

98-4183

RESULTS OF DIAMOND DRILLING
ON AVEBURY GRID - EL28/88
ALLEGIANCE MINING- M.MCKEOWN

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442001

**RESULTS OF
DIAMOND DRILLING ON THE AVEBURY GRID EL 28/88
BY ALLEGIANCE MINING N.L.**

MAY 1998

MINERAL TO SOLID
EL 28/88
11/11/1998
See folio 44

Prepared by

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for

**McKEOWN MINING PTY LTD
RIDGLEY, TASMANIA
(phone 03 6435 7560)**

on behalf of

ALLEGIANCE MINING N.L.

98-4183

RESULTS OF DIAMOND DRILLING
ON AVEBURY GRID - EL28/88
ALLEGIANCE MINING- M.MCKEOWN

ABBREVIATIONS

Allegiance	Allegiance Mining N.L.
CRA	Conzinc Rio Tinto Limited
CRAE	CRA Exploration Pty Ltd
Renison	Renison Ltd

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1 INTRODUCTION

During 1993, CRAE reviewed existing stream sediment sample data, collected by RGCE, and identified six samples which were anomalous in Pb and Zn. These six samples were related to drainage from an area 1500 metres long and 500 metres wide between Comstock and McLean Creeks, south of the Trial Harbour Road, where there were no records of previous mining. The samples were not anomalous in Sn and, so, had not been followed up by RGCE.

CRAE established the Avebury grid over this area and conducted a reconnaissance soil sampling program which revealed an area 400 metres long and 300 metres wide which was anomalous in Pb, Zn and Cu: up to 1300ppm Pb, 1150ppm Zn, and 450ppm Cu (Parkinson, 1993). Infill soil sampling was undertaken over a 600 metre by 600 metre area near the centre of the grid which revealed a west-north-west trending Pb-Zn anomaly within a less well defined Pb-Zn-Ni anomaly: up to 1900ppmPb, 1700ppm Zn and 7300ppm Ni (Green, 1997). The soil anomaly was thought to be skarn related and two drill holes were suggested to test this theory (Parkinson, 1994). Further soil sampling at the western end of the grid in 1996, suggested that this end of the grid was also anomalous in Pb and Zn, although the highest values were low compared with the anomaly at the centre of the grid: up to 896ppm Pb and 1410ppm Zn (Green, 1997).

In 1994, a 2 kilometre long, north-south line, at 356,000E (AMG) was cut through the area to enable a ground magnetic survey to be undertaken. The magnetic data from this line were compared to existing aeromagnetic data and it was concluded that the cut line, which was centred on the soil sampling anomaly, lay 500 metres east of the main magnetic anomaly. Modelling suggested that the source of the anomaly was a buried, steeply dipping ultramafic dyke (Aravanis, 1994). A helimag survey in 1994 revealed a dumbbell shaped, east-west magnetic anomaly, near the centre of the Avebury grid (Plan 1). Modelling of the helimag data suggested that the dumbbell anomaly was due to either a steeply dipping ultramafic body variable in width and/or depth (Doe, 1996) or steeply dipping ultramafic bodies, variable in dip direction (Tesselaar, 1996).

2 CRAE DRILLING PROGRAM

In the summer of 1996/97 CRAE drilled three diamond drill holes to test the coincident magnetic and soil anomalies on the Avebury grid. The locations of the holes are shown in

Figure 1, dip profiles of the holes in Figures 2 to 4, and the drill logs are attached (Appendix 1).

The anticipated target was skarn related base metal and/or gold mineralisation in Cambrian sedimentary rocks or Ordovician Gordon limestone. No base metal mineralisation was met in these holes but several nickeliferous zones were, including:

DD96ZA1	151.6m to 159.6m	8m	0.61% Ni
	188.5m to 198.5m	10m	0.34% Ni
DD96ZA2	68.9m to 72.7m	3.8m	1.67% Ni
	90.5m to 93.1m	2.6m	0.59% Ni
	102.1m to 105.8m	3.7m	0.77% Ni
	183.1m to 185.3m	2.2m	0.57% Ni
	189.6m to 190.7m	1.1m	0.98% Ni
DD96ZA3	185.6m to 186.0m	0.4m	1.09% Ni
	189.3m to 190.0m	0.7m	1.12% Ni

These results were taken from CRAE's annual report on EL 28/88 (Russell, 1998).

Core logging and subsequent petrological descriptions of rocks from these intersections showed that they occurred in magnetite bearing serpentinite, the serpentinite being derived from olivine rich peridotitic rocks. Nickel sulphides and nickel arsenides were identified: niccolite, millerite, nickeliferous? pyrrhotite and gersdorffite (Ashley, 1997). Ashley considered that the proportion of sulphide present suggested that it was introduced from a source external to the serpentinite, perhaps the Heemskirk granite.

3 ALLEGIANCE DRILLING PROGRAM

After Allegiance entered into joint venture with CRAE on EL28/88, Lindsay Newnham reviewed the results of the CRAE drilling program and recommended further drilling at Avebury specifically to test for nickel sulphide mineralisation in Cambrian ultramafics (Newnham, 1997). Two diamond drill holes were planned closer to the dumbbell shaped magnetic anomaly near the Avebury grid baseline. The two holes, numbered A001 and A002, were drilled early in 1998 and the drilling was supervised by the author.

The holes were drilled using a Longyear 38 rig supplied by Diamond Drilling Tasmania Pty Ltd and the rigs were moved to the drill sites, and supported during the drilling program, by helicopter.

The locations of the holes are shown in Figure 1, dip profiles of the holes in Figures 5 and 6, and the drill logs are attached (Appendix 2). Both holes intersected serpentinite with magnetite and nickel sulphides, A001 intersecting high grade nickel sulphides over an extensive down hole length. The results were:

A001	243.9m to 316.3m	72.4m	0.36% Ni	0.52% S
including	243.9m to 254.6m	10.7m	1.15% Ni	1.61% S
including	243.9m to 244.3m	0.4m	15% Ni	20.4% S
A002	118.3m to 120.3m	2.0m	0.14% Ni	0.08% S

Extensive assaying of the nickel bearing zone in A001 did not reveal the presence of high values of any other elements. The following analyses below illustrate this feature of the mineralisation:

A001	243.9m to 254.6m	10.7m	1.15% Ni	1.61% S
			261ppm Co	73ppm Cu
			36ppm Pb	1 56ppm Zn
			19ppm As	
			<1ppm Ag	6ppb Au
			<5ppb Pt	<1ppb Pd

A001 also intersected two other mineralised zones in the metasomatised Cambrian hornfels and chert sequence overlying the ultramafic, including:

A001	61.2m to 62.5m	1.3m semi-massive pyrrhotite		
			0.14% Ni	11.3% S
			75ppm Pb	250ppm Zn
			52ppm As	3ppm Ag

A001	148.2m to 150.6m	2.4m skarn		
			220ppm Ni	0.33% S
			315ppm Pb	0.40% Zn
			17ppm As	3ppm Ag
	164.2m to 165.8m	1.6m skarn		
			105ppm Ni	0.26% S
			145ppm Pb	0.40% Zn
			8ppm As	<1ppm Ag

These last two intersections came from a wider intersection, between 147.3m and 223.9m, which was variably metasomatised hornfels and chert with several true axinite/schorl skarn zones with traces of sphalerite and galena. It is most probable that this skarn zone is the source of the original stream sediment and soil anomalies which inspired the CRAE drill holes on the Avebury grid.

Petrological descriptions of parts of A001 were carried out by Wally Fander (1998), and these are attached to the A001 drill log (Appendix 2). The only nickel sulphide he identified was pentlandite and the only significant sulphide mineral he described was pentlandite, that is the nickel sulphide mineralisation was essentially monominerallic.

4 OLD DRILL HOLES

During the Allegiance drilling program, three diamond drill holes numbered TH1 to TH3, drilled by Renison Limited during the 1970s, were discovered. The holes were drilled on a grid in what was then termed Area D. Most of the core from these holes was located at Renison Bell and transferred to the Allegiance core yard in Zeehan.

Summary re-logging of the holes has been completed (Appendix 3) and short intersections of magnetic serpentinites were identified in TH1 and TH2. Parts of all three holes have been split and submitted for nickel analyses. The locations of the holes are shown in Figure 1, and the drill logs are attached (Appendix 3).

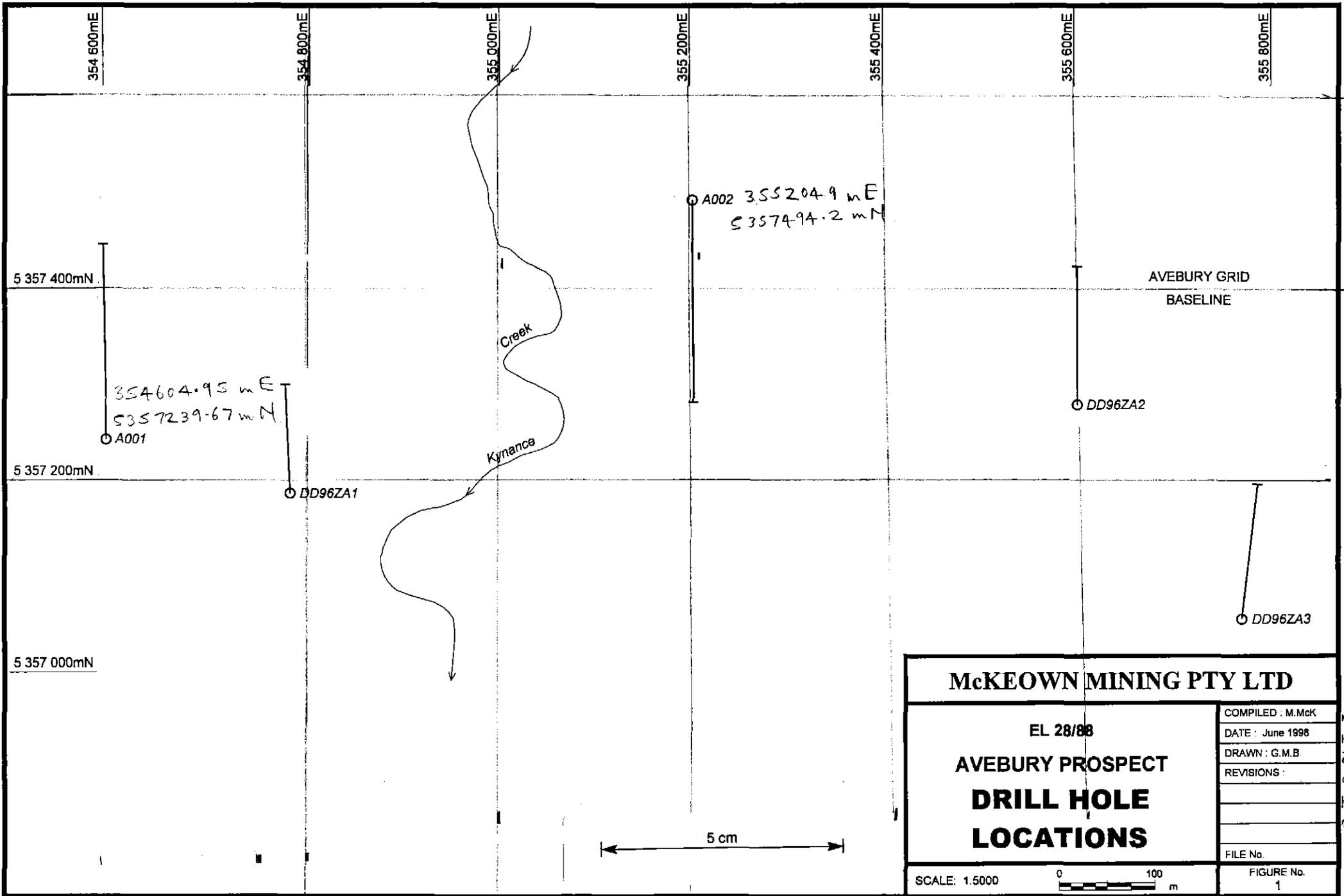
5 CONCLUSION

The drilling undertaken by Allegiance on the Avebury grid intersected high grade nickel sulphide mineralisation, and the intersection in A001 signifies the discovery of a significant new nickel prospect.

The geological ramifications of the results of all the diamond drill holes completed on this prospect, so far, including A001 and A002, are discussed in a separate report (McKeown, 1998).

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354 600mE

354 800mE

355 000mE

355 200mE

355 400mE

355 600mE

355 800mE

5 357 400mN

5 357 200mN

5 357 000mN

354604.95 m E
5357239.67 m N
○ A001

○ A002 355204.9 m E
5357494.2 m N

○ DD96ZA1

○ DD96ZA2

○ DD96ZA3

Creek

Kynance

AVEBURY GRID
BASELINE

5 cm

McKEOWN MINING PTY LTD

EL 28/88

AVEBURY PROSPECT

**DRILL HOLE
LOCATIONS**

COMPILED : M.McK

DATE : June 1998

DRAWN : G.M.B.

REVISIONS :

FILE No.

SCALE: 1:5000



FIGURE No.
1

442010

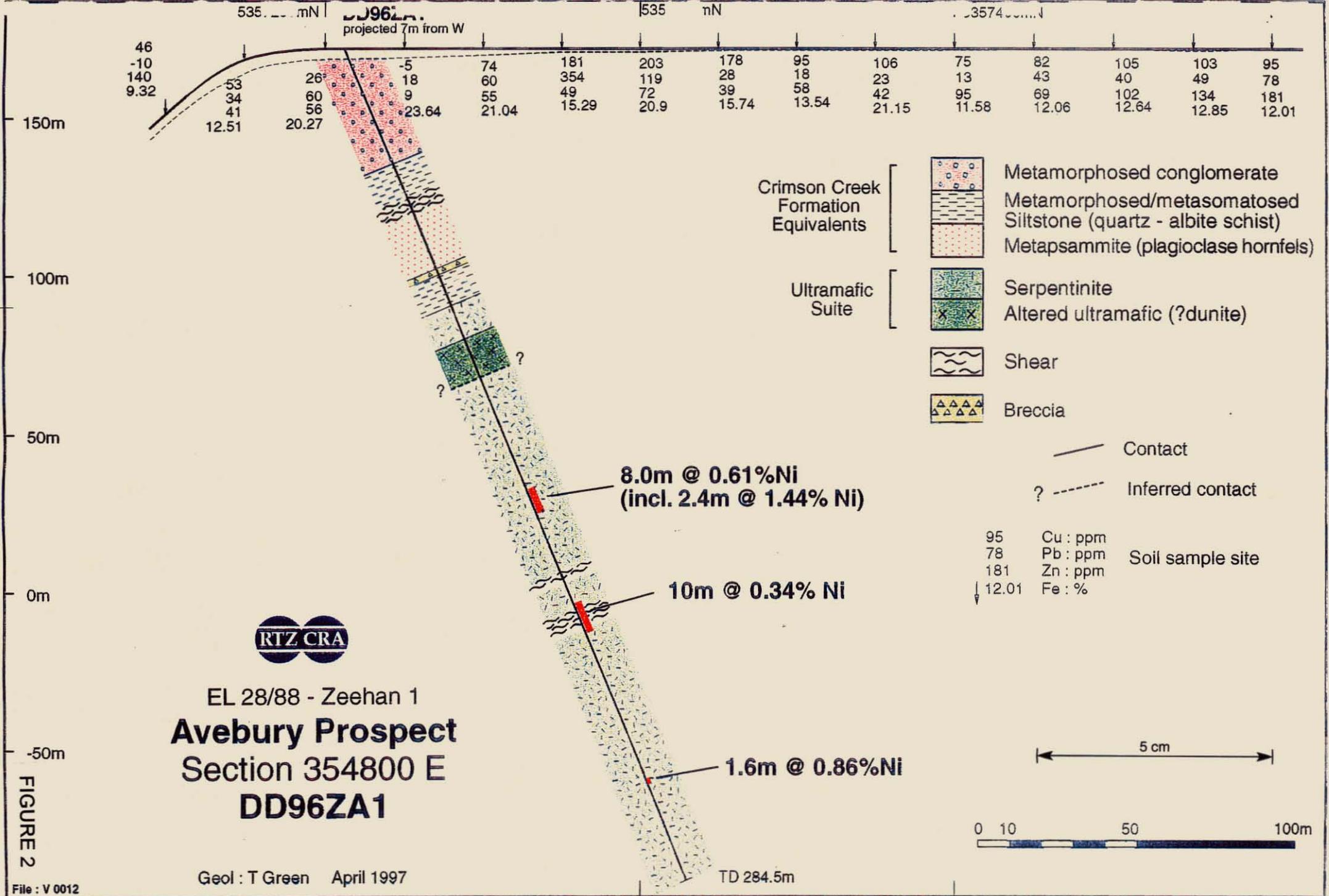


FIGURE 2

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Source : Tv1204

442011

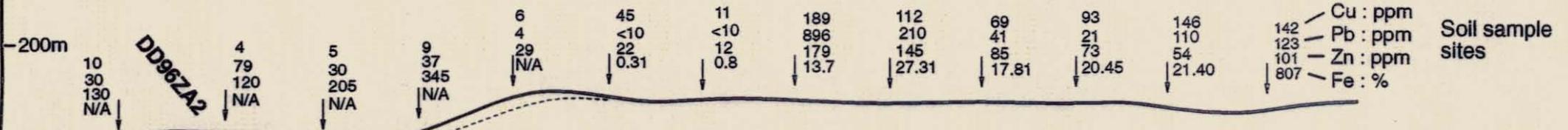
South

5357300mN

5357400mN

5357500mN

North



Soil sample sites

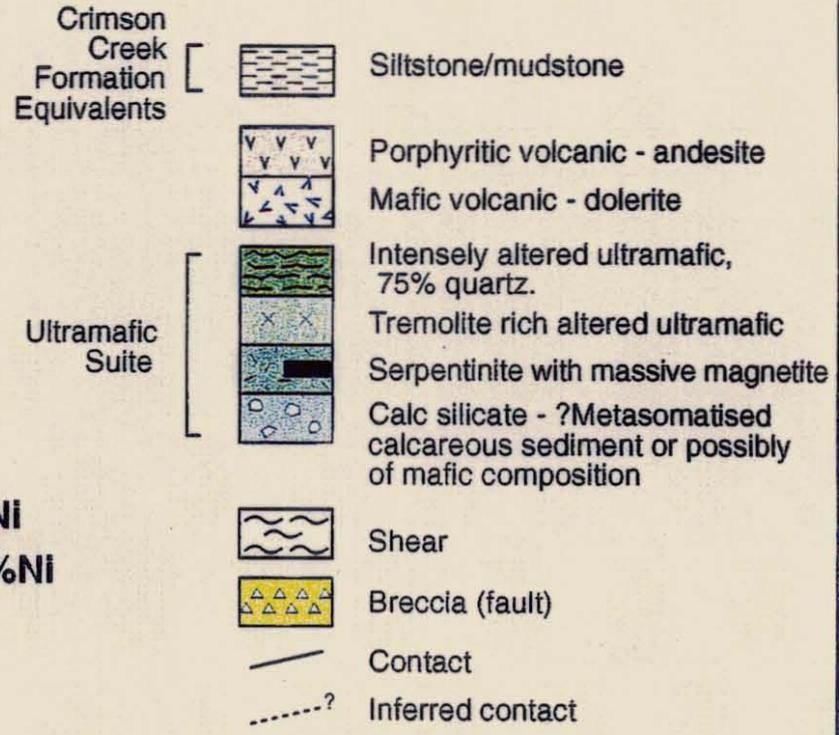
DD96ZA2

overburden

3.85m @ 1.67%Ni incl.
 1.15m @ 1.83%Ni
 1.0m @ 2.08%Ni
 1.15m @ 0.91% Zn

2.6m @ 0.59%Ni
 2.3m @ 0.89%Ni
 1.4m @ 0.56%Ni

2.2m @ 0.57%Ni
 1.1m @ 0.98%Ni



EL 28/88 - Zeehan 1
Avebury Prospect
 Section 355600 E
DD96ZA2

EOH 255.5m

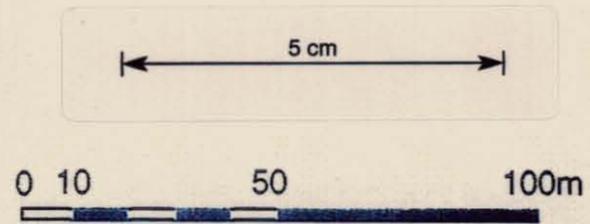
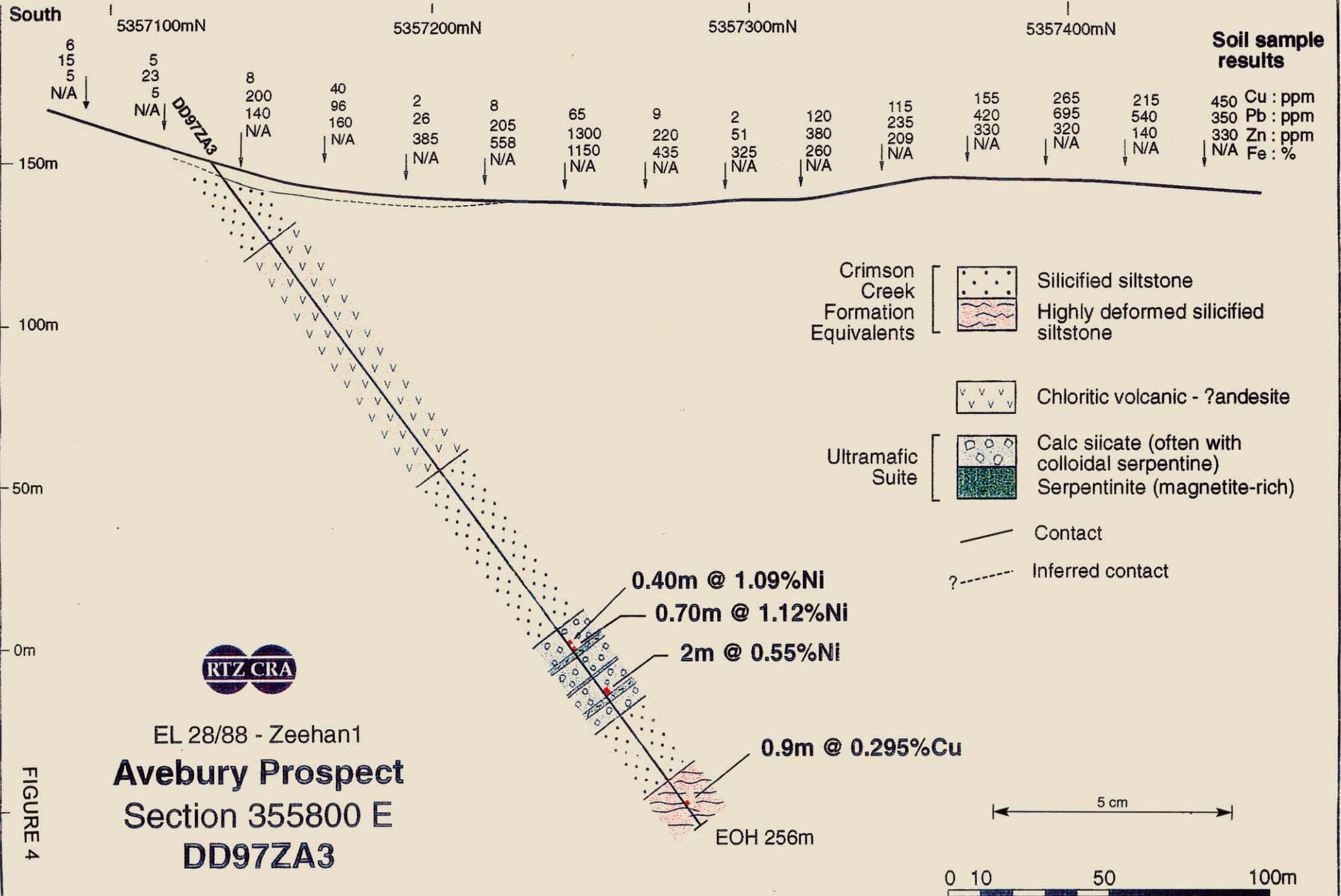


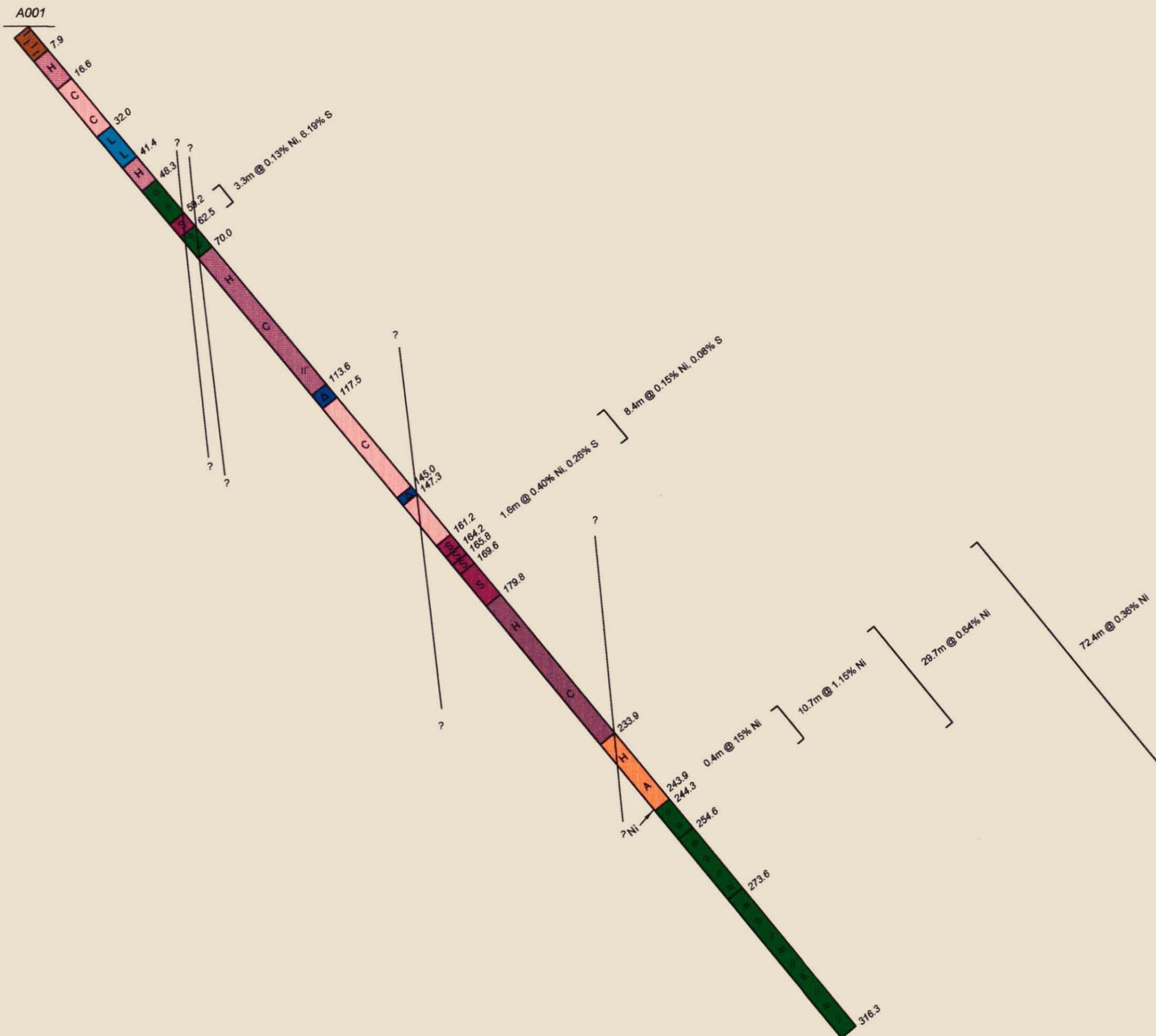
FIGURE 3

442012



EL 28/88 - Zeehan1
Avebury Prospect
 Section 355800 E
DD97ZA3

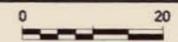
FIGURE 4



LEGEND

-  Claystone
-  Brecciated zone
-  Hornfels
-  Chert
-  Limestone and chert
-  Semi-massive pyrrhotite
-  Interbedded hornfels, chert, and serpentinite
-  Skarn
-  Interbedded hornfels and chert
-  Hornfels and altered rocks
-  Pentlandite
-  Serpentinite

5 cm

MCKEOWN MINING PTY LTD							
EL 28/88							
AVEBURY PROSPECT							
A001 DIP PROFILE							
SCALE: 1:1000							
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COMPILED : M.M.							
DATE : June 1998							
DRAWN : G.M.B.							
REVISIONS :							
FILE No.							
FIGURE 5							



LEGEND

-  No recovery
-  Interbedded hornfels and chert
-  Interbedded hornfels, chert and altered rocks
-  Serpentine
-  Chert
-  Serpentine with chrysotile

5 cm

McKEOWN MINING PTY LTD	
EL 28/88	COMPILED : M. McK
AVEBURY PROSPECT	DATE : June 1998
A002 DIP PROFILE	DRAWN : G.M.B.
	REVISIONS :
	FILE No.
SCALE: 1:1000	0 20 m
	FIGURE 6

