURSE

LINE 800E LOOP 8

(out of loop data)

Continuously Normalized

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

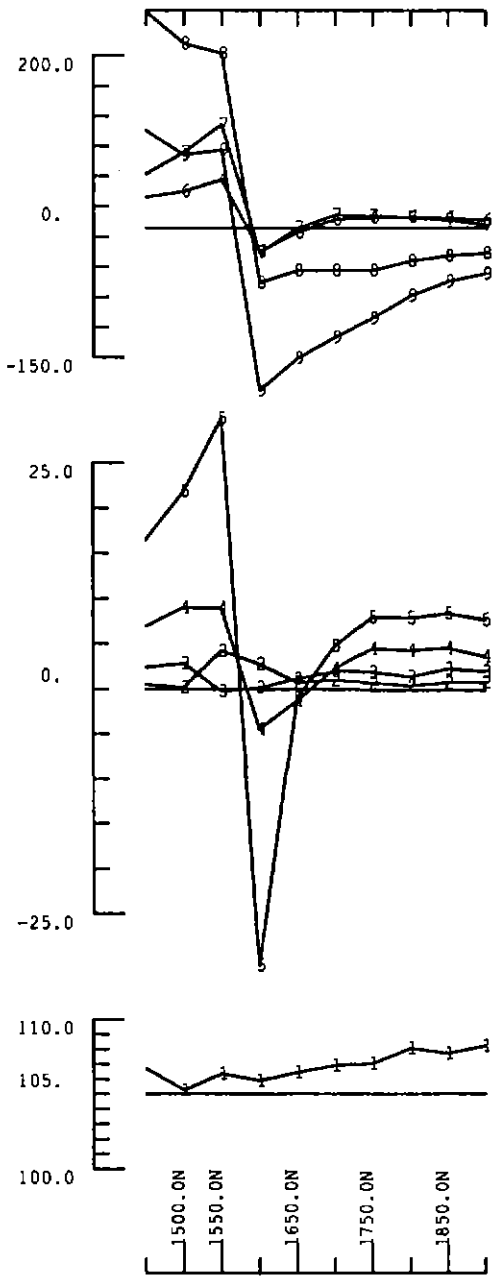
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121092



ZEEHAN GOLF COURSE

LINE 800E LOOP 8

(out of loop data)

Point Normalized

600E 1700N

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

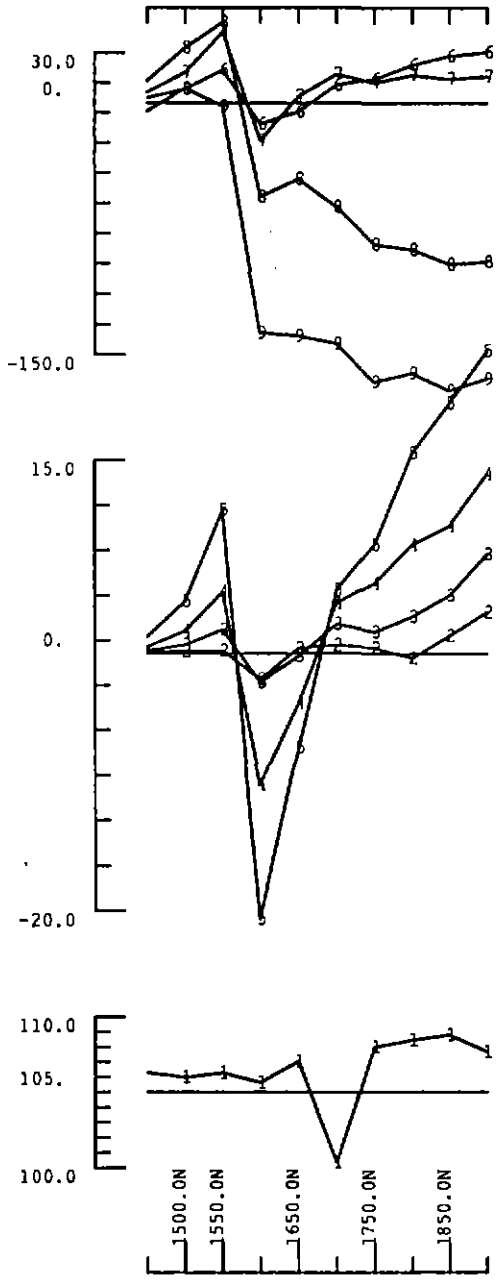
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121093



ZEEHAN GOLF COURSE

LINE 900E LOOP 8

(out of loop data)

Continuously Normalized

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

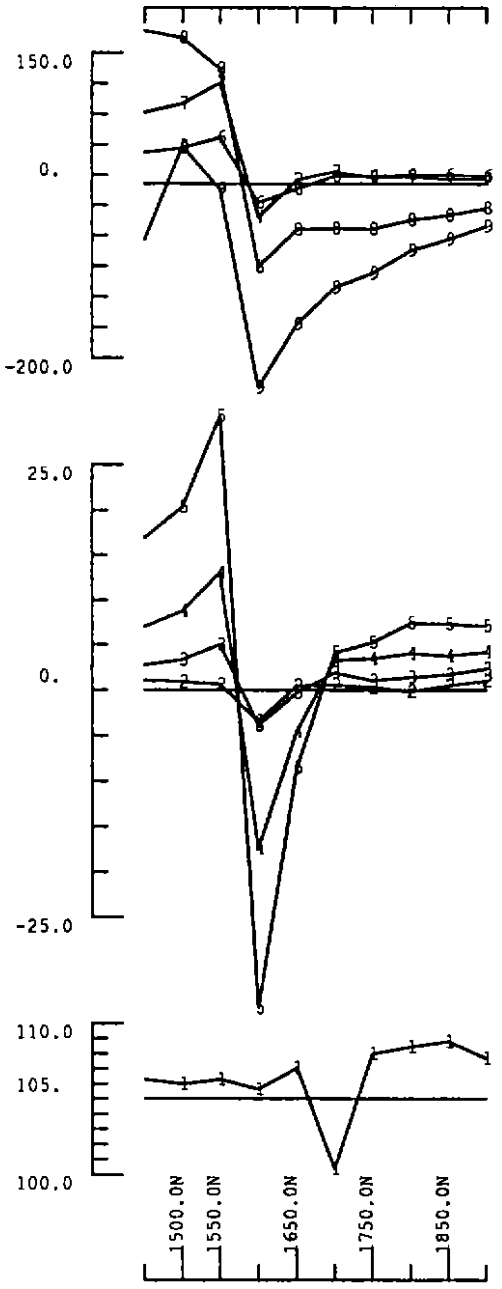
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121094



ZEEHAN GOLF COURSE

LINE 900E LOOP 8

(out of loop data)

Point Normalized

600E 1700N

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

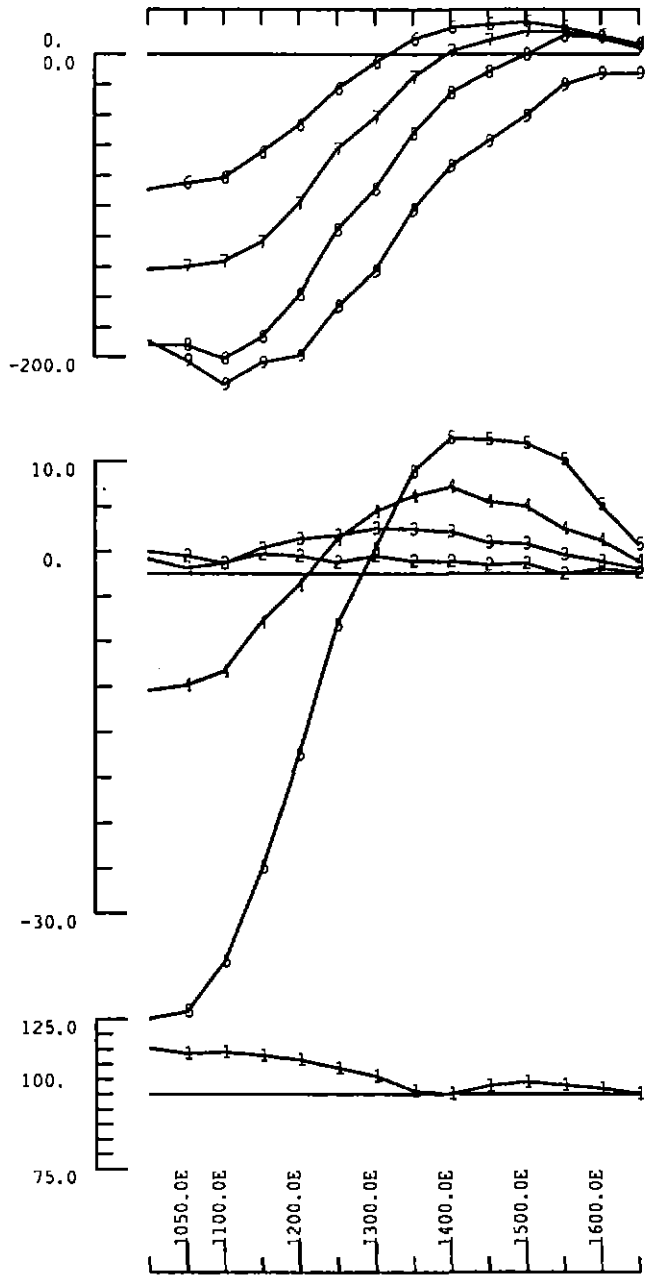
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121095

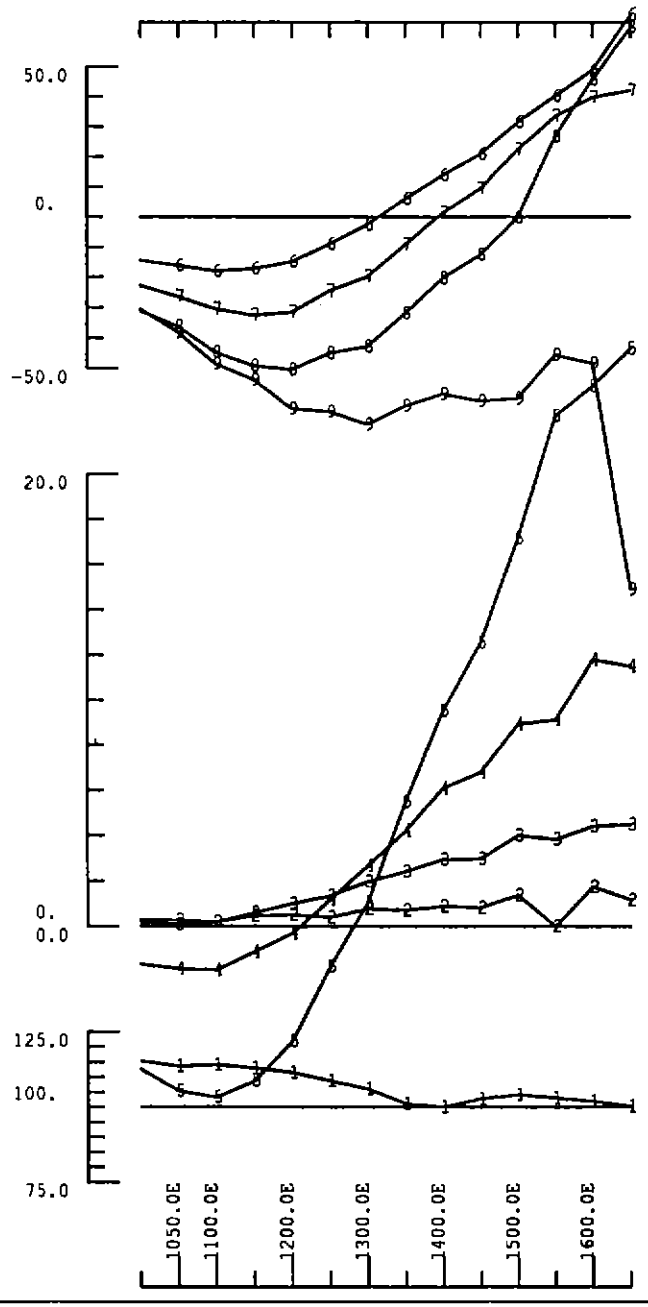


ZEEHAN QUEEN HILL
LINE 7000N LOOP 9
(out of loop data)
Continuously Normalized
UTEM Survey Febuary 1990
Secondary Magnetic Field
Hz Component
Freq. 26.23Hz

Aberfoyle Resources Ltd
March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121096



ZEEHAN QUEEN HILL

LINE 2000N LOOP 9

(out of loop data)

Point Normalized

1400E 2200N

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

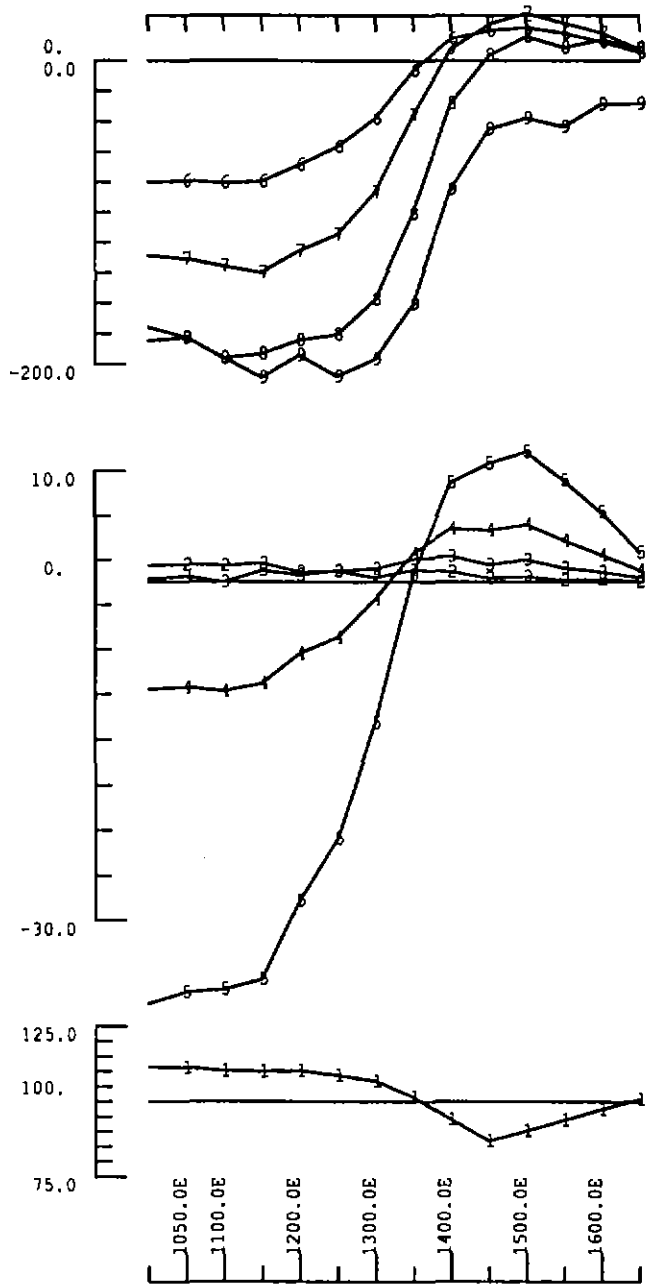
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 21/03/90 Horiz

121007



ZEEHAN QUEEN HILL

LINE 2200N LOOP 9

(out of loop data)

Continuously Normalized

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

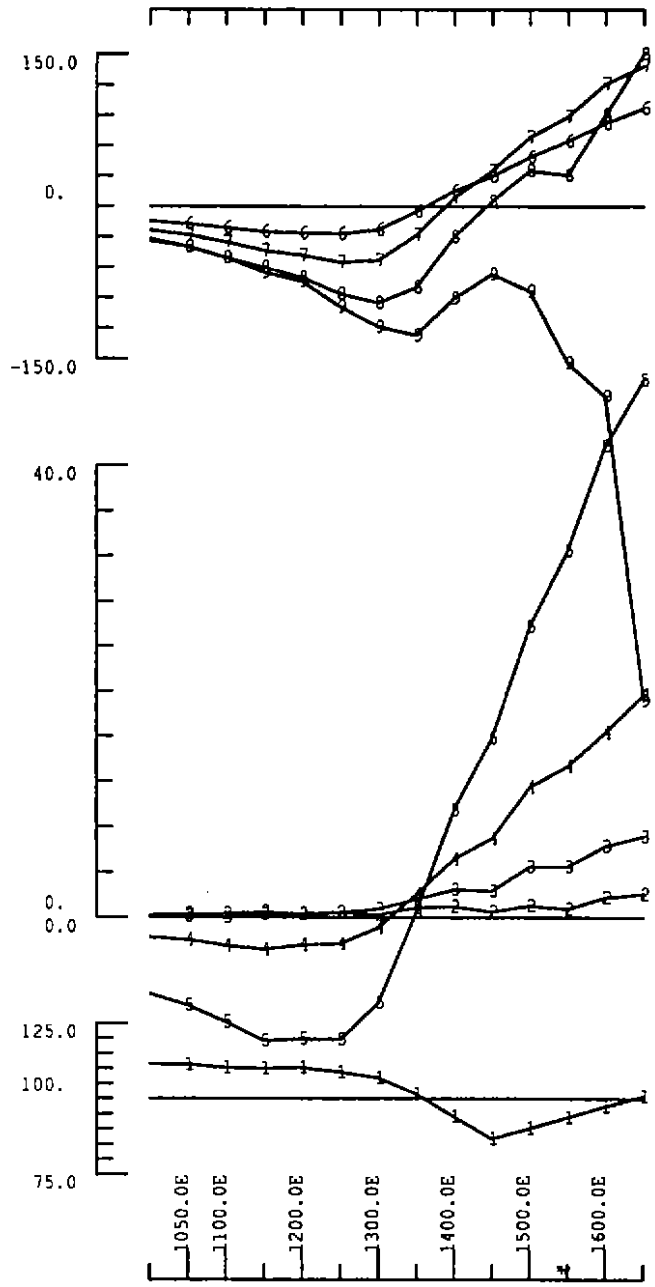
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121068



ZEEHAN QUEEN HILL

LINE 2200N LOOP 9

(out of loop data)

Point Normalized

1400E 2200N

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

Freq. 26.23Hz

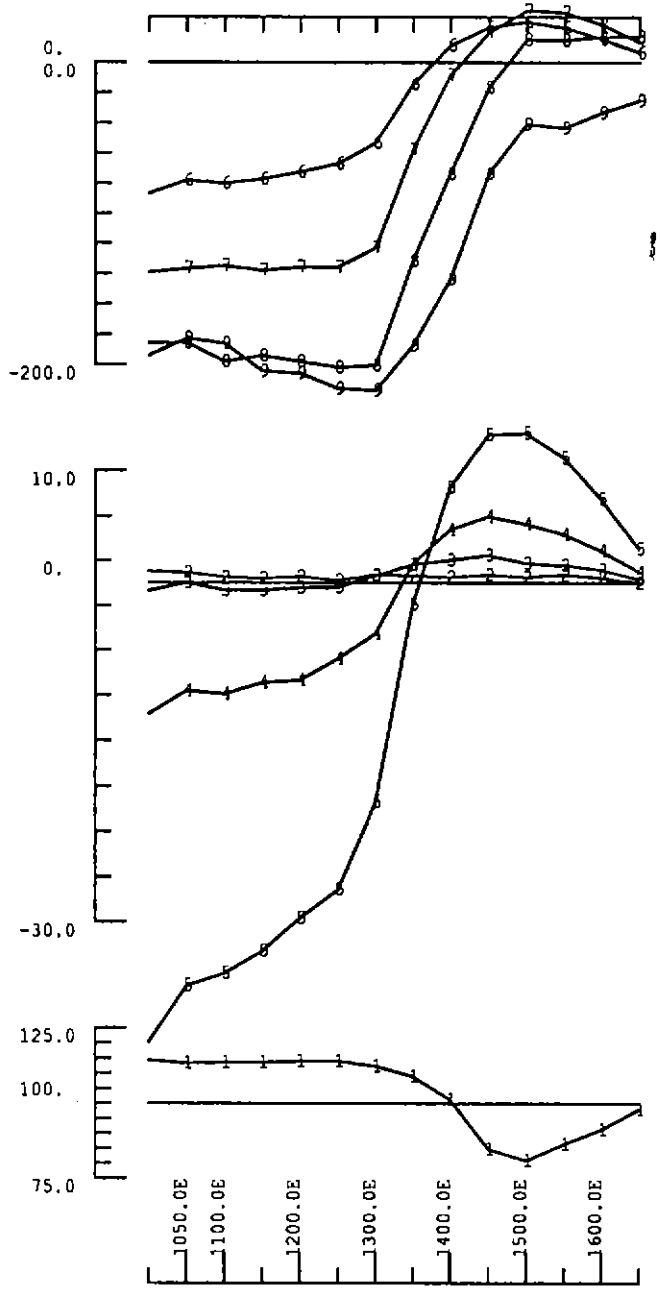
Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 21/03/90 Horiz

260

121099



ZEEHAN QUEEN HILL

LINE 2400N LOOP 9

(out of loop data)

Continuously Normalized

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

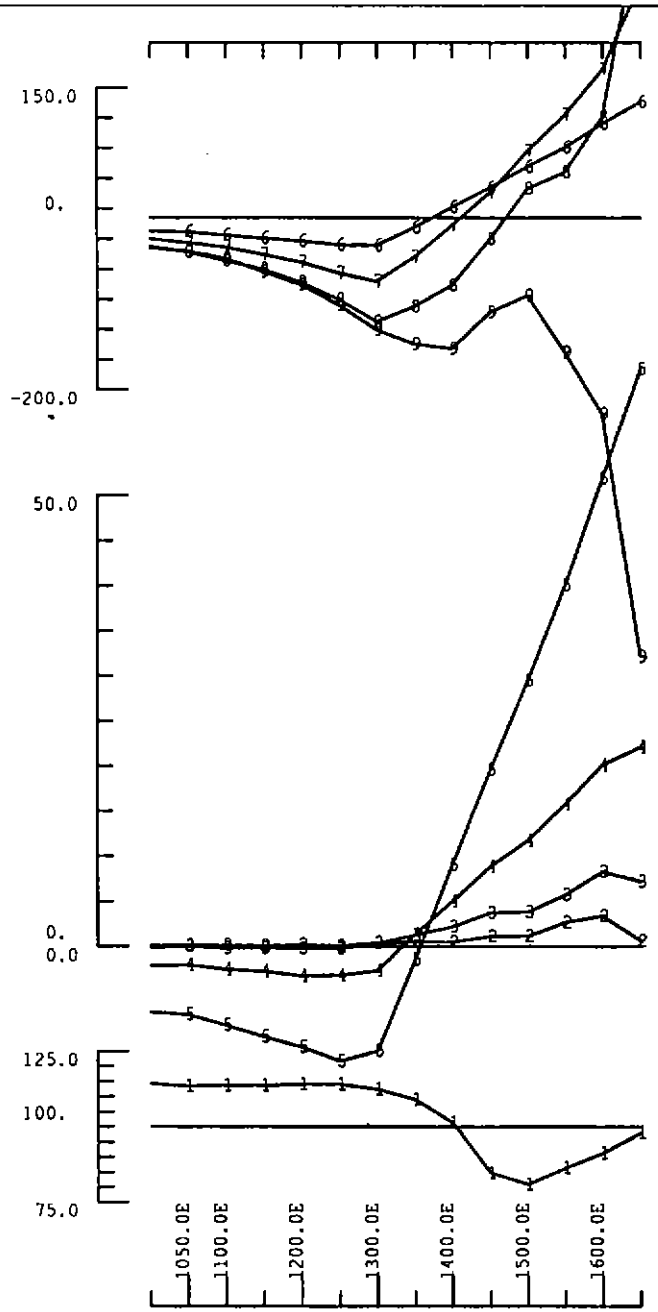
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121100



ZEEHAN QUEEN HILL

LINE 2400N LOOP 9

(out of loop data)

Point Normalized

1400E 2200N

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

Freq. 26.23Hz

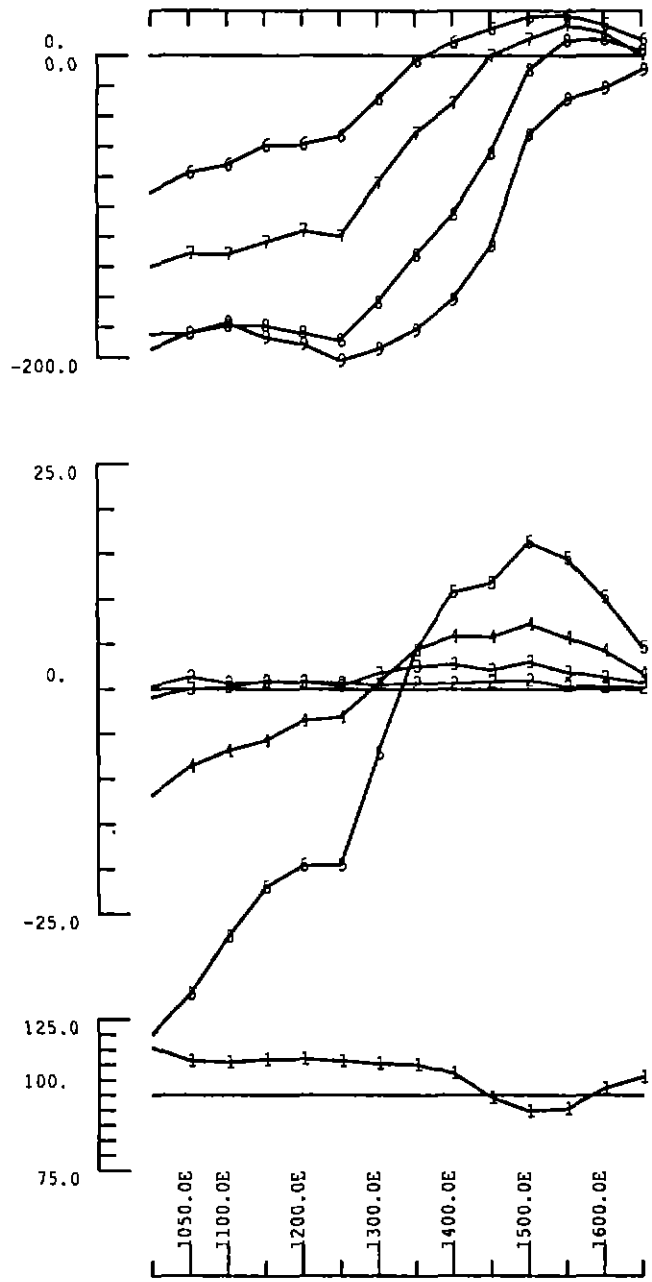
Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 21/03/90 Horiz

GRID

121101



ZEEHAN QUEEN HILL

LINE 2585N LOOP 9

(out of loop data)

Continuously Normalized

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

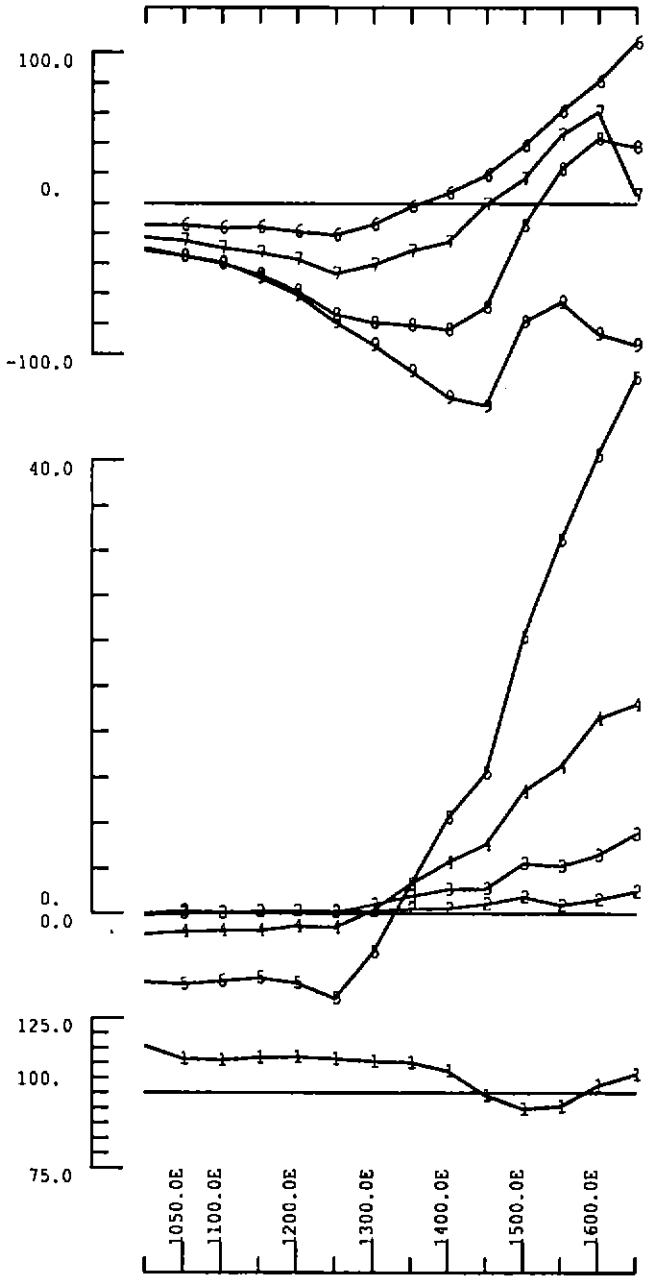
Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 20/03/90 Horiz

121102



ZEEHAN QUEEN HILL

LINE 2585N LOOP 9

(out of loop data)

Point Normalized

1400E 2200N

UTEM Survey Febuary 1990

Secondary Magnetic Field

Hz Component

Freq. 26.23Hz

Aberfoyle Resources Ltd

March 1990 <jjr>

Plot Date : 21/03/90 Horiz

APPENDIX 3

ABERFOYLE RESOURCES LIMITED

D.D.H. No. ZS 92

ZEEHAN GEOCHEMISTRY

Loc. SEVERN TAS.

121104

SAMPLE ASSAY DATA

SAMPLE No.	FROM (m)	TO (m)	L (m)	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Sn ppm	Rb ppm
513907	8.00	19.50	11.50	100	150	1550	0.5	4	140
513908	19.50	24.20	4.70	70	1250	6700	7.5	30	180
513909	24.20	33.60	9.40	90	205	810	0.5	3	170
513910	33.60	41.90	8.30	90	200	590	0.5	5	160
513911	41.90	52.70	10.80	100	275	970	0.5	4	140
513912	52.70	62.90	10.20	105	60	270	0	0	85
513913	62.90	71.60	8.70	100	55	310	0	7	45
513915	71.60	80.30	8.70	85	30	180	0	7	40
513916	80.30	90.30	10.00	85	170	590	0	3	70
513917	90.30	92.80	2.50	315	10500	18000	44	75	55
513918	92.80	94.60	1.80	240	31500	12000	108	55	200
513919	94.60	95.00	0.40	45	745	1750	2.5	25	15
513920	95.00	104.00	9.00	95	100	290	0	4	130
513921	104.00	116.00	12.00	105	75	270	0.5	7	140
513922	116.00	129.10	13.10	95	120	310	0	7	140
513923	129.10	129.70	0.60	40	1750	1850	1.5	9	80
513925	129.70	140.80	11.10	100	295	865	0.5	10	190
513926	140.80	145.10	4.30	110	230	770	0.5	7	170
513927	145.10	153.80	8.70	95	350	1300	0	7	240
513928	153.80	165.95	12.15	85	360	980	0.5	3	220
513929	165.95	178.80	12.85	105	100	220	0	7	150
513931	178.80	179.20	0.40	60	880	1750	1.5	15	150
513932	179.20	185.60	6.40	95	415	460	1	6	160
513933	185.60	194.10	8.50	100	25	140	0.5	3	80
513934	194.10	198.65	4.55	90	25	130	0	4	75
513935	198.65	210.35	11.70	105	120	385	0	6	110
513936	210.35	211.50	1.15	45	370	690	0.5	25	160
513937	211.50	220.10	8.60	95	30	180	0	3	90
513938	220.10	230.30	10.20	115	65	170	0	3	140
513939	230.30	241.35	11.05	115	45	175	0	7	140
513940	241.35	248.70	7.35	110	40	145	0	3	120
513941	248.70	263.20	14.50	105	60	175	0	5	140
513942	263.20	271.30	8.10	110	100	420	0.5	5	160
513943	271.30	278.20	6.90	60	45	90	0	4	95
513944	278.20	284.40	6.20	120	265	690	1	9	190
513945	284.40	298.20	13.80	90	380	1030	1	7	200
513946	298.20	307.70	9.50	95	270	640	0	9	170
513947	307.70	319.20	11.50	75	55	190	0	4	220
513948	319.20	329.05	9.85	90	50	210	0	4	210
513949	329.05	342.60	13.55	85	70	160	0	0	210
513950	342.60	354.10	11.50	80	70	175	0	7	160
513952	354.10	368.70	14.60	95	1360	1150	1	10	210
513953	368.70	377.60	8.90	65	50	170	0.5	5	160
513954	377.60	378.10	0.50	30	15	90	0.5	4	75
513955	378.10	383.00	4.90	110	35	130	0.5	6	190
513956	383.00	392.75	9.75	60	85	155	1	6	170
513957	392.75	396.10	3.35	50	20	90	0.5	4	230
513958	396.10	396.90	0.80	20	55	135	0	4	35
513959	396.90	404.30	7.40	80	45	115	0	10	170
513960	404.30	405.10	0.80	30	20	60	0.5	0	35
513961	405.10	405.60	0.50	35	32	45	0	4	140
513962	405.60	408.55	2.95	40	160	290	1	20	190
513963	408.55	420.10	11.55	45	55	120	0.5	7	190
513964	420.10	421.00	0.90	50	115	385	0.5	25	240
513965	421.00	431.80	10.80	60	745	1250	1.5	35	230
513966	431.80	434.45	2.65	70	340	2400	1.5	20	210
513967	434.45	435.75	1.30	100	365	1350	1	120	50
513968	435.75	437.30	1.55	110	445	6000	1.5	160	25
513969	437.30	438.95	1.65	130	535	3450	1	250	30
513970	438.95	441.60	2.65	155	825	3400	1.5	340	35
513971	441.60	453.10	11.50	25	115	460	0.5	25	15
513972	453.10	454.20	1.10	75	600	4000	1	90	30
513973	454.20	454.80	0.60	65	250	4400	1	25	25
513378	454.80	455.60	0.80	140	195	1000	0	330	40
513379	455.60	456.45	0.85	80	260	2300	0	160	40
513380	456.45	457.45	1.00	370	1250	6550	3.5	1200	45
513381	457.45	458.05	0.60	105	225	2700	0	420	35
513382	458.05	458.50	0.45	345	2950	9050	4.5	1000	150
513974	458.50	463.90	5.40	70	930	1900	1	55	270
513976	463.90	474.15	10.25	50	250	750	0.5	110	240
513977	474.15	485.30	11.15	40	45	125	0.5	45	190
513978	485.30	497.90	12.60	50	155	255	0	75	210
513979	497.90	508.60	10.70	45	100	175	1	20	210
513980	508.60	509.20	0.60	20	30	90	0	65	240
513981	509.20	510.30	1.10	20	25	150	0	30	300
513982	510.30	520.40	10.10	50	85	245	1.5	55	240
513983	520.40	530.80	10.40	60	55	125	1	70	240

513984	530.80	532.10	1.30	30	10	110	0.5	15	210
513356	532.10	533.20	1.10	50	0	70	0	1250	270
513357	533.20	535.60	2.40	30	0	50	0	190	270
513358	535.60	538.90	3.30	30	0	35	0	340	240
513359	538.90	539.40	0.50	615	115	170	2	7000	30
513360	539.40	540.20	0.80	50	0	100	0	280	300
513361	540.20	541.60	1.40	140	0	115	0	620	230
513362	541.60	542.10	0.50	40	0	55	0	140	330
513363	542.10	542.30	0.20	445	110	65	4.5	8090	85
513364	542.30	542.60	0.30	90	75	370	0	300	340
513365	542.60	542.95	0.35	820	940	70	10.5	40480	0
513366	542.95	543.80	0.85	105	45	80	0	2350	270
513367	543.80	545.25	1.45	225	0	35	0	970	230
513368	545.25	546.90	1.65	260	0	20	0	1200	200
513369	546.90	548.40	1.50	1550	300	175	16.5	6050	55
513370	548.40	549.40	1.00	155	185	180	2.5	2800	120
513371	549.40	550.00	0.60	35	50	95	0	480	240
513372	550.00	551.70	1.70	100	60	50	0	2350	220
513373	551.70	552.40	0.70	335	115	75	4	3550	30
513374	552.40	553.50	1.10	135	85	135	0	940	120
513985	553.50	556.80	3.30	40	55	120	0	160	300
513987	556.80	557.10	0.30	210	80	175	1	380	220
513988	557.10	565.30	8.20	45	45	160	0.5	10	270
513989	565.30	577.85	12.55	40	10	90	0	10	240
513990	577.85	583.00	5.15	40	10	65	0	20	170
513991	583.00	595.50	12.50	55	15	85	0	130	200
DETECTION LIMITS				5	5	5	0.5	2	3

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CORE GRIND SAMPLING - ZEEHAN HOLE No. ZS92

* DENOTES CUT. DATE 20/9/89

No.	SAMPLE NUMBER	INTERVAL	ELEMENTS REQUIRED	ST	SAMPLE NUMBER	INTERVAL	ELEMENTS REQUIRED	ST
1	513907	8 - 19·5		11·5				
2	908	14·5 - 24·2		4·7				
3	909	24·2 - 33·6		9·4				
4	910	33·6 - 41·9		8·3				
5	911	41·9 - 52·7		10·8				
6	912	52·7 - 62·9		10·2				
7	913	62·9 - 71·4		8·5				
8	914	71·4 - 71·6		0·2				
9	915	71·6 - 80·3		8·7				
10	916	80·3 - 90·3		10·0				
11	917	90·3 92·8		2·5	*			
12	918	928 - 94·6		1·8	*			
13	919	94·6 - 95·0		0·4	*			
14	920	95 - 104		9·0				
15	921	104 - 116		12·0				
16	922	116 - 129·1		13·1				
17	923	129·1 - 129·7		0·6	* (NO	924)		
18	925	129·7 - 140·8		11·1				
19	926	140·8 - 145·1		4·3				
20	927	145·1 - 153·8		8·7				
21	928	153·8 - 16595		12·15				
22	929	165·95 - 178·8		12·85				
* 23	STD 930	STANDARD						
24	931	178·8 - 179·2		0·4	*			
25	932	179·2 - 185·6		6·4				
26	933	185·6 - 194·1		8·5				
27	934	194·1 - 198·65		4·55				
28	935	198·65 - 210·35		11·7				
29	936	210·35 - 211·5		1·15	*			
30	937	211·5 - 220·1		8·6				
31	938	220·1 - 230·3		10·2				

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121107 PAGE 2 OF 4

CORE GRIND SAMPLING - ZEEHAN

HOLE No. ZS92

DATE 20/9/89

No.	SAMPLE NUMBER	INTERVAL	ELEMENTS REQUIRED	ST	SAMPLE NUMBER	INTERVAL	ELEMENTS REQUIRED	ST
1	513 939	230.3-241.35		11.05				
2	940	241.35-248.7		7.35				
3	941	248.7-263.2		4.5				
4	942	263.2-271.3		8.1				
5	943	271.3-278.2		6.9				
6	944	278.2-284.4		6.2				
7	945	284.4-298.2		13.8				
8	946	298.2-307.7		9.5				
9	947	307.7-319.2		11.5				
10	948	319.2-329.05		9.85				
11	949	329.05-342.6		13.55				
12	950	342.6-354.1		11.5				
13 STD	951	STANDARD						
14	952	354.1-368.7		14.6				
15	953	368.7-377.6		10.9				
16	954	377.6-378.1		0.5	✱			
17	955	378.1-383		4.9				
18	956	383-392.75		9.75				
19	957	392.75-396.1		3.35				
20	958	396.1-396.9		0.8	✱			
21	959	396.9-404.3		7.4				
22	960	404.3-405.1		0.8	✱			
23	961	405.1-405.6		0.5	✱			
24	962	405.6-408.55		2.95				
25	963	408.55-420.1		11.55				
26	964	420.1-421		0.9				
27	965	421-431.8		10.8				
28	966	431.8-434.45		2.65				
29	967	434.45-435.75		1.3	✱			
30	968	435.75-437.3		1.55	✱			
31	969	437.3-438.95		1.65	✱			

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CORE GRIND SAMPLING - ZEEHAN

HOLE No. ZS92

DATE 20/9/89

No.	SAMPLE NUMBER	INTERVAL	ELEMENTS REQUIRED	ST	SAMPLE NUMBER	INTERVAL	ELEMENTS REQUIRED	ST
1	970	438.95-441.6		2.65	*			
2	971	441.6-453.1		11.5				
3	972	453.1-454.2		1.1	*			
4	973	454.2-454.8		0.6	*			
5	513 378	454.8-455.6		0.8	*			
6	379	455.6-456.45		0.85	*			
7	513 380	456.45-457.45		1.0				
8	381	457.45-458.05		0.6				
9	382	458.05-458.5		0.45				
10	513974	458.5-463.9		5.4				
STD*	975	STANDARD						
12	976	463.9-474.15		10.25				
13	977	474.15-485.3		11.15				
14	978	485.3-497.9		12.6				
15	979	497.9-508.6		10.7				
16	980	508.6-509.2		0.6	*			
17	981	509.2-510.3		1.1	*			
18	982	510.3-520.4		10.1				
19	983	520.4-530.8		10.4				
20	984	530.8-532.1		1.3	*			
21	913 356	532.1-533.2		1.1				
22	357	533.2-535.6		2.4				
23	358	535.6-538.9		3.3				
24	359	538.9-539.4		0.5				
25	360	539.4-540.2		0.8				
26	361	540.2-541.6		1.4				
27	362	541.6-542.1		0.5				
28	363	542.1-542.3		0.2				
29	364	542.3-542.6		0.3				
30	365	542.6-542.95		0.35				
31	366	542.95-543.8		0.85				

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CORE GRIND SAMPLING - ZEEHAN

121109

HOLE No. 7592

DATE 20/9/89.

No.	SAMPLE NUMBER	INTERVAL	ELEMENTS REQUIRED	ST	SAMPLE NUMBER	INTERVAL	ELEMENTS REQUIRED	ST
1	367	543·8 - 545·25		1·45				
2	368	545·25 - 546·9		1·65				
3	369	546·9 - 548·4		2·5				
4	370	548·4 - 549·4		1·0				
5	371	549·4 - 550		0·6				
6	372	550 - 551·7		1·7				
7	373	551·7 - 552·4		0·7				
8	374	552·4 - 553·5		1·1				
9	513 985	553·5 - 556·8		3·3				
10	~~SD.~~ 986	STANDARD		0				
11	987	556·8 - 557·1		0·3	X			
12	988	557·1 - 565·3		8·2				
13	989	565·3 - 577·85		12·55				
14	990	577·85 - 583		5·15				
15	991	583 - 595·5		12·5				
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ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.
Phone (09) 458 7999 52 Murray Road, Welshpool, W.A. 6106 Telex AA92560
FAX: 004 31 8890

ANALYTICAL REPORT No. 23.3.08.06559

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

Aberfoyle Resources Limited
Exploration Division
P.O. Box 952
Burnie Tasmania 7320

ORDER No.	PROJECT
7304	

DATE RECEIVED	RESULTS REQUIRED
03/10/89	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
4	19/10/89	1	85

PLES	PRE-TREATMENT								ANALYSIS			
R W	SAMPLE NUMBERS	DRY	CRUSH	SPLIT	PUL-VERISE	SIEVE	OTHER SEE REMARKS	NONE		REFER TO ANALYSIS SECTION	PREPARATION	METHOD
	Various	Ro	Prep: 006,009,011,012,013,017						Cu,Pb,Zn,Ag/101			
	Various	Pu							Sn/401			
	Various	Ro	Prep: 006,009,011,012,013,017						Pb,Zn,Ag/104			
	Various	Pu							Rb/401			

RESULTS TO

Aberfoyle Resources Limited
Exploration Division
P.O. Box 952
Burnie Tasmania 7320

RESULTS TO

REMARKS

ZS92

STATE OF SAMPLES		ANALYSIS — PREPARATION				ANALYSIS — METHOD	
whole core	WC	perchloric acid	A1	cold acid	CA	atomic absorbtion	AAS
split core	SC	hydrochloric acid	A2	specific sulphide	SS	x-ray fluorescence	XRF
cuttings	CU	nitric acid	A3	other mixed acids	Ma	spectrophotometry	SPEC
rock	Ro	aqua regia	A4	alkaline attack	AA	colorimetry	COL
soil	SO	nitric-perchloric	A5	volatilization	VO	chromatography	CHR
pulp	PU	HF mixture	A6	ignition	IG	titration	TTN
water	WA	HF under pressure	A7	pressed powder (XRF)	PP	other chemicals means	CHEM
blue	TI	fusion	A8	glass fusion (XRF)	GF	miscellaneous	MISC
stream sediment	SS					fluorescence	FLUOR
heavy mineral	HM					inductively coupled plasma	ICP

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ANALABS

121111

A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	23.3.08.06559	19/10/89	7304	1 OF 4

JBE No.	SAMPLE No.	Cu	Pb	Pb	Zn	Zn	Ag	Ag	Sn	Rb
1	513378	140	195	–	1000	–	<0.5	–	330	40
2	513379	80	260	–	2300	–	<0.5	–	160	40
3	513907	100	150	–	1550	–	0.5	–	4	140
4	513908	70	1250	–	6700	–	7.5	–	30	180
5	513909	90	205	–	810	–	0.5	–	3	170
6	513910	90	200	–	590	–	0.5	–	5	160
7	513911	100	275	–	970	–	0.5	–	4	140
8	513912	105	60	–	270	–	<0.5	–	<3	85
9	513913	100	55	–	310	–	<0.5	–	7	45
10	513915	85	30	–	180	–	<0.5	–	7	40
11	513916	85	170	–	590	–	<0.5	–	3	70
12	513917	315	–	1.05	–	1.80	–	44	75	55
13	513918	240	–	3.15	–	1.20	–	102	55	200
14	513919	45	745	–	1750	–	2.5	–	25	15
15	513920	95	100	–	290	–	<0.5	–	4	130
16	513921	105	75	–	270	–	0.5	–	7	140
17	513922	95	120	–	310	–	<0.5	–	7	140
18	513923	40	1750	–	1850	–	1.5	–	9	80
19	513925	100	295	–	865	–	0.5	–	10	190
20	513926	110	230	–	770	–	0.5	–	7	170
21	513927	95	350	–	1300	–	<0.5	–	7	240
22	513928	85	360	–	980	–	0.5	–	3	220
23	513929	105	100	–	220	–	<0.5	–	7	150
24	513930 SD	125	195	–	2200	–	0.5	–	8	35
25	513931	60	880	–	1750	–	1.5	–	15	150

Results in ppm unless otherwise specified
T = element present, but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

AUTHORISED OFFICER

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121112

ANALABS

A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	23.3.08.06559	19/10/89	7304	2 OF 4

JBE No.	SAMPLE No.	Cu	Pb	Pb	Zn	Zn	Ag	Ag	Sn	Rb
1	513932	95	415	-	460	-	1.0	-	6	160
2	513933	100	25	-	140	-	0.5	-	3	80
3	513934	90	25	-	130	-	<0.5	-	4	75
4	513935	105	120	-	385	-	<0.5	-	6	110
5	513936	45	370	-	690	-	0.5	-	25	160
6	513937	95	30	-	180	-	<0.5	-	3	90
7	513938	115	65	-	170	-	<0.5	-	3	140
8	513939	115	45	-	175	-	<0.5	-	7	140
9	513940	110	40	-	145	-	<0.5	-	3	120
10	513941	105	60	-	175	-	<0.5	-	5	140
11	513942	110	100	-	420	-	0.5	-	5	160
12	513943	60	45	-	90	-	<0.5	-	4	95
13	513944	120	265	-	690	-	1.0	-	9	190
14	513945	90	380	-	1030	-	1.0	-	7	200
15	513946	95	270	-	640	-	<0.5	-	9	170
16	513947	75	55	-	190	-	<0.5	-	4	220
17	513948	90	50	-	210	-	<0.5	-	4	210
18	513949	85	70	-	160	-	<0.5	-	<3	210
19	513950	80	70	-	175	-	<0.5	-	7	160
20	513951 STD	110	200	-	2200	-	0.5	-	5	30
21	513952	95	1360	-	1150	-	1.0	-	10	210
22	513953	65	50	-	170	-	0.5	-	5	160
23	513954	30	15	-	90	-	0.5	-	4	75
24	513955	110	35	-	130	-	0.5	-	6	190
25	513956	60	85	-	155	-	1.0	-	6	170

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

AUTHORISED OFFICER

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ANALABS

A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

121113

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	23.3.08.06559	19/10/89	7304	3 OF 4

JBE No.	SAMPLE No.	Cu	Pb	Pb	Zn	Zn	Ag	Ag	Sn	Rb
1	513957	50	20	–	90	–	0.5	–	4	230
2	513958	20	55	–	135	–	<0.5	–	4	35
3	513959	80	45	–	115	–	<0.5	–	10	170
4	513960	30	20	–	60	–	0.5	–	<3	35
5	513961	35	32	–	45	–	<0.5	–	4	140
6	513962	40	160	–	290	–	1.0	–	20	190
7	513963	45	55	–	120	–	0.5	–	7	190
8	513964	50	115	–	385	–	0.5	–	25	240
9	513965	60	745	–	1250	–	1.5	–	35	230
10	513966	70	340	–	2400	–	1.5	–	20	210
11	513967	100	365	–	1350	–	1.0	–	120	50
12	513968	110	445	–	6000	–	1.5	–	160	25
13	513969	130	535	–	3450	–	1.0	–	250	30
14	513970	155	825	–	3400	–	1.5	–	340	35
15	513971	25	115	–	460	–	0.5	–	25	15
16	513972	75	600	–	4000	–	1.0	–	90	30
17	513973	65	250	–	4400	–	1.0	–	25	25
18	513974	70	930	–	1900	–	1.0	–	55	270
X/	513975 STD	130	210	–	2350	–	0.5	–	7	35
20	513976	50	250	–	750	–	0.5	–	110	240
21	513977	40	45	–	125	–	0.5	–	45	190
22	513978	50	155	–	255	–	<0.5	–	75	210
23	513979	45	100	–	175	–	1.0	–	20	210
24	513980	20	30	–	90	–	<0.5	–	65	240
25	513981	20	25	–	150	–	<0.5	–	30	300

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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ANALABS

121114

A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	23.3.08.06559	19/10/89	7304	4 OF 4

TUBE No.	SAMPLE No.	Cu	Pb	Pb	Zn	Zn	Ag	Ag	Sn	Rb
1	513982	50	85	-	245	-	1.5	-	55	240
2	513983	60	55	-	125	-	1.0	-	70	240
3	513984	30	10	-	110	-	0.5	-	15	210
4	513985	40	55	-	120	-	<0.5	-	160	300
X	513986 STD	120	190	-	2400	-	0.5	-	6	35
6	513987	210	80	-	175	-	1.0	-	380	220
7	513988	45	45	-	160	-	0.5	-	10	270
8	513989	40	10	-	90	-	<0.5	-	10	240
9	513990	40	10	-	65	-	<0.5	-	20	170
10	513991	55	15	-	85	-	<0.5	-	130	200
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	5	5	0.01	5	0.01	0.5	2	3	5
24	UNITS	PPM	PPM	%	PPM	%	PPM	PPM	PPM	PPM
25	METHOD	101	101	104	101	104	101	104	401	401

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

AUTHORISED OFFICER

121115 PAGE OF

CORE GRIND SAMPLING - MACKINTOSH / HATFIELD

HOLE No. ZS92

DATE 4/9/89

No.	SAMPLE NUMBER	INTERVAL	ELEMENTS REQUIRED	ST	SAMPLE NUMBER	INTERVAL	ELEMENTS REQUIRED	ST
1	513356	532.1-533.2	Cu Pb Zn Ag Sn		51			
2	57	533.2-535.6						
3	58	535.6-538.9						
4	59	538.9-539.4						
5	60	539.4-540.2						
6	61	540.2-541.6						
7	62	541.6-542.1						
8	63	542.1-542.3						
9	64	542.3-542.6						
10	65	542.6-542.95						
11	66	542.95-543.8						
12	67	543.8-545.25						
13	68	545.25-546.9						
14	69	546.9-548.4						
15	70	548.4-549.4						
16	71	549.4-550						
17	72	550-551.7						
18	73	551.7-552.4						
19	74	552.4-553.5						
20	80	456.45-457.45						
21	81	457.45-458.05						
22	513382	458.05-458.6						
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								

J15

ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.
52 Murray Road, Welshpool, W.A. 6106
FAX: 004 31 8890
Phone (09) 458 7999
121116
Telex AA92560

ANALYTICAL REPORT No. 23.3.08.06489

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

Aberfoyle Resources Limited
Exploration Division
P.O. Box 952
Burnie Tasmania 7320

ORDER No.	PROJECT
8450	

DATE RECEIVED	RESULTS REQUIRED
05/09/89	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
1	19/09/89	1	22

REFER BELOW	SAMPLE NUMBERS	PRE-TREATMENT: DRY	CRUSH	SPLIT	PULVERISE	SIEVE	OTHER SEE REMARKS	NONE	ANALYSIS: REFER TO ANALYSIS SECTION	PREPARATION	METHOD
	513356/374,513380/382	DC	Prep: 010,011,006						Cu,Pb,Zn,Ag/101		
	513356/374,513380/382	DC							Sn/404		
	513356/374,513380/382	DC							Sn/403		

RESULTS TO

R. de Bomford
Aberfoyle Resources Limited
Exploration Division
P.O. Box 952
Burnie Tasmania 7320

RESULTS TO

REMARKS

Z592

STATE OF SAMPLES		ANALYSIS — PREPARATION				ANALYSIS — METHOD	
ble core	WC	perchloric acid	A1	cold acid	CA	atomic absorbtion	AAS
plit core	SC	hydrochloric acid	A2	specific sulphide	SS	x-ray fluorescence	XRF
utting	CU	nitric acid	A3	other mixed acids	Ma	spectrophotometry	SPEC
k	Ro	aqua regia	A4	alkaline attack	AA	colorimetry	COL
	SO	nitric-perchloric	A5	volatilization	VO	chromatography	CHR
p	PU	HF mixture	A6	ignition	IG	titration	TTN
water	WA	HF under pressure	A7	pressed powder (XRF)	PP	other chemicals means	CHEM
issue	TI	fusion	A8	glass fusion (XRF)	GF	miscellaneous	MISC
am sediment	SS					fluorescence	FLUOR
vy mineral	HM					inductively coupled plasma	ICP

AUTHORISED OFFICER

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121117

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	23.3.08.06489	19/07/89	8450	1 OF 1

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Sn	Sn			
1	532.1-533.2 B13356	50	<5	70	<0.5	1250	-			
2	533.2-535.6 B13357	30	<5	50	<0.5	190	-			
3	535.6-538.9 B13358	30	<5	35	<0.5	340	-			
4	538.9-539.4 B13359	615	115	170	2.0	7000	-			
5	539.4-540.2 B13360	50	<5	100	<0.5	280	-			
6	540.2-541.6 B13361	140	<5	115	<0.5	620	-			
7	541.6-542.1 B13362	40	<5	55	<0.5	140	-			
8	542.1-542.3 B13363	445	110	65	4.5	>10000	0.809			
9	542.3-542.6 B13364	90	75	370	<0.5	300	-			
10	542.6-542.95 B13365	620	940	70	10.5	>10000	4.046			
11	542.95-543.8 B13366	105	45	80	<0.5	2350	-			
12	543.8-545.25 B13367	225	<5	35	<0.5	970	-			
13	545.25-546.9 B13368	260	<5	20	<0.5	1200	-			
14	546.9-548.4 B13369	1550	300	175	16.5	6050	-			
15	548.4-549.4 B13370	155	165	180	2.5	2800	-			
16	549.4-550 B13371	35	50	95	<0.5	480	-			
17	550-551.7 B13372	100	60	50	<0.5	2350	-			
18	551.7-552.4 B13373	335	115	75	4.0	3550	-			
19	552.4-553.5 B13374	135	85	135	<0.5	940	-			
20	456.45-457.45 B13380	370	1250	6550	3.5	1200	-			
21	457.45-458.05 B13381	105	225	2700	<0.5	420	-			
22	458.05-458.6 B13382	345	2950	9050	4.5	1000	-			
23	DETECTION	5	5	5	0.5	3	0.005			
24	UNITS	PPM	PPM	PPM	PPM	PPM	%			
25	METHOD	101	101	101	101	401	403			

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

AUTHORISED OFFICER

DATE SUBMITTED .....

DATE ASSAYED .....

D.D.H. No. ZS 92

LOC'N SEVERN ..... TAS.

SAMPLE ASSAY DATA

SAMPLE No.	FROM (m)	TO (m)	L (m)	LITH'Y	S.G.	ppm Cu	ppm Pb	ppm Zn	ppm Ag	ppm Au	% Ba	ppm Sn.	REMARKS	LENS
513 356	532·1	533·2	1·1			50	<5	70	<0·5			1250		2
57	533·2	535·6	2·4			30	<5	50	<0·5			190	121118	
58	535·6	536·9	3·3			30	<5	35	<0·5			340		
59	536·9	539·4	0·5			615	115	170	2·0			7000		
60	539·4	540·2	0·8			50	<5	100	<0·5			260		
61	540·2	541·6	1·4			140	<5	115	<0·5			620		
62	541·6	542·1	0·5			40	<5	55	<0·5			140		
63	542·1	542·3	0·2			445	110	65	4·5			*1·03%		
64	542·3	542·6	0·3			90	75	370	<0·5			300		
65	542·6	542·95	0·35			820	940	70	10·5			*10·9%		
66	542·95	543·8	0·85			105	45	80	<0·5			2350		
67	543·8	545·25	1·45			225	<5	35	<0·5			970		
68	545·25	546·9	1·65			260	<5	20	<0·5			1200		
69	546·9	548·4	1·5			1550	300	175	16·5			6050		
70	548·4	549·4	1·0			155	185	160	2·5			2800		
71	549·4	550·0	0·6			35	50	95	<0·5			460		
72	550·0	551·7	1·7			100	60	50	<0·5			2350		
73	551·7	552·4	0·7			335	115	75	4·0			3550		
74	552·4	553·5	1·1			135	85	135	<0·5			940		
80	456·45	457·45	1·0	LST		370	1250	6550	3·5			1200		
81	457·45	458·05	0·6	"		105	225	2700	<0·5			420		
513 382	458·05	458·6	0·55	"		345	2950	9050	4·5			1000		
													*TO BE RE-RUN BY METHOD 4O6.	
	542·1	542·95	0·85									4·74%		
	542·95	552·4	9·45									0·25%		
	542·1	552·4	10·3									0·62%		

ZS 92
CHECKS

ABERFOYLE RESOURCES LTD.

HELLYER DIVISION

7233

GENERAL ASSAY REPORT

118

121119

Date	AMDEL No.	Sample	ppm Sn.	% Sn	% sol Sn
	1250	513356	1300		<0.01
	190	513357	160		<0.01
	340	513358	340		<0.01
	7000	513359	6100		<0.01
	280	513360	260		<0.01
	620	513361	550		<0.01
	140	513362	120		<0.01
	8090	513363	8400		<0.01
	300	513364	300		<0.01
	4.084	513365		3.95	<0.01
	2350	513366	2300		<0.01
	970	513367	850		<0.01
	1200	513368	1400		<0.01
	6050	513369	5900		0.06
	2800	513370	2700		<0.01
	480	513371	460		<0.01
	2350	513372	2400		<0.01
	3550	513373	3300		0.01
	940	513374	900		<0.01
	1200	513380	1200		<0.01
	420	513381	420		<0.01
	1000	513382	1100		<0.01
	METHOD		B1	C1	F1/3

ASSAYER BP

CHIEF ASSAYER

DATE 16/10/89

NWPS 53926

ANALABS

121120

A division of MacDonald Hamilton & Co. Pty. Ltd.

Phone (09) 458 7999 — 52 Murray Road, Welshpool, W.A. 6106 — Telex AA92560

FAX: 004 31 8890

119

ANALYTICAL REPORT No. 83.3.08.06607

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

Aberfoyle Resources Limited
Exploration Division
P.O. Box 952
Burnie Tasmania 7320

ORDER No.	PROJECT
732A	

DATE RECEIVED	RESULTS REQUIRED
20/10/89	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
1	03/11/89	1	22

	PRE-TREATMENT								ANALYSIS			
REFER TO PREV.	SAMPLE NUMBERS	DRY	CRUSH	SPLIT	PULVERISE	SIEVE	OTHER SEE REMARKS	NONE	REFER TO ANALYSIS SECTION	PREPARATION	METHOD
	363,386/374,380/382	DB							Pb/A01		

RESULTS TO

R. de Bomford
Aberfoyle Resources Limited
Exploration Division
P.O. Box 952
Burnie Tasmania 7320

RESULTS TO

REMARKS

25 92

RB

STATE OF SAMPLES		ANALYSIS — PREPARATION				ANALYSIS — METHOD	
hole core	WC	perchloric acid	A1	cold acid	CA	atomic absorbtion	AAS
olit core	SC	hydrochloric acid	A2	specific sulphide	SS	x-ray fluorescence	XRF
utting	CU	nitric acid	A3	other mixed acids	Ma	spectrophotometry	SPEC
k	Ro	aqua regia	A4	alkaline attack	AA	colorimetry	COL
	SO	nitric-perchloric	A5	volatillization	VO	chromatography	CHR
ump	PU	HF mixture	A6	ignition	IG	titration	TTN
water	WA	HF under pressure	A7	pressed powder (XRF)	PP	other chemicals means	CHEM
issue	TI	fusion	A8	glass fusion (XRF)	GF	miscellaneous	MISC
eam sediment	SS					fluorescence	FLUOR
vy mineral	HM					inductively coupled plasma	ICP

AUTHORISED OFFICER

121121

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A Division of Inchcape Inspection and Testing Services Australia Pty Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	23.3.08.06609	03/11/89	7324	1 OF 1

TUBE No.	SAMPLE No.	Rb
1	513356	270
2	513357	270
3	513358	240
4	513359	30
5	513360	300
6	513361	230
7	513362	330
8	513363	25
9	513364	340
10	513365	<5
11	513366	270
12	513367	230
13	513368	200
14	513369	55
15	513370	120
16	513371	240
17	513372	220
18	513373	30
19	513374	120
20	513380	45
21	513381	35
22	513382	150
23	DETECTION	5
24	UNITS	ppm
25	METHOD	401

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

AUTHORISED OFFICER

121122

Summary list of petrographic samples from hole ZS 92

Sample No:	Depth	Description
564110	138.7-138.83m	grey green feldspar lithic standstone
564111	338.4-338.66m	grey black mudstone minor inter-bedded grey siltstone with pyrite blebs and lamanae.
564112	441.28-441.38m	white brown sidertised dolomite?
564114	434.5-434.6m	grey blue limestone calcite quartz veins
564115	464.3-464.4m	finely laminated grey siltstone/ sandstone
564119	563.1-563.25m	massive grey quartzite minor quartz, pyrite veins
564120	420.4-420.5	grey laminated siltstone (marker bed)

Summary list of petrographic samples from hole ZS92 (taken by JAA)

Sample No:	Depth	Description
564130	418.5m	Laminated siltstone from above Poverty Point Dolomite (for comparison with possible Dalcoath member underlying dolomite sequence).
564131	547.55m	Vuggy Py, Sd (An), Q, Cl, Cs vein 3cm wide in silicified Oonah.
564132	519.3m	Possible Crimson Creek or Dalcoath member i.e. laminated Slt/Psamm'te with possible volcanic detritus.

