

ALLEGIANCE MINING NL

EL 22 / 1997 - TRIAL HARBOUR

ANNUAL REPORT to July 2005

28 July 2005



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1. SUMMARY

Allegiance Mining NL has discovered a major nickel sulfide deposit in altered mafic and ultramafic rocks at Avebury, west of Zeehan. This Avebury deposit is currently subject to detailed evaluation and mine development.

EL 22/1997 covers a nine (9) square kilometre area immediately west of the Avebury deposit and is considered highly prospective for the discovery of additional nickel sulfide resources which may be capable of supplementing the Avebury operation.

Work to date has focused on the Burbank and Viking West areas, whilst earlier high definition aeromagnetic surveys identified several additional anomalous zones which warrant drill testing.

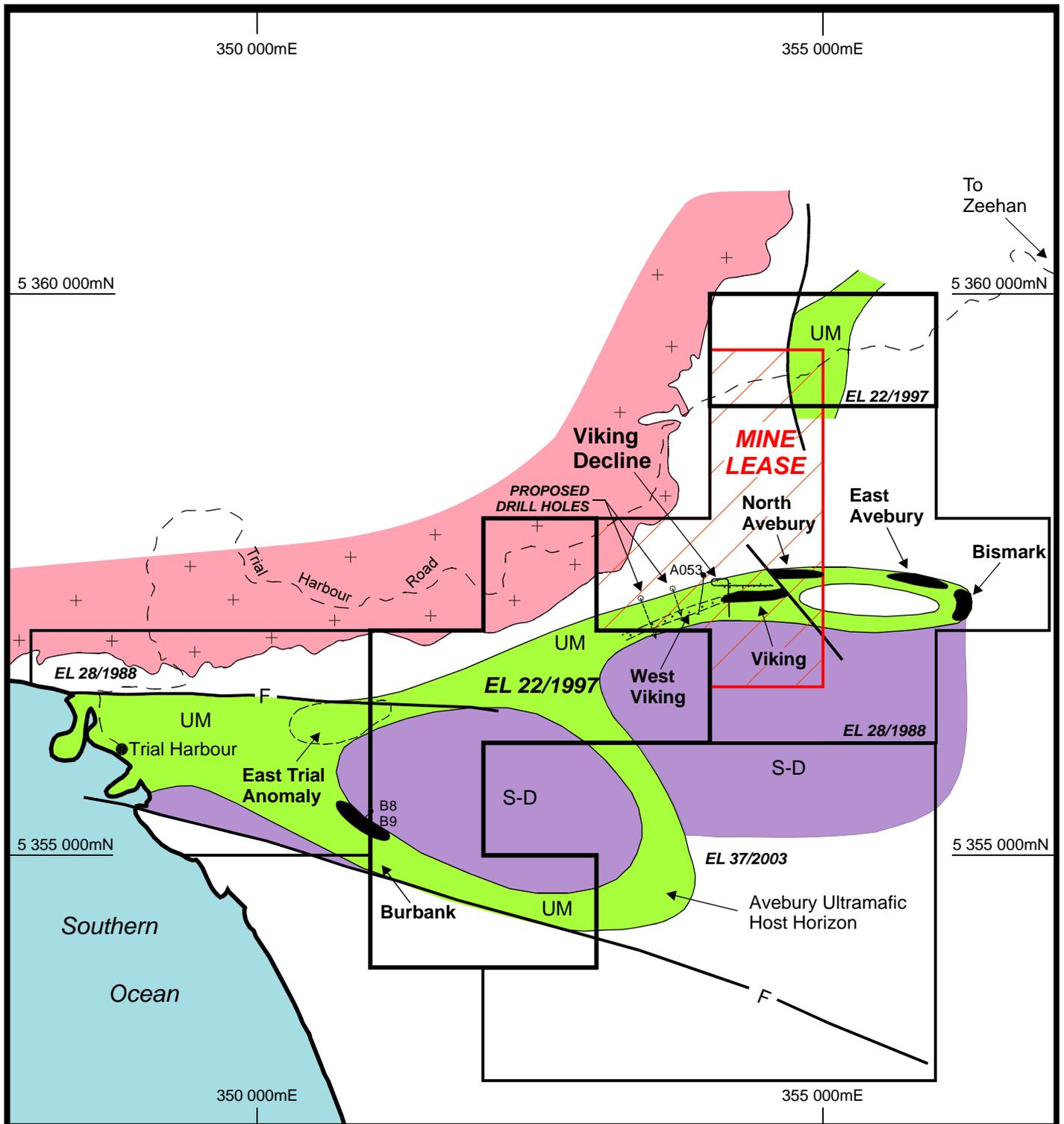
During 2004-05 two drill holes were completed at Burbank to test the depth extension of the 24 m 0.77% Ni zone intersected the previous year in DDH B7.

Both holes intersected broad zones of anomalous nickel in altered ultramafics adjacent to a major fault structure. The nickel is present in a non-sulfidic form associated with limonite and goethite.