442016

Appendix 1

Drill logs of holes ZA1 to ZA3

EXPLORATION PTY. LIMITED
 DRILL-HOLE SUMMARY LOG

442017
 Graphic Log

HOLE NAME: DD962A1 AMG EAST 354793 NORTH 5357206
 PROSPECT: AVEBURY GRID EAST NORTH
 RL: ZEEHAN 1 EL 28/88 RL 172m. DEPTH 284.5m

DATE DRILLED: 11/12/96
 LOGGED BY: B. THOMAS
 DRILLING CO.: ALMAC
 DRILL TYPE: DIAMOND
 DRILL RIG: LF70
 DRILL CORE: ZEEHAN

SURVEYS:

DEPTH	AZIM (AMG)	DIP	DEPTH	AZIM (AMG)	DIP
0	000°	65°	250	343°	68°
50	341°	67°	280	343 301°	68°
97	352°	67.5°			
180	353°	67.5°			
200	352°	67.5°			

OBJECTIVES OF HOLE:
 Diamond drilltest of the helimag anomaly - 6000nT anomaly

LITHOLOGICAL SUMMARY:

FROM	TO	FORM CODE	COMMENTS
0	2	Qha	Overburden
2	24		Ferruginous rotted conglomerate
24	43.9		Chloritic conglomerate
43.9	57.5		Chloritised volcanics - highly sheared
57.5	62.8		Broken core - fault zone
62.8	72.0		Chloritised volcanics.
72.0	83.3		Chloritised hornfels.
83.3	84.2		Fault breccia zone
84.2	93.7		White quartz/carbonate unit with magnetite
93.7	104.6		Serpentinite
104.6	130.7		White quartz/carbonate unit with magnetite (argillaceous limestone)
130.7	147.8		Uniform fine grained serpentinite
147.8	151.3		Multicoloured serpentinite
151.3	163.1		Mixed serpentinite and white replaced limestone units
163.1	284.5		Serpentinite with green/yellow and white/green blotches

MINERALISATION SUMMARY:

FROM	TO	COMMENTS

CONCLUSIONS:

Fracture
vein
Bedding
cleavage

RQ DATA
1 = > 30cm
2 = 10-30cm
3 = 3-10cm
4 = 1-3cm
5 = < 1cm

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

TENEMENT NAME Zeehan/El 2888 No.
PLAN - MAP REFERENCE

COORDINATES 354793ME 5357206MN AZIMUTH 000° (AMG) DRILLERS ALMAC COMMENCED 11/12/96

DEPTH HOLE No. DD96ZAI
CASING LEFT DPO No(s) SJ Tear

RL COLLAR INCLINATION 65° DRILL TYPE DIAMOND L_F 70 COMPLETED

DEPTH		Core Rec. %	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....)			
From (M)	To (M)									From (M)	To (M)	(m)	%
0	3	-	-	Qha Overburden no recovery						0	3	3.0	-
3	4.5	60	5X	Red/brown rotted bedrock probably pink quartzite with scattered iron blebs (?pyrite)	Heavily limonitic (+/- minor hematite alteration/weathering)					3.0	4.5	1.05	70
4.5	6.0	75	5X	+4cm of sst (pink med gr) then into red/brown rotted bedrock Brecciated appearance - rounded clasts of pink sst (up to 5cm fractured and manganese veins within clasts) Also smaller, red clasts up to 1cm + v. white small clasts - finer	Fe staining + Mn veins possibly along fractures. Sst Brecciated. Clay matrix supported (80%) clay = 10%					4.5	6.0	1.2	80
6.0	6.5	80	5X	As above with 5-10cm quartzite (med gr) at 6m. Last 40cm very brecciated - manganese rich veins + red/oss	Becomes very red at 6.3-6.5m Sericite or fractured at similar orientations to Mn					6.0	6.5	0.7	70
6.5	7.5	80	5X	1st 40cm - v. brecciated/red Manganese rich. Last 60cm same as 4.5-5m	- Small (0.5mm) voids could possible be weathered decay pyrite cubes?					6.5	7.5	0.8	80
7.5	8.5	70	5X	1st 5cm = v. fine grained quartzite (chert) - Broken up (1-4cm angular clasts - very little clay matrix - 7.5-8.45 is same as 4.5-5m although red clasts dominate. Last 5cm is med gr. sst (quartzite) and a coarser grained rock - v. coarse gr sst (last few cms) v. weathered + sericitized (pink-white colour).	Red clasts very brightly coloured after chert.					7.5	8.5	0.7	70

442018

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 1 of 2
TENEMENT NAME Zeehan / EL 28/88 No.
PLAN - MAP REFERENCE.....
DEPTH..... HOLE No. DD 96
CASING LEFT..... DPO No(s).....

354793mE
CO-ORDINATES 5357206mN AZIMUTH 000° (AMG) DRILLERS ALMAC COMMENCED 11/12/96
RL COLLAR..... INCLINATION 65° DRILL TYPE Diamond LF70 COMPLETED.....

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....)										
From (M)	To (M)										%										
8.5	9.0			5x	Still very weathered, brecciated conglomerate, mainly composed of pink clay & white (quartzite) clay with few clasts than seen earlier (???)	Manganese oxide (black) occurs along circular planar fractures mostly intersecting the core axis at 30°.	?	8.5	9.0	0.2	40										
9.0	10.0			3x	Very similar to 8.5-9.0, however - - more sandy matrix near the top of the segment.	Manganese along linear fractures very steep orientations		9.0	10.0	0.1	10										
10.0	11.0							10.0	11.0	-	-										
11.0	12.0			5x	Very weathered, brecciated conglomerate. - white clay (quartzite) matrix with sand & red clay clasts - 1st 3cm. Very fine grained quartzite (chert?) - slight greenish grey colour - dark brown to black manganese spots on fracture surfaces = 5cm thick unit. Rest (7cm) = Same as 1st 3cm - is (weathered, brecciated conglomerate.	Manganese occurs along fractures (2 - 3cm thick).		11.0	12.0	0.15	15										

442019

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No.

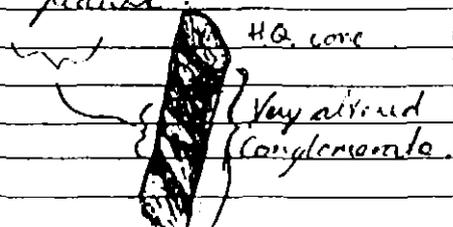
TENEMENT NAME No.

PLAN - MAP REFERENCE

CO-ORDINATES AZIMUTH DRILLERS COMMENCED DEPTH HOLE No. **00967A1**

RL COLLAR INCLINATION DRILL TYPE COMPLETED CASING LEFT DPO No(s)

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....)											
From (M)	To (M)										%											
41.3	42.8				<p>Brecciated, weathered conglomerate with green matrix. Some typical looking casts are quite large (~10x5cm) and become more common. The green die and to silic matrix now makes up the majority of the rock (~60%) and the clasts are small (except for a few lg. clasts at 41.3-41.7m). Cream silicified, rounded clasts are small (~0.5-1cm). They are common in column and are often fractured.</p>	<p>Manganese veins are and very thin (<1mm) - Fe stained areas common - often along fractures. There is no preferred fracturing direction seen.</p>		41.3	42.8	1.4												
42.8	43.9				<p>" " " " " " " "</p> <p>Some white areas, probably where even clasts were concentrated or now erosion, whitish patches within the green matrix. Round clasts are very rare, most are unrecognizable as clasts in the fractured green matrix.</p>	<p>Whitish, cream col. veins generally intersect the long core axis at roughly 45° and are generally planar.</p>		42.8	43.9	1.0												



442024

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No.

TENEMENT NAME..... No.

PLAN - MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. **00962A1**

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....)											
From (M)	To (M)										%											
47.0	48.5	1.46			Blue/green matrix with cream whisps and in a few areas, cream coloured clasts form lens whisping concentrations - but don't resemble clasts. (very fractured). Within the blue/green matrix are greener, slightly coarser grained (more chloritic) patches.  ~ Some features have a small amount of pyrite within green chloritic patches.	Manganese very m.c. Fe staining (oxide) along fractures.		47.0	48.5	1.46												
48.5	50.0	1.45			Same rock as above. - Green chloritic rich patches are more obvious & coarser grained (1mm long grains at their centre).	" " " "		48.5	50.0	1.45												
50.0	51.5	1.35			" " " "	" " " "		50.0	51.5	1.35												
51.5	53.0	1.30			Core more fractured and hence - more Fe oxide along fractures.	" " " "		51.5	53.0	1.30												

442026

DRILL CORE LOG

TENEMENT NAME..... No.

PLAN - MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. **00962A1**

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....)												
From (M)	To (M)										%												
3.0	54.5	1.5			Blue/green rock with cream whips throughout. Not extensively fractured (like 51.5 to 53.0m)	There is the occasional arched shaped void - 0.5 - 3cm long that suggests there may have been some carbonate (calcite/dolomite) weathered away, totally.		53.0	54.5	1.5	100												
4.5	56.0	1.45			Blue, fine gr. matrix with coarse green chlorite rich blebs. Cream whips, patches and the rare cream-breciated clasts. 2 fractures are planar & at ~ 40-45° to long core axis.	Fe oxide staining along fractures. At (54.65 & 54.85m) Pyrite not common		54.5	56.0	1.45													
5.0	57.5				" " " "	Not much Fe oxide along fractures (virtually none). Pyrite common along fractures.		56.0	57.5														
5.5	58.5	0.15			(Pugs) Very broken - Fractured core - originally blue/green rock with white whips and small very brecciated clasts.	Small amount of iron oxide along some fracture surfaces.		57.5	58.5	0.15	15												
8.5	60.0	1.5			Bluish grey, very fine silt rock with green chlorite rich blebs (up to 3cm long) coarse gr. Cream, pz rich areas form whippy patches & thin veins (0.5-1cm).	Rock quite fractured. Very little Fe oxide. Pyrite common along fractures.		58.5	60.0	1.5	100												

442027

C.R.A. EXPLORATION PTY. LIMITED
 DRILL CORE LOG

SHEET No.

TENEMENT NAME..... No.

PLAN - MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. **DD962A1**

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath. Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....)										
m	To (M)																				
7	70				Very fine grained dark grey, slightly blue with green chlorite blebs, often containing disseminated pyrite. (Some blebs contain 40% pyrite) White quartz veins have braded shapes and are 1-2mm wide. White to light grey wispy patches often have a brecciated appearance (qz rich patches). The green chlorite rich blebs also form irregular wispy patterns + blebs. The last 20cm of this section (69.8-70m) is v. dark grey with blue tinge & contains small fine grained blue/green chlorite rich blebs.	Pyrite has a darker colour than usual pyrite - but v. fine grained. Pyrite also forms as small 2-3mm wide, 20mm long veins with irregular shaly shapes.				28m											

442030

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No.

TENEMENT NAME..... No.

PLAN - MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. **DD962A1**

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH		Core Rec (M)	Core Size (M)	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weather, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analyzed by.....)										
From (M)	To (M)																				
77.5	80.5		RD		<p>size becomes slightly larger in the more concentrated areas. The boundaries between the 7 forms are not very distinctive, usually, especially between the dark bluish grey (rich) bluish green chert serpentine rich areas. The reddish brown sections are more distinctive. The reddish areas are also very fine grained and are at the boundaries of the rich sections - they may be predominantly quartz and calcite? Between 79.7 & 79.9, the reddish brown dominates the rock & has some white, thin serpentine rich area - more 79.9-80.5 = very chlorite rich rock with very little reddish brown areas.</p>	<p>There is very little, if any visible sulphides.</p>															

442034

C.R.A. EXPLORATION PTY. LIMITED
 DRILL CORE LOG

SHEET No.

TENEMENT NAME No.

PLAN - MAP REFERENCE

COORDINATES AZIMUTH DRILLERS COMMENCED DEPTH HOLE No. **DD962A**

RL COLLAR INCLINATION DRILL TYPE COMPLETED CASING LEFT DPO No(s)

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by											
From (M)	To (M)																					
84.2	86.5				Cont. described above, mud shis, very brecciated looking dark grey, bluish green & light bluish grey (gz) rock. The light grey quartz rich areas are very irregularly shaped, brecciated whispy patches and veins. The further along the core, the more they dominate - from ~ 60% - to ~ 80% of the rock. They become very vein like in some areas, and more patchy - whispy, in others.	Between the quartz rich patches are carbonic st. F. serpentine rich, bluish green lithol. Dark grey matrix is high in magnetite. The rock is a quartz magnetite rock.																
86.5	89.1	3.1			Very dark grey/blue, fine grained rock - grading suddenly from the rock type described above to the variety over the 1st. 500. The rock now consists of very dark grey/blue & less green patches with fine brown red areas. The - <u>condensed</u>																	

442036

DRILL CORE LOG

SHEET No.

TENEMENT NAME..... No.

PLAN - MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. **DD962A1**.....

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH		Comp Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analyzed by.....)										
From (M)	To (M)																				
7.1	91.9	0.8			<p>Very dark grey/green, very fine grained rock containing a high proportion of serpentine and chlorite forming along fractures and blebs. The rock is silicified, containing white whispy patches of quartz. Reddish brown patches also occur. Very little pyrite within dark serpentine rich rock.</p> <p>At 90.0m - the rock changes - suddenly to a light grey, very quartz rich rock with fine dark grey magnetite veins and whispy blebs. Greenish, serpentine rich blebs also occur within the rock.</p>	<p>Magnetite rock due to magnetite</p> <p>Mainly quartz</p> <p>Pyrite occurs as small blebs within dark grey magnetite blebs.</p>															
1.9	92.5	0.6			<p>light grey quartz rich magnetic rock. - Oxidized magnetite rock. Mainly quartz with lesser very dark grey magnetite rich blebs. Serpentine occurs along fractures.</p>	<p>Serpentine - greenish grey areas along fractures.</p> <p>Rock also calcic. (contains CaCO₃).</p>															

442037

C.R.A. EXPLORATION PTY. LIMITED
 DRILL CORE LOG

SHE...o.....

TENEMENT NAME..... No.....

PLAN - MAP REFERENCE.....

COORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. **DD962N**

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath. Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analyzed by.....)											
From (M)	To (M)																					
2.5	95.5	5.0	NO		Very gr rich, magnetic rock - light grey to white, irregular gr rich patches (most of rock - 80%) with dark grey magnetic blebs. Small irregular shaped green serpentine rich blebs also occur. Rock is slightly calcic (carbonation). At 93.65 the rock changes suddenly into the very dark grey, serpentine rich rock (serpentinite). This rock is still magnetic and contains small irregular patches and thin wavy veins of calcite, mainly along fractures.																	
95.5	104.5				Very dark grey, slightly blue, magnetic serpentinite. The rock is very fine grained, homogeneous rock with very planar fractures along which calcite or fibrous serpentine forms. (fractures ~ 2-4mm thick).	The fractures occur at about 30° to the long core axis (not horizontal (opposing) orientations). There are also very fine wavy veins cutting the core at ~ 70° to the long core axis. (calcite).		95.5	96.6	1.1												
								96.6	96.9	0.3												
								96.6	98.5	1.1												
								98.5	98.7	0.05												
								98.7	99.4	0.6												
								99.4	100.4	0.9												
								100.4	102.0	1.35												
								102.0	104.5	2.2												

442038

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No.

TENEMENT NAME..... No.

PLAN - MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. **DD962A1**

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....)											
From (M)	To (M)																					
149.5	152.5	3.0			<p>The first 2 m of this section are dark bluish-grey serpentinite with irregularly shaped and lumpy ^{irregular} cream, whispy patches of green serpentinite and calcium carbonates (dolomite? & calcite).</p> <p>The amount of cream and green blocks (whispy patches) within the blue/grey serpentinite varies considerably from joint serpentinite to zones of mainly cream and green material. White whispy patches of quartz occur (small over the last 1.1 m. (ie 151.4 to 152.5 m).</p>	<p>*Note: some creamy quartz (often anhedral shaped) described earlier (mainly 104 - 125m) may have been possibly dolomite? rather than qz.</p>		149.5	152.5	3.0												
152.5	164.5	12.0			<p>Dark grey/blue, very fine grained serpentinite that contains large patches of light grey to white whispy patches of quartz (10-40 cm long). Within the quartz rich zones, qz usually makes</p>	<p>Magnetite patches occur throughout the qz rich and serpentinite zones. (was magnetite rock).</p> <p>Pyrite or possibly Pyrolutite occurs as disseminated, concentrations within some areas of serpentinite.</p>		152.5	155.5	3.0												
								155.5	159.5	3.0												
								159.5	161.5	3.0												
								161.5	164.5	3.0												

442041

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHL No.

TENEMENT NAME..... No.

PLAN - MAP REFERENCE.....

COORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. **DD67A**

RE-COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....)											
From (M)	To (M)																					
					up to 80% of the rock. Green serpentine blobs & whips are common & smaller (1-7cm). Cream coloured whippy patches occur within the serpentine between the quartz rich zones. Magnetite and lesser Pyrite patches occur throughout this section.	The last 5cm (164.95 to 164.5m) is dark grey silty clay. The rock in this section is not as calcite rich as 104-128m, not bulking much, if at all, except for along thin calcite filled fractures (~20-30° to long core axis).																
164.5	164.7	0.1			Very dark grey serpentine that is very broken, forming ~3-5cm of very fine, dark grey silty clay.			164.5	164.7	0.1												
165.7					Very dark grey/blue serpentine that has creamy green serpentine patches/blocks throughout.	Core very magnetic. Doesn't bulk much with acid, except along white fractures filled with calcite.		165.7	166.2	1.6												
					• 166.0 to 166.3m = very broken up chert and grey clay.			166.2	167.5	1.0												
					• 172.5 to 172.2 = irregular fractures filled with white calcite.			167.5	170.5	3.0												
					• 175.4 = Broken core & fibrous serpentine.	Magnetite is high in the serpentine from this section of core (164.7 -		170.5	173.5	2.9												
								173.5	175.4	1.8												
								175.4	176.5	1.0												
								176.5	179.5	3.0												
								179.5	182.5	3.0												
								182.5	185.5	2.8												
								185.5	188.5	3.0												
								188.5	191.5	2.9												
								191.5	194.5	3.0												
								194.5	197.1	2.6												

42042

Magnetic Susceptibility					
Total Depth:			Drillhole Number: DD96 ZA1		
CL = Core Loss					
Depth	Value	Depth	Value	Depth	Value
0.0	C.L	20.0		40.0	0
0.5	C.L	20.5	20	40.5	30
1.0	C.L	21.0	9	41.0	20
1.5	C.L	21.5	C.L	41.5	20
2.0	C.L	22.0	9	42.0	30
2.5	C.L	22.5	C.L	42.5	25
3.0	20	23.0	15	43.0	15
3.5	C.L	23.5	5	43.5	10
4.0	25	24.0	6	44.0	20
4.5	5	24.5	15	44.5	35
5.0	10	25.0	14	45.0	10
5.5	12	25.5	C.L	45.5	36
6.0	15	26.0	16	46.0	40
6.5	30	26.5	10	46.5	22
7.0	25	27.0	20	47.0	19
7.5	5	27.5	22	47.5	35
8.0	10	28.0	40	48.0	25
8.5	5	28.5	23	48.5	32
9.0	10	29.0	20	49.0	40
9.5	C.L	29.5	5	49.5	39
10.0	5	30.0	11	50.0	40
10.5	C.L	30.5	C.L	50.5	30
11.0	C.L	31.0	C.L	51.0	60
11.5	C.L	31.5	C.L	51.5	20
12.0	5	32.0	11	52.0	26
12.5	C.L	32.5	12	52.5	52
13.0	C.L	33.0	10	53.0	16
13.5	C.L	33.5	10	53.5	30
14.0	C.L	34.0	0	54.0	20
14.5	C.L	34.5	11	54.5	15
15.0	C.L	35.0	29	55.0	30
15.5	C.L	35.5	10	55.5	15
16.0	C.L	36.0	35	56.0	30
16.5	C.L	36.5	14	56.5	19
17.0	C.L	37.0	10	57.0	50
17.5	C.L	37.5	15	57.5	40
18.0	19	38.0	40	58.0	C.L
18.5	C.L	38.5	25	58.5	10
19.0	C.L	39.0	10	59.0	5
19.5	C.L	39.5	30	59.5	10

Magnetic Susceptibility		Drillhole number: DD962A1			
Depth	Value	Depth	Value	Depth	Value
60.0	20	82.0	45	104.0	4000
60.5	50	82.5	35	104.5	60000
61.0	40	83.0	45	105.0	20000
61.5	40	83.5	65	105.5	8500
62.0	11	84.0	30	106.0	16000
62.5	45	84.5	900	106.5	8000
63.0	60	85.0	300	107.0	9000
63.5	40	85.5	2000	107.5	20000
64.0	11	86.0	45	108.0	15000
64.5	15	86.5	400	108.5	20000
65.0	10	87.0	250	109.0	30000
65.5	5	87.5	2500	109.5	15000
66.0	30	88.0	2000	110.0	15000
66.5	15	88.5	1000	110.5	15000
67.0	40	89.0	3000	111.0	20000
67.5	50	89.5	85000	111.5	15000
68.0	20	90.0	60 ?	112.0	85000
68.5	25	90.5	60 ?	112.5	7500
69.0	30	91.0	60 ?	113.0	5000
69.5	50	91.5	80000	113.5	2500
70.0	33	92.0	85000	114.0	150
70.5	30	92.5	25000	114.5	4000
71.0	60	93.0	20000	115.0	15000
71.5	80	93.5	3000	115.5	20000
72.0	60	94.0	600	116.0	20000
72.5	60	94.5	2000	116.5	350
73.0	70	95.0	4000	117.0	45000
73.5	45	95.5	4000	117.5	53000
74.0	50	96.0	2600	118.0	6000
74.5	55	96.5	1100	118.5	4500
75.0	55	97.0	4000	119.0	9500
75.5	50	97.5	3500	119.5	7000
76.0	39	98.0	2600	120.0	15000
76.5	40	98.5	2000	120.5	4400
77.0	50	99.0	3100	121.0	5500
77.5	48	99.5	3100	121.5	9600
78.0	10	100.0	2600	122.0	3500
78.5	30	100.5	3400	122.5	4500
79.0	32	101.0	2000	123.0	9000
79.5	30	101.5	3900	123.5	15000
80.0	50	102.0	6500	124.0	9000
80.5	20	102.5	5500	124.5	15000
81.0	45	103.0	6000	125.0	16000
81.5	35	103.5	3500	125.5	4000

Magnetic Susceptibility		Drillhole number: DD76 2A1			
Depth	Value	Depth	Value	Depth	Value
126.0	20000	148.0	5400	170.0	7000
126.5	6000	148.5	15000	170.5	15000
127.0	8500	149.0	6300	171.0	20000
127.5	40000	149.5	5200	171.5	15000
128.0	40000	150.0	19000	172.0	17000
128.5	Greater 100000	150.5	14000	172.5	26000
129.0	25000	151.0	8000	173.0	20000
129.5	Greater 100000	151.5	16000	173.5	120000
130.0	Greater 100000	152.0	8900	174.0	14000
130.5	40000	152.5	16000	174.5	26000
131.0	4600	153.0	45000	175.0	20000
131.5	7200	153.5	50000	175.5	23000
132.0	20000	154.0	52000	176.0	17000
132.5	22000	154.5	25000	176.5	22000
133.0	4700	155.0	59000	177.0	11000
133.5	7100	155.5	25000	177.5	18000
134.0	8900	156.0	33000	178.0	26000
134.5	7000	156.5	16000	178.5	18000
135.0	6000	157.0	10000	179.0	16000
135.5	6400	157.5	22000	179.5	17000
136.0	4600	158.0	4000	180.0	14000
136.5	6200	158.5	42000	180.5	20000
137.0	5600	159.0	20000	181.0	27000
137.5	7500	159.5	72000	181.5	19000
138.0	6000	160.0	14000	182.0	7000
138.5	8300	160.5	14000	182.5	13000
139.0	5200	161.0	16000	183.0	20000
139.5	5400	161.5	18000	183.5	24000
140.0	6100	162.0	13000	184.0	20000
140.5	7200	162.5	3500	184.5	35000
141.0	4400	163.0	39000	185.0	24000
141.5	6800	163.5	3000	185.5	24000
142.0	5900	164.0	4200	186.0	13000
142.5	5200	164.5	3500	186.5	9500
143.0	7600	165.0	28000	187.0	8000
143.5	14000	165.5	30000	187.5	7300
144.0	5400	166.0	28000	188.0	6700
144.5	5200	166.5	18000	188.5	8800
145.0	5600	167.0	12000	189.0	9300
145.5	7600	167.5	14000	189.5	9700
146.0	14000	168.0	17000	190.0	12000
146.5	20000	168.5	11000	190.5	17000
147.0	5500	169.0	22000	191.0	11000
147.5	9500	169.5	16000	191.5	9800

Magnetic Susceptibility		Drillhole number: DD96 ZAI			
Depth	Value	Depth	Value	Depth	Value
192.0	15000	214.0	13000	236.0	17000
192.5	43000	214.5	15000	236.5	28000
193.0	15000	215.0	17000	237.0	30000
193.5	12000	215.5	14000	237.5	30000
194.0	6000	216.0	13000	238.0	30000
194.5	15000	216.5	20000	238.5	35000
195.0	15000	217.0	16000	239.0	20000
195.5	12000	217.5	13000	239.5	20000
196.0	25000	218.0	20000	240.0	17000
196.5	9200	218.5	17000	240.5	24 15000
197.0	9000	219.0	17000	241.0	28000
197.5	25000	219.5	16000	241.5	20000
198.0	7000	220.0	19000	242.0	20000
198.5	7000	220.5	22000	242.5	20000
199.0	13000	221.0	19000	243.0	18000
199.5	18000	221.5	22000	243.5	17000
200.0	18000	222.0	16000	244.0	19000
200.5	17000	222.5	16000	244.5	15000
201.0	20000	223.0	26000	245.0	14000
201.5	16000	223.5	21000	245.5	26000
202.0	16000	224.0	19000	246.0	19000
202.5	16000	224.5	18000	246.5	22000
203.0	19000	225.0	22000	247.0	35000
203.5	15000	225.5	57000	247.5	27000
204.0	20000	226.0	26000	248.0	12000
204.5	23000	226.5	19000	248.5	23000
205.0	17000	227.0	30000	249.0	17000
205.5	17000	227.5	22000	249.5	16000
206.0	17000	228.0	52000	250.0	16000
206.5	16000	228.5	47000	250.5	17000
207.0	12000	229.0	46000	251.0	19000
207.5	17000	229.5	26000	251.5	16000
208.0	19000	230.0	18000	252.0	12000
208.5	15000	230.5	14000	252.5	16000
209.0	15000	231.0	22000	253.0	18000
209.5	17000	231.5	8000	253.5	10000
210.0	14000	232.0	8700	254.0	17000
210.5	13000	232.5	12000	254.5	12000
211.0	14000	233.0	33000	255.0	13000
211.5	12000	233.5	26000	255.5	12000
212.0	14000	234.0	24000	256.0	10000
212.5	17000	234.5	22000	256.5	6000
213.0	12000	235.0	41000	257.0	5500
213.5	14000	235.5	32000	257.5	6000

Magnetic Susceptibility		Drillhole number: DD96-ZA1			
Depth	Value	Depth	Value	Depth	Value
258.0	7000	280.0	10000	302.0	
258.5	4500	280.5	10000	302.5	
259.0	5200	281.0	7000	303.0	
259.5	4800	281.5	7200	303.5	
260.0	6700	282.0	8000	304.0	
260.5	5000	282.5	7500	304.5	
261.0	8700	283.0	6000	305.0	
261.5	7700	283.5	8500	305.5	
262.0	8100	284.0	8000	306.0	
262.5	6800	284.5	10000	306.5	
263.0	8700	285.0		307.0	
263.5	9700	285.5		307.5	
264.0	7700	286.0		308.0	
264.5	6100	286.5		308.5	
265.0	7400	287.0		309.0	
265.5	8600	287.5		309.5	
266.0	8400	288.0		310.0	
266.5	6700	288.5		310.5	
267.0	7700	289.0		311.0	
267.5	10000	289.5		311.5	
268.0	8000	290.0		312.0	
268.5	11000	290.5		312.5	
269.0	16000	291.0		313.0	
269.5	12000	291.5		313.5	
270.0	7000	292.0		314.0	
270.5	15000	292.5		314.5	
271.0	12000	293.0		315.0	
271.5	15000	293.5		315.5	
272.0	15000	294.0		316.0	
272.5	15000	294.5		316.5	
273.0	12000	295.0		317.0	
273.5	20000	295.5		317.5	
274.0	18000	296.0		318.0	
274.5	20000	296.5		318.5	
275.0	10000	297.0		319.0	
275.5	11000	297.5		319.5	
276.0	15000	298.0		320.0	
276.5	16000	298.5		320.5	
277.0	20000	299.0		321.0	
277.5	15000	299.5		321.5	
278.0	10000	300.0		322.0	
278.5	10000	300.5		322.5	
279.0	25000	301.0		323.0	
279.5	20000	301.5		323.5	

CRA EXPLORATION PTY. LIMITED
DRILL-HOLE SUMMARY LOG

442050

Graphic Log

FILE NAME: DD962A2 AMG EAST 355609 NORTH 5357297
 PROSPECT AVEBURY GRID EAST NORTH
 : ZEEHAN 1 EL 28188 RL DEPTH

DATE DRILLED: 31/12/96
 LOGGED BY:
 DRILLING CO.: ALMAC
 DRILL TYPE: DIAMOND
 DRILL RIG: LF70
 JOINT DRILL CORE: ZEEHAN

SURVEYS:

DEPTH	AZIM (AMG)	DIP	DEPTH	AZIM (AMG)	DIP
0	352°	48°			
50	305°	50°			

OBJECTIVES OF HOLE:

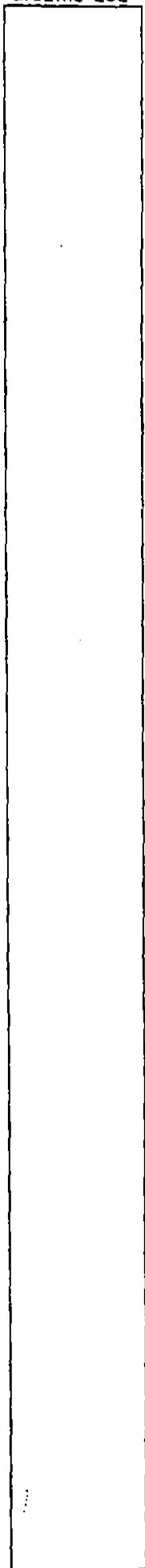
LITHOLOGICAL SUMMARY:

FROM	TO	FORM CODE	COMMENTS
0	2		Overburden
2	44		Andesitic, porphyritic lavas
44	66		Mixed fine grained porphyritic lavas, agglomerates? breccias?
66	88		Carbonate magnetite skarn unit.
88	122		Serpentinite with magnetite (dominated to semi massive)
122	168		Dacitic volcanics
168	174		Shear zone
174	195		Serpentinite with disseminated magnetite.
195	246		Rhyolites → Dacites, chloritized.
246	255.5		Chloritized rhyolites → Dacites with fine grained granite? → brown serpentine unit.