564130 Laminated sequence of interlayered sericitic claystone, and fine sandstone; minor fine pyrite more abundant in some layers than in others.

Thin beds of claystone and sandstone 0.4 to 4 mm thick, alternate in this rock, which appears to be typical of the Oonah Formation.

The sandstone layers are dominated by quartz grains to 0.2 mm, with minor detrital mica and leucoxene in a quartz-sericite matrix, which also includes fine carbonate and pyrite.

The claystone laminae consists mostly of sericite, and very fine quartz, with leucoxene and fine pyrite. The distribution of carbonate and pyrite may reflect an initially higher porosity in the sandstones. Some of the larger pyrite grains (0.5 mm in size) have fringes of fibrous quartz.

564131

Minor relict breccia fragments of carbonaceous and carbonate-rich fine rock; in layered, partly foliated lenses of quite complex massive to vein form mineralisation; variably of clays, pyrite, carbonate, fluorite, quartz; and some lenticular layers rich in stannite, arsenopyrite crystals lesser chalcopyrite, also accessory needle cassiterite.

About 30% of this rock consists of patches, within poorly defined layers, of massive to locally foliated, yellowish, very fine clays, some with zones enclosing small unoriented prisms of vein quartz.

Attenuated and shredded lenticular layers, probably reconstituted veins are intercalated and intergrown with the clay domains. These consist largely of crystals and aggregates of subhedral to euhedral pyrite crystals, some with a microporosity, contained within, (and cemented by), fine granular (vein) carbonate. Minor fluorite, small random prismatic quartz crystals, and unusually fibrous ?clay is also commonly intergrown with the pyrite-carbonate.

Several breccia blocks of silty and fine sandy black shale occur locally and appear to be relicts in this attenuated lenticular-layer-vein style of mineralisation. These blocks are partly altered to clays, quartz, carbonate and pyrite or cut by stringers variably of these minerals.

Pyrite, as noted is the dominant ore minerals, and as well as the coarser crystals and aggregates, it may be extremely fine and intricately intergrowns within the carbonate and clays and some occurs in crosscutting veinlets. Other ore minerals are :

(1) sets of disrupted lamellae (3% of the whole rock), possibly after pyrrhotite, intergranular to pyrite.

(2) euhedral arsenopyrite crystals (7%), generally about 0.15 mm size, and more or less restricted to several layer-veins, rich in pyrite, with lesser chalcopyrite and stannite, in a matrix of variably carbonate and/or quartz and/or clays.

564131 cont :

(3) Chalcopyrite, (3-4%), highly irregular grains rarely up to 0.5 mm, also as minute grains (0.01 mm), scattered and in loose clusters, variably in carbonate quartz clays, in general and more specific association with stannite.

(4) stannite, (2-3%) as individual grains to 0.5, and in coarser semi massive patches and short veins, mostly within the several layer-veins also with arsenopyrite and chalcopyrite, variably in carbonate, quartz, clays, also locally more or less intergranular to pyrite. Stannite commonly has minute inclusions of, and extremely thin rims of, chalcopyrite.

Rare cross cutting veins of stannite are present, apparently representing relatively late stage mineralisation.

Locally abundant small needles enclosed within the stannite may be consistent with a 'needle tin' habit.

564132

Laminated and layered sequence of sericitic shale (meta claystone) and sericitic siltstone, incorporating minor thin layers and lenses of very fine sandstone; accessory disseminated leucoxene, stringers of fine chlorite and carbonate.

Layers of extremely fine (clay) sericitic shale, some greater than 15 mm thick, alternate with layers to 8 mm thick, composed of alternating laminae of sericitic quartz-rich siltstones to very fine sandstone, and laminae of the sericitic quartz-rich siltstones to very fine sandstone, and laminae of the sericitic-shaly composition. Accessory fine flakes of muscovite, tourmaline and leucoxene are scattered in the silty to fine sandy laminae.

There are minor conformable and cross cutting veinlets and stringers of very fine chlorite, carbonate and limonite-lined stylolite threads. Some conformable chlorite veinlets have internal margins of extremely fine clouded carbonate; and locally carry rare fine pyrite.

Some of the sericite-rich layers and laminations have an S plane oblique (locally at a high angle) to the layering.

121128

Pontifex & Associates Pty. Ltd.

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26 KENSINGTON ROAD, ROSE PARK
SOUTH AUSTRALIA

P.O. BOX 91, NORWOOD
SOUTH AUSTRALIA 5067

MINERALOGICAL REPORT NO. 5543
by A.C. Purvis. PhD.

November 23rd, 1989

TO : Mr D.J. Noonan
Aberfoyle Resources Ltd
Exploration Division
39 River Rd
WIVENHOE TAS 7320

YOUR REFERENCE : Your letter dated 16/10/89

MATERIAL : Drill Core Samples
(Zeehan Deposits, Z592)

IDENTIFICATION : 564110 to 564120

WORK REQUESTED : *Thin section preparation and description.*

SAMPLES AND SECTIONS : Returned to you with this report.

Ian R. Pontifex
PONTIFEX & ASSOCIATES PTY LTD

BRIEF SUMMARY COMMENTS

Samples 5641110-11 appear to be typical of the Crimson Creek Formation, which has turbidite and mélange-like characterisitcs and could be allochthonous (?).

The abundant basaltic detritus in 564110 contrasts with the craton-derived leucoxene-tourmaline-zircon-clay-quartz detrital assemblages in 564115, 19 and 20, which may be autochthonous and probably correspond to the formations as marked on the drill hole cross-section supplied.

Samples 564112 and 14 consist essentially of ankerite-quartz ± pyrite assemblages. These may represent veins (cf. MacKay's Lode?) or replacement bodies within a reconstituted carbonate sequence, as you have suggested, (a conclusive opinion cannot be given from the petrography alone). Staining suggests that the 'ankerite' is locally relatively iron rich, i.e. gradational to siderite.

The petrography suggests that 564115 is part of the (?autochthonous) Oonah Formation rather than the Crimson Creek Formation.

In addition to the seven samples described (as requested), thin sections were also prepared of core samples 564116, 117, 118 which were also received, but for which descriptions were not required.

It is noted that a comparison was requested with 'other' samples from the Crimson Creek and Oonah Formations. Although Pontifex & Associates have described rocks from these areas in the past, we do not know specific geographic or geological representation of such samples, and cannot therefore comment on the requested comparisons.

564110 Carbonate-cemented, pebbly lithic greywacke, including sedimentary (carbonate) and lithic fragments; cut by oxide decorated shears, and by veins containing quartz and/or carbonate.

The largest fragments in this sediment are about 10 mm maximum diameter and consist of impure micritic carbonate, with minor quartz, fine opaque grains and clays, cut by veinlets of sparry carbonate.

The smaller grains, mostly 0.1 to 1 mm in size, consist of quartz, carbonate, sedimentary fragments (claystones) and altered volcanic fragments, broadly basaltic in character. Clays, carbonate and leucoxene occur in the altered lithic clasts.

Numerous generally very fine shear fractures and stylolite-like stringers in this rock contain fine opaque oxides $\pm$ quartz. Local groups of veinlets of this type appear to represent zones of dislocation, and these terminate earlier veinlets containing fine carbonate $\pm$ quartz. Later carbonate veinlets, with only minor quartz, appear to have been unaffected by these features.

564111

Deformed microfaulted tectonic melange; of sericitic pyritic and non-pyritic, partly graphitic, mudstone gradational to shale.

This rock is a highly microfaulted melange of distorted to planar-laminated clay-sericite-rich mudstone, gradational to shale by virtue of a fairly well developed common orientation of the very fine micaceous component (and minor very small pressure shadows adjacent to some pyrite crystals.) The layers are variously rich and poor in fine pyrite and/or graphite, and/or leucoxene.

The core sample indicates relatively continuous blocks several centimetres in maximum diameter, with a planar layering, locally offset along curved microfaults, within a matrix of distorted closely packed smaller fragments. These fragments have commonly a wispy distorted layering defined by diffuse small graphitic lenses, and/or a distorted lenticular distribution of pyrite crystals. Some fragments are uniformly pyritic.

A complex stockwork of somewhat diffuse carbonate veins is present.

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564112

Quartz, iron-rich carbonate (?ankerite or siderite) - pyrite rock (?vein or altered sediment); cut by later quartz-carbonate veins containing more iron-rich carbonate.

This is a heterogeneous rock with the following components :

(1) granular to prismatic quartz mostly as interlocking suhedral prisms to 4 mm long, locally subradiating

(2) granular to rhombohedral iron-rich carbonate rhombohedral against quartz. This carbonate takes up a blue stain after treatment with potassium , ferricyanide to indicate ankerite or siderite, but a more precise distinction between these two species cannot be made by staining and/or petrography.

This carbonate forms fine grained to medium grained aggregates (0.1 mm to 0.5 mm).

(3) Complex pyrite-carbonate intergrowths 2-10 mm in diameter with the pyrite generally separated from quartz by carbonate.

(4) Independent pyrite crystal masses to 4 mm diameter, set in quartz.

Late stage veins of carbonate-quartz contain carbonate which has stained darker than that in (2) and (3) above and is probably more iron-rich (sideritic).

There is no evidence as to whether this rock represents a space filling-type mineralisation; or if it represents replacement. If it is a replacement, the nature of any original lithology cannot be determined from the thin section.

564114

Massive, granular, iron-rich-carbonate (? ankerite), locally flooded also veined by quartz; with sparse, extremely fine opaque oxides on grain boundaries and along stylolites.

This rock contains a similar carbonate to that in 564112, in a massive granular mosaic with grains to 1 mm in size. Some areas of this mosaic have been flooded by quartz, and minor extremely fine opaque oxide grains have developed along carbonate grains boundaries, near the veins, possibly derived from iron in the carbonate.

Late stage quartz veins to 3 mm wide cut the rock but have been in turn cut by stylolites, decorated with extremely fine opaque oxide grains. Late stage thin carbonate veins are present.

As for 564112, it is not clear whether this rock is a space-filling vein, or a replacement.

564115 Laminated clay and carbonate-rich, siltstone to very fine sandstone.

This rock has braided laminae of extremely fine carbonate-rich layers, from 0.1 to 3 mm thick forming about 30% of the rock, at irregular intervals through a clay-rich siltstone to fine sandstone. Minor sericitic-clay-rich laminae are also present.

Detrital quartz grains from 0.03 to 0.12 mm in size are abundant, and cover the range from coarse silt (ca. 0.03 - 0.06 mm) to very fine sand (ca. 0.06 - 0.12 mm). Minor small fractured grains of possible felspar are present, and trace to accessory extremely fine grains of leucoxene > zircon > tourmaline (green and brown) are scattered along the layering.

Minor stringers of fine carbonate, at a low angle to layering contain minor chlorite and trace pyrite, and have been cut by later stringers of carbonate at a higher angle to the layering.

In spite of your field term 'black-mudstone', carbonaceous material was not identified in the thin section. As noted in the brief summary comments, this rock appears to represent the Oonah Formation, rather than the Crimson Creek Formation.

564119

Sericite, silty shale, with at least 2 schistosities; studded with very chloritic/ chloritised small porphyroblasts; cut by several veins of chlorite-quartz-carbonate-sulphide.

This rock is dominated by extremely fine, commonly oriented sericite, and is therefore not a quartzite as suggested in your notes. Minor to subordinate silt-sized and rare fine to very fine sand sized quartz grains are dispersed through this sericitic mass; also accessory detrital white mica and leucoxene.

The sericite defines a principal schistosity accompanied by conjuugate schistosities at 20°-30° to the principal schistosity.

Small porphyroblasts about 0.3 mm in diameter have been replaced by chlorite. Abundant chlorite-filled veinlets occur in a complex network, with carbonate and sulphides in the slightly thicker veins, locally together with quartz.

The development of conjugate schistosities is common in rocks which may be regarded as phyllites. Such schistosities may develop essentially at the same time without overprinting and there is no crenulation of one cleavage or schistosity by the others. This rock does not appear to be sufficiently high metamorphic grade to compare with Precambrian basement schists. It is essentially the same metamorphic grade as the other phyllites/clay slate (56115, 56120).

564120 Interlayered pelitic-sericitic-siltstone, and silty fine-sandy-shale; one main schistosity at a 30° angle to layering, also a second, minor schistosity. Cut by several quartz veins containing sulphides or carbonate.

The layers in this rock are from <1 mm to about 10 mm thick, and are alternately rich and poor in fine sandsized quartz grains with a matrix, dominated by sericite.

An accessory heavy mineral suite dominated by leucoxene, includes minor zircon and tourmaline as in 564115.

The quartz-poor layers are dominantly sericitic with scattered silt to fine sand sized quartz grains and fine leucoxene.

A principal schistosity is at about 30° to the layering; with a minor schistosity at about 65° to the layering. Some disruption and disturbance of the schistosities is seen along some of the contacts and adjacent to some of the quartz veins.

The quartz veins are arranged in a crudely en-echelon pattern with prismatic to granular quartz as their main component. Minor fine sulphides occur in some of the veins, and carbonate in others. Still other areas contain short prismatic crystals of apatite. The quartz grains commonly contain deformation lamellae.

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DIAMOND DRILL LOG

121137

PROJECT : Zeehan CML 36/81

PROSPECT: SEVERN

HOLE NO: Z592
PAGE: 1 of
LOGGED: DJN
DATE: 3/8/89

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
0.0				NO CORE RECOVERY TRICONE								
8.0			gn lh Gw	A highly brkn interval of pale gn - or. br weathered lh. Gw with minor ibd bk Mst from 8.6 - 13.5m From 25.3m the core is less leached and weathered darker gn Ss.		Minor siderite, calcite veining assoc. ± narrow lody intervals @ 19.5 & 24 - 24.2m.	19.5m a highly weathered sideritic lode ± large gl rich masses ± sp. 20.0m further gl rich masses assoc. ± sd veins. 24.0 - 24.2m abundant weathered & leached calcitic - siderite lde x-cuts the pale gn Ss ± gl, sp stringers & bands assoc. ± sd.	Core highly brkn & fractured drill & weathering induced not necessarily fault related.			17.4m minor timbers 3.5m of core lost b/w 8.0 - 13.5m. 1.9m of core lost b/w 17.0 - 17.6m 2.2m of core lost b/w 19.5 - 22.5m. 0.5m of core lost b/w 22.5 - 25.5m.	
27.0			gn lh Gw	A highly brkn interval of gn Gw, with only minor weathering. Minor ibd Mst ± Ca, graph. lining many Fractures & surfaces.		Minor 1-2mm Ca vns acting as plains of weakness for fracturing. Ca vns preferentially developed along Mst horizons.		Fracturing dominately drill induced.				
27.8			gn gritty Gw	A relatively competent interval of gn gritty Gw. An immature volcanic Ss ± fd clasts 1-3mm and Mst clasts 2 - 300mm irregularly dispersed through the Ss.		At 31.5m mineralised sd. vn @ 15-20° to CA. with minor fringing Ca vns. Also irregular sd. vns @ 30 & 60° to CA. From 30.5 - 31.5m minor 1-2mm irregular sd. vns at a high & to CA. From 27.8 - 30.5 Ca. vns 1-2mm @ 20-25° to CA.	mineralised sd. vn sub // to 15-20° cuts CA b/w 31.4 - 31.7m ± sp, gl veining ± sd also minor assoc. Ca veining.			At 32.4 - 32.6m narrow Ca infilled jt plane @ 15° to CA ± 2.3cm displacement ± assoc. irregular tension infill Ca. vns ± regular clean 50° to CA x-cutting Ca. vns.	
32.6			brec. Mst/	An intensely calcite veined Mst. breccia. A unit ± large angular to rounded Ss masses with interstitial Mst		Abundant irregular Ca vns, predominately developed ± in bk Mst though in places x-cutting gn Ss. Regular vns x-cut CA @ 35, 50°.	Minor py occurs ± Ca lining fracture faces.	Possibly block fracture, or soft sed def'n to produce breccia appearance. With some tension gash style resealing Ca vns.				
33.3												

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DIAMOND DRILL LOG

121138

PROJECT : _____

PROSPECT: _____

HOLE NO: 7592
PAGE: 2 of
LOGGED: DJN
DATE: 4/8/89

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
33.6			gr Gw	A massive interval of gr lth. Gw ± grains <1mm, fd & Mst grains in gr volcanic mtx.		Ca vns irregularly x-cuts the CA ± some more regular yet wavy 1-2mm vns @ 20, 35, 45° to CA. With <0.5mm very regular vns @ 45-60° to CA often acting as a plain for drill induced fracture.						
34.8												
34.8			gr Gw	A fractured & brkn interval of massive extensively ca veined gr Gw		Ca veining extensive ± numerous irregular vns & blebs x-cutting core. With an early 25° to CA <1mm – 10mm sd.m set, x cut by Ca vns 1-2mm @ 65° to CA which are in turn cut by a set @ 40 to CA Also massive Ca vns 1-3cm @ 80° to CA 38.9 – 39.0m.		Minor fH induced fracturing ± most of the fracturing drill induced or developed along vn faces acting as plains of weakness.			Minor low & fracturing ± minor pug & Ca lining @ 15 to CA @ 35.1 & 36.6m. Much of the fracturing is drill induced.	
39.1												
39.1			gr gritty Gw	A massive gr volcanic Gw ± an immature volcanic mtx ± fd & Mst grains 1-2mm. With larger Mst clasts 2-50mm giving the gritty appearance.		Minor irregular Ca, sd veining subll to CA & @ 40 to CA. Sd vns 1-2mm @ 40 to CA. With narrow <1mm Ca vns @ 45° to CA & @ rt ∠s to each other.						
39.9			bk Mst	An interval of bk Mst ± minor ibd Gw, highly brkn ± progressively less veining downhole.		Sd veining @ 25 to CA a core of Ca veining. Also abundant sd veining irregularly disrupting interval blw 39.8-40.1m Minor Ca vns @ 30° to CA & irregular seeding CA.	Minor py assoc. ± Ca vns from 40.1-40.2 are 1-2mm wide & @ 30° to CA & irregularly x-cutting CA.	Fracturing @ 20° to CA developed along Ca vn surfaces extensive drill induced fracturing & fracturing along vn surfaces.			Possible bedding developed @ 15-17° to CA, ± bedding surfaces somewhat irregular & distorted by slump movement.	
40.4												

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DIAMOND DRILL LOG

121139

PROJECT : _____

PROSPECT: _____

HOLE NO: Z592
PAGE: 3 of
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DATE: 4/8/89

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
40.4 41.4			gn Gw	A gn lh Gw ± irregular bands & clasts of bk Mst.		Ca vns irregular & wavy, ± minor narrow regular Ca vns @ 30+70° to CA. Some sd assoc. ± Ca vns @ 20° to CA. Sd primary vn phase lined vn cavity ± Ca veining internal to it.		A highly fractured interval ± fractures predominately abg vns but also sub ll to low ∠ to CA.				
44.9 41.9			gn Gw	A somewhat brecciated Gw ± Mst dispersed throughout ± Mst lining large fragments.		Minor irregular Ca. ms 1-2 mm infill tension gashes.		At 41.9 a cavity or fracture lined ± Ca ± Py lining Ca surface possibly 25-30 to CA.				
41.9 48.3			bk Mst	An intensely veined & brecciated Mst interval cut by Ca ± sd vns in places brecciated & resealed by Ca. Minor ibd Ss clasts somewhat deformed @ 42.3m. Core more competant & well bedded from 44-45.3m. From 46 - 45.3 ibd Ss more prevelant 2 - 30mm bands minor flt disruptions of 2-3cm along flt plains now sealed by Ca @ 20° to CA ± sed. py assoc. ± Mst.		Ca veining extensive both as tension gash infills, breccia infills & as destinct vns. Vns somewhat wavy & irregular @ 15, 25, 55 to CA, ∠ 0.5 - 10mm. From 42.9 - 45.3m irregular sd vns occur ± Ca vns also major low ∠ 10° to CA broad 4-66mm sd. vn elsewhere minor sd assoc. ± Ca.	Minor py ± in Mst possibly 1° sed Py or introduced ± Ca.					
46.3 46.9			gn Gw	A massive gygn / h. Gw ± flecks of gy bk Mst & Fd grains ∠ 0.5 - 1.5mm. Fractured in places generally brkn along Ca. vn surfaces. Minor intercalated bk Mst horizons of 1-5cm thickness. In places angulas to rounded, often soft sed. deformed Mst clasts occur throughout.		Irregular wavy Ca vns developed @ 45 to CA. More regular 0.5 - 2mm vns @ 75 & 20° to CA. Also wavy thick 2 - 12mm Ca vns @ 80 - 90° to CA @ 45.8 & 45.9m		At 46.2 - 46.3 core highly brkn, predominately drill induced. But some slickenslide surfaced fractures @ low ∠ 20° to CA.				In places graphitic slickenslides the fracture surfaces @ low ∠ to CA @ 42.2m. Also @ 40° to CA @ 42.4m. Bedding 24° to CA as defined by Mst & fine silty bands @ 44.3m. Fracturing generally — drill related though minor low ∠ graph. lined fractures.
											At 45.6m a fracture face ± slickenslide Ca & graph. ± in a Mst band @ 45° to CA. Though not regular Ss / Mst bedding surfaces @ 40 - 45 ⇒ 30 - 35 to CA down hole	

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DIAMOND DRILL LOG

PROJECT : _____

PROSPECT: _____

121140

HOLE NO: Σ 392
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DATE: 6/8/89

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
46.9 – 47.8			gygn Gw ibd gygn bk Mst ibd gygn bk grit	An interval dominated by fg-mg gygn Gw ibd ± lam. gygn-bk Mst ± minor ibd gritty horizons of 1-5cm width. Grit has coarse 1-4mm fd & Mst clasts 2-20mm aligned // to bedding.		Ca vns sub// to // to 30° to CA 1-4mm are disrupted by later vn phases vns @ 0-5 & 45 displace beds by 3-20mm. At 47.3m an irregular vn mass permeates throughout the interval, but also develops @ 20° to CA.	An early sd vn @ 15 to CA is disrupted by 45 to CA Ca.vn which is in turn displaced by narrow 0-5 to CA vn @ 47.2m	Minor displacement along vn surfaces & soft sed. def'n.			At 46.9 the inference is that the grit fines upwards indicating a facing down hole. Bedding @ 13° to CA. At 47.8 bedding in lam. Mst is @ 13° to CA also. In places fine lam. Mst show evidence of soft sed. def'n ± wavy bedding features & cracks & disruptions to lamanae.	
47.8 – 48.7			gygy brec Ss	A somewhat brecciated gyg° - i.e. f.g.-mg. Gw ± an anastamosing network of silty layers b/w irregularly shaped Gw fragments, or in places more silty → Mst like fragments. With the Mst & Slt fragments distorted clasts, ± the influx of interstitial silt a soft sed. def° feature.		Numerous irregularly shaped 2-15mm Ca-vns xcut the CA @ ≈ 25 & 70° to CA & @ 80 to CA.		At 47.8m a possible 5-10cm displacement on a reseated j't @ 10 to CA, has irregular displaced Ca-vns			At 48.1m a reseated fractures? 15° to CA ± abundant brecciation reseated by silt & Ca vns.	
48.7 – 51.1			bk Mst	A bk-gygn Mst ± minor ibd interval, in places graphitic. The interval highly deformed ± the graphitic bk Mst squeezed & contorted & encircling rafts of gygy fd volcanic Ss.		Massive Ca-vn dominated interval from 48.8-48.95m Ca ± brecciated Mst & Ss fragments throughout. Veining roughly 30-40 to CA. At 49.1m Further Ca veining @ 40° to CA ± minutely tension infills of fractures ± in Mst may be plt related reseating. Abundant irregular vn development & 35-40 throughout ± minor pervasion @ 90 to this vn trend infilling tension gashes.	Minor sed. Py & Ca, Py veining @ 48.7m @ 30° to CA. Clasts of sed. py occur ± in the contorted bk Mst.				Abundant highly fractured graphitic interval from 49.1-49.2m. With graphite present throughout the interval. Possible bedding @ 30 to CA as ⇒ by ibd silty Ss & bk Mst @ 50.5-51.1m.	

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DIAMOND DRILL LOG

PROJECT : _____

PROSPECT: _____

121141

HOLE NO: Z592
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DATE: 6/8/89

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
51.1			Ss/Mst breccia	A highly contorted interval of formerly ibd gy gn volcanic slt → & gy bk Mst. Now best described as a breccia. Formerly laminated Mst has been disrupted & squeezed & now interlongning ± the Ss.		Minor irregular & discontinuous Ca vns x-cut fragments @ 10, 35, 50° to CA.					As the Ca doesn't appear to infill the interstices b/w grains suggests dep^n an early soft sed. feature.	
52.7												
52.7			gngy GW	An interval of massive volcanic GW, ± large clasts of deformed bk pyritic Mst @ 53.1m & from 53.2 - 53.4 takes on a brecciated appearance ± gngy slt → Mst fragments dispersed in a sandy volcanic Mtx, ± anastamosing wispy bk slt bands through the		Very minor irregular tension infills of Ca.	Minor sed. Py assoc. ± bk Mst clasts.					
53.4												
53.4			bk carb Mst	An interval dominated by bk contorted graph. Mst ± minor ibd gy gn silty in places bk Mst becomes highly graphitic. From 53.6 - 53.8 highly contorted, brecciated silty GW & bk Mst ± Py clasts. From 53.8m dominately contorted bk Mst ± large gn clasts @ 54.2m.		Ca vns minor anastamosing irregular veinlets @ 20 to CA & 40, 45 to CA. Extensive veining from 53.4 - 53.6 ± bk Mst interval cut by numerous Ca vns & tension infills. With sharp Ca, sd vn developed @ 20° to CA @ the contact b/w gn Ss & bk Mst ± further smaller Ca vns @ 20° to CA.	Sed. Py occurs throughout the bk graph. Mst.	At 53.8m graphite lined Ca vn 11 fracts @ 20 to CA.				
54.8												

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DIAMOND DRILL LOG

PROJECT : _____

PROSPECT: _____

121142

HOLE NO: ZS92
PAGE: 6 of
LOGGED: TDJN
DATE: 6/8/89

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
54.6 55.9			gggy Gw	An interval dominated by gggn Gw, cut in places by irregular bands & distorted brecciated fragments of bk Mst. Evidence of some deformation disrupting original bedding to produce a brecciated texture & wispy bands of silt squeezed into fractures b/w Ss fragments.		Minor irregular tension Ca vn infills & minor 1-2mm vns developed subll to 10° to CA & minor veining @ 45 to CA.						
55.9 57.3			brec Gw/Mst	A highly contorted interval & fragments of Gw & Mst interdispersed to generate a brecciated appearance.		Some tension gash infill Ca vn & Zn areas of bk Mst & fringing & X-cutting Ss frags. Veining highly irregular & apparently tension related, but postdates soft sed. def'n.	Minor Sed. py assoc & bk Mst rich areas from 57.0 – 57.3m.				In places brecciated fragments of Mst & Ss are dispersed as rafts & in Ca vn material.	
57.3 61.3			gg gr Gw ± bd bk Mst.	An interval of ± bd fg. gggn silty volcanic Gw & massive rarely laminated gy bk Mst. Contacts irregular & a degree of soft sed. def'n evident, & a brecciated appearance in places & pods of Gw in Mst & vice-versa. ~~vice-versa~~		Extensive Ca veining rather irregular & narrow 1-2mm regular vns @ 20, 85, 45 to CA. From 60.6 – 61.3 extensive anastomosing Ca vn sets subll to CA.	Abundant clasts or blebs of sed. py occur throughout.				Some tension gash infill by Ca particularly in more silty → Ss bands	

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EXPLORATION DIVISION

DIAMOND DRILL LOG

PROJECT : _____

PROSPECT: _____

121143

HOLE NO: Z892
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DATE: 6/5/89

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
61·3 62·9			gn GW	A ggyn volcanic GW ± fragmental appearance ± some def's & injection of bk slt along fracture plains b/w GW fragments. Also bands & pods of ggyn bk Mst @ 61·6 – 61·9m.		Minor Ca. vns developed @ 20, 40, 45 & 80° to CA 1–10mm ± increase of anastamosing irregular vns from 61·4 – 61·6m.						
62·9 63·4			gngritty GW	A f.g. – m.g. GW ± abundant bk Mst fragments giving a grit like appearance.		Minor Ca vns @ 15, 45, 70° to CA.	Minor sed. py assoc. ± bk Mst fragments.				Possible So defined by alignment of bk Mst fragments @ 15 to CA.	
63·4 64·9			bk Mst : bd ggyn slt	A highly contorted interval of bk Mst & ggyn silty GW. Evidence of slumping & disturbtion producing a fragmented appearance to the interval.		Extensive veining @ 65 to CA 1–2mm ± broad 10–30mm vns @ the base of the interval @ 40° to CA. Throughout the interval a sealed low ∠ 5–10° fracture has minor Ca veining along it, but has acted as a conduit to feed intense 65 to CA veining.	Abundant sed. py throughout more commonly as large blebs ± in silty bs, but also as disem. grains ± in bk Mst fragments.				Minor fracturing along low ∠ un plain.	

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EXPLORATION DIVISION

DIAMOND DRILL LOG

121144

PROJECT : _____

PROSPECT: SEVERN

HOLE NO: ZS92
PAGE: 8 of
LOGGED: DJN
DATE: 6/8/89

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
64·4			gybk Mst ibd gygn Slt	An interval dominated by finely laminated by bk Mst and gy gn Slt. From 64·4 – 64·5m gn lh Cw dominates prior to downhole progression to f.g. sedn		Within the Cw narrow vns developed @ 40° C a broad 60mm vn @ a high ∠ to those developed @ 40° to CA. Downhole 2–4mm vns @ 35° to CA & narrow vns @ high ∠ to those @ 55°.	Mar sed. Py lamanae assoc. ⊂ f.g. sed.				So A's downhole 35→25° to CA.	
64·8												
64·8			gygn lh Cw	A highly contorted gygn lh Cw interval ⊂ clasts & wispy bands of gybk Mst. Some fragmentation of Cw ⊂ the injection of gybk Slt into the interstices b/w Cw fragments. Cw f.g. mng. ⊂ Co & 1–5mm flattened Mst clasts.		Mar fission infill vns, ⊂ < 1mm Cc. vn @ 45° + 2–5mm vn @ 65° to CA @ 64·9m.						
65·25												
65·25			gygn lh Cw ibd gygn Mst	A contorted interval dominated by gygn lh Cw ⊂ ibd gygn-bk Mst, in places contorted & fragmented. Often ⊂ bk Mst clasts ⊂ in Cw rich bands. Downhole progress more so to broadly ibd Cw & bk Mst often ⊂ more massive Cw intervals ⊂ mnr Cw & Slt horizons ⊂ in Mst bands. From 67·9 – 68·5m more contorted Cw & bk Mst.		Vning generally irregular, but some regular vns @ 35° 1–2mm & 70° < 1mm. Vning more intense downhole from 66·1m Cc vns 25, 30, 35° to CA, 1–3mm ⊂ mnr vning @ 60° to CA ⊂ Cc pug lining fractures @ low ∠ to CA.	lamanae downhole @ 30° to CA ⇒ So. From 66·3 – 66·9 possible Flt interval ⊂ core somewhat fragmented & Cc vning somewhat puggy fracture lining.	→			There is a semblance of fol'n ⇒ possible So @ 35° to CA low ∠ fractures @ 5–10° to CA developed from 66·1m – 66·5m ⊂ Cc pug along it. At 67·5 vugh ⊂ a lining of Cc X'ls.	
68·5												

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DIAMOND DRILL LOG

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121145

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
68.5			gn GBW	An ~f gygn feldspathic volcanic GBW ± minor Mst flecking. Cut by extensive Cc veining. Minor ok silt occurs along fragment surfaces. Vein lines contact ± downhole Mst @ 15° to CA.		Veining intense from 68.5-69.3m ± extensive vein recoating fractures with broad veins @ 20 + 85° to CA. U.V. fewer veins downhole but ± destruct vein set @ 55° to CA 1-5mm.						
69.3												
70.0			gybk Mst; bd gygn GBW	An interval dominated by massive to rarely laminated gybk Mst, ± narrow gygn GBW bands. In places GBW beds highly irregular + contorted indicating slump movement during soft sed. deform^n		Minor Cc veining ± 1-2mm veins @ 55°, 45, 15 + 65° to CA.	Minor wispy Cpy veinlets developed subparallel to So?				Possible So @ 15° to CA defined by Cc + Mst	
70a			gritty gn GBW	An interval of gygn GBW flecked by recemented elongate - ovoid bk Mst clasts, these define a possible weak foliation @ 25° to CA?		Minor < 1mm veins @ 510, 65° to CA.	Minor Py, Cc vein min at 70.3m.				? Fracture @ 70.3m filled by Sil-sericite ± Cc @ 45° to CA + vein @ 25° to CA.	
70.4			gygn GBW	Massive gygn volcanic GBW ± Mst grains minor @ & generally less than 1mm across but range to 2mm. ± Fol @ 60-65° to CA. From 71.0-71.2m ± Mst		Broad 5-15mm Cc veins @ 69-70° + 12 ± minor veins @ 2m @ 30-35°. Minor irregular veining subparallel to CA.	Minor Py, Cc veining @ 15° to CA ± 70.4m.					
71.6												

± 20° + 70.9m.

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
71.4 - 71.6			siderite bde	Core highly brkn by drilling ± some fragments of gn GW matrix so it's what is dominately an interval of fragmented & oxidised siderite.	71.4 - 71.6 feldspathic pulled from natural in hole.	An interval dominated by siderite.	Extensive gl, ss veining of the siderite bde.				May have been a cavity across the veining causing brittle fracture & fragmentation. Possible S-rock of core lost.	
71.6-73.5			brec. ggy GW	An interval dominated by gy gn GW ± somewhat contorted gy blk Mst fragments throughout ± minor wispy blk silty Mst injected along fracture planes b/w gn GW fragments.		Minor 1-2mm siderite vns @ 0-5° to CA. With irregular Ca blebs or tension infills disposed throughout with vein vns of Ca @ 20 & 35° to CA.	Minor Ca. py vns ± blk Mst fragments.					
73.5-75.7			ggy GW	Massive ggy GW ± odd mm stylolite like blk silt injection along fracture boundaries also odd blk Mst clast. Intense veining irregularly xcuts the material		Numerous isolated blebs or tension infills of Ca. With narrow 1-2mm veins @ 20, 30, 35° to CA. with possible mm clear siderite? vns @ 0-5° to CA.						
75.7-76.5			gy gn GW	A gy gn GW interval ± large clasts or possibly ibd gy blk Mst horizons. 75.8-76.0 & 76.1m narrow blk Mst beds or pods occur ± highly irregular contacts to enclosing GW. ⇒ some soft sed deformation. Only minor isolated blk Mst fragments occur in the base of the interval.		Numerous tension vns irregular xcut the base of the interval from 76.2-76.5m. Minor regular vns @ 15 & 45° to CA.	minor wispy Py±Ca veins penetrate the blk mst 758m - 760m & 76.4m.					

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
76.5			grggGW	A massive grgg GW, somewhat gritty appearance ∑ small 1-3mm Mst clasts dispersed throughout along ∑ <1mm fd. Minor breccia reseal by Ca from 76.6-76.8m. From 77-77.2m wispy bands of bk silty Mst occurs @ 15-20° to CA ⇒ So.		Ca veining 15-20° to CA ∑ same fracture reseals producing a somewhat brecciated look to the interval. Also minor irregular discontinuous xcutting 1-2m ca vns.					
77.2												
79.2			gr gg tec GW	An interval of massive gggr GW, ∑ minor intercalated gg bk silty GW forming discrete pods bands + fragments. Downhole the interval becomes progressively more brecciated in appearance ∑ angular fragments of Sr + silty GW (minor) as rafts ∑ in a reseating fabric of irregular ca vns.		Minor vn direction developed subparallel to CA, but generally veins irregular ∴ ca reseals fractures b/w fragments. ~~At 78.9-79.1m a~~				At 78.9-79.1m F.g. gggr So infills the intersection b/w Angular gg bk silty fragments.	
80.2			grggGW	A massive grgg GW ∑ flecking of Fd & gg bk Mst fragments (<1mm). Minor wispy bands + clasts of gg bk Mst occur sporadically.		Minor Ca vns occur as discontinuous blebs reseating fractures. Minor Ca veining @ 15, 25, 40° to CA.						
80.3												
82.2			grggGW with gg bk Mst.	An interval dominated by gggr GW ∑ irregular clasts + bands of contorted gg bk Mst. The disrupted nature of the Mst intervals ⇒ a degree of soft sed deformation		Veining irregular discontinuous tension All sizes ∑ Minor veining developed ∠ 35° to CA.	Minor Py assoc ∑ Ca vns ∑ in bk Mst intervals.				At 80.6m a cavity ∑ well developed Ca xls infills a fracture surface ∑ can also see fractures @ 35° to CA.	

TD

60, 34, 54, 13, 45, 56, 79, 38, 54

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DIAMOND DRILL LOG

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG TRACE	REMARKS	DEPTH
82·2 – 89·2			gyg-gbw ± gybk Mst	An interval dominated by gyg volcanic gbw ± ibl gybk Mst. (Ss : Mst = 10:1)	From 88·6 – 89·2 veining more intense than previous interval, ± broad 1–4mm irregular mass siderite ± chlorite veinlets.	Minor irregular blebs occur throughout, especially tension gashes. Minor regular veins @ 10°, 40, 50° to cA. 1–2mm, dispersed throughout		Minor fractures along ca vns.			From 82·8 – 83·5m a recemented fracture w.r. plt displacement ± 8–10cm displacement occurs. From minor banding (laminations) ein gybk Mst ⇒ So = 30–35° to cA.	
89·2 – 89·5			gybk Mst	An interval dominated by gybk Mst, ± some laminations due to the previous gyg silty gbw ⇒ So @ 25° to cA. Dk Mst has graph rich areas.		Ca veining irregular ± some assoc brecciation of Mst into rafts ± in ca vns, ± minor regular vns @ 45 & 70° to cA.					Fracturing @ 20° to cA along a Ca vn plane & highly graphitic blebs/bands in Mst.	
89·5 – 90·3			gyg gbw	Massive gn gy gbw ⇒ pale yellow gn down hole as intensity of siderite veining increases.		Ca veining minor and more regular @ 65° to cA & past data intense irregular Siderite veining. Siderite vns irregular x cut core axis @ low dip to sub ll to cA.	Minor gl sp assoc ± siderite vns from 90·2 – 90·3m.				Interval highly fractured by drilling with a plane of weakness @ 65° to cA. Some slickensiding on Ca vn surfaces.	
90·3 – 92·8			Siderite lode	Siderite lode dominates the interval, though minor selvedges of ss ± gybk Mst occur sporadically throughout. From 91·6 – 92/m an interval of gyg gbw is well developed ± minor irregular siderite veining ± low dip to cA fracturing ± some ankerite Siderite Ca deviation	At 92/m gyg fracture surface ± contact to siderite lode down hole. From 92·1 – 2·8m stylolite like bumps x cut the siderite lode ± accompanying vns of gl ± sp.	Minor gl, sp min @ 91·5m. Throughout intense sp ± less gl vns & blebs occur throughout the Siderite mass. The gl, sp min commonly as irregular Stylolitic 'lines' veins.	D – [illegible] – 91·4m [illegible] occurs. From 91·2 – 91·4m ± some ? gyg min occurs.				The gyg ss 91·6 – 92·1m intensely fractured, ± much of the fracturing induced by drilling.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
92.8 – 94.6			gn GSW → siderite lode	An interval dominated by pale ylgn volcanic GSW ± minor bands of gygbk Mst. Intense siderite veining throughout.		Siderite vns generally irregular & commonly discontinuous & isolated blebs or tension gashes. A major broad 1-3m siderite vn @ 50° to CA from 94.6 – 93.7m.	gl, py ± sp vns associated with broad siderite vn from 93.7 – 94.6m. Min'n as blebs & discontinuous veinlets.	Some bedding ± assoc. fracturing @ 0–5° to CA.			Banding of gygbk Mst 93.4 – 93.6m @ 25° to CA ± bands disrupted by displacement ± offset along siderite vns @ 40° to CA.	
94.6 – 95.0			Siderite lode	An interval dominated by siderite lode ± minor blebs & short <2cm veinlets of gl ± sp. Minor selvedges of gygbk Mst occur through the lode, along ± lesser GSW, the latter prevalent from 94.9 – 95m.			A 94.8 Py, Ga vn developed. X cuts siderite lode. Some assoc. dissolution ± Ca, Py vn.	Fracture @ 55° to CA @ 90° ± assoc. fracturing. A graphitic shear fracture at 94.9m to Ca, Py vn.				
95.0 – 95.9			gn GSW	A pale ylgn → gygn GSW cut in places by gygbk graphitic Mst bands. Mst highly contorted & interfingers ± GSW ⇒ some soft sed deformation.		Over the interval vns become less Fe rich ± trend from siderite → Ca. Veining rather haphazard or as tension infills ± some regular veining @ 20 & 35° to CA.	Irregular & sporadically disposed & often discontinuous Ga vns occur at 55° & two sets @ 30° to CA occur throughout along ± irregular discontinuous blebs				2 high degree of deformed fracture, ± some fracturing @ 40° to CA along graphitic or pyritised fracture planes.	
95.9 – 96.8			gn GSW	Massive gygn GSW ± some evidence of soft sed. fragmentation & injection of bk S/t into fragment interstices. Minor rafts of bk Mst do occur in GSW				Core fractured & broken from 95.9 – 96.8m with irregular planes ± some @ 35° to CA			Siliceous/calcite fracture fillings @ 45 & 70° to CA in 96.6 & 96.7m.	

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121150

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
96.8 – 98.5			gybkMst	An interval of dark gybk graphitic Mst ± pods, minor laminae & discontinuous beds of gygr Gw. In places the interval is highly contorted ± fragments of interbedded Ss & Mst, the Ss often have fragmented texture ± intrastratal slt.		Ca veining generally irregular discontinuous veinlets ± more regular ones @ 50° to CA & 40°. At 98m cavity lined ± xline Ca & pyg, fracture low to CA.	Minor Py pods to veinlets assoc. ± bk Mst.				Fracturing along graphitic plains or ca vn surfaces at 45 & 70° to CA. Possible Ss @ 35° to CA	
98.5 – 101.0			gygr Gw	Massive gygr Gw ± minor clasts of gybk Mst. In places blk slt infills fractures blw fragments generally a brecciated look following soft sed deform'n. From 99.0–99.5 has a dykey brecciated look, similarly Ca veining most intense over this interval.		Ca veining generally irregular ± intense tension infill veinlets throughout but esp 99–99.2m, with rarer closer regular ones @ 15, 20, 35° to CA.	Minor graph, ca veining.					
101 – 104.0			gygr Gw. bd gybk Mst	An interval ibd massive gygr Gw ± massive to poorly laminated gybk Mst. In places isolated fragments of Mst as clasts in gygr Ss. (Ss : Mst = 3:2) Mst Beds 2–3 & 10, 20–50cm ± finer scale < 3mm silty laminae in Mst intervals.		Ca veining not intense, but is persistent throughout as irregular wavy veinlets, tension infills & as low ∠ 0–5° veins & veins @ 20 & 35° to CA.					Silty → sandy laminae in Mst ⇒ So 30–35° to CA. Minor dislocations along vein sets @ 20 & 80° to CA.	

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121151

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
104.0 – 106.5			bk Mst : bd gygy Slt	An interval dominated by massive bk Mst ± minor bands & laminae of gygy Slt, & very minor Sst.		Cc veining sporadic discontinuous narrow < 2mm veinlets. @ 10, 15, 30, 55, 60° to CA.	Minor blebs 2-5mm of sed. Py occur in bk Mst intervals				Well developed Sc laminae @ 25° to CA.	
106.5 – 107.7			brec. bk Mst	A highly contorted & brec bk Mst. often ± gygy Slt infilling the interstices b/w angular Mst fragments, in turn Cc infills fractures b/w grains. Elsewhere bk graphitic mud infills & outlines fragments of bk Mst.		Cc veining highly irregular predominantly rescaly fractures. Also as vns @ 30 & 45° to CA.					Some graphite & calcareous rescaled fractures @ 50 & 70° to CA.	
107.7 – 109.9			bk Mst : bd gygy Slt.	An interval dominated by bk Mst ± bd gygy Slt & minor grit bands ± pd & 2-3mm Mst clasts, in places Mst/Slt are highly contorted ± the units interfingering & even somewhat brecciated in appearance esp from 109.4 - 109.9m.		Very minor Cc veining ± odd short veinlets infilling & rescaling tension gashes, ± minor vein development @ 60° to CA.					Slt-Mst laminae => 50 50° => 15° to CA in this interval	
109.9 – 110.4			gygy Slt	A v.f-g Sst to gygy Slt ± minor 2 - 4mm bk Mst clasts		Progressively less Cc veining downhole ± irregular veins & veinlets infilling tension gashes, ± some subvertical vns @ 35° to CA						

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
110.4 – 111.7			gy GW	A contorted interval of gy GW ± gy gr slt & bk Mst aubs & clasts interlayering ± it. The Mst selvedges have overall angular appearance do have subrounded corners. In places So ⇒ Slt cg 111.0m.		Ca veining minor, predominately as discontinuous tension infills ± in Mst clasts, also as irregular wavy X-cutting veins. Minor regular vn development @ 25 ± 45° to CA.		Graphite lined fracture @ 111.0m ± an intense ca sl bc to white lined fracture @ 104.5m.			In places Ca veining now brecciated bk Mst host incorporating Selvedges of Mst. Fine laminae in Mst @ 111.0 m ⇒ 50 parallel @ 40° to CA.	
111.7 – 113.4			bk Mst ± bd gy GW	An intensely Ca veined & somewhat brecciated in appearance, contorted interval of ibd to interlayering bk Mst & gy GW.		In these Ca veining infilling tension gashes 75, 50, 60° to CA but also irregularly developed @ an array of ds to generate complex vn ourpint. Early narrow <0.5cm ins @ 60° are overprinted by shallower dipping later tension infill X-cutting vns. Thick blebby ± discontinuous 1–3cm wide also occur @ 30 ± 40° to CA.		Minor graph lined fracture @ 30–35° to CA.			Evidence of some possible laminae ± in the bk Mst @ 25° to CA @ 113.3m	
113.4 – 116.0			gy ok Gr ± ok Mst	Interval of ± bd. gy ok fd GW ± ok Mst ± minor gy Slt laminae. Bedding surfaces commonly ...		Ca veining sparse, ± sporadic directions dips infilling tension cracks ± minor wispy veinlets @ <5 & 90° to CA.		Minor sl bedding graphitic fracture @ 55° to CA				

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121153

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
				In places Mst & GW interbedded. Mst also occurs as discrete clasts or selvedges in more sandy beds.		Intense Ca veining towards the base of the interval with numerous irregular vns developed sub ∥ to low ∠ to CA. vein c̄ slight siderite (Fe rich) margin.						
116.0- 116.5			bk Mst	An interval of bk Mst c̄ clasts subangular to rounded gy gn GW along c̄ minor wispy laminae of slt. In places minor brec. by infilling Ca vns producing selvedges of Mst.		Veining minor somewhat siderite or Fe rich Ca vns at low ∠ to CA, c̄ irregular blebs & veinlets dispersed sporadically throughout.					laminae ⇒ foliation @ 20° to CA.	
116.5 -117.1			brec. GW	A highly contorted interval brecciated gritty Mst ibd c̄ fragmental GW. gy SLT c̄ bk Mst & gy gn Ss clasts dispersed throughout to produce grit-breccia appearance. Downhole → gn Co. volcanic GW. c̄ bk Mst clasts sporadically dispersed & fragmented appearance c̄ bk slt infilling the interstices.		Broad Ca vns @ 40° to CA c̄ parallelling discontinuous Ca blebs in similar alignment. Minor [illegible] infilling short veinlets haphazardly [illegible] in bk Mst.						
117.1-118.0			gy bk Slt	An interval of gy bk Slt c̄ a brecciated [illegible] c̄ [illegible] wispy bk [illegible] [illegible] fragments		Ca veins sporadic again [illegible] infills [illegible], c̄ only minor veinlets [illegible] 40° to CA						

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
1180 – 1220			bk Mst / bd gg Gw	An interval of finely bedded (1–5cm beds) bk Mst ± gg Gw → gg Mst Gw grit. In places gy gn SH layers occur, these are brecciated by soft sed defn in places. Bedding surfaces are contorted ± some interfingering & disturbance through soft sed defn & compression ± sedimentation. From 121.5–122.0m becomes highly contorted, possibly from slumping ± Mst/Slt/Sh also interfingering in a contorted mass.		Minor bleby & short veinlets occur sporadically, more commonly as lenses infills ± in bk Mst. With some more regular veining @ 35 40 & 65° to CA. In places Ca vns → siderite with some siderite ± Ca @ 1140m.	Minor Py assoc ± Ca vn @ 1180.5m.				Minor laminae @ 27° to CA @1205m.	
1220 – 1228			bk Mst	From 122–1224.5 massive bk Mst ± wispy laminae & irregular pods of fg sed. py @ 45° to CA. From 122.45–122.8 highly contorted possibly slump deformation of bk Mst, intensely Ca veined ± numerous discontinuous pods & short irregular veinlets throughout, along ± irregular shaped pods of sed py.		Minor Ca veining @ 35–45° to CA from 122–122.45 ± odd irregular discontinuous veinlet oblique to these.	abundant sed py ± in bk Mst.				Becomes fractured 122.55–122.8m ± low 20° CA fracturing developed along graphitic planes.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
122.8 -123.7			bk mica Mst	A mixed interval gy slt & gy gn GW & brec. bk Mst. From 122.8 - 122.85 gy slt ± minor selvedges of bk Mst passes into gy gn GW from 122.85 - 122.9m From 122.9 - 123.2m a brecciated bk ± Mst ± Ca ± py vein resealing block fractures. From 123.2 - 123.7m contorted bk Mst ± gy slt ± gy slt becomes somewhat brecciated ± Ca resealing fractures From 123.5 - 123.7m gy Co GW gives way to gy slt ± bk Mst selvedges.		Silica veining ± some carbies ± x'l development @ 50° to CA @ 122.9m ± Si veins throughout from 122.8 - 122.9m From 122.9 - 123.7m irregular short Ca ± py vns seal fractures b/w blocks of Mst. Elsewhere short discontinuous Ca vns infill torsion gashes throughout	Minor fg assoc ± Ca vns.	Poss. bkle block fracture of bk Mst from 122.9 - 123.1m ± cavity at 50° to CA lined ± Qtz x'ls		Though rather irregular contacts => So @ 35° to CA. Degree of interfingering & discontinuity of contacts.	
123.7 -124.0			gy gritty GW	An interval gy GW somewhat gritty in appearance ± flecks of bk Mst ± Co., odd bk Mst clasts. A 5cm Silty band occurs from 123.7 - 123.75m		Sheet Minor ± Ca veining irregularly disposed through the silt ± minor wavy ca vns through the grit ± minor torsion infills.					Pt 123.7 @ & 123.75 graphitic lined fractures ± stockwork @ 30° to CA. Contact b/w silt & grit @ 35° to CA.	
124.0 -124.6			gy bk Mst	An interval dom intra by gy [illegible] ± minor ca gy Co. GW. The GW consists [illegible] throughout along ± clasts of [illegible] GW [illegible] 124.1m, brecciated appearance.		Ca [illegible] @ 152037 [illegible] to 2 ± vns 1 - 4mm vns irregular ± [illegible]	Minor fg, py vn mineral".	Minor bk Mst [illegible] -> So @ 45° to CA			Fracture @ [illegible]	37

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
				At 124.2m the Mst band is rather irregular & contorted boundaries following soft sed deformat^{n}. 124 – 124.1 bk Mst 124.1 – 124.2 gybk Sr 124.2 – 124.35 gygn Mst 124.35 – 124.55 ggn Slt → Sv 124.55 – 124.6 gy bk Sv → grit.							Contact @ 124.35 @ 30° to CA.	
124.6 – 125.1			bk Mst	massive. A bk Mst somewhat contorted & irregular mm silty masses randomly dispersed, with minor sandy bands.		Ca vns. @ 15-20° are irregular & vary 0.5 – 10mm. with a ca vn @ 55° to CA ∥ grapl lined fracture. Some torsion grad infilled Ca vns.					At 124.8m min fracturing along vn @ 25° to CA & some graph lining Ca vn.	
125.1 – 126.1			bk Mst ibd gy Slt	Downhole there is an progression from ibd gybk Mst & gy Slt towards a brecciated Slt & f.g. bk Mst infilling fracture planes.		At 125.7m broad brittle mass of Ca. & only minor torsion infill veins/lets elsewhere.					Slt/Mst laminae ⊥ to foliation (Sa) @ 30° to CA. Though bedding contacts somewhat irregular & a degree of interlonguing of beds & squeezing to produce small scale fractures.	
126.1 – 128.7			gy Slt → bk Mst ibd gy Sv	A sequence of ibd bk Mst & gybk Sv & minor gy Slt & gn Sv (Ss : Mst = 1:1). 126.1 – 126.25 gy fel Sv & minor discontinuous & contorted bk Mst bands → gn Sv. 126.25 – 126.35 gygn Slt. Then 126.35 – 127.05 bk Mst & minor wispy Slt beds & gn bands. 127.05 – 127.65 as Sv minor Mst flecks & clasts.								

PROJECT : _____

PROSPECT: SEVEN

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EXPLORATION DIVISION
DIAMOND DRILL LOG

121157

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DATE: 7/8/85

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
				From 128·65-128·7m a sequence of thl gySlt & bk Mst ± very minor Co. Cm. 128·2-128·7 gn Ss ± bk Mst bnd 128·65-128·75m.		Minor Ca vns @ 30, 35 & 100 to CA 1-2mm.	Py lagar @ 127·5m. Minor Py assoc ± Ca vns @ 127·7m.				bk Mst beds show evidence of slumping ± minor slip along bedding planes, also block fracturing & ltd. compaction.	
128·7 – 129·1			bkMs : thl gy Ca	A highly contorted interval ± irregularly shaped. Mst clasts & wispy bands in places brecciated ± Ca vns resealing fractures. Downhole → dk graphitic Mst ± only very minor thl Ca vns.		Minor Py qtz veining @ 128·65m as irregularly shaped blebs. with minor qtz siderite vns @ 45 & 80° to CA	Minor Py blebs & veinlets					
129·1 – 129·7			Siderite lode	An interval of siderite lode developed in a gy bk Mst, ± the Mst in places highly brecciated ± siderite sealing fractures b/w fragments.		Minor Siderite vns @ 40, 45, 60° to CA	Minor blebs of sp, ± assocg rodd py bleb. ± siderite breccia bk Mst from 29·1-129·2m. ± massive siderite from 129·2-129·6m with Ss / siderite breccia @ 129·7m.				Minor silty laminae @ 30° to CA.	
129·7 – 130·3			gy Ca bk Mst	Interbedded gy Pd Ca Mst flecks ± occasional large Mst clasts, ± bands of dk Mst ± some thl narrow often wispy discontinuous Slty bands.		Minor siderite veining irregularly x-cutting in usual ± some alignment @ 35° to CA. with vns [illegible] calcite 0·3-1·5mm vns irregularly x-cutting & sporadic intervals.	Minor Ca, Py ± mag.				Poorly developed silty / Mst laminations @ 40° to CA.	

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DIAMOND DRILL LOG

PROJECT : _____

PROSPECT: SEVERN

121158

HOLE NO: ZS97
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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
130 – 134	3 6		~~gybk Mst~~ gybk Mst	Dominantly a massive bk Mst interval ± minor gy silt lamanae, or wispy contorted interlonguing somewhat deformed Slt→Gw horizons. In places intermixing of slumping of Gw's & Mst is evident.		Cc veining @ 15° 25, 37, 50° to CA ± vns 0.5–2mm. At 130.4m a Ca, siderite vn 2–3cm xcuts @ 40° to CA. Blebs & irregular seinlets of Cc In places siderite assoc. ± Ca blebs. Veins commonly discontinuous, ± veins sealing fractures.	At 131.4m a 1–3cm Sed py horizon xcuts @ 27° to CA & @ 131.6m @ 40° to CA. Minor blebs of sed py occur throughout. Minor Ca, qtz py veining @ 134.5m @ 20° to CA.				Minor lamanae @ 30° to CA ± silty layers in bk Mst.	
134.6 – 135.35			gy Slt/bd gy Gw	An interval ± gybk Mst beds ± minor gy slt lamae ibd ± gy fd Gw ± minor Mst flecks. Downhole bk Mst highly contorted & wispy Cc Gw blebs irregularly dispersed. Gw/Mst contacts rather discordant ± slump movement & some interlonguing. Also minor small scale Flt fracture displacements in places resealed by Cc. vns.		Minor irregular wavy discontinuous Cc vns, ± more regular 1–2 cm veins @ 20–30°, 40° to CA.					Slt lamanae in Mst @ 30° to CA.	
135.35 – 136.5			gybk Mst. ibd gy Gw	An intensely siderite/calcite veined gybk Mst ± lesser ibd gy Gw masses in places bedding contacts highly distorted by slumping ± pinch & swell owing sed. compaction.		Siderite veining is intense, ± numerous short irregular veinlets dominantly throughout the interval, ± large blebs or masses in places. Some fracturing to the veins @ 30° to CA. Minor xcutting Cc veins @ 40° to CA.	Possibly very minor sp + lesser qtz blebs assoc. ± some of the larger siderite masses.	At 135.65m core fractured & broken ± a mass siderite veins graphitic Mst ± some pug. with some fracturing along graphitic planes.			Lamanae of slt/sed @ 136.2 in Cc @ 40° to CA. Some fracturing along vein plains, also minor gravity controlled fault fracture @ 35° to CA @ 136.4m.	

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DIAMOND DRILL LOG

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PROSPECT: SEVERN.

121159

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
136	5		gg S/t → gy GW.	An intensely ± quartz veined interval of gg S/t ± minor more fg. gn sandy areas. The gy S/t flecked by very fine Mst ± fine Mst infilling fractures. At 136.8m gn v.fg GW in places brecciated ± bk Mst infilling fractures. From 137.7-137.8m qtz/Ca veins are irregular blebs & tension infills. From 138.0-139.1m the S/t → gy GW flecked by bk Mst & 1-2mm pd.	Some calcite veining assoc. ± quartz from 137.8m - 139.1m: with Ca more prevalent than qtz down hole. Broad wavy irregular Ca/qtz vns @ 20 & 30° to CA over last 1m.	qtz vns @ 35°-45°-60° to CA ± qtz.sd vns @ 30° to CA. with qtz.sd vns cut by wkq vns. Vein ± generally increases from 30 - 60° down-hole, ± veins generally more intense but narrower.					Some graphite - gy lined fractures @ 20° to CA, ± a degree of ancing to produce rock spall, fracture from 136.8 - 137.3m. P 564110 138.8m	
139.1 - 140.8			gy gn GW lbd bk Mst	An interval of highly contorted gy gn GW + gy bk Mst. Bedding plains highly disrupted by slumping ± beds squeezed & interfingering ± brecciation of beds. Some fracture displacement subparallel to CA, ± fractures prior to complete consolidation of the beds, ± displacements of 1-2cm. With So beds 0.5 - 15cm.		Irregular Ca veinlets, blebs & tension gash infills throughout ± minor veining @ 15° to CA with veining more intensely developed in Mst.				Possible bedding laminations @ 40° to CA.	
140.8 - 141.75			gn GW	gy GW dominates but has a highly brecciated appearance ± bk Mst infilling fractures b/w black fractured GW. Minor Mst clast accn throughout So								

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DIAMOND DRILL LOG

PROJECT : _____

PROSPECT: SEVERN

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121160

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
				From 140.8-140.9 Mst clasts more prevelant enclosed in sandy matrix ± bk Mst flecks along ± fol in Gw. matrix. Similarly from 141.6-141.7 brecciated Gw gives way to lbd Mst/Gw ± Mst highly distorted.		Minor qtz veining @ 25 ± Cc veinlets randomly disposed as veinlets & blebs ± veins @ 30, 40° to CA.					Brecciation result of soft sed deformation.	
141.95 - 142.65			gy Slt lbd bk Mst	A contorted interval of lbd bk Mst + gy gn Slt ± Mst/Slt interlonguing, ± pinch & swell of beds & in places a brecciated appearance & raft of Mst in Slt & vice-a-versa.		Minor irregular veinlets & blebs xcut & parallel laminae.	Minor Ca/py veining occurs sporadically				A crude laminate could be implied @ 35-50° to CA.	
142.65 - 143.3			gn Gw. ods bk Mst	Another contorted interval of lbd ggn Gw & bk Mst. In places bk fel Slt also occurs. Bedding contacts highly irregular often ± clasts of Gw dispersed in Mst & vice-a-versa. Beds often discontinuous & exhibit pinch & swell.		Cc vns infill tension gashes, but also develop as irregular veins in places discontinuous 0.5-3mm vns. Veins @ 20, 30, 45° to CA.					At 142.85m possible fining in the Slt indicates a younging uphole!	
144.3 - 145.1			gy Mst lbd ggn lt Gw.	An interval of gy bk Mst → Slt lbd ± fgggn Slt/lty Gw lbd. Mst/Slt dominate towards the base of the interval.							Laminae @ 55° to CA towards the base of the interval.	