Petrological studies interpret the mineralisation as an epithermal nickel sulfide deposit which has been modified by circulating ground water associated with the major fault structure.

Drill hole A053 intersected 14m 2.5% Ni in altered and skarned ultramafics 300 metres west of the Viking deposit. This intersection lies within the Avebury Mining Lease, but is only 200 m from the boundary of EL 22/1997. The host rock formation is interpreted as extending further west and south into EL 22/1997.

Reflecting the encouraging drill results obtained during the year, further substantial drill programs are planned for 2005-06. These will focus on Burbank, Viking West and possibly the East Trial aeromagnetic anomaly.



LEGEND

- ++ Granite
- UM Ultramafics
- S-D Silurian-Devonian Sediments
- Mineralised zones

Allegiance Mining N.L.	
EL 22/1997 - ZEEHAN LOCATION PLAN	Compiled : L. Newnham Date : July 2005 Drawn : G.M.Bennett Revisions : File : Zeehan Location.cdr
Newnham Exploration and Mining Services	Figure No. 1

2. EXPLORATION PHILOSOPHY and STRATEGY

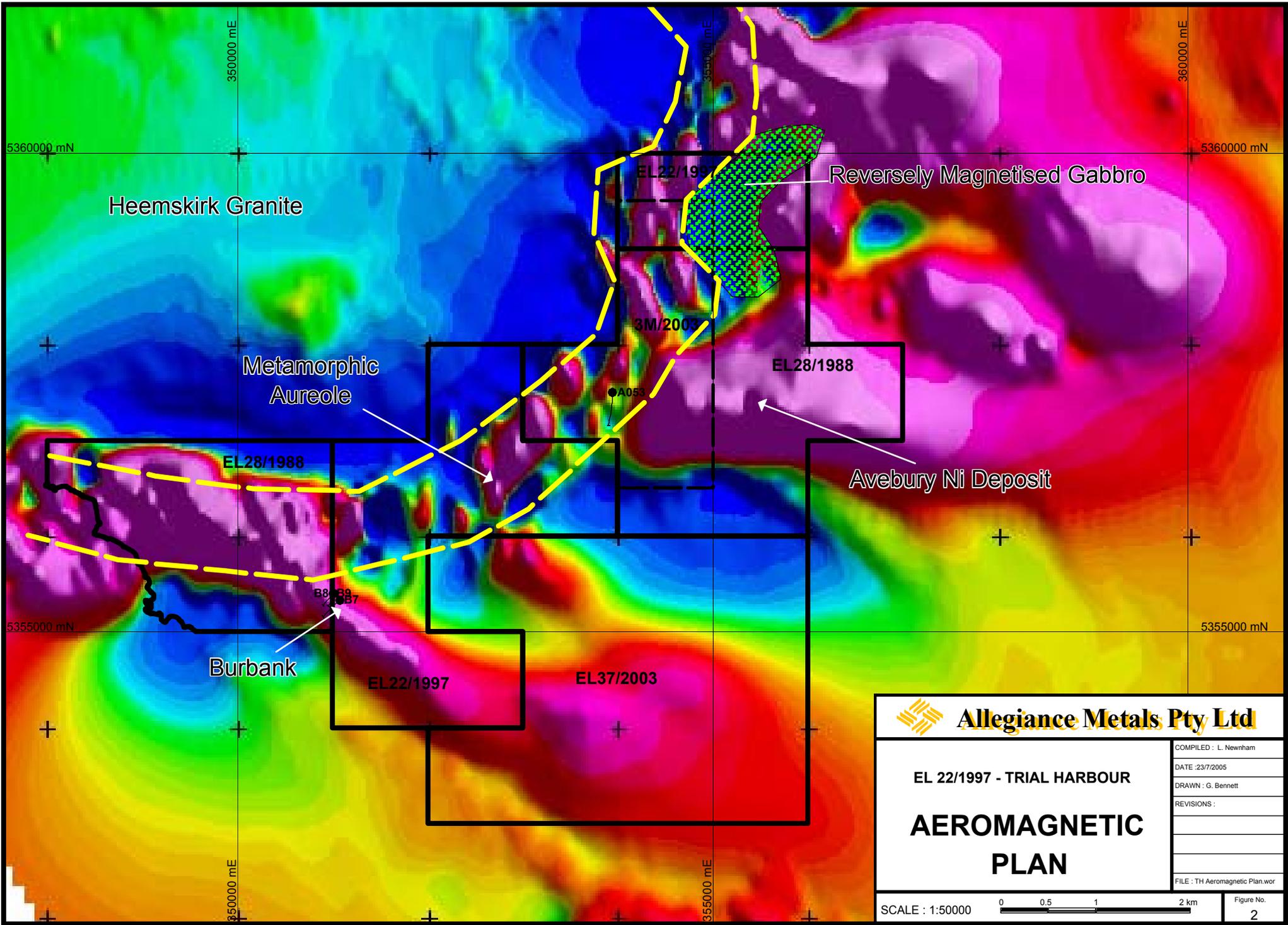
Since 1996 Allegiance Mining NL has been committed to nickel exploration in Western Tasmania. Much of this work has been focused in the area west of Zeehan.