MINERALISATION SUMMARY:

FROM	TO	COMMENTS

CONCLUSIONS:



442051

DRILL CORE LOG

TENEMENT NAME ZEEHAN 1 No.

PLAN - MAP REFERENCE ANEBURY

CO-ORDINATES..... AZIMUTH..... DRILLERS ALMAC COMMENCED 31/12/96 DEPTH..... HOLE No. DD96ZA

RL COLLAR..... INCLINATION..... DRILL TYPE LFD COMPLETED..... CASING LEFT..... DPO No(s) 2

DEPTH		Core Rec. Int %	Core Size RO	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....)			
From (M)	To (M)										From (M)	To (M)	Rec (M)	%
0	2	-	-	-	Overburden - not recovered						2	3.5	1.3	
2	5.9	75	SX		Ferruginous clay rock more iron rusty at top of unit.						3.5	5	1.5	100
											5	6.5	1.2	80
											6.5	7.4	0.7	77
											7.4	7.7	0.25	83
											7.7	9.2	0.80	100
5.9	15.0	90	IF		Partially weathered Grey/green volcanic rock, probably tuff material or Agglomerate End of NO @ 15m.	Silicified and chloritised Purple mineral < 1mm blebs disseminated throughout core possibly carbonate Almost porphyritic - med/coarse grained.					9.2	10.7	1.5	100
											10.7	12.2	1.5	100
											12.2	13.7	1.5	100
											13.7	15.0	1.3	100
											15.0	17.0	2.0	100
											17.0	19.8	2.8	100
											19.8	21.0	1.2	100
15.0	42.0	100	IF		Start of NO Green/grey volcanic rock probably an andesitic/dacitic lava agglomerate. Locally porphyritic (med/coarse grained) localised intraformational brecciation; hints of presence of amygdalae.	Strongly silicified and chloritised - chlorite more prevalent downhole. Purple/off white mineral disseminated thro' rock probably carbonate or smectite. Zones of massive fine grained chlorite after 30m? veins. No qtz or carb veins unsheared core, no sulphides.					21.0	23.0	2.0	100
											23.0	24.9	1.9	100
											24.9	27.9	3.0	100
											27.9	29.0	1.1	100
											29.0	32.0	3.0	100
											32.0	36.0	3.0	100
											36.0	38.0	3.0	100
											38.0	40.2	2.2	100
											40.2	42.0	1.8	100
											42.0	44.0	2.0	100
											44.0	46.2	2.2	100
											46.2	48.0	1.8	100
42.0	48.5	100	IF		Fine grained porphyritic andesitic lava.	Chlorite alteration minor zones of silicification 2 phases of chlorite Purple mineral not obvious.					48.0	50.0	2.0	100
											50.0	53.0	3.0	100
											53.0	56.0	3.0	100
											56.0	59.0	3.0	100
											59.0	62.0	3.0	100
											62.0	65.0	3.0	100

442052

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

HEE 2

TENEMENT NAME..... No.....

PLAN - MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. DD9162A2

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH om M)	To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....)				
											g From	(%) To	(%) Rec	%	
8.5	51.7	100	1f		Mineral fine grained andesitic lava and porphyritic lava	Localized reappearance of purple minerals. Highly variable alteration patterns - mainly chloritisation +/- silicification						65.0	68.0	3.0	100
												67.0	69.3	1.2	90
												69.3	71.0	1.7	100
												71.0	74.0	3.0	100
												74.0	77.0	3.0	100
												77.0	80.0	3.0	100
51.7	56.4	100	1f		Fine grained porphyritic andesitic lava; occ clasts suggesting agglomeratic generally quite uniform.	Chloritised						80.0	83.0	3.0	100
												83.0	86.0	3.0	100
												86.0	89.0	3.0	100
												89.0	92.0	3.0	100
												92.0	95.0	3.0	100
56.4	58.0	100	1f		Volcanic breccia with rounded clasts in a partially silicified chlorite/ carbonate matrix ?lapilli tufts							95.0	98.0	3.0	100
												98.0	101.0	3.0	100
												101.0	104.0	3.0	100
												104.0	104.5	0.5	100
												104.5	109.3	2.85	95
												109.3	110.5	1.2	100
58.0	62.0	100	2f		Fine grained porphyritic lava with possibly large amygdales	Chloritised localized variable alteration in 2 nd phase chlorite, silica (+/- carbonate + serpentine).						110.5	113.5	3.0	100
												113.5	116.5	3.0	100
												116.5	119.5	2.85	95
												119.5	122.5	3.0	100
												122.5	125.5	3.0	100
62.0	63.8	100	1f		Thermally altered fine grained lava.	Possible small scale sphalerite (Dark Brown) veining 25° t.c/A 2 nd phase chlorite alteration abundant.						125.5	127.5	2.0	100
												127.5	129.0	1.4	92
												129.0	131.0	2.0	100
												131.0	133.4	2.4	100
												133.4	133.8	0.4	37
63.8	68.4	100	1f		Lt grey/green soft unit Probably chlorite, carbonate (Calcite) and serpentine - minor qtz or ?clasts.	Upper contact 60° t.c/A Disseminated magnetite Sharp increase in magnetic susceptibility.						133.8	135.1	1.05	85
												135.1	137.0	1.9	100
												137.0	139.2	2.2	100
												139.2	140.0	0.8	100

442053

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

JHEE, No.

TENEMENT NAME..... No.

PLAN - MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. **DD962A2**

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....)				
From (M)	To (M)										From (m)	To (m)	Rec. (m)	%	
					Qtz vein with associated magnetite 67.7-68m.	Minor calcite veins generally 70° to c/a Clots of reddish brown sphalerite from 66m onwards (< 1m big) Dissem. sphalerite zone 3cm @ 67.55m. in ? limestone.						140.0	143.0	3.0	100
												143.0	146.0	2.85	95
												146.0	149.0	3.0	100
												149.0	152.0	3.0	100
												152.0	153.3	1.0	76
												153.3	154.8	1.3	79
												154.8	155.5	0.7	55
68.8	68.8	100	1f		Qtz-carbonate vein	Diffuse contact - upper lower contact 45° E c/a.						155.5	158.0	2.5	100
												158.0	161.0	2.9	98
												161.0	164.0	3.0	100
70.8	70.8	100	2f		Dk grey/black magnetic unit	Abundant disseminated (10%) sphalerite (+/- pyrrhotite) Localised zones of pyrite Irregular calcite veins and veins lower contact 75° E c/a but irregular.						164.0	167.0	2.85	95
												167.0	170.0	3.0	100
												170.0	172.6	2.6	100
												172.6	175.7	3.1	100
												175.7	178.8	3.1	100
												178.8	181.6	2.8	100
												181.6	184.6	3.0	100
												184.6	187.7	3.1	100
70.95	72.6	100	1f		lt grey/green unit calcareous - possibly replaced clean limestone. Strong possibility of serpentine alteration	Partially silicified - minor pyrite dissem blabs - ? calcification.						187.7	189.2	1.5	97
												189.2	189.9	0.7	100
												189.9	191.7	1.2	95
												191.7	193.4	2.0	100
												193.4	196.4	3.0	100
72.6	72.75	100	1f		Calcite/serpentine/magnetite vein with large < 3cm mass of pyrite, sphalerite + chalcopyrite	Vein contacts 85° E c/a.						196.4	199.4	3.0	100
												199.4	200.0	0.5	95
												200.0	203.0	3.0	100
												203.0	206.0	3.0	100
73.5	73.65	100	1f		Green/Dark Turquoise calcareous unit							206.0	209.0	3.0	100
												209.0	211.9	2.9	100
												211.9	214.9	2.5	100
												214.9	217.4	3.0	100

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

442054

4/3

TENEMENT NAME..... No.....
PLAN - MAP REFERENCE.....
DEPTH..... HOLE No. DD96ZA2
CASING LEFT..... DPO No(s).....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED.....
RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED.....

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....)				
From (M)	To (M)										From (m)	To (m)	Rec (m)	%	
76.5	78.0	100	1f		lt grey/green calcareous unit - replaced limestone	?clots of sphalerite (reddish brown) locally						217.4	220.5	3.1	100
												220.5	223.6	3.1	100
												223.6	226.6	3.0	100
81.0	82.7	100	1f		Magnetite - carbonate - serpentine altered limestone unit. locally semi-massive magnetite	Disseminated veinlets of pyrite. Minor blebs of sphalerite.						226.6	229.6	3.0	100
					magnetite or disseminated blebs <2mm in size.	Weakly calcareous at base - ? Calcilicates present.						229.6	232.6	3.0	100
												232.6	234.0	1.3	95
												234.0	236.4	2.0	100
82.7	83.05	100	1f		3-4mm disseminated magnetite zone	with blebs of reddish/brown sphalerite.						236.4	238.8	0.8	100
												238.8	239.0	0.2	100
83.05	86.0	100	1f		Grey/dark grey/green carbonate magnetite-serpentine unit possible calcilicates	Occ blebs of pyrite. + minor sphalerite						239.0	242.0	3.0	100
												242.0	245.0	3.0	100
												245.0	247.0	3.0	100
86.0	87.0	100	1f		Magnetite-carbonate-serpentine unit with semi-massive magnetite	Minor pyrite blebs (2-5mm) or disseminated veinlets.						247.0	250.0	2.9	100
												250.0	252.5	1.6	100
												252.5	254.0	1.5	100
												254.0			
87.7	90.7	100	1f		Grey/dark grey carbonate = magnetite-serpentine unit	Minor pyrite & sphalerite blebs (2-5mm)									
90.7	93.3	100	1f		Magnetite-carbonate-serpentine unit - semi-massive magnetite	Minor pyrite blebs.									
93.3	102.2	100	1f		Grey/dark grey carbonate magnetite-serpentine unit.	Minor pyrite & pyrrhotite blebs. Magnetite (semi-massive) areas ~3-8cm bands and blebs occur every 20-40cm.									

occur every 20-40cm.

Geology

CRA Exploration Pty. Limited - Diamond drill core log				Hole No: DD97ZA3	
Tenement: EL 28/88 Avebury, Tasmania			Map Ref.: SK 55-5, Queenstown		
Collar R.L.: 150m		Co-ordinates: 354793E, 5357206N		Hole Orientation: 65° towards 360	
			Logged by: TJG		
From	To	Geological Description	Special Features	Core Orientation	
0	8	Limonitic Fe-stained overbuden (?siltstone).	Possible bedding angle @ 20° to LCA		
8	10.2	Ferruginous clay altered siltstone. Orange Fe-staining. 3 to 10mm clasts evident may be indicative of a conglomeration.	Minor limonite.		
10.2	28	Ferruginous siltstone. Orange to light grey	Minor limonite. Bedding @ 25 - 30° to LCA. Some shearing evident.		
28	92.5	Fine- to medium-grained blue/grey to greenish chloritic volcanic. Initially quite broken, becoming more competent around 36.0m. Partially silicified, with small zone of chert.	Contact with siltstone marked by a clay-altered puggy zone. @ 34.3m - quartz carbonate vein 3cm thick which contains a 2mm pyrite vein. Minor Limonite present, none below 40m. ?Chrysotile/gypsum veins @ 40° to LCA		
92.5	95.5	3m cavity. Waterwashed, chloritic volcanic pebbles.			
95.5	109.1	Grey to bluish green, medium- to fine-grained volcanic unit. Chloritic clasts up to 5cm.	Minor fine-grained disseminated sulphides. Fine-grained pinkish-white mineral throughout, possibly a sulphide.		
109.1	119.3	Highly silicified, chloritic mafic volcanic, becoming increasingly altered with depth. Some epidote evident, as well as large chlorite clasts, often washed out. Contact with chert below irregular and marked by carbonate veins @ moderate angle to LCA.			
119.3	154	Silicified siltstone. Banding @ 45 to 60° to LCA. Chlorite veins @ moderate angle to LCA. Banding in chert steepens around 124.3m, steepening to 30° around 153m. Occasional brittle disruption evident. Reddish bands in chert associated with Fe-sulphides.	Straw-coloured crystals with reddish cores @ 119.8 - 124.2m & 133.6m. Fe sulphides in @ 121m, largely pyrite but possibly some pyrrhotite. Silicified chlorite veins around 138m containing sphalerite, galena, pyrite and pyrrhotite.		
154	162.5	Irregularly banded silicified siltstone and coarser unit, ?volcanic (feldspar phenocrysts). Coarser units more chloritic. Banding in siltstone @ 45° to LCA. Carbonate veining.			
162.5	181.6	Similar to above unit, but more fractured. Irregular steep veining responsible for hydraulic fracturing. Carbonate veining @ 30° to LCA. Broken core from 165.7 related to cavities. Serpentine associated with carbonate from 180.4m indicative of ultramafic.	Chalcopyrite @ 180m associated with pyrite. 30cm wide magnetite-rich band from 180.5m.		
181.6	188.2	Greenish calc-silicate unit. Patchy serpentinite throughout, indicative of altered ultramafic. Becoming increasingly serpentine-rich between 184.9 & 185.5m. Contact with unit above more or less gradational becoming increasingly carbonate rich.	Sparsely disseminated sphalerite has strong association with pyrrhotite. Rare galena.		
188.2	189.7	Similar to unit above, but more serpentine-rich. Carbonate-rich altered ultramafic. Serpentine almost ?colloidal.	Rare sphalerite. Up to 1% disseminated pyrrhotite. Greenish mineral present in minor amounts, similar to malachite but doesn't have the same colour.		
189.7	192.3	Carbonate-rich unit with occasional serpentine. 20cm serpentine-rich band @ 191.5m and 10cm band @ 190.3m. Disseminated magnetite throughout.	Pyrrhotite patchy, in very crude bands. Pinkish bronze mineral gives the appearance of native copper, patchy (minor).		
192.3	194	Serpentine-rich band. Colloidal. Carbonate-rich.	Minor disseminated sulphide (Cu-looking).		
194	198.4	White carbonate-rich unit. Possibly some silicification. Occasional black crystalline minerals, ?pyroxene. 15cm band from 194.3m has sedimentary appearance. Appears to be composed largely of banded pyrrhotite and dolomite. Rock greenish with depth.	Rare sulphides including pinkish bronze mineral (non-magnetic).		
198.4	199.8	Contact irregular but approximately 20° to LCA. Unit grey, becoming greenish, with lower contact grading to a green calc-silicate. Unit probably an altered ultramafic possibly serpentinitised.	Wavy magnetite + pyrrhotite bands throughout, with 10cm band from 199m		

Magnetic Susceptibility					
Total Depth: 256			Drillhole Number: DD97ZA3		
CL = Core Loss					
Depth	Value	Depth	Value	Depth	Value
0.0		20.0	10	40.0	CL
0.5		20.5	CL	40.5	CL
1.0		21.0	4	41.0	19
1.5		21.5	11	41.5	CL
2.0	10	22.0	4	42.0	15
2.5	5	22.5	5	42.5	30
3.0	15	23.0	0	43.0	32
3.5	10	23.5	0	43.5	30
4.0	CL	24.0	CL	44.0	30
4.5	CL	24.5	0	44.5	40
5.0	6	25.0	5	45.0	30
5.5	CL	25.5	CL	45.5	30
6.0	5	26.0	5	46.0	32
6.5	0	26.5	5	46.5	25
7.0	10	27.0	CL	47.0	15
7.5	14	27.5	10	47.5	22
8.0	0	28.0	14	48.0	30
8.5	-	28.5	CL	48.5	40
9.0	0	29.0	CL	49.0	30
9.5	-	29.5	32	49.5	35
10.0	0	30.0	CL	50.0	34
10.5	-	30.5	CL	50.5	31
11.0	-	31.0	23	51.0	45
11.5	5	31.5	35	51.5	50
12.0	0	32.0	39	52.0	40
12.5	0	32.5	CL	52.5	30
13.0	5	33.0	15	53.0	30
13.5	10	33.5	CL	53.5	40
14.0	4	34.0	5	54.0	39
14.5	8	34.5	CL	54.5	20
15.0	15	35.0	20	55.0	40
15.5	15	35.5	29	55.5	30
16.0	2	36.0	40	56.0	38
16.5	CL	36.5	30	56.5	39
17.0	0	37.0	22	57.0	30
17.5	5	37.5	CL	57.5	40
18.0	0	38.0	25	58.0	38
18.5	2	38.5	10	58.5	25
19.0	4	39.0	22	59.0	35
19.5	0	39.5	30	59.5	32

Magnetic Susceptibility		Drillhole number: D0972A3			
Depth	Value	Depth	Value	Depth	Value
60.0	35	82.0	40	104.0	42
60.5	32	82.5	4	104.5	40
61.0	38	83.0	50	105.0	10
61.5	42	83.5	25	105.5	25
62.0	42	84.0	40	106.0	0
62.5	30	84.5	40	106.5	40
63.0	28	85.0	CL	107.0	45
63.5	16	85.5	15	107.5	26
64.0	33	86.0	CL	108.0	30
64.5	25	86.5	CL	108.5	30
65.0	20	87.0	CL	109.0	25
65.5	26	87.5	CL	109.5	15
66.0	30	88.0	26	110.0	21
66.5	20	88.5	25	110.5	40
67.0	30	89.0	21	111.0	6
67.5	25	89.5	23	111.5	9
68.0	26	90.0	30	112.0	35
68.5	23	90.5	12	112.5	16
69.0	25	91.0	45	113.0	36
69.5	24	91.5	20	113.5	40
70.0	23	92.0	23	114.0	38
70.5	10	92.5	6	114.5	CL
71.0	37	93.0	CL	115.0	CL
71.5	25	93.5	CL	115.5	CL
72.0	24	94.0	CL	116.0	46
72.5	14	94.5	CL	116.5	CL
73.0	30	95.0	CL	117.0	CL
73.5	10	95.5	CL	117.5	30
74.0	15	96.0	CL	118.0	23
74.5	22	96.5	CL	118.5	36
75.0	35	97.0	35	119.0	12
75.5	15	97.5	CL	119.5	6
76.0	33	98.0	15	120.0	19
76.5	11	98.5	26	120.5	7
77.0	24	99.0	30	121.0	11
77.5	30	99.5	33	121.5	320
78.0	30	100.0	30	122.0	15
78.5	25	100.5	38	122.5	65
79.0	15	101.0	14	123.0	30
79.5	13	101.5	19	123.5	36
80.0	40	102.0	26	124.0	200
80.5	35	102.5	39	124.5	28
81.0	35	103.0	20	125.0	26
81.5	35	103.5	10	125.5	6

Magnetic Susceptibility		Drillhole number: DD97ZAB			
Depth	Value	Depth	Value	Depth	Value
192.0	70	214.0	15	236.0	32
192.5	45	214.5	25	236.5	26
193.0	50	215.0	20	237.0	28
193.5	30	215.5	10	237.5	28
194.0	30	216.0	10	238.0	37
194.5	4500	216.5	8	238.5	17
195.0	90	217.0	15	239.0	35
195.5	15	217.5	13	239.5	28
196.0	40	218.0	12	240.0	39
196.5	65	218.5	10	240.5	28
197.0	25	219.0	10	241.0	22
197.5	20	219.5	8	241.5	13
198.0	69	220.0	13	242.0	18
198.5	75	220.5	13	242.5	15
199.0	450	221.0	17	243.0	17
199.5	70	221.5	17	243.5	13
200.0	400	222.0	10	244.0	15
200.5	35	222.5	11	244.5	18
201.0	10	223.0	14	245.0	16
201.5	15	223.5	10	245.5	13
202.0	15	224.0	10	246.0	16
202.5	23	224.5	10	246.5	26
203.0	60	225.0	6	247.0	21
203.5	29	225.5	4	247.5	20
204.0	15	226.0	11	248.0	190
204.5	65	226.5	18	248.5	13
205.0	20	227.0	10	249.0	29
205.5	15000	227.5	11	249.5	11
206.0	6000	228.0	8	250.0	12
206.5	2500	228.5	32	250.5	7
207.0	85	229.0	9	251.0	10
207.5	20000	229.5	11	251.5	8
208.0	15000	230.0	16	252.0	4
208.5	23000	230.5	16	252.5	22
209.0	15	231.0	16	253.0	11
209.5	17	231.5	7	253.5	40
210.0	75	232.0	21	254.0	23
210.5	23	232.5	25	254.5	20
211.0	20	233.0	26	255.0	13
211.5	45	233.5	12	255.5	10
212.0	46	234.0	32	256.0	10
212.5	12	234.5	13	256.5	
213.0	19	235.0	10	257.0	
213.5	62	235.5	27	257.5	

From	To	read curries	From	To	read curries.
173	176.2	3.1			
176.2	177.4	.9			
177.4	177.9	.25			
177.9	180.8	2.6			
180.8	183.9	3.05			
183.9	187 m	3 m			
187 m	189.2	2.3 m			
189 m	192.3	3.1			
192.3	195.4	3 m			
195.4	198.5	3 m			
198.5	201.6	3.05 m			
201.6	204.7	3.1 m			
204.7	207.8	2.95 m			
207.8	210.9	3 m			
210.9	214 m	2.8 m			
214 m	216.6 m	2.4			
216.6 m	219.7	3.05 m			
219.7	222.7	3.05 m			
222.7	225.7	2.9 m			
225.7	228.8 m	2.85			
228.8 m					
228.5	230 m	1.04			
230 m	232 m	2.10			
232 m	235 m	3 m			
235 m	238	2.9 m			
238 m	240.7	2.58 m			
240.7	243.8	3.1 m			
243.8	246.9	3.02 m			
246.9	250 m	3.04 m			
250 m	253 m	2.85 m			
253 m	256	3.07 m			
	END of hole.				

Appendix 2

Drill logs of holes A001 and A002

**ALLEGIANCE MINING NL ZEEHAN JOINT VENTURE
 AVEBURY GRID
 A001**

Collar coordinates	see plan attached	Final hole depth	316.3m
Collar bearing	000 ⁰	Hole length	316.3m
Collar dip	-50 ⁰	Hole details	0.0m to 3.0m tricone
Coordinate system	AMG		3.0m to 53.8m HQ
			53.8m to 316.3m NQ

Drilled to test western end of a magnetic anomaly on the Avebury grid

Commenced	15 January 1998	Drilled by	Diamond Drilling Tasmania
Completed	22 January 1998	Logged by	Mick McKeown (McKeown Mining)
		Assays by	AMDEL, Adelaide

SUMMARY OF RESULTS

from m	to m	description	length m	Ni	S %	Pb	Zn
61.2	62.5	semi-massive pyrrhotite	1.3	0.14%	11.3	75ppm	250ppm
148.2	150.6	skarn	2.4	220ppm	0.33	315ppm	0.40%
164.2	165.8	skarn	1.6	105ppm	0.26	145ppm	0.40%
243.9	316.3	serpentinite	72.4	0.36%	0.52		
243.9	254.6	serpentinite	10.7	1.15%	1.61		
243.9	244.3	massive pentlandite	0.4	15%	20.4		

A001

DEPTH	DIP	BRG AMG	FROM	TO	DISTANCE	VERTICAL	CUM VD	HD	CUM HD	HDCOSBRG
0	-50.0	0	0	25	25.0	-19.2	-19.2	16.1	16.1	16.1
50	-49.0	0	25	75	50.0	-37.7	-56.9	32.8	48.9	32.8
100	-48.5	359	75	126	50.5	-37.8	-94.7	33.5	82.3	33.5
151	-51.0	6	126	177	51.0	-39.6	-134.3	32.1	114.4	31.9
202	-51.0	14	177	226	49.5	-38.5	-172.8	31.2	145.6	30.2
250	-50.5	14	226	275	49.0	-37.8	-210.6	31.2	176.8	30.2
300	-50.5	15	275	316.3	41.3	-31.9	-242.5	26.3	203.0	25.4

442075

COMPANY Allegiance Mining NL
 PROJECT Zeehan Joint Venture
 HOLE NUMBER A001

from m	to m	DESCRIPTION	from m	to m	rec m	rec %	from m	to m	Ni %	S %
0.0	7.9	CLAYSTONE	0.0	3.0	0.0	0				
			3.0	4.8	1.3	72				
		Extremely broken, brown to red brown claystone (after rock) with minor brown to black brown ironstaining on fractures.	4.8	6.0	0.5	42				
			6.0	9.0	0.8	27				
		The rock fabric is generally obscure but where preserved the rock appears somewhat brecciated.								
		The contact with next interval is gradational.								
7.9	16.6	WEATHERED HORNFELS	9.0	10.5	1.3	87	14.6	15.6	0.01	<0.05
			10.5	12.0	1.0	67				
		Extremely broken to broken, white to dark grey hornfels with sparse to minor brown to black ironstaining on joints.	12.0	12.7	0.7	100				
			12.7	14.1	1.4	100				
			14.1	15.7	1.6	100				
		BCA is generally obscure but is typically 45 degrees towards the end of the interval.	15.7	16.7	0.9	90				
		The interval is very weathered at the start becoming fresh towards 16.6m.								
		15.1m: a 10cm zone of rock with sand size, white to green fragments: tuff?								
		The contact with the next interval is gradational.								
16.6	26.9	CHERTY HORNFELS	16.7	18.0	1.3	100	19.6	20.6	0.01	<0.05
			18.0	19.6	1.6	100				
		Broken mottled white, cream, light green, grey and brown cherty hornfels, slightly weathered in part with sparse brown to black brown ironstaining on fractures, and trace quartz, serpentine and iron oxides as stringers.	19.6	21.0	1.3	93				
			21.0	22.6	1.6	100				
			22.6	24.0	1.4	100				
			24.0	25.5	1.5	100				
		The original rock appears fragmental (sand size) in part.	25.5	27.0	1.5	100				

COMPANY Allegiance Mining NL
 PROJECT Zeehan Joint Venture
 HOLE NUMBER A001

from m	to m	DESCRIPTION	from m	to m	rec m	rec %	from m	to m	Ni %	S %
		The interval has an hydraulically? brecciated texture in part.								
		BCA is irregular/obscure.								
		The contact with the next interval is sharp but irregular.								
26.9	32.0	CHERT BRECCIA	27.0	28.1	1.1	100				
			28.1	29.4	1.3	100				
		Grey green, grey and white chert breccia with trace to sparse dark brown iron oxides on fractures and joints (after sulphides?).	29.4	31.0	1.6	100				
			31.0	32.5	1.5	100				
		Fragments are up to 10cm across, some being rounded; narrow bands of chert appear to be ruptured beds.								
		BCA is irregular/obscure.								
		The interval is broken.								
		The contact with the next interval is sharp but irregular.								
32.0	41.4	LIMESTONE AND CHERT	32.5	34.0	1.5	100				
			34.0	35.6	1.6	100				
		Light to dark grey limestone and minor grey to brown and lesser red chert with common calcite as stringers and veinlets, trace to sparse pyrite on fractures and as stringers,	35.6	37.2	1.6	100				
		trace to sparse pyrrhotite as stringers, blebs and small patches, sparse graphite as	37.2	38.8	1.6	100				
		stringers parallel to bedding in the limestone, and sparse quartz as stringers.	38.8	40.4	1.6	100				
			40.4	42.0	1.6	100				
		The interval is banded with BCA typically in the range 50 to 60 degrees.								