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DIAMOND DRILL LOG

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PROSPECT: Seward

121161

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
				From 144.5 - 144.7 tends to ggg Gw ± a brec. appearance ± blk Slt infiltrating along fractures b/w fragments of Sc. Mst + Slt tend to be highly contorted ± fragments of gg Mst as selvedges ± in sandy matrix. or Mst. laminae interlayering ± gg Slt.		Ca uns irregular commonly discontinuous resealing fractures or as veins, in places produce a sealed breccia ± in Mst, ± Mst selvedges ocbur by Ca.					Again ↓ grade of destruction of bedding laminae is result of soft sed. deformation.	
145.1 - 147.0			blk Mst	An extremely contorted to brecciated graphitic blk Mst ± minor areas of Ca Gw ± selvedges of gg blk Mst. Though intensely disrupted by short irregular Ca uns the lo bedding is highly distorted by slumping. In places Ca uns so intense as to produce brecciated Mst.		Siderite uns 15° to subparallel to CA, calcareous Ca uns. with short irregular Ca uns @ 80° to CA. With numerous short irregular Ca veinlets filling tensile gashes					Minor slump fractures from consolidation or water loss impact effects bedding. Minor fracturing post-dates phase of mineralisation very minor effects on small scale Ca uns - with silicate uns post dating Ca fractures 146.3 - 146.45m: with a prominent Ca lined fracture @ 30° to CA	

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DIAMOND DRILL LOG

121162

PROJECT : _____

PROSPECT: SEVARN

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DATE: 8/8

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
147.0 – 148.65			bk Mst	An interval dominated by bk Mst ± minor ibd gy Slt ± gygr Ss. In places minor gygr Ss 147–147.05. 148.4m. Slt/Mst bedding contacts are irregular & interlayering of laminae, & breciated & selvedges of Ss, Slt isolated in Mst & vice-a-versa		Irregular Cc veins & short veinlets in fill tension gashes & more regular Ca ± siderite vns @ 15° to CA.					Possible bedding @ 20° to CA as defined by Mst/Ss contacts.	
148.65 – 149.7			gygr ibd bk Mst	A highly contorted interval of ibd gygr GW and bk Mst, ± some fragmentals of the GW in places ± bk Mst injected into fractures. (GW: Mst = 3:1)		Siderite veins ± Ca @ 75–20° to CA ± 1–25mm occur sporadically throughout minor tension infills of blebs of siderite & Ca occur	→ Ca veining a later phase than siderite.				A semblance of foliation @ 75° to CA.	
149.7 – 152.7			bk Mst : ibd gygr GW	(GW: Mst = 1:2) An interval dominated by generally massive bk Mst beds, in places ± minor Slt → GW bands, or in places where soft sed deformation more extensive, some bed disturbance & interlayering. Gygr GW Co ± Mst flecks, in places ± selvedges of Mst or ± wispy disturbed Mst bands.		From 149.9 – 150.9m 1–5mm siderite ± Ca vns @ 10° to CA occur. Downhole veining predominately calcite ± 1–2mm veins @ 10, 25° to CA. Progressively less veining downhole & minor tension gash infills by Ca.	Some minor py assoc. ± Ca vns. Minor blebs of py @ 152.6m assoc ± Ca & Mst.				Possible bedding @ 25 to 55° to CA, but steeply may cause distortions to bedding relationships	

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DIAMOND DRILL LOG

PROJECT : _____

PROSPECT: SEVERN

121163

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DATE: 8/8/87

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
152.7 – 153.8			bk Mst	A generally massive bk Mst ± minor blebs & angular fragments of gy slt irregularly dispersed throughout		Minor Cc vns @ 35 + 55° + an irregularly dispersed blebs & tension infills.	152.8 a Cc, siderite vn has minor assoc glisp ± Vns @ 75° to CA with Sc Py vn or band in Mst @ 45° to CA @ 152.9m.				153.8m a piggy graphite lined fracture at 30° to CA.	
153.8 – 155.2			ggg GW-bld bk Mst	A highly contorted interval of gy gn volcanic GW rbl gybk Slt & bk Mst. Distinctive ext ± a blocky appearance ± clasts of GW enclosed in mud + selvedges of mud & fd Slt enclosed by gy gn GW.		Irregular qz, Cc vns infill torsional gashes or as minor vns @ 25 + 40° to CA.					At 155.05 a graphitic slickensided fract fracture @ 45° to CA. From 154 – 154.3m core bk ± graphite fracture @ 40° to CA + irregular possibly drilling induced fractures.	
155.2 – 155.9			gy bk Mst bxc.	An intensely brecciated Mst ± minor selvedges of gy slt & minor GW. With intense Cc veining giving the interval a brecciated look enhancing the to highly contorted appearance as a result of sed dep'n.		Cc veining intense generating a massive infilling fracture partic with ± minor massive gy slt + Mst. ± Vns less abundant in highly contorted GW/Slt/Mst but generally retaining any preferred [illegible] 25 siderite [illegible] veins @ 35 ± 50° + 14 [illegible] 155.7 – 155.9m BIS slightly post dates siderite veining.	Minor sed py assoc ± Mst @ 154.7m.				Some fracturing @ 155.7m possibly drilling induced but may ll contorted bk Mst/Slt ± fracture sets irregular & at low ∠ 50° to CA	

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DIAMOND DRILL LOG

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PROSPECT: SEVERN

121164

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
155.9 – 156.2			bk Mst	A highly graphitic flt ± pyg. Upper contact @ 35° to CA ± possible bedding ∩ up-hole unit @ 35° to CA at a high ∠ to the Flt. Lower contact 30° to CA		Minor irregular Ca veining dispersed throughout the Flt. pugged Mst.						
156.2 – 157.5			bk Mst	An interval of bk Mst ± minor ±bl ss, becoming highly contorted downhole ± ± areas of interlayered Mst + ss, developing somewhat of a brecciated appearance ± selvedges of gy slt → ss enclosed by bk Mst. The bk Mst from 156.8 – 157m has minor blebs of red pyg		Minor Ca, qtz veining @ 50 + 35 to CA ± abundant qtz, Ca blebs @ 156.2 – , ± mm qtz, Ca blebs elsewhere throughout.					From 157m highly fractured bk Mst → pyg ± possible fracture @ 25° to CA.	
157.5 – 157.9			gn Qzv ibd bk Mst	A contorted interval demarcated by gn pyg & Qzv ± bk Mst + gy slt, irregular bands + blebs surrounded by Qzv or by a mosaic of qtz sweats.		Minor Ca veining occur irregularly throughout, often brecciating Mst. From 157.8 – 157.9m intense qtz veining produced a mosaic texture isolating Mst + Qzv fragments.						
157.9 – 160.8			gn Qzv ibd gy bk Mst	An interval of ibd gn Ca Mst Flecked Qzv ± bk Mst + gy slt ± gy slt → gy Qzv ± fg. fd + flattened Mst. fragments. In places Mst/slt becomes highly contorted from 159.5 – 160.8m.		Intense siderite veining ± vns @ 5–15° to CA with an overprint of Ca veining @ 0–10° to CA.						

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DIAMOND DRILL LOG

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PROSPECT: SEVERN

12116 1964

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
				From 159.5m - 160.0m bedding highly disrupted ± jumbled mass of Mst selvedges ± Ss & Slt ± Mst. Alsy ± interlayering sub & mutually ± block slumping of Sandy & Mst beds.		Ca veining brecciates Ca Mst & silicate, also some x cutting Ca veins @ 45° to CA. Also extensive siderotic irregularly developed through pale grey Ss & as blebs & tension infills.					Irregular prg lined fracture @ 150° to CA @ 160.0m. With CJ of Mst ± Slt & Mst laminae ⇒ bedding @ 55° @ 159.2 & 45° to CA @ 159.0m.	
160.8 – 161.1			bk Mst	A highly fractured graphitic Mst ± minor Rlt grey prg.		Minor Ca vn developed ± in bk Mst.		Fracture plane @ 40° to CA @ 160.5 & 35° to CA @ 161.1m			Possibly 10-20cm of Core loss.	
161.1 – 162.7			grn GW	A pale grn GW ± minor clasts & irreg discontinuous bk Mst clasts irregularly dispersed throughout. A CJ of bk Slt @ 162m may be a bedding contact ⇒ So @ 43° to CA?		Minor narrow Ca vnt @ 15 & 40° to CA. With irregularly dispersed blebs infill tension gashes throughout.					Minor slickenslided lined fracture plain @ 50° to CA @ 161.2m.	
162.7 – 165.2			bk Mst ± GW grn GW	A highly contorted interval of gy bk Mst ± bd. gy grn GW In places Mst & GW exposed & fragmented ± selvedges of GW enclosed by Mst & vice versa. Bedding contacts highly irregular & in places indistinguishable		Ca veining absent but is present throughout veins predominately siderotic irregular heavy minor infilling tension gashes. With minor veins @ 15, 25 & 60° to CA		Minor graphitic slickenslided Ca fracture @ 70° to CA @ 163.2m Foliation parallel ⇒ So @ 55° to CA?			Evidence of fracturing prior to complete compaction with large rafts or blocks of Mst deformed & plastic sediment to form irregular rounded masses.	

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DIAMOND DRILL LOG

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PROSPECT: SEVERN

121166

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
165.2 – 165.95			gygr GW	An interval of relatively massive gygr GW ± Pd 2-5mm & Mst flecks 1-5mm. Minor selvedges or clasts of Slt/Mst occur sporadically throughout		Irregular discontinuous @ 20 & 35° to CA, ± planar irregularly dispersed blebs throughout.					From alignment of clasts & Mst flecks imply a possible foliation @ 25° to CA.	
165.95 – 168.4			bk Mst	An interval dominated by bk Mst ± areas of gy Ca. Slt → GW. In places bk Mst layers discontinuous & interlayered ± gy Ca. Mst flecked Slt ± blebs of Mst also occur similarly squeezed subangular to subrounded GW fragments occur sporadically in the bk Mst.		Ca vns irregular & wavy, x cut & sub parallel to CA. opfa discontinuous as tension gash infills. Vns @ 25, 40-45° to CA.	Sed Py layers occur in the bk Mst @ 167.2m & 168.3m, 167.5m.	Minor small scale pit slips disrupt bedding lamination			Foliation possibly referred @ 40° to CA as ⇒ Mst flecks ± Slt/Mst contacts. At 166.2m stockwork irregular fracture @ 70° to CA.	
168.4 – 168.7			gggr GW	An interval of gygr GW ± minor ibd bk Mst, as Mst clasts, with a brecciated appearance in places ± angular blocky Mst clasts in gygr Sandy matrix ± minor Py dispersed throughout. Downhole Mst/GW contact highly irregular & brecciated Mst-GW infilling fracture blw GW/Mst beds.		Ca veining irregular blebs & veinlets throughout ± minor vein sub// to fracture @ 70° to CA.	Minor blebs of Py irregularly dispersed				168.5m a fracture @ 75° ± graphitic ca lined slickensided fracture. Possible bed contact @ 70° to CA.	

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121167 gpl

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
168.7 – 175.4			gy Slt ± Sw ± bd gy bk Mst	A broad interval of ibd gy Slt → f.g. – m.g Ss not lithic Ss ibd ± gy bk Mst In places Slt & Sw interlongue along somewhat deformed & squeezed bedding contacts Sw beds vary from 1-2mm to 2-3cm ± gy Slt → f.g Ss beds <1mm – 20-30cm. ± ibd bk Mst Similar to Slt		Minor brecciation & resealing of Ca vns enclosing Mst fragments with further Ca vns as blebs & irregular veinlets anastomosing throughout. Irregular Ca vns developed @ 0-20° to CA ± some assoc siderite from 170.3 - 170.6m as a thick Ca, Si vn xcuts @ low A.	Minor Sed Py assoc ± blk Mst @ sporadic locations				Evidence mineralising & block fit movement prior to consolidation of Slt-/Mst beds	
175.4 – 177.4			bk Mst	An interval of somewhat contorted bk graphitic Mst, ± minor wispy deformed gy Slt → f.g Sw bands squeezed? or, blebs irregularly dispersed.		Ca veining sparse irregular disposed blebs or short tension infill veinlets ± minor 1-2mm vns @ 25-30° to CA.	Sed Py sporadically dispersed blebs occurs throughout Minor Cu/py veining @ 175.55m				Graphite, calcite lined Slickenside fracs @ 50° to CA @ 175.85m. With further angular Slickenside fracs @ 40° 177.3 & 25° @ 177.2m.	
177.4 – 178.6			gy Sw ibd bk Mst	A highly contorted interval of ibd f.g gy Ss. Sw ± bk Mst, the Mst is rather graphitic. Has overall brecciated or ruptured appearance ± selvedges of angular to blocky Mst dismembered from 1° layering and currently enclosed ± in matrix of f.g. Sw somewhat in a mosaic form		Ca veining very sparse, ± odd bleb, or tension infill ± minor 1-2mm vns @ 25° to CA. ± odd short bleb or spurt randomly distributed					A semblance of foliation, Ss? could be explained by alignment of Mst fragments @ 30° to CA.	

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DIAMOND DRILL LOG

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121168

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
178.5			bk Mst	An essentially massive bk Mst interval ± minor blebs of Py & f.g. silt layers as wispy bands, possibly ± same assoc. Py.		Cc as sporadic blebs & irregular low ∠ veins or veinlets.	Minor pods of Sed py sporadically distributed.	Possible Foliation by fine Slt @ 30° to CA.			Fracture @ 15° to CA @ 178.5 & 25° to CA @ 178.3m produce a conchoidal spalling fracture with graphite on fracture plane.	
178.8			bk Mst → siderite fleck.	A bk Mst ± minor pods of gy gn Chl along ± large Pyritic clasts 1-6cm. The interval is clut by intense Ca, siderite vein ± minor assoc qtz vns		A Cc, siderite vn given way to siderite qtz vn downhole ± veining sub parallel to CA. In places minor brecciation of Mst to produce a mosaic of fragments surrounded by qtz.	Blebs of heavy brown sp assoc ± siderite vns ± minor py assoc ± qtz vns with abundant large 1-6cm Subrounded Sed Py clasts.				Minor fracturing ± graphite on sub-parallel to CA veining from 178.2m - 17[illegible] large fracture @ 179.2m - 179.9m	
179.2			bk Mst	A massive bk Mst interval ± a weak foliation defined by sed. py rich layers.		Minor short sporadic Cc blebs, ± minor < 0.5mm veins @ 50° to CA.	Abundant Sed Py occurs as blebs & as narrow laminae @ 20° to CA.				[illegible] @ 179.7m & [illegible] parallel to CA [illegible] graphite.	
179.7												
179.9			bk Mst	An intensely qtz, siderite veined bk Mst.		Intense siderite ± overprinting qtz veining cuts CA at & high & in places includes selvedges of Mst or isolated wispy irregular Mst bands.	Minor irregular blebs of Sp occur in the siderite					

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DIAMOND DRILL LOG

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PROSPECT: SEVERN

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121169

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
179.9 – 180.8			bk Mst	A bk Mst ± minor ibd Slt ± some gy fd lithic Gw, with minor brecciated Gw ± fragments infill by bk wispy stringers of Mst. with disturbed interlayering Slt bands ± in Mst. gy Gw has Co & bk Mst fleck & clasts throughout.		Minor Co, qtz veins @ 35° to CA	Minor Py Qtz vns & wispy Py blebs.				bedding @ 60° to ⇒ contacts b/w Ss/Slt. Minor py lined fracture @ 40° to CA.	
180.8 – 181.1			brec. gy Slt (bd gy Mst)	A fragmented interval ± 1° layering disrupted ± bk silt infilling interstices b/w fragments. An interval of fragmented gy Slt gives way to bk Mst that interfingers ± it occurs as brecciated selvedges ± in gy fd lithic Slt → Gw. Gw in turn gives way to a highly fragmented gy Slt → fg gy Gw.		Very minor wispy low ∠ Co vns ± Qtz blebs occurring sporadically.					The occurrence of bk Mst selvedges in Ss & their distribution ⇒ down hole fining possibly? With bedding roughly ⇒ @ 40–50° to CA.	
181.1 – 184.5			bk Mst	A massive bk Mst ± minor wispy gy Slt along ± Sed py blebs & wavy veins Bk Mst highly contorted & deformed producing wavy blebs.		Minor Co, qtz veinlets blebs sporadic Short ∠ infilled fractures Minor low ∠ Co vns @ 15° to CA	Abundant Sed Py blebs & short Py veinlets occur throughout.					

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121170

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	HARDNESS
181.5 – 181.85			bk Mst	An intensely qtz+Ca veined highly contorted basalt interval. A bk Mst ± minor wispy gy slt bands, ± sheared appearance. But much of deformation may be the result of intense veining.		The qtz, Fe+Ca veins are irregular in orientation commonly bifurcating or pinch+swelling. With veining @ 35° to CA. Becomes less Fe rich down hole.	Minor sed py blebs occur in bk Mst.				Uphole sericitic becomes calcitic down hole. Fracture lined ± partially pugged graphite @ 45° to CA @ 181.6m.	
181.85 – 182.55			bk Mst ± gy Slt → Gw	An interval of massive bk Mst, ± minor Gw selvedges or interbedding layers or angular pinch+swell blebs in the Mst. Similarly gy Slt → Gw bands ± <0.5cm pl+cl/cm bk Mst flecks + wispy bk slt layers + minor selvedges of bk Mst with slightly coarser grn (Gb ± Chl) lithic (<1mm) Gw.		Minor scattered blebs of Ca, qtz occur irregularly throughout ± minor Ca veining @ 35° to CA. With a broader 2-4mm Ca vein @ 45° to CA.					A possible bedding could be inferred @ 35° to CA.	
182.55 – 183.2			bk Mst	A highly fragmented bk Mst, ± intense soft sed deformation, slumping + brecciation of 1° beds. With fg. grn Gw clasts enclosed by bk Slt ± fg. sand enclosing selvedges of Mst. With 1° Slt/Mst laminae highly contorted.		Minor wispy irregular Ca, qtz veins + blebs developed throughout with minor Ca veining developed @ 15-30° to CA.	Large Py mass @ 183.0m also shows some fragmentation ± further Py clasts irregularly dispersed throughout.					

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
183.2 -183.7			gy-gn Ew vf gy bk Mst	An interval of bd massive bk Mst ± somewhat fragmented gy fd lithic Ew fringed by fragmental gn Ew, ± massive gn Ew also present, though bk Mst selvedges also enclosed by gn Ew. Fragmented gn Ss is reseated by bk silt.		Minor Qz blebs sporadic, ± narrow vns @ 15 to CA 1-3cm. wk brecciated Ca, qtz vns @ 20 - 45° irregular reacting bds 183.4 & 183.95m.	Minor irregular blebs of Py occur in bk Mst.	All fragments is soft bedding soft sed def?			Bedding @ 40° to CA can be inferred from Ss/Mst contacts. Best squeeze of Mst & Ss @ 183.25m would ⇒ So @ 15° to CA	
183.7 -184.8			gy Ew ± bd ± Pgn Ew	An interval of bd coarse (20.5) gy fel, ± lithic Ca Ew ± Py fel (<0.5) lithic (<0.5cm) Ss Brecc only minor component of the pale gn Ew. Minor selvedges of bk Mst. with bk Mst squeezed into fractures in the overlying? gy Ew		Veining becomes more intense towards the base of the hole. with qtz veinlets + blebs throughout ± qtz, Ca vns well developed @ 50° to CA, ± narrow qtz vns ± very minor Ca 1-2cm @ 55° to CA.					long location is that younger down hole is up, ± Mst squeezed into overlying Ss?	
184.8 -185.6			gy bk Mst	gy bk massive Mst in places fractured ± bk silt lining fractures becomes laminated silty Mst towards the base of the interval. Minor gy Ca. lithic Ew @ 184.8 - 184.85m. Minor irregular gy silt → Ew veins interstitial to bk Mst fractures.		Interval is cut by irregularly shaped blebs of qtz, Ca ± coating of Calcite veins becoming more prevalent downhole. ± <0.5-2cm veins @ 50-70° to CA.		Fracturing appears to be related to soft sed def? Though wider ± 3cm Ca, qtz vein cuts the Mst			Silt/Mst laminae ⇒ So @ 55° to CA	

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121172

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
185.6			gy Lam/Lbd gy Slt	An interval dominated by gy Co.lth. Lam, with lbd gy bk Slt, in places angular rafts of Mst, irregular Mst bands xcut or occur ⊂ in Lam mtx. Intense qtz & lesser Ca veining occur in places rafts of angular Lam are brecciated by qtz veining.		Qtz veins irregular xcut the Lam as broader veins ⊂ finer more diffuse veining ⊂ in Mst rafts. Minor Ca veining @ 30° to CA. Whereas qtz lacks any specific orientation.					Slt only very minor qtz veining. Possible. So laminae @ 50° to CA ⊂ in Slt	
186.2 - 186.7			gy Slt	A gy Slt in places ⊂ fine dark laminae, ⊂ laminae commonly deformed by slumping, & small scale folding & brecciation assoc ⊂ consolidation.		Minor qtz veins @ 45° to CA, but ⊂ only minor veining ⊂ the bulk of the veins are blebs & vein infills.					Possible laminae of dark Slt layers @ 45° to CA.	
186.7 - 189.0			gy Lam/Lbd bk Mst	An interval dominated by gy Co.Lam → gy Slt intervals lbd bk rarely laminated Mst. (Mst beds 10-20cm Slt 5-10cm) (Slt : Mst = 2:1) Some soft Sed def'n ⊂ rafts of Slt in places brecciated ⊂ Slt mtx ⊂ in Mst & vice-versa.		Mnor CA // schistosity with minor Ca veining @ 30+60° to CA & ow irregular brecciated infills & short anastamosing veinlets. with qtz veins abundant as short veinlets, vein infill blebs & veins @ 50° to CA.					Fine Slt laminae ⊂ bedding contacts @ 50° to CA. 188cm minor graphite lined fracture @ 40° to CA Possible dark coloured hole flowing @ 187.9m ⊂ opposite flowing up sequence towards base.	
189.6 - 193.5			gy Lam/Lbd bk Slt → Mst.	Similar to above interval but gy Lam more abundant (Lam: Mst = 3:1) ⊂ Lam intervals for more deformed. in places brecciated ⊂ Slt. infills of fractures and numerous rafts of laminated Slt & Mst ⊂ Lam mtx. Similarly bk Slt bands have rafts of numerous bk Mst flecks.		Ca veining dominant both as anastomosing short vein infill veinlets & blebs but also as short vns ⊂ veining 30-35° to CA. Minor irregular wavy qtz veins @ 40 & 90° to CA ⊂ anastomosing veinlets of these broader vns.		Graphite, Ca & Fe chlorite blebs & 45-35° to CA @ 191.0 & 192.4m.			Laminae & possible bed contacts → So @ 35-45° to CA.	

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121173

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DEPTH	DRILL RUN	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
193.5 – 193.6			gn brec GSW	An intensely Ca leached veined somewhat brecciated GSW. A gn pel ss ± silty fracture infills ± angular mst clasts. Cut by broad Ca (qtz) vn @ 40° to kt		Some off shoot Ca veining into mod dev ss. Vns 3–5cm.						
193.6 – 194.1			ggn brecc	An intensely brecciated interval ± subangular mst fragments in a gn Ca GSW mtx @ 193.6–193.65m. With gy bk silt mtx to angular silty-GSW clasts. 193.82–193.92 ± gn GSW mtx to bk silt-mst clasts 193.92–194.03m with bk mst mtx to gy silt clasts 194.02–194.1m.		Anastomosing veinlets + bleb accen dominately in gy silty breccia ± minor Ca/qtz veining at bndry ± gn & brecc @ 193.92m. ± Vns @ 50° to CA					Brecciation soft sed depn ± sub erosion of mst beds to source clasts.	
194.1 – 194.9			bk Mst	An intensely fractured bk graphitic gn ± ± irregular graphite lined boundaries to sub angular mst fragments. Brecciation not complete ± graph fractures rarely enclosing all ± less at exposed ± limit.		Down hole Ca veining intensifies after creating brecciated rafts of mst in vn mtx, vns appear to infill along graphite lined fractures					Possibly post depositional brecciation.	
194.9 – 195.5			bk silt	A bk silt ± minor ibd ggyn Ca GSW + bk Mst. Silt intervals ggyn ± bkk silty laminae. In places minor brecciation of silt/mst ± bk silt infilling fractures.		Veining minor ± bleb + short veinlets of Ca ± qtz					laminations @ 47–50° to CA.	
195.5 – 195.85			bk Mst	A highly contorted + deformed bk Mst interval ± wispy GSW clasts + irregular GSW bands		Irregular anastomosing Ca veinlets, blebs + lenses infills. In places forms a mtx to mst fragments. In places minor qtz ± Ca vns.					Some styl bk development, possibly as mobilisation of impurities as veins infill mst.	

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DIAMOND DRILL LOG

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
195.85			gn banded gy slt ± blk Mst	A variably brecciated interval of blk ggn Co.Cbx ± gy blk slt → blk Mst. 195.85 – 196.20m a gy slt becomes more intensely fractured ± minor blk silty fractures ± limited assoc. Ca vns becoming more intense & double to produce a breccia ± rafts of slt in Ca matrix. 196.20 – 196.25 gy slt → Mst grades into ggn slt → blk ± minor silty layers along fractures. 196.25 – 198.3m intensely Ca veined breccia ± angular slt clasts. 196.3 – 198.5 blk mst Ca wispy bands in gy slt mst ± only minor irregular Ca vns. 196.5 – 198.65 pebbly mst Mtx to rounded gy slt & blk Mst clasts 198.65 – 199.7 – poorly laminated & somewhat contorted (soft sed def?) blk Mst & gy slt interval. 196.7 – 197.2m highly carbonated interval ± layer covered by Co.Cbx clasts & rounded gy subangular Mst & slt clasts in blk silty matrix with fractured slt infilled grtz/Ca from 197.2 – 197.4m.		197.2m Ca vn @ 30° to CA 196.25m Ca vns @ 50° to CA. with veining throughout as thin irregular veinlets, tension infills & short perpendicular vns.				Possible silty laminae @ 37–40° ⇒ So?	
197.4												
197.9			gn gy Cbx	A monomictic gn gy Co.Cbx ± minor subrounded 1–2mm Mst flecks.		Minor Ca vns @ 25° to CA @ 197.8m, ± minor scattered Ca blebs elsewhere.						

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
197.9			bk Mst	An interval dominated by bk Mst ± minor bands & lenses of ggy Slt → Sst & irregular ggy Sst bed ± slump distorted contacts.		Intense Ca veining throughout, as sharp vns @ 20°-45° to CA, ± sheet irregular veinlets & blebs throughout					Minor slump disruptions @ 30° + 70° to CA cause small scale Slt displacements. Bedding @ 20° to CA.	
198.65												
199.65			ggy Sst → ggy Slt with bk Mst	An interval of ggy → gn lithic Sst (lithic = Mst fragments) tends to ggy Slt in places ± minor bk Mst beds Xcutting irregularly throughout, also Mst clasts as isolated masses.		Ca qtz vn at 199.8m @ 0° to CA is very broad ± some stylolitic of enclosing Slt. Possibly vuggy fracture. Elsewhere wide irregular veinlets & blebs of Ca occur.	v. minor Sed py clasts.				Possible bedding - contacts & laminations @ 35° to CA, problem bed surface distorted by soft sed def'n. At 199.3m a relatively sharp bk Slt ggy Sst contact @ 45° to CA.	
200.0												
200.7			ggy Sst with bk Mst	At highly contorted bk Mst ggy Sst interval, extensive soft sed def'n causing a sed. mixing, ± slumping & brecciation. ± Subrounded Mst clasts in a Sst matrix		Some regular Ca vns developed @ 30° to CA ± irregular anastomosing vns, veinlets, blebs & fracture infills throughout.	Minor Sed py assoc. ± ggy Sst as contorted slumped discontinuous beds					
201.7			ggy Sst	A massive ggy Sst/Slt ± minor Mst flecks & odd larger Mst clast throughout.		Cont in places by irregular Ca/Qtz vns, ± some preferential direction 35 → 50° to CA.					Possible bedding @ 30° to CA ± fg ggy Sst/Slt & ggy Sst/lithic Sst.	
201.9			bk Mst	An essentially massive bk Mst ± minor wispy Slt bands, ± some evidence of soft sed def'n causing irregular mixing & slumping of laminae.		Numerous Ca vns @ 20° to CA ± irregular fracture veinlets & blebs infilling closely fractured.					Possible bedding defined by Slt bands @ 35 → 55° to CA.	
203.05												

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121176

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
203 – 203.25			gg siltstone gt.	A gritty relatively coarse clastic GW ± numerous rounded 1-5cm fd, mst grains in a fine matrix. Silt input ↓ downhole but overall appearance is that sequence fines downhole as fd / mst clast ↓ in size. Composite Δ in mtx only rpt Δ in source of fines from Slt to volcanic detritus.		Minor Ca vns @ 35 & 50° to CA.					Upper contact 50° to CA ± lower contact @ 55°.	
203.25 – 206.5			gg gn GW: bk mst	An interval dominated by gg gn fg. lth. GW (1 – 40cm) ± bk mst (1 – 20cm) (GW: Mst ≈ 2:1) Minor raft of Mst in SS, generally well bedded sequence throughout in places irregular.		Ca veining v.c.l. intense ± veins & veinlets distributed throughout @ 30-40° to CA.					Ss/Mst contacts & Slt laminae can not imply So = 50° to CA. Minor slump Mt disrupts bedding towards @ 205.6m ± Flb @ 30° to CA.	
206.5 – 207m			bk mst: lbl gg gn GW	An interval dominated by somewhat deformed & fractured bk mst: lbl ± minor massive gg gn GW & somewhat contorted Ss. The bk mst have an assistemory Ca/qz? fine vn network locally fractures about cracked Stained mst fragments, in places only v.v.s. low displacements in others Lightly contorted clasts in silty mtx. Minor massive GW		Ca vns infilling pre-existing fracture fabric, possibly developed during soft sed deformation rather than later Filling & larger reticulated mst Clasts are rimmed by gg Slt. Coarse veining irregular, blebs & short veinlets.					Possible laycrum & bedding contact Ss/Mst @ 50° to CA.	

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DIAMOND DRILL LOG

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PROSPECT: SEVERN

121177 9/1

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
				@ 206.6m. ~ 5cm thick subangular Mst clasts 206.85 - 207m. ~ same silt infilling fractures in GW.								
167 - 206.6			bk Mst ± bd gy GW	An interval dominated by massive bk Mst ~ minor ± bd gypsum silt-GW ~ minor silt layers sporadically ~ in Mst. Also minor massive gypsum Co. lh. GW ~ 207.3-207.6m. LA - places GW as isolated pods, produced during soft sed def'n squeezing mud into GW layers.		Irregular Ca blebs, veinlets occur sporadically throughout.	Py pods + irregular layers occur sporadically throughout But all gypsum is Py.				Apparent bedding @ 50° to CA from silt layers in Mst	
206.6 - 208.05			gy GW ± bd bk Mst	A gy bk, Co. lh. GW ~ rafts of former Mst layers dispersed throughout. Soft sed def'n disrupting 1° laminae to produce elongate to subangular Mst clasts.		Minor irregular wavy Ca vns x cut to subparallel to CA.					In places is Mst 1° bedding @ 45° to CA.	
208.05 - 208.3			Dk Mst	Somewhat carbonated bk Mst horizon cut by wispy silt bands + lens like beds to 1cm thick silt. Minor sed Py layering		Ca veining irregular x cutting laminations & also subparallel to it.	Minor fg sed py layer at base @ 208.05m				Dark silty layers in Mst @ 50° to CA.	

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DIAMOND DRILL LOG

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
208.3 -208.5			brec. Gsy Mst	A slightly fractured gyg Gw ± silty infillings along fractures passes down hole into a brecciated Mst. with intense Cc veining isolating rafts of Mst.		brecciation ± fragmentation appears to be post deposition ± fractures recealed by Cc vns. Cc vening is irregular ± cuts Mst fragments & fragmentation with minor vein development at low & 10-20° to CA						
208.5 -209.1			bk Mst	Massive bk Mst ± minor sltd gyg Gw ± odd silt laminae ± in Mst beds. Bedding contacts commonly deformed In places Gw fragments occur disposed in the Mst		Cc vening not intensive ± minor irregular veinlets & shear tension infill. Some broader vns disrupting units forming fracture breccia textures in places. with vening 2 35° to CA.	Minor Py clots occur in assoc ± discontinuous Gw bands.				Possible Mst/Ss bedding contact @ 40-45° to CA.	
209.1 -210.0			Bk mst → gyg slt	A bk Mst down hole becomes progressively more silty & laminated. In places narrow felspathic sandy to silty layers (2mm 20mm) occur throughout. In places layering wisps & interfingers but generally only mm soft sed def°.		Minor Cc blebs tension infills & veinlets occur on occasions // CA or subll to laminations ± minor lamination @ 20 ± 60° to CA. Vening @ 60° to CA @ 209.98m is slightly siderotic ± minor assoc min?	Minor gl py blebs & py blebs occur in Mst flanked by siderotic/calcite vns @ 209.98m with 25 xl development vug in fracture @ 209.97m @ 60 to CA ± graphitic slickensides.				Bedding laminations @ 40° to CA.	

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DIAMOND DRILL LOG

121179

PROJECT : _____

PROSPECT: SEVEN

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
210.0			bk graphitic Mst	A massive bk Mst ± gy silt clasts & py silty clasts. Tends to be more sandy & silty towards base ± intensity of siderite veining ↑ed, ± siderite fabric Mtx to sl aligned micro py ogl.		Minor siderite vns & splay & anastomosing across the CA @ 25° siderite also as scattered blebs.	Py clasts occur as rafts in the Mst, v.f.g. silty pyritic clasts occur as aligned to sublaminar clasts. Sl blebs ± V. minor gl/asscn ± siderite vns.					
210.35			gy Slt Mdst bk Mst → siderite bleb.	(210.35-210.0) A bk Mst, intensely veined grades way to a moderately veined less fractured (210.5-210.0) massive gy Slt, ± same breccia & silt infilling. In turn Slt → bk graphitic interval ± veined highly fractured Mst (210.85-211.0-211.2m) which in turn tends to moderately veined ↑ highly carbonised bk Mst ± gy Ca ± bk CSW fragments irregularly disposed throughout.		Siderite veining generally @ 45° to CA but also as anastomosing splaying mass in places fracture infill or closely Mst fragments. Also as short veinlets & blebs. In places assoc. Qtz-Py. Also chloritic siderite → calcite.	At 210.4-210.45 extensive layer Py clasts in siderite vn. may actually be rafts of sed py enclosed by siderite vn. No apparent base metal min°.				At 210.95- sl Slickensided bk graphitic fracture @ 60° to CA. Core throughout somewhat fractured @ 60° ± increase fracturing from 210.95-211.2m ± light 60° to 70° intensely fractured 15° to CA fracture.	
211.5												
214.5			gy CSW ± bk Slt	A massive competent interval of gy Ca ± bk CSW ± bd ± gy bk Slt → Mst. In places well developed laminations ± more silty bands. But some alignment of lithics in CSW (CSW: Slt = 1:1)		Ca vns developed @ 35, 40, 45° to CA. commonly 1-2mm or occasionally broader ± some assoc. breccia. Also some veining sub ll to ct of an irregular crazy ± cutting veinlets of					laminations → So @ 45-50° to CA. Minor small scale slump fldg as ll scale at ~50° to CA @ 212.5m	
215.5												

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PROJECT : _____

PROSPECT: SEGUELA

121180

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
215.5 - 216.5			gy bk Slt	A generally well laminated mst/slt interbed ± minor ibd gu Co Lam, in places slt flecked ± lithic fragments of fel. Minor slumping & defn of lamnae, causing discontinuities to the bedding. In places minor brecciation ± slt infilled fractures & some sandy layers + bed offsets by minor slumping noted.		Ca veining minor ± uns @ 45>20° to CA. all bleb & vein infill also.	Minor Py bands // sed layering ± some silty bands.				laminations @ 65° to CA. slump fold in ibd // to CA + at base @ 35° to CA	
216.5 - 217.3			gy brn/bk brecciated Mst	A highly contorted/deformed gy gn Lam ibd bk Mst. gy gn Co. Lam has irregular gy slt clasts throughout somewhat fractured ± interstitial slt. Bk Mst highly fractured ± Ca vein cementing breccia fragments along ± gy fg. silt→Mst, in places Mst more massive with minor penetrative or developing breccia texture. ibd bk Mst + gy slt gives way to fg. gy Mst or minor gy bk slt.		Ca veining irregular infilling fractures x cutting metamorphic wavy veinlets with an apparent preferential alignment of short veinlets @ 30° to CA.					Possible layering → so @ 45–50° to CA.	

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DIAMOND DRILL LOG

121181

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DATE: 15/9/89

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
217.1 – 219.2			gy&dk bk Mst	An interval dominated by gy Co' ll Mtsc GW 3–30cm, ↓↓ & massive bk Mst 2–15cm. (Gen M/st ≈ 3:1) Minor slump development in more silty bands in places Mst clasts are enclosed by GW, rare-nom.		Minor irregular short Ca vns. with minor development @ 30° & 55° to CA.					Possible bedding Contact @ 90° to CA. In places lamination ⇒ 50–55° to CA. nom. uphole.	
219.2 – 220.9			bk Slt	An interval dominated by bk Slt & minor gy frag. GW & coarse gy to dk GW bands. occasional massive bk Slt → Mst 5–10cm but generally bds <2cm. Generally grading is fine uphole as an overall sequence. In places bedding contacts irregular & some deformation, slumping & minor small scale laminae pl to offset.		Ca veining small scale, & irregular wispy veinlets sporadically scattered Minor vein development @ 15, 25, 80° to CA.	Minor blebs of py @ 219.95m.				Laminae & bi/dist contact @ bedding @ 60–70° to CA.	
220.9 – 220.5			gn GW	A massive f.g. gn Co. GW & minor subangular Mst lithic fragments <0.5mm		Minor irregular short tension infill Ca vns & more regular vns @ 20, 35 & 45° to CA.					[illegible]	
220.5 – 221.2			bk Mst	An interval dominated by massive bk Mst & minor irregular deformed bds of gn GW, in places selvedges of GW enclosed by Mst		With Ca vns sparse & commonly Ca as short tension infill veinlets.	Minor blebs of py occur as & Ca @ 90 & 60° to CA With minor short vn development & 20 cm more massive Mst horizons.				Possible lamination ⇒ So @ 45° to CA & silty → So horizons or laminae in bk Mst.	

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DIAMOND DRILL LOG

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PROSPECT: SEVERN

121182

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
221.2			gy GW-bd bk Mst	An interval gy GW → gy slt ibd bk Mst. In places well laminated, but generally massive, bedding contacts commonly irregular & some slumping or small scale slump folds as at 221.65m. Also some breccia & slt infill of GW as at 222.2m.		Cc uns & parra, & some veins at 25, 30 & 35° to CA. Also minor irregular splays off these main veins & veinlets along & isolated blebs infilling tension gashes esp. 2m Mst.					At 221.7m Change from HQ to NQ Coring. Lamination & parallel Mst/Slt contacts @ 50° to CA. At 221.65m slump folds @ 55° to CA.	
222.9			Bk Mst	A highly contorted rather massive bk Mst & odd slt → GW selvedge		Cc uns sporadic & broad 1-2mm @ 222.9m @ 27° to CA. With sporadic uns @ 30 & 40° to CA with minor crosscut uns. Also irregular blebs sporadically displaced.	In places minor subangular Py clasts & somewhat distorted Py lamae	From 224.5 – 224.65 core fractured & low & graphite lined fractures			A lamination can possibly be inferred from silty layers @ 45-50° to CA but difficult & of strongly disturbed structure.	
224.65			gy GW	A contorted interval of bk Mst & gy Cc lithic GW. With bk Mst & laminated Mst & Slt clasts enclosed in a mtx of gy GW.		Minor Cc blebs & irregular Cc uns subvll to CA. With minor veining @ 25, 30 & 40° to CA & tension infill uns cutting Mst clasts @ 70°.	Minor pods of Py along & some disseminated fg. Py & in more silty to sandy bands					
225.0			Bk Mst	A highly contorted bk Mst & wispy irregular selvedges & bands of gy GW Slt → GW throughout in places rounded clasts of Slt & GW enclosed [illegible] has undergone extensive soft sed defn.			Minor subrounded Py clasts mainly in bk Mst.					
225.62												

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DIAMOND DRILL LOG

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121183

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
226.2 - 228.6			Frac. bk gygr Mst.	A highly fractured interval of somewhat contorted bk Mst ± irregular gy slt clasts or selvedges disposed ± in the bk Mst matrix. In places lightly intruded gy slt lamnae & isolated clasts from eroded beds a disturbed bedding. Mst tends to be highly graphitic.		Ca veining limited ± small scale flecks or torsion infills & minor irregular veinlets.	Numerous subangular py flecks or clasts throughout the Mst.	Core intensely fractured & broken throughout with fracture sets generally less than 45° ± fracture fi recognisable @ S. 150/45°W Ca.			0.3m of core loss ?	
228.6 - 229.0			gygr Gw ibd bk Mst	A contorted interval of ibd gygr Ca lithic Gw & bk Mst in places Gw → gy slt. Commonly subangular Mst clasts or selvedges to disturbed laminae interference or occur as rafts ± in the Gw. In places near-massive beds of bk mst ± sm ibd gy slt occur.		Ca veins almost absent ± minor blebs or shear torsion infill sporadically displaced.		Generally competent interval minor pug @ 45° to Ca along ± minor fragments.			Fast ± E-W Slt / Mst sedimentary contact @ 25° to Ca.	
229.0 - 229.7			breccia Gw. Mst	A highly contorted & brecciated grit of Gw & Mst with large commonly fractured & Mst injected Gw clasts, along ± Gw & bk Mst selvedges ± in a variably silty to Mst matrix.		With Ca as minor x cutting veins uns ± in Gw, also again Ca ppt fragments possibly recently cavities ? & commonly ± a breccia appearance as Mst occurs interstitial to Gw.	Numerous py pods or clasts occur ± in Mst from 229.45-229.7m clasts subrounded 2<10 mm.				From 229.7-229.3m dissolution & pitting of the core ± intense dissolution & cavity development from 229.3-229.45m ± minor residual qtz & Ca ± in core area	

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DIAMOND DRILL LOG

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121184

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
229.7 – 230.3			Frac bk Mst	An intensely fractured bk Mst ± ibd gn Co. GW. Fracturing intense in intervals of ibd GW/Mst ± competent beds of Mst remaining. Core so highly fragmented during drilling fracture dip difficult to imply, though appear to be less than 45° to CA.		Ca veining minor throughout though fine crosscutting veinlets enclose ± Xcut fragments of Slt/Mst from 230.1–230.3m.					Possible Slt/bk Mst lamination @ 15° to CA @ 230.2m? but possible bedding highly contorted by soft sed def'n.	
230.3 – 233.2			Frac. gn GW ibd bk Mst	Again an intensely fractured interval dominated by gn fg Co GW in places brecciated or as selvedges or interlayering ± bk Mst. (GW: Mst – Slt) In places GW fractured ± bk slt infilling. Any residual bedding is highly contorted, ± Mst clast irregularly distributed.		Ca veining minor ± tension infills ± veins @ low ∠ 10, 30° to CA ± as irregular blebs, some more qtz veins @ 50° to CA @ 230.7m.		Fracturing particularly intense from 230.6–232m.			Core highly fractured ± in places drilling has reduced it to 1–2cm fragments. Fracturing recognised @ 5±10°, 30, 35±45° to CA. ± possibly an array of ±10cm ds.	
233.2 – 235.6			gy bk Mst ibd gy gn Slt	An interval of somewhat contorted gy bk Mst ibd ± gy gn Slt, ± bedding contacts irregular and in places deformed ± disrupted ± bk Mst infilltrating GW along fractures. Slt ± Mst commonly interlayered. Selvedges of slt ± GW occur ± in bk Mst bands.		Ca veining again limited ± thin irregular main infill veinlets.	Minor irregular nods of Py enclosed ± in the Mst.	In places minor fracturing ± qtz development ± some solution cavity development ± minor qtz ± residual pinkish Slt in fractures. Fractures @ 15, 30–35, 60° to CA			Possible Slt laminations @ 10–20° to CA, possibly somewhat distorted by soft sed def'n. NOTE Mst/Slt bed Contact @ 30° to CA	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
235.6 – 238.9			bk Mst : ibd gy gy Slt ± Gw	An interval dominated by gy bk Mst (5-50cm) ibd gygn Slt → gygn Ca bk Gw (5-20cm). In places bedding somewhat deformed ± an interlayering of Gw + Mst, ± selvedges of Gw in the Mst. (Mst:Ss = 2:1)		Again only minor Ca veining, ± irregular bleb + torsion infill veinlets developed sporadically.		Some fracturing + dissolution b/w 236.9 – 237.6m. With fractures recognised @ 40° to CA ± some irregular fracturing + dissolution @ higher d/c.			Possible Ss/Slt contact @ 25-30° to CA ; ± some lamination @ 45° to 55° to CA, but possibly somewhat deformed by soft sed def'n. Some possible small scale fracture displacement of Mst by subparallel to low d to CA b/w 237.9 – 238.9m.	
238.9 – 241.35			Bk Mst	A bk Mst ± ibd, wispy gy Slt horizons developed at low d to sub ll to CA. In places minor ibd gygn Ca-Gw. At 240.8-241m some dissolution cavity development ± in somewhat fractured bk Mst.		V. minor Ca spits – blebs + short veinlets ± minor resulting veins in the area of dissolution @ 30 ± 55° to CA.	Minor pods + bands of py lamination ± some assoc Ca developed in more massive bk Mst.	Fractures developed @ 20-30° + 60 – 80° to CA.			Slt/Mst contacts → @ low d to CA. Core fractured + broken throughout ± intense fracturing 239.9 – 241.35m. Possible py Slt laminae ⇒ 50 @ 35° to CA.	
241.35 – 242.15			gy Gw	An interval dominated by gy Ca lh. Gw, essentially massive, ± some soft sed def'n + irregular interlayering + selvedges of Mst b/w 241.35 – 241.5m. Elsewhere min bk Slt infiltrating fractures in Gw.		Very sporadic small bleb + spurts of Ca veinlets.		Core competent				
242.15 – 244.9			bk Mst	An interval essentially of bk graphitic Mst ± min gy Slt laminae + gy Slt selvedges.		Ca was sporadic, mostly 1-2mm veinlets irregularly developed throughout @ 10-30° to CA, with irregular more extensive bleb + vein @ 244.5 – 244.7m ± somewhat different in appearance to rest.	Py pods + short veinlets occur sporadically throughout the Mst.	Core moderately to intensely fractured, with graphitic fractures @ low d to CA ± 242.25 – 242.7m.			Slt laminae ⇒ So @ 30° to CA. Intense fracturing of gy Ca vn + adjacent essentially oy veining @ 244.4 – 75m.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
246.7			gygr Slt → fg Gsw	A massive gygr Slt → fg Gsw interval. In places intensely Ca veined, ± Ca veins enclosed selvedges of Slt. In places Slt has brecciated dark gygr Slt ± dark silty layers infilling along fracture surfaces.		Intense Ca/pB veining developed, ± broad vns 1-3cm @ 30° to CA ± narrower vns 1-3mm @ 75° to CA & 20° to CA. With veining most intense from 245.7m - 245.9m. Vn lt only limited sulph & blebs elsewhere.		Some more intense fracturing 246.1-246.6 ± both lt & 0-30° & high & 60-80° fractures. Some may be drill induced.			Some dark silty laminae @ 55° to CA @ 244.85m	
246.7 - 247.0			gr Gsw	An interval of relatively massive gr gy Gsw cut in places by crisp Slt/y layers ± small scale breccia infills by Slt along fractures.		Minor Ca/pB veining @ 50° to CA 1-4mm.						
247.0 - 247.2			brec. Gsw	An interval dominated by brec. gygr Gsw → massive Gsw ± in places some intercalated Slt/Mst layers ~~of~~ & down hole highly contorted Gsw/Mst interval. Abundant blk silt infilled fractures in fg gr Gsw.		Veining irregular dominately Ca ± some qtz. ± some preferential development @ 15° to CA ± Sympathetic vns @ a high & to these @ ~50° to CA. Downhole low & vns tend to be more [illegible]					Minor low & subhz to CA graphitic & chloritic fault fractures.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
247.7 – 254.9			bk Mot ibd gn GW	A highly fractured interval dominated by bk dominated contorted Mot ± scattered banks, selvedges & rare beds of gy gn GW. (Mot:GW = 10:1) Intense soft sed def^n & disturbed bedding contacts & isolated GW selvedges & disrupted py laminae ± in Mot.		Ca/qtz veining limited, ± minor development of some fracture faces. With minor dev^t @ 25° to CA.	Minor pods of Py assoc. ± Sp, Mot ± minor veinlets of py in Mot.	Fracturing intense 247.7 – 249.1m 30±60° to CA. 249.7 – 249.9 many fine broken fractures @ 35° to CA. 249.1 – 251.1 minor bx & gouge fractures. 251.1 – 251.2m py.			Fracturing intense ± bk py developed along ± graphitic slickenside faced fractures. In places Sp Mot shows evidence of dissolution ± cavities developed 251.2 – 254m fracturing moderate to intense ± fractures 10–20° & 30–60° to CA. 254.0 – 254.6 fracturing intense (highly broken & fragmental)	247.7
254.9 – 258.5			gn GW	An interval dominated by variably brecciated to massive gn Co. GW with selvedges & occasional ibd bk Mot. When brecciated, bk silt occurs interstitially to the gn GW fragments? Also minor ± disruption of GW ± in Mot.		Ca/qtz veining limited, dissolution cavities possibly after Ca. veins @ 30, 35, 40, 45° to CA ± in places some dilation infilled by Ca veins make identification of more intensely veined sections difficult. Minor Ca spots throughout ± minor veins @ 15, 20 & 40° to CA. Minor dissolution cavities after Ca	Minor Py assoc. ± Qtz/Carb @ 257.9m.				In places core fractured, also exhibits some dissolution. 257.8 – 258.3m fracturing @ 254.9 – 255.0m. 255.5 – 256.7m moderate fracturing, some dissolution ± fractures 30° though ± to CA. Lower section ± Si/Mor contact => 50 – 70° to CA?	254.9
258.5 – 261.2			brec. Mot gn GW	± somewhat brecciated ~~to~~ gritty interval of ibd Mot & GW. In places brec. gn Co. GW fragments ± silt matrix. Best dominated by bk Mot ± gy gn GW clasts & wispy Ss bands throughout								

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
261.2 - 262.5			brec gn GW	A dominately brec gn GW interval ± minor ? bd bk Mst In places GW becomes more massive, but brec silt infilled areas dominate. 261.7 - 261.85m bk Mst interval ± some Py		Ca/qtz vns @ 50, 30, 35° to CA varying from 1-2m to 5-30mm. ± vn intensity ↑ downhole ± only minor blebs uphole.	Py podo assoc ± bk Mst @ 262m. Minor Py assoc ± Ca as a bleb @ 262.95m.	Massive				
262.5 - 263.2			gyg GW ± bd bk Mst	A highly contorted interval of gyg gn Co. GW commonly brec. ± bk silt infilling fractures. Irregular masses of bk Mst occur throughout ± minor GW clasts in places.		Irregular Ca vns sporadically occur @ 20 to 40° to CA, ± minor Ca, qtz blebs & spots throughout.		Massive				
263.2 - 266.5			bk Mst	An interval dominated by bk Mst but ± gy silt ± gyg gn Co. GW clasts disposed throughout or as wispy bands. The gyg gn GW in particular becomes more prevelent downhole.		Ca veining ↓ downhole ± only minor spots ± irregular veinlets developed. Most intense vein development @ 263.6-263.7 @ 40 & 35° to CA & 264.7-265m @ 40° to CA. Ca veining moderately intense, generally irregular, ± minor 5% oil CA vns 266.5-[illegible] with numerous irregular blebs from [illegible] Some veins @ 30 & 45° to CA					Soft sed deformation no ID horizons preserved.	
266.5 - 267.0			gn Ss	An interval dominately of gn Co. GW ± abundant 1-5cm bl lithic bk Mst fragments throughout ± some soft sed deformation & interbeds of Mst ± some lamy ½-5cm Mst clasts & wispy silty layers.							Possible laminations of silt beds @ 5-15° to ? ?	

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DIAMOND DRILL LOG

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
267.0 -270.4			bk Mst ibd gn GW	An interval dominated by massive bk carbonaceous Mst ibd ± massive to weakly brecciated (silica injection) GW. In places Mst selvedges or wispy bands are hosted by the GW. Elsewhere units to Polymictic breccia ± Mst silt, fractured silt & GW clasts in bk Mst matrix. In places soft sed def'n produced irregular bed contacts, slump folding & mixing of clasts.		Numerous small Calcg veinlets, occur as irregular fracture infillings, blebs & in places irregular anastamosing veinlets @ ~90, 55 & 60° to CA.	Subrounded to irregular Py clasts or masses occur in Mst.				DK Mst content ↑ downhole as Sd/Slt.	
270.4 -271.3			gn GW ± gy Slt	A highly contorted intervals of gn GW, gy Slt & bk Mst. 1° bedding highly disturbed ± a compressed intervals of units, in places bk silt forms matrix to larger clasts.		Short irregular veinlets developed throughout, but more prevalent in Sd units.						
271.3 -271.5			gy Slt ± bk Mst	Irregular ibd gy Slt & bk carbonaceous Mst ± minor gn GW beds. Bedding ∈ planar, irregular & highly contorted ± splayed, wispy beds & selvedges.		Spine Calcg veinlets occur sporadically throughout.	Minor Py as clasts & as matrix to bk Mst.				Possible bedding could be ⇒ by Sd/Slt contacts @ 55 ⇒ 45° to CA.	

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DIAMOND DRILL LOG

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
271.8			blk Mst ibd gn Sltst	An interval dominated by variably contorted massive blk Mst ibd ± the occasional gy/gn Cgw Tuff. In turn are ibd ± a no. of polymictic breccia → mtx supported conglomerate, with pale gy silt mtx ± Slt, Mst, Py, Fd clasts and in places Cgw clasts evident. In places blk Mst matrix dominates rather than gy Sltst. On occasions gn/gy fractured gy/blk silt infills. Mst also exhibit soft Sed def'n ± contorted laminae & irregular Slt selvedges.	→ mtx supported cong.	Minor Ca, Se (talc?) veining occurs @ 20, 30, 50° to CA 271.3 - 271.7m. Elsewhere uns qz/Ca ± uns 30, 40, 50° to CA ± broad Ca uns as stringers and/or subpll to CA. Short irregular irregular veinlets & spurts occur throughout.	Py occurs throughout ± fg. Py clasts 0.2 - 100mm. occur ± large Pymasses 274.1 - 274.3m ± Py elsewhere throughout as irregular spurts lining uns or fractures or large 2° blebs. From 276.5-276.8 coarse 2° Py blebs occur in massive qz	Possible Mst Yb Sltst contact @ 15° to CA.				271.8
278.2											Fine fg Py clasts possible represent reworked Sed Py clasts, whereas coarse subhedral Py blebs 276.5→ possible represent ± Py/Qz vein development. Angular to subrounded Ss clasts in gn Ss → conglomerate possibly derived from the Ss qz'ites.	
278.2			blk Mst ibd gy Sltst	An interbedded ± convoluted contorted sequence of blk Mst biggy & pale gy Slt ± occasional pod & wispy band of gy/gn Cgw		Ca, qz veining, mm ± narrow veinlets subpll to foliation & @ a high ± to it @ 30, 140° to CA. Short irregular spurts occur sporadically throughout.	Minor Py spurts, pods & laminae occur subpll to enfolded So.	In places entire sed def'n carrying Py/Slt laminae/beds contorted. Bedding 5-20° to CA 279.4m R.L.D: 195° Fol'n = 15°			CORE ORIENTATION AT 277.5m	
279.7											Apparent laminations/beds ± to CA ± narrow ± sinuous ± anastomosing ± Slt ± discontinuous ± some bed parallel contact with Ss clasts enclosed in Mst derived from source Ss beds	
279.9 - 280.8			gn Sltst	An interval of gn Co. Slt → fg Cgw in places ± Py & blk Mst laminae. Downhole tends from Ss → to blk Mst ± ibd gy/Co Slt & ± breccia of Slt, laminated Slt, blk Mst & Ss. Minor continuous irregular		Minor sporadic Qz/Qz spurts occur as irregular ± vein/veinlet zones.	fg. sed Py occurs as laminae 279.9 - 280m.	R.L.D: 280°? Fol'n: 10° to CA			laminae of Slt ± fg. Py are ± 15° to CA.	

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DIAMOND DRILL LOG

121191

1961

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
280.8 – 282.2			bk Mst	A bk carbonaceous Mst interval ± wispy gy bk Slt spots & irregular laminae along & Py spots throughout.		Minor irregular Ca veinlets occur sporadically throughout but lack any preferred orientation.	Minor spots of Py occur sporadically throughout.				Poss. bk s-lt laminae @ a low ∠ to CA	
282.2 – 282.6			bk Mst	A bk highly fractured Carbonaceous pug → bk Mst. With minor lbl gy gn GW.		Minor qtz vn & Ca/qtz vn developed esp so in more brecciated zones					0.1m of Core loss.	
282.6 – 283.0			Y Slt	A highly carbonated polymictic intraclastic brecciated carbonated matrix of clasts ± bk slt mtx. fg. gy gn GW gy Ca GW laminated Slt, Slt clasts ± contained bk to gy Mst mtx ± in places irregular ie not laminae.		The interval is then cut by irregular veinlets, spots & blebs of siderite & qtz. Again veining lacks a preferred orientation.	Minor Py laminae possibly ll or offprinted bedding laminations.				Ess. pervasive @ 20-25° to CA.	
283.0 – 283.4			bk Mst	A highly fractured bk carbonaceous Mst → pug.		Minor qtz ± siderite veining is recognisable though orientation is difficult to infer.	Minor spots of Py occur as small isolated blebs.				0.4m of Core loss. Both low ∠ (<30°) & high ∠ (60°) to CA fractures could be noted	
283.4 – 284.4			bk Mst	A somewhat contorted bk Mst ± some lbl gy Slt & in places selvedges of Slt & quartz GW in Mst. From 284.2-284.4 it is a massive ironstone ie iron rich gy GW		Veining generally moderate ± short Ca, Se (Mn?) spots subll to foliation or Stringers to it & at 150° to CA.						

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DIAMOND DRILL LOG

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
283.4			bk Mst			Minor Ca, sdstn & qtz veining 283.4-283.6m with intense Ca ± qtz overprint veining Ea S @ 284.2m ± Ca vns forming a net like pattern ± broad vns @ 75° & 5° to CA downdeep.					Lamination tad fm 15-30° to CA over the interval. At 283.6m a gyg lined carbonaceous fracture develops @ 35° to CA.	
284.4												
284.4 287.5			fine gyg silt/vfl gyCm	An intensely fractured interval of gyg silt, gyCm & bk Mst. In places fractures lined ± gyg. In places dissolution (possibly Ca vns) has pitted gyg & bk beds with qtz as possible narrow bnd or a clast @ ≈284.7m		Sporadic narrow (<2mm) Ca ± lesser qtz veins throughout as anastomosing irregular veinlets & hunks or as isolated spurts or short torsion infills. But at 284.6 & 285m broad now fractured qtz ± lesser Ca vns occur	Py occurs as blebs or irregular veinlets particularly 284.4 - 284.9m, ± possibly some 2° Py veining @ 284.7m. Subsidy Py occurs as blebs across laminae sporadically throughout.				Silt/Mst lamination @ 10° to CA. @ 286.0m 284.4 - 284.5m blk carbonaceous gyg 284.5 - 284.7 core is heavily broken ± low & high a graphitic fractures. 285 - 285.3m moderately to intensely fractured 286.5 - 287.5 moderate to intense fracturing ± carbonaceous gyg lining a low a fracture 286.8m ± fracture a 30° to CA cuts interval.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
287.5 -288.3			bk Mst + lt gy Slt	An interval dominated by bk Mst + lt gy Slt → gy Slt fg Gwn in places. Again soft sed def^n evident disrupting to laminae, ± interlayering of laminae + pinch swell + some erosion + redeposition of clasts. Bk Mst + fg gy nature ↑ downhole. Laminae highly contorted to base of interval.		Some Cc ± Sal (talc?) veins @ 30 + 50° to CA @ 287.9m. Minor cc vns elsewhere throughout, subll to laminae or as short isolated spurts. Minor vns @ 50°. On occasions some amoc qtz/cc vns esp 288.- 288.3m.	—				287.5-288.3 Core highly fractured ± fractures 45-60° to CA, commonly lined ± carbonaceous py or some slickensided Cc. Foliation @ 15° to CA of Slt/Mst ⇒ S_0?	
288.3 -288.5			gr Gwn	Chert band of massive to finely la — ! (bk Slt) gr Cc Gwn		Minor qtz vns @ 60 & 70° to CA. ± minor spurts elsewhere.	v. minor Py spurts.				laminae @ 15° to CA ⇒ S_0.	
288.5 -289.5			gy Slt lod clasts	TB highly variable + fractured interval. 288.5-288.8m bk Mst dominates ± some gy Slt laminations + in places ⇒ Yb ±. Py Slt clast along ± laminated Slt, fg gy gr Gwn bk Mst clasts ± in a contorted fg mainly Slt/Mst laminated matrix. 288.8-289.0 gy Mst lod fg gr Gwn + gy Slt again highly contorted laminae subll → CA 289.0-289.2m gr Calc lod 3gr Slt + bk Mst. 289.2-289.5 gy Slt + gy Slt matrix lge Gwn + Mst clasts.	288.9m slickensided fr vn fracture @ 35° to CA. Torsion infilling qtz vns + low + vns sporadically throughout, commonly on clast boundaries or X cutting Mst fragments	Minor Py clasts, ± fine Py laminated Slt clasts as detailed ± in Yb Slt @ 288.5-288.6m.				Possible bedding @ 25-30° to CA ⇒ lay on irregular S_0/Slt contact. Intense soft sed def^n disrupted irregular bed surfaces, small scale x-flt dislocations + erosion + redeposition of large clasts in mud matrix. Slumping + def^n of lt laminations	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
289.9 – 290.0			bk Mst ibld gy Slt	A somewhat soft sed ± lt def'n deformed ibd sequence of bk Mst & gy Slt. beds 0.5–1.5cm.		Veining irregular network fine vns throughout ε vn. sealing small scale x sets Flts at 289.9m broad & 6mm qtz ± Ca vn.	Minor fine Py vns or laminae ∥ So ε odd pod qtz/Py.				laminae of Mst/Slt @ 20° to CA.	
290.0 – 290.4			grd g. Gsw ibd gy Slt	similarly deformed interval of ibd grd g. Ss → Slt ε gy bk Slt → Mst laminae 1–25mm comonly c1cm. beds somewhat irregular ε some slumping & small scale x flt dislocations.		V. minor Ca ± qtz veinlets & specks sporadically throughout. ε minor small scale vn developed @ 15–20° to CA.	V. minor pits of Py assoc ε fg. Ss				laminae ⇒ bedding @ 25→15° to CA.	
290.0 – 291.6			bk Mst ibldg Slt	A contorted interval dominated by bk Mst ε some well defined lt gy Slt, but generally 1° set features defined by soft sed def'n ε irregular wispy Gsw, Mst, Slt layers indicate slumping & small scale x flting disrupting laminae. to produce contorted interval.		Qtz ± Ca vns as broad irregular veinlets as tension infills but also as wavy vns ∥ to cft & locally @ 40°. In places as fine vn network ∩ at low & high ∠ to CA.					Possible laminae of Slt/Mst @ 20° to CA ⇒ So? The contorted nature of Qtz vns ⇒ that some of the def'n of sediments may have post dated consolidation & been sympathetic ε veining. ???	
291.6 – 292.6			grd g Gsw	Amassive interval of gn fg. Ca. Gsw ε v. minor Mst flecks. Minor pods of ibd Mst wrapped by Gsw ~291.75 – 291.9m.		Qtz Ca veining @ 20, 30, 35° to CA as tension infills & sharp x cutting veins. Minor spurts & oleds occur elsewhere.	v. minor Py assoc ε bk Mst.				A possible somewhat inverted laminae @ 150° to CA in	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY ROCK NAME	LITHOLOGY DESCRIPTION	ALTERATION	Min'n	Veining	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
292.6			bk Mst	A bk Mst ± minor ibd gy SH, in places somewhat contorted by small scale xplts & some slumping		v. minor Py c/bks enclosed by qtz.	Ca/qtz vns @ 10, 20, 35° to CA. With intense v. minor vein development subll to bedding & to small scale FIt dn locations. Mas minor ferruginous infills.				Slt laminae (ibd Slt/Mst) @ 10–15° to CA Small scale xplts at a high & to So & @ 35° to CA.	
295.0			bk Mst	An essentially similar interval of massive bk Mst, slightly - moderately fractured ± minor wispy Slty layers & some contortion from soft sed defn.		Minor pods of fg sedimentary Py.	Ca/qtz vein development @ 15, 40, 50° to CA ± small scale patches subll to CA. Rare irregular blebs sporadically throughout.				Slt laminae subll to 5° to CA. Fractures 15, 30, 40 & 50° to CA commonly lined by graphite or bk carbonaceous pug.	
298.2			Yb Mst.	A somewhat contorted & in places fractured polymictic breccia. The interval has clasts of gy & palegy Slt, Mst Py & pg. GBWIn gy bk Mst Mtx. In places tends to a massive yet highly contorted bk Mst ± irregular wispy Slt layers.		Subrounded Py Clasts occur as pods ± in Yb.	298.2 – 299.6m intense network of anastomosing Ca-qtz vns throughout total destroying the interval. Dominantly subll to CA but also X-cutting. Minor blebs & irregular fine veinlets 298.6 – 299.6m				Core somewhat fractured ± some assoc. pug developed from 299.1 – 299.6m. Fractures at low & to CA & dominately @ 15° to CA. With Yb value difficult to ⇒ So.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
299.6 - 300.1			gyj Slt	A competent interval of gy f-g Slt with some ill-def b/g fg Gw in places as fractured & gy Slt infilling fractures & fg brecciated Gw clasts. To the base interval more highly laminated & pale gy & gy bk tbd Slt, somewhat contorted by slumping along bedding plains & small scale tear fts.		Veining mostly & occasional qtz±Ca veinlet, & minor vein development sub// to 30° to CA.	v. minor Py & Po sporadically distributed				laminations of Slt ⇒ So @ 15° to CA.	
300.1 - 300.5			bk Mst	An interval dominated by bkg Mst & vertically featureless though minor wispy bk & gy Slt layers. 300.2 - 300.22 narrow band of gy Slt & minor gy Slt clasts 1-2cm & qtz slightly mineralised along the uphole margin		Moderately strong vein development @ 20, 25 & 65° to CA with some qtz Py veining @ 25° cut by Ca veins @ 65° to CA. Also irregular spots & wavy veins irregularly distributed	An apparent disseminated min occurs along the uphole margin of the Slt & some Py, slightly sp?, cp?				gy Slt band @ 300.2m ⇒ bedding @ 15° to CA	
300.5 - 301.7			gyj-Py Gw	A fine gy gn Slt tends to gy Slt downhole in places tends to f-g Gw 300.5 - 300.7 intensely qtz veined gy Slt & part of sporadically veined Py 300.7 - 300.75 300.75 - 301.7 gn Slt ⇒ gy Slt & sporadic veining & some fracture infill by bk Slt.		10-30° to base of interval.	v. minor py across an odd fracture.	@ 300.5m RLD = 146° Fai = 40°			CORE ORIENTATION AT 301.5m. Bedding contact @ 300.5 @ 40° to CA b/w bkmst & gy Slt.	

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121197

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
301·7 – 302·0			bk Mst	A somewhat contorted & mildly fractured bk Mst → Yb Mst downhole, intensely veined. Downhole subangular to ten upto 4cm occur enclosed in bk Mst Mtx: along ξ minor Py pods.		qtz veins developed at 70° & subparallel @ 60° but also as irregular spotty short veinlets & blebs sporadically distributed in places form network of anastomosing veins.	Minor Py pods also Py ± sp ?? @ 70° veinlets, ξ minor pods of py assoc ξ qtz.				fracture sub // to bor 4 to CA.	
302·0 – 302·2			gy slt & bk bk Mst	A somewhat contorted interval of pale gy – bk slt ibd ξ pale gy slt, 1° laminae commonly destroyed or distorted by slump compression, interbeds ξ rafts of laminated sed. enclosed in a Mtx of bk Mst. Minor narrow Py gn Gtz bands.		Minor qtz veinjgy @ 45 – 50° to CA.	Minor Py clasts also minor Py fringing assimilated slt clasts.				laminations @ 45° to CA: a possibility	
302·2 – 303·1			bk Mst ibd gy slt	A bk Mst ξ ibd gy slt => gy slt ibd bk Mst ie. abundance of Mst ↓ downhole. Also large Gtz clasts enclosed in bk Mst Mtx occur @ 302·45–302·6 Similarly large Mst clasts occur ξ in laminated Mst slt sequence @ 302·8–303·0		Irregular veinlets occur sporadically throughout @ 55, 60° & subparallel to CA also is a latch shart veinlets x cutting foliation or subparallel it.	Minor sedimentary Py occurs as narrow laminae // So.				A lamination @ 20 → 30° is implied by slt/Mst. Some small scale Flt dislocations of laminae @ 30° to CA.	
303·1 – 303·6			bk Mst ibd gy slt	A competent interval ξ abundant bk mst & lesser ibd gy slt ξ slt ↑ towards base, in places fine laminae ξ in Mst								

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
304	6		bk Mst grit	A polymictic unit ± gy slt gygr Ss, Py & bk Mst clasts in a bk Mst matrix. In places tends to a more massive bk Mst		with broad wh qtz veins @ 70-90° to CA cut in places by Cc vns, ± vns < 45° to CA & commonly subparallel thin tension veinlets.	Py clasts rimmed ± some assoc qtz/Ca in places.				Some fracturing ± carbonaceous py in places @ 30° to CA. ± min intense fracturing at 306.1m.	
306	2											
306.2			bk Mst	An interval of intensely fractured & fg piggy bk carbonaceous Mst ± areas of qtz/Ca veining.		broad qtz veins x cutting places or occur as large blebs Possibly @ 30° to CA but difficult to determine given the extent of fracturing.						
306.6			bk Mst ± Gg slt	A highly contorted almost breccia interval ± irregular shaped gy slt & laminated slt clasts enclosed in a matrix of bk Mst. In places 1° laminations highly contorted by slumping.		Irregular blebs of qtz & Cc occur throughout, but not true vns & lack any preferred orientation.	Minor Py blebs sporadically distributed.				Interval fractured ± numerous low ∠ fractures. 5, 15 & 30° to CA.	
307.7												
307.7			bk Mst	A massive bk Mst in places slightly polymictic ± silt, Mst, Py clasts in bk Mst, but essentially massive bk Mst ± minor wispy py & silty bands. Contact gy slt ± vns bk Mst @ 309.05-308.2m.		qtz ± Cc vns 30-60° to CA as broad 5-10mm vns x cutting minor irregular blebs occur elsewhere, particularly assoc ± gy slt 308.05-309.2m	Py blebs occur throughout the bk Mst. tend to be very coarse @ 309m possibly related to veining.				An intense qtz veined breccia 309-309.1m ± a network of vns containing b/w fragments.	
309.1												

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121199

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
309.1 – 319.2			bk Mst	An essentially massive bk carbonaceous Mst, in places some slump contortion evident, ± wavy gy slt bands in places a brecciated look ± selvedges of slt enclosed by bk Mst. In places mm fg. gy Sw as contorted micaceous interlayers ± Mst.		qtz ka vns as irregular tension gash infill blebs, also some irregular vns developed sub// to CA. 316.8-317.4m intense qtz ka/Py vein developed sub// to CA with sharp narrow qtz/ca vns @ 15, 40, 50° to CA. Minor irregular qtz vns occur throughout generally at low to to CA. Brecciation. qtz vns ± some unoc. brec. of slt also occur @ 20-25° to CA & at a high & to irregular vns @ 0-25° to CA. Irregular blebs & vns as spurts throughout, ± mm sharp narrow vns @ 45° to CA	In places Py bands & irregular clasts to subround fg pods.				Possible bedding ⇒ by slt laminae @ 55° to CA. 313.8-314.5 mm irregular vn & fracture ± mm carbonaceous proj. 315.3-315.5m core highly fractured ± no. of vn & fractures.	
319.2 – 321.1			bk Mst. ibd gy slt	A contorted interval of slumped bk carbonaceous Mst & ub, gy slt. In places selvedges or rafts of Sw + slt occur wrapped by Mst. Domains of slt ⇒ fg gy Sw. Sel. Py occurs throughout. some brec. zones ± ub quartz enclosing selvedges of slt.			Py occurs throughout as fine Py laminae, now somewhat distorted by slump folding. Also larger isolated masses both as sel. Py clasts, but possibly some 2° Py.	massive				
321.1 – 322.0			gy gn Sw	An interval dominated by gy gn Sw ± selvedges and bands of gy bk Mst, ± areas of brec. gy Sw & lithic slt Sw enclosed by fg Sw.			Spotty blebs of Py occur sporadically throughout 2-10mm. with Py more abundant 321.7-322.0.					

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
323 – 325.1			bk Mst ibd gy slt	Irregularly bedded & somewhat contorted bk carbonaceous Mst with ibd gy Slt, ± minor ibd v.gy f.g Cb.Cw In places irregular Slt/Mst laminae ⇒ semblance of so but generally highly contorted & slumped appearance (Mst: Slt = 2:1)		1 irregular blebs of qtz ± some veining, sub // to So also some developed @ low & to CA along ± scattered isolated irregular blebs.	In places fine Py laminae, & Py bands, along ± irregular blebs of Py possibly eroded Sed Py laminae.				Possible bedding foliation @ 322.5m @ 45° to CA. At 324.7m Py laminae ⇒ Possible So = 35° to CA At 329.9m minor Flt dislocation @ 20° to CA.
325.1 – 326.9			gy Slt ibd bk Mst	Highly contorted, slumbed in places brecciated interval ± rafts of Mst in Slt & visa-versa. 1° laminae highly contorted. Similar to preceding interval but more contorted & ↑ed abundance of gy Slt. (Slt: Mst ≈ 2:1)		qtz vns irregular & wavy sub // to CA, along ± short irregular veinlets & scattered blebs Minor qtz/Cb vns @ 45° to CA @ 326.6m.	Minor ± scattered blebs & rafts of Sed Py also occur.					
326.9 – 329.05			gy slt ibd bk Mst	Pale – dk gy Slt ibd bk carbonaceous Mst, ↑ in dominance of Slt over Mst of (3:1). With Mst as narrow 1 – 50mm but generally irregular often discontinuous as rafts or selvedges ⊂ in Slt. Contacts irregular ⇒ a degree of slumping & contortion evidence possible fine 1° laminae are disturbed, or occur as redeposited rafts.		An anastomosing network of fine vns <0.5mm occur throughout appear to be narrow qtz vns, but possibly some remobilised Slt?	Minor blebs of redeposited sed Py clasts.				? bedding dip 45–50° to CA ⇒ by poorly preserved 1° laminae

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121201

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
328.65 – 329.5			gy Slt	An interval of massive gy Slt in places fine laminae of dk Mst occur, also irregular bk Mst bands.		Fine irregular anastomosing network of qtz vns occurs throughout along & more regular vns @ 35, 40, 45 & 50° to CA.	Minor clasts of sed Py occur & bk Mst bands.				Fine Mst laminae ⇒ 76 @ 50° to CA @ 329.35m.	
329.5 – 330			gy Slt	A massive gy Slt interval disrupted by large rafts of massive → lam. bk Mst, & some distortion & interfingering of Mst & Slt		Fine network of anastomosing qtz vns throughout.						
330 – 330.9			gy Slt & bk Mst	an irregular bedded somewhat distorted slump beds of gy Slt & bk carbonaceous Mst & some interfingering of units & in places residual finely lam. beds.		Narrow 0.5-1.5cm qtz vns occur sub ⊥ to CA & tension splits off the main set at 60-65° to CA as short veinlets. Minor displacements along vn set sub ⊥ to low & to CA.	Minor sed py clasts.				The somewhat irregular beds ⇒ So @ 45-50° to CA	
330.9 – 331.6			bk Mst	Interval of massive bk Mst & some narrow ilbd beds of gy Slt, Narrow Slt laminae 2-10mm are generally contorted by slumping and in places show evidence of small scale fault dislocations.		Veining minor & qtz blebs irregularly scattered & narrow veinlets sub ⊥ to CA & @ 45 & 70° to CA.	Minor Py mainly as clasts, small discontinuous laminated masses assoc. & bk Mst laminae.	@ 332.19 R.L.D = 337° Fol^n = 45-50° @ 331.5m R.L.D = 328° Fol^n = 35°			Minor fg. pug on fracture @ 50° to CA 331.4m. Possible Slt lamina ⇒ & in bk Mst @ 39° to CA. CORE ORIENTATION AT 331.5m.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
331.6	4		ggSlt ± bk ggbk Mst	An interval dominated by ggSlt & gr ggSst ± tbd gy bk Mst. In places fine laminae ± bk Mst possibly defining 1° laminations or crossbedding as at angle to bedding planes. But some soft sed def'n has disturbed the 1° bedding, as bed interfingers & in places wedge out & are offset by small scale ft dislocations		Irregular qtz vns occur throughout along ± scattered blebs, in places minor offsets occur along vns. Also narrow regular vns @ 10 & 60° to CA.	In places fine Py laminae depict x-bedding or fine scale bedding laminae.				Fine scale laminae @ 25° to CA, ± what now appears to be bedding surface @ 45-50° to CA.	
332.4	4		bk Mst	A bk carbonaceous Mst ± fine Py & Slt laminae in places ± some dislocation of laminae through slump faulting		Minor irregular narrow qtz vns, ± a network of short veinlets developed down hole.	fine Py laminae occur throughout.				laminations defined by Py & Slt @ 50-60° to CA.	
332.8	4		ggSlt ± bk bk Mst	A somewhat carbonated ggSst ± bk Mst interval ± Slt & gr sed balls in places wrapped by Mst & Slt, downhole turns to Y. breccia ± ± numerous subangular - subrounded Slt, gr, Mst clasts in a Slt/Mst matrix with fine stockwork network of Slt veinlets downhole.		Minor irregular qtz veins developed.	blebs to rounded clasts of Py occur scattered throughout.				layering highly carbonated ± interlayering Slt / Mst.	
333.6												

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121203

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
333.8 – 334.05			bk Mst	A fg-mg. Col/Gn → ggn slt → bk Mst → gy finely laminated Slt → massive bk Mst fine Py laminae & cmt laminae in fine Slt & Py flecks throughout massive Mst.							A generally fining downwards sequence but & clear breaks b/c facies. Fine laminae of mst & py @ 35° to CA.	
334.05 – 334.35			bk Mst & gy slt	Highly contorted bk Mst & gy Slt, & interfingering layers, that become highly contorted by slump folding down hole, to pt clasts have been deformed & rotated to subll to CA & inferred bedding @ 40° to CA.		qtz veins & down hole & large irregular blebs & irregular veinlets	Py blebs & irregular laminae along slt/Mst contacts. With Py & down hole & large blebs (clasts?) & rexHost Py laminae.					
334.35 – 335.95			bk carbonaceous Mst & gy slt → Gw	Dominantly massive bk carbonaceous Mst & minor bk gy Slt → Gw bands. In places some small scale slump distortions & selvedges of Mst & Slt & Slt in Mst. Some interfingering & irregularity to bd surfaces through slumping. (Mst : Slt = 7:1)		Sporadic irregular qtz veins throughout & minor regular veins @ 100°/90°	Minor fg rexHost Py aggregates scattered grns & slt, also minor py aggregates & some of the irregular qtz veins.				Fine scale laminae → bedding @ 50° to CA. Possibly shallow 50 → 45° to base of interval.	

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121204

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
336.95 – 337.4			bk Mst	Predominately massive bk carboneceous Mst ± irregular gy silt layers, in places highly contorted + slumped. Minor rafts of fam silt enclosed by Mst.		Irregular qtz vns 1–3mm developed subll to CA. With equal qtz vns @ 35 & 70° to CA.	In places irregular py laminae, in places contorted by slumping. In places irregular subrounded py clasts, ± some fracture vns developed at ⊥ to regular vns @ 30° to CA.					
337.9 – 341.1			bk Mst	A massive bk Mst cut in places by py silt, ggy silt & gn Gw bands, 340.7–341.1. Also Py silt rafts. Also 339.2 – 339.5, massive 339.3 gy – bk silt ± band downhole. Also some Gw, silt balls wrapped by Mst.		Minor narrow vns @ 25° to CA @ 337.7, with further vns @ 35, 65, 75° to CA. Minor irregular veinlets sporadically throughout.	Irregular blebs & subrounded py clasts occur throughout, along ± fine Py silt bands & Py clasts ± some fine Py laminae.				Py & silt laminae => a bedding at 25° to CA.	
341.6 – 342.6			bk Mst	Essentially massive bk Mst cut by irregular slump deformed silt layers, ± irregular silt selvedges in places. In places layers interfingering.		v. minor scattered 2% blebs sporadically throughout ± short veinlets emanating from blebs. With an abundance of qtz vns 342.55 – 342.6m ± vns @ 35, 50° to CA ± a network of cm vns crossing fractures.	Py layers similarly deformed, ± small transfer & slump interfingering, also scattered py clasts.				Minor background 341.4 – 341.5, ± bxi & fracture & fractures subll to CA & @ 35° to CA. minor py arms ± fractures	
342.6 – 343.25			ggy gn Gw	A gy to bk Gw => ggy gn silt, cut in places by fg gybk silt.		qtz veins more numerous downhole, ± fine irregular veinlets giving way to more regular 1–2mm vns @ 20, 25, 35° to CA					bk Mst band @ 35° to CA => so but fine Si in laminae @ 65° to CA	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
343.25			bk Mst ± w gy Slt	A highly contorted bk Mst ± contorted thd layers of gy Slt, ± irregular bands delineated of Slt defined by Mst.		V. minor sporadic short qtz blebs ± veinlets.	Py clasts & disrupted Py bands also occur, commonly ± fine Py layers lining boundaries to Slt/Mst contacts					
345.0												
345 -												
345.3m			bk Mst	A more massive bk Mst interval, ± minor Slt bands ± gy Slt contorted @ 345.3 - 345.4m.		Minor qtz vns @ 10° & 45° to CA.	Fragmental or Py clasts throughout as scattered 1-2mm blebs ± in Mst. ± minor Py bands.				with bedding @ 55° to CA ⇒ by Slt & Py laminae.	
345.7			bk Mst ± w gy Slt	A highly contorted bk Mst ± irregular layers & interlayering gy Slt bands & disrupted fine laminae. (as at 343.25 → 345m)								
346.0						Minor irregular qtz blebs ± some short veinlets.					Possible bedding @ 35° to CA ⇒ by Slt bands?	
346.0			gy gr GW	A massive fg gy gr Co GW ± v. minor bk Mst flecks cut in places by narrow gy Slt bands.		With minor regular 1-2mm qtz veins @ 45 & 25° to CA.						
346.7											Possible bedding laminations @ 60° to CA	
346.7			gy Slt	A highly contorted interval of pale to dk gy Slt, ± 10 laminations highly distorted by slumping & resultant slump folds & small scale Slt dislocations. In places laminae are rafted off.		Minor irregular veinlets poorly developed at 0 - 35° to CA.						
347.5												

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
347.5			gn gy Gw	A massive gn → gy Co. Gw c mnr Mst flecks + c mnr silty bands towards base.		c irregular q/z veinlets, sporadically throughout but more prevalent towards base. c mnr more regular un directed @ 30° to CA.	v. mnr Py veinlets + wisps base, also c mnr blebs.					
347.9			bk Mst : Ld gy slt	Again highly contorted layers of pale - dk gy slt interbedded c bk carbonaceous Mst, c layers highly irregular interlayering + pinching out, c Yb appearance towards lb base		v. mnr irregular q/z veining.	irregular reefing Py bands, c some Py along contacts b/c Mst/slt.					
348.2			bk Mst	c gy slt + bk Mst clasts in a fine mud matrix. Essentially massive bk carbonaceous Mst, c mnr lbl laminated gy slt + in places irregular slt bands, some breccia of slt + infillings of Mst. More contorted + slumped slt c Mst towards the base of the interval, c appearance of fine irregular veinlets + narrow q/z veinlets	Mnr narrow ons subpll to CA, c some torsion. Ltl vns, + off shoot veinlets. sporadically occurring	Abundant Py also throughout as scattered clasts c in Mst c Tex c in slt bands in places from fine laminae. less Py down hole					
350.8			bk Mst Ld gy Gw	A bk carbonaceous Mst weakly laminated, c pale gn slt interlaminations + veinlets. With some contortion of Gw/Mst contacts also. (Mst: Gw = 2:1)		Irregular q/z blebs infilling tension gashes + some veining @ 30 - 40° to CA + also @ 90° to CA	c clasts + mnr massive zones c c 10% c fine Py					
351.6							30.85-350					

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
351.6			gr GW	AN interval dominated by massive f-g gr GW (Fd, mt Fd) Thin GW is cut in places by gy bk Mst bands. In places some slump contortion of GW/Mst contacts. Also some brec. of fgy Mst ± mud infills.		Minor qtz blebs infilling tension breaks, also vns @ 15 ± 30° to CA Also some irregular scattered short veinlets	In place v.fg Py occurs dissem. throughout fg Slt. Also coarser recrystd Py as blebs in Mst.					
354.1			gy Slt ± bk Mst	A contorted slt/Mst ± GW interval ± slump deformed contacts, selvedges striped ± inclusions of slt in surrounding mtx of slt in Mst vice-versa.		Tension vns developed @ 15° to CA @ a high ∠ to inferred fol'n ± some short veinlets developed sub // to fol'n	Minor fg Py dissem. in Mst.	Some of the gy Slt shows evidence of swelling ± a scattered clay pug now developed			Possible bedding @ 35° to CA ⇒ by Slt/Mst contacts?	
355.0			bk Mst	A highly contorted interval dominately of bk carbonaceous Mst, ± gy Slt bands and in places rounded to angular clasts or rafts of slt ± Mst, producing a somewhat brecciated look. Dominately bk Mst ± some gy Slt → GW clasts fm 357 - 358m.		Qtz veining in core 3553 - 355.7m. producing a brec GW from 355.3-355.5 ± some angular rafts of Mst. As VNI became more regular, veining @ 20°-0° to CA can be recognised ± on contouring network of vns.	blebs of py ± fine laminae ± narrow bands sporadically throughout				Downhole veining appears more irregular ± that fine veinlets sub // to CA & as a scattery network. Downhole possibly some fine gy silty vns ± some assoc. Py ± some scattery tension infill qtz at high ∠ to inferred laminae @ 25-30° to CA. CORE ORIENTATION @ 358.5m. Fine Slt & Py laminae @ 42° to CA 360.3m with slump deformed contacts @ 30° to CA	
358.0			bk Mst	A bk carbonaceous Mst ± some blk gy Slt, in places dominated by Slt, in places fine laminae, also ⇒ more massive bk Mst. Contacts generally irregular as		Scattered qtz blebs & short tension infill vns in places networks of fine vns.	Minor magnetite subrounded ex in py clasts & some in Mst ± fine recrystd laminae ± places	@ 358.7m R.L.D = 25 Fol'n = 25°				

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DEPTH	DRILL RUNS	CORE LOSS	ROCK NAME	DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
				a result of slumping with small scale slump folds, & F/L dislocations.		At 361.8m mm vein of qtz @ 27° to CA. 362.2 m an interesting [illegible]/siderite? breccia vn occurs, c [illegible]/sd fragments regular angular fragments dispersed in a mtx of bk Mst. Developed @ 12° to CA, c some pug through along vn surfaces where fractured. Some fine rexllised py assoc c mtx.	Also fine dissem. py c silty bands. gl, sp ± py mi assoc c sid. vn @ 362.9m.	At 360.6 fine silt & prexllised [illegible] py laminae @ 30° to CA ⇒ So.			362.9m a broad vn 2-3cm is developed @ 7° to CA. Again [illegible]/sd. c wedges of bk Mst incorporated. Also coarse gl, sp ± py blebs subll to vn. With fractures @ low ∢ often py lined subll to vns, c high ∢ 70° to CA x fractures often lined c narrow qtz/sid veinlets.	
363.5 - 366.0			gy Slt and bk Mst	Downhole trends from bk Mst c narrow gy Slt bands to gy Slt c narrow bk Mst bands. Laminae irregular through slump distortion. Also fine wispy qtz veinlets forming an anastomosing network esp. through dominantly silty interval.		With some py assoc c irregular [illegible] vn network @ 364.4m. With minor scattered qtz veinlets throughout. Minor irregular qtz/cc vns & blebs throughout. Some veining subll to CA [illegible]	Minor fg. dissem. py assoc c silty clasts also as rexllised [illegible] clasts [illegible] c silty laminae				But a foliation @ 35-40° to CA can be ⇒ to indicate So ⇒ 45° to CA to base of interval.	
366.0 - 368.7			bk Mst	A contorted bk [illegible] mst c sporadic pale gy bk Mst → Slt areas irregularly distributed by slump distortion. Also minor interbedded gy Slt [illegible] Co. Gw [illegible]		Sporadic fine qtz vns + veinlets occur throughout [illegible] subll to CA but also forming an irregular [illegible] network	Subrounded, fg. py clasts occur throughout				A sense of bedding is inferred at 40-45° to CA? from [illegible]	

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368.7			gy Slt	A massive gybk Slt, in places shows evidence of brecciation & infills of bk mst & also has irregular laminations through slump bed contacts Mst 368.7-368.8m.		Cut by fine K 3.5-1.5-0.5 Vn @ 55° to CA.						
369.2												
369.2			bk Mst	A generally massive bk carbonaceous Mst & irregular paler gy Mst → Slt clasts or layers defined by slump def'n.		Fine wispy py in sediment & cgs → ca. Irregular veins & veinlets also some quartz & ca.	Mins blebs of Py sporadically disseminated.				With possible fine Slt bands & 20° to CA → 75°.	
370.5			bk Mst: bd gy Slt ibd Yb.	A highly variable interval of gy Slt & contorted ibd gy Slt 370.3-370.5, passes to Yb & clasts of Y gn Slt, gy Slt bk Mst in gy Slt mtx 370.5-370.6 m then passes to gy Slt: ibd & contorted laminae 370.6-370.7 then into Y.b & gy Slt, py gy Slt & bk Mst clasts in fg. gy Slt mtx. & some wispy Py & py fragments, some evidence of slump contortion 370.7-373.3 dominately bk Mst &		Fine wispy py & cgs → ca. & some veinlets & ca.	Py patches in Slt 370.4-370.5. Py clasts & Yb. Mins large Py clasts & fine wispy Py in bk Mst.			At 371.3m possibly graded bedding ⇒ fining down hole, from Slt & large clasts to fine Slty layer. A clear bedding laminae ⇒ bedding @ 45-50° to c.a.	
373.3												

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
				gy Slt, ± gy Slt ting downhole, ± areas showing fine laminations. With main bands of Yb @ 371·8 – 371·9. & 373·05-373·2m ± gy blk silty mtx to gy slt to gy Qtzite, wh qtz, ylgn. Slt & possibly dol.? Clasts. With dominately blk Slt & gy Slt clasts over the basal polymict interval.	With irregular wh qtz blebs towards base of interval.						
373·3 – 373·65			grey GW	A massive f.g. GW ± possible very fine fol. & irregular network of Slt lined uns ± minor qtz uns @ 30° to CA. With massive gy qtz vn → Qtzite 373·55-373·65m ± xcutting wh qtz uns @ 30 & 70° to CA.								
373·65 – 374·5			Y. b	A Yb ± clasts angular to subrounded & varying from 5·1cm to 1·2mm all in a gy blk silty mtx to Clasts of gy Slt to gy blk Slt gy Qtzite, py & ylgn Slt		With wh Qtz veining irregular often in Rotty b/w fractured fragments ± some uns @ 45° & 0° to CA in larger clasts.	Minor Py clasts 2-6mm, generally more prevalent over base of interval 374 – 374·5m.					

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
374.5			ggslt ⇒ bk Mst	An interval ± lge gg - pale gg slt & Lst clasts ± as mtx of bk Yb Mst. Passes downhole into more massive bk carbonaceous Mst which is cut by irregular gg slt bands or ± as elvelopes of gg slt.		Minor qtz veins at 55° to CA, ± small scale veinlets emanate from main veins both in gg slt network of fine qtz veins developing ± some regular vns @ 15°, 25° to CA. Minor irregular qtz vns along ± stylolites in Lst clasts in Yb	Minor Py ± in stylolite fractures in Lst @ 374.6				Minor fracturing lined by graph @ 55° to CA.	
375.4			Yb	A polymictic breccia ± gg silty mtx in places tends to a more layered gg slt ibd bk Mst, but throughout has clasts of bk Mst, gg slt, fggg's, fggslt, gr Co. GW.		Minor irregular narrow qtz veinlets sub ll to foliation often irregular as they follow irregular somewhat slumped slt/Mst or pass along grain boundaries. Many regular narrow vns @ 20° to CA.		At 375.4 a qtz slickenside fracture @ 55° to CA			Clasts & ill ordered ⇒ foliation that may indicate So @ 35-40° to CA. MAY BE ABLE TO ORIENTATE SLICKENSLIDES FROM C.O. @ 382m	
377.6			gggn - pkbn Lst	A narrow Lst interval ± some irregular qtz vn development ± some irregular fracture fills by gg slt, with some irregular narrow vns developed		Minor wh qtz vn development sub ll to CA & @ 25° to CA with wh/gy irregular qtz infilling possible [illegible] Cont in next core tray						
378.8												

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379.1			Yb ; bd gyst Mst	A gygn Yb dominates ± pale gy gyst, bk Mst, Colour gy/gn/bw clasts 1–20mm somewhat contorted ± short wispy irregular bands, deformed by stamping. Ibd ± Yb are gy-bk Mst in places contorted ± lam. clasts & irregular gy/st, bk Mst clasts. From 379.8–381.2 Yb ± bk mst, gy/slt, gy/st clasts & irregular deformed bands.		Network of anastomosing fine qtz vns throughout bk Mst. With minor vns @ 20° to CA, bdrk 1–2cm ± 2–10cm rubbly texture qtz vns.					Foliation indicated by alignment of clasts @ 30–35° to CA. @ 381.0m. At 381.3 R.L.D = 292° Foln = 40° to CA. CORE ORIENTATION @ 382.5. Some zone of foliation @ 40° to CA, can be defined by slt/Mst bands & alignment of clasts.	
381.2												
382.65			gy/slt ibd bk Mst	A highly contorted interval of pale gy/slt & minor bk Mst bands ± clasts or selvedges of bk mst & rafts of mst wrapped by slt. With massive bk Mst, ± some slt contortions 381.2–381.3m. With some recrystallised py areas ± large slt clast @ 381.8m. Massive gy Mst 381.95–382.05. With bk Mst 382.05–382.15m. ± some slt bands in contorted Mst.		Minor qtz py vn @ 30° to CA, also minor veining subparallel to CA. Recrystallised fine-banded? py pyrite bands & clasts @ 381.9m. With fine-grained py ± slt from 382.05–382.2.	Intense wk qtz blebs, minor irregular veinlets @ 382.60m. With minor areas py clasts.					
382.65			gy/gn Ss	An essentially massive Co. Gm ± v. minor lithic clast in places ± irregular bk Mst bands & minor areas gy/slt.		Irregular blebs of qtz sporadically throughout ± some alignment // to CA @ low & bdrk.	Minor py blebs areas. ± Mst.					
383.0												

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOSS	REMARKS	DEPTH
383.0 – 384.8			bk Mst	Essentially massive bk Mst ± minor bd gy-pale gy Slt, ± min Co.GW bands in places bands are contorted. Fm 384.5-384.8m some gy pvg & graph. ± fractures @ 30 & 50° to CA.		Pvg with wh q blebs & stockpowder wisplets occasionally throughout. With minor regular ns @ 60° & 35° to CA ± minor ns & ll to CA, with narrow wisplets @ 40° to CA ± anastomosing network pink wisplets throughout Mst.	Py clasts occur throughout the Mst ± possible rexilined fenestral py throughout, ± minor banding in places.				With fol^ @ 30-35° to CA => Sa from gys & Sz/ bk Mst ibd.	
384.8 – 385.5			gysIt	Massive gysIt ± v. minor bk Mst bands & occas gy Co.GW clasts.		With minor irregular blebs of Ca ± some assoc py and in places gysIt pvg with an irregular network of fine vns. Mst same vns @ 20-30° to CA.					With minor fracturing @ 30-35° to CA ± pvg lining.	
385.5 – 386.8			gy bk Mst	Dominately gy bk Mst ± minor areas of contorted bk Mst, gysIt ± gy Co.GW (poorly sil Lst) in places gy Qtz vnlt ± minor Y bands.		A mass of irregular qtz/ca ± py clasts with minor regular qtz vns @ 35°-40° ± bull to CA to @. Also minor irregular short veinlets	v. Minor irregular py blebs.				With lamanae @ 30-35° to CA => So.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
386·8 – 388·3			bk Mst, ± Py	bk Carbonaceous Mst ± clasts throughout ± gy Lst, gy Slt, gn Cgl clasts - py clasts sporadic throughout to give an impression of Massive Mst, ± Py. With minor gy Slt bands ± in Mst.		Minor Cc vns @ 20° to CA ± irregular qtz veinlets sporadically throughout. With ↑ in Cc vns downhole, ± numerous irregular vns, ± are brecciated @ 388·15m.	fine disem py in places recrystallised. no deformation, angular py clasts ± minor disem. py grains.					
388·3 – 389·9			bk Mst	Massive bk Mst ± minor gy Slt bands ⇒ to massive gy Slt downhole.		Irregular qtz/Cc vns occur sporadically throughout ± vns 1-2cm from 388·3 - 389·0 ± finer qtz vns reduced from 389-389·9. with Cc, sl dk qtz veinlets well developed 388·2 – 388·1m.	Minor clasts + irregular veinlets of py. minor py overgrowths.				Py laminae + Slt laminae ⇒ bedding @ 30° to CA. With low ∠ fracturing + py development @ 20-40° to CA from 388·5 - 388·8m.	
389·9 – 392·1			gy Slt + bk Mst	Massive bk carbonaceous Mst ± gy Slt / bk Mst bands. In places occasional clasts of Slt, some interlayering of Slt/Mst bands.		With irregular qtz vns throughout a ± network, ± tension infill vns.	With py bands & occasional blebs of recrystallised framboidal py blebs. ± py throughout				Slt/Mst, py bands @ 30-35° to CA. Minor low ∠ fracturing 391·6 - 391·7m @ low ∠ to CA.	

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392	2	1	Yb → bk Mst	A Yb ± gy slt, py/gy qtz bk Mst, slt (lithics) ± a bk Mst Mtx also ± py clasts with bk Mst ± some gy slt laminae + Yb bands of slt + py.		Minor se blebs + qtz @ 392.2m ± minor irregular qtz vn networks @ 392.5 - 392.75m.	Py clasts ↑ down bk, ± py bands.					
392.75			wh gy - rd slt	A sharp Δ in rock colour wh gy gn - rd br variably banded slt. In places laminated with gy slt ± bk Mst selvedges + irregular bands from 392.75 - 393.1m with gn gy - rd pk br slt laminated 393.1 - 393.3m. 393.3 - 393.7 wh rd br massive slt ± gy slt bands 393.7 - 394.0 gy slt ± minor rd br partially oxidised? py 394 - 394.9 wh slt + rd br bands ± some py. Minor gn selvedges to base.		V. minor irregular Ca/sd vns sporadically developed.	Minor py ± gy slt @ 393.35m. 393.7 - 394.0m rd br bands ± fg Hmt after py? ± py rexllsd pg grains. Scattered py 394 - 394.9.			Fol^n of slt bands @ 393.2 @ 45° to CA. 45-55° to CA @ 393.6m. Py fol^n @ 65° to CA @ 393.7 - 394.0.	
394.9			gy/wh - rd slt	A finely laminated gy wh slt ± rd br fine laminae. From 395.75 - 396.1m gy gn slt massive, cut by minor Ca vns. ± gy slt → Mst to base. Rd/br bands ⇒ oxidation ± gy gn bands more reduced beds		Minor irregular Ca vns subpll to CA as short veinlets. ± minor veins @ 65° to CA.	V. minor framboids? of rexllsd py sporadically distributed as clusters of isolated py grains.				Rd/br laminae @ 35-40° to CA. banding tends to 50-55° to CA @ 395.1m.	
396.1												

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396.1 – 396.9			gy Lst	rd br pte → gy Lst weakly Stylolitised & numerous irregular network of 0.2 – 10mm vns of qtz/Ca V. minor gy silt band. 396.75 – 396.8m.		35, 40, 45, 70° to CA vns & numerous irregular network of qtz/Ca vns.						
396.9 – 397.8			Yb silt	A variable interval & gy gn silt & Yb bands & rd br silt & gy Lst & gy gn silt, gy qtz clasts in gy gn gy silt mtx & pale yl silt rafts in places. A reduced silt band.		Minor blebs of wh qtz throughout & mm veining.					Fol'n of silt @ 55° to CA.	
397.8 – 398.4			rd br dol?	Possibly silicified? oxidised rd br Lst → dol cut by numerous wh qtz vns & Ca vns.		Numerous wh qtz & Ca vns irregularly developed throughout, & some regular vns @ 40 & 60° to CA.					Fol'n @ 40° to CA.	
398.4 – 399.0			gy gn yl silt → Yb	398.4 – 398.6m reduced gy gn silt & minor f.g rd & pale gy silt bands @ 55° to CA. Tends to Yb downhole & fine rd br gn & buff gy silt Lo.? clasts & coarser gy bands Tod & then				Minor Small Scale silt dislocations of bnds @ 398.9m.			As coarsens downhole ⇒ possible uphole facing. Fol'n 55-60-55° to CA over interval.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
399.0 – 400.5			gy grn SLt → Pg Ss/Cg	↑ gy grn SLt → rd Pg Ss downhole ± some assoc. ± Carbonate ± Ss which becomes gl gn downhole. Fg Ss Py, chloritic fragments in fine mtx.		Minor Ca VNS @ 15° to CA. ± further narrow VNS sub// to CA. with minor veinlets at 70° CA from 399 – 399.3m.	Minor rafts of Py grains, ± fine Py x'ls ↑ downhole.				Fol'n at 60° to CA.	
400.5 – 401.7			gr gy wh SLt → Yb or grit.	Downhole the sequence coarsens from fine SLt ± fine gl wh SLt + gy bk SLt flecks ± v. fine SLty mtx. ± occasional gy to Pg rich clasts possibly on vesicle infills. Downhole Y grit ± gy gy SLt, gy Qtz, gl wh SLt, pk to Rh? all ± fine whgl SLty mtx! Also minor sbl fine SLt. Wisps wh, gy fine SLt ± wh, gl SLt clasts to base.			In places minor Py banding.				Fol'n @ 35° to CA. Fining uphole sequence → facing uphole.	
401.7 – 404.3			gy bk Mst in Yb	Downhole a variable interbedded sequence of gy ± bk Mst ± Yb. 401.7 – 401.9m gy → dgy Mst tending to grit in places ± gy SLt, gr gy to dgy SLt clasts in f-g SLt mtx. 401.9 – 402.2 a Yb. ± an abundance of clasts including gy Qtz, bk Mst, gy SLt, gy gy Ca-Cem f-g Py throughout, gy SLt matrix 402.2 – 402.35 gy fine SLt/Mst ± minor dark SLt ± bk Mst, gy SLt ± gy Qtz clasts ± fine Sd/Cg beds + Py clasts throughout		V. minor irregular Qtz veining developed both ± in clasts + fringing them.	F-g Py 401.7-402.2 seems to be recrystallised + overprint both clasts + mtx.				Fol'n/foln alignment of R clasts @ 45° to CA.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
				402.35 - 402.45 gy Qtz clast ± sme ± fg vn + bk inclusion trails 402.45 - 402.65m gy bk slt ± occasional gl/gy Qtz clast, bk Mst flecks. 402.45 - 402.65 massive bk carbonaceous Mst ± sme gy slt ± ubgy gtz clast. 402.65 - 403.5 gy slt ± subrounded Qtz clasts irregular disposed throughout along ± vnlts 1-5mm gy/bk slt clasts. In places gy slt → gy clast 403.5 - 404.3 gy slt → gy/bk Mst ± bk Mst pale gy Slt clast throughout, with some laminate in places. 403.7-404m before → Yb 403.8 - 404.3 c Py, bk Mst, gy/bk gy slt clasts in gritty slt mtx.		Minor Ca vn xcut CA, ± irregular vns ± sme Mn @ 10 + 20°. Minor Ca vns ± slt. 402.65-403.5m Causing some brec. to slt. ± veining more intense on Qtz clasts.	anastomosing veinlets + blebs of pyrrhotite. Py occurs throughout. Py clasts, blebs + shrt bleb extensions occur throughout from 403.8 - 404.3m.				laminations 25-30° to CA.	
404.3 - 405.1			gy-blgy Lst, heavily Stylolitised ± irregular Ca blebs + vns throughout. Minor gy slt bands @ 404.8m as Slt + Lst interlayers.	Minor py lining Stylolitic surfaces.		irregular Ca vns throughout.					
405.1 - 405.6			gy Ss → gy Yb slt.	405.1 - 405.3 gy slt → gy Ss placed downhole to Y slt grit ± bk Mst, gy slt clasts throughout.		A network of Ca vns irregularly developed throughout. Minor Ca vns in gy slt.	Py occurs as clasts + irregular blebs + laminae throughout, slt interval.					

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
405.4 – 405.75			gy Lst	A narrow horizon of gy Lst, intensely stylolitised & irregular Ca/qtz veins throughout		No pattern to veining due to cross-cutting veins in fills.						
405.75 – 406.9			gy Slt	Massive gy Slt in places tends to be carbonaceous Mst from 406.2 – 406.5m. fine laminae throughout Slt. At 406.7m a gy/br Lst cuts half the core @		Minor irregular qtz veins assoc. with Mst. Some irregular siderite veins at 406.5 – 406.6m.	Also minor py bands assoc. with Mst. Fine py along & thin silty bands define laminations in Slt.				At 406.4m some carbonaceous py laminations test 40 – 35° downhole.	
406.9 – 407.8			gy/gr Lst	An interval dominated by gy/br Lst & minor fine gy Slt interca'tions & Lst towards the base of the interval. Stylolites irregular though downhole ch ⇒ stylobedding		Irregular qtz & Ca veins occur throughout & some more regular veins @ 50–65° to CA.	In places minor py in fills along Stylolitic surfaces				Stylobedding @ 45° to CA.	
407.8 – 408.3			lam Slt	A v well laminated gy Slt & possibly some coarser gy qtzose layers, darker silty & py layers.		Minor irregular Ca/qtz vein spurts throughout	Minor fine py bands & laminae				laminations @ 40° to CA ⇒ 50.	
408.3 – 408.55			gy Lst	gy bl Lst & broad irregular Ca veins, pervasively stylolitic & semi regular stylolites ⇒ stylobedding		Irregular Ca veins in places subparallel to stylobedding @.					Stylobedding @ 45° to CA.	

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MOUNT MARGARET (BH)

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
408.55			gy lam Slt	A uniform gy-dk gy well laminated Slt in places min slump dep'n of lamrae, ± variable dk silty, felsic, py bands throughout.		With regular Ca vns @ 30, 60, 70° to CA, 1-2mm vns at high & to fol'n, ± minor irregular blebs. Irregular blebby ca/sd vns @ 419.9-420.1m.	Mica across bed py lamrae, in occasions resulted forming coarse 005°-15° py bbb alligned lamrae.	@ 418.9m R.L.D=246 Fol'n = 33° 64.4° → 043.5° @ R.L.D = 238 Fol'n = 240			laminated 35-40° 408.55 30-35 410.0 20° 411.5 20° 414.1 20° 415.5 35-40° 417 45° 419.2 50° 416.7m 40-45° 420 m CORE ORIENTATION @ 418.7m R.L.D = 227° ?? Fol'n = 50° to CA.. with lamrae 20-25° to CA @ 420.7m.	
420.1			p'y lgr gy Slt	A variably laminated p'y lgr gy Slt, ± minor darker gy Slt bands, & Slty carbonate lamrae. Minor low & fracture ± ankerite core @ 420.7m.		With broad irregular veins at high to 30° to CA most in base from 420.7 - 421.0m. Minor py/sd irregular vns @ 420.5m.						
421.0			gy lam. Slt	A similar uniform Slt as @ 408.55m. ± Py dk silty lamrae. Fol'n of Slty lamrae. 422.0m 5-10° to CA 423.3 10-15° to CA 424.2 Subll to CA. 426.2 10° to CA. 427.5 30° to CA 428.5 35° to CA 429.3 30-15° to CA 430 15° to CA 431.0 20° to CA.		Regular Ca/py vns throughout ± minor Ca vns Subll to CA @ 50° to CA 60, 70° to CA in places ±Sd+Py. Minor irregular	Minor py lamrae ± Ca vns ± to Cpy along lamrae. Minor ... assoc ± Sp ... @ 425.2m ...				From 421.4-422.4 Core somewhat broken ± some swelling clay ... @ 10° to CA @ 421.5m, ± minor fracturing 421.6-422.1 ± fractures @ 0-5° 65° to CA ...	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
				431.5m 25° to CA. Minor variation in S throughout							Core highly broken 430.9 – 431.4m by numerous local fractures	
431.8 – 432.3			gg lt to bk Mst.	A highly irregular + contorted gy slt to bk Mst. with 10/15 of gy arenaceous slt somewhat broken & isolated in matrix of bk Mst, ± interlayering of slt / Mst.		Minor sporadic qtz / Ca blebs & short veinlets ± minor qtz basin vns at 45 & 90° to CA ± some displaced along bedding planes positioning minor calcite vn at 20° to CA	Abundant rexlised Py throughout esp assoc ± bk Mst. both as isolated clasts also as rare Py.					
432.8 – 434.45			lam. gy slt	A gy laminated slt ± py & dk slt laminae, in places minor slump contortion interlayering of Mst / Slt. At 434.5-434.45m brec. Slt ± Ca/qtz vns infilling, ± wk qtz ± coarse 2° py vn assoc ± slt.		Ca/Sd vns @ 50-60° to CA ± v. minor assoc. gl. with irregular blebs of qtz. Sd vn network ± some assoc sp development from 434 – 434.5m	← minor gl ± Sd. Abundant Py both as fine laminae also as clasts or coarse aggs. ← sp ± Sd 434.45 2° py vn.				Laminations varies from 30 → 25° to CA towards base.	
434.45 – 437.3			gl gran – bk gy Lst	A variably rexllised & silicified Lst as varies from gl gy gy → bl gy Lst, Stylolites as an anastamosing network		Sharp wk qtz vns x-cut 30, 70-90° to CA as 3 – 5 mm bands, ± some [illegible]						

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
				434.45 - 434.[illegible] recrystallised gyb Lst ... Silicified Hand Lst minor Py intensely qtz veined, lesser ... 435.5		Ca vns also irregular open infilling cavities or as vn network.	Minor Py ± Cpy along stylolite surfaces or lining wh qtz vn surfaces. Within recrystallised mat occurs ± qtz/Cb on blebs & small veinlets.					
				434.[illegible] - 435.75 gyb Lst ± minor Py as stylolite accumulations & Ca/qtz vns.	435.75-437.3 513376							
				435.75 - 437.3 recrystallised Silicified Hand, intensely qtz & Ca veined and moderately well mineralised internally ± 1-2% Py, as massive blebs vein linings stylolite accumulations ± min most common from 435.75 - 436.1m.								
437.3												
438.35			Lst > Sd	Yellow/orange recrystallised Lst now dominately Sd. Intensely networked by Ca & lesser qtz veining with qtz vns.	437.3 - 438.35 513377	Intensely veined by broad irregular ... qtz vns 0.5-4cm often infilling cavities or vuggy @ 40-50° to CA. with Ca vns 1-3mm developed throughout with wavy regular vns @ 25, 40 to 60° to CA. also as vns running from ...	Minor spots of Sp @ 437.45m. & 437.5m ± Sp commonly on stylolite surfaces. Minor py blebs throughout generally ... ± wh qtz. ... @ 438.35 ... spotted.					

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	SAW ALTERATION ASSAY SAMPLE NO.	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
438.95			skar Lst → Sd	An interval of intensely qtz veined, recrystallised siliceous Lst, downhole finer, less veined & recrystallised & some stylolites r/c Lst features still evident from 440.2 – 441.6m.	438.95 – 441.6 513378	438.95 – 440.2m intense wk qtz vns & minor residual carbonaceous stylolitic laminae. Minor Ca vns occ w as low as 30–50° to CA & minor shear veinlets. From 440.2 – 441.6 wk qtz & minor py occurs as cavity infills & shear irregular vns & broad shear Ca vns at 20–30° to CA in places fringed by Sd.	Abundant Py assoc with qtz vns & as isolated blebs. With abundance of Py downhole. ← tuna py.					
441.6			gybl Lst	A gybl Lst & minor stylolites throughout with possible pale wh gl silt clasts & in Lst 451–452. & siderite Ca veined & qtz cavity infilled interval 444.3 – 444.6m		Numerous 1–5cm wk qtz vns & minor hairline fractures occurring from 30–80° to CA. minor gybl qtz vns & v. minor oil Sd vn. Abundant wh qtz Ca cavity infills, more so downhole. With strong 1–2mm Ca Sd vns & fracture fillings at 30–50° to CA.	V. minor scattered py grains most noticeable 444.3 – 444.6m.					
445.2			v/gygy → dolgybl	An interval essentially gybl Lst & some glauc silt clasts: 445.2 – 449.0m & minor stylolite laminae. & some small scale fracture infills qtz &							Essentially massive Siliceous Lst. Minor siderite veining @ 447.0 & 447.3m.	
452.1												

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION -454.0	STRUCTURE	BREAKDOWN	VISUAL LOG	REMARKS	DEPTH
453.1			wh, ppl/br rx Lst.	An interval of rexillised Lst now dominately siderite, coarsens down hole, ± minor residual patches of blgy lst @ 453.5m. cut in places by stylolites. Numerous cavity & small fracture veinlets of qtz.		Wh, gy qtz infills cavities from which fine qtz veinlets emanate.	At 453.8m a few grains of blk/br sp.					
454.2			blgy Lst	Massive blgy Lst ± some possible grn/wh silt or dolomitic silt clasts. In places minor rexillised siderite occurs.		Minor scattered blk & Sp blebs in places as an inclusion trail along Calcilised un.					Abundant whgy qtz infills cavities & small scale fractures ± 1-2cm un qtz vn @ 60° to CA @ 454.6m.	
454.8			rexillised siderite.	Possibly a former p.g. Lst replaced completely by arb rx Siderite. Minor grygn fg silt @ 456.2m ⇒ former lithology. Massive rx Sd, cut by numerous Ca vns, in places forming a Siderite breccia 457.8-458.1m. Also abundant wh ± bands. In places dk stylocumulates in	454.8-455.6 513379 456.46-457.45 456.45-457.45 rx dol. Sd, qtz ± Py 513380 457.45-458.05 baron rex Sd. Sd±qtz 513381 458.05-458.6 rx Sd, Py, stylons or stylocumulate. 513382	Abundant veins of wh qtz infilling cavities or forming vns @ 30 & 70° to CA. Ca vns xcut qtz & Sd, ± Ca vns @ 30, 45° to CA & subparallel CA also forming irregular veinlets & fractures in Sd breccias.	Py min's occur in assoc ± wh/gy qtz cavity infills & vns. ± Py commonly as fringe b/w qtz & Sd. Also Py as scattered blebs. V.r most min's 454.8-457.4 & 458.2-458.3m.					

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
458.5			Slt → gy Lst	A mixed interval ± gybk Mst ± ylgn/wn Slt, passes downhole in gyn dol. → Ss. and passes to gybl Lst with dk stylolites through Lst. with wh/gy irregular qtz vns with minor calcite vns in places.		Minor irregular qtz vns & minor Ca vns.	Py class ∓ occurs ∓ Slt, ± Py throughout the Lst. with minor sp blebs along vn surfaces.				Slt laminae @ 30-35° to CA from 458.5 - 458.6	
459.1			gygn Slt	A somewhat contorted gygn Slt, ± dk silty layers forming clasts to form a filmy vn like anastamosing network		With minor Ca vns @ 15° to CA.	Minor fine Py lining gy Slt stringers					
459.4												
461.0			gygn Slt	An unusual interval of massive gygn Slt blocked by glbr Slt fleckes. Downhole end, is partially fine gy Slt		With some irregular Ca qtz vns developed from 460.9 - 461.4	Fine Py assoc ± glbr gn Slt fleckes. In places strong veinlets ± gl, sp veinlets & blebs				S_0 = 42 → 106° Slt 30° to CA. Fol^n = 30° 460.5m Core Orientation. R.L.D = 315° laminations @ 30° to CA ⇒ S_0 Downhole 461.1m laminations 30° to CA	
461.3			gygbgy Slt	A highly contorted gy - gbgy Slt ± highly disrupted laminae, in places fractured off on right ± unbroken gy Slt. From 461.85 - 462.0m highly assoc. by wh Ca. vns passes to breccia ±		Irregular blebs & veinlets of Ca ∓ massive Ca Slt breccia V. minor vns of qtz developed	V. minor brec of gl assoc ± Ca. @ 463m. With associated py as blebs & lining laminae ∓ 461.7 - 461.9	✓ CD, vns ± sp, gl.				
463.9												

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C22

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
464.9			gy lam SH	A pronounced laminated throughout gy-dk gy SH cut by irregular Ca minor qtz ± py veins sub ∥ to CA. From 464.4m - 465.2m Core highly fractured broken by numerous low ∠ fractures ± some py lining fractures. 468 - 467.5m core slightly fractured by low ∠ fractures, ± minor silty pcg.		Ca/qtz veins 25, 55° ± sub ∥ to CA.	Minor irregular py blebs throughout ± some py ± qtz. Minor sp gl. py blebs ± Ca veins @ 20° to CA @ 469.8m. Minor py ∥ to laminae.				laminae @ 55 → 35 → 55 → 50° to CA as defined by py bands + dk lam.	
470.6			gy SH	A massive gy SH, in places brecciated ± Ca infilling fractures + fragments 471.2 - 471.3m minor low ∠ fractures ± minor py lining fractures in places minor fractured fragments, ± fractures @ 35, 55° to CA.		Irregular Ca veins throughout as fracture infill + minor irregular veins @ 30, 50° to CA. ± sub ∥ to CA. Minor Ca/qtz veins ± v. minor gl sp veins	Large py clusts, blebs throughout ± Minor sp. gl. blebs assoc ± Ca/qtz veins @ 20° to CA.				In places v. minor laminae @ 35° to CA	
473.6												
474.15			dk gy - py SH	dk gy - py SH sub ± some irregular lighter gy SH as irregular bands + SH with massive gy gy SH [illegible]			Minor py blebs assoc ± Ca veins.				Fol @ 40-45° to CA.	

Ca veins of variable ± py/SH

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
474·6			gy slt	pale gy slt, ± wh gy slt, ± dk bands, ± occasional py bands		Minor irregular wh qtz vns cause some brec. of slt. with minor regular vns developed @ 10, 20° to CA. ⊂ ∥ to laminae.	Minor Py bands, & clasts of py.				Well developed laminae @ 40-45° to CA.	
474·8												
479·8			dk gy slt	dk gy slt well laminated ± pale gy & dk gy bands		Ca vns @ 15, 20 25, 60, 65 regular narrow Ca/qtz vns to CA.	Minor py laminae along ± blebs & large rk py clasts from 477·3 - 476·8m.				laminations of dk slt @ 45° ⇒ 10° to CA downhole.	
477·3			gy slt → blk Mst	A finely laminated gy slt ± dk laminae ± py bands. Downhole bands to massive blk Mst ± fine p/gy silt laminae		With Ca/sd vns @ 5, 20°, 55° to CA ± some py assoc ± vns, also minor irregular qtz vns @ 45° to CA	v fine py laminae, ± coarse py clasts. & irregular vns. ± irregular py laminae ± contorted				laminae @ 15-50-75° to CA.	
479·7			gy slt	Predominately lam p/gy slt ± lod dk gy Mst, & blk Mst ± gn gy slt bands & gn chl slt bands commonly fringing Ca/sd vns.		v. thin qtz vns @ 30°-0° to CA, ± irregular vns, Some minor Ca ± qtz vns. With sd/ca vns 15-20° to CA often ± irregular tension infill vns entering through them.	In places minor sp. py gl blebs also v. minor sp blebs assoc. ± sd vns. Minor py blebs ± vns				laminations @ 30° to CA back to 35° - CA in base.	
485·3												

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
485.5			gy slt/sd gy Lst	A highly contorted gy slt ± bk mst infilling fractures, ± gr/gy Lst clasts in places ~~silicified~~ ± irregular Ca vns. Possible relict gy Lst ~~completely~~ or/gy Lst completely silt.		Irregular Ca vns throughout & qtz vns throughout					Lamination @ 40° to CA.	
485.8												
487.3			gy lam slt	A gy → dk gy lam slt ± well defined gy bk silty bands ± minor pale gy bands.		Irregular qtz/Ca vns throughout in places forming breccias & fracture infills					Lamination @ 30° 50° 45° 10° defined by dk gy silt.	
487.3			gr/gy/gy slt → bk mst	A variably banded gr/gy/gy slt ± bk mst bands ± minor felsic pleates		Irregular Ca/qtz vns developed @ 487.8m ± fine Ca vns, 10° 45 & 80° to CA.	Minor py assoc ± qtz/Ca vn @ 25° to CA 488.1m					
488.1			pale gy Slt	A gy/bk slt well laminated ± laminations @ 25-35° to CA		Irregular qtz/Ca vns @ 60, 70 ± minor veining ∥ to laminations.					Laminations @ 30° to CA.	
489.0			pale gy slt → gr/gy slt	similar to above but more intensely qtz/Ca vns. 489.6 - 490.1m gr/gy/gy Lst ± bk ± gy slt		Numerous irregular Ca/qtz vns throughout 30, 45, 70° to CA vns.						
490.3			gy lam slt	A well laminated gy to dk gy slt. ± pale gy slt. ± gr/gy ± gy slt bands.	With minor gy Lst bands in places 2-10mm more prevalent downhole.	Ca, qtz vns @ 5, 30° to CA ± Ca/qtz blebs.	Minor Py ± fracture ± some Py/Ca vns ± 25° to CA ± Ca/qtz slt ∥ m+x.				Slt laminations @ 30-35° to 60° to CA downhole	
493.9											C.O. 493.9m	

Scale 1/1 = 3c

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
497.9			gy slt + bk gy Lst	An 18.6m sequence of gy slt & p/gy Lst, ± some irregular banding, ± fracture displacement bands ± loc. ∫ folds @ 499.5. From 497.9 – 498.3m gy Lst bands predominate.		In places brecciated ± wh qtz mpfilling b/w slt fragments, ± vns @ 30, 60, 80° to CA. also minor Ca vns.					laminae @ 25° to CA. ± pervasive fold @ 499.4m.	
499.5			gy Ss → slt	A lam. gy fg Ss ± prevalent dk slt lamination downhole becomes more silty → input of fine qtz ↓.		499.6 – 499.7 broad band of qtz/Ca ± some selvedges of slt ± minor fg py ± slt. Elsewhere v. minor hairline infill short qtz ∂ Ca vns. ± qtz as pairs/gals. x cut So. Ca vns 70 & 40° // to So. ± minor irregular blebs qtz					laminations of fine dk slt @ 499.8 40° to CA; 500.8 15° to CA; 502.8 35-40° to CA; 503.5 45-50° to CA; 505.5 40° to CA; 506.3 35° to CA	
506.6			gy bk slt	A variably laminated dk gy bk ~~carbonaceous~~ mst – slt. In places paler gy slt bands x cut to → sense of bedding		Minor narrow qtz vns @ 65° to CA @ a high ∠ to So. ± minor low ∠ 25° to CA qtz/py vns.	Minor fg py concentrated as grains ± agglomerate along bedding laminae.				Bedding laminations @ 2° to CA; 507m 45° to CA; 507.3m 50° to CA; 508.1 45° to CA; 508.4 50° to CA	
508.6			gy pug	A gy pug interval ± some assoc. swell. ± residual fine altered gy gn – bk slt fragments bridged by gy clay pug.	Faulted boundary b/w Dalcoth & Canal formation	Minor irregular qtz vns ± cent or occur as residual ble bx.					Upper contact to pug @ 60° to CA ± lower contact @ 45° to CA	
509.2												

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12123022

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
509.2 – 510.05			gybk Slt	A highly contorted gybk Slt ± minor 1bd gybk Mst. Downhole develops into more laminated Slt/Mst, ± minor x-cutting dislocations of beds. Uphole chaotic ± rafts of Mst in Slt & interbeds of slump breccia Slt.		Intensely veined by shear tension Qtz vns, ± some torsion release vns sub-ll to CA ± more preferred veinlets @ 75° to CA. Downhole Cc vns predominate ± network of breccia infill Cc vns @ 509.7 – 509.95m.	Minor Cc/Py vns @ 20-25° to CA @ 509.7m ± some fine cross-cutting vns.				laminations dominate @ 50° to CA.	
510.05 – 510.3			gr gy Slt	A massive gr gy Slt or Mst, ± minor gybk Slt beds & gr Chl? fracture infills. Minor Py · Py to end of core.							Possible fold @ 40° to CA as ~~1cm thick gy Slt~~	
510.3 – 530.4			gy dk gy Slt 1bd Mst	A ~~massive~~ variably laminated ± 1bd interval of pale gy – dk gy Slt & Mst ± minor R-g. Gy Ss beds sporadic. From 510.3 – 512.5m gy Slt & bk Mst somewhat contorted laminae ± slump slump fold/Flt dislocations of laminae, with more intense irregular Cc/Qtz vns throughout this region.		Minor Cc/Chl/Slty vns & veinlets sporadic throughout @ 10-20, 45° to CA. with minor sheet narrow ch Qtz vns @ 40° & sub-ll to CA.	From 517.5m – 520.9m minor Py veinlets/vns developed sub-ll to slightly x-cutting fold @ 25° to CA. 518.6 Py/Chl/Cc vn @ 15° to CA ± off sheet veinlets & some brecciation. 517.7 Py/Chl/(rare bk) vn @ 20° to CA ± minor huge Py blob/bleeding along ± bed x-cutting in places.	513.9 – 514.3m somewhat contorted & slumped defined Slt/m.s.		laminations & bedding throughout @ 512.8 40-45° to CA 513.6 50° to CA 514.5 20-25° to CA 516.5 30-35° to CA 517.5 35° to CA 519.5 40-45° to CA 520.0 45° to CA	

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DIAMOND DRILL LOG

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121231

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
520 -521.0	q		Frac bk Mst	A fractured interval of bk Mst intensely veined by wh qtz ± what appear to be angular fg. pyritically disseminated bk mst Clasts ± in qtz veined Mtx (SEVERN FAULT?)		In tense wh/gy qtz veining infilling In places bkn selvedges of bk Mst, fg Mst clasts ± with irregular cluster + chaotic veinlets of wh or bk qtz / vfg?		Tectonically bkn interval of Quartz sealed fractures, angle to bcore Plan?			The fracturing post dates veining & may be due ± in part to some degree ± hetero contrast of qtz vein ± Mst. But some assoc. carbonaceous fg & graphite surfaces at low & to CA ⇒ fracturing.	
521.0 -530.8	gybk dl thly bk Mst and fg ss mx		A variably laminated, bedded dk gy - bk carbonaceous Mst interval. In places highly contorted by soft sed defn ± rafting of laminae + bands into mst mtx, also slump contorted mixing of layers. 521-523.7 generally well laminated bedded mst ± ss fg bands. 523.7 -524.9 highly carbonated dominantly bk carb. Mst ± minor discontinuous & disrupted fg gy ss bands.			Minor qtz vns @ 70° to CA, ± fracture irregular vns throughout.	absent fine pg ss laminae & as eyglomerate blebs. With minor py, qtz, chl mx @ 25°.	524.7 - 524.75 Q'Ryan possible Flt seal. 526.7m Q'slide possible Flt seal.				
						V. minor sporadic short qtz veinlets + blebs. Minor Pg / qtz veining, possibly some remobilisate of mx Mst and pg. + 20° to CA ± as irregular blebs 523.7 - 523.85m.	Intensely mineralised by fine sed py dominantly lam laminae, but also along slump planes & as irregular blebs + Pg PG clasts.				to 1^ 10° - 45° - 35° to CA from 521 - 521.6 - 521.2 - 523.7	
											Possible tectonic bndy @ 30° @ 522.8m.?	