COMPANY Allegiance Mining NL
 PROJECT Zeehan Joint Venture
 HOLE NUMBER A001

from m	to m	DESCRIPTION	from m	to m	rec m	rec %	from m	to m	Ni %	S %
		The interval is not broken.								
		The contact with the next interval is sharp at 80 degrees to the core axis.								
41.4	48.3	CHERTY SERPENTINITIC ROCK	42.0	43.6	1.6	100	47.4	48.3	0.03	<0.05
		Dark green hard serpentinitic rock with brown cherty patches, sparse quartz as stringers, and rare traces of chalcopyrite visible under a hand lens.	43.6	45.0	1.4	100				
			45.0	46.6	1.6	100				
			46.6	48.0	1.4	100				
		CA is obscure.								
		The interval is broken.								
		The contact with the next interval is sharp but irregular.								
48.3	54.3	HARD SERPENTINITE	48.0	49.6	1.6	100	48.3	49.3	0.12	0.10
		Intermixed light green and dark green serpentinitic rock (as in the previous interval) with with minor schorl? as black masses of acicular crystals, sparse light green serpentine as stringers and blebs, and trace chalcopyrite flecks visible under a hand lens.	49.6	51.0	1.4	100	49.3	50.3	0.06	<0.05
			51.0	52.6	1.6	100	50.3	51.3	0.06	<0.05
			52.6	53.8	1.2	100	51.3	52.3	0.09	0.06
			53.8	55.3	1.5	100	52.3	53.3	0.13	<0.05
							53.3	54.3	0.15	<0.05
		The interval is hydraulically? brecciated in part with a suggestion of light green fragments in a dark green matrix.								
		CA is obscure.								
		The contact with the next interval is sharp at 45 degrees to the core axis.								

COMPANY Allegiance Mining NL
 PROJECT Zeehan Joint Venture
 HOLE NUMBER A001

from m	to m	DESCRIPTION	from m	to m	rec m	rec %	from m	to m	Ni %	S %
54.3	59.2	SERPENTINITE	55.3	58.3	3.0	100	54.3	55.3	0.21	0.31
		Mottled light to dark green serpentinite with black stringers carrying sparse pyrrhotite, minor calcite as stringers, veinlets, veins and patches, sparse apple green serpentine, trace green serpentine as stringers carrying trace pyrrhotite, trace to sparse pyrrhotite and chalcopyrite throughout, trace black sphalerite throughout, and sparse black mineral throughout.					55.3	56.3	0.16	0.24
							56.3	57.3	0.09	0.15
							57.3	58.3	0.09	0.16
							58.3	59.2	0.10	0.21
		The interval is not broken.								
		CA is obscure.								
		The contact with the next interval is sharp but irregular.								
59.2	61.2	SERPENTINITE AND MINOR PYRRHOTITE	58.3	61.3	3.0	100	59.2	60.2	0.12	1.75
		As between 54.3m and 59.2m but with minor pyrrhotite as stringers, veinlets and patches, sparse black stylolites or fine stringers carrying sparse pyrite, trace green serpentine as stringers carrying trace pyrrhotite, and trace brown garnet? patches.					60.2	61.2	0.15	3.97
		CA is obscure.								
		The interval is not broken.								
		The contact with the next interval is gradational.								
61.2	62.5	SEMI-MASSIVE PYRRHOTITE	61.3	64.3	3.0	100	61.2	62.5	0.14	11.3
		Pyrrhotite with common black serpentine and sparse vuggy pyrite (marcasite?) after pyrrhotite; the pyrrhotite occurs as a crystalline mass and as veinlets through the								

COMPANY Allegiance Mining NL
 PROJECT Zeehan Joint Venture
 HOLE NUMBER A001

from m	to m	DESCRIPTION	from m	to m	rec m	rec %	from m	to m	Ni %	S %
		serpentine. CA is obscure. The interval is not broken. The contact with the next interval is sharp but irregular.								
62.5	62.9	SERPENTINITE Light to mid-green, hard serpentinite with trace green serpentine as stringers, trace calcite as stringers, trace disseminated pyrrhotite visible under a hand lens, and sparse black mineral as flecks. CA is generally unclear but may be about 45 degrees. The interval is not broken. The contact with the next interval is sharp but broken but may be at 45 degrees to the core axis.					62.5	63.3	0.06	0.55
62.9	63.3	SERPENTINITE RUBBLE Puggy green serpentinite rubble. CA is obscure. The interval is extremely broken. The contact with the next interval is gradational and broken.								

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 PROJECT Zeehan Joint Venture
 HOLE NUMBER A001

from m	to m	DESCRIPTION	from m	to m	rec m	rec %	from m	to m	Ni %	S %
63.3	64.9	SERPENTINITE Mottled dark green and lesser light green serpentinite with sparse calcite as stringers and veinlets, and trace disseminated pyrrhotite visible under a hand lens. CA is obscure. The interval is extremely broken. The contact with the next interval is gradational.	64.3	67.3	3.0	100	63.3	64.9	0.02	0.49
64.9	66.2	SERPENTINITE WITH MINOR SULPHIDES As between 63.3m and 64.9m but with minor pyrrhotite and pyrite as disseminations and stringers, and trace calcite as stringers. CA is obscure. The interval is broken. The contact with the next interval is gradational.					64.9	66.2	0.01	0.42
66.2	70.0	SERPENTINITE Dark green serpentinite with minor light green serpentine as ruptured bands less than 1cm thick, minor epidote as occasional bands and patches less than 5cm across, and minor black silicate? mineral. CA is obscure.	67.3	69.8	2.5	100	66.2	67.2	0.02	<0.05
							67.2	68.2	0.03	<0.05
							68.2	69.2	0.04	0.06
							69.2	70.0	0.04	0.09

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 PROJECT Zeehan Joint Venture
 HOLE NUMBER A001

from m	to m	DESCRIPTION	from m	to m	rec m	rec %	from m	to m	Ni %	S %
		The interval is broken.								
		<i>The contact with the next interval is gradational.</i>								
70.0	92.3	INTERMIXED HORNFELS, CHERT AND SERPENTINITE	69.8	72.9	3.1	100				
			72.9	73.9	1.0	100				
		Intermixed grey fine grained hornfels, white chert and dark green serpentinite with sparse epidote as blebs near 70.0m, trace to sparse calcite and quartz as stringers, and trace disseminated pyrite on some fractures.	73.9	74.8	0.9	100				
			74.8	76.2	1.2	86				
			76.2	78.2						
			78.2	79.0	0.5	63				
		The interval has a hydraulically? brecciated texture.	79.0	80.6	1.4	88				
			80.6	81.5	0.9	100				
		CA is obscure.	81.5	83.2	0.8	47				
			83.2	83.6	0.3	75				
		The interval is extremely broken.	83.6	84.2	0.5	83				
			84.2	84.5	0.2	67				
		The contact with the next interval is gradational.	84.5	84.8	0.3	100				
			84.8	85.2	0.4	100				
			85.2	86.6	1.4	100				
			86.6	88.3	1.7	100				
			88.3	88.5	0.1	50				
			88.5	91.3	2.7	96				
			91.3	92.4	1.1	100				
92.3	103.0	INTERMIXED CHERT AND SERPENTINITIC ROCK	92.4	94.3	1.9	100				
			94.3	95.9	1.6	100				
		Intermixed brown chert, dark green serpentinitic rock and minor white chert with trace quartz as stringers and veinlets, and trace disseminated pyrrhotite.	95.9	98.9	3.0	100				
			98.9	100.3	1.4	100				
			100.3	103.3	3.0	100				

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 PROJECT Zeehan Joint Venture
 HOLE NUMBER A001

from m	to m	DESCRIPTION	from m	to m	rec m	rec %	from m	to m	Ni %	S %
		The interval has a mottled, hydraulically? brecciated texture.								
		BCA is irregular.								
		The interval is extremely broken.								
		The contact with the next interval is gradational.								
103.0	109.7	INTERMIXED CHERT AND SERPENTINITIC ROCK	103.3	106.3	3.0	100				
		Intermixed brown chert and hard, green serpentinitic rock with trace to sparse pyrite and pyrrhotite as stringers and flecks, trace chalcopyrite as flecks, and rare vuggy quartz stringers.	106.3	109.3	3.0	100				
		The interval has a mottled appearance and bedding has been ruptured.								
		BCA is obscure.								
		The interval is broken.								
		The contact with the next interval is sharp but broken.								
109.7	113.6	INTERMIXED CHERT AND MINOR SERPENTINITIC ROCK	109.3	110.7	1.4	100				
		As between 109.7m and 113.6m but with a more brecciated texture.	110.7	112.3	1.6	100				
			112.3	113.4	1.1	100				
		The interval is very broken.								
		The contact with the next interval is sharp but broken.								

COMPANY Allegiance Mining NL
 PROJECT Zeehan Joint Venture
 HOLE NUMBER A001

from m	to m	DESCRIPTION	from m	to m	rec m	rec %	from m	to m	Ni %	S %
113.6	117.5	BRECCIATED CHERT: FAULT?	113.4	115.3	2.1	111				
		As between 109.7m and 113.6m but more brecciated: fault?	115.3	118.3	2.5	83				
		The interval is extremely broken.								
		The contact with the next interval is sharp but broken.								
117.5	126.0	CHERT	118.3	119.2	0.9	100				
		Brown and minor grey white chert and minor green serpentinitic rock with sparse to minor pyrite and pyrrhotite as stringers and flecks, and minor chlorite? as patches.	119.2	121.3	2.1	100				
			121.3	124.3	3.0	100				
		The interval has a brecciated texture.								
		BCA is typically 30 degrees.								
		The interval is broken.								
126.0	136.5	CHERT	124.3	127.3	3.0	100				
		Grey white, green and minor brown chert and lesser intermixed hard serpentinitic rock with sparse quartz and schorl as irregular stringers, trace calcite as stringers, and trace pyrrhotite and chalcopyrite as rare disseminations, e.g. at 131.2m.	127.3	130.3	3.0	100				
			130.3	133.3	3.0	100				
			133.3	136.3	3.0	100				
		The interval has a brecciated texture.								
		BCA is typically 45 degrees.								
		The interval is not broken.								

COMPANY Allegiance Mining NL
 PROJECT Zeehan Joint Venture
 HOLE NUMBER A001

from m	to m	DESCRIPTION	from m	to m	rec m	rec %	from m	to m	Ni %	S %
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The contact with the next interval is gradational.

136.5	145.0	BRECCIATED CHERT	136.3	139.3	3.0	100				
			139.3	142.3	3.0	100				
			142.3	145.3	3.0	100				

Grey to brown, brecciated chert, slightly vuggy in part, with sparse chlorite as patches, sparse serpentine as veinlets and on fractures, and sparse calcite as stringers and as matrix to bands of breccia.

BCA is obscure.

The interval is broken.

145.0	146.6	BRECCIA	145.3	148.3	3.0	100				
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White chert fragments in a chloritised matrix.

The interval is broken.

The contact with the next interval is sharp but broken.

146.6	148.2	BRECCIATED CHERT								
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Brecciated grey, cream and white chert with trace to sparse axinite as veinlets and patches, trace calcite as veinlets, sparse chlorite as patches, sparse ragged garnet? crystals up to 4mm across, and trace pyrrhotite?

146.8m to 147.3m: calcite vein with rock fragments and pug; CA is 20 degrees.

BCA is obscure.

COMPANY Allegiance Mining NL
 PROJECT Zeehan Joint Venture
 HOLE NUMBER A001

from m	to m	DESCRIPTION	from m	to m	rec m	rec %	from m	to m	Ni %	S %
		The interval is extremely broken.								
		The contact with the next interval is sharp at 40 degrees to the core axis.								
148.2	150.6	LIMESTONE BRECCIA WITH SKARN	148.3	151.3	3.0	100	148.2	149.4	0.02	0.46
		Serpentinised limestone fragments in an axinite/schorl matrix with sparse vuggy quartz as stringers.					149.4	150.6	0.02	0.21
		BCA is obscure.								
		The interval is extremely broken.								
		The contact with the next interval is sharp but broken.								
150.6	160.2	BRECCIATED CHERT	151.3	154.3	3.0	100	159.2	160.2	0.01	<0.05
		Brecciated cream to green chert with minor serpentinitic veins and bands and sparse slightly vuggy quartz as stringers and veinlets.	154.3	157.3	3.0	100				
			157.3	160.3	3.0	100				
		BCA is obscure.								
		The interval is extremely broken especially in the serpentinitic bands.								
		The contact with the next interval is sharp but broken.								
160.2	165.8	AXINITE SKARN	160.3	163.3	3.0	100	160.2	161.2	0.02	0.06
		Cream to green (chloritised?) brecciated chert with common axinite as veins and	163.3	166.3	3.0	100	161.2	162.2	0.01	0.13
							162.2	163.2	0.02	<0.05

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 PROJECT Zeehan Joint Venture
 HOLE NUMBER A001

from m	to m	DESCRIPTION	from m	to m	rec m	rec %	from m	to m	Ni %	S %
		patches with sparse brown sphalerite as flecks, trace galena as spots, and sparse schorl as small crystals up to 4mm across.					163.2	164.2	0.02	0.16
		BCA is obscure.					164.2	165.8	0.01	0.26
		The interval is broken.								
		The contact with the next interval is gradational.								
165.8	169.6	BRECCIATED CHERT	166.3	167.8	1.5	100	165.8	166.8	0.02	<0.05
		As between 150.6m and 160.2m	167.8	169.3	1.5	100	166.8	167.8	0.02	<0.05
							167.8	169.6	0.01	<0.05
		The interval is broken.								
		The contact with the next interval is gradational.								
169.6	179.8	AXINITE SKARN	169.3	172.3	3.0	100	169.6	170.6	0.02	<0.05
		As between 160.2m and 165.8m but with minor schorl crystals as patches up to 5cm across.	172.3	175.3	3.0	100	170.6	171.6	0.01	<0.05
			175.3	178.3	3.0	100	171.6	172.6	0.01	<0.05
							172.6	173.6	0.02	<0.05
							173.6	174.6	0.01	<0.05
		The interval is broken.					174.6	175.6	0.01	<0.05
							175.6	176.6	0.01	<0.05
		The contact with the next interval is gradational.					176.6	177.6	0.02	<0.05
							177.6	178.6	0.02	<0.05
179.8	197.6	CHERT AND HORNFELS WITH MINOR SKARN	178.3	181.3	3.0	100	178.6	179.8	0.01	<0.05
		Cream to green chert with green serpentinitic hornfels and minor skarn veining	181.3	184.3	3.0	100	179.8	180.8	0.02	<0.05
		becoming less intense towards 197.6m; the skarn consists of axinite and quartz with	184.3	187.3	3.0	100				
			187.3	190.3	3.0	100				

COMPANY Allegiance Mining NL
 PROJECT Zeehan Joint Venture
 HOLE NUMBER A001

from m	to m	DESCRIPTION	from m	to m	rec m	rec %	from m	to m	Ni %	S %
		trace schorl and minor serpentine.	190.3	193.3	3.0	100				
		The chert has a mottled brecciated texture.	193.3	196.3	3.0	100				
		BCA is obscure.								
		The interval is broken.								
197.6	198.2	AXINITE SKARN	196.3	199.3	3.0	100				
		Quartz, chloritised? in part, with common axinite, and minor schorl crystals as patches up to 5cm across.								
		CA is obscure.								
		The interval is broken.								
		The contact with the next interval is sharp but irregular.								
198.2	208.4	CHERT AND HORNFELS	199.3	202.3	3.0	100				
			202.3	205.3	3.0	100				
		As between 179.8m and 197.6m with no skarn veining but with sparse calcite and quartz as stringers and veinlets.	205.3	208.3	3.0	100				
		BCA is irregular but averages 45 degrees.								
		The interval is broken.								
		The contact with the next interval is sharp at 70 degrees to the core axis.								

COMPANY Allegiance Mining NL
 PROJECT Zeehan Joint Venture
 HOLE NUMBER A001

from m	to m	DESCRIPTION	from m	to m	rec m	rec %	from m	to m	Ni %	S %
208.4	213.0	HORNFELSED ROCK	208.3	211.3	3.0	100				
		White spotted, green hornfels with occasional large fragments up to 5cm across, rare axinite/serpentine stringers, and trace schorl as fine crystals.	211.3	214.3	3.0	100				
		BCA is obscure.								
		The interval is not broken.								
		The contact with the next interval is gradational.								
213.0	223.9	CHERT WITH SPARSE SKARN	214.3	217.3	3.0	100				
		Cream, grey and green chert with sparse axinite and lesser serpentine as veining and patches.	217.3	220.3	3.0	100				
			220.3	223.3	3.0	100				
		The interval has a brecciated texture.								
		BCA is obscure.								
		The interval is not broken.								
		The contact with the next interval is gradational.								
223.9	225.8	HORNFELS	223.3	226.3	3.0	100				
		Green brown chloritic? cherty hornfels with trace to sparse disseminated pyrrhotite.								
		BCA is obscure.								

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from m	to m	DESCRIPTION	from m	to m	rec m	rec %	from m	to m	Ni %	S %
		The interval is not broken.								
		The contact with the next interval is sharp but irregular.								
225.8	234.8	ALTERED CRYSTALLINE ROCK: GABBRO?	226.3	229.3	3.0	100				
		Very altered, dark green brown crystalline rock with common quartz as stringers, veinlets and patches, and sparse green serpentine on joints; this could be an altered gabbro.	229.3	232.3	3.0	100				
			232.3	235.3	3.0	100				
		The interval has a brecciated texture in part.								
		CA is obscure.								
		The interval is not broken.								
		The contact with the next interval is sharp but irregular.								
234.8	243.9	HORNFELS	235.3	238.3	3.0	100	242.9	243.9	0.13	0.06
		As between 223.9m and 225.8m plus common quartz as stringers and veinlets, sparse green serpentine on fractures, and sparse to minor flaky chlorite as patches up to 5cm across.	238.3	241.3	3.0	100				
			241.3	244.3	3.0	100				
		BCA is obscure.								
		The interval is not broken.								
		The contact with the next interval is sharp but irregular.								

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from m	to m	DESCRIPTION	from m	to m	rec m	rec %	from m	to m	Ni %	S %
243.9	244.3	MASSIVE PENTLANDITE Massive slightly magnetic pentlandite. CA is obscure. The interval is not broken. The contact with the next interval is sharp but irregular.					243.9	244.3	15.0	20.4
244.3	247.6	SERPENTINITE Massive light green serpentinite with sparse to minor pentlandite as disseminations and stringers. CA is obscure. The interval is not broken. The contact with the next interval is sharp at 70 degrees to the core axis and is marked by 5cm of serpentinite breccia.	244.3	247.3	3.0	100	244.3 245.3 246.3	245.3 246.3 247.6	0.33 0.22 0.32	0.67 0.32 0.53
247.6	316.3	SERPENTINITE Black serpentinite and a zone with light green serpentinite, with sparse to minor pentlandite as disseminations, blebs and patches, sparse calcite and quartz as stringers and veinlets. 271.6m to 275.6m: intermixed black and harder white serpentinite; a brecciated texture suggests black serpentinite fragments in a white serpentinite matrix, with minor	247.3 249.4 250.3 253.3 256.3 259.3 262.3 265.3	249.4 250.3 253.3 256.3 259.3 262.3 268.3	2.1 0.9 3.0 3.0 3.0 3.0 3.0 3.0	100 100 100 100 100 100 100 100	247.6 248.6 249.6 249.6 250.6 251.6 252.6 253.6 253.6 254.6 254.6 255.6	248.6 249.6 250.6 251.6 252.6 253.6 254.6 255.6	0.41 0.23 1.23 1.11 0.86 0.84 0.66 0.24	0.59 0.30 1.80 1.56 1.17 1.11 0.85 0.28

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from m	to m	DESCRIPTION	from m	to m	rec m	rec %	from m	to m	Ni %	S %
		magnetite crystals throughout, and sparse to minor pyrrhotite as disseminations, stringers and patches.	268.3	271.3	3.0	100	255.6	256.6	0.23	0.27
			271.3	274.3	3.0	100	256.6	257.6	0.47	0.56
			274.3	277.3	3.0	100	257.6	258.6	0.29	0.34
		CA is obscure.	277.3	280.3	3.0	100	258.6	259.6	0.29	0.34
			280.3	283.3	3.0	100	259.6	260.6	0.16	0.16
		The interval is not broken.	283.3	286.3	3.0	100	260.6	261.6	0.15	0.15
			286.3	289.3	3.0	100	261.6	262.6	0.17	0.18
		END OF HOLE AT 316.3m.	289.3	292.3	3.0	100	262.6	263.6	0.19	0.18
			292.3	295.3	3.0	100	263.6	264.6	0.16	0.17
			295.3	298.3	3.0	100	264.6	265.6	0.17	0.21
			298.3	301.3	3.0	100	265.6	266.6	0.35	0.54
			301.3	304.3	3.0	100	266.6	267.6	1.17	1.76
			304.3	307.3	3.0	100	267.6	268.6	0.26	0.36
			307.3	310.3	3.0	100	268.6	269.6	0.18	0.25
			310.3	313.3	3.0	100	269.6	270.6	0.34	0.53
			313.3	316.3	3.0	100	270.6	271.6	0.91	1.38
							271.6	272.6	0.27	0.38
							272.6	273.6	0.80	1.22
							273.6	274.6	0.15	0.30
							274.6	275.6	0.22	0.64
							275.6	277.3	0.12	0.22
							277.3	278.3	0.12	0.18
							278.3	279.3	0.12	0.18
							279.3	280.3	0.18	0.22
							280.3	281.3	0.07	0.07
							281.3	282.3	0.07	0.07
							282.3	283.3	0.05	<0.05
							283.3	284.3	0.10	0.11
							284.3	285.3	0.11	0.17
							285.3	286.3	0.27	0.44

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COMPANY Allegiance Mining NL
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from m	to m	DESCRIPTION	from m	to m	rec m	rec %	from m	to m	Ni %	S %
							286.3	287.3	0.09	0.12
							287.3	288.3	0.38	0.63
							288.3	289.3	0.09	0.08
							289.3	290.3	0.12	0.15
							290.3	291.3	0.09	0.12
							291.3	292.3	0.12	0.18
							292.3	293.3	0.22	0.31
							293.3	294.3	0.13	0.21
							294.3	295.3	0.13	0.17
							295.3	296.3	0.12	0.15
							296.3	297.3	0.16	0.28
							297.3	298.3	0.17	0.39
							298.3	299.3	0.24	0.64
							299.3	300.3	0.20	0.49
							300.3	301.3	0.39	0.85
							301.3	302.3	0.27	0.62
							302.3	303.3	0.25	0.54
							303.3	304.3	0.22	0.41
							304.3	305.3	0.17	0.23
							305.3	306.3	0.16	0.33
							306.3	307.3	0.28	0.52
							307.3	308.3	0.18	0.23
							308.3	309.3	0.13	0.14
							309.3	310.3	0.12	0.13
							310.3	311.3	0.14	0.13
							311.3	312.3	0.13	0.15
							312.3	313.3	0.14	0.13
							313.3	314.3	0.12	0.13
							314.3	315.3	0.13	0.10
							315.3	316.3	0.12	0.10

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A001

from m	to m	Ag ppm	As ppm	Co ppm	Cu ppm	Ni ppm	Pb ppm	S ppm	Zn ppm
14.6	15.6	<1	8	30	57	100	25	<500	57
19.6	20.6	<1	4	22	23	55	15	<500	53
47.4	48.3	<1	12	51	<2	320	5	<500	57
48.3	49.3	7	300	50	7	1200	350	1000	400
49.3	50.3	<1	20	54	17	550	60	<500	145
50.3	51.3	<1	24	65	130	550	10	<500	105
51.3	52.3	<1	34	78	170	900	15	550	195
52.3	53.3	<1	4	99	57	1300	15	<500	380
53.3	54.3	<1	38	110	4	1500	<5	<500	140
54.3	55.3	6	28	89	240	2050	700	3050	1350
55.3	56.3	9	14	76	135	1550	1750	2350	800
56.3	57.3	6	4	51	26	850	1400	1500	750
57.3	58.3	9	18	33	4	850	1550	1550	550
58.3	59.2	5	46	35	52	1000	950	2100	1150
59.2	60.2	13	54	52	240	1150	750	17500	1300
60.2	61.2	4	32	67	430	1450	230	39700	900
61.2	62.5	3	52	77	350	1400	75	113000	250
62.5	63.3	1	20	53	54	550	130	5450	430
63.3	64.9	1	6	76	430	200	330	4850	1200
64.9	66.2	<1	8	80	130	145	140	4150	750
66.2	67.2	<1	4	110	7	240	100	<500	310
67.2	68.2	<1	4	89	3	270	15	<500	120
68.2	69.2	<1	6	85	46	370	15	600	140
69.2	70.2	<1	4	81	50	350	30	850	330
148.2	149.4	5	14	46	82	210	350	4600	5850
149.4	150.6	1	20	43	26	230	280	2050	2050

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A001

from m	to m	Ag ppm	As ppm	Co ppm	Cu ppm	Ni ppm	Pb ppm	S ppm	Zn ppm
159.2	160.2	<1	10	32	6	105	55	<500	330
160.2	161.2	<1	8	31	19	150	185	550	700
161.2	162.2	<1	12	23	29	77	550	1300	1600
162.2	163.2	<1	8	37	3	170	20	<500	79
163.2	164.2	<1	8	33	23	160	140	1550	2200
164.2	165.8	<1	8	23	25	105	145	2600	3950
165.8	166.8	<1	6	30	4	185	30	<500	290
166.8	167.8	<1	12	28	16	150	75	<500	550
167.8	169.6	<1	8	27	4	135	65	<500	900
169.6	170.6	<1	14	20	<2	155	15	<500	63
170.6	171.6	<1	8	30	3	145	40	<500	420
171.6	172.6	<1	12	23	2	145	25	<500	105
172.6	173.6	<1	6	25	<2	195	5	<500	76
173.6	174.6	<1	10	22	3	120	5	<500	59
174.6	175.6	<1	8	17	4	94	10	<500	120
175.6	176.6	<1	12	22	12	130	50	<500	650
176.6	177.6	<1	6	26	5	220	85	<500	97
177.6	178.6	<1	10	22	3	180	<5	<500	600
178.6	179.8	<1	8	22	12	115	15	<500	700
179.8	180.8	<1	12	24	4	190	50	<500	145
242.9	243.9	<1	42	46	2	1250	<5	600	86
243.9	244.3	1	64	3400	1150	150000	<5	204000	700
244.3	245.3	<1	6	72	29	3250	10	6650	47
245.3	246.3	<1	4	50	17	2200	<5	3200	34
246.3	247.6	<1	8	74	15	3150	<5	5300	38
247.6	248.6	<1	14	115	17	4100	10	5900	71

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A001

from m	to m	Ag ppm	As ppm	Co ppm	Cu ppm	Ni ppm	Pb ppm	S ppm	Zn ppm
248.6	249.6	<1	10	68	12	2300	15	3000	86
249.6	250.6	<1	24	270	55	12300	155	18000	330
250.6	251.6	<1	22	240	57	11100	50	15600	185
251.6	252.6	<1	26	185	35	8550	25	11700	165
252.6	253.6	<1	32	190	65	8350	95	11100	270
253.6	254.6	<1	32	145	14	6550	20	8450	150
254.6	255.6	<1	26	76	2	2400	5	2750	130
255.6	256.6	<1	14	74	2	2300	10	2700	65
256.6	257.6	<1	18	115	3	4650	15	5550	93
257.6	258.6	<1	16	85	3	2900	15	3350	82
258.6	259.6	<1	14	86	6	2900	10	3400	110
259.6	260.6	<1	12	61	2	1550	5	1600	57
260.6	261.6	<1	12	64	<2	1500	<5	1450	37
261.6	262.6	<1	14	70	<2	1700	<5	1800	51
262.6	263.6	<1	16	64	<2	1850	10	1800	38
263.6	264.6	<1	18	60	<2	1550	<5	1700	25
264.6	265.6	<1	16	64	3	1700	<5	2100	39
265.6	266.6	<1	16	94	21	3450	<5	5350	75
266.6	267.6	<1	26	240	28	11700	10	17600	105
267.6	268.6	<1	20	79	6	2600	5	3550	105
268.6	269.6	<1	14	65	4	1800	5	2450	50
269.6	270.6	<1	20	96	16	3350	5	5300	90
270.6	271.6	<1	16	210	26	9050	5	13800	115
271.6	272.6	<1	10	65	8	2700	<5	3750	58
272.6	273.6	<1	10	190	24	7950	10	12200	67
273.6	274.6	<1	14	60	7	1450	<5	2950	56
274.6	275.6	<1	18	70	15	2150	5	6350	41
275.6	277.3	<1	10	58	7	1150	5	2150	50