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HOLE NO: 23[illegible]
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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
				524·9 - 530·8 dominantly gy bt/sst ± some gy SLTST beds, variably contorted by slumping, ± mixing of laminae, & some small scale slumpfolds & localised & rafting of lam. beds. 524·7m - 525·3 a sanded contorted bed ± abundant fine sed py lining laminae but also abundant x-cutting py veins both subll to lam & at high & to it. Overall poorly mineralised gy bt/sst ± mm py, ±Ca vein development.		Dominantly fine qtz/py vns ± veinlets ± mainly assoc Ca in places. Veins @ 70°, 20°, 80° subll to fol^n throughout	At 524·7 - 525·8 & 526·5 - 527·0m vn gg vns ± assoc py, chl ± Ca? Similar narrow vns @ 20, 45, 70° to CA occur sporadically throughout				524·6 laminae @ 25° to CA 525·3 - 527·5 laminae fairly L from 20 - 10 - 0° to CA 527·5 - 530·8 strongly somewhat contorted by 530m @ 10° to CA. laminae poorly defined @ 40-45° to CA @ 524·8m.	
530·8 — 538·9			bt Mst ± lt gy sst	An interval of interbedded bt Mst & Slt gy sst→ss commonly finely laminated in places slt→fg gy ss. In places bt/slt displays enhanced sed lofting ± highly contorted beds.		Bleb. & vns of Siderite, in places ± assoc. chl & Py occur throughout. Vns @ 15, 20, 35° to CA. In places form an irregular braccia network. Also minor qtz, Py-chl veining as at 532·1m	In places fine sed. Py occurs disposed in bt Mst & Slt. Py in assoc. ± sed as vns. Though not intense a number of Py mineralised vns do occur & interval may run 1·25% py. (But will be cut)				generally sequence well contorted @ 20° to CA 530·8 30° to CA 531·2 40° to CA 531·4 35° to CA 531·7 30° to CA 532·7 60° to CA 533·3 Sharp Δ @ 533·35 ± fol^ 0 - 15° to CA from 532·35 - 535·5m. 15→20° 535·5 - 537·8 20 - 30° 537·8 - 537·9 30° to CA 537·9 - 538·9	

532·1 - 538·9 may run 1·25% py vns by volume and will be cut.

530·8 - 532·1	0% bt/sst	→ Struck.	
532·1 - 533·2	5% py vns	→ saw	513356
533·2 - 535·6	0·125% "	→ saw	513357
535·6 - 538·9	1·4% "	→ saw	513358

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
538.9 = 539.4			gy slt → Py lode	A lodey interval, ± some residual gy bk intensely fractured & veined Slt to Mst. The Mst is fractured ± cr, infilling of interbedded qtz, py ± po lode.	Chl alt'n assoc ± Py, po min'n 513359	Intense irregular Py, Chl, Qtz network throughout ± a concentration of irregular wk Qtz veining 539.00-539.1m. Also minor sl dev'd veining as a late stage cutting phase.	Py occurs throughout as narrow, vein & veinlets, also as massive blebs. A po, py mass occurs @ 539.1-539.15m. po occurs as scattered blebs from 539.05-539.3m.	Mineralisation appears to display ↑ vein infill			H.L intervals 538.9 - 538.95 Py/Chl vn. 538.95 - 539.1 qtz, Py, po blebs in Bk Mst 539.1 - 539.15 massive po/Py lens. 539.15-537.2 bk Mst, po, Py, chl, qtz blebs 539.2 - 539.3 massive Py, Chl ± po blebs ± possibly some sd, Py blebs 539.3 - 539.4 bk Mst, Py Chl vn.	
539.4 - 540.2			bk Mst ± bd gy slt.	An ibd sequence of gy slt & bk Mst. inplaces laminated ± Slt → Ss.	513360	Minor narrow irregular Sd vns x cut 21.30, 55° to CA broken bll & high dip to fol'n	Minor mineralised Py, Chl, Sd vns x cut subll to fol'n, generally unmineralised.				Full core sections down hole from 25,30 - 55° to CA.	
540.2 - 541.7			bk Mst	An interval dominated by bk carbonaceous Mst ± minor gy slt lens. Intense sd vn development fracture debly Py min'n. Core at CA fracturing subll to low & 2/m from 541.5-541.7	Chl assoc ± Py.	Intense irregular Sd vns & veinlets ± min assoc w light fr chl & minor Py. veining dominately at high & 80-90° to CA ± smaller anastomosing veinlets ± linking subvns from 1° vns to form fracture infill pattern.	Py occurs as large irregular masses ± vein chl & lesser sd from 540.25-541.0m. Minor Py min'n assoc ± sd, chl from 540.3 - 540.7m.				Silvo matrix loss from 540.2 - 540.75m. 541.05 - 541.7m dominantly bk Mst & gy slt ± minor sd veining @ 541.7m. & as minor narrow veinlets.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
541.0 – 542.1	G		gy Slt: bd bk Mst	A massive interval of gy slt bd ± bk mst, ± bk Mst more prevalent towards b.	513362	Minor Sd vns xcut @ low dip, 20, 25 & 60° to CA both with & subpll to fol^n.	At 542.0m a narrow 2–5cm Py. Sd ± Chl vn @ 15° to CA occurs, otherwise devoid of min^n.				bedding Slt/Mst @ 20° to CA.	
542.1 – 542.3			gy Mst to Sd, Py bde	A contorted gy bk Mst & Sd Slt interval, defn may only be result of soft Sed action, but may be some movement assoc ± massive vn min^n developed.	Chl alt ± Pyrite. 513363	Sil vein ± min^n	Intense Py Sil chl vn min^n developed throughout Mst, ± min^n fringing Sil veinlets parallel to & across Mst.				Intense Hbl Py vn min^n.	
542.3 – 542.6			gy Slt bd: bk Mst	Mildly fractured bbd gy Slt bk Mst, ± minor Py Sub ll to bedding laminae. Some Sd? along fracture surfaces.	513364	Minor Sil veinlet development subll to subparallel to bedding, emanates from major Sil vn at 15° to CA. Numerous veinlets irregularly disposed throughout bundle.	Minor disseminated Py possibly Sed rather 2° hydrothermal Py-min^n, ± [illegible] along bedding laminae.				Fol^n 10–20° to CA. ⇒ ll bundle. Minor brittle fracturing sub ll to fol^n, intensely fractured 542.5 – 542.6	
542.6 – 542.95			Sd, Py bde	A massive slightly fractured & subsequently brecc Sd, Py/chl bde. Some dissolution of Sd. Minor residual rafts of bk Mst occur throughout.	513365 Chl alt assoc ± min^n as large masses & along fractures	Massive Sil vn/vns ± overlying pl... minor xcutting later narrow Sil vns [illegible]	Massive Py ± assoc Sd, Chl, in places ⇒ 50% sulphide [illegible]				Fractures 25 & 30° to CA, [illegible] Upper contact of bde 30° ± 20° to CA	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
542.95 – 548.4			gy slt to bk mst	A moderate - intensely developed veined interval of gy slt ⇒ vuggy Si tbl bk mst. In places highly contorted from soft sed def'n. Some brec. of slt or mst assoc ε Py, sl, Py/Q vein development. At 547.9m Foreign rounded infill material which fell in during the rod pull @ 5479m. 542.95–543.8 Sacc 543.8–545.25 Sacc 545.25–546.9 Sacc (vuggy) 546.9 – 548.4 Sacc @ 547.55m Vuggy Py, Sl, Q, Cl, G vn 3cm wide in Si veined Gouge.	Po 1st appears @ 543.8m at the same place that occurs in assoc ε Q/Py vns. Minor Chl alt'n assoc ε Py vns 513366 513367 (Py/Q/Chl/Po vein in brec zone) 513368 513369	542.95–543.8 as well as Py/Q vns are Sl vns are x cutting at high ∠ to CA 75°±. 543.8 – 546.9 Mineralised vns throughout as an anastomosing network generally low ∠ to CA rarely exceeding 30° to CA, i.e. sub ll fol'n & unsuitable for neighbouring vn fronts. Minor Sl vn development sub ll fol'n also x cutting at 60–70° as late stage phase.	542.95–543.8m dominately a narrow network of Py/Q/Py vns, sub ll to fol'n & in places at 10–30° to CA. 543.8–546.9m Py, Q±Chl vns persist as narrow veinlets sub ll to CA to 30° to CA, in places with some Chl. In addition are massive vns of Py Q Chl, Sl ± Po also occur. Po as scattered blebs & as a residual vein phase to vein massive Py vns. Vns lenticular bulby, occur as massive blebs 546.9 – 548.4m gy bk slt/mst contains to soft sed def'n irregular Py/Q vns more Py Sl ± Chl vn development	Minor sc/f sed displacement of beds. But also fracture infill breccia ε assoc. ε vn min'n development			Fol'n low ∠ to CA 10–20° in places sub ll. The main massive Py, Q Chl, Sl, Po vns possibly postdate early narrow Py/Q vns essentially parallel along fol'n. More massive vns brecciate host lithology. Py Sl Chl ± Po ε Chl stringers or interstices ε fracture wl Q/Py infilling Py Sl Chl Q Chl In tense po min'n assoc ε massive Sl, Py ± Chl vn @ 544.8m also minor po blebs in Py vn @ 545.4m ε only minor po blebs elsewhere	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
548.4	4		gy slt → ss	Predominately gy slt ± v fine bk silty or carbonaceous rich laminae → Sc. Core fractured 548.4 – 548.6 ± intensely fract. broken 547.5 – 548.6m. Fract @ 12°, 40° to CA. Sc lines fracture surface @ 12° ± Sd in lyr & fractures.	513370	Minor Py vns 1-3mm irregularly x cut CA 10, 35, 80° CA but also irregularly anastomosing. Narrow regular Sd vns x cut 80° to CA	Only minor Py as vns, may be remobilized sed'y Py.				Fol'n 5-10 → 20° to CA as defined by intensity laminae	
549.4	4		gy slt → ss ± bdd gy bk Mst	A somewhat contorted ± bdd gy slt → gy ~~Mst Ss~~ ± bk Mst. Minor syn-sed slump faulting & fld'ing evident. Slip displacement low & listric fault to sub ll to CA. Becomes more silty → Sst/Slty downhole. (Ss, q, bk lithics, fel.)	513371	Minor narrow Sd vns 75, 15° to CA. From 549.9-550.0m development of Qz, Py vns as breccia infill phase. Minor Qz/Cc vns @ 75, 85° to CA	Irregular Py vns & blebs occur throughout, locally as apparent tension infills ± as narrow vns. In places minor Qz, Cc ± Py vns, more abnt downhole	Minor low ∠ fractures sub ll to fol'n.			Fol'n of laminae @ 30° to CA ± listric faults 10-15° to CA. Down hole fol'n → 15° to CA.	Ss, not Pyrite Ss
550.0												
550.0	0		gy slt → ss	A variably broken & fractured interval of gy slt → Sst ± min wispy Mst bands. From 550.2 – 550.5m gy Ss → Qz ss (q, fel, lt slt) 550.0 – 550.2 Core highly broken gy slt → Sc int bkmt. Fractures sub ll to CA → 30° ± Sd/Sl Shiny banding. 550.5 – 551.7 some soft Sed def'n structures evident. 550.2 – 551.7 fractures present are generally confined to sub ll to fol'n	513372	Irregular Py ± Sd veins & veinlets ± Py, q vns throughout. Py, q vns @ 10° cut fol'n & sub ll to fol'n	Py mineralisation ± Py/Sd & Py/q vn development				Fol'n 10° to CA	
551.7												

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
551.7			gy slt-bd gy bk Mst	Dm intensely fractured interval of gy slt-bd gy bk Mst, cut by Py vns & chert veinlets, with chert veinlets away from main vns. Some Py, Q vns.	513373	Py veins & veinlets ± minor amount of Qtz	broad ± irregular vns 0.4 - 2 cm ± minor veinlets emanating from them	Fractures @ 10, 40, 70, 85 75 to CA			Se lines many of the fracture surfaces	
552.4			bk Mst ± irregular ban? clasts.	Dm interval ± gy bk Mst ± irregular slump entered or gy gn slt, or possibly partially altered basalt? clasts. Possibly some sd replacement of clasts.	513374	Sd vns x cut an irregular vn network.	Py min. assoc ± Sd vn envelopes, ± further fg Py masses assoc ± possible sd replaced basalt clasts. Py ↓ in abundance down hole.	Intense slump (soft sed def^n) def^n ± mod. squeezed into non competent Slt / ban? P clasts			Thin section of possible Sd replaced basalt clasts?	
553.5			gy slt to ss ± bk Mst	Dominantly gy fractured slt → fg ss ± wispy bk Mst thl layers with minor irregular possible siderite/sd ban clasts @ 555.4m & 557m/m 553.5-553.85 ban gy slt to ss 553.85-554.35 gy slt to ss non prevalent bk Mst ± Py blebs ban/sd/Py clasts, Py vns & ban Q, Py vns. 555.85-556.8 gy slt, ss, minor bk Mst ± occasional Py vn.		Sd veins occur an irregular network & blebs ± vns @ 15, 30, 55, 60 Minor Q/Py ± Cl vns & envelopes. Py veinlets ± vns irregularly dispersed.	Py occurs assoc ± Sd vns, also as irregular blebs, & ± assoc ± Sd as replacement of ban? clasts.	Massive.				

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
556.8			bk mst	Dominantly bk mst ± minor ibd gy s/ltst. Intense Py, q, chl ± Py sd vn development. From 557.0 - 557.1 core highly broken, dominately contains bk mst ± lesser >ltst, minor sd, q vns ± irregular Py blebs.		Intense Py Sd ± Py q, chl vein development as irregular network infilling fractures	fg sed py assoc ± some bk mst laminae. Py / q ± Cl vns @ 25, 40° to CA				Fol 25-30° to CA, dom hole becomes highly contorted by soft sed slump ltst	
557.1												
557.1 – 557.3			gy slt ibd bk mst	A very puggy interval of gy slt ± bk mst, minor q/Py rsd vns. lower contact a fracture @ 25° to CA.		minor isolated q/py ± sl vns		Highly fractured and/or puggy. Fault?				
557.3 – 557.5			gy slt ibd bk mst	A° highly contorted flt dislocated bk mst gy slt → ss (most likely soft sed ltst)		sl vns occur throughout, with minor tension vn infill q vns.	Irregular Py blebs assoc ± sl d also Py/q/Py irregularly throughout				Fol 30-35° to CA, ± flow & soft sed flt. now partially fractured by drilling @ 10° to CA.	
557.5 – 557.9			bk mst ibd gy bx	Highly contorted gy bk clasts are rebrecciated ± gy bk silty fracture infill matrix. Minor sil replacement of bk clasts. Becomes more silty downhole.		Minor tension infill qz vns ± wk q vns dominately in bk clasts						

CUT

26° / 180°

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
557.9			gy slt	A dominantly gy slt interval ± minor lbd bkmat as irregular laminae/addings 558.5 - 558.2 bk mst band fringed by q-py vns @ 40° to CA	gy lbd.	Minor sd vein development subpll to fol^n, with other q vns @ ±30° to CA x cutting fol^n.	558.15m q/py vns fringe bk Mst ± qv vns penetrating out into host.				Rare ^{cm} of wispy to well developed bkmat laminae @ 15° to CA.	
558.2			gy slt	Massive gy slt ± irregularly shaped darker silty masses as possible fracture infills		V. minor q vns as tension infills. ± as minor 060° vns @ 30° to CA.					Possibly start of Oonah Formation??	
559.7			gygn slt	Massive gygn slt ⇒ So very similar to preceding interval but lacking gybk slt masses.		Minor Sa lining fractures, ± minor irregular qtz vns @ 60° to CA ± some tension infill veinlets.					Minor Ca/q lined fractures @ 45° to CA.	
561.7			gy slt	An essentially gy slt ± narrow darker silty bands (tension gash bands?) & irregular wavy bands. From 561.7 - 561.9m generally massive somewhat contorted slt, lacking laminae, ± sharp base @ 561.9 @ 55° to CA s/w laminated slt & massive slt.		Minor py/cl veins.	Minor q/cl/py vns @ 45-50° to CA. Minor py blebs irregularly dispersed.				gy slt ± some darker bands @ 10° to CA to subpll to CA. Resembles somewhat the marker band above the Mathina Carbonate sequence.	
562.5												

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
562.5			ggn dol sltst	A massive ggn dolomitic sltst ± wispy dk silty infills of soft sed def^ fractures. Possibly dolomitic ?? apparent v. slight reaction to HCl.		Minor qtz ± sil veins/veinlets & blebs ± some preferred orientation @ 40° to CA					Fol^n 15-20° to CA.	
565.3			ggn slt	A ggn slt ± minor lgt blk silt, laminated from 565.3 - 566m, ± abundance of Mat ↑ down hole		Ca vn @ 20° to CA ± minor Ca vnlts permeating fm main vn	Minor Ca, Pyr vnlts & min^ @ 566-566.6m					
567.1			ggn slt ± lgt ggn clst	566.05 - 567.1 highly contorted ggn slt ± wispy dk brn silty infills b/w rafted slt clasts ⇒ soft sed def^		Minor qtz vnlts @ high & to CA & @ 40° ± some sd @ 45° to CA.						
567.5			ggn slt	Irregular subrounded & fractured lgt clasts are infilled & enclosed by ggn slt.		Minor narrow irregular qtz vnlts developed @ 45° to CA.						
568.5			ggn slt	Somewhat fractured ggn slt ± lt gn silty infills along fractures. In places tends from slt ⇒ ss ± ↑ in the abundance of qtz; particularly down hole		Minor wh qtz veining developed @ 35° to CA & as irregular blebs						
574.3			ggn slt ± lgt ggn ss	Fine variably lam ggn slt occurs ± fg ggn ss with difficult^ to distinguish except in ↑ in qtz abundance. In place wispy gn blk silty layers infill possible fracture developed during soft sed def^		Minor wh qtz vnlts, stockwk veinlets & blebs occur sporadically.					Fol^n 10 - 15° to CA Transition to Quartzite.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
574.3			Silt/Lst	A contacted interval c irregularly shaped to subrounded ggy Lst clasts c in gy grnbk silty mud mtx. Also some silt rafts c in mud mtx.		In places cut by irregular short tension qtz vns. Fe stain patchily prevalent c appear to qtz vns @ 20-25° to CA.					Some iron staining developed downhole	
575.0			ggy Sst bd ggy silt	Dominately maroon ggy Ss c minor wispy somewhat stump contacted 1-3mm ggy silt bands.		v. minor Fe stained wispy qtz veinlets developed at high ∠ to CA c a single vein @ 40° to CA					Minor silt banding developed @ 5-10° to CA.	
575.75			ggy silt.	ggy Ss & ggy silt clasts occur as rafts c in a darker silty mtx, c some silt infilling smaller scale fractures in clasts.		Minor irregular ca blebs & veinlets to developed & sporadically throughout. v. minor radiating @ 35° CA.						
576.75			gy silt/gy Ss	ggy silt in places c darker laminae / bd c gy Ss → qtz in places wisp gy bk silty bands infilling fractures as a wispy anastomosing network throughout. Though highly contorted by soft sed def'n possible So is implied.		v. minor qtz blebs c minor Fe stain.					Possible fol'n @ 15° to CA??	
577.85												
579.4			ggy Qtz	Massive ggy Qtz interval cut in places by wk q vns.		wk q vns developed @ 30, 35, 55, 75° to CA in occasions forming irregular stringy meshes.						

Aberfoyle Resources Limited
EXPLORATION DIVISION

PROJECT : _____

PROSPECT: _____

DIAMOND DRILL LOG

12124 Fig 2

HOLE NO: 259-
PAGE: 106 of
LOGGED: DJN
DATE: 1/9/89

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
579.4			grgy silt ± some lbd qtz	Dominately grgy silt ± lbd gn, bk Ss → Qtz. The interval highly contorted by soft sed defn, ± irregular shape Qtz clast ± pods irregularly dispersed.		V. minor odd wh qtz veinlet. Minor q/sd dkg fracture infill to CA @ 579.5 - 579.6m.						
580.7												
583.0			grgy Ss → Qtz	Massive gn gy Ss → Qtz ± odd gy silt clast. ± irregular chloritic silt ± sdq veinlets infilling fractures throughout Ss & Qtz.		V. minor q, sd veins & vnlets sporadically developed.						
588.0			grgy silt ± lbd gn Ss	Dominately grgy silt ± mm ± lbd gn Ss → Qtz bands. Interval highly disrupted by small scale x cutting flts truncating & displacing narrow beds. In places some brec as result of slump defn. Entire interval is intensely fractured ± cl silt infill of fractures.		At 10, 15, 20, 25° ca narrow qtz vns occr commonly Fe stained. In places forming an anastomosing vein network.					Bedding dominant Subll to CA to 5° to CA. Silt dyke prevalent from 585.9 - 587.2m. ± Ss absent	
587.2			grgy Ss lbd grgy silt	Interval dominated by fg grgy Ss in places → more silty in other areas mm → ± Qtz.		Minor wh q vn developed as irregular spots, vns @ 20° ± limonite stain fracture						
589.4												

Aberfoyle Resources Limited
EXPLORATION DIVISION

DIAMOND DRILL LOG

12124 (32)

PROJECT : _____

PROSPECT: _____

HOLE NO: ZS92
PAGE: 107 of 107
LOGGED: DJW
DATE: 1/9/09

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
				generally contorted throughout from aft set defn. In places more silty bands @ 15° to CA. Numerous fractures throughout ± chl. silt infills.		From 1t. Chl silt, sl, py vn @ 597.75m @ 30° to CA	Minor py assoc ± chl vn.				Silky fracture infills poorly developed throughout of ± otter intervals	
589.4 -590.1			gr qzy Qtz vbl gr silt	Finely laminated Qtz ± numerous fine 0.5 - 5mm gr silt bands through gr So → QTZ. In places minor dk silty bands assoc ± gr SH.		Minor wh qtz vns @ 40, 45° to CA.	Minor Py blebs assoc. ± wh qtz vns.				Foliation well developed @ 50-55° to CA => So.	
590 -594.6			gr gy gr Qtz thbd gr gy SH	An thbd sequence of gy gr Qtz and gr gy fine silt with Qtz beds 1.0 - 30cm & silt beds 0.1 - 40cm Qtz : silt = 4:1 Variably fractured ± silt beds ± gr chl infills.		Some wh qtz vein development ± in qtz ± irregular vns @ 30, 50cm to CA.					gy gr SH ± Qtz ± bedding contacts @ 40° to CA. In places minor gy bk silt assoc gr silt beds.	
594.6 595.5				Massive gr Silt intensely fractured ± gr chl. silt infills irregularly developed in particular @ 40° to CA.							Prevalent gr chl. ± fracture set @ 40° to CA may => So.	
EOH												

121244

APPENDIX 4

ABERFOYLE RESOURCES LIMITED — D.D.H. No. 75 91 — 121245

ZEEMAN GEOCHEMISTRY — Loc. SEVERN TAS.

SAMPLE ASSAY DATA

SAMPLE No.	FROM (m)	TO (m)	L (m)	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Sn ppm	Rb ppm
564002	53.00	59.75	6.75	110	40	320	2	4	220
564003	59.75	64.40	4.65	115	300	1750	1.5	25	260
564004	64.40	70.40	6.00	70	25	105	2	10	310
564005	70.40	81.50	11.10	65	15	120	1.5	7	290
564006	81.50	86.35	4.85	75	50	185	2	7	160
564007	86.35	97.55	11.20	95	15	140	1.5	8	130
564008	97.55	107.55	10.00	100	15	145	1.5	8	160
564009	107.55	113.90	6.35	80	180	250	5.5	40	310
564010	113.90	114.70	0.80	1200	1875	2700	53	340	45
564011	114.70	118.60	3.90	90	65	160	3.5	9	200
564012	118.60	130.50	11.90	70	30	170	1.5	6	160
564013	130.50	141.40	10.90						
564014	141.40	148.70	7.30	100	30	255	1.5	8	160
564015	148.70	161.80	13.10	105	325	620	3.5	8	270
564016	161.80	169.25	7.45	95	10	130	1.5	4	170
564017	169.25	184.10	14.85	110	25	175	2.5	4	90
564018	184.10	190.35	6.25	100	15	145	2.5	4	85
564019	190.35	204.30	13.95	100	15	145	1.5	10	65
564020	204.30	211.10	6.80	115	10	130	1.5	3	75
564022	211.10	222.80	11.70	85	15	215	2	0	65
564023	222.80	227.55	4.75	85	10	140	2	3	85
564024	227.55	240.70	13.15	90	130	370	2.5	0	120
564025	240.70	249.50	8.80	170	55	340	2.5	0	140
564026	249.50	265.90	16.40	130	50	195	2	8	120
564027	265.90	276.90	11.00	80	50	195	2	3	150
564028	276.90	288.95	12.05	110	50	185	2.5	7	70
564029	288.95	303.35	14.40	110	500	470	3	15	150
564030	303.35	316.20	12.85	115	100	480	2.5	5	220
564031	316.20	325.70	9.50	105	225	285	3.5	15	230
564032	325.70	339.10	13.40	105	15	145	2	7	70
564033	339.10	351.95	12.85	100	15	135	1.5	6	70
564034	351.95	364.60	12.65	110	65	460	1	3	100
564035	364.60	370.70	6.10	130	15	160	2	5	60
564036	370.70	380.85	10.15	105	70	160	1.5	15	95
564037	380.85	395.00	14.15	135	65	300	1	6	90
564038	395.00	398.80	3.80	95	0	140	1.5	9	120
564039	398.80	410.20	11.40	35	5	130	1	6	220
564040	410.20	412.40	2.20	35	5	100	2	35	320
564041	412.40	412.95	0.55	10	15	85	1.5	40	90
564043	412.95	414.55	1.60	75	25	100	1.5	60	260
564044	414.55	421.60	7.05	155	50	175	1.5	9	100
564045	421.60	429.80	8.20	105	5	135	1.5	7	50
564046	429.80	441.10	11.30	130	40	130	1.5	10	140
564047	441.10	445.70	4.60	95	65	160	1.5	5	150
564048	445.70	464.30	18.60	130	95	345	2.5	15	95
564049	464.30	479.20	14.90	80	45	260	1.5	5	85
564050	479.20	491.20	12.00	100	25	100	2	4	140
564051	491.20	501.20	10.00	90	60	150	2	30	200
564052	501.20	517.55	16.35	115	50	155	2	4	140
564053	517.55	535.85	18.30	100	60	105	2.5	15	160
564054	535.85	537.00	1.15	50	55	320	2	30	70
564055	537.00	537.45	0.45	255	75	200	2	25	0
564056	537.45	538.00	0.55	20	30	105	2	25	120
564057	538.00	545.95	7.95	95	55	65	2	5	140
564058	545.95	550.50	4.55	105	20	80	2	5	180
564059	550.50	553.10	2.60	100	30	225	1	4	40
564060	553.10	555.40	2.30	40	30	60	2	15	170
564061	555.40	555.80	0.40	75	35	75	1.5	20	120
564062	555.80	556.00	0.20	80	115	50	6.5	4	80
564064	556.00	556.30	0.30	15	15	185	2	30	200
564065	556.30	556.85	0.55	55	505	1050	1.5	20	95
564066	556.85	560.90	4.05	65	30	90	1.5	8	140
564067	560.90	561.50	0.60	160	55	95	1.5	9	40
564068	561.50	562.15	0.65	115	25	105	1.5	6	25
564069	562.15	563.45	1.30	60	175	70	1.5	5	45
564070	563.45	565.50	2.05	30	40	65	1	7	110
564071	565.50	566.00	0.50	20	70	600	1.5	4	140
564072	566.00	567.70	1.70	35	190	400	1.5	10	85
564073	567.70	570.45	2.75	15	40	75	2	0	0
564074	570.45	571.20	0.75	25	20	50	1.5	3	15
564075	571.20	572.50	1.30	25	65	35	2	5	40
564076	572.50	573.40	0.90	20	25	35	1.5	8	20
564077	573.40	576.90	3.50	20	60	65	2.5	8	40
564078	576.90	577.75	0.85	20	80	40	4.5	10	230
564079	577.75	580.65	2.90	60	45	70	2	3	95
564080	580.65	583.50	2.85	50	35	45	2	6	130
564081	583.50	584.10	0.60	105	40	130	1.5	6	85

564082	584.10	586.60	2.50	80	25	70	1.5	9	170
564083	586.60	587.25	0.65	25	25	45	1	5	50
564085	587.25	589.90	2.65	150	90	105	2.5	15	200
564086	589.90	590.80	0.90	40	75	60	2	25	150
564087	590.80	592.00	1.20	70	65	45	1	25	110
564088	592.00	593.30	1.30	15	25	50	1.5	9	45
564089	593.30	595.50	2.20	25	35	65	1.5	9	100
564090	595.50	596.80	1.30	35	50	25	2	10	210
564091	596.80	599.30	2.50	125	50	65	1.5	65	140
564092	599.30	600.10	0.80	35	45	150	2.5	0.14%	220
564093	600.10	604.10	4.00	45	60	265	1	0.435%	340
564094	604.10	605.00	0.90	125	30	55	1.5	0.04%	220
564095	605.00	605.60	0.60	45	10	60	1	1.48%	55
564096	605.60	607.00	1.40	45	25	20	1	45	180
564097	607.00	607.40	0.40	155	10	45	0.5	30	60
564098	607.40	613.30	5.90	50	20	40	0.5	45	200
564099	613.30	613.55	0.25	50	15	50	1.5	30	120
564100	613.55	615.65	2.10	15	10	35	1	25	200
564101	615.65	617.00	1.35	90	25	100	0.5	80	45
564102	617.00	617.25	0.25	15	15	70	0.5	40	5
564103	617.25	619.10	1.85	130	50	70	1.5	95	100
564104	619.10	621.10	2.00	50	45	50	1	45	220
564105	621.10	629.95	8.85	45	45	70	1	25	220
564107	629.95	636.00	6.05	40	105	85	1	45	350
564108	636.00	642.00	6.00	35	50	55	0.5	9	190
DETECTION LIMITS				5	5	5	0.5	2	3

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CORE GRIND SAMPLING - ZEEHAN

121247

HOLE No. ZS 91

DATE 8/10/89

No.	SAMPLE NUMBER	INTERVAL	ELEMENTS REQUIRED	ST	SAMPLE NUMBER	INTERVAL	ELEMENTS REQUIRED	ST
1		0 -53m	NO CORE					
2	564001		STANDARD					
3	002	53-59.75						
4	003	59.75-64.4						
5	004	64.4-70.4						
6	005	70.4-81.5						
7	006	81.5-86.35						
8	007	86.35-97.55						
9	008	97.55-107.55						
10	009	107.55-113.9						
11	010	113.9-114.7	CUT	0.8				
12	011	114.7-118.6						
13	012	118.6-130.5						
14	013	130.5-141.4						
15	014	141.4-148.7						
16	015	148.7-161.8						
17	016	161.8-169.25						
18	017	169.25-184.1						
19	018	184.1-190.35						
20	019	190.35-204.3						
21	020	204.3-211.1						
22	564021		STANDARD					
23	022	211.1-222.8						
24	023	222.8-227.55						
25	024	227.55-240.7						
26	025	240.7-249.5						
27	026	249.5-265.9						
28	027	265.9-276.9						
29	028	276.9-288.95						
30	029	288.95-303.35						
31	030	303.35-316.2						
				0.8				

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PAGE 2 OF 4

CORE GRIND SAMPLING - ZEEHAN

121248

HOLE No. ZS91

DATE 8/10/89

No.	SAMPLE NUMBER	INTERVAL	ELEMENTS REQUIRED	ST	SAMPLE NUMBER	INTERVAL	ELEMENTS REQUIRED	ST
1	564031	316.2-325.7						
2	032	325.7-339.1						
3	033	339.1-351.95						
4	034	351.95-364.6						
5	035	364.6-370.7						
6	036	370.7-380.85						
7	037	380.85-395						
8	038	395-398.8						
9	039	398.8-410.2						
10	040	410.2-412.4						
11	041	412.4-412.95	CUT	0.55				
12	564 042		STANDARD					
13	043	412.95-414.55						
14	044	414.55-421.6						
15	045	421.6-429.8						
16	046	429.8-441.1						
17	047	441.1-445.7						
18	048	445.7-464.3						
19	049	464.3-479.2						
20	050	479.2-491.2						
21	051	491.2-501.2						
22	052	501.2-517.55						
23	053	517.55-535.85						
24	054	535.85-537	CUT	1.15				
25	055	537-537.45	CUT	0.45				
26	056	537.45-538	CUT	0.55				
27	057	538-545.45						
28	058	545.95-550.5						
29	059	550.5-553.1						
30	060	553.1-555.4						
31	061	555.4-555.8	CUT	0.4				
				3.1				

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PAGE 3 OF 7

CORE GRIND SAMPLING - ZEEHAN

121249

HOLE No. ZS 91

DATE 8/10/89.

No.	SAMPLE NUMBER	INTERVAL	ELEMENTS REQUIRED	ST	SAMPLE NUMBER	INTERVAL	ELEMENTS REQUIRED	ST
1	564 062	555.8 - 556	CUT	0.2				
2	063	[redacted]	STANDARD					
3	064	556 - 556.3	CUT	0.3				
4	065	556.3 - 556.85	CUT	0.55				
5	066	556.85 - 560.9	CUT	4.05				
6	067	560.9 - 561.5	CUT	0.6				
7	068	561.5 - 562.15	CUT	0.65				
8	069	562.15 - 563.45	CUT	1.3				
9	070	563.45 - 565.5	CUT	2.05				
10	071	565.5 - 566	CUT	0.5				
11	072	566 - 567.7	CUT	1.7				
12	073	567.7 - 570.45	CUT	2.75				
13	074	570.45 - 571.2	CUT	0.75				
14	075	571.2 - 572.5	CUT	1.3				
15	076	572.5 - 573.4	CUT	0.9				
16	077	573.4 - 576.9		3.5				
17	078	576.9 - 577.75	CUT	0.85				
18	079	577.75 - 580.65						
19	080	580.65 - 583.5						
20	081	583.5 - 584.1	CUT	0.6				
21	082	584.1 - 586.6						
22	083	586.6 - 587.25	CUT	0.65				
23	084		STANDARD					
24	085	587.25 - 589.9						
25	086	589.9 - 590.8	CUT	0.9				
26	087	590.8 - 592	CUT	1.2				
27	088	592 - 593.3	CUT	1.3				
28	089	593.3 - 595.5						
29	090	595.5 - 596.8	CUT	1.3				
30	091	596.8 - 599.3	CUT	2.5				
31	092	599.3 - 600.1	CUT	0.8				
				27.7				

249 Cutting 38.6m

CORE GRIND SAMPLING - ZEEHAN

121250

HOLE No. ZS 91

DATE 8/10/89

No.	SAMPLE NUMBER	INTERVAL	ELEMENTS REQUIRED	ST	SAMPLE NUMBER	INTERVAL	ELEMENTS REQUIRED	ST
1	564093	600.1-604.1						
2	094	604.1-605	CUT	0.9				
3	095	605 - 605.6	CUT	0.6				
4	096	605.6 - 607	CUT	1.4				
5	097	607 - 607.4	CUT	0.4				
6	098	607.4-613.3						
7	099	613.3-613.55	CUT	0.25				
8	100	613.55-615.65						
9	101	615.65- 617	CUT	1.35				
10	102	617 -617.25	CUT	0.25				
11	103	617.25-619.1	CUT	1.85				
12	104	619.1-621.1						
13	105	621.1-629.95						
14	106		STANDARD					
15	107	629.95-636						
16	108	636-642						
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
				7.0				

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121251

ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.
Phone (09) 458 7999 — 52 Murray Road, Welshpool, W.A. 6106 — Telex AA92560
FAX: 004 31 8890

ANALYTICAL REPORT No. 23.3.08.06610

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

Aberfoyle Resources Limited
Exploration Division
P.O. Box 952
Burnie Tasmania 7320

ORDER No.	PROJECT
7323	

DATE RECEIVED	RESULTS REQUIRED
20/10/89	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
10	03/11/89	1	108

STATE OF SAMPLES	PRE-TREATMENT								ANALYSIS		
REFER BELOW	SAMPLE NUMBERS	DRY	CRUSH	SPLIT	PUL-VERISE	SIEVE	OTHER SEE REMARKS	NONE	REFER TO ANALYSIS SECTION	PREPARATION	METHOD
	564001/564108	SC	Prep: 00	,012,0	14,016				Cu,Pb,Zn,Ag/101		
	564001/564108	SC							Sn,Rb/401		
	564001/564108	SC							Sn/404		
	564001/564108	SC	Prep: 00	,012,0	14,016				Ag,Pb,Cu,In/104		
	564001/564108	SC	Prep: 00	,012,0	14,016				Ag,Pb,Cu,In/104		

RESULTS TO

R. de Bomford
Aberfoyle Resources Limited
Exploration Division
P.O. Box 952
Burnie Tasmania 7320

RESULTS TO

REMARKS

ZS 91

STATE OF SAMPLES		ANALYSIS — PREPARATION				ANALYSIS — METHOD	
wh[illegible]e core	WC	perchloric acid	A1	cold acid	CA	atomic absorbtion	AAS
split core	SC	hydrochloric acid	A2	specific sulphide	SS	x-ray fluorescence	XRF
cutting	CU	nitric acid	A3	other mixed acids	Ma	spectrophotometry	SPEC
ro[illegible]	Ro	aqua regia	A4	alkaline attack	AA	colorimetry	COL
so[illegible]	SO	nitric-perchloric	A5	volatilization	VO	chromatography	CHR
pu[illegible]	PU	HF mixture	A6	ignition	IG	titration	TTN
water	WA	HF under pressure	A7	pressed powder (XRF)	PP	other chemicals means	CHEM
tissue	TI	fusion	A8	glass fusion (XRF)	GF	miscellaneous	MISC
stream sediment	SS					fluorescence	FLUOR
he[illegible]y mineral	HM					inductively coupled plasma	ICP

AUTHORISED OFFICER

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ANALABS

121252

A Division of Inchcape Inspection and Testing Services Australia Pty Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	23.3.08.06610	02/11/89	7323	1 OF 10

TUBE No.	SAMPLE No.	Cu	Cu	Pb	Pb	Zn	Zn	Ag	Ag	Sn
1	564001	130	–	200	–	2300	–	1.0	–	9
2	564002	110	–	40	–	320	–	2.0	–	4
3	564003	115	–	300	–	1750	–	1.5	–	25
4	564004	70	–	25	–	105	–	2.0	–	10
5	564005	65	–	15	–	120	–	1.5	–	7
6	564006	75	–	50	–	180	–	2.0	–	7
7	564007	95	–	15	–	140	–	1.5	–	8
8	564008	100	–	15	–	145	–	1.5	–	9
9	564009	80	–	180	–	250	–	5.5	–	40
10	564010	–	1200	–	1875	–	2700	–	53	340
11	564011	90	–	65	–	160	–	3.5	–	9
12	564012	70	–	30	–	170	–	1.5	–	6
13	564013	SNR	–	SNR	–	SNR	–	SNR	–	SNR
14	564014	100	–	30	–	255	–	1.5	–	8
15	564015	105	–	325	–	620	–	3.5	–	8
16	564016	75	–	10	–	130	–	1.5	–	4
17	564017	110	–	25	–	175	–	2.5	–	4
18	564018	100	–	15	–	145	–	2.5	–	4
19	564019	100	–	15	–	145	–	1.5	–	10
20	564020	115	–	10	–	130	–	1.5	–	3
21	564021	125	–	180	–	2350	–	1.0	–	3
22	564022	85	–	15	–	215	–	2.0	–	<3
23	564023	85	–	10	–	140	–	2.0	–	3
24	564024	90	–	130	–	370	–	2.5	–	<3
25	564025	170	–	55	–	340	–	2.5	–	<3

Results in ppm unless otherwise specified.
T = element present, but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	23.3.08.06610	03/11/89	7323	2 OF 10

TUBE No.	SAMPLE No.	Cu	Cu	Pb	Pb	Zn	Zn	Ag	Ag	Sn
1	564026	130	-	50	-	195	-	2.0	-	8
2	564027	90	-	50	-	195	-	2.0	-	3
3	564028	110	-	50	-	185	-	2.5	-	7
4	564029	110	-	500	-	470	-	3.0	-	15
5	564030	115	-	100	-	480	-	2.5	-	5
6	564031	105	-	225	-	285	-	3.5	-	15
7	564032	105	-	15	-	145	-	2.0	-	7
8	564033	100	-	15	-	135	-	1.5	-	6
9	564034	110	-	65	-	460	-	1.0	-	3
10	564035	130	-	15	-	160	-	2.0	-	5
11	564036	105	-	70	-	160	-	1.5	-	15
12	564037	135	-	65	-	300	-	1.0	-	6
13	564038	95	-	<5	-	140	-	1.5	-	9
14	564039	35	-	5	-	130	-	1.0	-	6
15	564040	35	-	5	-	100	-	2.0	-	35
16	564041	10	-	15	-	85	-	1.5	-	40
17	564042 SD	125	-	180	-	2300	-	1.5	-	5
18	564043	75	-	25	-	100	-	1.5	-	60
19	564044	155	-	50	-	175	-	1.5	-	9
20	564045	105	-	5	-	135	-	1.5	-	7
21	564046	130	-	40	-	130	-	1.5	-	10
22	564047	95	-	65	-	160	-	1.5	-	5
23	564048	130	-	95	-	345	-	2.5	-	15
24	564049	80	-	45	-	260	-	1.5	-	5
25	564050	100	-	25	-	100	-	2.0	-	4

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
- = element not determined

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	23.3.08.06610	02/11/89	7323	5 OF 10

TUBE No.	SAMPLE No.	Cu	Cu	Pb	Pb	Zn	Zn	Ag	Ag	Sn
1	564051	90	–	60	–	150	–	2.0	–	30
2	564052	110	–	50	–	155	–	2.0	–	4
3	564053	100	–	60	–	185	–	2.5	–	15
4	564054	50	–	55	–	320	–	2.0	–	30
5	564055	255	–	75	–	200	–	2.0	–	25
6	564056	20	–	30	–	105	–	2.0	–	25
7	564057	95	–	55	–	65	–	2.0	–	5
8	564058	105	–	20	–	80	–	2.0	–	5
9	564059	100	–	30	–	225	–	1.0	–	4
10	564060	40	–	30	–	60	–	2.0	–	15
11	564061	75	–	35	–	75	–	1.5	–	20
12	564062	80	–	115	–	50	–	6.5	–	4
13	564063	135	–	205	–	2350	–	1.5	–	5
14	564064	15	–	15	–	185	–	2.0	–	30
15	564065	55	–	505	–	1050	–	1.5	–	20
16	564066	65	–	30	–	90	–	1.5	–	8
17	564067	160	–	55	–	95	–	1.5	–	5
18	564068	115	–	25	–	105	–	1.5	–	6
19	564069	60	–	175	–	70	–	1.5	–	5
20	564070	30	–	40	–	65	–	1.0	–	7
21	564071	20	–	70	–	600	–	1.5	–	4
22	564072	35	–	190	–	400	–	1.5	–	10
23	564073	15	–	40	–	75	–	2.0	–	<3
24	564074	25	–	20	–	50	–	1.5	–	3
25	564075	25	–	65	–	35	–	2.0	–	5

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

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121255

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	23.3.08.06610	03/11/89	7323	4 OF 10

TUBE No.	SAMPLE No.	Cu	Cu	Pb	Pb	Zn	Zn	Ag	Ag	Sn
1	564076	20	–	25	–	35	–	1.5	–	8
2	564077	20	–	40	–	65	–	2.5	–	8
3	564078	20	–	80	–	40	–	4.5	–	10
4	564079	60	–	45	–	70	–	2.0	–	3
5	564080	50	–	35	–	45	–	2.0	–	6
6	564081	105	–	40	–	130	–	1.5	–	6
7	564082	80	–	25	–	70	–	1.5	–	9
8	564083	25	–	25	–	45	–	1.0	–	5
9	564084 STD	125	–	170	–	2300	–	1.5	–	8
10	564085	150	–	90	–	105	–	2.5	–	15
11	564086	40	–	75	–	60	–	2.0	–	25
12	564087	70	–	65	–	45	–	1.0	–	25
13	564088	15	–	25	–	50	–	1.5	–	9
14	564089	25	–	35	–	65	–	1.5	–	9
15	564090	35	–	50	–	25	–	2.0	–	10
16	564091	125	–	50	–	65	–	1.5	–	65
17	564092	35	–	45	–	150	–	2.5	–	0.8 1400
18	564093	45	–	60	–	265	–	1.0	–	4.0 4350
19	564094	125	–	30	–	55	–	1.5	–	0.9 400
20	564095	45	–	10	–	60	–	1.0	–	1.48 0.6 >5000
21	564096	45	–	25	–	20	–	1.0	–	45
22	564097	155	–	10	–	45	–	0.5	–	30
23	564098	50	–	20	–	40	–	0.5	–	45
24	564099	50	–	15	–	50	–	1.5	–	30
25	564100	15	–	10	–	35	–	1.0	–	25

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	23.3.08.06610	03/11/89	7327	5 OF 10

TUBE No.	SAMPLE No.	Cu	Cu	Pb	Pb	Zn	Zn	Ag	Ag	Sn
1	564101	90	–	25	–	100	–	0.5	–	80
2	564102	15	–	15	–	70	–	0.5	–	40
3	564103	130	–	50	–	70	–	1.5	–	95
4	564104	50	–	45	–	50	–	1.0	–	45
5	564105	45	–	45	–	70	–	1.0	–	25
6	564106 SD	130	–	205	–	2350	–	1.5	–	8
7	564107	40	–	105	–	85	–	1.0	–	45
8	564108	35	–	50	–	55	–	0.3	–	9
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	5	25	5	25	5	25	0.5	2	3
24	UNITS	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM
25	METHOD	101	104	101	104	101	104	101	104	401

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	23.3.08.06A10	03/11/97	7323	OF 6 10

TUBE No.	SAMPLE No.	Sn	Rb							
1	564001	–	35							
2	564002	–	220							
3	564003	–	260							
4	564004	–	310							
5	564005	–	290							
6	564006	–	160							
7	564007	–	130							
8	564008	–	160							
9	564009	–	310							
10	564010	–	45							
11	564011	–	200							
12	564012	–	160							
13	564013	–	SNR							
14	564014	–	160							
15	564015	–	270							
16	564016	–	170							
17	564017	–	90							
18	564018	–	85							
19	564019	–	65							
20	564020	–	75							
21	564021	–	35							
22	564022	–	65							
23	564023	–	85							
24	564024	–	120							
25	564025	–	140							

Results in ppm unless otherwise specified
T = element present, but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	23.3.08.06610	03/11/93	7323	7 OF 10

TUBE No.	SAMPLE No.	Sn	Rb								
1	564026	–	120								
2	564027	–	150								
3	564028	–	70								
4	564029	–	150								
5	564030	–	220								
6	564031	–	230								
7	564032	–	70								
8	564033	–	70								
9	564034	–	100								
10	564035	–	60								
11	564036	–	95								
12	564037	–	90								
13	564038	–	120								
14	564039	–	220								
15	564040	–	320								
16	564041	–	90								
17	564042	–	35								
18	564043	–	260								
19	564044	–	100								
20	564045	–	50								
21	564046	–	140								
22	564047	–	150								
23	564048	–	95								
24	564049	–	95								
25	564050	–	140								

Results in ppm unless otherwise specified

"T" = element present; but concentration too low to measure

"X" = element concentration is below detection limit

"–" = element not determined

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121259

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	23.3.08.0610	03/11/89	7325	8 OF 10

TUBE No.	SAMPLE No.	Sn	Rb							
1	564051	–	200							
2	564052	–	140							
3	564053	–	160							
4	564054	–	70							
5	564055	–	<5							
6	564056	–	120							
7	564057	–	140							
8	564058	–	180							
9	564059	–	40							
10	564060	–	170							
11	564061	–	120							
12	564062	–	80							
13	564063	–	35							
14	564064	–	200							
15	564065	–	95							
16	564066	–	140							
17	564067	–	40							
18	564068	–	25							
19	564069	–	45							
20	564070	–	110							
21	564071	–	140							
22	564072	–	85							
23	564073	–	<5							
24	564074	–	15							
25	564075	–	40							

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

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121260

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	23.3.08.06610	03/11/89	7323	9 OF 10

TUBE No.	SAMPLE No.	Sn	Rb							
1	564076	–	20							
2	564077	–	40							
3	564078	–	230							
4	564079	–	95							
5	564080	–	130							
6	564081	–	85							
7	564082	–	170							
8	564083	–	50							
9	564084	–	35							
10	564085	–	200							
11	564086	–	150							
12	564087	–	110							
13	564088	–	45							
14	564089	–	100							
15	564090	–	210							
16	564091	–	140							
17	564092	–	220							
18	564093	–	340							
19	564094	–	220							
20	564095	1.48	55							
21	564096	–	180							
22	564097	–	60							
23	564098	–	200							
24	564099	–	120							
25	564100	–	200							

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	23.3.08.06610	03/11/89	7393	OF 10 10

TUBE No.	SAMPLE No.	Sn	Rb
1	564101	-	45
2	564102	-	5
3	564103	-	100
4	564104	-	220
5	564105	-	220
6	564106	-	35
7	564107	-	350
8	564108	-	190
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23	DETECTION	0.01	5
24	UNITS	%	PPM
25	METHOD	408	401

Results in ppm unless otherwise specified
T = element present, but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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ABERFOYLE RESOURCES LTD.

HELLYER DIVISION

121262

7295

CHECKS

GENERAL ASSAY REPORT

Date	Sample	ppm Sn	% Sn	% Sol Sn					
	Aberfoyle Exploration 564092	1450		<0.01					
	564093	4450		<0.01					
	564094	430		<0.01					
	564095	—	1.25	<0.01					
	METHOD	B1	01	F1/3					

ASSAYER.....

CHIEF ASSAYER.....

DATE 13/12/89

NWPS 53926

Summary list of petrographic samples from ZS 91.

Sample No.	Depth	Description
564122	604.3-604.4m	Black mudstone in places tending to polymict breccia, mild pyrite, chlorite, quartz, siderite? veining.
564123	605.4m	Polymict breccia with dark silty matrix to mudstone, quartzite fragments, minor siderite veins and pyrite blebs.
564124	600.3-600.4m	Possible soft sediment deformed grey siltstone interbedded with black mudstone with some siderite? quartz vein development.

Summary list of petrographic samples from hole ZS91 (taken by JAA December 1989)

Sample No:	Depth	Description
564125	617m	Evaporite texture now preserved as Mesatytic CO_3.
564126	567.75m	Poverty Point clast, mnr. po.
564127	613.7m	Possible Montana volcanics and evaporite fragments in Oonah shale.
564128	604.25m	Possible Cassiterite mineralisation.
564129	559.2-559.3m	Crimson Creek matrix with tectonially brecciated fragments of Oonah Quartzite, dolomite with some gn lithic greywacke clasts.

Summary list of Photographs ZS91

Sample No:	Depth	Description
564129	559.2-559.3m	Crimson Creek breccia with Oonah clasts.
-	613.55m	Oonah shale with volcanic and evaporite clasts.
564126	567.75m	Poverty Point clasts, wh.q vein stockwork mnr.' po min.

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121265

Pontifex & Associates Pty. Ltd.

TEL. (08) 332 6744
A.H. (08) 31 3816
FAX (08) 332 5062

26 KENSINGTON ROAD, ROSE PARK
SOUTH AUSTRALIA

P.O. BOX 91, NORWOOD
SOUTH AUSTRALIA 5067

MINERALOGICAL REPORT NO. 5595
by A.C. Purvis PhD.

February 13th, 1990

TO : Mr John Anderson
Aberfoyle Resources Ltd
92 Beulah Rd
NORWOOD SA 5067

YOUR REFERENCE : Order No. 6931

MATERIAL : Drill Core Samples

IDENTIFICATION : 564125 to 564132 (except 128)

WORK REQUESTED : Thin or polished thin section preparation and description.

SAMPLES & SECTIONS : Returned to you with this report. ✓ BGK

Ian R. Pontifex
PONTIFEX & ASSOCIATES PTY LTD

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DJN

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16 FEB 1990

GENERAL COMMENTS

In this suite of rock polymict breccias 564126, 27, 29 appear to be dominantly sedimentary in origin and contain fragments showing weak to very strong deformation. These rocks appear to represent the possibly allochthonous Crimson Creek Fm. with autochthonous sericitic claystones (564130, 32) to fine sandstones in (tectonically) lower sequences (e.g. Oonah F.). No. 564125 appears to be a metasomatic carbonate and the ore (564131) contains replacement bodies of quartz carbonate and sulphides, including stannite and minor fine 'needle tin' crystals (very fine acicular cassiterite). The replacement may have been localised at or close to the allochthon/autochthon boundary (?fault).

There is no clear evidence of former evaporites and the dolomite in 564125 may have replaced a graphitic sediment, possibly with CO_2 derived from the oxidation of graphite.

'Needle tin' is a common associate of stannite in Tasmania and New South Wales and may reflect late stage low temperature fluid activity. Allochthon/ Autochthon relationships in this area may have been modified by Devonian (Taberabberan) tectonic activity.

564125

Weakly layered, coarse grained dolomite, with interstitial carbonaceous material (?graphite) sparse pyrite and quartz. Epigenetic dolomite.

Coarse anhedral to rhombohedral dolomite dominates this crudely layered rock with grains to 4 mm in size forming a more or less polygonal aggregate. Interstitial areas are occupied by carbonaceous material, more abundant in some poory defined layers than in others, but forming about 7% of the rock. This is possibly graphitic, suggesting that the rock represents the dolomitisation of a carbonaceous sediment, as the result of hydrothermal alteration.

Minor pyrite is present and local discontinuous quart veins represent a further hydrothermal overprint on the dolomite. Dolomite veins are also present, and at least some of these post date the quartz veins.

564126

Breccia of pyritic-graphitic shales, with lenses and blocks of carbonate containing pyrite and quartz veins; sparse extremely fine pyrrhotite, chalopyrite and sphalerite in carbonate.

The bulk of this rock is a graphitic-pyritic slate, containing minor sericite and dispersed fine quartz. Blocks of sericitic and graphitic-pyritic shale and of vein quartz are present, together with rare fragments of sericitic quartz sandstone.

The abundant opaque carbonaceous component obscures the texture to some extent, but a fragmental texture can be seen. Some areas have been flooded by carbonate and other by late stage chlorite.

Carbonate domains up to 40 mm across are common. They consist mostly of calcite, but with dome dolomite. They may include some fragments, as well as large possibly authigenic (?hydrothermal) nodules, rich in pyrite, and containing veins and euhedral crystals of quartz. Veins of quartz also extend into the host slate breccia blocks.

Pyrite in the carbonate domains is generally coarser and more aggregated, and the crystals tend to contain more minute inclusions (of carbonate). Sparse blebby grains of pyrrhotite, sphalerite, also of chalcopyrite about 0.01 mm size are scattered, also loosely clustered within the carbonate.

564127

Breccia of graphitic, pyritic, chloritic and sericitic slates, siltstones and sandstones; with vein quartz, chlorite and carbonate.

Many of the fragments in this weakly layered rock have become highly elongate parallel to a contorted to nearly planar foliation. Some fragments, mostly siltstones and silty claystones, show little or no deformation.

Graphite, sericite, chlorite and pyrite are all present in various amounts in the various sedimentary lenses and fragments. The size of the quartz grains ranges from silt to fine sand in highly extended, almost boundinaged fine sandstone fragments. The sandstones contain sericite pyrite and of leucoxene as well as graphitic fragments.

Lenses of vein quartz, passing into, and veined by pale green chlorite are present, to 8 mm diameter. Some of these contain pyrite.

Late stage veins of fibrous quartz and minor sericite cut across the fabric of the rock.

564129

Breccia of angular to elongate and subrounded fragments (clasts) of variously graphitic, pyritic, sericitic-slates, also of quartzites, carbonate rocks and quartz-carbonate rocks.

This rock consists of a loose packed random aggregate of angular to sub-angular to subrounded and some distorted fragments as clasts, of various sedimentary rock types, up to 15 mm in size.

Blocks of quartzite (to 15 mm diameter) are angular, and aggregated with more abundant clasts of highly deformed graphitic, pyritic-sericitic slates. A small fragment 4 x 3 mm, of possible altered vesicular basalt is present.

Fragments (or clasts) of (1) dolomite, with chert and quartz veins; (2) dolomites with sand sized rounded quartz grains $\pm$ micritic carbonate fragments to 2 mm in size, also form part of the breccia aggregate.

Irregular carbonate veins occur throughout.

Some of the slate fragments have been severely deformed and pinched in between more competent clasts.

Aberfoyle Resources Limited
EXPLORATION DIVISION

DIAMOND DRILL LOG

PROJECT : ZEEHAN CML 36/81

PROSPECT: SEVERN

1212712

HOLE NO: ZS91
PAGE: 1 of
LOGGED: DJN
DATE: 1/9/89

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
0.0				Precollar Tricone							Cuttings r-rd br highly oxidised & weathered Mst.	
53												
53			bk Mst	A bk carbonaceous Mst somewhat frac. 53-53.4m as coring begins.		@ vns form an irregular fine network throughout & wh @ vns & area. graph. line ano. frac.					From 53 - 53.1 gn/h Gw.	
53.9												
54.0			bk Gw ibd bk Mst.	A contorted gy bk/k Co. Ss & ibd bk Mst. Co (1-2mm) & lh. clasts occur throughout the f.re silty mtx to the Gw. 1° So highly deformed by soft sed. def^n & bk Mst irregularly squeezed.		Irregular wh br q vn networks developed in places forming breccia infill vns to frag. of bk Mst.						
54.0			gn calc Gw/sd gygn Slt	An ibd sequence of gn-gygy Co Gw & fine gygn-gy bk Slt.		wh. br q vns reseal tension gashes & frac. @ a high ∠ to fol^n also developed subll to fol^n.	mar Cc ± Py veinlet & bleb develop't @ 53-54m	Fol^n of Slt/Ss So contacts @ 30-40° to CA			In places small scale frac. & in Slt → Gw Some frac. lined & chloritic Slt. At 54.6m a Slt band seems to coarsen downhole ⇒ uphole facing.	
56.0			gy bk Co. Gw ibd gy bk Slt → Mst.	Generally well bedded gy bk Co. Gw & gy Slt → bk Mst In places Slt well lam. In places Gw/Slt contacts irregular & some soft sed. def^n Slt/Mst bands 2-4cm & Gw bands 5-20cm & (Gw : Slt = 2:1)		q, cc vns occur sporadically throughout on occasions regular @ 30, 45 to CA but generally as irregular blebs or short veinlets.					Slt/Mst lamnae & Slt/Gw bed contacts @ 55° to CA.	
57.3												

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121272

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
57.3			gr Co. Gw	Relatively massive gr Co Gw bnd ± minor irregular gr - grgy slt masses as rafts & irregular bands towards the base of the interval.		V. minor Ca/qtz veinlets developed sporadically.					Lower graph lined contact @ a fracture @ 50° to CA.	
57.55			blk carb Mst	A blk carbonaceous mst ± graph fracture linings in places. In places some ggslt & bfel Ss fragments contorted ± blk Mst.		Wk qtz vnlg as an irregular network & as blebs and short tension veinlets.					In places graph. fract. 40° to CA. From 57.6 - 56.75m core highly frac. & graph. fragments. 58.8-58.9 core highly fractured & some vlg qtz fragments from veining.	
58.9			grgy Co. Gw ibd gy blk Mst	A highly contorted grgy Co. Gw ± irregular stepped blk carbonaceous mst masses, as bands & isolated rafts & large masses.		Wk br to stained qtz vns more regularly developed subparallel to CA to 10-15, 30° to CA ± odd x cutting veinlet & blebs b/w main veins.						
59.75			pale gl gr Co. Gw	A somewhat leached pale gl gn Co. Gw ± occasional ggy gr slt rafts or short irregular band. With qtz Co, blk mst clasts in relatively coarse Ss 0.5-2mm grain.		Minor qtz vn development @ 20° to CA						
60.4			pale gl gr Co. Gw ± dol lode	As above but ± major bleaching & Vn development ± abundant Sd. Some gl Co ppg along fracture surfaces ± vn as a result of fluid action		Sd vn developed @ small to 10-20° to CA. occupies half the core - visual	Minor sp. gl min assoc ± Sd vn development.				accretionary Sponge like, fd grain patterns, ± fd/gl lining growth surfaces & many floral shaped voids in qtz.	

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12127 4322

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
60.96			gn Co. GW	Massive gn Co GW ± dk pale yl gn area where some leaching has occurred. From 60.95 - 61.2 pale yl slt → yl. gn Co GW		Minor Cc vn developed as irregular blebs + short veinlets subpll to low & to CA. Short wkly mn infill tension gashes & from minor to major vns @ 20, 40, 65° to CA.	In places a vn intense that forms a fracture infill.					
64.9			gn slt: vf gn Co GW	Contorted slumped deformed interval of grgy slt & gn Co GW. gn slt dominates ± lesser wedges & rafts & irregular banks of Co. GW dispersed throughout slt GW ↑ in abundance downhole & tends to dk rd br colour towards the base of interval		Cc ± qtz vns dominate as an irregular network in places forming broad veins @ 20-25° to CA ± minor veinlets perpendicular from main vns.	Minor coarse 1-2mm py associated ± irregular Cc vns 64-4 - 64.7m				Abundance of Cc veining ↑ downhole. Minor qtz vns & blebs in assoc ± Cc vns.	
66.95			gn-alb GW → rb	A somewhat contorted interval dominated by 8° Co. GW → or brn Co. GW ± gy, br, wk slt clasts irregularly dispersed throughout the GW matrix clasts occurring more prevalent downhole		blebs & short irregular vein quartz sets of Cc occur throughout					Minor ± brecciated veinlets @ 45° to CA = a fracture surface @ 25° to CA some with silty-carbonaceous py development surfaces	
67.4			rd br Co GW: vf gy rd br slt.	A variably lbl & somewhat contorted GW/slt interval Dominated by rd br Co GW ± lesser selvedges & contorted wavy slt bands. In places minor slt beds @ 30-35° to CA. Generally belly contacts		Sd, Cc veining quite intense ± low & 15-20° obs stockwork sd vn network abundant from 68.2-68.9 ± Cc vns were prevalent elsewhere. Some ab qtz						
69.8												

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121274 213

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
				dislocations during soft sed. deft's, in places where silt more prevelent, silt beds appear to be fractured, compressional ? fractures infilled by darker rd br silt. to give a jigsaw appearance		~ broad sd vn @ 68.9m. Broader sd vns more prevelent in silt rather than fine beds.					68.9 – 69.3m core somewhat fractured ~ low t fractures @ 20–30° to CA. Core in places poor recovery possibly being broken by drilling.	
69.85			rd br gg silt with gn Co bleb	Somewhat contorted rd br gg silt / sd gn Co bleb interval. The gn Co bleb = lithics occurs dominately as selvedges or pkt dislocated beds, somewhat deformed by soft sed. deft's. Where rd br silt is somewhat fractured ~ jigsaw texture ~ gy silt infilling fractures.		Minor bleb & irregular qtz ~ minor Ca vns & veinlets occur sporadically throughout					At 70.4m a 2–10mm wh qtz in ~ gn silt vn cuts @ 40° to CA.	
70.4												
73.6			ggg silt	an interval dominately of ggg silt, in places esp. 70.4 – 70.8m some evidence of soft sed deft's & disturbance to sed. laminae. Also some darker silt infilling of fractures ~ in ggg silt. In places dark brown silt → rd br fg Cbd ± Co.		minor Ca vns occur throughout as bleb, veinlets & sporadic vns @ 20 & 40° to CA	minor Py on fractured surfaces @ low & to CA <5° @ 73.95m Py probably associated with qtz & Ca.				Possibly some sed. banding developed @ 30–35°/40° to CA, also supported by concentrations of silt beds of ggy & ggg & rd br.	

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121275 N 7142

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
73	6		rd br Co Gw ± Nr slt	True crimson coloured sequence of ibd Co Gw ± p-g slt. (Gw : slt = 2 : 1) In places slt rd br ⇒ ggn.		Sporadic qtz ± Ca, 3-12 mm & veinlets throughout, along ± scattered irregular blebs. With mm 15, 20, 25, 40 & 45° to CA	At 78.5m mm py veinlet @ 15-20° to CA 0.5 mm wide.				belting contacts & fine silty laminae ⇒ belting @ 30 - 20 - 25° to CA	
78	6											
81	5		gn Co Gw ibd ggn slt	An ibd sequence dominated by gn Co Gw ± thin ± ggn slt ± contacts variably contorted, ± some minor soft sed def° evident. (Gw : slt = 3 : 1)	wk-mod mm @ 30° sub ll foln also at 65° to CA cut by a later phase sub ll to 15° to CA. Also many irregular veinlets sporadically distributed.	wk-mod mm x cut both as regular & irregular 1-3mm mm, in places some brecciation & incorporation of slt & Gw rafts in mtx of mm qtz. Veinlets of Ca, qtz particularly intense from 81.2 - 81.5m.	v. minor py occurs as irregular blebs asso. ± sub ll to CA as remarks				with slt laminae & belts @ 25-30-35° to CA.	
81.5												
82.75			blk ggn Co Gw ibd ggn blk slt	dk ggn blk variably laminated slt ± ibd ± dk ggn Co Gw (slt : Gw = 3 : 2) Earlier sub mm phase developed at 40° to CA sub ll to Sa ± Ca mm later low ∠ sub ll to CA phase. ggn slt ⇒ blk slt downhole.		Intensely veined interval ± Ca mm & veinlets throughout. Veining dominately @ 15-20° to CA ± some smaller x veinlets mmly from the dominant mm sets. From 82.1 - 82.5m major low ∠ 10° to CA Ca mm fringed by earlier Gw, ± Ca mm also @ 40° to CA @ 82.5 - 82.6m.					slt laminae & belting @ 30-40° to CA.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOS	REMARKS	DEPTH
82.75			gy Co GW	dk gy Co. GW mica scattered lithics, (<1-15mm) in places more fg GW with poss bedding @ 25° to CA.	Vns developed @ 20, 30° & 0-10° to CA, c most vns subll to 10° to CA	Moderate vn development c Wh.q vns dominate c lesser assoc Ca & Sd? Vns usually both as tourmaline or in plane breaks resembling vns.						
84.3												
-85			bk-ggy^ slt	An interval of fine slt or Mst c dk gy bk slt 84.8-84.6m, c more dk slt @ bands 1-8cm from 84.6-84.9m. From there an ggy^ slt, in places tends to fg Co GW & in places is laminated		Ca wh.q vns as irregular short veinlets & scattered blebs, c some vn development subll to foln & at 10-20° to CA.					laminae & possible bedding contacts ⇒ So 55-60° to CA.	
85.6												
-86.35			gy bk Mst to gy gy Co GW	An interval of lbl GW/Mst with gr Co. GW 85.1-85.9m, gr gy Slt → bk Mst 85.9-86.0m, c core highly fractured & tends to contain numerous frag. 86-86.25 lbl GW Mst c lenses of soft sed def^ at bedding contacts 86.25 -86.65 gr gy Mst to Slt.		Wh.q ± Ca vns as irregular network c some preferential vn development @ 50° to CA possibly subll foln.					Irregular bedding contacts of So / vein ⇒ So @ 55-60° to CA.	
86.35												
-90.8			gr Slt to gr Co GW	An interval dominated by fg gr gy Slt to Mst, c variably lbd wedges / selvedges of gr Co GW (GW: Slt = 2:3)	Vns less prevalent @ 20° to CA & more irregular ⇒ downhole c Ca more prevalent c fissure veinlets developed.	With wh.q. Ca vns developed @ 45, 30, 20° to CA as irregular pinch & swell vns & terminating veinlets.					With possible bedding @ 35-25-20° to CA downhole from 88m 30-30-35-40° to CA to base of interval.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
90.8			gybk slt / ggy Co Gw	Minor bands (90.8–91.95) of laminated bk Mst → slt grades way to dk gy bk Co Gw which coarsens downhole & passes to ggy Co Gw ± lithics. From 91.1–91.2 ggy slt again dominates.		Ca uns 20–25° to CA, both as narrow more regular 0.5–1.0mm uns, more irregular broader uns 2–10mm. Intense Ca veining @ 40° to CA in dk bk Mst/slt @ 90.8m.					The passage from relatively coarse (1–2mm) ggy Co Gw → fg bk Gw ⇒ A fining or younging uphole. (Excellent fining)	
91.2			gr Co Gw / lit gn slt	An interval dominated by fg gr Co Gw. ± lithics & in places irregular beds, to reasonably well developed slt beds. Though not excellent slt/Gw contacts ⇒ Sb @ 60° to CA. Some coarsen & dfn of coarsening. (Gw : slt = 5:1) slt beds more prevalent & broader 10–30cm downhole ± slt often contorted ± calc/qtz veining. 1cm slt / Gw ⇒ 0/5 fin silty matrix		Few & 10° to CA w/ggy qtz uns @ 10–15° to CA with regular narrow wk qtz uns @ 50–55° downhole with irregular Ca veining infill veinlets more abundant downhole.					Slt & mst @ 90.8 has fine laminations ⇒ Sb @ 50° to CA. 7m 91.2 passes uphole from gr pebbly ggy slt again supporting fining up sequence ⇒ younging uphole. (Excellent fining)	
93.9			dk gy Co Gw	Massive dk gy pebbly ss ± dk 1–10cm Mst lithic fragments sporadic throughout. Dk slt band 1–3cm @ 50° to CA @ 94.2m.		Dominately Ca ± minor associated qtz veinlet development becoming more intense downhole. Ca predominately as narrow 1–3mm uns 15° to CA & broader 1–15mm uns @ 40° to CA, ± sporadic veinlets as shown below.	Minor Py assoc ± veining from 94.7 – 95.3m.					
96.35												

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
96.55 97.55			~~gg/blk sed~~ Y.b	A highly contorted & jumbled interval of dk gy GbW & gy blk slt, in places laminated. Intense soft sed def'n & subsequent brecciation & resultant mixing of debris to produce a mixed interval Σ dominately dk sndy-slty matrix to GbW, Mst, slt clasts.		Intense qtz Cc veining overprints the interval to enhance the brecciated appearance Σ irregular narrow to broad uns network isolating subangular of Sed material. Veining forms double &					Tr uns base fm eg 35-37.55 tends non sympathetic to ea dir ca Mst sed. Irregular Sx segments Σ Bedding irregular ea- development @ 45° to CA with some more narrow uns @ 40°-50° to CA.	
97.55 99.8			gn: GbW	An interval dominated by gn GbW, in places Σ irregular clasts of gy Slt throughout along Σ 0.5-1.0mm bkn Mst fragments. In places narrow bands of gy Slt 0.5-10cm.		Irregular Cc bkg tension infills & occasional narrow uns @ 10, 50, 70° & subll to CA.					Iron stained Sx @ 45° to CA.	
99.8 100.8			br rd pp fel Sst	Dominately br rd pp GbW Σ minor scattered fine <0.5mm lithics and Σ some ltbd rdbr Slt. 99.8-99.95, 100.6m rdbr Slt dominates. In places rdbr GbW => gangued GbW.		Narrow regular Cc uns @ 0.5-2mm @ 50° to CA Σ qtz uns @ 65° to CA. With qtz Cc uns also at 10-15° often as broader irregular tension infills.					Fracture & slt veining contact @ 50° to CA.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
100 - 101.5	1.5		gn Co Lcw	Dominately gn Co.Lcw ± scattered selvedges / irregular bands of ggg Mst. Tends to a finer ss → slt from 101.3-101.5m again supporting a fining up sequence.		Minor narrow qz/Ca vns 45,50° to CA ± further broader torsion vns infill to 10° to CA, also irregular network of fine veinlets from 100.8-101.2m.	Minor py on fracture @ 101.3m @ 45° to CA. In places minor areas ± gyb vns as isolated blebs.					
101.5 - 102.4	0.9		br.rl gn Co Lcw	A massive to variably brecciated br.rl gn Co Lcw ± fine Mst like zones ± in places rd.br Mst selvedges + dissected bands, often ± a gn silty mal → fg. Co Lcw where many of rd.br Mst clasts.		102.2-102.4m irregular blebs of Ca vein as breccia infill to rafts of Lcw + as an irregular vn network. With some more regular vns developed @ 30-35° to CA.					Possible fine gn silty bands @ 25-30° to CA @ 101.6m.	
102.4 - 105.1	2.7		gn Co Lcw	Dominately massive gritd Ss ± ggg Mst clasts throughout, with ibd gn Mst towards the base of the interval 103.7-105.1m, in places Mst contorted + fractured ± dark silt infilling fractures, + in places Mst + wisps rounded gn Co Lcw clasts. A degree of brecciation + mixing of Lcw/Mst from 103.7m			Wh-q, Ca vns dominately as irregular torsion infill blebs + as irregular bands + vns @ 10-25° to CA.	Minor Ca blebs + ± Ca vns @ 102.4m.				Ss/Mst contact → Ss @ 45-50° to CA.	

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121280 613

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
105.1			br-gn → w.rd-pk CoGW	Massive Co.GW, pinkish by occasional lithic fragment (<0.5cm). With sporadic ill-defined fragments dispersed throughout 2-20mm. Downhole there is a progression from gn br - rd br CoGW. Particularly rd br from 105.9m ± gn-gy zone @ 105.8m in areas ± wh-gy, Ca vn, possibly reduction.		wh-gy, Ca vns @ 20, 35-60° to CA. ± irregular vns & veinlets sub-// to CA.					
107.2			rd br-gn-gy CoGW	Downhole - progressively more reduced ± trend from rd br-gn - gn-gy CoGW. Sporadic rd br-gn-gy fragments. Most clasts accur. Uphole reduction boundary marked by narrow 0.5cm Ca vn @ 45° to CA, ± lower boundary by Ca-q vn @ 40° to CA.		Sporadic irregular q, Ca veinlets occur throughout ± main veins mostly boundaries of the interval.					
107.55			pale yl-gn CoCalc	A somewhat bleached pale yl-gn Co.GW core broken possibly by drilling though in places some Chl. lining fractures at low & to CA from 107.7m - 107.9m. From 108-109.05m. core fractured & broken. At 108.6m dissolution fractures of EGW.		Irregular wh-gy Ca-q veins occur @ 108.5, 108.6, 108.3m. Irregular network of Sd vn Network throughout ± Ca vn @ 30° to CA @ 109.6m.					
108.7												

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
108.7			pale T/gn foliated sd ggy silt.	A highly broken & fractured fault zone with ltd pale yl.gn Ca.GW sometimes leached by fluid movement ± fg ltd ± ltd silt/sd ggy ppg. In places minor sd. mx.		From 111.8-112.3 highly broken Sd lode ± minor dmm blebs & short veinlets of gl.cp.ppg. Minor irregular q±Ca veins & veinlets throughout GW, along ± Ca, sd blebs. With Ca mx @ 15, 60° to CA non fracture plains	Minor gl.cp.Py areas ± sd lode.				Fracture planes @ 10, 15, 60, 25° can all be identified ± many fractures be & ± irregular surfaces ~ subpll to CA.	
113.9			sd lode	Relatively competent sd lode, ± some brecciation evident from 114.7-114.9m ± some dkgy silty ppg on fracture surface @ 114.0m. residual pale ylgn GW occurs bound by massive sd @ 114.25 - 114.45m, ± sd mx X cutting Ca veins @ 30-35° to CA.		Ca blebs & irregular mx from a network throughout the sd lode from 113.9-114.3m.	Minor dissem py.gl mx areas ± sd lode @ 114-114.05m. Irregular obliate like mx of gl.sp areas throughout the sd, particularly from 114.45-114.7m ± lesser gl.sp blebs/mx. gl.sp mx possibly represent in growth fract surfaces.				From 113.9-114.05 pale yl-gy silt xcuts lode @ 15° to CA ± fragments of yl-br GW/silt zone silty ppg.	
114.7			pale gl.gn GW ltd gg ± silt	Interval dominately of residual leached pale yl.gn Ca.GW ± mottled ltd ggy-gy-gn silt → MSL masses bedding highly contorted ± silt according more so as selvedges to GW mx		Minor Skarn mx as fleck & blebs of wh q ± Ca occur throughout ±. mx orientation mx 40 65, 70° ± CA. Similar mx ± mix to sd lode development					GW progressively less leached & darker gn downhole, as tend recovery from sd. mx as mass flow is flow.	
116.95												

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
116.75 – 118.6			pale gn GW	Interval dominated by pale gn gyl GW. A somewhat leached appearance. In places minor ggy gyl SH clasts but generally only sparse occurrences. Minor fd & 1-Acs Mx t clasts < 1.0mm 2 in GW		Irregular vns & large clast like vn masses of wh-q, Cc occur throughout. Along 2 irregular ldg fers vn infill veinlets. Dominant vn type are many massive x-cutting Stg vns. 1mm – 3mm @ 30-35° to CA.	Minor blebs of Py possibly in assoc 2 small scale SE vns @ 117.9m.				116.95 – 117.0m minor Slt bnd @ 40° to CA ⇒ possible So.	
118.6 – 121.3			rd br GW ⇒ ggy gyl GW	A variably leached fel GW sequence, 2 overall appearance of :bd GW WS, but 2 colour content due to variable leaching & reduction. In places minor lithic fragments 1-3mm SK – gy/gn SH. But dominately crimson brown GW ⇒ ggy gn GW. Fracture network throughout crimson bands has lead to reduction & Δ to ylgn along sealed fracture plans through fluid movement.		Vn qtz occurs irregularly regularly fracture network as blebs & vns. With more regular Stage vns @ 30 & 65-70° to CA 121.2m.	Some Py assoc 2 possibly Se? Small bleb @ 10° to CA fracture @				Some leaching assoc 2 irregular fracture veinlets dominately leached in assoc 2 regular vns & produce aureole Δ to pale yl gn GW intervals	
121.3 – 122.55			pale yl gn GW	A leached pale yl gn Co GW interval again intensely leached possibly in assoc 2 SE vn ⇒ lode development. GW flecked by fine fd < 0.75mm & Mx t clasts < 1.0mm	Sdvns occur as narrow 5-10cm vns @ 30° to CA 2 more pervasive vn network – 20cm vns @ 30-25° to CA from 21.3 – 122.1m.	Minor Qtz vn development as irregular vns @ 50° to CA & 2 minor vn assoc 2 SE @ 30° to CA. Only minor irregular vn 122.1 – 122.55 = Fde most prevalent.	Minor gl, sp?, Py in vn or Stylobite like development along SE vn growth front @ 122.1m				intensely leached 2 SE vein interval that tends to 2 lode in places	

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DIAMOND DRILL LOG

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
122.85 – 123.4			gn Co Gw	More typical fresh dk gn Co Gw ± accessory gl brn Slt clast @ 122.7m. Elsewhere fd & lith. clasts (mst/Slt) 1-4mm occur, giving it a somewhat f-g. grit appearance. With the range of mst/slt lith clasts, rd, br, gy l. gn, blk being somewhat V. grit appearance. Also selvedges or soft sed def contorted beds of v.f-g gn Gw Slt @ 123.0m – 122.7m.	Downwardly irregular wk q-m network ± minor assoc Ca vns low ∠ to CA. varying fr 0.5–5mm. Some more regular vns @ 20, 30, 40° to CA.	V. minor py assoc ± wk q vns as sporadic blebs.					
123.4 – 124.85			pl v lgn – gn to grit'ised pl v lgn – gn Gw	A variably leached & reduced interval. With intense leaching assoc ± fluid flow during Sd vn development. From 123.4 – 123.7m pl v lgn grit → Gw ± c. clasts 1-5mm of rd, bk, gn Slt & wk q sfd. 123.7m Sd vn 123.75 – 123.9 pl v lgn Gw ± minor grit 123.9 – 124.1 dk gn Co. Gw → f-g Gw ≠ Slt in places. 124.1 – 124.85 dk gn grit → v lt gn grit i.e. more oxidised or less reduced downhole. Influx of gritty material ↑ downhole & to ~ coarser.	123.9 – 123.75 Sd vn ± some assoc wk q @ 27° to CA; ± minor py blebs & sporadic bands of Sd 7ft 124.05 wk q Ca vn @ 27° to CA. Elsewhere narrow irregular wavy 30° to CA Ca, q & Sd vns 40° to CA are developed also sporadic blebs & tension gashes.	Minor py assoc ± Sd. Also py as disseminated bands & grit @ 123.6m				Contact o/w grt & Cr Gw @ 124.85 lc @ 20° to CA.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: * DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
124.85 – 125.95			Common br GW	A crimson brown f.g. GW ± wispy gn Co-bearing & gn gritty bands & irregular wavy horizons throughout.		Narrow 1-3mm wh.q veins subparallel to low & 10-30° to CA, wavy & irregular ± minor associated veinlets.					Minor wispy gn Co-sericite bands @ 35° to CA.	
125.95 – 126.4			gn Y grit.	f-g - c.g Y. grit ± 0.5-1.5mm rd, br, blk, gn, silt grains ± ft → 1.5-6mm Slt, wh.q clasts as coarser into Y. grit bands. Grains subangular to rounded.		Minor wh.q vn development @ low & to subparallel to CA as irregular wavy vns.					Could say fining upwards sequence from coarse grit → Y. GW. ⇒ Facing unknown.	
126.4 – 127.9			Common br GW	Dominately Cr. br Co. bearing ± minor lithic clasts 0.5-1.0mm gy, rd, br Slt bearing. From 126.4 - 126.55 pl gl. br GW ± minor reduction assoc. ± sed vn. At 127.7m tends to f.g grit ± abundance of Slt grains 1-4mm ± gn GW - Y.		Sd. vn ± wh.q cuts @ 20° to CA @ 126.5 ± minor py assoc. ± an irregular network of 1-2mm Sd vns throughout from 126.4 - 126.55m Wk Ca vns ± q from a irregular network at low & subparallel to 20° to CA throughout rd/br GW with some regular vns @ 20° to CA.						
127.9 – 129.3			gn Bearing grit	gn Co. bearing ± abundant lithics 0.5-6.0mm, rd, br gy Slt & wh.q in places coarsens towards a Y. grit ± Sed Mtx, mainly @ 128.9 - 129.7m		Minor regular Ca, q vn development @ 10, 20, 50° to CA ± irregular narrow 0.5-1.0mm vns throughout ± minor biotite development					Variable bl/gy - coarse GW ± odd fragmental Slt band → Sa at 20-25° to CA.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
129.3 – 130.5			gn Co/Gw ibd gn Slt	An interval dominated by f-g. 0.5-1.0cm gn Co/Gw ± bk Slt clasts, fd + odd lge gy gn Slt clast. The Ss is cut in places 129.3 – 129.45 + 129.85-129.85 by g-gy Slt/Mst bands ie. massive f-g silt., in place some soft sed defn ± rafts Ss ± in Slt also small scale slump f/b of contacts.		Irregular Cc, qv ns developed as a low ± network throughout + @ 30° to CA. Also as blebs + short veinlets.					At 129.3m Slt/Ss contact somewhat faulted: but @ 25° to CA.	
130.5 – 134.4			gn Slt/Mst ibd bk Mst	A highly mixed sequence of gn Co/Gw / gn-gy Slt as contorted masses ibd gy bk Mst/Slt ± some f-g. Slt/Ss areas ± Mst. gn Slt bands + selvedges occur ± in gn Co/Gw bands from 131.1 – 132.1 + 132.2 – 133.1m. From 132.7 – 133.8 bk Mst – gy Slt ibd gy bk Co/Gw qvn highly contorted by soft sed defn. 130.5 – 131.1 + 133.8 – 134.4m mixed sequence of bk Mst ibd gy Gw + gn Co/Gw. Again ± extensive soft sed. defn + mixing.	From 133.8 – 134.4m Cc uns 0.5-1.0cm @ 45-55° to CA ± irregular uns + veinlets sub // to CA esp. ± in Mst	At 130.6m 1-2cm Ss, Cc, qv @ 25° to CA. At 130.7m Cc, qvs as massive bands + blebs ± Gw @ 80° to CA. Also abdnt Cc qvns @ 65° to CA @ 130.65m. At 131.5m Cc vn @ 25° to CA. At 132.1 irregular qv, Cc blebs uns at high & Cc abdnt ± Gw/Mst band. Irregular short knots Cc qvnlets low & to sub // to CA throughout Mst/Ss from 132.7 – 133.8m. At 133.1 Cc vn @ 20° to CA.					From 133.2 – 133.1m core highly brkn, to a degree drill related but also some low ± Slt/graph. bnd fractures ~~at 10-30°~~ to CA. Possible bedding b/w gy/Gw bk Mst @ 30° to @ 133.1m. At 134.2m Gw/Mst contact @ 55° => So.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
134.4 – 136.2			grgySltlw dkgygn Slt	A gn gy Slt/Mst lbd dk gygn Slt/Mst, a variably mixed Slt/Mst sequence c degree of mixing c sept ind dfn & discordn to laminae.		Minor Cc vn developmt @ 50° to CA. But mainly confined to short tension veinlets & blebs sporadically throughout.					Possible bedding @ 25-30° to CA as defined by Slt/Mst bands.	
136.2 – 139.9			gn gy Slt lbd gy bk Mst	A mixed & somewhat contorted Slt/Mst interval c minor gn Co Lam beds. Dominantly gy gn – gy Slt lbd gy. bk Mst, bedding commonly distorted c slump mixing.		V. minor irregular short Cc veinlets & odd boudinaged blebs.	V. minor dissem gn grain sporadically throughout.				Possible bedding 15-20° to CA from Slt beds.	
136.9 – 139.0			gn Co Lam	Dominately gn Co Lam c odd lbd gy gn Slt bed Some slump fill displacmt of Mst/Ss contacts.		Cc vns broad 1-2 mm – 10-20mm in places enclosing selvedges of Ss or Slt @ 20° to CA & curbil – 10° to CA From 137.9-138.7m Ea ↑ in abundance & occurs as a breccia infilling to selvedges of gn Ss. Cc + Wq vns are irregular & sporadic c blebs & short veinlets more prevalent in Mst & Slt.					fine laminae in Slt/Mst → Ss @ 40° to CA	
139.0 – 141.4			gn Co Lam lbd gy gn Slt – gy Mst	Predominantly mixed sequence c gn Co Lam c irregular gy gn – gy gn Slt beds & gy bk – gy gn highly contorted Slt/Mst beds. The interval shows extensive							Some slickensided Cc vn or fracture surface @ 30° to CA @ 139.7m	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
				evidence of soft sed def'n, slumping & missing of sed. packages.		With odd narrow vn 20–30° subpll to CA ± qtz Cb vnlet sa.						
141.4												
142.95			grgy slt	An irregularly laminated grgy slt/Mst, wavy irregular laminae occur throughout, sometimes outlined by soft sed def'n. Generally fg grgy slt & Mst ± mm bk Mst laminae. Despite slump & small scale flt displacement of laminae Sb can be ⇒		Cb vns @ 25,30° to CA ± further min vns @ 65° to CA odd occasional Cb blebs & short vnlet.		wavy slump fold bs, small scale flt dislocations Soft sed def'n.			Sb @ 60° to CA ons ⇒ by laminae.	
143.95			grgy brec & grgy lt to bk Mst	A highly contorted & mixed interval dominated by grgy slt ⇒ gybk Mst ± odd gr Co Qtz vnlet. With a gy Qtz clast @ 144m. In places slt is laminated. Overall unit is intensely mixed through soft sed def'n & slumping to produce contorted jumbled mix		Minor, fine subpll to Sb, bkbs 25–30° to CA Cb vns 1–5mm ± odd bleb & vnlet throughout egp. area ± contorted bk Mst. Some VN breccia infill 144.5–144.7m.	Minor fg sed py particularly around ± grgy slt, esp where laminated.					
145.3												
148.7m			gr Co Qtz vn	Dominantly gr Co Qtz vn: fg pl, bk Mst clasts < 0.3mm in places sa bd ± grgy-bk slt/Mst. The Qtz ⇒ slt in places sa pl, Hm & in abundance & become fair		Irregular wh q, Cb vns & vnlets occur sporadically throughout.					Some leaching ± pl grgy Co Qtz vn @ 148.45–148.7m. Minor slickensided Cb vn @ 65° to CA @ 148.6m	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
				Slt/Mst bands generally narrow & irregular ± a layer of soft sel flt/fg displacmt of sel laminae.		glacies as blebs & veinlets but also as uns, 45, 60, 10 & subll to CA. Major Ca/sl vn @ 25° to CA from 145.6-145.9m.					So possibly 40-45 →60° to CA downhole as ⇒ Slt/Gw contacts & by laminae in Slt	
148.7 -149.2			bk Mst in gygy Gw	A highly contorted & mixed interval of bk Mst, gygy Co Gw ± g-gy Slt. Again soft sel defn ± mixing of beds, clumping patch swell and overall highly distorted.		Minor narrow regular sl/ca vn @ 65° to CA with minor scattered irregularly shaped ca/q blebs sporadically throughout						
149.2 -150.1			bk Mst	Dominately bk Mst ± some minor gy to gygy Slt bands, generally contorted ± slt massive irregular stringers interlayering ± bk Mst.		Irregular ca/q vns & vnlets cut the CA @ 50° also occur as irregular blebs & veinlets.	f-g sel py quite abundant throughout bk Mst.				Semblance of sel layering in Slt & fg ± @ 50-55° to CA.	
150.1 -152.2			bk Mst ± bd gy Gw	A highly contorted interval of ± bd f-g gy Co Gw → slt ± gy-bk Slt → Mst. An intensely deformed interval ± some breccia esp. of Gw ± Mst Slt infilling fractures. Represent defn prior to consolidation. Also squeezing & interlayering of Units.		Irregular Ca/q blebs & veinlets throughout as torsion vn/flts or spots in Mst or interbreccia to breccia fragments. With uns developed @ 45, 70° to CA.		Becomes highly broken, fracs ± graph & py lined fractures from 151.9m - 152.2m with fractures irregular also ± graph slickensided facies @ 30, 50° to CA.			In places quite bk ± graph py developed esp where Mst dominates. Also graph/ca slickensided fracture surfaces. 40-45° to CA. Intensely broken → graph py 150.4 - 150.5m.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
152.2 – 153.4	4		bk Mot ibl gy GbW	Massive bk Mot bands ± occasional wispy gy GbW ± Sft band, but more frequently cut by Ca/q vns. Interbedded ± Mot are gy, ColW → Slt bands, in places laminated also exhibiting some soft sed defn. (Mot:GbW = 4:1).		Ca, q vns @ 30–40°, ~~rarely~~ 50, 65° to CA. Also numerous irregular wispy veinlets + blebs throughout esp. Mot.		Some fracturing @ 153.3m ± some graph bed finishes ± minor pug.			Poss slip sliding fm S:/GbW contact & minor @ 25-30° to CA. GbW bands @ 153.25–153.3m & 153 – 152.7m.	
153.4 – 154.0			gy bk Mot ibl gy GbW	A highly contorted interval of gy-bk Mot ibl gy-gyGbW, intensely shearing ± mixing of units, along ± some small scale fracturing to produce a mixing of units. In places selective ± rafts of ± ± Mot.		More blebs & veinlets ± old Ca, q vn throughout ± vns @ 50 ± 70° to CA					Foln possible 50–70° to CA ??? but highly contorted hence difficult to determine	
154.0 – 155.1			gy ColW	Massive gy ColW ± some fine bk Mot bands 0.5–3mm ofd @ 10m. Cutting numerous Ca vns.		Ca, q vns @ 30° 35, 45, 50, 55, 65 to CA ± vns 0.5 – 7mm but dominantly <2mm generally regular but odd wavy irregular vn low ∠ to CA. Odd terminal infill blebs + veinlets.						

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
155.1 – 156.5			bk Mst / bld gy Slt → Gw	A highly contorted & in places brkn interval of bk Mst ± slump contorted & bld gy Slt & gy Co'lw. (Mst : Gw : Slt = 6 : 5 : 3)		Limited Ca, q vns fracture @ 40, 60° to CA ± irregular blebs & veinlets throughout more so as fracture infill ± in Gw Band		Breaks to a degree bdl in broad Bnd @ 155.75 – 155.85 bnd & fracture to ~45° ± some gy smdy @ 156.1 – 156.0			Possible bedding @ 45-50° to CA ± difficult to ± irregular bedding surfaces.	
156.5 – 157.05			bk Mst	Massive bk Mst ± irregular gy Slt/Mst & gy Gw → Slt clasts & bands. Some soft sed deformed bands of Slt/Mst ± Slt – Gw drapshms or redeposited clasts.		Minor irregular blebs & veinlets of Ca, q sporadic throughout with more vns low dip CA.						
157.05 – 157.6			gy bk Mst	Dominately gy bk pug in places fractured also odd residual interval of bk Mst. Swelling pug from 157.1m. with Ca vns & Y.b of Slt/Mst ± Slt Ca, q infill Mtx blw breccia fragments from 157.05 – 157.1m. Tasks to dk bk Mst pug down hole		Some Ca, q vns @ 70° to CA. ± blebs of Ca, wh q throughout pug.		Dominately a swelling pug ± some grad fracturing but overall still competent.			Unusual gr ± mineral resemblis gr feldspar? assoc ± Ca vns from 157.05 – 157.4m (could be nickel mineral) or chrome mineral Possibly some core loss, with 0.5m core lost 5/10 – 157.4 – 160.6m	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
158.0			bk Mst	A dk MSt interval somewhat broken, ± some bk pyg development in places. But dominately competent Mst ± some irregular gy silt–Ss clasts enclosed by carbonaceous Mst mtx.	?	Sporadic irregular short Cc/q vns Cut Mst. or occur as residual fracture clasts.					Some fracturing drill induced. But from 158.2 - 158.5 core highly broken. - 0.3m Core loss ?	
158.8			bk Mst ± gy	Dominately bk carbonaceous Mst ± gy - gygn Slt → Gw in places core fractured & Mst commonly reduced to bk carbonaceous swelling pyg. Generally more competent where Gw beds or irregular interlayering of Slt/Ss & Mst. Bk carbonaceous pyg @ 159.5 - 159.65m & 160.4 - 160.8m	Sd vns 40-50° to CA ± competent, & possibly @ 75° to CA in Mst.	Cc/q vns developed as irregular blebs & broad veinlets. Also intense Sd vn/q development as an irregular vn. network often quite massive intervals. Sl most prevalent from 158.5 - 161 m Minor Cc/Sd vns 20, 70° to CA. ± minor Cc/q veinlets also developed in Gw. Minor q, Cc veinlets in gy Slt @ 20 & 45° to CA. Minor Cc, q blebs & short veinlets throughout ± some vn development @ 15 & 60° to CA ± high & fracture regular narrow 1-2mm vns.				From 159.15-159.65m intense fine stockwork throughout bk Mst ± Cc, q vn developed. Unusual grn mineral assoc. Cc vns, resembles plumbian pellespar, but is soft possibly grn Co3 or a Nickel mineral? or grn fluorite? or chrome mineral? Core loss during drilling or when reamed b/w 161.8 - 162.1m. Bedding of Gw/Sl @ 50° to CA.	
161.8			plgygl Gw	Afgpale ylgn Co Gw → Slt in places ± minor ibd gybk Slt → Ss from 162.1 - 162.2m								
162.8			gn Gw ibd plgn Slt-ggySlt	gn-plgygl Gw ibd ± polylgn Slt and gybk Slt/Mst. Bedding somewhat deformed, ± irregular slump deformed surfaces. Also some small-scale Slt displacements of ± cms. e.g. 10° to CA @ 162.95m.								
164.55												

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
164.55 – 169.25			gybk slt to gn GW	A mixed contorted interval of gybk slt → Mst ± bdf gn CoGW → slt. Bedding contacts irregular often ± slump folding. Commonly selvedges / clasts of slt in GW. From 165.4m – 166.7m dominantly gybk slt. From 166.7 – 169.25 again highly mixed & disturbed slt / GW sequence		Irregular blebby Ce, vein as infilling tension vns. ± some preferential vn development @ 35°–55° to CA, but generally vns lack preferred orientation	Minor py laminae @ 166.75m.	At 165.7m sc lined fracture @ 25° to CA.			Possible bedding @ 50° to CA from slt/bs contact. At 166.7m well developed ± laminae @ 75° to CA. Laminae & slt beds @ 45–50° to CA from 167.7 – 168m.	
169.25 – 172.5			gn GW/gy slt / gy slt.	Dominantly fg gn felsic → gy slt ± some minor beds of gy bk slt → Mst. Slt becomes more abundant downhole, in places gy slt flecked by bk Mst, minor gn CoGW. gn fg GW beds more less prevalent. (Slt : GW ≈ 3:1)		Well developed Ce veinlets & blebs → irregular vns. @ 10, 35, 40° to c.a. With minor regular vns @ 70–75° @ 169.25 – 169.5m.	From 171.9 – 171.95 abundant fg. sed py as blebs & disseminated grains.				bk Mst laminae @ 50° to CA vns 1–2mm wide com 1–10cm ± broad zones @ 171.6 – 171.9m. Bedding ~~tests~~ to 60° to CA to base of interval.	
172.5 – 174.2			gn GW : GG gybk slt	A mixed contorted interval of gn CoGW & gybk Mst similar to 164.55–169.25m. The gn CoGW commonly fractured ± bk slt infilling fractures. The laminae in Mst/slt are deformed ± minor slump folds & slt disruptions. Also some squeezing & interlayering of bs/slt.		Minor Ce vns developed @ 15° to CA 1.2 to 8–12m vns, also irregular specks & blebs throughout, ± short xcrax veinlets in Mst & broader blebs in GW. Regular 1–2mm CaCO3 vns fracture @ 15° to c.a @ 174.–						

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
174.2			bk Mst ibd gy Slt	Highly disturbed bk Mst ibd gy Slt ± Lt in places f-g gy Co Lithic Gw Beds highly disturbed, by slumping. Also numerous rafts of f-g Gw & Slt clasts in bk Mst mtx.		Blebs & irregular masses of Ca occur throughout & occasional non regular veinlets @ 70-80° to CA & @ 20° to CA.	From 178.9-179.5 irregular disseminated ammorph gy Slt & ± fg bands f-g disseminated Py laminae.				Minor low & to mod fracturing b/w 174.2 - 175.3m, minor Ca lining fractures & surfaces but possibly drill induced. Some fracturing assoc & on & graph @ 178.5m.	
179.5			gy bk Mst ibd gy Gw	A contorted interval of gy bk Mst ibd gy Gw, Gw becomes less prevalent downhole, occurring only as rafts & irregular Slt wedges/clasts in bk Mst. Evidence of slump mixing & small scale slump fold duplexing of 1° layering.		Ca un ↑ markedly downhole, as irregular blebs & tension infills, & minor regular veining @ 15-25 & 80° to CA.	Minor veining Py bands & blebs & laminae in Mst. Also fg-med Py in gy Slt clasts.					
180.7			bk Mst ibd gy-dgy SH	A highly contorted interval & mixed sequence of bk Mst & gy-dgy Slt → Gw. Original 1° bedding highly disturbed & slumping, mixing, & flt disruptions. Commonly selvedges or clasts of Slt enclosed by Mst. But the most striking feature is the intense Ca veinlet & vein development		An intense network of shart irregular Ca veinlets & blebs persist throughout. Minor regular un developed @ 30, 70, 80° to CA cut downwardly blebs infilling tension gashes of respecting Ca veinlets & through clasts	Minor fine disseminated Py assoc & some Slt clasts, or as fine Py laminae & Slt.			Possibly has undergone two phases of deformation & Slt & Slt sub-deformation & slump deformation 2nd is fracturing assoc & intense Ca vn development revealing.	

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184. -184.5			bk Mst ibd gy Slt → Gw	Finely laminated bk Mst ibd gy Slt → ggGw lamnae, GW appears to have an increased detrital qtz input.		Minor Ce vn development @ 25, 35, 50° to CA.	Minor py lamnae development.	Small scale flt or jt dislocation & Ca infill along that 50° CA.			Fine Slt lamnae => So @ 50-65° to CA.	
184.5 -187.1			bk Mst ibd gy Slt → ggGw	A contorted mixed interval of bk Mst & gy Slt & in places gy to lithic Gw beds. Beds contorted by slumping & small scale flt dislocations. Commonly gy Slt & ggy Slt clasts are isolated in mtx of bk Mst, represent brkn & redeposited beds. Also Slt mass highly irregular slump conchoidal & rotty look.			Ce vn development moderate — intense mainly brkn pieces infills, & numerous scattered bleb & short veinlets throughout so from 186 - 187.1m with some regular vns @ 25 to 30, 75° to CA.					Intense soft sed deformed interval.	
187.1 -188.85			bk Mst	Dominately bk Mst & some lt gy Slt. Eventually featureless massive Mst, cut by occasional narrow Slt bound or ftg. Gw bound Except for contorted Slt/Mst mass @ 187.8 - 187.9m.		Regular Ce vn development @ 25, 30, 45, 65° to CA. Only minor vn development & occasional, tension bleb & short veinlet development fr. - 187.9 - 188m. broad Ce vn 187.9 - 187.95m.					Slt lamnae => So @ 50-55° to CA. Possibly some displacement recorded on a jt or small scale flt @ 30° to CA @ 187.85m.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
189.85 190.35			bk Mst ibd gy Slt	Zonally contacted bk Mst ibd gy Slt interval, in places well developed fine lamanae in Slt. Also coarser gy Slt → Gwv ± fd + Mst fragments, in places Mst fragments reach 2 to 20mm, though commonly < 2mm.		Cc vns scattered ± some vn development @ 20-25° to CA with scattered blebs + short veinlets irregularly distributed.					Reduce to NQ @ 189.0m. lamanae in fine Slt @ 189.2m are @ 60° to CA. ± bedding parallel to 40° to base of hole.	
190.35 191.0			gy fg-slt	A gy polymictic gnt ± angular - subrounded bk Mst, pl gy Slt, dk gy Slt clasts in a fine Slt → fg Gwv mtx ± fd, (< 1mm) + fine lithics (Mst clsts) in fine Slt/fg mtx to larger clasts 2 - 30mm.			Mm - blebs of sel py					
191.0 193.7			gy Slt ibd bk Mst ibd gy fg-slt	A mixed somewhat soft sed. deformed interval of gy Slt ibd bk Mst, ± occasional gy - ggn Ca ± Mst Gwv bands. In places gy Slt → fg Gwv large bk Mst clasts ± assembly 190.35 - 191.0m. Bedding contacts generally irregular + wavy & in places soft small scale ptt dislocation + slump left's of bedding to produce rafts Mst in Gwv + vice-versa.		Very occasional Cc blebs or short veinlet. ± all mm vn @ 10, 30, 40, 70 to CA. More prevalent 192.4 - 193.7m.					Possible Sc @ 50-55° to CA from alignment of bk Mst clasts in gy Slt. tends 70° to CA ± fine gy Slt laminae in bk Mst @ 193.2m.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
193.7 – 196.0			gy bk silt/sst/ltbx gy/gy silt/sst	A mixed interval, ∈ mod-intense soft sed defⁿ of bed contacts & in places ripping & folding & slumping of units. Dominately gy – gy/gn silt in places tuffy to f.g. gy lam silt (concg). tbd gy silt → bk Mst.		minimal to moderate Ca vn development, dominately as tension infill blebs & short veinlets, but some vn development @ 10, 35, 50, 55, 45 commonly assoc ∈ plain of dislocation.	Minor Sed py assoc ∈ bk Mst @ 195.8 – 196.0m.	In places zones of Mst/silt ming & flt planes of dislocation. Flt planes 15, 25, 40, 45 to CA			Interval has undergone intense defⁿ, in that laminated units are displaced throughout along small scale flts or fltes. Possibly soft sed defⁿ. Possible 1° lamination but difficult to see due to degree of disturbance. May fold to 70–75° towards base of the interval. Minor Mst banding @ 65° to CA @ 196.1m along ∈ some alignment of the Lithics. Bedding @ 55–65° to CA is inferred from Ss/silt contacts. 196.6 – 197 Mst 197 – 197.8 Ss 197.8 – 198.2 Mst 198.2 – 198.45 Ss 198.45 – 200.75 Mst 200.75 – 201 Ss 201.0 – 201.3 Mst. Bedding & finely lam mst/silt @ 202.2 to @ 57° to CA.	
196.0 – 196.6			gn Co Lith	More typical gn/gy Co lithic lith ∈ Co 0.5–1.5cm & lithics (Mst) commonly 0.5–1cm but upto 3 – 7mm.		Some irregular blebs of Ca & short tension veinlet sporadically developed.						
196.6 – 201.3			gn fg Lith bd gy bk Mst	A bedded sequence of gy/gn fg lithic lith bd ∈ gy bk Mst ⇒ gy silt. A degree of defⁿ to bedding contacts & to individual beds evident. Often ∈ Mst clasts ∈ in Lith & vice versa.		Ca vn not dominant ∈ irregular blebs & veinlets throughout preferentially subtl to CA. Most prevalent 196 – 199.8m. v. minor 199.8 – 201.3m						
201.3 – 203.0			gn Ss	Dominately massive gn Co lithic lith ∈ minor bands of gy bk Mst – silt from 202.1 – 202.45		Only v. minor Ca vns @ 5–10° & 55° to CA						

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY, ROCK NAME	LITHOLOGY, DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOS	REMARKS	DEPTH
203			gySlt ibl bk Mst	An interval of massive gySlt in places ± ibl Mst/Slt laminated zones, laminated zones show some slump disturbance evidence of lamination.		Only v. minor irregular wispy Ca veinlets @ 60° to CA.	Blebs & irregular masses of Py 1-2 — 10-20mm.				Slt/Mst contact @ 70° to CA ⇒ S_0?	
203.6												
203.2			gr Cb Gw	Pervasively gr Cb like Gw in places → ggy gr Cb Gw, ± odd bed of gySlt–gybk Mst, Masses of Slt/Mst variably disturbed in to/from Cb Gw as clasts in Gw. At 204.3 some tendency to grothy mtx of Gw b/w large Slt fragments.		Moderate Ca-qtz development, generally as irregular vns & veinlets & blebs, some ± regular vns @ 25, 40, 50° to CA.					Ang 1° lamination highly disturbed by soft sed def^n difficult to ⇒ S_0.	
204.3												
205.8			bk Mst in gySlt	A somewhat contorted interval of bk Mst & gySlt ± Mst/Slt interlayering & rafts of Mst in Slt. Becomes more regular & fine ± Slt → Gw laminae in gybk Mst → Slt.		Irregular wavy veinlets & blebs of Ca. ± Qtz Ca ↑ drillhole ± broad Ca. vns 1-2 upto 20mm. 55, 60, 70° to CA.					Vague semblance of fol^n can be seen @ 55-60° to CA.	
205.8			bk Mst-ibl gySlt	A well bedded regular sequence of bk Mst ibl gySlt. In places minor ± cm scale slump disturbances of gySlt laminae in Mst ibls, in places very accentuated gy Cb Gw bands.		Minor irregular Ca veins & veinlets 0.5-2mm Ca vns @ 50, 70, 75, 80° to CA.	Minor fine Py laminae in bk Mst.				laminae 0.5-2mm ± beds 10-20cm ± (Mst:Slt = 1:1). Bedding @ 50-60° to CA.	
209.0												

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
209	0		gy Slt : bd bk Mst	Again a contorted mixed interval of gy Slt + bk Mst. C small scale flt disruptions + displacements of Mst/Slt beds. Also some slump mixing C bk Mst infilling b/w Slt masses.		An anastomosing network of Cc veins x-cut + are irregularly developed throughout. Also isolated blebs + short veinlets	v. minor blebs + masses of Py assoc. C some Cc veins esp @ 209.2m. Also minor Py blebs + laminae assoc C bk Mst beds.				Mst : Slt = 2:1	
211.1												
211.1												
213.2	2		gy Est. bd bk Mst	A somewhat contorted to bd bk Mst, gy Est, C clasts in parts Est in Mst. In places more regularly bedded C laminae ⊥ bd. Small scale flt/slump dislocations of So.		A network of Cc veins blebs + irregular veinlets Xcut the interval. With vns 20-25, 45-50° to CA.					Bedding laminae ⇒ So @ 50-55° to CA.	
213.4												
214.7			gy Slt bd bk Mst	well bedded interval of gy Slt C bd bk Mst in places fine Mst laminae C/s Slt + Slt Cs Mst. Beds 1-2 but only 5-20cm (Mst : Slt = 2:3). Also occasional clast of Lst.		Minor irregular Cc vn development C some preference to vn development @ 25° to CA.					Bedding Subparallel by Cc filled Slt/Mst contacts @ 60-65° to CA.	
214.7												
215.9			gy Est	A massive gy bl Lst interval in places 214.7-215.1/50cm bk Mst assoc. C Est as a fracture infill b/w Lst fragments. Throughout has a somewhat fragmental appearance C stylolitic Mst along fragment surfaces. Minor stylolites developed.		Irregular Cc vns + veinlets developed throughout C some preferential vn development @ 30 + 45° to CA.						

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
215.9			bk carb Marl ibd gy silty Lst	A carbonate interval with apparent bedded appearance of gy silty Lst ± bk carbonaceous Marl. Resembles Slt/Mst.		Ca vns 30, 35, 70° to CA 0.5-1cm vns ± some irregular veinlet development.	Minor fine disem. Py as irregular layers assoc ± carbonaceous Mst @ 217.3m, again for Ca ± CO_3 throughout Mst.				Bedding apparently @ 25-30° to CA but ± semi bedding @ 70° to CA borehole.	
218.1			gy Ca Lst → grst.	Again a carbonated interval poorly ± f.g. Ca impregnated → Lst. i.e. a CO_3 marl mtx to a ss grst ± 1' lithic clast. With rafts of bk carbonated spotty f.g. Marl.		With Ca vns @ 20, 30 & 35° to CA as 0.5-2cm ± up to 0.5-1.0cm vns ; in places irregular veinlets emanate from main vns.	At 218.7m some Py assoc. ± Ca vn @ 30° to CA.					
218.9			gy carbonate Marl.	An intensely Ca veined interval which has a brecciated ± veinlet fracture appearance. Dominantly gy bk carbonate Marl ± some irregular ~ 5cm silty bands becoming more prevalent downhole. Possibly some soft sed. slumping too.		Intense Ca-vn network ± numerous blebs, veinlets veining throughout, often defining fracture infills b/w fragments.						
221.85												
222.2			Y. b/bd gy Lst	A Polymictic breccia → conglomerate ± clasts of subrounded/angular gy Slt, gy Ca Lst, ± Ca in + Mtx of bk Mst. In places massive bands/beds of gy Lst.		Irregular Ca vns preferentially developed ± in Lst / Slt clasts, ± angular blebs of Ca in Mtx. Also some regular X cutting vns @ 40° to CA.					The nature of Ca veining suggests brecciation of marl mtx possibly at phase of Ca vn development - later veinlets ± cutting @ 40° to CA.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
222.8			gy slt ibd bk Mst.	An irregularly ibd gy slt & bk Mst ± occasional chert of gy Lst. Some sharp defn of bedding contacts.		Abundant irregular veinlets & blebs of Ca occur throughout, again are more regularly ori to bedding in Lst clasts & bands. Odd regular late chlz vn @ 70° to CA, ± some brown veinlets.					Laminae of slt in Mst ⇒ So @ 70° to CA? Veining ↓ downhole.	
224.35			JJ Colour ibd gy slt ibd gy Lst	Interval banded by gy Colour which has been intensely carbonated, or ± carbonate Mst matrix. Ibd ± gy bk slt → Mst ± minor bands of gy Lst. In places Mst → V. gritt ± coarse fgmts of slt, Lst clt in carbonate Mst matrix	Possibly Carbonate overprint on slt/Lst bands?	Intense Ca vn development throughout ± pervasive veinlets & blebs in Mst to make it reactive. Broader irregular vns & veinlets also here. In places Ca appears as clasts in fgmt.					Bedding 70 → 60°/090° to CA downhole as ⇒ by slt/Lst/Lst contacts.	
226.85												
227.55			V. b	A polymictic breccia ⇒ conglomerate & mixed sequence ± clasts of Lst, slt, fgmt in a matrix of bk carbonaceous slt. Possible original bedding highly disturbed by slumping & by overprint of Ca vn development.		Numerous short Ca veinlets & blebs throughout, & more massive vns in Lst & slt fgmts.	V. minor blebs of Py assoc ± Mst throughout interval.					
230.3			bk Mst ibd gy slt ibd gy fgmt	A mixed ibd sequence of gy bk Mst in places ± slt laminae, ibd gy gn slt in places brecciated ± gy bk slty infill & fractures. Ibd gn fgmt with Sil soft sed defn variable ±		Some vn development @ 25 & 30-60° to CA 0.5-2 mm wide, but generally short irregular vns & blebs of varying width throughout	Irregular blebs & ~~veins~~ of Py occur particularly assoc ± the gn fgmt, possibly some assoc ± carbonate. Odd blebs in Mst				(Mst/fgmt/slt = 3:2:1)	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
				Silt/fgw beds deformed & interlayering.								
230.0												
231.35			bk/Mot & lt gy/fgw	A dominately bk Mot interval & wispy bands & isolated masses of gygn fgw silt. Any 1° layering highly deformed		Short wispy veinlets & blebs of Ca occur throughout.	Minor blebs of py occur scattered through Mt.					
231.35												
240.7			bk Mot lt gy Silt	Dominately massive bk mot & occasional gy silt band, in places irregular silt → fgw nodules, sometimes disturbed & interlayered Mot silt becomes sporadic from 236.4-240.7 & dominately massive Mot & occasional silt laminae or band. Some bed distortion still apparent.		Ca vn development & in intensity downhole. With a mixture of irregular vns, blebs & veinlets throughout From 231.35-234.6m. With vns more regular & less frequent from 234.6-236.4m & vns 15, 30, 45° to CA. 1-2 cm. From 236.4-240.7m vns less frequent mainly as scattered blebs, short veinlets & some regular vn development @ 30° to CA.	V. occasional blebs or fine lenses of py occurs in bk Mot. esp @ 238.6m, 237.6-237.7m.			232.5m gygn bed fracture @ 15° to CA. Fine silt laminae in Mot @ 15-20° to CA. → 10° to CA 236m.	
240.7			gygy silt	A sometimes fractured gygy silt & fine bk silt infilling fractures & some lt bk blebs of gy bk Mot clasts occurs @ 240.7 or carbonated Slt → Ss. Some Ca, Sl vn, veinlets & disseminations & bk mot bed & mass @ 240.7-240.9m.		Little Ca vn development & odd vn, veinlets & blebs occur & bk mass? & odd vn & bleb From 240.7-244m. Edge vn cuts CA @ 30° @ 240.7m.					
244.9												

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
241.4			bk Mst >bd gygn slt => Cgw	A contorted mixed interval of bk Mst gygn slt => Cgw. Intense slump deft^ of bk Mst / slt. Dominate massive lam gy slt passes into massive ga Cgw & some fracture infill by gy bk slt.		Lots Cx @ 20, 30, 70° to CA but generally irregular vns, veinlets & blebs throughout.	Minor Py assoc. Ca vns & as scattered blebs & Sx.					
243.3			gft/Mst/Cgw	A contorted interval of dkgn gy slt >bd gn Cgw & bk Mst. Interval subjected to extensive soft sed deft^ & slt/Mst/Cgw all intermixed.		Ca occurs as short irregular veinlets subll to CA & odd broader vn developed at a low ∠ to CA; & Ca non pervasive upon	disem Py grains occur scattered sporadically throughout.					
244.4			slt/Mst/Cgw	A more regularly >bd sequence of gn Cgw >bd bk Mst & gygn slt, & slt in places well laminated. Some soft sed deft^ causing irregularities to bed surfaces, & small scale flt dislocation & squeezing of select layers.		Minor regular vn development @ 65°/40 to CA & odd vn @ 15° to CA throughout. Also scattered veinlets sporadically throughout	Disseminated Py grains occur throughout the Mst & in places Em Sx & slt.				(Slt/Sx/Mst = ?:?:) Below 244m to 246m well developed laminated & bed contacts @ So 40-45° to CA.	
247.6			bk Mst >bd gygn slt	A highly contorted interval of bk Mst >bd gy & lt Cgw & contortions due to soft sed deft^. Mixing of massive bk Mst, gygn slt & laminated slt. & gy fg Carbonate Mst => Cgw		Interval intensely veined by a network of irregular Cx vns. Generally no regularity to vns, possibly some preference @ 45, 80, 10°	Minor Py assoc & some gygn slt blebs & masses.					