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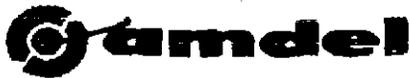
A001

from m	to m	Ag ppm	As ppm	Co ppm	Cu ppm	Ni ppm	Pb ppm	S ppm	Zn ppm
277.3	278.3	<1	12	61	3	1150	5	1750	49
278.3	279.3	<1	10	67	<2	1200	<5	1750	28
279.3	280.3	<1	8	72	2	1750	10	2150	51
280.3	281.3	<1	8	41	<2	700	<5	650	25
281.3	282.3	<1	8	36	2	650	<5	650	35
282.3	283.3	<1	14	23	<2	490	<5	<500	30
283.3	284.3	<1	42	47	6	1000	5	1050	52
284.3	285.3	<1	36	52	7	1050	5	1650	56
285.3	286.3	<1	16	110	10	2700	5	4350	85
286.3	287.3	<1	12	46	4	850	5	1200	36
287.3	288.3	<1	14	130	17	3750	15	6300	220
288.3	289.3	<1	10	41	<2	900	<5	800	27
289.3	290.3	<1	8	58	19	1150	15	1450	45
290.3	291.3	<1	8	52	3	900	<5	1150	73
291.3	292.3	<1	8	65	4	1150	5	1800	49
292.3	293.3	<1	10	93	7	2150	15	3050	96
293.3	294.3	<1	12	69	56	1250	60	2050	86
294.3	295.3	<1	12	64	5	1300	5	1700	40
295.3	296.3	<1	12	59	6	1200	5	1500	26
296.3	297.3	<1	10	82	7	1600	5	2800	75
297.3	298.3	<1	12	81	16	1650	10	3900	67
298.3	299.3	<1	12	105	20	2350	5	6400	45
299.3	300.3	<1	12	92	27	2000	15	4850	68
300.3	301.3	<1	10	140	23	3900	10	8500	67
301.3	302.3	<1	10	110	17	2700	10	6200	55
302.3	303.3	<1	10	105	12	2450	5	5400	57
303.3	304.3	<1	12	91	9	2150	5	4050	47
304.3	305.3	<1	12	70	3	1650	5	2300	17

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A001

from m	to m	Ag ppm	As ppm	Co ppm	Cu ppm	Ni ppm	Pb ppm	S ppm	Zn ppm
305.3	306.3	<1	24	70	41	1550	35	3300	39
306.3	307.3	<1	135	99	22	2800	15	5150	160
307.3	308.3	<1	10	73	<2	1750	<5	2250	24
308.3	309.3	<1	12	64	<2	1300	<5	1400	20
309.3	310.3	<1	12	65	<2	1200	10	1250	22
310.3	311.3	<1	12	72	<2	1350	10	1300	21
311.3	312.3	<1	10	66	4	1300	<5	1500	36
312.3	313.3	<1	8	68	<2	1400	5	1300	68
313.3	314.3	<1	10	61	62	1200	65	1250	22
314.3	315.3	<1	8	63	<2	1250	10	950	25
315.3	316.3	<1	8	61	<2	1200	10	950	20
method detection limit		IC3E 1	IC3E 3	IC3E 2	IC3E 2	IC3E 2	IC3E 5	IC3E 500	IC3E 2



442099

Job: 8AD0438
O/N:

Final

ANALYTICAL REPORT

SAMPLE	Sn	Au Au Dpl	Pt Pt Dpl	Pd Pd Dpl
A001 47.4-48.3	<4	--	--	--
A001 48.3-49.3	5	--	--	--
A001 49.3-50.3	17	--	--	--
A001 50.3-51.3	7	--	--	--
A001 51.3-52.3	<4	--	--	--
A001 52.3-53.3	<4	--	--	--
A001 53.3-54.3	10	--	--	--
A001 54.3-55.3	15	--	--	--
A001 55.3-56.3	<4	--	--	--
A001 56.3-57.3	9	--	--	--
A001 57.3-58.3	<4	--	--	--
A001 58.3-59.2	<4	--	--	--
A001 59.2-60.2	<4	--	--	--
A001 60.2-61.2	4	--	--	--
A001 61.2-62.5	6	--	--	--
A001 62.5-63.3	12	--	--	--
A001 63.3-64.9	23	--	--	--
A001 64.9-66.2	18	--	--	--
A001 66.2-67.2	6	--	--	--
A001 67.2-68.2	85	--	--	--
A001 68.2-69.2	120	--	--	--
A001 69.2-70.0	74	--	--	--
A001 148.2-149.4	58	--	--	--
A001 149.4-150.6	45	--	--	--
A001 159.2-160.2	5	--	--	--
A001 160.2-161.2	23	--	--	--
A001 161.2-162.2	18	--	--	--
A001 162.2-163.2	8	--	--	--
A001 163.2-164.2	9	--	--	--
A001 164.2-165.8	31	--	--	--
A001 165.8-166.8	18	--	--	--
A001 166.8-167.8	6	--	--	--
A001 167.8-169.6	5	--	--	--
A001 169.6-170.6	37	--	--	--
A001 170.6-171.6	16	--	--	--
A001 171.6-172.6	27	--	--	--
A001 172.6-173.6	11	--	--	--
A001 173.6-174.6	28	--	--	--
A001 174.6-175.6	27	--	--	--
A001 175.6-176.6	13	--	--	--
A001 176.6-177.6	9	--	--	--
A001 177.6-178.6	65	--	--	--
A001 178.6-179.8	6	--	--	--
A001 179.8-180.8	12	--	--	--
A001 242.9-243.9	--	1	5	10
A001 243.9-244.3	--	40	<5	<1
A001 244.3-245.3	--	7	<5	1
A001 245.3-246.3	--	4	<5	<1
A001 246.3-247.6	--	5	<5	<1
A001 247.6-248.6	--	4	<5	2

UNITS	ppm	ppb	ppb	ppb	ppb	ppb	ppb
DET. LIM	4	1	1	5	5	1	1
SCHEME	XRF1	FA3	FA3	FA3	FA3	FA3	FA3



442100

Job: SAD0438

O/N:

Final

ANALYTICAL REPORT

SAMPLE	Sn	Au Au Dpl	Pt Pt Dpl	Pd Pd Dpl
A001 248.6-249.6	--	2	<1	--
A001 249.6-250.6	--	6	<1	2
A001 250.6-251.6	--	2	<1	--
A001 251.6-252.6	--	<1	<1	--
A001 252.6-253.6	--	11	<1	--
A001 253.6-254.6	--	5	<1	--
A001 254.6-255.6	--	1	<1	--
A001 255.6-256.6	--	3	<1	--
A001 256.6-257.6	--	2	<1	--
A001 257.6-258.6	--	3	<1	1
A001 258.6-259.6	--	5	<1	--
A001 259.6-260.6	--	3	<1	--
A001 260.6-261.6	--	2	<1	--
A001 261.6-262.6	--	4	<1	--
A001 262.6-263.6	--	3	<1	--
A001 263.6-264.6	--	3	<1	--
A001 264.6-265.6	--	4	<1	--
A001 265.6-266.6	--	5	<1	--
A001 266.6-267.6	--	8	<1	2
A001 267.6-268.6	--	6	<1	--
A001 268.6-269.6	--	4	<1	1
A001 269.6-270.6	--	9	<5	1
A001 270.6-271.6	--	4	<5	3
A001 271.6-272.6	--	4	<5	1
A001 272.6-273.6	--	16	<5	<1
A001 273.6-274.6	--	4	<5	--
A001 274.6-275.6	--	3	<5	5
		5	<5	7
				2

UNITS	ppm	ppb	ppb	ppb	ppb	ppb	ppb
DET.LIM	4	1	1	5	5	1	1
SCHEME	XRF1	FA3	FA3	FA3	FA3	FA3	FA3

A001 magnetic susceptibility readings

from m	to m	mag sus
0	1	0
1	2	0
2	3	0
3	4	0
4	5	0
5	6	0
6	7	0
7	8	0
8	9	0
9	10	0
10	11	0
11	12	0
12	13	0
13	14	0
14	15	0
15	16	0
16	17	0
17	18	0
18	19	0
19	20	0
20	21	0
21	22	0
22	23	0
23	24	0
24	25	0
25	26	0
26	27	0
27	28	0
28	29	0
29	30	0
30	31	0
31	32	0
32	33	0
33	34	0
34	35	0
35	36	0
36	37	0.2
37	38	0.1
38	39	0.2
39	40	0
40	41	0
41	42	0
42	43	0
43	44	0
44	45	0
45	46	0
46	47	0

A001 magnetic susceptibility readings

from m	to m	mag sus
47	48	0
48	49	0.1
49	50	0.1
50	51	0.1
51	52	0.1
52	53	0.1
53	54	0.1
54	55	0.1
55	56	0.1
56	57	0.1
57	58	0.5
58	59	0.2
59	60	7.1
60	61	3.5
61	62	6.0
62	63	6.1
63	64	0
64	65	3.3
65	66	32
66	67	0.1
67	68	0
68	69	0
69	70	0
70	71	0
71	72	0
72	73	0
73	74	0
74	75	0
75	76	0
76	77	0
77	78	0
78	79	0
79	80	0
80	81	0
81	82	0
82	83	0
83	84	0
84	85	0
85	86	0
86	87	0
87	88	0
88	89	0.1
89	90	0.1
90	91	0
91	92	0
92	93	0
93	94	0

A001 magnetic susceptibility readings

from m	to m	mag sus
94	95	0
95	96	0
96	97	0.1
97	98	0.1
98	99	0.1
99	100	0.1
100	101	0.1
101	102	0.1
102	103	0.1
103	104	0.1
104	105	0.1
105	106	0.1
106	107	0.2
107	108	0
108	109	0
109	110	0.1
110	111	0
111	112	0.1
112	113	0.1
113	114	0.1
114	115	0.1
115	116	0.3
116	117	0.5
117	118	0.1
118	119	0.1
119	120	0.3
120	121	0.2
121	122	0.3
122	123	0.5
123	124	0.1
124	125	0.1
125	126	0.2
126	127	0.2
127	128	0.2
128	129	0.1
129	130	0.1
130	131	0.1
131	132	0.1
132	133	0.1
133	134	0.1
134	135	0.1
135	136	0.1
136	137	0
137	138	0
138	139	0
139	140	0
140	141	0.1

A001 magnetic susceptibility readings

from m	to m	mag sus
141	142	0.1
142	143	0.1
143	144	0.1
144	145	0.1
145	146	0.1
146	147	0.1
147	148	0.1
148	149	0.1
149	150	0.1
150	151	0
151	152	0
152	153	0.1
153	154	0.1
154	155	0.1
155	156	0.1
156	157	0.1
157	158	0.1
158	159	0.1
159	160	0.1
160	161	0.1
161	162	0
162	163	0
163	164	0
164	165	0
165	166	0
166	167	0
167	168	0
168	169	0
169	170	0
170	171	0
171	172	0
172	173	0.1
173	174	0.1
174	175	0.1
175	176	0
176	177	0
177	178	0
178	179	0
179	180	0
180	181	0
181	182	0
182	183	0
183	184	0
184	185	0
185	186	0.1
186	187	0.1
187	188	0.1

A001 magnetic susceptibility readings

from	to	mag
m	m	sus
188	189	0.1
189	190	0.1
190	191	0.1
191	192	0.1
192	193	0.1
193	194	0.1
194	195	0.1
195	196	0.1
196	197	0.1
197	198	0.1
198	199	0.1
199	200	0.1
200	201	0.1
201	202	0.1
202	203	0.1
203	204	0.1
204	205	0.1
205	206	0
206	207	0
207	208	0
208	209	0
209	210	0
210	211	0
211	212	0
212	213	0
213	214	0
214	215	0
215	216	0
216	217	0
217	218	0
218	219	0
219	220	0
220	221	0
221	222	0
222	223	0
223	224	0
224	225	0
225	226	0
226	227	0
227	228	0.1
228	229	0.1
229	230	0.1
230	231	0.1
231	232	0.1
232	233	0.1
233	234	0.1
234	235	0.1

A001 magnetic susceptibility readings

from m	to m	mag sus
235	236	0.1
236	237	0.1
237	238	0
238	239	0.1
239	240	0.1
240	241	0.1
241	242	0.2
242	243	2.6
243	244	4.6
244	245	19
245	246	19
246	247	7.5
247	248	17
248	249	12
249	250	17
250	251	27
251	252	25
252	253	20
253	254	16
254	255	15
255	256	11
256	257	12
257	258	11
258	259	8.5
259	260	16
260	261	13
261	262	14
262	263	13
263	264	14
264	265	13
265	266	15
266	267	20
267	268	12
268	269	14
269	270	12
270	271	18
271	272	17
272	273	17
273	274	14
274	275	14
275	276	20
276	277	12
277	278	8.8
278	279	12
279	280	9.4
280	281	8.8
281	282	9.2

A001 magnetic susceptibility readings

from m	to m	mag sus
282	283	17
283	284	23
284	285	9.4
285	286	15
286	287	10
287	288	19
288	289	18
289	290	7.5
290	291	12
291	292	20
292	293	11
293	294	14
294	295	19
295	296	13
296	297	14
297	298	13
298	299	7.7
299	300	11
300	301	8.9
301	302	15
302	303	10
303	304	8.3
304	305	14
305	306	13
306	307	12
307	308	16
308	309	15
309	310	16
310	311	13
311	312	11
312	313	12
313	314	19
314	315	13
315	316.3	15

END OF HOLE AT 316.3m



Central Mineralogical Services

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International: Telephone + 618 8370 9779 Fax + 618 8370 9788

16 March 1998

Mr L.A. Newnham
Newnham Mining & Exploration Services
PO Box 132
RIVERSIDE Tas 7250

REPORT CMS 98/3/3

YOUR REFERENCE: Letter M. McKeown
DATE RECEIVED: 10 March 1998
SAMPLE NO'S: A001 (17 cores)
SUBMITTED BY: M. McKeown
WORK REQUESTED: Petrology, Mineragraphy

H.W. Fander, M.Sc.

c.c. McKeown Mining Pty Ltd
PO Box 50
RIDGLEY Tas 7321

REPORT CMS 98/3/3DDH A001 INTERSECTIONS

Seventeen drill core intersections were received for petrographic and mineralogical study; thin and polished sections were prepared as appropriate and descriptions are appended.

The only serpentinites recognisable as such without doubt were the last three intersections; at **289.9m**, some of the original dunite is preserved, and there is no evidence of gabbroic rocks.

Most of the other rocks are extensively or completely contact-metasomatised, so that the nature of the original rocks are not known or are speculative; normally skarns of this type would be formed from pre-existing carbonate rocks but derivation from strongly magnesian types such as serpentinites could be feasible. Chromium assays could assist in determining the origin of these metasomatised rocks.

The Ni mineralisation is apparently due solely to pentlandite, and the absence of significant amounts of other sulphides is metallurgically attractive. The mineralisation postdates serpentinitisation and predates a later episode of minor shearing.

SAMPLE NO: A001/36.2m (T.S. 67633)

Page 1

CLASSIFICATION: Tremolitised Limestone.

COMPOSITION: Mainly fine-grained calcite pigmented with ultrafine goethite. Extensive development of small, subrandom, replacive tremolite needles throughout. Carbonaceous partings.

FABRIC: Finely-crystalline; faint preferred orientation (bedding) augmented by some subparallel tremolite needles.

MINOR MINERALS: Semi-concordant sulphide veinlets, and crosscutting coarse (white) calcite veins with sulphides. Also small sulphide grains throughout.

INTERPRETATION/COMMENTS: This rock has been thoroughly metasomatised but, unusually, is not recrystallised, ie cannot be termed a marble in the metamorphic sense. The sulphides are not pyrite or pyrrhotite. Ni assay recommended.

SAMPLE NO: A001/48.8m (T.S. 67634)

CLASSIFICATION: Phlogopitised Subgreywacke.

COMPOSITION: Framework of matrix-supported sub-angular to subrounded grains of quartz, argillised feldspar, felsite, rhyolite, in a fine siliceous matrix with many small patches of fine replacive phlogopite.

FABRIC: Poorly to moderately sorted sand-sized grains, crudely bedded, with occasional silty-shaly intercalations. Indurated.

MINOR MINERALS: Quartz-sulphide veinlets; also fine sulphides throughout. Fine black pigmentation may be carbonaceous matter.

INTERPRETATION/COMMENTS: Volcanic components may be more plentiful but not recognisable because of alteration (?vitric material). Sulphides were mostly introduced with the replacive phlogopite, with later veining.

SAMPLE NO: A001/60.4m (T.S. 67635) Page 2

CLASSIFICATION: Diopside Hornfels.

COMPOSITION: Dominantly composed of random prismatic crystals of diopside, with interstitial patches of unusual green/brown chlorite in which sulphides preferentially occur.

FABRIC: Variable crystallinity, with some diopside crystals up to 12mm long. No relict textures to indicate nature of original rock.

MINOR MINERALS: Conspicuous sulphides (pyrrhotite and a trace of dark sphalerite). Trace of carbonate.

INTERPRETATION/COMMENTS: Nature of original rock not known, presumably represented by chlorite patches. Possibly ultramafic but this is speculative and other interpretations are possible.

SAMPLE NO: A001/73.8m (T.S. 67637)

CLASSIFICATION: Actinolite Hornfels.

COMPOSITION: Consists very largely of matted pale-green actinolite needles which have completely replaced the pre-existing rock. Patches of dark tourmaline (schorl) formed after the actinolite.

FABRIC: Relict textures indicate a fine-grained, bedded sediment. Some faulting/shearing occurred after actinolite formation and preceded tourmalinisation.

MINOR MINERALS: Ultrafine leucoxene/rutile occurs throughout, possibly inherited from the primary rock.

INTERPRETATION/COMMENTS: Thought to have been a semi-calcareous fine-grained sediment, thoroughly metasomatised, then sheared, followed by tourmalinisation.

SAMPLE NO: A001/88.6m (T.S. 67638) Page 3

CLASSIFICATION: Metachert.

COMPOSITION: Bands of microcrystalline quartz, with bands and lenses containing abundant fine apatite and ultrafine white leucoxene. Streaks and lenses of carbonate, partly replaced by actinolite.

FABRIC: Strong relict bedding, banding, and parallel lenses. No clastic textures recognisable.

MINOR MINERALS: Crosscutting veinlets of untwinned alkali feldspar and of quartz. Occasional grains of sphene.

INTERPRETATION/COMMENTS: Originally a silica-rich chemical sediment, mainly chert, with phosphatic lenses and bands.

SAMPLE NO: A001/121.0m (T.S. 67639)

CLASSIFICATION: Metasomatised Sediment.

COMPOSITION: Chiefly composed of alternating bands of fine-grained orange/amber phlogopite and bands and lenses of pale green, random actinolite needles, with relict cherty lenses and streaks.

FABRIC: General banding, due to replacement of beds of different composition by specific minerals. Minerals are fine-grained within bands.

MINOR MINERALS: Conspicuous sulphides associated with the actinolite rather than phlogopite. A few relatively large apatite crystals in phlogopite.

INTERPRETATION/COMMENTS: Originally a chemical sediment, perhaps correlatable with and broadly similar to 88.6m though less cherty, more argillic. Needs a Ni assay.

SAMPLE NO: A001/150.9m (T.S. 67640) Page 4

CLASSIFICATION: Metasomatised Clastic Sediment (?Tuff).

COMPOSITION: Bands of clastic grains suspected to have been glassy, feldspathic and felsic volcanics, but now completely altered to quartz-sericite and variably replaced by fine actinolite. Parallel veins of K-feldspar/actinolite/epidote/quartz.

FABRIC: Original bedding and clastic (framework grain) textures have survived; very few clastic quartz grains.

MINOR MINERALS: Conspicuous semi-opaque finely granular leucoxene-sphene occurs throughout. Crosscutting chlorite-carbonate veins.

INTERPRETATION/COMMENTS: The inferred composition of the original rock suggests that it was a lithic-feldspathic tuff of felsic to intermediate derivation.

SAMPLE NO: A001/164.6m (T.S. 67641)

CLASSIFICATION: Axinite Rock.

COMPOSITION: Dominantly composed of large random bladed axinite crystals with characteristic habit, and minor ragged diopside patches, with patches of very dark Fe-rich sphalerite (marmatite).

FABRIC: Random, coarsely-crystalline, with some radiating-prismatic crystal groups. Sphalerite 50 μ - 10mm+.

MINOR MINERALS: A few interstitial carbonate patches. Ultrafine leucoxene-sphene in places, probably inherited from original rock.

INTERPRETATION/COMMENTS: Origin of rock unknown but was presumably a carbonate which was metasomatised/pneumatolysed.

SAMPLE NO: A001/178.4m (T.S. 67642) Page 5

CLASSIFICATION: Axinite Skam.

COMPOSITION: Mainly large prismatic axinite crystals, with minor interstitial quartz, actinolite, diopside. Poikiloblastic crystals of dark green tourmaline partly enclosing the other minerals.

FABRIC: Coarsely-crystalline with random fabric. No relict textures. Typical skam fabric. Tourmaline was the last mineral to form.

MINOR MINERALS: A few calcite patches and chlorite aggregates. Conspicuous ultrafine leucoxene in parallel lines throughout the other minerals.

INTERPRETATION/COMMENTS: Similar to 164.6m but with more diver composition.

SAMPLE NO: A001/227.5m (T.S. 67643)

CLASSIFICATION: Sheared, Altered Diopside Skam.

COMPOSITION: Relict parallel bands of pale, prismatic diopside crystals with intercalated masses of fine replacive phlogopite (green) as dense matted flakes.

FABRIC: Banded structure probably due to parallel shears along which phlogopite alteration proceeded.

MINOR MINERALS: Occasional sphene crystals and small sulphide grains.

INTERPRETATION/COMMENTS: Appears to have been a virtually monomineralic diopside rock, sheared and retrograded. Originally a carbonate rock (?dolomite).

SAMPLE NO: A001/239.4m (T.S. 67644)

Page 6

CLASSIFICATION: Phlogopitised Skam.

COMPOSITION: Remnant irregular patches of small prismatic diopside crystals intergrown with flakes of pale phlogopite, set in a mass of ultrafine, pale phlogopite.

FABRIC: Mostly very fine-grained, dense phlogopite; diopside and adjacent phlogopite coarser, up to 0.5mm. No relict textures.

MINOR MINERALS: Black oxide opaques, with sphene rims. Occasional small patches of sericite, chlorite.

INTERPRETATION/COMMENTS: Similar to 227.5m; probably originally a diopside skam, extensively retrograded.

SAMPLE NO: A001/245.7m (T.S.67646)

CLASSIFICATION: Diopside Skam.

COMPOSITION: Almost monomineralic, consisting of fresh granular to prismatic crystals of diopside, with aggregates of small magnetite crystals.

FABRIC: Finely-crystalline, with patches of larger crystals up to 3mm. No relict features.

MINOR MINERALS: A few small patches of pale chlorite. Isolated pyrrhotite patches.

INTERPRETATION/COMMENTS: No evidence of serpentinitic origin, no chromite seen.

SAMPLE NO: A001/250.4m (T.S. 67467) Page 7

CLASSIFICATION: Steatitised Serpentine.

COMPOSITION: Dark areas are serpentinite, consisting of antigorite/chrysotile with characteristic mesh textures, pigmented with ultrafine magnetite. There are large areas of replacive talc, with granular magnetite.

FABRIC: The mesh fabric is medium-grained and is typical of a dunite. The talc is clearly replacive.

MINOR MINERALS: Patches of pentlandite, associated with the granular magnetite. *See separate description.*

INTERPRETATION/COMMENTS: The mineralisation appears to be associated with the magnetite and with the replacive talc. The serpentinite is of ultramafic origin (ie not gabbroic).

SAMPLE NO: A001/271.3m (T.S. 67648)

CLASSIFICATION: Serpentine (Sheared).

COMPOSITION: Classical network fabric of antigorite units pigmented with ultrafine magnetite, and fine chrysotile veinlets and networks of magnetite veinlets.

FABRIC: Network textures are coarser - grained than at 250m, indicating original grainsizes of 1-2mm for individual olivine crystals. Thin parallel shears postdating the sulphides.

MINOR MINERALS: Concordant and crosscutting pentlandite and magnetite veins. Chlorite in shears. Sulphides postdate the serpentinitisation (*see separate description*).

INTERPRETATION/COMMENTS: Originally a dunite or peridotite, correlatable with 250.4m but coarser and not steatitised. Sulphides were introduced after serpentinitisation and before shearing. There are two generations of magnetite, (a) ultrafine, from breakdown of olivine; (b) introduced, much coarser.

SAMPLE NO: A001/289.9m (T.S. 67649) Page 8

CLASSIFICATION: Tremolitised Serpentinite.

COMPOSITION: Dominantly composed of relatively large, stout prismatic crystals of tremolite, with irregular interstitial patches of pale chlorite and antigorite. *See below for a further description.*

FABRIC: Antigorite patches have shadowy serpentine network textures, and tremolite is clearly replacive.

MINOR MINERALS: Chromite grains with magnetite rims. Fine magnetite as small inclusions in tremolite. Scattered small pyrrhotite and pentlandite patches.

INTERPRETATION/COMMENTS: The distribution of the dark serpentinite patches in the core indicate very variable replacement by tremolite. *See below.*

SAMPLE NO: A001/289.9m (T.S. 67649)A

CLASSIFICATION: Partly Altered Serpentinite.

COMPOSITION: Another section was prepared and consisted of only incipiently to partly serpentinised dunite (forsterite olivine) with olivine crystals up to 3mm. It has been partly replaced by coarse tremolite, and this in turn is partly replaced by pale green talc. In some places talc directly replaces serpentinite. Sulphides are associated mainly with tremolite. The occurrence of forsterite (the Mg end-member) is unusual, as olivine generally contains some Fe.

This rock shows a complex alteration history.

MINERAGRAPHY OF SELECTED SAMPLESA001/61.7m (PS 67636)

The dominant sulphide is pyrrhotite as branching veinlike masses in a host of dense, dark chlorite. Some pyrrhotite is altered to pyrite, and there are thin, fine inclusions ("flames") of pentlandite sporadically distributed through the pyrrhotite. There are also small chalcopyrite inclusions.

A001/244.2m (PS 67645)

This consists almost entirely of massive, coarsely-crystalline fresh pentlandite, cut by occasional pyrite veinlets and containing a few thin lamellae of chalcopyrite and pyrrhotite.

Photo 1; magnification = 135x

A001/250.4m (PS 67647)

The only sulphide detected was pentlandite, as coarsely-crystalline masses with good cleavage, cut by magnetite veinlets. There are associated masses of granular magnetite and fine magnetite along cleavage-planes.

Photo 2; magnification = 135x

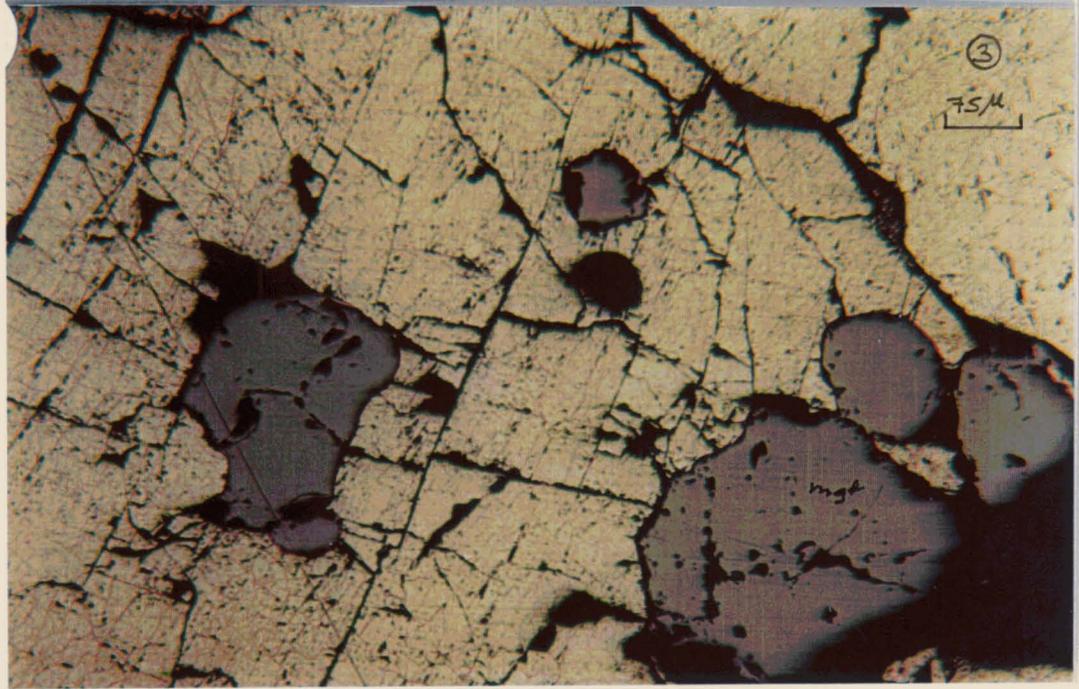
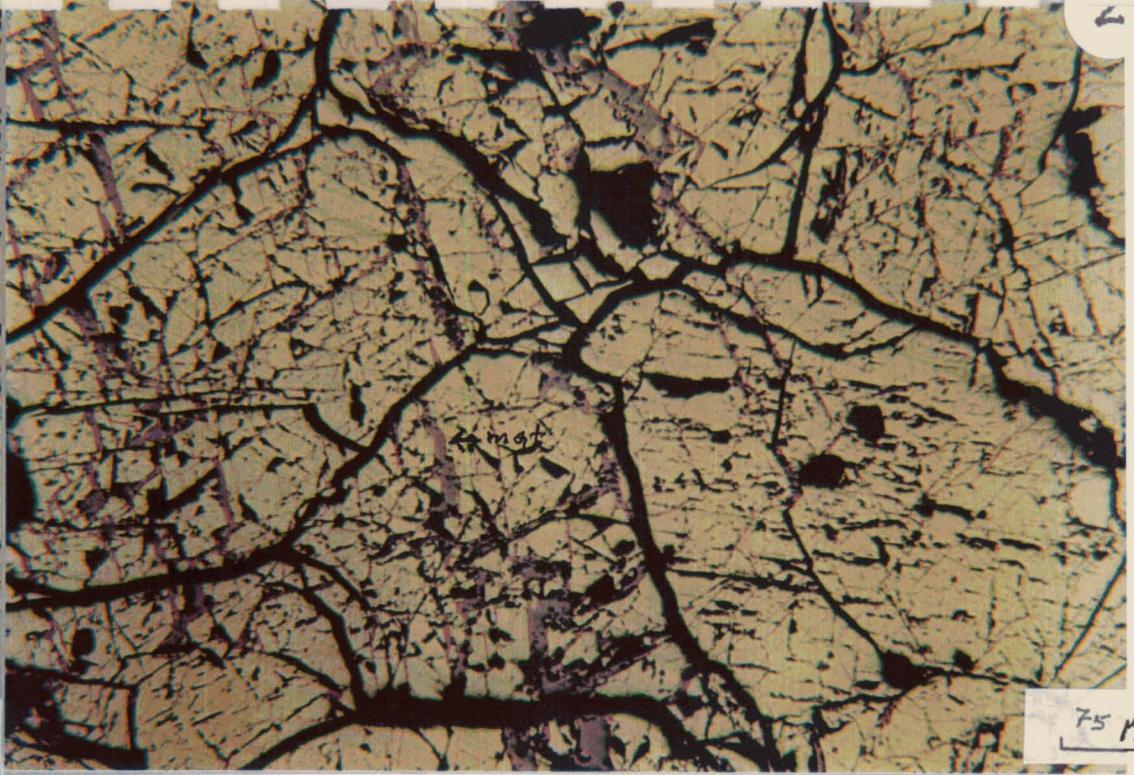
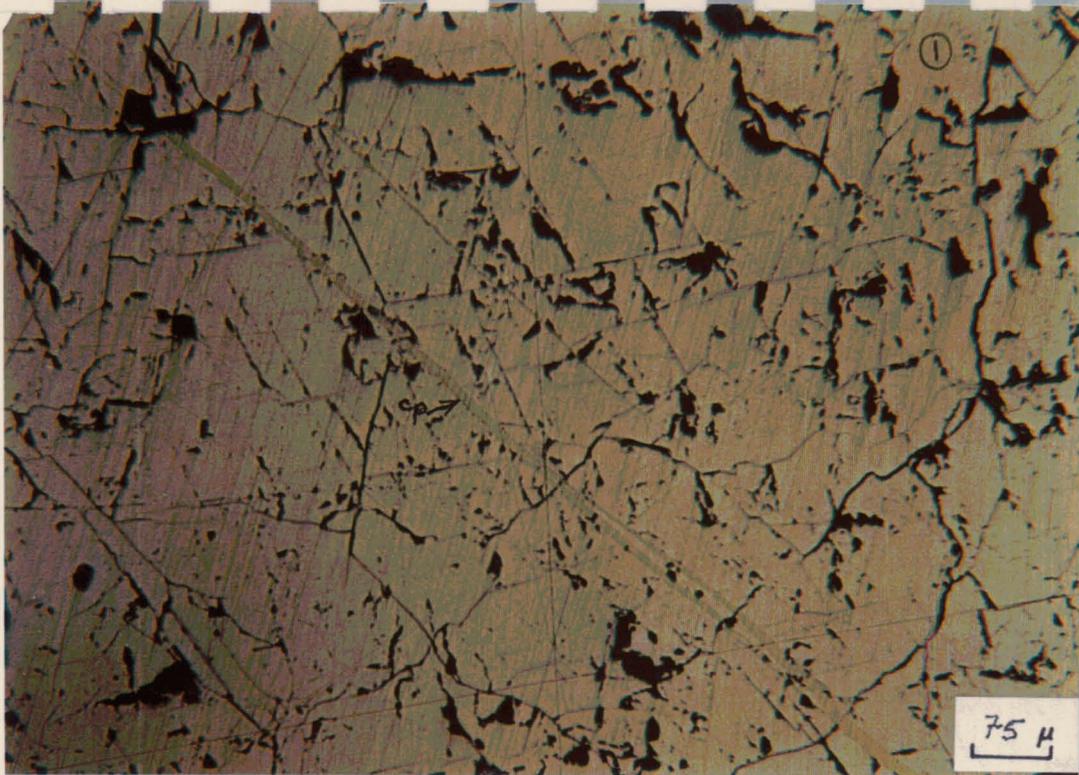
A001/271.3m (PS 67648)

Again, the only sulphide was pentlandite, as well-cleaved coarsely-crystalline masses; coarser granular magnetite is associated. There are traces of chalcopyrite in the magnetite.

Photo 3; magnification = 135x

In all these samples, the Co is contained in the pentlandite; there is a constant relationship between Co and Ni.

Metallurgically, the occurrence of only one sulphide is a very significant advantage, enabling high-grade Ni concentrates to be produced with the minimum of processing.



442119

**ALLEGIANCE MINING NL ZEEHAN JOINT VENTURE
AVEBURY GRID
A002**

Collar coordinates see plan attached
Collar bearing 180⁰
Collar dip -50⁰
Coordinate system AMG

Final hole depth 307.0m
Hole length 307.0m
Hole details 0.0m to 26.7m tricone
26.7m to 54.4m HQ
54.4m to 307.0m NQ

Drilled to test central part of a magnetic anomaly on the Avebury grid.

Commenced 26 January 1998
Completed 3 February 1998

Drilled by Diamond Drilling Tasmania
Logged by Mick McKeown (McKeown Mining)
Assays by AMDEL, Adelaide

SUMMARY OF RESULTS

from m	to m	description	length m	Ni	S %
118.3	120.3	serpentinite	2.0	0.14%	0.08

A002

DEPTH	DIP	BRG AMG	FROM	TO	DISTANCE	VERTICAL	CUM VD	HD	CUM HD	HDCOSBRG
0	-50.0	180	0	25	25.0	-19.2	-19.2	16.1	16.1	-16.1
50	-52.0	182	25	75	50.0	-39.4	-58.6	30.8	46.9	-30.8
100	-49.5	182	75	125	50.0	-38.0	-96.6	32.5	79.3	-32.5
150	-52.0	183	125	175	50.0	-39.4	-136.0	30.8	110.1	-30.7
200	-52.0	179	175	225	50.0	-39.4	-175.4	30.8	140.9	-30.8
250	-53.0	179	225	275	50.0	-39.9	-215.3	30.1	171.0	-30.1
300	-53.0	181	275	307.0	32.0	-25.6	-240.9	19.3	190.2	-19.3

442121

COMPANY Allegiance Mining NL
 PROJECT Zeehan Joint Venture
 HOLE NUMBER A002

from m	to m	DESCRIPTION	from m	to m	rec m	rec %	from m	to m	Ni %	S %
0.0	26.7	no recovery - triconed	0.0	26.7	0.0	0				
26.7	33.2	HORNFELS	26.7	29.7	2.0	67	29.7	32.8	2.7	87
		Extremely broken, moderately weathered, grey hornfels with common limonite on joints and fractures, trace pyrite on joints, sparse quartz as veinlets and stringers; the interval is slightly vuggy due to the effects of weathering.								
		BCA is typically 50 degrees.								
		The contact with the next interval is sharp but irregular.								
33.2	58.4	HORNFELS AND MINOR CHERT	32.8	35.7	2.9	100	35.7	38.7	3.0	100
		Dark grey hornfels with minor brown cherty bands and occasional green chloritic? bands, with sparse chlorite as stringers and veinlets, trace to sparse pyrrhotite as disseminations, flecks and stringers, sparse limonite on joints, sparse quartz as veinlets and stringers.	38.7	41.7	3.0	100	41.7	44.7	3.0	100
		Some bands appear to be tuffaceous, composed of fine rock fragments.	44.7	47.7	3.0	100	47.7	49.2	1.5	100
		The interval is broken to extremely broken in part.	49.2	50.7	1.5	100	50.7	52.2	1.5	100
		BCA ranges from 50 to 70 degrees.	52.2	54.4	2.2	100	54.4	57.3	2.9	100
		The contact with the next interval is gradational.	57.3	60.4	3.1	100				
58.4	117.3	ALTERED ROCK, HORNFELS AND CHERT	60.4	63.5	2.9	94	63.5	66.3	2.3	82
		Green, fine grained altered rock (tuff?) with common, ruptured, white to green white	66.3	69.3	3.0	100				

COMPANY Allegiance Mining NL
 PROJECT Zeehan Joint Venture
 HOLE NUMBER A002

from m	to m	DESCRIPTION	from m	to m	rec m	rec %	from m	to m	Ni %	S %
		and brown white cherty bands, and minor intermixed grey hornfels, with sparse quartz as stringers and veinlets, trace disseminated pyrrhotite, trace fine schorl crystals.	69.3	72.4	3.1	100				
			72.4	75.5	3.1	100				
			75.5	78.3	2.8	100				
			78.3	81.3	3.0	100				
		Many cherty bands are ruptured and BCA is irregular, ranging from 30 to 70 degrees, and is typically 50 degrees.	81.3	84.4	3.1	100				
			84.4	87.5	3.1	100				
			87.5	90.6	3.1	100				
		The interval is broken.	90.6	93.1	2.5	100				
			93.1	94.0	0.9	100				
		The interval has a brecciated texture in part, particularly where cherty.	94.0	97.0	3.0	100				
			97.0	100.0	3.0	100				
		The contact with the next interval is sharp but broken.	100.0	103.0	3.0	100				
			103.0	106.0	3.0	100				
			106.0	109.0	3.0	100				
			109.0	112.0	3.0	100				
			112.0	114.8	2.8	100				
			114.8	117.9	3.1	100				
117.3	158.8	SERPENTINITE WITH MAGNETITE	117.9	121.0	3.1	100	117.3	118.3	0.06	0.07
			121.0	123.9	2.9	100	118.3	119.3	0.14	0.08
		Black serpentinite with minor magnetite and trace to sparse pyrrhotite as disseminations and stringers.	123.9	127.0	3.1	100	119.3	120.3	0.13	0.08
			127.0	130.0	3.0	100	120.3	121.3	0.11	0.14
			130.0	133.0	3.0	100	121.3	122.3	0.10	0.13
		CA is obscure.	133.0	136.0	3.0	100	122.3	123.3	0.08	0.11
			136.0	139.0	3.0	100	123.3	124.3	0.07	<0.05
		The interval is broken.	139.0	142.0	3.0	100				
			142.0	145.0	3.0	100	136.0	137.0	0.19	0.17
		The contact with the next interval is sharp but broken.	145.0	148.0	3.0	100				
			148.0	151.0	3.0	100	151.0	152.0	0.20	0.28
			151.0	154.0	3.0	100				
			154.0	157.0	3.0	100	157.8	158.8	0.09	<0.05

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COMPANY Allegiance Mining NL
PROJECT Zeehan Joint Venture
HOLE NUMBER A002

from m	to m	DESCRIPTION	from m	to m	rec m	rec %	from m	to m	Ni %	S %
158.8	187.6	CHERT AND CHERTY HORNFELS	157.0	160.0	3.0	100	158.8	159.8	0.04	<0.05
			160.0	163.0	3.0	100				
		Green, brown and minor black chert and cherty hornfels, with sparse quartz and schorl as stringers and veinlets, sparse calcite as stringers, trace to sparse serpentine as stringers; the quartz veinlets are slightly vuggy.	163.0	166.0	3.0	100	172.0	173.0	0.02	<0.05
			166.0	169.0	3.0	100	173.0	174.0	0.02	<0.05
			169.0	172.0	3.0	100				
			172.0	175.0	3.0	100	186.6	187.6	0.16	<0.05
		The hornfels appears sandy in part; parts of the interval have a mottled pebbly texture.	175.0	178.0	3.0	100				
			178.0	181.0	3.0	100				
		Bedding in the more cherty parts is ruptured. BCA is irregular and is typically 40 degrees.	181.0	184.0	3.0	100				
			184.0	187.0	3.0	100				
		The interval is broken.								
		The contact with the next interval is sharp but irregular.								
187.6	193.1	SERPENTINITE WITH MAGNETITE	187.0	190.0	3.0	100	187.6	188.0	0.90	0.72
			190.0	193.0	3.0	100	188.0	189.0	0.24	0.07
		Intermixed, mottled light green and dark green to black serpentinite, with minor magnetite as patches and blebs, sparse dark green serpentine as veinlets; the black serpentinite contains more magnetite than the light green.					189.0	190.0	0.17	<0.05
		The interval is broken to extremely broken.								
		The contact with the next interval is sharp but broken, and is marked by 5cm of puggy serpentinitic breccia: a faulted contact?								
193.1	201.0	SERPENTINITE WITH MINOR CHRYSOTILE	193.0	196.0	3.0	100				
			196.0	198.1	2.1	100				
		Black serpentinite with minor green serpentinite as spots up to 1cm across, with minor chrysotile as veinlets.	198.1	201.2	3.1	100				

COMPANY Allegiance Mining NL
PROJECT Zeehan Joint Venture
HOLE NUMBER A002

from m	to m	DESCRIPTION	from m	to m	rec m	rec %	from m	to m	Ni %	S %
		The interval is very broken, especially near the chrysotile veinlets.								
		The contact with the next interval is gradational.								
201.0	226.0	MOTTLED SERPENTINITE	201.2	203.9	2.7	100				
			203.9	207.0	3.1	100				
		Mottled black and green serpentinite; green serpentinite occurring as spots and patches within black serpentinite, with sparse green serpentine on fractures, trace disseminated, fine grained pyrrhotite.	207.0	208.0	1.0	100				
			208.0	211.0	3.0	100				
			211.0	214.0	3.0	100				
			214.0	217.0	3.0	100				
		The interval is generally not broken.	217.0	220.0	3.0	100				
			220.0	223.0	3.0	100				
		The contact with the next interval is gradational.	223.0	225.0	2.0	100				
226.0	251.0	SERPENTINITE WITH SPARSE CHRYSOTILE	225.0	228.0	3.0	100				
			228.0	231.2	3.2	100				
		As between 193.1m and 201.0m with sparse chrysotile becoming more common towards end of the interval, with rare puggy zones up to 30cm long.	231.2	234.3	3.1	100				
			234.3	237.4	3.1	100				
			237.4	240.2	2.8	100				
		The interval is broken.	240.2	243.3	3.1	100				
			243.3	246.5	3.2	100				
		The contact with the next interval is gradational.	246.5	249.6	3.1	100				
251.0	307.0	SERPENTINITE WITH MINOR CHRYSOTILE	249.6	252.7	3.1	100	301.0	302.0	0.19	0.06
			252.7	255.8	3.1	100	302.0	303.0	0.18	<0.05
		As between 226.0m and 251.0m with minor chrysotile.	255.8	258.9	3.1	100	303.0	304.0	0.19	<0.05
			258.9	262.0	3.1	100				
		The interval is broken to extremely broken.	262.0	265.0	3.0	100				
			265.0	268.0	3.0	100				
		END OF HOLE AT 307.0m	268.0	271.0	3.0	100				

COMPANY Allegiance Mining NL
PROJECT Zeehan Joint Venture
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from m	to m	DESCRIPTION	from m	to m	rec m	rec %	from m	to m	Ni %	S %
			271.0	274.0	3.0	100				
			274.0	277.0	3.0	100				
			277.0	280.0	3.0	100				
			280.0	283.0	3.0	100				
			283.0	286.0	3.0	100				
			286.0	289.0	3.0	100				
			289.0	292.0	3.0	100				
			292.0	295.0	3.0	100				
			295.0	298.0	3.0	100				
			298.0	301.0	3.0	100				
			301.0	304.0	3.0	100				
			304.0	307.0	3.0	100				

A002ASS

A002

from m	to m	Ag ppm	As ppm	Co ppm	Cu ppm	Ni ppm	Pb ppm	S ppm	Zn ppm
69.4	70.4	<1	8	26	29	175	25	<500	175
73.4	74.4	<1	<3	31	16	150	10	<500	250
90.6	91.6	<1	8	36	82	91	55	2850	130
98.0	99.0	<1	26	33	33	105	25	<500	185
102.0	103.0	<1	8	36	12	79	10	<500	180
115.8	117.3	<1	165	86	230	900	15	550	270
117.3	118.3	<1	82	49	120	600	25	650	170
118.3	119.3	<1	125	35	17	1400	25	750	155
119.3	120.3	<1	240	44	10	1250	20	800	150
120.3	121.3	<1	380	37	16	1050	20	1350	240
121.3	122.3	<1	66	57	<2	950	15	1250	125
122.3	123.3	<1	61	51	<2	800	20	1050	155
123.3	124.3	<1	57	45	<2	700	10	<500	180
136.0	137.0	<1	32	80	<2	1900	20	1700	105
151.0	152.0	<1	42	80	<2	2000	10	2750	100
157.8	158.8	<1	26	65	5	850	10	<500	160
158.8	159.8	<1	52	39	115	390	45	<500	87
172.0	173.0	<1	<3	44	8	155	15	<500	89
173.0	174.0	<1	<3	45	20	210	20	<500	140
186.6	187.6	<1	24	97	<2	1550	10	<500	185
187.6	188.0	<1	99	260	32	9000	60	7200	600
188.0	189.0	<1	96	55	<2	2350	<5	700	360
189.0	190.0	<1	40	39	<2	1700	<5	<500	135
301.0	302.0	<1	38	80	<2	1900	5	550	110
302.0	303.0	<1	30	71	<2	1750	<5	<500	105

A002ASS

A002

from m	to m	Ag ppm	As ppm	Co ppm	Cu ppm	Ni ppm	Pb ppm	S ppm	Zn ppm
303.0	304.0	<1	30	75	<2	1850	5	<500	115
method detection limit		IC3E 1	IC3E 3	IC3E 2	IC3E 2	IC3E 2	IC3E 5	IC3E 500	IC3E 2

A002 magnetic susceptibility readings

from m	to m	mag sus
29	30	0
30	31	0
31	32	0
32	33	0
33	34	0
34	35	0
35	36	0
36	37	0
37	38	0
38	39	0
39	40	0
40	41	0
41	42	0
42	43	0
43	44	0
44	45	0
45	46	0
46	47	0
47	48	0.4
48	49	0.5
49	50	0.1
50	51	0
51	52	0
52	53	0
53	54	0
54	55	0
55	56	0
56	57	0
57	58	0
58	59	0
59	60	0
60	61	0
61	62	0.1
62	63	0
63	64	0
64	65	0
65	66	0
66	67	0
67	68	0
68	69	0
69	70	0
70	71	0.1
71	72	0
72	73	0
73	74	0
74	75	0
75	76	0

A002 magnetic susceptibility readings

from m	to m	mag sus
76	77	0.1
77	78	0.1
78	79	0.1
79	80	0
80	81	0
81	82	0
82	83	0
83	84	0
84	85	0
85	86	0
86	87	0
87	88	0
88	89	0
89	90	0
90	91	0
91	92	0.1
92	93	0.1
93	94	0.1
94	95	0.1
95	96	0.1
96	97	0.1
97	98	0
98	99	0
99	100	0
100	101	0
101	102	0
102	103	0.1
103	104	0.1
104	105	0
105	106	0
106	107	0
107	108	0
108	109	0
109	110	0
110	111	0
111	112	0.1
112	113	0.1
113	114	0.1
114	115	0
115	116	0
116	117	0.1
117	118	0.1
118	119	0.1
119	120	0
120	121	14
121	122	36
122	123	47

A002 magnetic susceptibility readings

from m	to m	mag sus
123	124	31
124	125	38
125	126	4.4
126	127	5.6
127	128	5.1
128	129	22
129	130	5.2
130	131	8.5
131	132	4.9
132	133	7.4
133	134	8.3
134	135	6.1
135	136	4.8
136	137	8.1
137	138	6.7
138	139	5.1
139	140	7.1
140	141	6.0
141	142	6.2
142	143	5.9
143	144	8.0
144	145	6.4
145	146	6.4
146	147	6.5
147	148	3.4
148	149	3.5
149	150	4.4
150	151	5.8
151	152	3.4
152	153	3.9
153	154	5.3
154	155	6.0
155	156	7.5
156	157	9.8
157	158	35
158	159	0.4
159	160	0.1
160	161	0
161	162	0
162	163	0
163	164	0
164	165	0
165	166	0
166	167	0
167	168	0
168	169	0
169	170	0

A002 magnetic susceptibility readings

from m	to m	mag sus
170	171	0
171	172	0
172	173	0
173	174	0
174	175	0
175	176	0
176	177	0
177	178	0
178	179	0
179	180	0.1
180	181	0.1
181	182	0.1
182	183	0.1
183	184	1.2
184	185	0.2
185	186	3.6
186	187.4	4.2
187.4	188.4	16
188.4	189.4	29
189.4	190.4	20
190.4	191.4	15
191.4	192.4	29
192.4	193	26
193	194	10
194	195	3.7
195	196	3.1
196	197	2.9
197	198	3.2
198	199	4.3
199	200	5.3
200	201	4.0
201	202	5.4
202	203	4.9
203	204	4.2
204	205	3.8
205	206	4.6
206	207	4.2
207	208	6.0
208	209	6.6
209	210	6.7
210	211	5.9
211	212	5.6
212	213	6.1
213	214	4.8
214	215	6.1
215	216	5.5
216	217	5.4

A002 magnetic susceptibility readings

from m	to m	mag sus
217	218	4.1
218	219	6.3
219	220	5.7
220	221	4.7
221	222	4.2
222	223	4.7
223	224	3.8
224	225	4.0
225	226	4.2
226	227	3.5
227	228	4.5
228	229	3.6
229	230	4.6
230	231	4.2
231	232	4.1
232	233	5.2
233	234	7.1
234	235	2.8
235	236	2.5
236	237	2.4
237	238	4.0
238	239	2.5
239	240	2.2
240	241	3.9
241	242	4.0
242	243	3.7
243	244	7.6
244	245	5.5
245	246	2.4
246	247	4.9
247	248	3.2
248	249	2.7
249	250	5.1
250	251	4.2
251	252	3.5
252	253	3.8
253	254	4.3
254	255	3.1
255	256	3.1
256	257	1.4
257	258	1.6
258	259	3.1
259	260	2.6
260	261	2.0
261	262	3.6
262	263	0.8
263	264	2.3

A002 magnetic susceptibility readings

from m	to m	mag sus
264	265	3.1
265	266	2.4
266	267	1.1
267	268	1.7
268	269	1.5
269	270	1.2
270	271	0.6
271	272	1.0
272	273	1.3
273	274	1.4
274	275	2.3
275	276	2.6
276	277	1.6
277	278	1.9
278	279	1.7
279	280	2.0
280	281	1.5
281	282	1.8
282	283	1.2
283	284	2.7
284	285	2.0
285	286	2.1
286	287	1.9
287	288	1.5
288	289	1.4
289	290	1.4
290	291	1.1
291	292	0.8
292	293	0.8
293	294	1.3
294	295	2.1
295	296	2.5
296	297	2.2
297	298	1.5
298	299	1.3
299	300	1.5
300	301	1.8
301	302	0.7
302	303	1.8
303	304	2.0
304	305	1.4
305	306	3.1
306	307	4.9

END OF HOLE AT 307.0m

Appendix 3

Drill logs of holes TH1 to TH3

SUMMARY LOG

HOLE NUMBER: TH1

from m	to m	
0.0	7.0	rubble
7.0	65.8	hornfels and chert
65.8	69.5	serpentinite with magnetite and sparse pyrrhotite
69.5	72.5	serpentinised dolomite? with sparse pyrrhotite
72.5	90.9	hornfels and chert
90.9	95.2	serpentinite with magnetite and trace to sparse pyrrhotite
95.2	212.0	hornfels and chert with occasional traces of pyrrhotite, occasional patches of leucoxene spotting, occasional patches of phlogopitisation, sparse schorl in part, rare green chlorite (serpentine?) veinlets, rare axinite veinlets
212.3	212.8	serpentinite with magnetite and sparse to minor pyrrhotite
212.8	318.5	hornfels and altered rocks with trace to sparse pyrrhotite
318.5	413.2	granite

END OF HOLE AT 413.2m

THE MOUNT LYELL MINING AND RAILWAY COMPANY LIMITED

021

ADVANCE		RECOVERY		ASSAYS %								BULK ASSAYS						REMARKS	
From	To	m.	%	From	To	m.	%Cu	%Fe	%Mg	%Zn	From	To	m.	%Cu	%Fe	%Mg	%Zn		
				200	202	2	0.06	40.10	635	30	410								
					204		0.08		530	5	40								
					206		0.06		300	5	30								
					208				230	5	60								
					210		0.05		475	5	70								
					212		0.03		615	45	85								
					214				570	45	115								
					216				280	45	70								
					218		0.04		170	45	50								
					220		0.05		170	45	50								
					222		0.05		90	45	35								
					224				65		45								
					226		0.04		100		65								
					228				200		55								
					230				150		55								
					232				130		55								
					234				110		55								
					236				85	5	50								
					238		0.05		45	45	55								
					240		0.06		30		55								
					242		0.05		30	5	45								
					244		0.06		40	45	60								
					246				60		55								
					248		0.12		60		55								
					250		0.03	40.10	80		50								
					252		0.06		65	50	75								
					254				35	45	65								
					256		0.05		20	410	55								
					258		0.05		580	410	80								
					260				130		60								
					262		0.05		400		85								
					264		0.08		165		135								
					266		0.03		1800		45								
					268		0.06		710		70								
					270				830		35								
					272				115		55								
					274				70		65								
					276		0.06		136	10	180								
					278				60	410	600								
					280		0.06		45		75								
					282		0.07		80		100								
					284		0.12		85		315								
					286		0.05		25	10	75								
					288		0.03		45	40	40								
					290		0.06		150		80								
					292		0.03		120	10	55								
					294				40	40	60								

THE MOUNT LYEELL MINING AND RAILWAY COMPANY LIMITED

T.H.1

ADVANCE			RECOVERY			ASSAYS			BULK ASSAYS			REMARKS
From	To	m.	From	To	m.	Gravimetric	Gravimetric	Gravimetric	Gravimetric	Gravimetric	Gravimetric	
294	296	2	294	296	2	0.05	5.18	85	410	70		
	298			298		0.04		55		55		
	300			300			6.0		195			
	302			302			205	10	45			
	304			304			35	410	60			
	306			306			970	40	110			
	308			308			25	10	75			
	310			310			150	410	80			
	312			312			85	10	70			
	314			314			270		75			
	316			316		0.03	235	410	70			
	318			318			395		60			
	320			320		0.06	35	10	70			
	322			322		0.07	30	55	200			
	324			324		0.08	45	30	150			
	326			326		0.07		35	80	110		
	328			328		0.06	70	30	55			
	330			330		0.04	50	20	105			
	332			332			85	25	65			
	334			334			40	10	35			
	336			336			30	20	60			
	338			338		0.07	60	410	95			
	340			340			75	15	65			
	342			342			30	10	30			
	344			344		0.06	40	15	30			
	346			346		0.07	35	10	45			
	348			348		0.14	100	20	60			
	350			350		0.06	85	20	55			
	352			352			20	10	40			
	354			354			65	10	75			
	356			356		0.07	60	15	35			
	358			358			25	20	20			
	360			360		0.06	135	20	35			
	362			362			585	120	235			
	364			364			100	30	65			
	366			366		0.10	55	60	30			
	368			368		0.06	60	10	35			
	370			370			90	20	45			
	372			372			30	50	35			
	374			374			35	20	45			
	376			376			30	410	35			
	378			378		0.08	65	10	30			
	380			380		0.07	20	15	35			
	382			382		0.06	10	10	35			
	384			384			50	510	60			
	386			386		0.07	30	15	110			
	388			388		0.06	15	410	35			

016

	DESCRIPTION	REMARKS
0 - 6.00 m	Soil, sand and rubble.	
6.00 - 32.29 m	Dark grey/black/purple shale with minor bands of slightly coarser material - fine grained tuffaceous sediments? e.g. 16.10 - 16.70 m. Very fine grained sulphide scattered through core - vein of massive pyrite at 31.00 m. Magnetite throughout core.	6.00 - 14.50 m ground badly broken.
32.29 - 32.85 m	Light grey fine grained igneous rock? Possibly aplitic? Very fine light crystals in a darker groundmass. Rock is intermittently altered either side of this; back to 30.25 m and downhole to 39.25 m - latter zone shows extensive silicification with less magnetite.	
32.85 - 65.75 m	Dark grey/black siltstones. Very similar to 6.00 - 32.29 m but slightly coarser grained - possibly tuffaceous. Contains magnetite and very fine grained scattered sulphides (pyrrhotite). From approximately 60.00 m core becomes mottled brown and pale grey (bluish), sulphides slightly coarser - often in veinlets.	
65.75 - 69.50 m	Dark grey/black rock, magnetite with veins and disseminations of pyrrhotite. Minor siliceous. Possible bedding at 68.25 m, B.C.A. = 25°. If bedding, it suggest that magnetite is primary, being in obvious bands (and blocks) downward of bedding.	
69.50 - 72.54 m	Light grey siliceous rock. Shows fracturing and probably silicified. However lower contact appears to be parallel to bedding. Pyrrhotite and chalcopyrite developed at 69.60 m.	
72.54 - 76.60 m	Brown, slightly mottled with light grey patches, siltstone or possibly a fine sand/greywacke? (dolomitic?). Mottling perhaps due to fracturing or bleaching in metamorphic aureole from granite. Development of massive pyrrhotite at 72.55 m and 74.66 m. Former pyrrhotite near upper contact developed as bands parallel to contact - metasomatic replacement along original bedding? B.C.A. = 50°. Minor veinlets of pyrite and extremely minor fine veinlets of carbonate.	
76.60 - 85.66 m	Gradual change to a dark green brecciated, tuffaceous greywacke? This gradually changes to a light grey siliceous sandstone (greywacke?) at 77.60 m which contains odd dark green/fine grained patches. From 80.25 m merges with a fine grained but stronger "brecciated" zone (although core not broken) - possibly bleaching. Pyrrhotite developed in coarser sections.	
85.66 - 90.93 m	Dark green/brown tuffaceous? siltstone - probably a greywacke (dolomitic?) similar to 72.54 - 76.60 m but coarser grained. No visible mineralisation. Extremely minor carbonates in fine siliceous. From 89.00 m the core becomes mottled with white quartzose patches, also darker areas contain chlorite.	
90.93 - 95.24 m	Black (magnetite) and light grey rock (quartz). Gradual increase in amount of magnetite from 90.93 m and from 92.50 m veins and disseminations of pyrrhotite become obvious, increasing down the hole.	
95.24 - 98.40 m	Gradual change to a light grey fine grained siliceous rock. Mottled appearance due to bleaching. If originally a greywacke sequence could represent the fine grained part of a bed. No visible mineralisation.	
98.40 - 125.00 m	Change to dark grey/black rock. Original rock medium grained and probably a sandstone (dolomitic) - large percentage of magnetite, often massive and extensive veins and disseminations of pyrrhotite (some minor veins possibly pyrite?). Rock also contains a significant amount of carbonate. Some small light coloured siliceous patches similar to 95.24 - 98.40 m, have no carbonate and no visible mineralisation. e.g. 115.00 - 115.45 m. From approximately 119.00 m the percentage of magnetite decreases. However, the percentage of pyrrhotite appears to remain constant (approx. 10%) to 125.00 m. 123.00 - 124.00 m core is banded.	
125.00 - 138.00 m	Transition to a light grey fine grained "quartzite" similar to 115.00 - 115.45 m. Appears vaguely brecciated (bleached) and darker patches are associated with minor pyrrhotite mineralisation in cracks. "Strombolite actinolite" developed.	
138.00 - 153.24 m	Transition to a darker medium grained "sandstone", shows some mottling possibly "brecciation" but probably bleaching and some small fine grained patches, e.g. 143.00 m, which are brecciated contain carbonate. Elsewhere little or no carbonate - possibly dolomitic and brecciation due to dolomitisation? Numerous dark olive green fine grained patches. Pyrrhotite as disseminations and veinlets is developed extensively throughout the core. Probably some magnetite.	
153.24 - 185.40 m	Dark grey, slightly reddish fine grained sediment. Strongly brecciated from 153.24 - 156.50 m. Carbonate in matrix of brecciated zone and as narrow veinlets elsewhere. Small light green patches. Whole zone dolomitic? Bedding at 170.00 m, B.C.A. = 30°. Rare veinlets of pyrrhotite but generally barren. Lighter coloured medium grained more siliceous zone 179.69 - 181.50 m.	172.20 - 173.40 m core badly broken and some core loss - probably associated with a fault.
185.40 - 220.10 m	Light grey fine to medium grained mottled, due to bleaching or brecciation (probably the former) sandstone.	