Hole

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
247.5 – 250.3			gg silty Marl → Lst	A interval of highly Carbonated Slt → resembl Gw in grain size but highly Carbonated as → Lst. Appears to fine downhole Uphole resembles a gg Co Gw Ss ± lithics (Arenite) but appears to be highly reactive ± acid.		Regular Ca vns x cut @ 50°. ± irregular blebs & short veinlets throughout.						
250.3 – 254.25			bk Mst lbd gg Slt	A contorted interval dominated by bk Mst ± some gg Slt & odd band of gggy Slt. Also occasional masses of gg Co lithic Gw. Overall highly mixed sequence, ± slumping, & isolation of clasts in bk Mst Mtx		Wispy irregularly shaped Ca, vns & vein. Some vns @ 20, 55-60° to CA. Also large 1-3cm irregularly shaped Ca blebs.	Py occurs down. in Mst or Ss, generally as rounded clots like bodies of diss Py. Also some Py assoc. ± short Ca vns.				Bk Mst flecks in gg Slt ⇒ 50 @ 25° to CA.	
254.25 – 257.5			gg Marl lbd gggy Slt lbd gg bk Mst	A highly mixed interval of lbd gg Marl → Lst, gggy Slt, gg bk Slt → Mst. Intense slump mixing of units. The gg Marl & Lst is massive to unusually laminated resembles for more a fgr Ss. gggy Slt masses are fractured & bk Slt, Ss & Py lining fracture network. Slt & Lst masses are like large rafts or clasts ± in a a dk Slt → Mst Mtx. Also odd gg Co, Lithic Gw	Possibly Ca after Fd in gg Gw	Ca vns generally irregular 1-5mm ans. veinlets & blebs ± vns 15, 30, 60° to CA but more generally Ca as granular veinlets	Py occurs in assoc. ± Ca vns & in places odd rounded blebs of fg Py.					(Mst. Slt; Mst = 4: 0.5)	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
257·5			bk Mst tbl gy Slt	An interval dominated by gy/bk Mst, cut in places by darker wispy Mst bands also by pale gy Slt bands. Some soft sed defn evident & irregular slump disturbed bd contacts, also isolated wavy bands or clasts ±in Mst units. Also minor isolated masses of gy Co Gn.		Irregular & wvns, blebs & veinlets occur throughout.	A no. of large Py blebs, subrounded & some assoc. Ca occur ±in dk gy Mst 257·5 - 257·8m. Elsewhere v. minor Py assoc. & Ca veinlets.				
261·05			gn Slt gy Co Gn	A variably fractured gn Co Gn ⇒ gn Slt / ± dk Slt infilling fractures and in places gy Slt masses occur irregularly ±in gn Slt.		occasional blebs, veinlets & odl regular Ca vn crossent the interval. ± vns @ 15° & 20-25° to CA.					Minor graphitic fracture @ 15° to CA. Towards base of interval soft wtq assoc. & irregular Ca vns.	
261·85			bk Mst	Dominately bk Mst ± some fine gy Slt laminae, also in places some darker Mst bands. In places evidence of some soft sed defn & isolation of Slt schistose ±in bk Mst.		Irregular blebs & veinlets of Ca occur throughout, ± some regular 0·5-2cm vns @ 25, 45, 50° to CA.	Minor py assoc. ± occasional Ca vein or veinlet. Also minor fine dissem. py assoc. gy Slt.				Fine Slt laminae of bk Mst banding @ 20° to CA ⇒ So.	
265·9			gy Lst → Marl	A v.f.g. Lst generally massive but in places ± paler gy Slt → Ss laminae also ± what appear to be discontinuous dk, carbonaceous laminae. In places appears to some minor slump disruption & sequence is not bedding continuous. Trace Co Gn? ± some minor dk carbonaceous Mst bands	(Possibly an intrusive CO_3 divergent on a fine Slt rather than fine Lst.)	An a banding of irregular vns & blebs throughout with numerous regular vns of 1-5mm @ 25, 30, 40, 45, 50, 80° to CA.	Minor Py assoc. ± odl Ca veinlet or vn.	@ 270·2m R.L D·341 Fl° = 21° bis So			Fine laminae ⇒ So @ 20-25° to CA.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
277.1			dk Mst ibd gy Slt	A somewhat contorted sequence of dk Mst & gy Slt ± some slumping & mixing of units. In places a more regular bedding persists. Slt Clasts occur subord in Mst throughout, ± a greater mixing & evidence of slumping locally.		Irregular Ca blebs & pellets occur throughout. With regular vns 0.5–1mm ± odd broader 2–4mm vn @ 40–45° to CA. odd vn subparallel to 20° to CA.	Commonly fine CJ down Py ± anor. ± Slt clasts, also Py blebs. ± scattered down Py grains throughout but generally ± ± Slt.				Banding of Slt/Mst ± in places ? bed ⇒ So @ 35° to CA.	
276.8												
276.8			gy Lst	A narrow band of ± massive gy Py. Mst → Lst. Appears similar to previous Lst intervals.		The interval cut by broad irregular Ca vns that cut the interval that possibly infill broad fractures of 2–6mm. Possibly ± preferred @ low ∠ to CA.					@ 277m RL.D = 8° So = 47° from dk Slt/Py laminae.	
276.9			gy Slt ibd gy blk Mst.	Interval dominated by gy-bk Slt → Mst, ± in places ± dk Mst bands or occasional Slt → gy Co/Cw. Minor dk laminae ± in gy Slt along ± selvedges of bk Mst?		blebs & irregular veinlets of Ca occur throughout, possibly slight preferential vn development Subpll to CA.					laminae ± in Slt & Slt/Mst contact ⇒ So @ 45° to CA.	
278.3												
280.8			gy gy Co Cw	An interval dominately of gy gy Co. Cw ± thin → Slt. ± ibd gy Slt → Mst in places ± in places occasional thin gy bk ± m in clasts.		Numerous irregular Ca vns occur throughout, ± some preferential vn development ± 25/30–35° to CA.					gy Slt bnd 280.6m – 280.75. CORE ORIENTATION @ 280.4m	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
280 – 286.5			bk Mst ibd gygy Slt.	A sequence of ibd gygy fel lithic Slt → Ss ibd bk Mst. In places Mst flecked by gy Slt. In places dk mst flecks through Slt. Dominately fine gy Slt → Ss ibd gygy Slt & c bands of dk Mst.		Veining not extensive, but irregular Ca vns 1-5mm occur throughout & some regular vn development @ 15, 30, 50, 70, 80° to CA. At 283.2m broad 5-10cm Ca vn, contacts @ 20-25° to CA.	← Minor blebs of gl, py assoc c broad vn				At 284.65m Ss sequence fines upHole from gn fld lithic arenite → Ss → Slt ⇒ Youngs upHole. Fol^n 40 → 25° to CA downhole from bedding contacts & lamnae.	
286.5 – 288.95			gygy lam Slt	Dominately gygy lam Slt, c fine Slty lamnae in places gy silty → Ss ibd. Some evidence of slump deform & folding of lamnae & also small scale offsets along jts.		Ca vns commonly as seal jts, also some irregular Ca vn development. Regular vns & jt infills @ 10, 25, 35, 40, 45° to CA.					Fol^n of fine gn silty lamnae is at 40 → 30 → 25° downhole.	
288.95 – 289.75			gy ss ibd gn Slt	A somewhat contorted Slt interval, c wispy bands of formerly laminated gn Slt irregularly dispersed & mixed c gy Slt & in places bk mst masses. In places gn Slt → Ss.		A no. of irregular blebs of Ca infill tension gashes. c minor regular Ca vn (0.5-2cm) @ 40 & 60° to CA.					In places irregular Ca vns brecciate & rock enclosed selvedges in mtx of Ca.	
289.75 – 292.3			gy Slt → gygy Ss	Mixed to somewhat poorly bedded sequence of gy Slt & gn gy Slt → Ss c occasional masses & clasts of bk Mst, & less commonly clasts of m Ca. In places Slt → fine Slt		292.2 – 292.8m a broad Sd vn c lamnae of qtz Ca x cuts @ 40-45° to CA. Elsewhere irregular Sd vns & masses & veinlets						

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
				The slumpy mixing of units & inclusion of foreign clasts indicates 1° fabric deformation.		...assoc qtz & carb. Particularly 291.4 – 293.3m. 291.3 – 291.9 Cg, q vn development. Elsewhere 289.8 – 291.3 dominantly irregular carb, qtz & chlorite veinlets, generally low & to CA orientated. Some regularity @ 35-45° to CA.						
292.3			gn Cgw	Essentially a massive fg gn Cgw possibly ± some fine (<0.5mm) Cc. Spt. v. Sl veining gives gn Cgw a v. broad banding. Minor fg Slt assoc ± Sd from 292.3 – 292.6m.		After intense network of Sl vns is overprinted by broader 1 – 5mm more regular vns @ 15, 20, 50, 60° to CA. Irregular network of v. thin Cc veinlets as regular vns dominate.					Unusual gn mineral occurs assoc ± Sd @ 292.3m.	
293.0			gn fg Slt → Cgw ± bkMst	Dominantly fg gn Slt → Cgw ± irregular mmes, beds & clasts of bk Mst throughout. (Sc: Mst 3:1). 293 – 294.7m dominantly Sd. q vn development which grades way to Cg, q vns 294.7 – 294.9m.		Sd, q vns, regularly developed @ 15, 20, 65° to CA ± a no. of irregular vns + blebs throughout ± some network vns in bk Mst. Mostly Cc vns for less regular 1-3mm vns & veinlets ± some preference to 50° & strong irregular vns sub // to CA.	A no. of blebs of fg. Py occur sporadically throughout. Minor blebs of gl, sp? 1-2mm assoc ± Sd. q vns @ 294.0m.					
294.9			bkMst	An essentially massive bk Mst ± irregular mm fg Slt beds & clasts. Evidence of a degree of slumping & mixing in places fg Slt		Irregular Cc vns, veinlets & blebs occur throughout. Some regularity vns @ 10-15° to CA.	blebs & fg Py laminae occur throughout.				A semblance of laminations of bk dk carbonaceous flecks ± fg Slt @ 50° to CA.	
297.0												

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
297.0				dominates ± irregular bk Mst bed lamin throughout.		Only minor regular Ca vn development @ 10, 20, 25, 40, 70					Lamination ⇒ So @ 25→15-30° to CA throughout.	
301.05			gy Slt ibd p'ly gy Cw	A variably bedded interval of mainly gy Slt→Mst ibd p'ly Slt→Cw ± fd (<0.3m) ± fn carbonaceous chert & laminae. Downhole Slt→ laminated gygy Slt.		Also minor (<1mm) Sl vns from 297.9m @ 30-40° to CA ± a broad 2-5cm Sl, g vn @ 20° to CA @ 300.45m.					(So : Slt = 3:5)	
302.25			bk Mst	Essentially massive bk Mst ± minor ibd gy Slt → fg gy Ca, lattice Cw		Irregular Sl vns occur throughout from 301.05-301.9m ± vns 20, 30 ° subll to CA, generally irregular wavy vns. ± from 301.9-302.85 Ca, Sl variably occur as irregular veins ± veinlets. Only v. minor throughout of Ca from 302.05-302.25m.	Minor blebs of gl occurrence ± Sl, g vns @ 301.45-301.55m.					
303.35			gygy Cw ibd gygy Slt.	Dominately fg gygy Cb bk Mic Slt → Cw ± some ibd gy massive gy Slt ± occasional band of gy Slt & bk Mst. Generally fg. downhole.		Ca vns developed @ 40, ±5 to CA, ± minor irregular vn over-lap development as irregular fleckes & wavy unsubll to CA					(So : Slt = 1:1) Semblance of bedding @ 25-30° to CA as ⇒ bk Mst fleckes gygy Slt & laminae.	
307.95			dk gy Slt ± some darker bk Mst	Dominately dk gy Slt cut by bk Mst fleckes & irregular bands some slump distortion of Slt laminae. In places Slt→		Ca vns throughout numerous occur @ 10, 27, 40° to CA also some irregular Ca vein development along ±	fg. disem. Py occurs throughout but bands/zones may contain up to slightly coarse Slt-Vfg sandy				Dk Mst laminae ⇒ So 35→30-40° to CA.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
307.8 – 309.05			gybk Mst : lbl gybk Sst	Again dominately contorted gybk carbonaceous Mst & names of gybk SH → Sst the latter as large clasts or slump deformed blks mixed & Mst.		Scattered blebs & short veinlets, more so downhole. At 306.3m 1-2cm Ca vn @ 35° to CA. Ca vn not common & 2-10mm wide @ 25° to CA @ 308.25 & @ 55° @ 308.5m Elsewhere minor wispy irregular vns & veinlets, generally @ 30-35° & tension relief at high ∠ to this @ 55° to CA.	Also short discontinuous wispy laminae of Py 1-2mm. Also diseminated Py. Py in Mst @ 307.95m.				Some darker carbonaceous Mst not wispy bands & lam so inferred of possible bedding @ 20-30° to CA.	
309.05 – 310.5			bkMst : lbl gy Slt	A highly slump disturbed & mixed interval of bk Mst & lt gy Slt. From 309.5 – 309.8m core somewhat broken, may add be drill induced, though there is some carbonaceous platy or finely fractured material & fractures 15-20° to CA. Some drill induced breakage 310 – 310.2m.		Irregular wispy Ca vns & blebs, veinlets quite prevalent from 309.05 – 309.5m. Broad 2-3cm vn @ 25° to CA @ 310m Elsewhere minor wispy vns.	A no. of clusters of fg. Py occur throughout.				
310.8 – 311.6			bkMst : lbl gybk & Slt → Sst	A generally well bedded sequence dominated by gybk Mst & lbl gybk Slt → Sst (Slt is flecked by fd. wispy & wispy bk carbonaceous mmes & fine gy Slt/Sst mtx). Banding ⇒ So 25-30-35° to CA downhole.		Wispy narrow Ca vns & Stockwk to So & & broad 1-2mm tension relief vns at & high ∠ to these @ 50-55° to CA & with further regular vns @ 15, 20, 25 & 10° to Ca.	Diseminated fg Py occurs throughout fine Slt & & wispy bands of fine Py & small to So.				Banding becomes ev & little less regular downhole & some slump distortion producing wavy bed surfaces. In places highly carbonaceous slump mixing as at 311.65 – 311.9m.	

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DIAMOND DRILL LOG

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
313.6				A contorted slump mixed sequence of bk carbonaceous Mst & gy slt.		Wispy Ca vns & blebs occur throughout & lesser broader 1-3mm irregular Ca vns & some regular veins @ 15, 20, 25, 30, 45° to CA.	Occasional large blebs of f-g. Py occur along & similar fg Py bands.					
316.2												
316.2			gybk slt	A dk gy bk slt cut by irregular bands, clasts of bk Carbonaceous Mst		Ca vns 1-3mm @ 20, 50, 70° to CA along & irregular blebs & veinlets	Minor fg assoc. & Ca vns.				alignment of bk carbonaceous clasts => S @ 25° to CA.	
317.5			bk Mst interbedded gy slt	Dominately bk Mst & some bk gy slt in places regularly bedded in other areas somewhat contorted by slumping								
317.3						Ca regular Ca vns dog 25° to CA. In places as wispy vns sub// to S. Also as irregular infill, blebs & veinlets. Also one irregular wavy vn development.	F.g. disseminated Py occurs throughout bk Mst. Also in gy slt clasts.				bk carbonaceous bands => S @ 40° to CA.	
317.3			Gr Mst interbedded gy slt	Dominately bk Mst sequence somewhat contorted & slump dfn & mixing of Mst & gy slt. In places gy slt => f.g. gy Ss.								
324.8						Blebs & irregular brecciation vns & veinlets of Sd, q ± Ca from 319.9 — 323m & Sd vns prevalent @ the expense of a downhole. Broad vns @ 45° to CA then Sd light & VN development @ 40° to CA. From 322.5 - 324.8 Ca vns prevalent than Sd & numerous wispy irregular vns & veinlets only.	Occasional sub rounded masses of py occur. Along & odd fg Py band in Mst. Minor Py assoc & vns. Minor blebs of gl & minor py assoc & Sd/q vns. Irregular wavy Py bands occur @ 322.5-324.8 fg with qtz vns & Carb.				Py & bk Mst bands => S @ 50° to CA @ 320.9m.	
											Veining decreases from 323.3 - 324.8m though some wispy Ca vns occur.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
324.8 – 328.7			gy slt ibl bk Mst	A contorted mixed sequence of gy slt & gy Calc Wk bk Mst. Wk gy slt dominant upto 6 & gy bk Mst clasts as subedges & in slt. Dominate Mst dominates & crispy slt beds & clasts enclosed by Mst.		Irregular Cc vnts occur throughout also as cottoid blebs & veinlets exp on slt bdg preferential development & esp to CA but generally irregular vns						
328.7 – 331.85			gy bk Mst ibl gy Calc Wk	An interval dominated by beds of gy Calc Wk 5 – 70cm beds & lesser ibl gy bk Mst, the Mst commonly contorted & subedges of slt, Wk & in places Mst & in slt. From 327.5 – 328.1m an absence of Mst & gy slt. & bk Mst. (Wk: Sb = 1:1)		Cc as irregular vns & blebs. Commonly broad 1 – 20cm masses generally lacking any preferred orientation. Some vns @ 20, 25, 45° to CA.					Bedding contacts irregular, with degree slumps evident esp & mixed lithologies & in the dominantly slt/Mst beds.	
331.85 – 332.65			bk Mst ibl gy grn slt	A mixed slump deformed sequence of gy bk Mst ibl gy slt. Commonly Mst enclosed by slt & vice-versa. Mst clasts commonly cut by short Cc veinlets & irregular vns. (Slt : Mst = 2:1)		Some regular development @ 70° & 25° to CA Also scattered blebs & short veinlets.					Bedding => bk Mst clasts in Sh & contacts @ 331.85 => Sb 25° & to CA ???	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
332	6.5		bk Mst	A highly contorted sequence of bk Mst ± gyg silt masses as irregular wavy beds & clasts. Core highly fractured from 333.95 – 337.95 with fractures sub// to 15° & CA cut by fractures @ 70° to CA. Some minor pyg on fracture surfaces. With much of fracturing induced by drilling.	Some regular vns @ 40, 60° to CA ← & sub // to CA.	Many irregular Cc/q masses & vns occur sporadically throughout. In places f.g. vn networks are developed. With 2–5mm vns @ 70° to CA & 75° to CA from 337.25 – 337.75. ± low & vns 5 – 30mm.	V. minor f.g. pyg assoc. ± some of the Slt. Irregular Pyritised Slt beds ⇒ possible Ss @ 15–20° to CA @ 332.8m.				Some shatterable ca. graph surfaces @ 15, 30° to CA Bw 333 – 332.2m But generally very competent.	
339.1			gyPelSs	An interval dominantly of gy Co hw ± some tbl gy Slt beds & bk Mst clasts		Numerous irregular Cc vns X cuts as a vn network ± som regular vns @ 20, 30, 40° to CA.						
339.9												
337.9			bk Mst	A massive interval of bk Mst. Odd patch of gy Co hw. As irregular masses.		Minor Cc veinlets & blebs ± minor vns @ 20, 35° to CA.						
340.6												
340.6 – 351.95			gygn felSs ± tbl gybk Mst	A somewhat contorted interval of tbl cmbk Mst ⇒ Slt ± tbl gygy Co hw. Beds commonly disturbed by slumping. Commonly clasts of hw isolated in Mst & similarly clasts of Mst in Ss. (Slt: Gn = 3:2)		Cc vns & veinlets occur throughout generally as irregular blebs, tension infills with odd regular vn @ 20, 25, 40, 60 to CA.	In places bx ⇒ of Py occur in Mst. Also some Py assoc ± Cc blebs & veinlets			Minor low-t & fracture development commonly ± graph or Ca vn lined surfaces @ 10, 15° to CA @ 340.7 – 340.9m & 343.1 – 344.1m	
											@ 351.6 – 351.7m ± some assoc. pyg.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
351.9			bk Mst lbl gy Lst	An interval dominately of gybk Mst ± subordinate gy wkd clasts throughout + minor Lst band @ 353m. Also minor bands of gy, CO Lst + lbl bk Mst		Minor Cc blebs + short veinlets occur sporadically throughout ± odd regular vn @ 25, 70 vein to CA.	Minor Py lining surface of Mst & Lst on the grid margin also some py ± in Lst band areas. ± Mst inclusions enclosed by Lst.				Lst band & & carbonaceous Mst bands ⇒ So 40° to CA.	
353.6			gybk Mst + lbl gy Lst	A somewhat shrp contacted to occasionally laminated interval of gybk Mst in places → silt lbl ± narrow bands or vns isolated clasts rafts of gngy Slt → Gw Sx. Becomes less contorted & more bedded downhole. (Slt°: Mst = 2:1)		Some sd, Cc vn development from 353.6 - 353.9m, irregular wavy vns → masses @ 20-40° to CA? Cc vns occur throughout vns isolated blebs & masses & irregular veinlets odd regular vn @ 25, 30, 40 to CA. Some wh q amon ± irregular Cc vn masses downhole. Downhole vns more regular ± vns 30, 50, 60, 80° to CA	Wispy laminae or isolated blebs of fg Py occur throughout the Mst.				Slt laminae & Py bands ⇒ So @ 30 → 45° to CA. Veining generally high & to Po'n, though some irregular masses // So.	
364.6												
364.8m			gy lam Slt	Mst short interval of gngy lam Slt ± some bk Mst laminae. Some shrp flt displacent of bnds.		Some irregular vn development throughout @ 1-3mm.					Wh laminae @ 25° to CA	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	BREAKDOWN	VISUAL LOG	REMARKS	DEPTH
364.8			gybk Hst	A contorted gybk Hst interval ē some irregular gr gy Slt in places → GW some ebl incl clasts at bk carbonaceous mat ēn gybk mst → Slt.		Numerous irregular blebs of Cc and throughout ē some veinlets of Cc subparallel ē some in preferred @ 15-20° to CA.	Irregular blebs of Py 1-8mm occur amon ē Cc blebs.					
365.3			gybk Hst	A reasonably well bedded								
370.7			gr Slt grit	A gritty interval ē fl o lt mst blebs clast 1-5cm in a gr Slt matx. The The sequence tends to fine downhole into a Py-m.g. GW. But difficult to ⇒ facing.		The interval is cut by an abundance of Cc wns & veinlets & blebs, wh at ans 25, 45, 60° to CA.						
371.0			gy-gygn Slt → GW ± gybk mst.	A somewhat mixed interval ē slump deformed margins to beds, also some slump mixing fronts. Dominantly gy-gygn Slt tending to Co GW in places of cut out beds of lt mst. Also odd selvedge of clast of mst enclosed by Slt.		Abl regular vn 1-2mm @ 65, 75° to CA. Elsewhere abl veinlets, blebs & shears un developed subll to CA	occasional clast of Py ē Cc occur throughout 5-8cm				Bedding @ 30-35° to CA? is inferred from Hst/Slt contacts & mst clasts alignment.	

Regular Cc wns @ 30, 40, 60° to CA 1-3mm. Also some un developed subll to CA. Irregular blebs & veinlets occur throughout mass to zn mst after forming from infill veinlets.

Occasional blebs of Py and ē Cc wns & blebs.

bedding of Slt/Hst ⇒ S- 25-35° to CA.

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	HOLE DIA
371.55			gybk Mst	An intensely disturbed interval of gybk Mst as a matx to numerous clasts of gy or gygn SH, GW. Lot gritty alt. Tends to V.G. contt ē range of clasts. Appears to be type of slumping or squeezing of matl thru grabt fragments.		Irregular wisps and 1-3mm fine an network throughout. A no. of blebs & short Cb veinlets occur sporadically.						
372.15			gn GW : bd gybk mst	An interval dominated by gygn Cb (ltbr (mst) GW in places tends to gygn SH. Mst fragments ≤2mm common throughout GW, but also occasional 2-30mm Mst or gn SH clast. In places irregular bands or clasts of gybk → bk mst occur.		Cb ± q vns occur @ 15°, 45, 60, 80, 75° to CA along ē irregular blebs & veinlets of Cb ± q.	Odd 2-5mm subrounded blebs of Py mainly as isolated grains towards the base of the interval.				Possibly bedding @ 40-15° to CA but difficult to tell as only one core piece.	
376.1												
376.1			Y. Sil.	A polymictic interval ē a matx of gybk Mst ē numerous clasts of gn GW, bk Mst, wk gy Arg, subrounded to avoid clasts of Py ± qtz. Clasts generally 2-20mm but occasionally 20-60mm. In places gn Cb ltbr GW bands & cut.		Zones of broad Sil Cb ± q vns & cut with veining 20-30° to CA. Also irregular Sil in networks throughout ē numerous ≤2mm veinlets with new Cb ± q developed @ 75° to CA & some irregular Cb vns @ 30° to CA. With wisps of Sil ± Cb vns @ 20° parallel to CA from 380.7 - 380.85m	N numerous clasts of Py occur throughout with both angular - rounded Py blebs 1-3mm ē in Mst. But also subrounded Py ± q clast 2-3cm. Also Py rich mst avoid clasts					
380.85												

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	HARDN
380.85			gr Co Lith Gw	An interval centrally of massive gr, Co Lithic Gw in places rarely to gr gy ft. In places, more, gy - bk ft dyke & vein.		From 378.45 - 381m irregular wh q vns 381 - 381.5 q grns & wh & Ca @ 377.5 abt 60° to CA from Core q vns. Also 381.8 - 382.1m Sd ± q ± v. minor Ca vn development 20, 30, 40, 50, 60° to CA also some irregular vns & all to CA. Minor gr tale assoc ± Sd @ 382.9m. From 384.1m wh q, Ca dominate ± Ca vns parallel down hole. Locally irregular vn network ± Some vns developed @ 30, 60, 75° to CA with q, Ca vns highly irregular from 386.5 - 387.45m	Possibly v. minor gl as ± 2m 666 assoc ± veinlet Sd vns @ 383.9m.			Foliation veining @ 20 - 25° to CA => Sect. is cut @ 381.5m ???	
387.65			ggg-St	Dominantly gy gr Slt in places laminated, also ± areas of gy gy Co. Gw ± min f.g. lithics. Core in places fractured ± all or dk Slt resealing fractures Blebs & irregular veinlets of q, Ca occur throughout Some min alteration of laminae Some squeezing of q Co Gw ± old ft closure in Ss.		Some regular vn development @ 20-25 ± 70° to CA Dominantly wh q vns ± bobs & veinlets of wh q ± Ca closure.				laminations @ 20° to CA => Co.	
389.2												

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
389.2			gr-ggy Slt / ggy Co Lith	Dm tbd sequence gr-ggy slt in places laminated ± cm interbedded gr Co lithic Lith (as for 389.65-389.2m) tbd gy Co lithic Lith ± some cm gy Slt		V. minor scattered blebs & veinlets of Ca/q occur sporadically throughout.					laminations & bedding contacts ⇒ bedding at 33° to CA	
390.75			ggy Co Lith	gr → ggy-gr Co lithic Lith, a generally massive interval of gybk Mst 0.5-5mm, coarsens downhole ± an increase in the abundance of lithics. 391.4-391.5 ⇒ intensely ch q ± cb veined bk Mst.		V. minor blebs & short veinlets of ch q ± cb occur in the oldest portion of lithic Lith Slt unit developed as irregular veinlet displacing the rock @ 391.4-391.5m.					graph & tbl bed dipping @ 20° to CA @ 391.4m.	
394.7			gr Co Lith	Essentially massive gr Co Lith ± very minor irregular bands of gr Slt from 394.5-395m. In places fg 1-2mm but generally ch very minor gybk to the request		V. minor irregular whq ± Ca vn development ± some preferred vn development sbll to CA @ 25, 20-30° to CA.					Slt bands ⇒ laminated to bedded @ 20-25° to CA at least over last 50cm.	
395.0			ggy gr-cb Slt	Dominantly gr-ggy Slt fg Mst which is plane ⇒ cb ± occasional coarser Slt-Sh bed ± Co, lithic fragments		V. minor Ca ± Chl vn development. most as irregular veinlets or blebs aligned in a broad direction @ 15-20° to CA.		Minor small scale Mi/Ft discontinuities @ 65° to CA.			Slt/fss contact @ 15° to CA may ⇒ fault.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
395.85			gn-bt bt-bn	Domin weakly gn-fo bt-bn Gw in places takes on a rd-br hue. Fs, Mst bt-bn fragments rarely >0.5cm. Minor gn-rd-br Slt-vf bands 396 – 396.2m.		Minor irregular wh q vns occur throughout with vns @ 15, 20, 30° to CA. also E common of irregular q-carb vns & veinlets vns become broader 5–10mm brown like in pits from 397 – 397.45m @ 20° to CA.					Slt/Ss laminae & So contacts are @ 20° to CA @ 396m.	
397.45			gn-br – rd-br Gw	Domin weakly Gw interval E gn-br → rd-br Gw downhole E from bt-bn < 0.5mm & mm fd. In places minor rd-br Slt-vf Mst. Slt/Ss contacts irregular ⇒ some soft sed disruption.		Narrow brown infill wh vns occur throughout generally irregular E some preferred tension direction @ 20° to CA.					Veining in places isolates selvedges of Mst ss, more intensely developed in Mst beds.	
398.8			rd-br Mst	Massive interval of rd-br Mst in places minor gngy Slt → Gw laminae developed. With some shear distortion and mixing of Mst/Gw and/or along E small scale ft slip displacements of Gw laminae @ 20° to CA. Also in places some apparent packing infill by dk silt-br Chl & some pyg.		Though not extensive irregular wh q vns & brown gnsh reddish occur sporadically throughout commonly with 2 mm enclosing selvedges of the host rock. Also some wisp veinlets appear E chl ? infilled fractures. Wh q vns regular vns @ 25, 30, 40, 55 ft small to CA.					Fol^n of So/E Slt ft at 40 → 35–30° to CA From 405–409m dips E Essentially massive Mst.	
400.2												

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
410.2 – 410.4			gn-plyl Slt	A domin. fairly Slt interval ± gn-plyl Slt bands + minor gngy Slt. In places Slt → fgn GW. Mnr plyl → pkbs ± Aft bands. Some small-scale slumped disruption of bedded units by Slt slip planes. Also some small scale fracturing like infill of gn Slt on Chl ± Sd.		V. minor Sd vns ± cut at 70° to CA, ± odd blk Sd elsewhere. Mnr Cavn subparallel subp to CA. Mnr gn development assoc ± Sd from 410.2m along 2, 1-5cm Ch vns @ 70-90° to CA from 410.2m – 410.95m.	Mnr wisps of Py assoc ± Cl. aq. @ 411.85m. With Ch aq ± Py vns from 411.85m – 411.95m.				Bedding contacts a dominant fabric. Some Cavn on Ah1 ⇒ So 70-60-45° to CA. From 410.6 – 411 @ at 45° to CA.	
412.4 – 412.6			Sd lobe	An interval dominantly of massive Sd ± some assoc altered ± bleached gngy Slt → Sdst. From 412.4 – 412.55m Ca dominates on Sd.		From 412.55m – 412.2m Sd dominates ± minor irregular vns or resorbed remnants of gngy Slt.						
412.95 – 413.95			gngn Slt	A somewhat wkly (dominantly drill induced) gngn Slt, ± a network of fine Sd veinlets throughout. Occasional pod gn Ch Slt ± some assoc sparse fuchsite, wispy veinlets through Slt. Upper Slt → gngy Slt. Dark to plgy Slt/Sdst over last 10cm.		A network of fine Sd vns occurs throughout along ± oblique blebs. Also mnr irregular Cl vns? ± some preferential development @ 65° to CA					Some gn Chl slickenfibre. Mnr irregular fracturing generally at a high ± to CA. 95cm core loss @ 412.95 – 413.90m	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
413.75 – 414.50			bleached plgr Gw → sdst bkx	An intensely sid overtprinted & bleached gn Gw → slt. In places residual lithic gn Gw clasts form a mtx to blebs of sd & bleached plygn slt/Gw clasts. From 413.7 – 414.4m An intense stockwk of sdms occurs.		An intensely sid overtprinted interval c mass of clear & 10–70° vn network throughout along c becomes massive blebs more a boxwk. Possibly an brecciation cx sd appears as clasts in gn slt/Gs mtx? – later x cutting chl vn phase @ 50° to ct.	v. min blebs of Gn				Cl was generally regular 0.5–3cm have slight wave in them. Again core broken by drilling	
414.50 – 415.2			gggy slt	An interval dominately of gnggy slt c some assoc gg slt. In places some slump folding of the slt c names of gn Cb lithic clast. Also some fracturing in slt infilled by gn slt + Cl along c some gg slt.		Minor blebs of irregularly shaped sd. Also minor irregular blebs or veinlets of wh q.					A bedding of ~ 70° to Ct may => So ??	
415.2 – 415.85			gn Cb lithic gg slst	A somewhat irregular shape defined ibl sequence of fg gn Cb lithic Gw ibl c gg to ggg slt. Commonly slt bands or laminae are disrupted. In places slt/Gw fractured with c selvedges on a cm to [illegible]		Minor irregular Ce, q vn development c some regular vn @ 35, 55, 70° to ct. Minor irregular < 10mm Sd vn/veinlets more c 415.5m						

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
416.05			gn GW	Essentially a interval of gn-gngy Co lithic GW ± Md/Mst grns <0.5mm.		Irregular wkg & lesser Cc vns x cut the interval, generally regular but ± some wavy form & violet branches. Wk vns @ 530, 35, 45° to CA. Also some larger masses or fossil rebef blebs.					Banding of finer grained Slt/So + Sc => So @ 50° to CA. At 418m good bedding contact & fine lamanae => So @ 48° to CA.	
418.45			gn GW:ll gn-gy Slt.	Interval of 1st gn GW lithic GW:bl ± fine Slt/Mst gn gy ± occasional dk gy band. Intervals of Slt & GW 5-20cm. In places some slump mixing of slt/GW. Some fracture development gn silt or Chl.		Scattered blebs & short veinlets of Cc occur in assoc ± Ch. infilling fractures. Some preferential Ca vn development @ 50° to CA & Cl, Ca @ 50° to CA.					some darker Slt bands => So @ 50° to CA. as do lamanae ± in gn Slt bands.	
420.45			gn GW	Dominately massive gngy GW => fgd dk gy GW ± Co clasts <0.5mm ± fine Mst lithic clasts <1.5mm. In places fg. dk GW band => Slt. In places some fracture assoc. ± Cc vn development ± selvedges of GW anchored in a M+x of Cc. Also odd irregular slump clast of slt in GW.		Cc vn development is intense from 420.45 - 421m ± only minor narrow veinlets from 421 - 421.6m. The intense vn network developed uphole is at a low ∠ 10-20° to CA, ± assoc masses of Cc anchoring selvedges of the band. So ± regular vns @ 15, 20, 30° to CA				Fine GW Slt / GW bedding contacts => So @ 60° to CA.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
421.6			gn Lmbk fgy slt	A highly irregular & contorted interval of grgy fgw & irregular stepped masses of gy slt. Abundant fractures of bk slt infilling fractures		Irregular veinlets of Ca occur throughout the interval, with some vn development @ 80° to CA. But generally irregular fracture infills. A broad Ca vn 1-3cm occurs @ 10° → sub// to CA @ 423.5-423.6m						
423.05			grgy slt / dk gy fgw	A well bedded sequence dominated by intervals of grgy slt & minor dk gy bands / bds & ggn Co banded fgw slt beds 10-75cm & fgw = 5-60cm (3:5 slt:fgw 17:23)		Ca vns occur throughout & broad 1-10cm irregular vns & in slt & some propensity to 45° to CA & sub// to 10° to CA. Narrower veins & veinlets occur @ 10, 25, 30° to CA & odd brecciated infill veinlet. Veining less intense & Ca. & some chlorite					At 423.55 a fgw bed coarsens towards its base => a fining upwards sequence from grit → p.gs	
427.05											With fine laminae & some slt or dk slt bands => bs @ 50-55° to CA.	
427.05			gn fgw / grgy slt	An intensely veined mixed sequence of gn slt & gn fgw Difficult to infer 1° structure of strong 3° vn overprint		Ca vn development intense & large irregular masses enclosing selvedges of the host rock.					From 426.4-427.05 fracture set & graphite @ 5° → sub// to CA. Cut by drill induced fracture set @ 40-45° to CA.	
429.05												

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
428.05 – 429.80			gn Slt.	Domainly p/gn Slt in places → fg. gn Sdst, cut by occasional dk gy Slt band. Core highly brkn along Se bed fracture planes or clean surfaces. w.r.t fractures 10, 15, 25, 35 & 60° to CA. Some slickensided bed surfaces.		Some Se vnlse 40 ≥65° to CA & sub ll to CA. Minor irregular Ca vns occur sporadically throughout & some vns @ 10° to CA					JKS lt lamnae ⇒ So @ 45° to CA.	
429.8 – 431.55			gn gy Slt/Sdst → pg.	A highly weathered sequence of pg gn to leached Slt, & dissolution of Sdst & pg Slt bed. Thin bds gn gy Slt → pg. In places resdl fragments of Sdst & Slt. In places more massive gn Sdst occurs & some bio turbation evident. Becomes more competent towards.		Blebs of Se & Ca occur sporadically throughout. In places some q assoc Ca & Clay.					Some v.ill-defined fracturing evident or fracturing along bed Se surfaces.	
431.55 – 433.05			gn Calc Sdst	Massive fg. gn Sdst, in places ± CO (0.5-1mm) but generally (< 0.3mm). Where CO coarse (0.5-2mm) rel Lithics occur. Minor gy Slt clasts occur.		Irregular Ca & less Se blebs, veinlets & tension infills occur. Some preferential vn development ≤ 30° to CA, but generally short irregular vns.						

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
433-0 -433-9			gy slt ± gyn Gbd	Mixed contacted, broken sequence of gyn slt → Gbd ± bl gybx not. A highly slump deformed sequence, in places bands of gy - gyn fg/l Gbd enclosing slt clasts & wisp-worm. (slt: Gbd: 2:1)		Minor blebs & short irregular lenses/veinlets of Cc ± q.					Some leaching along low ∠ fractures 15-20° to CA ± some Se & fractured fragments of slt.	
433-9 436-5			gy slt	A sequence dominated by gy - gyn slt ± minor gyn Gbd bands ± irregular bands & clasts of laggy slt. In places bands highly disturbed ± gy slt clasts in Gbd. Core broken throughout.		Occasional irregular blebs & short veinlets of sd occur sporadically throughout but more so down to 6. Minor irregular short Cc vns.	V. minor blebs of py assoc ± Cc vns.				dk slt bands ⇒ So @ 30° to CA. Se dirs fractures @ 30-45° to CA along ± a no. of low ∠ fractures.	
436-5 437-5			gn gy Gbd	A sequence of gn Gbd in gy slt, the interval is somewhat contacted by soft sed ppt & mixing of Gbd/slt fragments in slt mtx. Core again highly broken by drilling ± irregular fractures at low ∠ to CA & further sporadic fractures at high ∠ to CA		Irregular blebs & veinlets of sl ± q occur throughout.	Minor Py occurs in assoc ± irregular Cc veinlets.					

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
437.15 – 439.7			ggg sltst/ gbkw	A somewhat lower interval of ggg slt in places ⇒ ggg GBW small scale slump fds displays slt laminae & in places there is a mixing of ggg slt, bk slt & fg GBW.		Irregular SL veinlets & rosses occur throughout, along & minor bkds & veinlets of wkg. Vns generally form an irregular network though there is a preferred orientation @ 40, 50° to CA & subpll to CA					Core highly broken particularly along CA fractures @ low & 10–20° to CA & degree of irregular drill induced fracturing @ high & 80° to CA. From 439.4 – 439.7 core highly broken & numerous fragments	
439.7 – 441.1			ggg slt.	An interval formally well bedded ggg slt & some bkd ggg slt & some ggg gwt. But the interval has been highly fractured, & fractures infilled & recealed immately by Cl & lesser wkg vn development.		Irregular Cl vn network infilling fractures occurs throughout & minor assoc wkg. Some broader wkg silica vns do occur @ 439.85, 440.2, 440.45 & 441.0m. & veinlets @ 50, 60, 80° to CA.	V. minor all bkd py assoc & wkg. SL vns.				Bedding of slt & fine grained ggg ⇒ 50 @ 25° to CA. In places resembles polymictic slt & minor rounded slt/ss clasts in ggg slt matrix.	
441.1 – 441.5			gybk Mst	A somewhat vn fractured gybk Mst/slt interval of slt and bk Mst bands ± cut, but in places irregular Ea, & bkds isolate Mst xenoliths.		Numerous bkds & shad veinlets form a zone to selvedges of Mst. Also irregular q, Cb vns ~~not~~ irregular developed & sub ll – 25° to CA.					Bands of slt/ fine ⇒ bedding @ 25–30° to CA.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
441.0 445.7			gy ggy slt ±bk Mst: gy gritty slt.	An interval of ibd gy - ggy slt ± bk Mst in places gn gritty slt ± clasts of gn gy slt & gn ss. (1-4mm) In places num bands gn CaGw. Also minor bands of Lst 449.5 - 449.6m. (bk Mst : gn slt : gn grit = 10:80:10)		Minor irregular wk-g, Cc vn development, in places vns form a mtx to selvedges of slt & Mst. With preferred vn development @ 15, 40, 55 & 75, 35° to CA.		4538m RLD = 48° So = 40° 4556m So = 30° RLD = 47°			laminations & Slt / Mst / grit beds ⇒ So 330 - 45° to CA.	
445.7 448.4			gy lam Lst ± bk gy slt Mst	An interval of gy bk Lst ± bk impure carbonaceous Mst flecked by bk Mst. In places pl gy Mod → Lst is well laminated. No noticeable stylobk development but high CO_2 contents & highly reactive ± gold. From 453.2m - 453.35m: some breccia of Lst ± angular clasts of Lst as selvedges ± a mtx of bk Mst.	Irregular Cc vns occur throughout as an irregular network of vns, wirelets, blebs. Some preferred vn development @ 15, 35, 40, 55, 65° to CA.						laminations of Mst / Lst 35-45-55° to CA dominate through the interval	
450.4 457.35			gy lam Lst ± bk gy slt	Similar to preceding interval but ± more intense fracture infill network, not true stylobks but ± abundant bk slt & assoc Cc vns ± clotted along an irregular fracture network. Some minor gy gn slt bands. In places bk slt ± slt band ± lam Lst → Marl.		Fine narrow irregular vns ± wirelets assoc. ± bk carbonaceous cmnts. Also broad irregular vns, as tension infills sub ll to 30° to CA @ 456.0 to CA.		RLD = 71° Fol^n = 35° @ 457.45m			laminae in impure Lst → Marls @ 30-40° to CA ⇒ S$_n$.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
459.35			gy Lst.	Again similar to preceding intervals, but intensely Ca veined throughout. With numerous irregular un mass isolating selvedges of Marly Lst. Minor gyg silt beds, but dominantly massive gy – gyg Lst – Marl.		Numerous irregular un, veinlets & Ca masses occur throughout forming mtx to selvedges of hostrock. Minor irregular uns @ 25, 45, 80° to CA & sub// to CA.		More Silty beds @ 460.5 ⇒ So @ 30° to CA. From 460.5 – 461.1 only minor un development = dk Lst & marly silt well pronounced & laminated beds. R.L.D = 99° Rel'n = 25° @ 460.6m			Laminated silt & Lst @ 459.9m ⇒ So @ 25° to CA. generally poorly laminated & 1° structure destroyed by intense Ca overprint. At 461m @ dk Lst / marly Ca contact ⇒ So @ 30° to CA. Core orientation @ 460.5m.	
461.9			irregularly brecciated silt / Lst	A brkn somewhat puggy interval of gy silt, bd Lst. In places residual silt, mst & Lst clasts or breccia fragments, in a mtx of gy puggy silt. In places gy silt → pg Colw Strong evidence of a degree of dissolution assoc & fluid movement. Pug bands 462.7 – 463.05m minor pug 463.1 – 463.8m Pug @ 464.1 – 464.3	Also some Se lining irregular fractures.	Irregular masses & blebs of Sd occur sporadically throughout. Similarly irregular Ca un network occurs throughout, & Ca infilling blw breccia clasts often & x'l lined vughs developed.					Dc silty laminae @ ~ 40° to Colw ⇒ So @ 25-30° to CA. Tuffs in places laminae display evidence of? slumping.	
464.3			gy silt	massive to laminated gy silt → Marl & minor bd Lst in places suffered dissolution. Generally fine bk carbonaceous laminae throughout but in places becomes more marly → Lst.		Some Ca un to vughs infill & assoc fracturing @ 464.7m @ 15 & 25° to CA. Elsewhere minor irregular Ca un developments @ 10 & 30° to CA.					Laminae ⇒ So @ 25-30° to CA.	
464.4												

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
466.4			gybk lst	A somewhat impure gybk lst ± some assoc carbonaceous mat ± some graphitic fractures. A degree of dissolution is evident throughout. From 468.3 - 468.7 core somewhat broken in places → gy silty pug.		Irregular 1-3mm Ca vn network is developed in places some well formed vn's in veinlets.					Again high fluid flow plt interval.	
468.7												
469.2			gy s lt	A broken interval of gy massive → laminated slt., in places a degree of surficial dissolution evident. Core highly broken ± many of the fracture surfaces lined ± Se.		Irregular blebby veinlets of cc sporadically ± Se for most dominant as vn's or fracture coats					Darker colour dominant 0/Ca 25 - 30° to ca	
469.2												
472.2			Lst interbed slt	A slightly more competent interval of intensely Ca veined gybk Lst ± some thin gy slt & blk Mst. Again has somewhat of breccia appearance ± an intense mixing of lst & slt 470.2 - 470.5 more highly broken ± some assoc. pug.		Generally an intense Ca vn network but in places some areas with 4, Ca vn development @ 60° to ca but also as breccia infill mtx.					blk Mst/gy slt bed contact @ 20° to ca 270 so.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
472.2			Pt gy-gybk slt/vfgybk Mst	A variously bedded slt/Mst interval of pale gy to dark gy slt beds and dk gy Mst beds. In places minor slump disruptions of laminae. In places becomes a highly contorted slump deformed mix of slt/Mst + some minor gygr fg Cgw		In terms Ca = q vn network is developed throughout + some more regular vns @ 70, 50, 25° to CA					Bedding of slt/Mst is @ 25-30° to CA. Downhole 473.5 - 473.7m tends to a somewhat altered gy grit + slt, pl vn cut by broad Ca, q vn @ 70° to CA.	
479.2			gybk Mst	Interval Dominantly of impure gybk Mst + some minor beds of gy slt + dark dk Mst. In places evidence of slump movement of Mst, slt, Mst.		Ca, q vns + vnlet @ 60, 70, 45° to CA + broad 3-30mm Ca, q vns @ the bottom to + Rare irregular Ca vn network @ base + throughout					Bedding of slt/Mst is @ 35-40° to CA. Some minor style of development. 478.4m Core in hole pulled rods back	
481.45			gy-gygr Cgw	A gy - gygr Cgw interval with fine 0.5-2mm lithic fragments. Minor dk gy silty laminae occur @ 479.2 - 479.5 @ 15° to CA.		A very irregular Ca + q vn network is developed throughout Downhole veining more intense forming a breccia mix Ca, q vns @ 60, 70° to CA but also irregular Ca, q veins + veinlets vns occur throughout					The highly mixed + deformed nature makes 1° structure difficult to judge.	
483.6			gy slt/dk Mst	An intensely slump deformed mixed interval of gy slt + dk Mst. In places slt laminae. In places small scale slip on slt planes disrupt 1° bedding. Minor clasts of fine slt in slt/Mst mix.								

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
484.5			Lemst: bk mst gygslt	A variably mixed to laminated dominately bk Mst ± lemgygslt interval. Small scale gt displacements & slump mixing of maroon bk Mst ± to lesser extent gygslt.		Irregular blebs, veinlets & veinlets of qz, Ca occur throughout	Minor v. fg Py forms fine bands ⊂ in lem slt/mst sequence. Usually conformably displaced along SS ⇒ post or during development movement on aligned soft sed dfn.	Small scale displacement dubll to 10° to CA, post or development.			Laminae @ 55° to CA b/w slt/mst ⇒ So.	
497.2			gygslt ± lem mst.	A generally well bedded & laminated sequence of gygslt ± lem slt ± bk Mst. In places minor gt displacements of beds. Also evidence of slump folds & mixing from 487.6-488.2 m.	Pt 487.5-492.6 minor sericite in development @ 30° & irregular veinlets throughout. Ca mins less prevalent towards the base.	Veining & Ca is generally restricted ± broad irregular vns forming a loose & network in places cut by higher & more regular vns @ 30, 40, 60° to CA. In places veining becomes intense forming a matrix to rel breccias of host rock. e.g. 484.8 - 486.8m & 487.6 - 488.2m. ctd		Minor gygslt fg aggr @ 487.6m.			Laminations ± slt/mst contacts ⇒ So 45-50° to CA.	
495.05			gygslt	A somewhat laminated ± bedded gygslt ± minor bk mst bands, 2 - 3cm gradually crown		Irregular bleb, veinlets & vns ⊥ cut the interval ± some regularity to the vns @ 20, 30° to CA. Some irregularity vns brecciated towards the base of the interval.					Bedding ⊥ of clasts & gr slt/gygslt 60-55 - 493.8m ⊂ A laminae with possibly some x-bedding ⊂ laminae @ 35° to CA then slt @ 495.2 But elsewhere laminae subll to beds.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
495.05 – 497.8			ggy/slt ± bk mst.	Mixed sequence of gg slt ± bk Mst. Evidence of slump mixing & in places clasts of slt in matrix of Mst		Irregular blebs & veinlets of Sd occur throughout & mm assoc. Ca veinlets @ 20°/65° to CA. Some Chl assoc ± Sd veins generally ± pale ggy slt. Also some Cl veins & blebs developed ± Sd veins ± bk Mst. 497.3 – 497.8m.	Mm blebs of gl. sp occur ± some of the veins & veinlets.				Minor broken ground & ptg development @ 495.5 – 496m. Some semblance of bedding @ 30–35° to CA, but ± signs of slump mixing difficult to accurately define.	
497.8 – 500.2			ggy slt ± bd & ggy slt	A bedded slt sequence dominated by g–ggy slt ± some ± bd gy slt & minor plgy–rd & slt. In places irregular fracture network is developed throughout resealed by ggy slt & Ca veinlets (ggy slt : gy bk slt : rd & slt = 20 : 3 : 1)		Irregular Ca veinlets occur throughout infilling fractures, in places broader than 1mm. but lack a definite regularity. with minor irregular Sd blebs from 497.8 – 498.1m.					Laminae & beds @ 25–30° to CA. dk gy beds 2–20mm ± rd to slt beds 20–70 mm.	
500.2 – 501.2			gy bk Mst ± bd gy slt	Dominately dk carbonaceous Mst in places ± fine gy slt laminae & some ± bd gy slt. Small scale slt disruptions are evident & in places ; 500.2–500.85m some slump mixing of Mst & slt.		Irregular Ca blebs & veinlets occur sporadically throughout.					Slt laminae => So @ 30–45° to CA	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
502.7			plgr gritty bx	A pl gr gritty rock with ē 1-5mm slt clasts, ↓ to in a fine gr slt mtx. In places gr grit displaced by bk slt + Mot In places isolating grit as selvedges in bk siltstone. In places isolated Mot clasts are isolated in gr grit mtx.		Irregular Ca±q veinlets occur sporadically throughout along irregular ans + blebs					Some drill induced fractures evident esp @ 502-1m. From 501.2-504.5 beds are V.G.E absent range of Slt clasts as seen in bk mat mtx.	
503.75												
503.75			gr Slt ibb bkMot	A mixed sequence of gr gy slt ibb bk Mot ē minor gr slt grit. Interval highly slump deformed. Commonly Mot grainsize clasts occur as isolated selvedges in gr slt mtx. Structure Slt/Mot form slump deformed bed contacts.		Minor irregular Ca ans + veinlets + old bleb sporadically throughout.					Possible bedding & laminations @ 25-30° to CA ⇒ So ???	
504.65												
504.65			bk Mot ibl qtz slt	A sequence dominated by massive bk carbonaceous Mot ē minor gy gr slt laminae + massive gy slt beds. In places minor breccia of Slt/Mot ē selvedges in mtx of Ca from 510.85 - 511.35. Possibly a cemented breccia as minor large fg QV clasts.		Irregular Ca ans + veinlets + bleb occur throughout ē minor regular ans 20, 30, 50° to CA 2-10mm. Regular ans later phase X cut irregular massive ans.	Minor Py as fine disseminations ē gy gr Slt. or irregular blebs assoc ē Ca ans. Odd Py band occurs in bk Mot.				Carbonaceous Mot more prevalent downhole. Bedding of Slt/Mot + laminae @ 30-40° to CA.	
516.3												

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY ROCK NAME	LITHOLOGY DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
516.3 – 517.55			gy slt - fg ss	An interval of gy blk slt → fg ss. Ltr in places tends more to gy slt or blk Mst in other areas fine (< 0.5cm) lithics (chert) (< 3mm) suggest fg ss.		Minor irregular Ca vn & blebs development ± anastomosing @ 20° to CA.					A segment of the carbonaceous Mst lithics in GW → belly @ 20-25° to CA.	
517.55 – 521.1			blk Mst	An interval dominated by gy blk Mst & minor bands of gy slt and in places sandstone irregular shaped slt → ss clasts in Mst Mtx.		Irregular clasts & blebs, veinlets & vns of Ca occur throughout with minor regular vn development @ 20, 30, 60° to CA but generally irregular vns & veinlets.	Minor Py assoc ± Ca veins & veinlets & blebs Minor fg. Py dissem in gy slt clasts				Slt laminae & banding @ 30-35° to CA → Sc.	
521.1 – 526.5			blk Mst	A highly soft sed cleaved deformed interval of blk Mst ± irregular swirly masses of gy slt. In places magnetic Some carbonaceous bands.		Irregular blebs of Ca, qz occur throughout, in places appear as brecciated clasts of Ca in Mst mtx Minor regular vn development @ 35° to CA but on the whole vns irregular or more commonly are blebs.	Irregular blebs & clasts of fg Py occur sporadically with some Py blebs assoc ± Ca vns.					

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
526.5 528.3			bk Mst ± bd gy Slt	Dominantly bk Mst ± some ± bd gy Slt in places beds highly contorted ± irregular bands & scattered clasts.		Minor q, Ca ± Cl vn & veinlet development assoc ± Py min°. with further vnlets & blebs of Ca. Lt/th later phase x cutting Ca vns @ 45 & 20° to CA.	Minor Py min° assoc ± narrow vns & veinlets of Ca, q, Cl. Also larger scattered masses of fg. Py vns @ 30° to ct.				Possible banding of Slt & dk carbonaceous bands @ 30-35° to ct.	
528.3 535.85			bk Mst.	Massive bk Mst ± some irregular shaped masses of strongly disturbed gy bk Mst → Slt		Irregular blebs & masses of wh. q & short veinlets occur spordically throughout. Minor short Ca veinlets.	minor masses of Py assoc ± wh. q. Cl blebs. Also minor Py assoc ± some wh. q veinlets. Also some fg. brown Py assoc ± some gy Slt masses. Also some larger masses of agglomerates of Py.					
535.85 537.0			bk Mst ± minor bd Slt.	Massive bk Mst ± some wispy irregular gy Slt mass sporadically distributed. At 535.85-535.95 irregular shaped gy mass of bd Slt	Cl alt assoc ± vn phase.	Irregular Ca masses & vns occur sporadically. Also irregular vns & veinlets of q, Cl, Py. Also irregular Cl, q veinlets	Masses of Py & irregular vns occur in assoc ± Ca. alt. Also as veinlets ± q, Cl, Py. At 536.35 vn of qz, py, q, Ca x cut @ 60° to ct.					

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
537.-			bk Mst	A massive bk Mst c irregular wispy gy slt ⇒ or masses throughout But most notable are the numerous wispy Py veinlets.		In places qz,cl occur assoc c Py veinlets. Downhole sd veinlets & blebs occur in assoc c Py* & qz, Py uns.	Numerous Py blebs veinlets occur throughout, c a possible irregular preferential orientation @ 35-40° to CA.					
537.45			bk Mst	A massive bk Mst c minor irregular, wispy shaped gy slt masses.		minor Cl±qz±Py veinlets runs developed throughout along c more wk qz vns.	occasional masses of Py occur sporadically.				Again there is a semblance of an alignment 30-40° to CA.	
538.0			gy lam slt	A unevenly, low dipping deformed gy slt c dk bl Mst. Mm scale slump bedding produces small irreg loose folds on the laminae. In places becomes more irregular c bk Mst + gy slt as disturbed beds. (Slt : Mst = 3:1)		V minor blebs of wh. qz or short narrow veinlets	V. minor Py assoc c odd veinlet.				Bedding laminae in Slt @ 30° to CA.	
538.4			gy slt to gy slt	A mixed sequence of gy slt - gy gn Slt to dk gy slt & In places irregular shaped masses gy gn Slt. In places		In places irregular blebs, vns & veinlets of Cc ± qz occur sporadically throughout					Lamination ⇒ So @ 40-45° to CA. Minor stylolites developed along the margins of Slt seams.	
538.2												

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
				Slt is laminated. In places slt → f-g gy Co LW		Irregular Cc, qtz vns + veinlets occur throughout in places form a mtx interbedded to brecciated clasts of Lst.	Some f.g Py bands assoc. ± dk carbonaceous Mst beds.	From 545.35 - 545.85 core somewhat bitty, drill induced through some fracture surfaces are lined ± gy silty pwdr.			Py & dk Mst bands @ 30° to CA ⇒ So.	
539.8-545.75			gy Lst	An interval dominated by gy Lst ± dk carbonaceous Mst as ibl beds & as irregular shaped masses interbedded to Lst masses.								
545.75 - 545.95			gy lam Slt	An interval of gy lam Slt ± dk carbonaceous laminae in places has etched surface → dissolution		Short irregular masses of Cc.					laminae @ 60° to CA ⇒ So.	
545.95 - 546.2			gy Co LW	A coarse gy Co LW → grit ± pl 1-3mm & 1-2mm dk lithics grains.		Irregular shaped Cc vns ⊥ to CA along ± add multiple veins.						
546.2 - 546.7			gy Slt ibl gy Lst	Irregular wavy contorted interval of gy-dk gy Slt (in places → carbonaceous Mst) → LW ± some ibl gy Lst.		Irregular vns & veinlets & masses of Cc & qtz occur throughout. In places ~~fau~~ reseating fractures &/or brecciated Slt & Lst masses.					Some graph lined low & fractures @ 10-30° to CA. Also minor gy Slt to pwdr lined fractures.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
546.7			gy Lst	Intensely veined interval of fracture sealed gy bl Lst ± occasional clast of gy Slt.		Cc vns form an irregular network throughout Lst, resealing fractures & in places forming a mtx enclosing selvedges of Lst.						
547.0												
547			gy Slt ± bl bk Mst.	A contorted slump disturbed Slt / Mst sequence. In places residual somewhat fractured gy Slt beds & in places gy lam Slt, with ibd gy bk Mst ibd ± Slt or fine a slumb disturbed mass to lam Slt, Slt & gy Cw clasts. Downhole more gn Slt → gn Co Lst, ± wispy ibd beds of bk Mst		Irregular blebs, veinlets & odd vn @ 15-20° to CA. In places vns as fracture infills vns Cc ± wlq. with blebs or veinlets less prevalent downhole	ub. minor Py as disem. grains & clots ± ol wispy bk Mst bands downhole					
550.5												
550.5			gy Slt → Yb	A gy bk Slt - Mst mtx encloses clasts of gn Co Lst, gn Slt, bk Mst. Clasts generally 2 - 10mm but clasts 10 - 100mm occur, generally only large Lst clasts. In places wispy bands of pl gy & bk gy Slt clasts occur.		Very minor blebs & veinlets of Cc ± q occur Sporadically.		Zone of wispy Slt - fol'n @ 45-50° to CA.			From 551.9 - 552.4 m Core Somewhat brkn dominately DRIL induced though some low ∠ fractures.	
552.7												

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
552.7			gybk Slt ibl gy bst	A brkn interval of gybk Slt - Mst ± clasts of gybl Lst ± gygn Slt occur throughout as subang - subrounded clasts. Irregular gy silty masses line fracture surfaces.		Irregular blebs & veinlets of qv ± Cc occur sporadically.					Drill induced fracturing.	
553.1												
553.1			bk Mst → Hb	An interval dominated by bk Mst ± lesser gy Slt as irregular bands or as odd clast. Irregularly shaped clasts of Qtz, gy Slt ± gygn Slt ~~of gybk~~		v. minor irregular veinlets + blebs of wh. q ± Cc	Py occurs as numerous blebs veinlets & irregular masses throughout. But Py more abundant downhole.	Possible alignment of Slt + Py bands @ 20° to CA, but may be Slump related/fracture			irregular Slt/bk Mst bands ⇒ intrusive Slump texture, with angular clasts... seemingly sed derived ???	
554.3												
554.8			gn bk Ss	A fig. gn bk Ss a very dense interval, ± green tinge after Cl? In places Ss → Qtz? Also minor irregular masses of bk Mst. Irregular masses & veinlets of Cl occur throughout. ~~Downhole~~ Perhaps more to the felsic?		Dirty Cc - Sd vn & hessian veinlets occur throughout. Most vn @ 30° to CA.	Minor blebs of Py and/or ± Sd? vns. Also abl blebs elsewhere				Banding of Seven Fault zone ± Seven sealing feature @ 554.3m Banding of shear zone @ 47° to CA.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
554		8	bk Mst	Bk Mst ± wisPy bands of dk carbonaceous matter and gy slt bds & odl gn ol/pyrox masses ± assoc blebs of Py.		Minor q, cl ± Py vns @ 20° to CA.	Py vns @ 10-15° to CA also minor Py assoc ± Ss masses & minor fg Py assoc ± laminae	5m Sdun @ 45-47° to CA @ 555.0m			dk carbonaceous bands & gy slt @ 40° to CA.	
555		4										
555.4			bk Mst	Dominately bk Mst ± odl gy slt band ± odl Alt Qtz clast.		Irregular vns & stringlets of wh q occur sporadically.	Minor Py occurs assoc. ± wh q vns also as ct & q/Py stringlets. Also numerous irregular Py masses ± in more massive bk Mst.				With gy slt defining possible So @ 25° to CA? 555.4m Start of true textural brecciation.	
555.8				At 555.4 & 555.45 rexllised dirty ferroan? ± Ss or dolomite as equigranular sugary appearance ± some assoc Py is. mesolytic dol after evaporite?								
555.8			breccia (Py, Alt, slt) Mst hom.	Alt irregular intensely sheared or strained interval ± minor wispy bands of bk Mst, minor clasts of gy slt & gy Qtz with an intense irregular Cc, wh vns. Massive fg Py ± odl coarse bleb dominate.		Intense Cc, q vn network throughout.	Massive irregular bds of fg Py & lesser coarser Py blebs.					
556												

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
556.-			grbk ss	An unusual grbk ss ± Py blebs throughout ea darker Cl/Slt Mtx. ± minor dbl gybk slt/Mst ± bedding contact sub// to CA.		minor q, Cb vns @ 25° to CA.	Fine to coarse Py blebs 0.5–4mm occur throughout to produce Sc like texture.					
556.3			bk Mst	An irregular disturbed interval of bk Mst ± gy Qtz → ss masses vn isolated zones Stained in gybk Mst. In places minor Cl overprint esp uphole.		An interval comprised of irregular dbl –Sd vns, veinlets & masses occurs in places resulting in fingery texture developed.	Py Py occurs throughout in assoc ± the veining. At 556.3 – 556.35 possibly some minor Cassiterite assoc ± Py or brown pink bleached Py???				Some possible Sty lo cumulate [] Cm zone intensely chloritised areas. ?	
556.85			Mst ± bl Slt	A mixed interval of gybk Mst ± v.dkgy Slt – ggy Slt		Irregular wk q. vns + veinlets & blebs occur throughout	minor diseminated f.g. Py masses occur sporadically throughout along ± dkd Py blebs.					
557.35												

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DEPTH	DRILL RUNS	CORE LOSS	ROCK NAME	DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
537.35			Vb Slt	A) polymictt breccia possibly sed derived. Consists of an array of clasts 1 – 100mm diam subrd squeezed or irregularly distributed in a mtx of bk carbonaceous Mst. Clasts include gy Ss, gy ± pygn Slt, gy qz, bk Mst clasts generally angular to subangular esp qz. Odd Py Py clasts. Very odd wispy gy Slt band.	Minor veinlets, one + blebs of Q & Ca	Minor Py as fg. Py clasts, but more common as irregularly dispersed blebs. In places Py blebs (?) as bands, fine laminae or fringe the margins of clasts.				Minor low ∠ to CA slickensided surfaces graph fractures.	
560.9												
560.9			bk Mst	Dominately massive bk Mst ± odd subrounded clast of Qtz. Also numerous irregularly shaped Py masses.	Cl - more abundant in earlier veinlet phase.	A no. of Q, Cl, Py veins transect the interval. Can irregular network veinlets commonly form or x cut by late more regular ones @ 15° to CA. Also large irregular masses of Q, Cl, Py.	A no. of irregular to semi-parallel masses, of fine to coarse 1 – 5mm Py blebs occurs throughout. Also some Py as veinlets.					
561.5												

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
561.5 – 562.25			Y. breccia.	A broken interval of gybk Mst with ± irregular bands or clasts of gy/gybk Mst. Many of fractures lined & slickenside graph. Fractures generally irregular & some drilling influence evident.		Some irregular wh. g ± bands cl, py vn developed ∥ to band.	Minor fg arsen ± irregular vns.				A gy silty py developed at the contact @ 561.5m ± fracture @ 35° to CA. 561.5 – 565.4m – crush zone – aggregate Py/a clasts in tectonic breccia.	
562.25 – 563.45			Yb → blde	An intensely mineralised (Pyrite) breccia, possibly sed derived? An abundance of clasts Qtz, gy & gygy Stk, bk Mst Py, in places Py forms a mtx to subangular of Mst & Qtz. Some Qtz clasts appear to be subrounded ⇒ sed origin. Mtx to clast variably gy silt → silica rich material or Py in places.		Narrow, anastomosing wh. vn network occurs throughout much of the interval.	Abundant Py 20–30% by volume occurs throughout as irregular clasts & as laminated fgr Py beds 3–10cm thick. Fgr Py lenses exhibit swirled & sed Py texture					
563.45 – 565.5			gybk Mst ± Qtz clasts	An intensely broken zone of gybk/silty ⇒ graphitic Mst & clasts or bands of gy Qtz throughout. Also odd Py clasts/aggs & gy Silt clasts.		Irregular wh. ± vns & veinlets & blebs throughout where veining locally intense are less broken.	Minor blebs or clasts of fg. Py. also some Py assn ± bks Mst.				In places tends to gy silty ± bk graphitic ppy. where Qtz or Yb bands tends to be more competent.	