DIAMOND DRILL LOG T.H. 1

APPENDIX 1

442142

U18

DESCRIPTION	REMARKS
<p>Metting varies from light to medium grey coloured patches and occasional dark brown more "streaky" areas. Minor pyrrhotite and some "patches" of tremolite/actinolite. Minor carbonate in matrix and veinlets. 202.60 m small "vein" containing axinite and possibly some arsenopyrite. Darker zones at 212.30 - 212.75 m and 214.90 - 216.30 m contain extensive magnetite with an increased amount of pyrrhotite. Bleaching and alteration created some "vague" banding but no obvious bedding.</p>	<p>Broken core - 202.60 m - (filled) perhaps at having fallen down hole from 173.00 m.</p>
<p>220.10 - 318.50 m Dark grey/purple, mottled with lighter coloured patches (tremolite-actinolite?) fine grained shale. Lighter coloured vein-like patches contain carbonate and generally have a greenish mineral in centre but no obvious sulphides. Occasional disseminations and stringers of pyrrhotite (with some arsenopyrite?) particularly in greys perhaps more siliceous patches. Veins of black and green minerals? e.g. 239.00 m. At 260.80 m pyrite and pyrrhotite occur - heating during metamorphism, pyrite to pyrrhotite? Rock becomes very siliceous (silicified?) at 261.50 - 264.00 m where degree of silicification begins to decrease and rock changes back to an altered argillite which continues to granite contact. Extensive alteration and bleaching, often in form of small "veins" which can occasionally be seen as alteration bordering small cracks. e.g. 272.26 m. Massive sulphide at 266.00 m but usually as veinlets and patches of sulphides, scattered irregularly throughout core. and is predominantly pyrrhotite, but also some pyrite/arsenopyrite and pyrrhotite in a nug at 315.00 m carries some chalcopyrite.</p>	<p>Stringers and veinlets of pyrrhotite exhibit conductivity but rock resistive.</p>
<p>318.50 - 413.24 m At 318.50 m a very sharp intrusive contact with granite. The granite immediately next to the contact appears to be composed largely of quartz with a fine black mineral - tourmaline? and some very fine grained sulphides. The granite changes to a more "normal" granite within 5 cm but still appears to be slightly "altered" and finer grained up to 320.70 m. Generally the granite is very fresh, consisting of crystals of pink to buff/green feldspar and white/cream quartz up to 1 cm in diameter with a finer grained black mineral, thought to be tourmaline. Variation in colour of feldspar gives alternating zones of pink and cream/buff coloured granite. Occasional veins of quartz and tourmaline. e.g. 346.60 m and 393.10 m to 396.20 m. The latter also contains fluorite and a small vein of greisen at 395.80 m.</p>	<p>320.00 m, 10 cm taken for whole rock analysis via Renison. 366.00 m, 10 cm taken for whole rock analysis via Renison.</p>
<p>END OF HOLE</p>	

442143

DESCRIPTION SECTION No. 10712 T.H.I. 320m.
 NW. Reader CMS/75/4/23

a. Hand Specimen:
 Grey, medium to coarsely crystalline granitic rock.
 K feldspar stain test positive.

b. Microscopic:
 This is a stressed micro-adamellite, with minor primary biotite and traces of tourmaline. It is thus quite similar to other described intersections of Pine Hill Porphyry.

This rock tends to be porphyritic but not strongly so. There are larger patches of quartz and microperthite, set in a microgranular, sometimes graphic, intergrowth of quartz microperthite and sodic oligoclase (fairly strongly argillised). The biotite occurs as rather poorly developed shreds and is uncommon; it is a very dark variety, and contains iron oxides and minute ? zircon inclusions with pleochroic halos. Accessory apatite is scattered through the rock. Traces of ? xenotime occur.

The tourmaline is a very dark green variety, occurring as small, poorly defined, irregular patches associated with microfractures. Isolated small patches of fluorite are present, and are associated with chlorite and ? allanite. There is a possibility that traces of cassiterite may be present, though fine grained and difficult to identify. The second minerals are post-magmatic and are possibly related to the stress phase which is evident in the primary minerals.

DESCRIPTION SECTION No. 10713 T.H.I. 386m.
 NW. Reader CMS/75/4/23

a. Hand Specimen:
 Pinkish, coarsely crystalline granitic rock.
 K feldspar stain test positive.

b. Microscopic:
 This is a biotite adamellite, with accessory tourmaline and fluorite. Compositionally it is quite similar to the intersection at 320m, but appreciably more coarsely crystalline; it also contains more biotite. Petrologically it can be correlated with the Pine Hill porphyry; its fabric suggests however, that it represents a major intrusive, of which the Pine Hill porphyry would be an offshoot. It would be interesting and relevant to compare this rock with the larger granites in the region (i.e. Hamskirk, Meredith).

The major minerals are microperthite (40%), quartz (30%) and sodic oligoclase (25%), with 5% of biotite, and accessory zircon, xenotime, apatite and iron oxide (? magnetite). Fluorite patches and semi-opaque tourmaline probably represent introduced, deuteric minerals.

The fabric is fairly typical of granites, with a tendency for occasional plagioclase to form. The feldspars are only lightly argillised. Microperthite is pink due to very fine iron oxide pigmentation. Some of the biotite is chloritised.

The rock is slightly stressed; microfractures are filled with carbonate films.

SUMMARY LOG

HOLE NUMBER: TH2

from m	to m	
0.0	21.0	weathered rock and clay
21.0	387.0	hornfels and chert with trace to sparse schorl, trace axinite?, trace pyrrhotite, trace to sparse chlorite as veinlets
387.0	389.7	serpentinite with magnetite and sparse pyrrhotite
389.7	441.4	hornfels and chert with trace to sparse schorl, trace pyrrhotite
441.4	512.7	intermixed chert, cherty hornfels and brecciated chert with sparse schorl, trace to sparse pyrrhotite; some zones are coarser grained to grit size

END OF HOLE AT 512.7m

REVISION LIMITED - DIAMOND DRILL RECORD

HOLE NUMBER	TH. 2	SURVEY			From - To	Distance D	VERTICAL		HORIZONTAL	
		Depth	Bearing	Dip			D. Bln Dip	R.L.	D. Cor Dip	Prog. Total
PURPOSE	To test skarn of TH1 and "fault" zone.	00		-45 ⁰			00		0	
		50	17 ⁰	-30 ^{1/2}	11-25	25	15.6	-15.6	19.6	
		100	17 ⁰	-34	23-75	50	28.0	-43.6	41.5	61.1
LOCATION	Line 27E 2500N Area ID.	150	17 ⁰	-31	75-125	50	25.7	-69.3	42.9	104.0
		200	16 ⁰	-28	125-175	50	23.5	-92.0	44.1	148.1
COLLAR R.L.		250	-	-22	175-225	50	18.7	-111.5	46.4	194.5
		280	-	-21	225-265	40	14.3	-128.0	37.3	231.8
CO-ORDINATES		300	17 ⁰	-17	265-290	25	7.3	-133.1	23.9	255.7
		320	-	-20	290-310	20	6.8	-139.9	18.8	274.5
LENGTH	512.7m	335	-	-14	310-327 ^{1/2}	17 ^{1/2}	4.2	-144.1	17.0	291.5
		350	-	-25	327 ^{1/2} -342 ^{1/2}	15	6.3	-150.4	13.6	305.1
HOLE SIZE	0-48 NQ 48-512.7m BQ	370	-	-17	342 ^{1/2} -360	17 ^{1/2}	5.1	-155.5	16.7	321.8
					360-513	153	39.6	-195.1	147.8	469.6
COMMENCED	March 28th 1977.									
COMPLETED	May 17th 1977									
SIGNIFICANT CORE LOSS ZONES										
ORE ZONE GROUND CONDITIONS										
LOGGED BY	A. ROSS.									
COMMENTS	Magnetite - pyrrhotite basic rock from 38' to 389.4m - May correlate with altered ultrabasic zone in TH. D.D.H. 1. Metasomatized conglomerate rich zone from 441 to 494m									

SUMMARY - ASSAY DATA

LODE NAME	FROM	TO	LENGTH (m.)	AVERAGE WEIGHTED ASSAYS			
				Sn.	Cu.	As.	S.

SUMMARY METALLURGICAL DATA COMPOSITE SAMPLE

LODE NAME	FROM	TO	Sn.	Cu.	As.	S.	De F ₃	Ag.	Bi.		an - Rec.	Cu - Rec.	Carb.	Silic.	S.G.

442146

DIAMOND DRILL RECORD

HOLE NUMBER TH 2

LOGGED BY A.R.

DEPTH (m)	RECOVERY (%)	DESCRIPTION	FORMATION	ASSAYS											
				FROM	TO	Si	S	As	Cu	Pb	Zn	Sr			
0 - 21	2	Weathered rock and clay. Poor recovery.													
21 - 32	10	Fresh but broken, massive to weakly bedded sandstones, grey-wacke. Variable mottled colours and irregular veinlets indicating metasomatic alteration. Colours predominantly grey to dark brown. One metre core loss between 30 and 31m. No visible sulphides.	CRIMSON GREEN FORMATION VOLCANICLASTIC SEDIMENTS												
32 - 85.6		Light grey to cream, grey to brown metasomatised, altered sandstones and minor chert-siltstone. Poorly bedded. Trace pyrrhotite associated with some actinolite/chlorite veins. Bedding slumped - turbidite. Core slightly broken. Main alteration by way of pale green patches and diffuse layers parallel to bedding. BCA 44 ⁰ at 77m Brecciated fragments in carbonate filled fracture at 85m (Zone 4cm wide)													
85.6 - 90.1		Colour change. Predominantly light grey to green altered siltstones, greywacke -- mainly cherts with less volcaniclastic sediments. Trace very fine pyrrhotite. Metasomatic alteration as before. Carbonate filled breccia at 88.9 to 90m.													
90.1 - 99.5		Change to dark brown (bluish tinge) massive poorly bedded greywacke. Metasomatised volcaniclastic sediment. BCA 60													
99.5 - 104.5		More cherts in volcaniclastic sequence. Grey colour. Non calcareous. Irregular mottled alteration. Trace pyrrhotite.													
104.5 - 118.7		Brown metasomatised (actinolite/Chlorite), volcaniclastic, poorly bedded sediments													
118.7 - 161		This zone displays greater metasomatic alteration. Grey to cream, more siliceous, fine grained sediments. Bedding often contorted although BCA av. 50 ⁰ . Actinolite patches and veinlets, some containing black fine grained tourmaline and/or trace sulphide (pyrrhotite). Microbrecciation throughout. Brown volcaniclastic sediments from 135 to 137m. From 145 to 151, zone particular altered with mottled cream and grey colours and trace pyrrhotite. Bedding often contorted. Pinkish tinge to cream patches could be fine axinite. Patches of black tourmaline													
161 - 288		Slight change in colour to darker grey-green and brown volcaniclastic sediments. Variable alteration. From 170m veinlets of cross cutting, later stage carbonate occur. Very common from 173.2 to 176.5m (Veinlets are 30 ⁰ to CA). Carbonate infilled fractures occur at 173.5, 174.6, 175.9m Lesser veining from 176 to 179m then carbonate veins and broken core common from 179-181.4m. FAULTY ZONE 173 to 181.4m No mineralisation evident. Carbonate veinlets cross cut the actinolite/chlorite alteration. Veinlets occur sporadically up to 195m. From 181.4 to 195, metasomatised cherty sediments with trace pyrrhotite well bedded BCA 70 ⁰ , Non calcareous. After 195, lithologies are predominantly brown with green alteration. Mainly slumped bedded volcaniclastic sediments. Fine to medium grained greywackes, siltstones, with very minor buff cherty layers. Trace sulphide in actinolite zones and very rare black tourmaline. After 253m, minor quartz veinlets as alteration.													

442147

DIAMOND DRILL RECORD

HOLE NUMBER TH 2

LOGGED BY A.R.

FROM	TO	DESCRIPTION	FORMATION	ANALYSIS					
				FROM	TO	Sn	S	As	
288	288.8	Altered actinolite rich zone. Trace pyrrhotite and black tourmaline. Minor bedded chert.							
288.8	294.3	Brown pebbly turbidite. Clasts are slumped, rounded fragments in volcaniclastic matrix.							
294	387	Core slightly broken from 296 to 305m. Grey to dark grey-brown metason-ised volcaniclastic sediments. Irregular blotchy alteration. Mainly quartz rich with lesser actinolite. Core very broken from 324.5 to 330m. Actinolite alteration increasing from 336m. BCA 60° at 345m. Brown, poorly bedded slumped volcaniclastic sediments with minor chert layers. Core very broken from 353 to 356m, with 1 metre lost. Less alteration from 360 to 365m, then normal actinolite rich alteration. Core broken from 384 to 386.5 with 0.5 metre lost.							
387	389.7	Very dark to black semi-massive magnetite/pyrrhotite rich rock. Blotchy altered basic rock. May correlate with altered serpentinite in D.D.H. 4.	SWAB?	387	389.4	<0.05	Sn core analyser		
389.7	441.4	Mainly brown, metasomatised volcaniclastic sediments with minor chert. Slumped bedding. B.C.A. 65° at 398m. Minor quartz actinolite alteration. From 408.0 to 408.3 Zone of black tourmaline, trace pyrrhotite, chalcop-rite. Increased actinolite alteration from 417.3 to 421.5. Trace pea. From 421.5 to 431m, brown slumped sediments with one or two minor carbonate veinlets. Some pelletal rich zones. From 431 to 434.5m green altered chert and volcaniclastic sediments. Microbrecciated BCA 50° at 434m. Rare carbonate veinlets. Increasing clastic component in last few metres of this interval.							
441.4	512.7	Complex, metasomatised, altered weakly mineralised conglomerate/breccia rich lithology. Zones of axinite, actinolite rich alteration common up to 494m. Very indurated - possibly silicified carbonate component or diopsidic. Minor development of black tourmaline. BCA's 70-90°. Sulphides up to 2% in rare zones. After 494.5, narrow well bedded and laminated siltstone occur. ECA 50°. Siltstone from 494.5 to 495.5, and 496.5 to 500.5m. Cemented siliceous pebble grit from 503.6 to 505.2m. From 505.2 to 512.7 mainly poorly bedded siltstone with minor coarse zones. Little alteration. Definite sedimentary facings difficult to find, although suggest facing is "down the hole".	CONGLOMERATE	441	494	<0.05	Sn core analyser Check samples taken.		
				480	480.5	0.06	0.62	0.14	
				476	477.0	0.05	<0.10	<0.05	
END OF HOLE 512.7m									

442148

Diamond Drill Core DDH-TH2TH2/344m (TS 21412)

This is a metasomatic rock consisting largely of pale green actinolite with irregular to crudely vein-like masses of phlogopite studded with fine dark but color-variable tourmaline. Small grains, and irregular aggregates of albite occur intergrown with the phlogopite and these features include sporadic subhedral grains of apatite (to 750 μ) in addition to frequent very fine inclusions (tourmaline, actinolite, phlogopite). Sphene is a minor accessory constituent. Occasional late-stage zeolitic veinlets (with recognizable stilbite and chabasite) are present. Most of the rock is featureless in terms of relict features but there is some evidence that it represents a metasomatised breccia. It contains a few altered fragments of a fine-grained clastic sediment and grades marginally into a strongly phlogopitised sandy siltstone with some similarities to TH 6622 and TH 6623.

TH2/388.5m (TS, PS 21413)

This is a partly metasomatised granular fine to medium grained ultra-mafic evidently closely related to DDH TH1/68m. Where relatively fresh it consists of granular olivine (mean 200-300 μ) with accessory magnetite as olivine-intergranular particles and irregular to spongy aggregates. Elsewhere olivine interstices consist of pale green phlogopite which on textural grounds has developed by replacement of serpentine. These phlogopitised areas grade into weakly sheared masses crudely vein-like areas of massive phlogopite and a more or less complete progression can be seen from fresh dunite to phlogopite rock. The paragenesis (partial serpentinisation and subsequently metasomatism) is identical to that in TH1/68m.

Polished section examination reveals the magnetite is primary as disseminations and aggregates which are partly to extensively replaced by secondary pyrrhotite aggregates with included patches of chalcopyrite and locally accompanied by bladed grains of ilvaite. No pentlandite was observed but extremely rare subspherical inclusions (<10 μ) of hezlewoodite are seen in magnetite and assay for Ni may be warranted.

TH2/408.4m (TS, PS 21414)

This is a quartz-tourmaline rock with a vague relict "granitic" fabric and is considered as a completely altered "microgranite" (or ?micro-adamellite). The main constituents are weakly stressed anhedral quartz and strongly zoned color variable schorl. A few variably sericitised feldspar relics persist and in places feldspar "ghosts" are seen in vaguely pseudomorphous quartz with sericite inclusions.

Accessory carbonate is present and occasional irregular patches of chlorite developed at a late stage by replacement of tourmaline. Rare tabular grains of topaz occur closely intergrown with tourmaline. Fine to ultrafine granular to subhedral sphene is common throughout the rock and developed in part by replacement of primary ilmenite which persists in sporadic corroded relics. Polished section examination reveals sparsely disseminated patches of pyrite and partly pyritised pyrrhotite intergrown with tourmaline aggregates and rare patches of chalcopyrite (to 400 μ) intergrown with quartz. No cassiterite was observed in the sectioned areas.

TH2/422.3m (TS 21415)

This is a brecciated and pervasively phlogopitised fine sandy siltstone possibly weakly tuffaceous originally, although clastic components, apart from disseminated quartz grains are altered beyond recognition.

The rock consists mainly of microcrystalline quartz, phlogopite which is pervasive but also concentrated into veinlets and aggregates in brecciated areas and subordinate to minor semi-fibrous to euhedral poikilitic tremolite-actinolite. Minor accessory sphene is present and very fine ilmenite, typical of similarly phlogopitised pelites from the Renison Mine area is common throughout. Traces of pyrrhotite occur within the phlogopite segregations.

A late 200 μ - 1mm wide vein of colorless chlorite cut across the sectioned area. Marginal portions of this feature include thinly dispersed microscopic grains (typically <10 μ) and small clusters (to 75 μ) of cassiterite.

TH2/442m (TS 21416)

A weakly brecciated and thoroughly metasomatised labile pebbly sandstone by analogy originally a poorly sorted Crimson Creek Formation tuffaceous greywacke. The clastic fabric persists with random to weakly bedded angular to subangular rock fragments now consisting of actinolite and cloudy microcrystalline quartz and feldspar and "cemented" by semi-ragged actinolite. Diopside and cloudy blue schorl are accessory alteration products. Traces of Fe-sulphide (pyritised pyrrhotite) are associated with the tourmaline. Cloudy granules of sphene are weakly disseminated throughout.

TH2/448.4m (TS 21417)

This is a weakly sheared diopside-tremolite rock consisting essentially of granular to subhedral diopside particles (mean 50 μ) enclosed within and marginally corroded by semi-orientated subhedral to ragged grains of tremolite. Magnetite is disseminated throughout in two generations with chromiferous-cored primary grains partly overgrown by secondary finer-grained material. Small patches of pyrrhotite are also present loosely associated with fine particles and spongy aggregates of secondary magnetite.

General features indicate this rock was initially a fine to medium-grained granular pyroxenite (diopsidite) altered and weakly mineralised more or less contemporaneously with a weak phase of shearing. It contrasts with previous ultramafics from this area in carrying primary chromite-cored magnetite. Ni-assay may be warranted.

THZ/466.8m (TS 21418)

This is a weakly sheared tremolite-rock with accessory amounts of chlorite, green phlogopitic mica, poikilitic carbonate, opaques, and "grading" locally into a semi-schistose diopside-tremolite rock. The paragenesis is similar to that at 448.4m with tremolite (and phlogopite, chlorite) developing in part at least from diopside.

Opaques tend to be concentrated into semi-orientated spongy aggregates and thin films paralleling the crude schistosity. Much of this material is fine grained "secondary" magnetite locally accompanied by and intergrown with fine grained pyrite and pyrrhotite. Also present are rare relict primary grains of magnetite with chromiferous cores. These indicate an altered ultramafic (pyroxenite) origin and provide a link with the 448.4m specimen.

THZ/452.1m (TS 21419)

This is a metasomatised and incipiently sheared tuffaceous or at least volcanomict conglomerate.

The coarser pebbles are typically fine grained basic to intermediate volcanics (leucobasalt-leuco-andesite) typified by semi-felted feldspar laths (now saussurite-stained albite) or less commonly microcrystalline. Accompanying these are occasional fragments of tuffaceous sandstone, disseminated sand-sized quartz grains, chert fragments and altered (tremolitised) dolomite fragments. The matrix consists of finer clastic particles of similar composition but with relatively abundant quartz.

The rock is semi-pervasively impregnated with finer grained tremolite grading locally into crudely vein-like masses of tremolite-actinolite. Accessory traces of cloudy sphene are present and this phase may mask a little ultrafine cassiterite (thus a Sn-assay would be warranted).

THZ/457m (TS 21420)

This is a coarse quartz-tourmaline-diopside-actinolite rock with traces of sphalerite. The rock is characterised by abundant strongly growth- and color-zoned schorl interspersed with granular to poikilitic intergrowths of quartz and diopside. Tremolite-actinolite is an accessory constituent over most of the area sectioned but locally semi-massive. Accessory cloudy albite is present. The sphalerite is a red (moderate to high Fe-variety) as diopside interstitial patches (to 500µ) locally accompanied by small patches of pyrrhotite. This rock is a crudely zoned vein or segregation. The assemblage is similar to that of some of the associated metasomatised rocks.

THZ/474m (TS 21421)

This is a diopside-tourmaline-tremolite rock evidently related to the 457m specimen. It consists mainly of fine granular to subhedral diopside with disseminated skeletal to poikilitic anhedral grains and aggregates of green to brown pleochroic schorl. Irregular patches of tremolite-actinolite occur and are partly altered at a late stage to aggregates of talc flakes. Fine grained sphene is an accessory component and more or less evenly disseminated throughout. There are trace to minor amounts of pyrrhotite as small blebs typically interstitial to diopside and/or tourmaline and thinly dispersed very fine particles of near-opaque sphalerite.

THZ/480.8m (TS 21422)

This is a metasomatised chert crudely banded and probably dolomitic in part originally. Cherty microcrystalline quartz persists in places but elsewhere the rock consists largely of granular and cloudy poikilitic diopside with accessory tremolite actinolite and small aggregates and vermiform-like veinlets of prehnite. Accessory comprise disseminated pyrite crystals blebs and fine spongy aggregates of pyrrhotite, minor very fine sphene and rare poikilitic blebs of sphalerite. Cloudy discontinuous veinlets of diopside occur sporadically and conceivably represent metasomatised diagenetic carbonate veinlets.

THZ/485.1m (TS, PS 21423)

This is a metasomatised pebbly tuffaceous greywacke originally poorly sorted weakly bedded and with a variety of rock fragments including basic to intermediate volcanics, cherts quartz grains and silicified rhyolitic material in addition to reworked clasts of tuffaceous sandstone (these could reflect an early phase of brecciation). An unusual feature is the presence of frequent detrital grains (mean 250-300µ to 500µ) of chomite.

Metasomatism is rather subtle and selective. Some areas of the rock are pervasively stained with phlogopite (largely degraded) whilst elsewhere tremolite-actinolite is the dominant phase and accompanied by anhedral quartz grains stuffed with fine tremolite inclusions.

Pyrrhotite is disseminated throughout as fine particles and discontinuous veinlets. Sulphide is most abundant in the tremolitic areas and here pyrrhotite forms spongy aggregates and occasionally vein-like masses (to 1cm wide) with tremolite. Minor traces of chalcopyrite are associated and pyrrhotite is incipiently replaced at a late stage by pyrite.

TH2/488.4m (TS 21424)

This is a diopside-tourmaline rock essentially similar and closely related to the 457m and 474m specimens. Some areas consist of more or less massive intergranular to subradiating and subhedral diopside weakly clouded with ultrafine indeterminate inclusions. Elsewhere color zoned tourmaline is closely intergrown with the diopside. Accessory carbonate and prehnite are present in dispersed diopside-intergranular masses and in thin semi-continuous veins. Sparsely disseminated blebs of pyrrhotite are present and these are also of intergranular habit.

TH2/491.7m (TS, PS 21425)

This is a near-monomineralic tremolite rock fine-grained, with a weakly schistose fabric, and with sparsely disseminated grains and small clusters of chromite indicating that it represents a completely altered ultramafic. In contrast with 485.1m there are no relict clastic features.

In other respects the rock is fairly featureless. However, it carries sporadic spongy patches (to 1cm+) of pyrrhotite of tremolite-interstitial habit and of fairly constant optical orientation. Sporadic patches of chalcopyrite are closely intergrown with pyrrhotite which is locally replaced pseudomorphously by secondary pyrite. As with the previous altered ultramafics assay for Ni may be warranted.

TH2/503m (TS 21426)

This is a metamatised tuffaceous grit or greywacke rather similar and closely related to 485.1m specimen. Related types are 452.1m, 422m, TH6622, TH6623 and the (TH27E)8N and 9N specimens of CMS 76/6/2.