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY ROCK NAME	LITHOLOGY DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
565.5			gdyfel Ss ilc gy bk Slst	An irregular bedded to disrupted mixed interval of gdyfel Ss, lcc gy bk Slst → Mst, in places bulk of Ss are disrupted & Ss occurs as selvedges in the Mst.		Irregular blebs, vns & bands of Ca ± some vns of Fe rich Ca → Sd @ 35 & 60° to CA. to base of interval.						
566			Blk	A polymict breccia or sedimentary conglomerate? The interval is a wide range of clasts in a gy bk Slty (mst) matx. Clasts include gy Lst, gy QFP, gy Slst, gdyn Slst, bk Mst, Py. In places clasts fractured & veined.	Possibly some mild alteration. ± Py.	Intense network of Fe rich Ca → Sd veins occurs throughout. Also some wh. q vns & developed as a fracture seal. ppt on broken fragments. 567.3 Ame stockwork Qtz network, 1cm @ 45° to CA.	Abundant Py assoc ± vn development as irregular masses, narrow veinlets Possibly some veins filling Fe brown Carb. assoc ± Py, q, Ca from 567.6–567.7m				Cal. healing of possible bedding @ 60° to CA, though disrupted by small scale Xcuts. Py increase in abundance downhole with Py 5–10% by vol. Where wh. q seals fractures & breccia clasts looks like structural related brecciation.	
567.7			Yb	A dk Yb dominated by clasts of bk Mst, gy Lst, gybk Slst, gy Ss. There is a strong wh. q Qtz vn & stockwork throughout. (Possible Porphyry Related Dd. clasts.			Py occurs as irregular shaped clasts, also as short veinlets and as vns, commonly assoc ± Q vns but also as Py vns. Minor all bleb po also occurs such as @ 567.75m.				Py 5% by volume but locally reaches 10% by volume. Brecciation or polymict nature looks more structural ± angular irregular clast distribution all fractured & sealed by stockwork	
568.35												

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DIAMOND DRILL LOG

12134 (2)

PROJECT :
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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	MICRO
568.35 – 570.45			bk Mst breccia.	Very similar to preceding interval but v. minor Py. An interval of FIt brecciated bk Mst ± some fragments of gy Slt & gjz & mm Lst. Intense wh. q. vn stockwk overprint.		Intense stockwk of wh q vn Rescale fracture b/w brecciated clasts also xcuts clasts. Magnetic content occurs @ 568.45-568.5 & 568.65-568.9m. Some irregular wh q vn developed in Lst.	At 569.3-569.9m a Py band occurs. Minor veinlets & blebs of Py occur clasts assoc. ± wh q vns. In places fine Py [illegible] assoc ± bk Sil/Py stylolitic laminae irregular vns & veinlets in place [illegible]. The apparent laminations is in fact of massive Py clasts & bands ⇒ possibly sed. origin but also some vns & veinlets. & blebs elsewhere throughout that have been structurally folded & brecciated				568.65 15cm Q vn. Again possible structural breccia possibly evidenced by dk Sil/Py or q sealy fractures. In places resembles more so a sed. conglom but generally appears to be a structural breccia ± vns Com angular mst & aggd Y clasts & gjz & Slt or wh q mtx. Py throughout as minor component 1-2% but locally massive bands or large clasts 50-60% Py	
570.45 – 571.2			gy Lst	A mildly brecciated gy Lst in places all bk Mst clast, ± gy Slt. In places gy bk Slt infills fracture in Lst. (May represent large Porphyroblast clast).								
571.2 – 572.5			bk Mst → Yb	An interval dominated by bk Mst in places → Yb with clasts of Py, gy Slt, gjz, Lst in a gy silty mtx or wh q mtx. Also in places quartz infilled fracture network in Mst. From 571.25-571.35 massive clast gjz Lst flanked by Sil/Py. 571.35-571.45 Massive band Py ± some breccia clasts & Sil/Py/Lst vns. From 572.15-572.45 massive breccia clasts of Py.		Wh. q vn occurs as an irregular vn network developed as flat Clean fracture Sealing fracture that post dates brecciation generation of Y zones. Vns generally as an irregular network though some preferred development @ 70-90° to C.A.	The apparent laminations is in fact of massive Py clasts & bands ⇒ possibly sed. origin but also some vns & veinlets. & blebs elsewhere throughout that have been structurally folded & brecciated					

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DIAMOND DRILL LOG

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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY ROCK NAME	LITHOLOGY DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
572.5			gy Dol.	Dominately massive pale gy Dol (may be partially bleached) cut by fractures & dk gy silt + wh q vn networks throughout. In places more brecciated → Polymictic texture ± clasts of gy Dol, Py, bk Mst, gy Qtz in a greyish wh vn q matrix.		In places vns of wh q ± Py form a mtx to brecciated clasts. Wh q vns occur as discontinuous infill fractures & more massive Lst vns generally occur as an irregular network. Some preference @ 70-80° to CA & 30° to CA.	Possible 1m-3m thick of Cs @ 572.51m. Py occurs as breccia clasts also occurs as remobilised phases ± margins of or as fringing phases to clasts.				Possibly represent a large fill dropped block of Paverty? Fault	
573.4			bk Mst Lst ± Py	Interval dominated by massive bk Mst zones in places the Mst is slightly sandy. Lbl ± Mst are narrow breccia zones 5-30cm thick appear for more ± sedimentary with breccia clasts of Py, bk Mst, gy silt, gy Lst, gy Qtz (Mst : Py = 4 : 1)		Intense wh q vn network again occurs vns @ 60, 70, 80° & 30° to CA, generally occurs as an irregular network more so in bk Mst than Py beds in the latter occurs as isolated blebs.	Py occurs as clasts in gy silty mtx of Py vns, but also as vns wrapping clasts & as scattered blebs More Py assoc ± vn qtz	Clasts irregular shapes but in places appear to be subrounded ⇒ possible sedimentary ins structural emplacement.			Y zones intensely sheared distorted, possible Alt related ?, now as jumbled mass of clasts in a sheared gy silt mtx Core somewhat fractured 10-30° fractures lined ± graphite 576.4 - 576.9m, some carbonaceous gy lining fractures.	
576.9			gy-Cb bx ± gy Lst.	A somewhat gritty gy bx i.e. An interval ± gy silty mtx to clasts of pale wh y silt, gy Mst & possibly some feldspar. Also some dark carbonaceous Mst bands. Possibly add Qtz clasts (May represent Flinck fragment from Crimson (reef Formation).		Minor blebs of wh q.	Minor Py assoc as blebs & as fracture veinlets.				A semblance of bedding maybe ⇒ @ 25-40° to CA. 576.6 - 576.9m Crush Zone ± veining.	
577.35												

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DIAMOND DRILL LOG

121346 (a)

PROJECT : _____

PROSPECT: _____

HOLE NO: 259
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DATE: 9/01/87

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
577.75 – 580.65			Mod Mst lbl Yb.	Interval dominated by what appears to be sedimentary derived Yb ± clasts of dkg, Bol, silt, Mst, Sc, Py in a gy-bk silty matrix. lbl ± Yb are dk carbonaceous Py Lst or Mst possibly dolomitic. (Mst : Yb ≈ 1:4).		Intense wk q vn network developed throughout but far more persistent ± in Mst's. Mnr Ca ann ± q also regular Ca vns @ 60° to CA.	Py occurs as fine to coarse clasts ± in the Yb. But also as irregular blebs assoc ± Ca, q vns. Dg also occurs on fracture/ppy veins crosscutting throughout Yb bands				In places irregular Slt/Mst/Sc banding developed @ 40° to CA ⇒ So.	
580.65 – 583.5			bk Mst lbl Yb.	Interval dominated by bk Mst ± lbl bands of Yb ± occasional gy lam Slt, Lst or fg gy Sc, bands. Again Yb bands look to have a sedimentary origin ± subangular to subrounded clasts of slt, Sc, dkg, bk Mst, Lst, minor Py in dk sil/dg matrix. In places wk q vn infill fracture b/w selvedges of Mst.		Wk q vns more extensive ± in bk Mst, though odd bleb or silt veinlet ± cut clasts or fragt clasts in Yb bands. Some assoc ± wk q vns, veinlets & blebs.	Minor Py occurs as odd blebs in Yb, also as blebs in Mst or occasionally in assoc ± wk q vns. ~~Py [illegible] Feathery ppy veinlets associated throughout Yb bands.~~				gy Slt laminae are @ 40° to CA. ⇒ So? With ± concordant ± micaceous fine to clay sized input & minor slump folds? Some Slt/Sc bedding towards the base of the interval ⇒ So any ∨ to 25–30° to CA. A minor band of gy Slt ⇒ So @ 30° to CA?	
583.5 – 584.1			ggy Sw	Interval of gy gr Co Sw ⇒ grit ± fel, ± Mst clasts. 1–3 mm throughout gy gy finer matrix. (Felted Fragment From Crimson Creek Formation).		[illegible] Ca vns developed @ 40–45° to CA. ± 35 & 75° to CA. Same also seen as vn/veinlets on surface @ 582.5m.						

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EXPLORATION DIVISION

DIAMOND DRILL LOG

121347

PROJECT : _____

PROSPECT: _____

HOLE NO: 85 91
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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
584	/		bk Mst/Slt gy Slt	Dominately irregularly bedded bk Mst + gy Slt, in places laminated, mine gy Co lam beds. In places extensive slump mixing of units. In places gy Slt has a somewhat gritty appearance. Mine irregular bands of gy gr Lst.	In places some lge gr silty clasts possibly ? some overprinting Cl alteration.	Irregular blebs, & veinlets of Ca occur throughout. Ca ves appear to seal fractures & occur as irregular blebs possibly distorted by small scale movmt?	occasional blebs or veinlet of Py assoc ? bk Mst. or ? with Qz ves.				v. minor slabs of gr. talc. Slt - banding @ 20-25° to CA likely => Sø or may just be some slump def.	
586.6			gy Lst	A mottled gy Lst-dol interval, ? Stylolite development in places producing mottled texture of pl gy & dk areas. Possibly some mild brecciation downhole, ? dk silt infilling fractures.		Some irregular Ca ves development throughout. or as blebs in filling voughs ?						
587.25												
587.9			bk Mst	Dominately bk Mst ? occasional foreign clast, generally Y appearance in places. Clasts subrounded ⇒ detrital origin. Clasts include gy Lst, Py, gy Slt, bk Mst, qtz.							some mild bx & fractures lined ? carbonaceous py to grph.	
589.4			Yb	Again what appears to be a sedimentary breccia ? a wide range of clasts including Mst, Slt, Lst, Py. Clasts are enclosed in a fine grained matrix. At 590.7-590.8 massive Py. gy Lst ⇒ qtz and.		A abundant irregular veinlets & blebs of Ca occur throughout. With the blebs commonly as a matrix to clasts. Some veinlets are at 20-25° to CA.	Py occurs chiefly as scattered irregular clasts or blebs but also as veinlets ? assoc ? Qz ves.				In places bk Mst is more prevalent ? takes on banded Mst/Slt appearance. Beds @ 25-30° to CA.	

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DIAMOND DRILL LOG

PROJECT : _____

PROSPECT: _____

121348

HOLE NO: 23 (W)
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DATE:

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
590.8 -592			bk Mst	Generally massive bk Mst ± occasional irregular clast of gy Slt → Ss. Irregular Q, Ca vns occ throughout ± Py mineralisation ± veining		Irregular network of vns developed throughout, in places more regular @ 15, 30, 70° to CA, wavy not sharp in contacts. Bk vns Py ± Fe rich dirty Ca vns. 591.1m vein 2.3cm FIt? Irregular vn network of Ca vns occurs throughout along ± veinlets of Py.	Bkts of Py occur over ± vns also scattered bk Mst. Also as wavy irregular Py veinlets. In places appears that had Ca vn then followed by Py ± later vn Q vn then.	591.7 small subrun (FIt) seat.			Interval may have 1-2 to 5% Py by volume. From 590.8 - 591.1m core bkn ± zone darkened Py & Qtz vn contrib developed ± due to leaching; fractures 10 - 20°, 35° to CA.	
592			Dominantly gybk Mst → Mst in places had Yb ± clasts of gyQtz, gyg Slt, gyg Sy/Ss ± more Py. In places bk Mst ± Qtz Py, Py form a mtx to clasts.				Py occurs as a mtx to breccia clasts, also as scattered blebs irregular veinlets 592.5 gy/bk Qtz ± rbk fracturing means of Cs ?				Clasts highly irregular in shape, & in places look like a mixed Slump assemblage. Past the presence of a range of Qtz ± Mst clasts in a mtx of Py @ 592.1m ⇒ Structural depth ± FIt sealing.	
593.3												
595.5			bk Mst → Mst lbl gy Slt	Irregular? somewhat slump? contorted bk Mst & gy/bk Mst interbedded with lbl gy Slt → Ss. In places rounded clasts of gy Qtz, gy Slt give a polymictic appearance in places. In places irregular bands of Mst & Slt are somewhat disrupted In places gybk Mst dominates as at 593.7 - 593.6m	Mild Cl. alteration assoc. ± rounded clasts Py Ss?	In lower Ca, Qtz vn network occurs throughout. With veining most intense in bk Mst bands @ 595.4 - 595.7 & 593.2 - 593.6 with Ca vns parallel ± cut bands & Qtz ± bk Mst.	Py occurs as fine brown grains ± in Ss, also as Py bands also as minor bands & blebs assoc. ± vns, & as scattered blebs ± in Mst. Py possibly as irregular veinlets Py ± 5% over last 70cm.				595 - 595.1m highly broken graphitic shale fracturing to py ± fractures @ 70° & 30° to CA. Appears to be a pt sed slump type rather than fltng.	

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DIAMOND DRILL LOG

PROJECT : _____

PROSPECT: _____

121349

HOLE NO: 2591
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DATE:

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
595		5	bk Mst	Dominately massive bk Mst minor gy slt bands, Mst displays evidence of slump distortion ± wispy slt bands through dominately massive bk carbonaceous Mst.		V. minor irregular blebs, veinlets + odd vn of wh. q.	Minor Py occurs as blebs and veinlets or bands ± in Mst or gy slt.				Downhole 596·3-596·5m Semblance of banding of slt + Py ⇒ So @ 45° to CA.	
596·8			bk Mst	Dominately massive bk carbonaceous Mst, ± minor irregular masses of y/gn fgw → slt. Presence of Fluorite ⇒ hydrothermal mineralising fluids present. 598·4-599 (CCF) transition from Flt Zone into tectonically fractured zone ± in Oonah Formation.	Overprinting Cl alteration assoc ± Py min. At 597m * possible clear brown Fluorite assoc. ± blebs Py min	Irregular vns, blebs & veinlets of Py occur throughout wh-bl qtz ± Cl occur assoc ± Py or as separate vns or veinlets. wh. q vns more intense downhole Py min + Cl alt less intense. Minor blebs of Fe brown Calcite? (Sd) ± in wh. q 598·4-599 m wh q vns sealed Flt ± shear upper contact 50 to CA irregular lower - 40° to CA	In places intense Py vn min developed, ± Py as blebs, short veinlets & old vn or mass commonly assoc ± qtz. Also scattered Py blebs throughout Mst. 597·2-599·3m feathery stringers As dominates over Py.			Py looks like later stage (non-sch.) phase. In places core quite broken ± graph lining fractures. Core breaks on fx 597·2 - 597·5 by low & irregular fractures. Intense graph lined fracturing @ low & to irregularly to CA @ 598·5 - 599·1m. Py 2-5% by volume	
599·3			bk Mst	An intensely fractured to puggy interval of bk Mst ± intense Ca vns & blebs throughout. From 599·5 - 599·8 gy bk pug.		Ca occurs as vns & blebs throughout. In places Ca vns Fe brown → Sd in appearance.	Minor Py on fracture surfaces or fringing qtz or Ca fragments.				Fractures generally irregular but some regular fractures @ 40, 45, 50 70°, 30, 55.	
600·1												

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DIAMOND DRILL LOG

PROJECT : _____

PROSPECT: _____

121350

HOLE NO: Z591
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DATE:

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
600.1			bk Mst ibd gy Slt	A somewhat slumped? contorted bk Mst & gy Slt in places → Yb. ē subrounded clasts of gy qtz, bk Mst or gy Slt clasts in Slt to Mst mtx. Core highly brkn throughout, ē fractures generally lined ē graph. Fractures - irregular from low - high ti. In places some carbonaceous ptng such as 600.1 & 603.8m.		Veining is intense ē numerous irregular veinlets & blebs of wh qtz + Ca throughout. In places Ca → Fe brown Ca or Sd? / An.					Some fracturing well indurated but generally well developed irregular fracture set present throughout. T.S. @ 600.3 - 600.4m 564124	
604.1			bk Mst → Yb	An interval dominated by carbonaceous Mst, ē scattered clasts of Slt, so in places giving it a Yb appearance		Intense network of Py vns throughout along ē minor wh qtz & Fe brown Ca → Sd? vns assoc ē Py.	Network of Py vns & blebs & irregular masses.	Core somewhat broken from 604.5 - 605m ē dk carbonaceous ptng lining some fracture surfaces. Fractures irregular & @ 15, 40, 80 to subtl to CA.			Abundance of Py decreases downhole but 3-10% by vol. T.S. @ 604.3 - 604.4m 564122	
605												
605.6			bk Mst	Dominately massive to mildly slump distorted bk Mst ē minor irregular wispy bands or clasts of gy Slt. In gaggy Slt → Sa. (Competent → shrd/brnah weakly brecciated in places)	Cl. alteration occurs in assoc. ē Py.	blebs, vns, veinlets of wh qtz. Fe brown Ca → Sd & blebs of Cl.	Irregular blebs, masses & veinlets of Py occur throughout ē assoc Cl haloes & minor Sd?	Minor graph lined fractures @ 30, 40° to CA ē assoc irregular fracturing producing broken interval from 605.1 - 605.3.			Many of Cl, Py Sd altered masses appear to be clasts or rafts in bk Mst. T.S @ 605.4m 564123	

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DIAMOND DRILL LOG

PROJECT : _____

PROSPECT: _____

121351

350

HOLE NO: 35 W
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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
605.6			bk Mst	Massive bk Mst ± minor wispy gy Slt clasts, ± Py N bed fine Ss or Slt clasts.	Minor Cl assoc ± Py, Cc vns.	Minor Py, Cl, Cc vn development @ 15 & 30° to CA. wispy Py veinlets oblique @ 15° to CA.	Minor Py as wispy, veinlets blebs & as fine disseminated Py in Ss clasts. Minor minor Py as Vns in assoc ± Cl & Cc. Age Cc Fe bearing ⇒ SL?				Py may be pedogenic? and related and hence wpy ⇒ some 1° laminae @ 15° to CA?	
607.												
607.9				A somewhat carbonated & possibly brecciated interval of bk Mst ± gy gn - y/gn Slt (the latter somewhat altered + leached) Some assoc. irregular veins of gy gn fg Ss.	Some Cl alt assoc ± development of Cc / Sd? vns. & veinlets. Also bleb or veins of grn talc or Se?	Irregular veinlets + masses of blgy Qtz, or bx Cc → Sd ± Py form a mtx to infilling phase bk disrupted host material.	Minor masses Py & wispy veinlets. Also some assoc. Cp? Main more prevalent towards base of the interval. (Some possible bearing of Py to Cc? 607-35-607.4m)					
607.4			bk Mst to gy Slt	Interval bounded by bk Mst ± Cc vns & bl gy Slt & minor dk gy Ss unit from 608.7-610.8m. gy Slt more prevalent than bk Mst. gy Slt locally tends to gy Ss. Throughout wispy Slump disturbed bedding of Slt & mst. More slump contorted zone from 611-613.3m.	Wk ± ms ± minor Py, Cl ± pyrrhotite developed. Also minor Cc + Fe bearing Sd? vns & veinlets developed in more assoc Py veining Vns peaked from 608.6-613.3 with max ca. 12 vns 608.6-611m Vn @ 10, 20, 25, 40, 60° to CA.	Fine Py occurs as disseminated grains in gy Slt matrix. Also Py assoc ± Cp, Sl? vns. Minor Sympathetic Py blebs & veinlets from 611-613.3m. Minor Cp assoc ± Sl? @ 610.9m?				A banding @ 10-15° to CA may be roughly inferred. Possibly minor fluorite assoc ± some Py, Cl, Sl? vns.	
613.3												

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DIAMOND DRILL LOG

PROJECT : _____

PROSPECT: _____

121352

HOLE NO: 2391
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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
613.3 – 613.55			bk Mst / gy Slt ± gy Dol.	A mixed & slump disturbed gy Slt & bk Mst progresses downhole to gn gy dolomite? the latter is somewhat fractured & interstitial bk Silt & gy gn Slt. So. @ 613.45m recrystyte clast.	Possibly some overprinting Cl alteration.	v. rare Wh qz, gy Cb? sealing fractures in Sol.?	Minor scattered blebs & irregular masses of Py.				Fracturing in dol.? may be structurally induced but mixing of gy Slt & bk Mst looks more sedimentary	
613.55 – 615.65			bk Mst / lt gy Slt	A somewhat slump disturbed & mixed sequence of bk Mst & gy Slt, & gy Slt more prevelant downhole. From 613.55 – 617 minor vesicular? input of subrounded, gy gn volcanic clasts (Mostera Vol.) also subrounded gy Qz clasts		Minor veinlets of wh qz, Cb? as sporadic irregular occurrences.	Minor blebs & masses of f.g. Py occur throughout. Also minor blebs of Py, Cl ± Fe brown Ca. Also minor blebs of wh qz ± Py.				Def^n appears to be all soft sed. Some irregular graph. lined fractures 615.35 – 615.6m: generally low & to CA.	
615.65 – 617				A highly contorted & mixed sequence of bk Mst / lt gy Dol.? / gy Slt → Yb. Possibly some structural def^n, but subrounded nature of many clasts → sed def^n. Yb & clasts of Pyritised gy Qz, gy gn dol. & gy Slt. More polymictic appearance downhole.	In places minor Cl. assoc. & Py blebs.	Minor blebs of wh gy qz along & minor wh. g. vns & minor blebs? vns & veinlets. qz vns 60° to CA, Slt vn 20° to CA, Py vn 10° to CA. Can be identified generally among or veinlets irregularly distributed.	Numerous blebs & irregular veinlets of Py & occur throughout & some fg Py dissem. in Qz clasts. Also fine dissem Py & in bk Mst. in places				Rough Slt / Mst banding may = So @ 45° to CA. Minor graph lined fractures @ 30° & 45° to CA also some irregular fractures. Possibly some drill induced fracturing.	

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DIAMOND DRILL LOG

PROJECT : _____

PROSPECT: _____

121353

HOLE NO: Z591
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DATE:

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	MAGSUS
617.25			Dol'	wh. to gy dol. a vesicular equigranular sugary textured interval of dol ± dk silt interbedded to equigranular K'lic [Ankeritic CO_3]		Minor Xcutting bx Ca vns or veinlets @ 45° to CA. (Py Fe rich Sd)						
617.25			bk Mst	An interval dominated by bk Mst ± fine minor bands of gy silt. Throughout clasts of gy Qtz ± plgn crystals, Py, ± pleochroic clasts seem to be after Bg.	Remarkably some mild Cl alt assoc ± Ca vns.	Irregular wh.g vns occur sporadically along ± minor plyltic Ca vns. Some Ca, Py ± Qtz vning was mill to CA. vning more intense downhole.	Irregular veinlets ± blebs of Py occur throughout along ± large Py clasts. In presence of gy silt ± Py ± minor Py				Py ↑ intensity downhole 616-617.1 2-5% Py. Core somewhat broken, drill induced. Some fracturing @ 5, 55, 55° to CA is evident.	
619.1			gy silt ± bk Mst ± CA Mst	A somewhat irregularly bedded interval of gy silt. in places ⇒ fgy gy Ss ± bk bk Mst. In places beds are somewhat slumpo distorted.	Minor Cl accompanies assoc. ± Qtz Ca vns.	Irregular vns ± veinlets of wh.q ± Py in places ± assoc Ca, all more intense vns ± blebs of br Ca downhole. Vns @ 30, 35° to CA ± vns @ high ± to each other.	v. minor scattered Py assoc ± Qtz vns or as fine disseminations. Also minor bleb assoc. ± Ca vns				Banding @ 25, 40, 45° to CA may ⇒ So. Minor slickenlides or grooved surfaces fracture surfaces @ 10, 30, 45° to CA along ± some irregular grooved fractures.	
620.1			gy silt ± bk bk Mst	An interval of laminated to slump disturbed gy silt ⇒ f.g. Ss ± bk bk Mst thin fg. gy Ss slightly qtz rich may be basal cs/gvt?? But from 621m gy silt looks more			Some Py assoc as coarse blebs ± wh.q ± Ca. Also some blebs ± vns bx ± Cl alteration				Lamination @ 30-35° to CA ⇒ possible So	

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DIAMOND DRILL LOG

PROJECT: _____
PROSPECT: _____

1213543

HOLE NO: 2391
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DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	MAG SUSCEPTIBILITY	REMARKS	DEPTH
				typically Crimson Creek Slt 624-6-625 core highly broken + fragmental to a degree brittle/ductal. also dk grey bedfeature @ 45° + graphitic fracture gouge to ct. From 621.1 -625 gy slt broken to fg Py Sp ± dk bk mat. From 625-628 laminated dk rock mass Slt, 628-629.75 mainly gy Slt ± bk mat pleeches + mm bands.			vns @ 620, 40, 45 but generally as highly irregular network From 623.1-625.8 irregular Q, ± Py, Cl + mm brown Ca laminate From 625.8-629.75 laminated with Chl/Q vns, veinlets + blebs.				In places possible slump disturbance of So?	
629.75 -630	gy Slt		gy Slt	An 18cm sequence of gy Slt, Ca, lithic clasts + dk gy Slt → unit pleached by 1-5mm bk mat fragments. Also mm bk mat bands in gy Slt. (gy Slt : gy Slt = 2:1)		Irregular vns + veinlets of brown Ca → Sl? occur throughout vns @ 15, 80, 45, 35 to CA.	No. Min'n					
636 - 638.7	bk Mat ± gy Slt		bk Mat ± gy Slt	Interval again dominated by dk carbonaceous Mat Thin ± gy Slt → So, [redacted] 637.55-637.70 bedding Py (So, Slt clasts in bk Mat matrix), irregular banded gy Slt + bk Mat zones. Also minor Py bands. Core somewhat broken + graphitic fractured places also some minor gouge developed @ 636.2 - 636.3 + 637.95 - 637.45m.		Irregular marginal wh qtz/Ca vns X cut @ 50, 60° to CA. Minor irregular blebs of br Ca → Sl? Minor Py veins ± irregular wh qtz vns.	Py bands ± fine Py/coarsely banding X cut @ 30° to CA @ 638.3-638.75m + 638.20-638.85 Also mm blebs + irregular masses thin bleb/st.				Bedding @ 40-45° to CA is inferred From thin Slt/Slt — Minor loss @ 10-20° to CA fractures lined ± graph. Packing irregular through some fractures @ 30-35° to CA cuts bedding.	

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DIAMOND DRILL LOG

121355 354

PROJECT : _____

PROSPECT: _____

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DATE: 12/8/84

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
638.7			bk Mst	Dominantly dk carbonaceous Mst ± sandy tbd gy Slt ± gy Sd, 1° layering highly disturbed by slumping, commonly related irregularly shaped Slt/Ss masses in bk Mst. Core fractured throughout in places more intensely, most fractures lined ± graphite & slickenslides, commonly irregular though regular fracture planes @ 15, 20, 25° to CA can be recognised.		Minor wk q, Ca veinlet & bleb development & more dominant than Ca, veins more prevalent downhole.	Minor scattered bleb & irregular veinlets of Py & odd Py clast. appears to be Sed Py??				Strong slickenslide fracture plane developed subparallel to CA presumed as stray ark q vein lined ± graphitic gouges. @ 639.6m Core highly broken & fractured to graphitic fragments 640.2 – 640.7m. Core Orientation @ 640.9m Possibly didn't work No Fol 1" so of little use & core too broken to pierce together.	
642m												

EOH

121356

APPENDIX 5

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DIAMOND DRILL LOG

PROJECT : ZEEHAN CML 36M/81

PROSPECT: SEVERN

121357

HOLE NO: ZS 90
PAGE: 1 of
LOGGED: DJN
DATE: 26/7/89

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
CO 14.5				Pre-collar - Tricone No Core Recovered.								
14.5 29.0			gn lh Gw	gn lithic Gw intensely brkn and fractured (drill induced?) highly weathered and leached. From 27.5-30.0m there are minor Mst clasts (>0.3cm in diameter).							Core somewhat weathered & possible dissolution cavities present.	
29.0 30.7			gn lh Gw	gn gritty lithic Gw mnr to abundant bk Mst fragments (2-25mm) dispersed throughout the Gw. Contains abundant immature volcanic detritus.				Jointing and small scale fault development @ 45° to CA			Mnr dissolution cavities developed from 29-29.5m Core highly brkn from 29.7-30.7m due to jointing & drill induced fracturing. Some Ca lining fracture surfaces. Bedding possibly @ 40-45° to CA ⇒ from alignment of Mst clasts.	
30.7 33.3			gn lh Gw	gn lh Gw mnr ibd bk Mst & odd large Mst clast.		Mnr 1-3mm Cc vn development & an early 1-2mm vn set @ 30-40° to CA cut by later 2-3mm set @ 50° to CA & @ a high ∠ to the 1st set. Also irregular Cc vn develop't @ low ∠ to CA. At 30° to CA a Cc vn 4-15mm wide is developed @ 33.7m. Mnr irregular 1-2mm Cc vnlts are developed throughout					Mnr dissolution texture from 31-31.5m Wispy Mst layers @ 25° to CA defining bedding.	
33.3 33.8			gn lh Gw	Coarse pl gn gritty lh Gw & abundant 1-50mm irregular to elongate Mst clasts in coarser 0.5-1mm sandy mtx.							Upper contact @ 20° to CA Possibly grading uphole as coarser Mst fragments occur towards 33.8m	

Aberfoyle Resources Limited
EXPLORATION DIVISION

DIAMOND DRILL LOG

121358

PROJECT : Zechan CML 36M/81

PROSPECT: SEVERN

HOLE NO: ZS 90
PAGE: 2 of
LOGGED: DJN
DATE:

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
33.8			gn lh Gw	A highly disturbed interval of contorted and disrupted gn lh Gw with clasts and wispy bands of Mst.		Abundant Cc. vns developed @ 40° to CA & irregularly anastamosing throughout the interval.						
34.0												
34.0			gn lh. Gw	gn lh Gw ± mnr wispy bands of bk Mst, somewhat contorted by small scale slumping and partings.		Cc. vns 1-4mm are developed @ 45° to CA in places fracture ‖ veins. A x-cutting narrow < 1mm Cc. vn set occurs @ 15° to CA.		Possibly small scale flty &/or joint develop @ 15-25° & 45° to CA from 35-35.5m.			Narrow Mst bands define a possible So @ 50° to CA.	
36.0												
36.0			gn lh Gw	gn lh Gw is cut in places by narrow 1-50mm Mst bands in places laminated but generally massive Gw ± odd coarse bk Mst clast → to gritty lh Gw in appearance.		Cc. veining 3 generations 1. 2-10mm vns somewhat wavy & irregular @ 50-60° to CA. 2. Narrow <2mm vns @ 35° to CA. 3. Narrow <4mm vns resealing flts @ 5°		small scale mnr 1-2cm vuggy flts has been resealed by later Cc. vns but disrupts So & earlier Cc. vn sets. Generally @ 5° to CA with high & 45-50° subordinate surfaced fractures (joints by Flt.?)			So laminations @ 35° to CA.	
38.6			bk Mst. lam	bk lam Mst ± mnr lbd gn lh Gw as 1mm to more massive 10cm bands. (9:1 = Mst:Gw). From 40.9-41.2m core fractured & brkn ± bk Mst → graphitic Mst ± some pug developed.		Irregular anastamosing Cc. veinlets 1-2mm wide ± assoc. Py cut the Mst. ± Sharper 1-5mm vns @ 35° to CA & @ a high & to So.	Mnr Py min° assoc. ± irregular anastamosing Cc. vns Py @ 40.9m & 38.7m 38.95m	40.9-41.2m graphitic & pug lined Flt cuts core highly brkn.			well developed So laminations @ 40° to CA.	
41.2												

Aberfoyle Resources Limited
EXPLORATION DIVISION

DIAMOND DRILL LOG

PROJECT : _____

PROSPECT: SEVERN

121359

HOLE NO: Z590
PAGE: 3 of
LOGGED: DJN
DATE:

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
41.2			bk Mst ± bd gn lh Gw	Highly contorted & slump disrupted intensely fractured & Cc veined interval of ± bd bk graphitic Mst & gn lh Gw (mg). From 41.2 -41.9m ± bd grggy lh Gw & bk Mst ± some rafting of Mst into Gw ± irregular bed surfaces to the Mst.		Intense anastomosing veinlets 1-2mm of Cc ± mnr assoc. Py x-cut So ± sharper veinlets 1-4mm @ 60° to CA. From 41.9-42.05m broad Cc. vn ± assoc. wispy bk Mst bands.	Mnr Py blebs assoc. ± Cc. veinlets.	From 42.05 -42.6 highly fractured & graphitic & grggy fracture surfaces ± mnr irregular cc. vn develop't			From 41.2 - 41.9m So @ 30° to CA. Strong slickenslide develop't on fracture surfaces @ 15° to CA.	
42.6												
43.8			gn lh Gw	gn lh Gw ± mnr ± bd bk graphitic Mst Gw mg ± Cc & Mst flecks (<2mm).		Intense Cc. veining throughout ± irregular anastomosing veinlets 1-3mm & some x-cutting veinlets @ 40°/60° to CA.	Mnr Py assoc ± the anastomosing Cc veinlets	From 42.9 - 43.1 intense fracturing & filthy? ± Slickenslide graphitic surfaces			Possible So develop't @ 10° to CA? At 42.8m Slickenslide Cc. veined fracture surface @ 10° to CA.	
45.5			gn lh Gw	gn gritty lh Gw ± 1-3mm Mst flecks throughout mg lh Gw.		mnr irregular Cc veining @ 245° to CA ± mnr vns @ 20° to CA.		From 44.3 - 44.5m highly fractured possible faulting? more likely drill-induced				
46			gn lh Gw ± bd bk Mst	gn lh Gw ± bd bk Mst ± (Gw : Mst = 5:1) 45.3-45.6 & 44.6 - 44.8m intervals of bk graphitic Mst.		mnr anastomosing blebs & veinlets of Cc ± veinlets @ 30° to CA @ high ∠ to each other Also some veining sub // to the CA.		Fracturing along Cc veinlets @ 30 & 50° to CA & @ 45.6m mnr slump disruption of So along a plain @ 15° to CA @ 45.3 - 45.5m slickenslide fracture surface @ 20° to CA			Possible So contacts @ 45° to CA b/w Mst & Gw.	
47.3												
47.0			gggn bk Cg → brec. lh Gw	A gn mg lh Gw mtx ± coarse S-rounded to elongate bk Mst clasts dispersed throughout.		Mnr Cc blebs & veinlets dispersed throughout ± mnr vein sets @ 40 & 55° to CA ± some q cosa ± Cc. From 47.7-47.8m thick Cc vn @ 60° to CA.	Mnr Py veinlets @ 47.3 m @ 35° to CA				Possible bedding defined by alignment of Mst clasts @ 20-30° to CA. Lower contact ± bk grggn. Mst @ 30° to CA.	
47.7												

Aberfoyle Resources Limited
EXPLORATION DIVISION

DIAMOND DRILL LOG

PROJECT : _____

PROSPECT: SEVERN

121360

HOLE NO: ZS90
PAGE: 4 of
LOGGED: DJN
DATE:

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
48.7 – 49.3			bk graph. Mst	A highly fractured interval of bk graph. Mst ± mnr ibd ggg lh. Gw.		Mnr irregular Cc veinlets x-cut So. ± Strong Cc vns developed From 48.5 – 48.6m ± Cc displacing & disturbing remnant Mst.	Mnr Py veinlets developed subll to So.	Fracturing subll to bedding possibly drill induced.			bedding lamanae @ 30-35° to CA.	
49.3 – 51.0			bk graph. Mst	Relatively competent bk Mst ± mnr ibd Ss.		Extensive irregular Cc veins throughout ± some vn sets @ 30 & 50° to CA	At 49.4m Py asse ± Cc as veinlets @ 50° to CA.	Fracturing @ 60° to CA often ↓ed ± angular or paralleled by Cc vns.			Possible So developed from 25° to CA @ 49.6m to 35° to CA @ 50.6m.	
51.0 – 55.1			gn lh Gw ibd bk Mst	Well developed gn lh Gw ibd ± gg bk Mst, in places well laminated. (Gw: Mst = 2:1) Mnr rafts of sedimentary (syngenetic) Py occur ± Mst fragments in Gw. Also mnr Py bands subll to lamanae in more Mst rich intervals.		17 Cross cutting Cc vns of 2-5mm occur throughout, along ± blebs & tension gash infills. Some vns occur subll to So & @ 35° to CA.	53.1, 53.2 & 53.45m syngenetic Py bands 2-3cm wide @ 17° to CA. Mnr Py asse as beds ± irregular Cc vns From 52.95 – 53.1 abundant Py disperse throughout Mst & Cc as isolated grains 0.1-0.3mm. Slightly coarse 1-4mm Py blebs occur	Mnr Small scale bedding dislocation along ↓s commonly reserved by cc vns			Bedding well developed @ 45° to CA as defined by So contacts & fine scale lamanae So decreases 15° to CA by 54.0m Mst bands 1-2mm lamanae & upto 2cm ± odd wider band 5-10cm	
55.1 – 60.4			gn lh Gw	A featureless interval of ggg lh Gw cut in places by narrow Cc vns & veinlets From 59.2 – 59.5m ggg lh Gw → gg bk Mst ± an increased input of flattened 2-20mm clasts of Mst.		V. narrow < 1mm Cc vns & veinlets irregularly x-cut the CA ± slightly broader x-cutting veinlets @ 40, 60, 70 to CA & 1-3mm wide.	v. mnr Py asse. ± the broader Cc vns				Possible So @ 45° to CA from allignment of flattened Mst clasts allignment.	
60.4 – 61.1			gg bk Mst ibd ggg lh Gw	A narrow band of ibd ggg Gw & bk Mst ± bands dominated by Mst ibd ± more sandy beds ± only a mnr input of ggg immature sand sized detritus.		Irregular Cc vns of 1-3mm x-cut & tend to ⊥ the So	Some Py asse ± Cc vns that are sometimes subll to CA.	Bedding @ 40° ± ⊥.			A possible grading upwhole maybe inferred from trend from sandy to more Mst rich material.	

Aberfoyle Resources Limited
EXPLORATION DIVISION

DIAMOND DRILL LOG

PROJECT : _____

PROSPECT: SEVERN

121361

HOLE NO: 2590
PAGE: 5 of
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DATE:

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
61.1			gn lh Gw	An interval dominated by (immature volcaniclastic) gn lh Gw ± mnr narrow bk Mst bands & clasts throughout. From 62.15 - 62.2m mnr slickenslide development on fracture faces. A 62.7 low ∠ 10° to CA fracture cuts the core with some assoc. slickenslide & pug develop't. Possibly some assoc. flt. movement.		Mnr wispy irregular <1mm Cc vns occur throughout ± a later x-cutting set of sharp narrow 1-2mm vns @ 60-65 & 20° to CA ± a broad set 3-8mm @ 50° to CA x cutting & parralleling fractures @ 62.7m.		From 63.9-63.6 core highly frac. along ∫ + vn plains ± some assoc. pug develop't Mnr Flttg?			Possible So @ 50° to CA as defined by bk Mst band @ 62.15m. With grading possibly inferred as uphole.	
64.1			Cc. vn	A broad Cc. vn ± mnr inclusions of gn lh Gw.								
64.3			gn lh. Gw	An intensely frac. interval of gn lh Gw, mnr bk Mst clasts & flecks 2-10mm occur in Gw.		Broad 5-15mm Q vns ± assoc. Cc. x cut CA @ 60° ± narrower 1-3mm Q. Cc vns @ 65° to CA. x-cutting broader 10-20mm Cc vns @ 40° to CA.		A sericitic pug lined fracture occurs @ 25° to CA. Core highly broken Frac. @ 64.5m				
64.6			gn lh Gw	An intensely Cc. veined interval of gn lh Gw ± broad Cc. vns @ 64.6-64.85 & 65.4-65.55m. In places becomes gritty ± Mst clasts & fd grains 1-3mm disposed irregularly in fg-mg Gw mtx.		Along ± the broad vns are a No. of narrow vn sets. Commonly vn faces are frac. ± slickenslide surfaces. Narrow 1-3mm vns @ 15° to CA occur along ± irregular vns @ 20° to CA. ± broader vns 0.8-1cm @ 10° & lining areas of broad 1-5cm vns @ 70-75° to CA. This broad Cc veining has some assoc. An at 65% & 66.05m.		Most fracturing is drill induced or developed along vn surfaces & 68.4m intersecting low ∠ 10° to CA fractures occur ± mnr assoc. pug & Cc. slickenslides developed on the fracture surfaces				
68.5												

Aberfoyle Resources Limited
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DIAMOND DRILL LOG

121362

PROJECT : _____

PROSPECT: SEVERN

HOLE NO: ZS 90
PAGE: 6 of
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DATE: 28/7/89

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
68·5 64·6			gn lh Gw	An interval of f-g-mg immature volcanic lh Gw ± mnr intercalated Mst fragments in places appears brecciated.		Irregular Cc vns infill breccia cavities ⩽in Mst frag. Irregular to linear vns cut CA @ 35° ± narrow <1mm vns developed at a high ∠ to and cutting the earlier irregular set @ 75° to CA. At 69·1m major 2-10mm Cc-vn @ 20° to CA large degree of irregular veining sub ll to CA from 68·5 – 69·0m.	At 69·5m mnr An, Cm ± mnr assoc. Gn, Sp cuts CA @ 25°				Some slickenslide Cc develop't on frac. @ 17° to CA @ 68·5m. Further fracturing sets @ 7°, 25° intersecting @ 68·9m ± mnr slickenslide Cc upon the surfaces.	
64·6 71·4			bk Mst	An interval dominated by f-g bk Mst, which in places → Co. grit ± abundant 0·5-1mm Co flecks ⩽in a Mst mtx, often ± large massive Mst clasts ⩽in the grit.		At 70·4m a low ∠ 17° to CA Cc, An vn 4-5mm cuts CA. A somewhat irregular narrow <1mm Cc vn set @ 25° to ct is cut & often displaced by later An vns @ a high ∠.	Mnr 1-2mm Cc, Py vn @ 70·3m. Numerous Cc, An vns ± v. mnr assoc. Sp, Gn cut Mst @ 20-25° from 69·5-69·9m. Py, Cc vn set @ 71·2m @ 30° to CA + @ a high ∠ to An set & truncated by the later. At 70·7m Py blebs ± mnr assoc. Cc occur irregularly ⩽in Mst grit. Broader An vns ± mnr assoc Sp, Gn. Irregular Cc/Py veining sub ll to CA occurs @ 75+-75·8m.				From 70·4 – 71·4m Sc varies from sub ll to CA Mst ltbd gritty Mst to 25° to CA b/w Mst ± gy lh Gw.	
71·4 76·6			gn lh Gw	An interval of f-mg immature volcanicly derived lh Gw in places mnr intercalated Mst from 72·9 – 73·1m. @ 75·6m a narrow 4-5cm Mst band ± mnr Gw & Cc clasts or cavity infills occurs. somewhat brec. in appearance. 76·1m-76·3m large Mst mass occurs again ± as brec. look & Cc. infills.		Cc veining in a no. phases 1. early phase sub ll to CA but often discontinuous as bleb. 2. veining @ 35° to CA 1-3mm 3. vns @ 55°-75° to CA & 1-3mm wide & @ a high ∠ to 1. & 2. An vns are abundant from 71·4 – 72·6m & @ 30-40° to CA ± vns <1-15mm wide, also some irregular An veining truncated by sharp x-cutting vns.		Bedding of Mst @ 73° is @ 30° to CA.				

Aberfoyle Resources Limited
EXPLORATION DIVISION

DIAMOND DRILL LOG

PROJECT : _____

PROSPECT : SEVERN

121363

HOLE NO : 3590
PAGE : 7 of
LOGGED : DJN
DATE :

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
76·6			gn lhGw → An lode	An interval of gn F-m-g. Gw ± f-g. <1mm Co. flecks dispersed in f-g. sandy mtx. The Gw is cut in places by mnr Mst rich bands or in some places is brec. ± mud infilling frac. The most striking feature is the extensive An ± Sp. Gn Veining ± minor assoc. Cc vns.		There is extensive An veining throughout often ± mas An horizons : from 77·15 - 77·65 m ± only v. mnr Gw bands from 78·2 - 78·6 m. An veining is phased - i) narrow 1-2mm irregular vns @ 35-50° to CA ii) Sharper 2-15mm vns @ 45° to CA iii) broad vns. @ 50° to CA The An vns are then cut by somewhat irregular Cc vns @ 50-60° to CA or as infills b/w brec. & mineralised An. fragments. An veining is as broad mas. areas in places frac. & brec. by subsequent Cc veins & by Gn, Sp min°. In the more sandy areas where the An veining is less prevelant vns are irregularly x-cutting @ low d's. Mnr remobilisation of Cc, An truncating mineralised bands.	Mnr Py min° occurs, as diss. grains & blebs c. in Cc vns & as Gn/Py blebs c An masses. Sp, Gn ± Cp. Py min° occurs both as a distinct x-cutting Gn rich vn phase @ 80° to CA 77·3m & as dis. grains assoc. ± An frag. Sp rich phase Also Sp rich vns @ 40° to CA @ 78·5m	Progress : 1. 3 phases of An veining 1. mineralisation 3 Cc veining ± assoc. Py			76·6 - 76·7m interdispersed Mst & Gw define a possible So @ 55° to CA From 76·7 - 79·2 m gn lhGw somewhat brec. ± mud infills along frac. planes, becomes less apparent downhole ± only mnr wispy mud horizons from 78 - 79·2m.	
79·2			gybk Mst ibd gygn lhGw → An lode	An interval ± mnr gybk Mst & lesser ibd gygn lhGw cut by extensive An & lesser Cc veining. From 79·2 - 80m dominately mas. An & Cc ± only mnr Mst from 79·2 - 79·3m. From 80 - 80·3m mnr gy lhGw ± some ibd Mst highly brkn & ± extensive Cc vns. From 80·3 - 80·7m mas An.			More extensive than previous lode. Mnr veining @ 40° to CA of Gn, Sp ± Py. Sp & Gn also form blebs interstitial to An x'ls ± stronger fg. Sp ± Gn vns or bands @ 40-45° developed b/w 80·4 - 80·7m. Mnr Cp. Py lines fracture surfaces & 80·3 - 80·4m.				From 80·1 - 80·3m core v. brkn ± some pug developed on frac. surfaces => possible filling. Similar from 79·2 - 79·4m possible fit development. Py. Cp occurances v. minimal.	
80·7												

Aberfoyle Resources Limited
EXPLORATION DIVISION

DIAMOND DRILL LOG

121364

PROJECT : _____

PROSPECT: SEVERN

HOLE NO: ZS90
PAGE: 8 of 8
LOGGED: DJN
DATE:

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
80.7			bk Mst	An interval dominated by bk Mst ± mnr interbedded gygn lh Gw, ± some slump & breccia develop't of Gw ± in Mst mtx from 80.7–81.7m.		Mnr torsion gash An Cc infills throughout the interval indicating a degree of strain & post depositional disruption. Mnr irregular An vns @ 50° to CA.		@ 81.8m some pyg & graphite develop't on frac @ 20° to CA. @ 82.1m some slickenside & graph. develop't on frac. surfaces @ 25° to CA.			Possible bs @ 50° to CA but maybe slump alignment of sand & mud.	
82.2												
82.2			gn lh Gw	∩ dominately gn gy lh Gw interval ± mnr ibd bk Mst ± contorted slump structures from 82.35–82.5m.		Irregular Cc veining ± cuts core & infills torsion gashes. V. mnr irregular An veining assoc ± Cc @ 82.25m.	Mnr Py assoc ± Cc veining @ 82.45m				Hole stopped as it had deviated Northwards from planned course & had dipped to an unacceptable level. Hole recollared after rig stepped back 3m as ZS92 and overgrid. Chrome barrel used to limit deviation.	
82.5				EOH 82.5m.								

121365

APPENDIX 6

Hole No:	Sample No:	Depth:	Summary Description:
ZS91	564136	604.15m	A tectonic breccia with quartzite fragments and bk mudstone matrix with pyrite siderite veins with minor associated calcite veining. (Sample hydrothermal pyrite)
	564137	115.6m	A siderite lode with minor blebs of galena and sphalerite with some galena veins. (Sample pyrite/galena blebs)
	564138	412.55m	A siderite lode with calcite veins and minor pyrite blebs some residual green lithic greywacke. (Sample pyrite blebs)
ZS92	564133	542.8m	Somewhat leached black Oonah siltstone with masses of pyrite, siderite and chlorite. (Sample pyrite masses)
	564134	440.6m	Brown dolomite with pyrite blebs and stylocumulate of carbonaceous matter. (Sample pyrite blebs)
	564135	91.4m	Siderite lode with abundant pyrite and minor associated galena. (Sample pyrite/galena blebs)

121367

SULPHUR ISOTOPE SAMPLES PREPARED FOR ABERFOYLE EXPLORATION

564133	Numerous lathes of pyrite (with minor chalcopyrite).
564134	Pyrite cubes and clumps with 2 to 5% sphalerite at their margins: drilling at the centre of such grains is safe.
564135	Near-massive pyrite with occasional fine clusters of chalcopyrite and sphalerite. Safe to drill in the centre of massive grains.
564136	Pyrite occurs as two types, a disseminated, idiomorphic, well-zoned type, and a carbonate replacement type paralleling carbonate cleavage. The two were not seperable for the purposes of sulphur isotopes. Minor sphalerite is also present, but contamination was not likely to be significant.
564137	Coarse clots of galena with vey minor intergrown chalcopyrite. Finely disseminated arsenopyrite in the matrix.
564138	A small pyrite pseudomorph after carbonate has no other sulphide impurities. Vughy late pyrite was not sampled.

Analysis for Dr D.J. Noonan, Aberfoyle Resources Ltd.

Hole No.	Sample No.	$\delta^{34}S_{CDT}$
ZS91	564136	6.29
	564137	5.17
	564138	5.16
ZS92	564133	4.52
	564134	4.98
	564135	7.10

9484

— LEGEND —

Devonian	Db	Bell Shale
	Df	Florence Quartzite
Silurian	Sc	Crotty Quartzite
Ordovician	Og	Gordon Limestone
Cambrian	€c	Crimson Creek Formation
Proterozoic Oonah Formation	M	Montana Beds
	QS	Quartzite & black slate
	LQS	Quartzite & lt grey slate
	Q	Quartzite
	V	Volcanics

250 E 500 E 750 E 1000 E 1250 E 1500 E 1750 E 362 000 E

536 250 N 2250 N 2000 N 1750 N 1500 N 536 250 N

DESPATCH FAULT

QUEEN HILL

GOLF COURSE

MONTANA

Zeehan

SEVERN

NEW MOUNT ZEEHAN

N° 2 MONTANA SHAFT

QUEEN N° 4 SHAFT

Core Storage

ABERFOYLE EXP. Office

ABERFOYLE HOUSE

SINGLE MENS QUARTERS

Montana Reference Plane (0622 M.S.L.)

Gulf Course Reference Plane (0624 M.S.L.)

South Intrusive Plane

Contact Metamorphic Plane

3480

3040

2620

ADAMS STREET

TARLETON STREET

MAIN STREET

CHURCH STREET

SEVERN STREET

KING STREET

QUEEN STREET

ZEEHAN STREET

KELLY STREET

PARRATT STREET

KEMA STREET

HOLTON STREET

TRIBAL TUBERCULOSIS ROAD

G.N. M.N. 11° 14' 00"

Magnetic north correct 1978 annual change easterly by 0.4'

SCALE metres 0 20 40 60 80 100 metres

5 cm

REFER PLATE QH138 FOR DETAILED LEGEND

Revised by	Date
S.M.R.	25/1/83
S.M.R.	29/4/83

Aberfoyle Exploration Pty Ltd

Geology: S.M. Richardson
Drawn: R.J.E.
Traced: J.L.R.
Checked:
Revised by: SMR Date: 2/8/82

NORTH WEST TASMANIA
QUEEN HILL AREA
INTERPRETIVE SUMMARY PLAN

Location code: -
Date: February, 1982
Scale: 1: 2,500
Plate N° QH 181

121373

9422

RL 1200

1100

1000

900

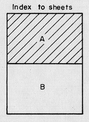
Reference Plane 450m E of SEVERN Reference Plane

ZS90 ZS92

ZS90 (Abandoned)

EOH 82.5m

Index to sheets



5 cm

Aberfoyle Resources Limited 121371
EXPLORATION DIVISION

REVISIONS			
Init.	Date	Init.	Date
Location Code :			

NORTH WEST TASMANIA

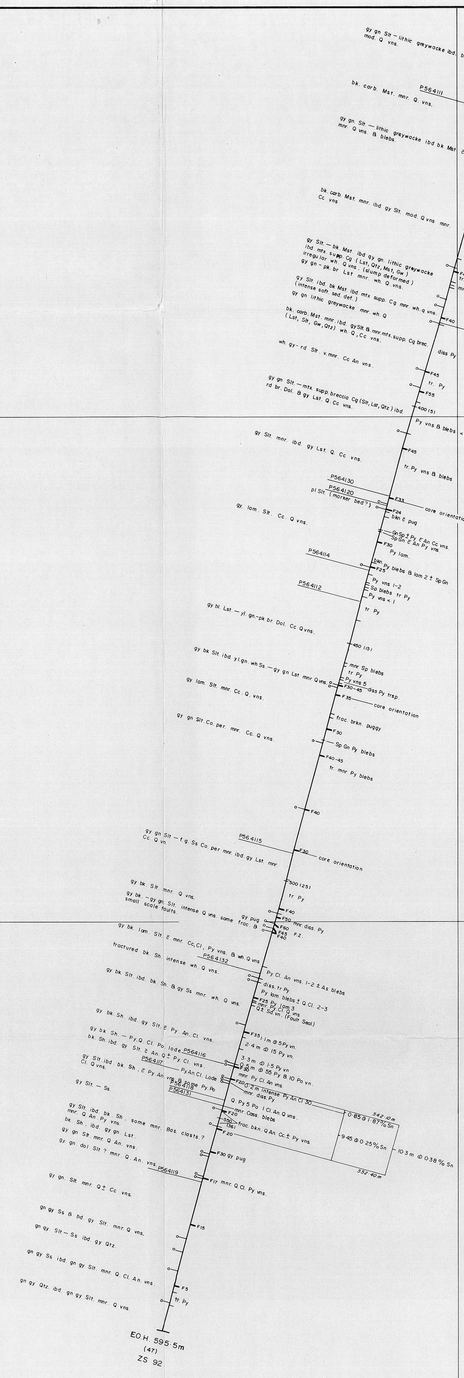
ZEEHAN DEPOSITS

CROSS SECTION ON DDH ZS 92

Scale : 1 : 500 | Date : December, 1989

Compiled : DJN
Drawn : DJN
Traced : RJE
Checked :
Plate No : QH 247/ 92

9423



Aberfoyle Resources Limited				121372
EXPLORATION DIVISION				
REVISIONS				
Init.	Date	Init.	Date	
NORTH WEST TASMANIA				Compiled : DJN
ZEEHAN DEPOSITS				Drawn : DJN
CROSS SECTION ON DDH ZS 92				Traced : RJN
				Checked :
Location Code :	Scale : 1 : 500		Date : December, 1989	Plate No : QH 247/92

9420

RL 1200

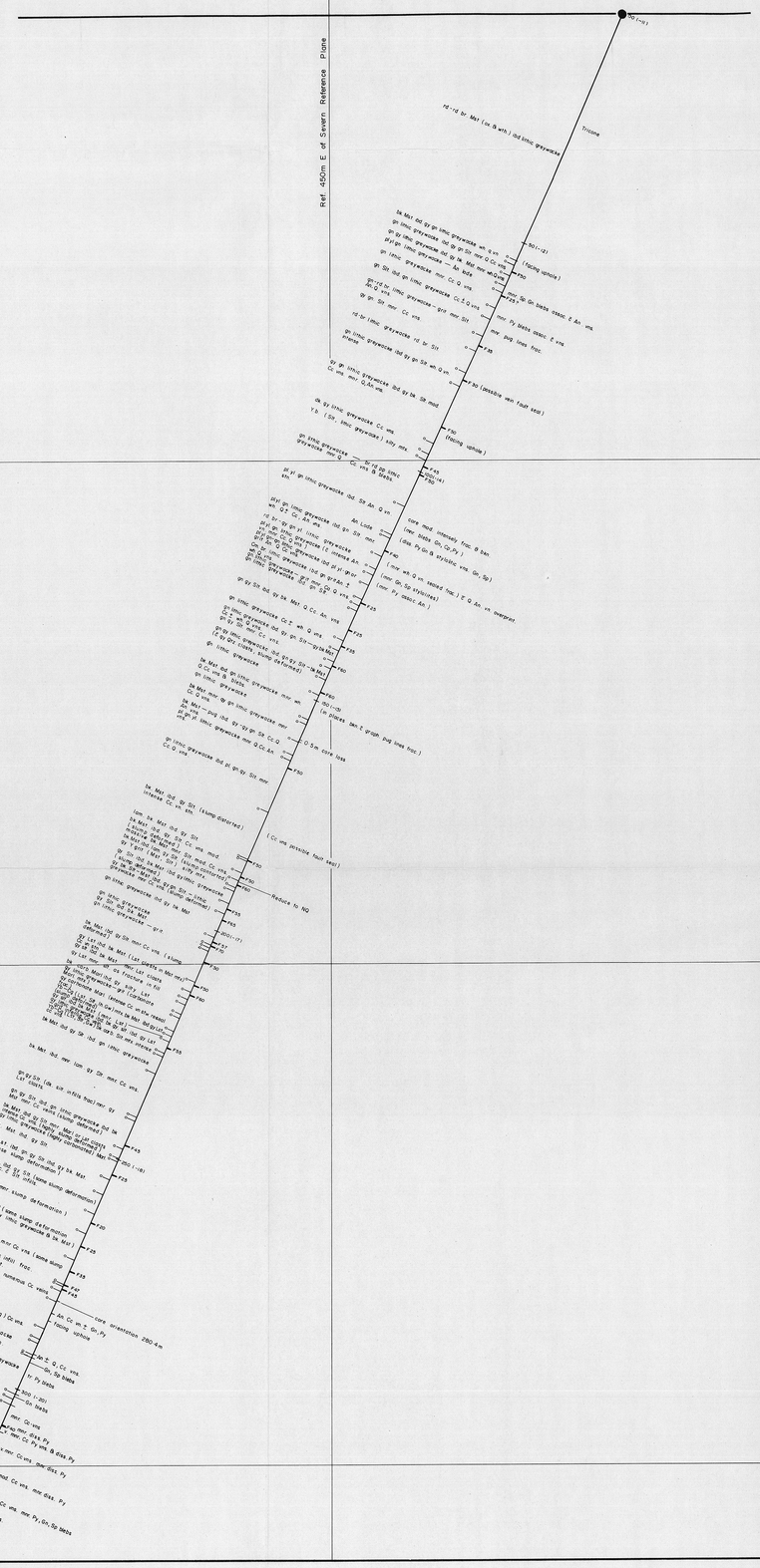
1100

1000

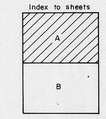
900

ZS 91

Ref. 450m E. of Severn Reference Plane



Index to sheets



5 cm

Aberfoyle Resources Limited
EXPLORATION DIVISION

121369

REVISIONS			
Init.	Date	Init.	Date
Location Code :			

NORTH WEST TASMANIA

ZEEHAN DEPOSITS

CROSS SECTION ON DDH ZS 91

Scale : 1 : 500

Date : December, 1989

Compiled : DJN

Drawn : DJN

Traced : RJE

Checked :

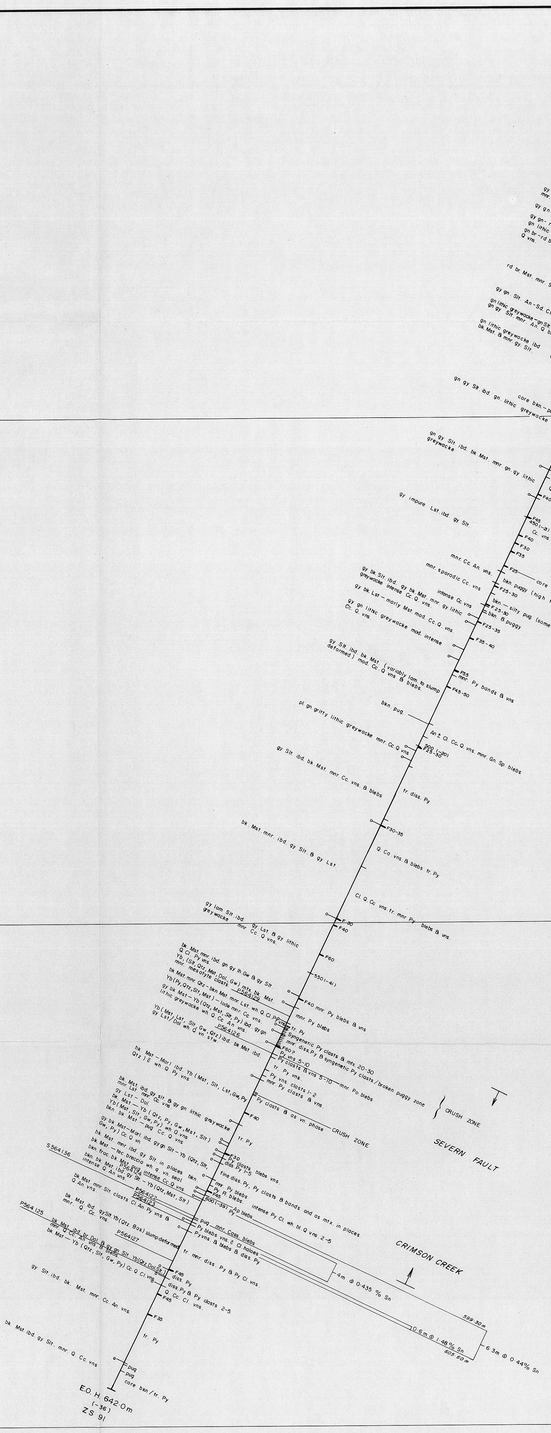
Plate No : QH 247/91

9421

RL 800

700

600



800 RL

700

600

Index to sheets

A

B

P 564122 PETROGRAPHIC SAMPLE
S 564136 SULPHUR ISOTOPE ANALYSIS

5cm

121370

Aberfoyle Resources Limited
EXPLORATION DIVISION

REVISIONS			
Init.	Date	Init.	Date
Location Code :			

NORTH WEST TASMANIA

ZEEHAN DEPOSITS
CROSS SECTION ON DDH ZS 91

Scale : 1:500 | Date : December, 1989

Compiled :	DJN
Drawn :	DJN
Traced :	RJE
Checked :	
Plate No :	QH247/91

9425

5000E 5400E 5800E 6200E

GN MN

2585N 1000E

2400N

2200N

2000N

12500N

Block Conductor producing EM response until 7.15ms delay time. Shale source interpreted.

Queen Hill

Block Conductor producing EM response until 7.15ms delay time. Shale source interpreted.

1700E

Fowler Street

2000E

12100N

TOWNSHIP OF ZEEHAN

Post Office

1900N

Zone within which DHEM conductor interpreted to occur

Clubhouse

ZEEHAN GOLF COURSE

ZS 92
361308·2 E
5361212·7N

11700N

1400N

ZS 91
361147 E
5360850·3N

900E

800E

1000E

Boundary

11300N

700E

600E

500E

400E

1000N

Manganese Hill

CML

LEGEND

- Formed Road
- Zeehan CML boundary
- UTEM or DHEM loop corner and loop number
- Shallow Current-Gathering Conductor, producing early-time (unless otherwise indicated) UTEM anomaly. Conductor due to geological unit, weathering trough, conductive groundwater, ie. "formational" source, non-prospective. Accuracy of anomaly placement ±25m
- Surficial Conductivity Variation. (accuracy ±25m)
- Shallow Conductor (<25m) of cultural origin, producing large amplitude UTEM response
- Plan projection of Diamond drillhole

5cm

5000E 5400E 5800E 6200E

Aberfoyle Resources Limited
EXPLORATION DIVISION

121374

REVISIONS			
Init.	Date	Init.	Date

Location Code :

NORTH WEST TASMANIA

ZEEHAN TIN DEPOSITS

Geophysical Surveys 1989-1990

Scale : 1 : 2500 | Date : April, 1990

Compiled : JJR
Drawn : JJR
Traced : GLC
Checked : JJR
Plate No : QH 250