Recognisable clastic material is sized in the medium sand to fine pebble range, angular to subangular, poorly sorted and vaguely bedded. Cloudy microcrystalline quartzofeldspathic basic-intermediate ("basaltic/leuco-andesitic") volcanic fragments are common. Accompanying these are a variety of chert fragments and clasts of labile psammopelites (tuffaceous shale, siltstone, fine sandstone). There are occasional clastic feldspar and quartz grains and detrital chromite (similar to 485.1m) is a characteristic accessory component. The original matrix is obscure having been replaced entirely by metamorphic aggregates of green tremolite-actinolite with a little associated quartz, prehnite, traces of tourmaline and fine grained disseminations of pyrrhotite. The framework is similarly but less extensively altered. Late zeolitic veinlets occur locally.

TH2/505m (TS 21427)

This is an unusual rock recognisable as an altered rhyolitic tuff. Similar rocks are present but very sparsely in the Crimson Creek Formation where the volcanics either primary or reworked are typically of more basic character.

The rock consists mainly of platy subvitic and rather featureless lithic fragments and slightly subordinate quartz grains, many of which are recognisable as fragments of phenocrysts. There are sporadic altered (silicified) feldspar grains and a few lithic fragments include quartz or feldspar phenocrysts. The lithic fragments exhibit a fairly marked dimensional orientation (ash flow tuff). The matrix consists mainly of microcrystalline quartz and may have contained shards although there is no longer any microtextural evidence to support this.

Alteration comprises the introduction of very fine quartz, partly in crude veins, and subordinate but variable amounts of finer grained colorless tremolite which has partly degraded to colorless chlorite and carbonate. Traces of fine brown tourmaline are associated and accessory fine grained sphene is developed locally. Rare partly leucoxised magnetite crystals are of primary origin. Close microscopic examination did not reveal any cassiterite.

TH2/512.2m (TS 21428)

This is an extensively metasomatised bedded and relatively well sorted fine-grained sandstone.

Relict angular to subangular clastic quartz grains comprise from <10 to around 35% of the various layers and are accompanied by partly to completely altered similarly shaped grains of feldspar (now albite) in varying proportions. Accompanying these are frequent completely altered (to actinolite) clastic particles which were probably fine to microcrystalline volcanic material (tuffaceous greywacke). Bedding is now reflected in an alternation of relatively siliceous bands and bands consisting largely of very fine grained actinolite.

Irregular patches of cloudy carbonate develop from actinolite. Late stage quartz-chlorite veinlets occur sporadically.

TH2/450m (TS 21429)

This is a phlogopitised volcanomictic conglomerate composed largely of poorly sorted angular to subround rock fragments with a relatively sparse phlogopite-stained and poorly resolved cement.

Rock fragments include basic to intermediate lavas with subordinate more acid ("rhyolitic") types in addition to quartzose and argillic to psammopelitic sediments. Accompanying these are sporadic chert fragments, occasionally with fibrous actinolite pseudomorphing diagenetic carbonate rhombs, and a sand sized clastic matrix consisting of angular to subangular quartz grains and finer rock fragments with minor accessory feldspar and rare detrital chromite (up to 500µ diameter).

HOLE No.: DDH-TH2 Cont. SCALE: .

DIAMOND DRILL HOLE PLOT

Much of the matrix quartz is of acid volcanic character and a few rhyolite fragments show ignimbrite-like microtextures.

Reddish, partly degraded, fine grained metasomatic phlogopite is virtually pervasive particularly in the matrix. This material is accompanied by very fine opaques (ilmenite) and locally by a little ultrafine Fe-sulphide.

No facing criteria are evident in the area sectioned. Determination of facing in conglomerates is a tenuous problem and one rarely resolved from micro- as against macrostructures.

442152

SUMMARY LOG

HOLE NUMBER: TH3

from m	to m	
0.0	142.0	core not located
142.0	163.5	hornfels and chert with trace pyrrhotite
163.5	230.0	hornfels and chert, occasionally with sand size grains evident, with trace pyrrhotite and magnetite
230.0	351.5	hornfels and chert with sparse pyrrhotite

END OF HOLE AT 351.5m

DIAMOND DRILL RECORD

HOLE NUMBER : T.H. 3

LOGGED BY : A.F.R.

147

INTERVAL (m)		RECOVERY		DESCRIPTION	FORM	% St.										
FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL	% Cu	% Al	% S	% Ph	% Zn	% B	g/t Ag
0	127.4			MONOTONOUS SEQUENCE OF VOLCANICLASTIC SEDIMENTS — TUFFACEOUS SILTSTONES, SANDSTONES with minor <u>CHERT</u> . VARIABLE METASOMATIC ALTERATION by way of irregular veins, patches of <u>ACTINOLITE</u> with traces of <u>PYRITE</u> , <u>PYRROTITE</u> , <u>CHALCOPYRITE</u> and <u>MAGNETITE</u> .												
0	3	0	0	Talcose.												
3	6	2.5	83	Very broken core. Brown clay common on broken surfaces. Fragments of brown to blue grey tuff siltstone and sandstone. Several fragments with pyrite films on joint surfaces. Minor mottled zones about rare chlorite/actinolite veinlets.												
6	7.5	1.5	100	As above. Weathered brown to grey tuff sandstone and siltstone. Cherty, hornfelsed. Brown clay on broken surfaces. Rare chlorite veinlets.												
7.5	9.2		100	Less weathered. Mixture of brown tuff sandstone, brecciated grey-brown and green chert. Microfracturing and veinlets of chlorite common - very irregular but commonly parallel to bedding, which is better developed in this zone. B.C.A. 40°. Trace very fine pyrite, speck chalcopyrite, magnetite associated with alteration veinlets.												
9.2	13.3		100	Brown, intermixed tuff sandstone and siltstone. Hornfelsed and with very common diffuse ultrafine, irregular patches of chlorite, which roughly define bedding. B.C.A.s average 40°. At 12.9m, 5mm wide quartz vein, 5° to GA. Trace very fine pyrite.												
13.3	18.5		100	Weakly to strongly magnetic zone. Some lithologies as above. Dark brown to black tuff sandstone, siltstone, but with larger bands of actinolite/chlorite alteration. Trace pyrrhotite, chalcopyrite in several alteration bands. Mostly hornfelsed siltstone. Massive to poorly bedded with rare silt layers defining bedding. B.C.A. averages 40°-45°. (PETROLOGY DESCRIPTION 17,7m)												
18.5	21.6		100	Non magnetic zone of intensely altered sandstone. Diffuse veinlets of pale green chlorite common, parallel to bedding and in microfractures. Rare patches of buff chert, fractured. At 20.4m, veinlet of very fine quartz-tourmaline at 30° to CA. Bedding poorly developed. No sulphides.												
21.6	24.5		100	As above, but alteration is not as intense. Interbedded tuff sandstones and minor siltstone. Rare actinolite/chlorite veinlets, sparsely dispersed, commonly at 40°-45° to CA.												
24.5	26.05		100	As above, but weakly magnetic. Massive to poorly bedded tuff sandstone. Very rare actinolite/chlorite veinlets. No mottled alteration patches. No sulphides.												
26.05	31.9		100	Core broken (5 - 10cm pieces). Weak to moderately magnetic, dark brown to black interbedded tuff sandstone and siltstone. Very rare actinolite/magnetite veinlets at 45° the widest (1cm) occurring at 26.75m and 31.1m.												

442155

DIAMOND DRILL RECORD

HOLE NUMBER : T.H. 3

LOGGED BY : A.P.R.

143

INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.	% Sn.										
FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu	% As	% S	% Ph	% Zn	% Pb	g/t Ag
31.9	33.1		100	Non magnetic dark brown to black tuff sandstone. Hornfelsed, no significant metamorphic alteration.												
33.1	34.7		100	Weakly magnetic tuff sandstone and minor siltstone. Weak alteration Massive.												
34.7	36.0		100	Moderately magnetic dark brown to black siltstone, sandstones with rare actinolite veinlets and very rare mottling. Trace sulphide films on joint surfaces.												
36.0	38.0		100	Core becoming very broken, due to chlorite on joint surfaces, which are common. Moderately magnetic with rare magnetite/actinolite veinlets with trace sulphide. Magnetite occurs as primary sedimentary feature?												
38.0	41.2		100	Non magnetic hornfelsed dark brown to black massive siltstone, with fine green irregular actinolite alteration. Very rare fleck pyrite.												
41.2	46.2		100	As above, very irregular greenish alteration. Bedding discernible. B.C.A. 40°. Trace pyrite, pyrrhotite.												
46.2	46.5		100	As above, with coarse magnetite in two actinolite veins.												
46.5	48.2		100	As before, dark brown to black hornfelsed siltstone and interbedded tuff sandstone. Irregular, cross cutting and sub-parallel to bedding, veinlets with trace fine sulphide.												
48.2	48.7		100	Lower BCA'S, 30-35° Irregular light green actinolite vein with minor carbonate, trace pyrite. Minor hornfelsed sediment.												
48.7	52.2		100	Core becoming very broken. Highly jointed hornfelsed dark brown to black siltstone, minor sandstone. Actinolite alteration not as common. Minor silty layers BCA 40°												
52.2	55.0		100	More intense alteration - Actinolite patches, some with fine disseminated sulphide. Buff chert common. Non magnetic												
55.0	56.1		100	As above. Actinolite alteration not as intense. BCA'S 40.												
56.1	61.4		100	Irregular actinolite alteration increasing. Whitish green chert occurring as very minor beds (<1 cm) in dark brown siltstone. Numerous joint surfaces at 50° to CA, often with light green amorphous mineral (diopside ?) coating. Very irregular quartz veinlets are common.												
61.4	63.1		100	Alteration not as intense. Non-magnetic brown to black hornfelsed siltstone. Finely bedded in part. BCA'S 40 - 45°. Filmy pyrite on broken surfaces. Overall sulphide content low. (Petrology description 62.1m)												
63.1	63.2		100	Buff to light green microfractured chert, infilled with actinolite. Trace pyrite films.												
63.2	66.8		100	Variably altered, hornfelsed dark brown to black siltstone. Alteration is usual actinolite veinlets, subparallel to bedding and crosscutting. At 65.5m is a more intensely altered zone (15m) with trace pyrite, chalcopyrite. Fine black mineral common (11valite?).												

442156

DIAMOND DRILL RECORD

HOLE NUMBER: TH 3

LOGGED BY: A.P.R.

150

INTERVAL (m)		RECOVERY		DESCRIPTION	FORM	% Sn.										
FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu	% Al	% S	% Pb	% Zn	% Bi	Wt Ag
115.1	120.0		100	Core becoming very broken. Lithology is a lighter brown cherty siltstone with intense microfractures, microfaulting. Numerous veinlets of fine carbonate. However, no sulphides. Approaching fault?												
120.0	120.4		100	Intensely brecciated light brown siltstone infilled with carbonate. Breccia fragments common. Infilled fault? Crude layering at 40° with set of carbonate veinlets at 80° to this plane. Mottled green brown colouration.												
120.4	122.2		100	Mottled colouration of light brown bedded siltstone and sandstone. Bands and veinlets of carbonate, common. Weathered pyrite veinlet at 120.8m. Highly irregular veinlets (mottled and bleached).												
122.2	127.4		100	Much less carbonate veining. Brown cherty siltstone with much irregular actinolite alteration. Pyrite, pyrrhotite very common in these veins but the overall sulphide content of the zone is <1%. Bedding is very fine but slumping is common.												
127.4	132.6		100	<u>MOTTLED, BLEACHED ALTERED ZONE OF SILTSTONE, SANDSTONE, GRADING TO CHERT.</u> Very pronounced change. Grades into highly slumped interbedded siltstone and sandstone, which has been intensely bleached and mottled. Colours are light grey, green, buff to dark brown. Bedding is very irregular and alteration is not confined to this feature i.e. does not selectively replace individual beds. BCA's 45. No sulphides apart from trace pyrrhotite, chalcopyrite (and pyrite?) in actinolite veins at 129.5m, 129.8m. Grades into dark brown, intense cherty siltstones, minor sandstone but without the spectacular mottling and bleached appearance of the above interval. Very minor actinolite veining with trace pyrrhotite at 133.9m. BCA or 45°. Rare rounded fragments of white, speckled black, sandstone. (Petrology description 131.5m).												
132.6	163.5			<u>EXTREMELY SILICIFIED, ALTERED SEQUENCE OF MICROFRACTURED CHERTS, SILTSTONES. ALTERATION IS IRREGULAR, RESULTING IN BLOTCHY, MOTTLED COLOURS RANGING FROM BROWN, GREEN TO WHITE, PALE GREEN.</u>												
132.6	135.8		100	Very dark green to black cherty siltstones with trace pyrrhotite, pyrite (possibly very fine tourmaline ?) in actinolite veins. BCAs average 45°.												
135.8	139.6			White to green slumped, mottled chert, siltstone. Trace pyrite, pyrrhotite in actinolite veins & patches. Minor brown, slumped but												

442158

DIAMOND DRILL RECORD

HOLE NUMBER : T.H. 3

LOGGED BY : A.P.R.

152

INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.	% Sn.										
FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu.	% Ag	% S	% Pb.	% Zn.	% Bi.	g/Ag
163.5	230.0			MONOTONOUS SEQUENCE OF VERY DARK BROWN TO BLACK HORNFELSED SILTSTONES & MINOR TUFACEOUS SANDSTONES. OVERALL, ALTERATION IS NOT AS INTENSE OR SPECTACULAR AS THE ABOVE ZONE. MODERATE TO STRONGLY MAGNETIC FROM 185m TO 223m. TRACES PYRRIOTITE, PYRITE, MAGNETITE IN METASCHISTISED VEINS AND PATCHES.												
163.5	171.8		100	Dark brown with minor light brown to grey massive to thick bedded siltstones and minor sandstone. Several minor (< 5cm) zones of bleached or mottled alteration. Trace, irregular pyrite veinlets, especially at 168.5m. Very rare carbonate veinlets.												
171.8	175.9		100	Becoming slightly altered. Same lithology as above. Pale green to blue-grey irregular zones with numerous fine wispy veinlets, some of which are carbonate. One cm wide carbonate-tourmaline? vein at 173.8m. Trace disseminated pyrite in wispy veinlets throughout.												
176.9	179.9		100	Less alteration. Dark brown massive to thick bedded siltstones B.C.A. 45°.												
179.9	181.7		100	As before. Increase in alteration, consisting of irregular patches of blue-grey alteration. Rare pyrite veins, and trace pyrrhotite occurring along bedding at 179.6m. Sparse carbonate veinlets, with largest vein at 178.9m. Slumped bedding from 180.0 to 180.3m, around lithic fragments. Tourmaline-sulphide veinlets common at 180.0m, 180.3m.												
181.7	183.7		100	Altered sequence as before. Siltstone to lithic siltstone with numerous tourmaline, minor carbonate veins throughout. No preferred attitude - very irregular and associated with actinolite. Trace pyrrhotite in actinolite vein at 183m.												
183.7	190.8		100	Lesser alteration. Black to dark brown massive siltstone with irregular patches of pale green brecciated chert from 185.6 to 186.0m. After this, only rare actinolite veinlets. Sulphides very rare. (Petrology description 183.9m).												
190.8	195.9		100	Black massive siltstones with minor pelletal zones (1 - 2m), B.C.A. 45°. Several diffuse alteration veinlets without sulphide. Moderate to strongly magnetic.												
195.9	198.7		100	Increase in alteration. As above but with pale brown to blue-grey "bleached" zones common. Pale green actinolite and magnetite common in irregular veinlets at 198.5 to 198.7m.												
198.7	207.7		100	Lesser alteration. Same black moderately magnetic, thick bedded to massive hornfelsed siltstone with minor slumped sandstone layers. Sparse, later stage, pale green veinlets (actinolite). Occasional narrow fractured cherty zone (20 - 30cm wide). Sulphides not seen.												

442160

DIAMOND DRILL RECORD

HOLE NUMBER : T.B. 3

LOGGED BY : A.F.R.

154

INTERVAL (m)		RECOVERY		DESCRIPTION	FORM	% Sn.										
FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag
248.5	248.8		100	Fault? Very broken zone. Numerous white, non calcareous amorphous veins in chert fragments.												
248.8	251.6			Brown, green, pale green chert and siltstone. Microfractured. Rare sulphides.												
251.6	255.5	1.8	62	FINELY BEDDED GREY SHALE and SILTSTONE with numerous pyrite, lesser pyrrhotite veinlets occurring in actinolite patches and as discrete veinlets along bedding and as irregular veinlets. Overall sulphide content less than 5%. Core loss from 251.9 to 253m.	250	251	0.11		<0.05	<0.10						
					251	252	<0.01		<0.05	<0.10						
					253	254	<0.01		0.05	<0.10						
					254	255	<0.01		<0.05	<0.10						
255.5	279.4			MONOTONOUS SEQUENCE OF BROWN INTERBEDDED SILTSTONES, SANDSTONES, VARIABLY ALTERED WITH VEINS, PATCHES OF ACTINOLITE, TRACE SULPHIDE IN A FEW ALTERED PATCHES.												
245.5	255.2		100	Lithic fragments common, subangular.												
255.2	260.1		100	Mainly brown sandstone, minor siltstone. B.C.A.'S average 45°. Minor actinolite alteration. Trace sulphide only in some veins, patches. Rare, fine, irregular carbonate veinlets.												
260.1	260.3		100	Intensely carbonate veined with breccia fragments. Trace pyrrhotite.												
260.3	261.9		100	As before, with numerous carbonate veinlets. Trace pyrite, pyrrhotite in actinolite patches. Pale green clayey vein at 261.5m, at 40° to CA with trace pyrite, pyrrhotite.												
261.9	279.4		100	Monotonous brown sandstone with patches of rare actinolite veins, with pyrrhotite, pyrite. Minor interbedded siltstone. B.C.A.'s average 45°. Rare irregular carbonate veinlets.												
279.4	281.0		100	WELL BEDDED, TUFF SANDSTONE WITH COMMON LITHIC FRAGMENTS (SUB-ANGULAR) UP TO 2cm IN DIAMETER. NOT CORRELATABLE WITH "SHEARED CONGLOMERATE" AS IN T.H. D.D II, 2 (Petrology description 279.7m).	280	281	<0.01		<0.05	<0.10						
					281	282	<0.01		<0.05	<0.10						
281.0	290.6			BLUE GREY INTERBEDDED SHALE, SILTSTONE AND SANDSTONE. WELL BEDDED IN PARTS. B.C.A.'s AVERAGE 45°. OVERALL, LESS ACTINOLITE ALTERATION.												
281.0	281.5		100	Intense actinolite alteration with numerous veinlets of pyrite.												
281.5	287.0		100	Blue-grey shale, siltstone with numerous irregular veinlets and patches of pyrite, pyrrhotite. No significant actinolite alteration. B.C.A.'s average 45°.												
287.0	288.3		100	As above, but without significant sulphides.												
288.3	290.4		100	Thicker bedded, dark brown to black siltstone with minor pyrite veinlets. No actinolite alteration.												

442162

DIAMOND DRILL RECORD

HOLE NUMBER : T.H. 3
 LOGGED BY : A.P.R.

156

INTERVAL (m)		RECOVERY		DESCRIPTION	FORM	% Sn.											
FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S	% Pb.	% Zn.	% Bi.	g/t Ag	% WO ₃
325.35	328.0		100	Loss broken core. Brown to grey, well bedded sandstones and less siltstone. Trace, very fine disseminated pyrite in rare alteration (quartz-chlorite) veinlet.													
328.0	329.5		100	Core very broken. Lithologies generally as above. Interbedded sandstones, siltstones with rare clasts of pink brown sandstone. Trace pyrite in irregular veinlets.													
329.5	331.0		100	Mainly massive to thick-bedded pale brown sandstones, grits and much less grey bedded siltstones. Very rare, quartz veinlets with trace green chlorite?													
331.0	335.0		100	Brown sandstones (generally thick bedded) with minor grey well-bedded siltstones with numerous irregular quartz veins, generally at 30° to C.A. Few specks pyrite in quartz veins. B.C.A.s 45° - 50°.													
335.0	336.05		100	Brown and grey sandstones, siltstones with well developed, slumped bedding. Quartz veins or layers parallel to bedding, becoming common. Few specks pyrite.													
336.05	336.65		100	Very contorted zone of blue-grey sandstones, siltstones, buff chert, with irregular, diffuse margined quartz veinlets and associated fine pale green chlorite, brown mica. Trace very fine pyrite and pale brown sphalerite? Slightly weathered, vuggy pyrite associated with pale-green fine grained mica.	336	337	<0.01		<0.05	<0.10							
						338	<0.01		<0.05	<0.10							
						339	<0.01		<0.05	<0.10							
						340	<0.01		<0.05	<0.10							
						341	<0.01		<0.05	<0.10							
336.65	339.2		100	Less contorted, still slumped and with numerous irregular veinlets, pyrite, pyrrhotite (some with very fine tourmaline). Very minor brecciated zones. Grey to light brown quartzite, laminated siltstone, and minor chert. B.C.A.s 25° - 45°.													
						342	<0.01		<0.05	<0.10							
						343	<0.01		<0.05	<0.10							
						344	<0.01		<0.05	<0.10							
						345	<0.01		<0.05	<0.10							
339.2	342.3		100	Very slumped sequence of pale brown to grey siltstone, minor chert, quartzite. Numerous veinlets of pyrite, pyrrhotite throughout. Overall, intensely microfractured, irregularly bedded. B.C.A.s average 45° - 60°. Vuggy pyrite veins at 5° to C.A., very common between 341.0 and 342.3m.													
342.3	345.4		100	Less slumped, grey to pale brown sandstone, minor quartzite. Pyrite and pyrrhotite veinlets common.													
345.4	347.0		100	Grey to light brown quartzite (generally finely bedded) and becoming slumped. Less sulphide veinlets (trace pyrite, pyrrhotite).													
347.0	348.1		100	Highly brecciated, slumped grey to brown quartzites. Rare irregular veinlets of pyrite, one associated with fine brown mineral?													
348.1	349.8		100	Yellow brown mudstone, brown brecciated to slumped quartzite and bedded siltstone. Few specks disseminated pyrite. (Petrology description 349.6m).													
349.8	351.5		100	Darker brown bedded siltstone and buff sandstone. B.C.A.s 45°.													
				END OF HOLE													

442164

DIAMOND HILL HOLE PLOT

SCALE: CMS REPORT 78/12/7

The twelve drill-core intersections were thin-sectioned and examined in the usual way; they are briefly described below.

- 17.7m (T.S. 2631A) Distinctly magnetic. This is a severely hornfelsed fine-grained siliceous sediment; the development of abundant biotite has obscured or obliterated many details, but the rock can be correlated with the Crimmon Greek formation. Surviving (i.e. unreplaced) clastic grains are mainly quartz, minor feldspars (including plagioclase), chert and felsite. New minerals too have formed, by recrystallization (contact-metamorphism) and metasomatism, include abundant dark, fine biotite flakes, small magnetite crystals, and patches of finely-fibrous diopside. Thin quartz-chlorite-tourmaline veinlets cut the rock, and there are traces of pyrite.
- 62.1m (T.S. 26319) This is a fine-grained biotite-hornfels, or strongly biotitized fine-grained metasediment; its dark colour is partly due to abundant carbonaceous (graphitic) material, partly due to the dark biotite. The rock was very probably a carbonaceous, argillaceous siltstone; most of the constituents have been recrystallized to fine, red-brown biotite, and only the coarser elastic grains of quartz, feldspar, chert and felsite have survived. Very small, fibrous idiosidite patches have developed, providing evidence of metasomatism as well as contact-metamorphism. Quartz-pyrite veinlets cut the rock.
- 83.9m (T.S. 26120) Weakly magnetic. A completely metasomatized rock, now composed principally of actinolite and phlogopite; the nature of the original rock is not known, but it was presumably a fine-grained, argillaceous sediment. There are wedges and lenses of dense, mottled fine phlogopite containing apatite porphyroblasts and dendritic illeucoxene patches; bands of phlogopite-tourmaline occur. The bulk of the rock consists of mottled fibrous-actinolar actinolite bundles; some of the coarser crystals have a colourless, tremolite core. Sulphides are interspersed and consist of pyrrhotite and chalcopyrite.
- 131.9m (T.S. 26321) This is a fine-grained calc-silicate hornfels; some of the components are too fine-grained to be readily identifiable. No primary sedimentary characteristics are now recognizable, but the rock was presumably a fine-grained calcareous sediment, probably impure and argillaceous. The major calc-silicates are fibrous actinolite and microgranular diopside, with abundant fine sphene throughout, and occasional patches of relatively coarse axinite. Fine magnetite is present in parts of the rock. Fine-grained quartz occurs interstitially. The mineral assemblage indicates a medium-to-high temperature contact-metamorphic situation.
- 152.9m (T.S. 26322) This calc-silicate rock is almost monomineralic and may be termed a diopside-hornfels; as in the previous intersection, it presumably represents a semi-calcareous sediment. The rock consists of microcrystalline diopside, with haphazardly distributed and randomly orientated clusters of coarser diopside crystals, and occasional granular sphene patches. Faint banding is apparent and is probably inherited; the banding is accentuated by parallel streaks of whitish leucoxene/sphene.
- 183.9m (T.S. 26123) Essentially a chert, cut by veins of tourmaline, this is a good example of the lack of reactivity of siliceous sediments; very little recrystallization or replacement has taken place, and the introduced minerals are virtually confined to veins. The rock consists of featureless, microcrystalline quartz, with occasional small patches of cloudy sphene; tourmaline veins cut the rock. They are composed almost entirely of tourmaline with minor interstitial chlorite and occasional, coarse calcite; the tourmaline is conspicuously zoned, with wide colour variations from pale brown, green, dark smoky greenish-brown to black. Traces of sphene are associated with these veins, and no cassiterite was identified, though there are occasional semi-oblique inclusions in tourmaline which could be cassiterite. It is more likely that the mineral is a complex oxide.
- 213.5m (T.S. 26124) A thoroughly metasomatized, banded sediment, which from its present assemblage is deduced to have been a shale or siltstone; however, apart from the banding (probably inherited bedding) there are no recognizable primary features. The rock is composed of bands of fine, textureless sericite, alternating with bands of intergrown phlogopite, actinolite and magnetite in various proportions; there are random patches of quartz, fibrous diopside, and chlorite, and the whole assemblage has a contorted fabric.
- 234.7m (T.S. 26325) A biotitized, fine-grained metasediment, originally an impure, carbonaceous chert and broadly resembling the intersection at 62.1m, though more siliceous. The rock consists of microcrystalline quartz, thin parallel streaks of fine carbonaceous matter (possibly sub-graphitic) and small lenses of poorly developed feldspar. Small, orange-brown biotite flakes are haphazardly distributed as small patches, discontinuous veinlets and larger replaceive masses in places. The fabric suggests that the rock was brecciated prior to biotitization.

DIAMOND HOLE PLOT

SCALE:

(T.S. 26326)
This is an impure, carbonaceous metachert, with evidence of minor metamorphism.

The main constituents are microcrystalline quartz, ultrafine chlorite, sericite and carbonaceous matter. Small spots of cloudy leuconene occur throughout. Lenses and veinlets of biotite aggregates, and small intergrowths of quartz and tourmaline, have formed sporadically. Thin wisps of carbonaceous matter accentuate the preferred orientation of the rock.

Veins of quartz and stilbite, carrying traces of pyrite, cut the rock, and there are other veins composed of chlorite and carbonate.

(T.S. 26327) Weakly magnetic.
This carbonaceous, impure metachert closely resembles the intersection at 234.7m; it contains sufficient fresh pyrrhotite to respond to a hand-magnet.

The major constituents are microcrystalline quartz and subparallel streaks and clusters of fine carbonaceous matter. Reddish-brown biotite aggregates are haphazardly distributed as bands and patches, often cutting across the orientation. There are lenses of completely recrystallized, mosaic quartz intergrown with biotite, pyrrhotite, pyrite and tchalcopyrite, as well as sericite (altered feldspar) and chlorite.

The mineral assemblage suggests relatively low-temperature metamorphism following low-grade metamorphism.

(T.S. 26328)
This is a biotite-hornfels or biotitized metasediment, possibly of mixed clastic/chemical origin and with ituffaceous components. It resembles the core at 17.7m.

Ampibole, clastic remains of quartz, feldspar, chert and felsite are fairly common; most have a thin rim of chalcedony. They are set in a cloudy, microcrystalline, poorly-defined matrix of quartz, sericite, carbonaceous matter, biotite and leuconene. There are rafts or tabular bodies of much finer-grained rock, providing evidence of intraformational brecciation.

The rock is cut by chlorite-carbonate veins carrying minor sphene; there is a possibility that cassiterite is also present but is too poorly-defined to be optically identified.

(T.S. 26329)
There is a laminated, impure metachert, pervasively metamorphosed and with traces of sulphides.

The laminations are caused by thin streaks of pale brownish leuconene-rutile, representing TiO₂ precipitated with the chert and subsequently recrystallized to ultrafine rutile. The rock consists of microcrystalline featureless quartz, typical of recrystallized chert, and numerous small flakes of sericite which have developed partly by replacement, partly by recrystallization of existing clays. There are poorly-defined patches of fine feldsparite or a related mineral, occurring as spots throughout the rock.

Small irregular grains of pyrrhotite, and cubic crystals of pyrite, are disseminated with the sericite, generally where sericite is coarsest and most abundant.

279.7m

301.3m

315.0m

349.6m