The prime target is nickel sulfide deposits formed within Cambrian mafic and ultramafic formations which have been strongly altered (skarned) by the intrusion of highly fractionated Carboniferous granites. It is probable that such deposits will be non-outcropping and the alteration process will result in the formation of significant magnetite.

To date, the Allegiance exploration effort has resulted in the discovery of the Avebury deposit and the identification of several other prospects and anomalies currently subject to on-going exploration; eg, Burbank, East Avebury, Bismark, Pontiac, Bison and Viking West.

Exploration strategy is a combination of aeromagnetic surveys, ground mapping and lithogeochemical studies and a heavy commitment to drilling.

EL 22/1997 covers a small, but key, area in the Allegiance exploration effort. The geological settings which host the Viking and Burbank deposits extend into the licence area and aeromagnetic and ground evaluation programs have both highlighted the very high prospectivity of the area and identified a number of drilling targets.



Heemskirk Granite

Metamorphic Aureole

Burbank

Reversely Magnetised Gabbro

Avebury Ni Deposit

EL22/1997

EL28/1988

EL28/1988

EL22/1997

EL37/2003

3M/2003

A053

B8839
B87



Allegiance Metals Pty Ltd

EL 22/1997 - TRIAL HARBOUR

AEROMAGNETIC PLAN

COMPILED : L. Newnham
DATE :23/7/2005
DRAWN : G. Bennett
REVISIONS :
FILE : TH Aeromagnetic Plan.wor

SCALE : 1:50000



Figure No. 2

3. EXPLORATION COMPLETED 2004-05

Exploration during 2004-05 was focused on:

- Burbank project
- strike extensions of Viking West

3.1 Burbank Project:

Two cored drill holes, B8 and B9, were completed to test at depth the broad nickeliferous zone intersected in DDH B7 in 2003-04, and in shallow holes B1-B6 in 2002-03.

The two holes totalling 666 m were completed from a single helipad adjacent to the Little Henty River in January-February 2005. Drilling was undertaken by Almac Drilling using an LY38 drill rig working 24 hours/day, 7 days/week, supported on a daily basis by helicopter based in Zeehan.

Coring was HQ-NQ, generally with good core recoveries. Core was logged in Zeehan, selected intervals were split in half for assaying by SGS, and remaining core was stored in Zeehan.

Petrological studies were completed by SKM (NZ). Drill logs, assays and petrological report are appended. Drill hole sections and plans are attached.

DDH B8: intersected an altered ultramafic body between 105.0-283.0 m (178 m). A major fault zone cut through this body (145.0-243 m). The fault zone was strongly leached and vuggy with major water flows reported. There was pervasive and abundant development of limonite, goethite and magnetite within, and adjacent to, the fault.

The interval 143.5-159.5 m (16.0 m) assayed 0.77% Ni, 0.37% Zn and <0.10 S, and is equated with the depth extension of a similar zone in B7 (24 m 0.77% Ni, 0.28% Zn - high core losses).

Petrological studies have identified this unit as serpentinitised ultramafic, with veins and stringers of magnetite, weakly hydrothermally altered and containing no sulfides.

DDH B9: intersected a similar thick unit of altered ultramafics between 144.0-351.7 (207 m) beneath B8 and the higher B7. The major fault intersected in B8 was again present in B9. The altered ultramafic and the fault zone were severely leached with the pervasive development of limonite and goethite, probably derived from the weathering of magnetite and sulfides.

The interval 150.2-215.0 m (64.8 m) averaged 0.50% Ni, 0.15%

Zn and 0.08% S. Included in this were several higher-grade intervals:

150.2-156.8 m: 6.6 m 0.9% Ni, with values to 2.09% Ni

162.8-168.5 m: 5.7 m 0.71% Ni, with values to 1.07% Ni

180.5-185.5 m: 5 m 0.83% Ni, with values to 1.53% Ni

Petrological studies again suggested the unit of higher nickel values was a serpentinised ultramafic with veins and stringers of magnetite. The unit was hydrothermally altered and strongly leached at a later time of circulating ground water.

However, unlike the shallower B7 and B8 intersections, some fine-grained pentlandite was observed at 147.5 m, associated with magnetite.

Burbank Summary:

The nickeliferous zones in DDH B8 and B9 have been petrologically interpreted (Appendix 5) as - “ **... an epithermal nickel deposit formed along a major structure that also served as a later conduit for oxidised groundwaters such that sulfides are only preserved peripherally to the structure or possibly at greater depths within it. Limonite and goethite produced by the oxidation are considered to host the nickel in the oxidised samples, but at much higher concentrations than the limonite of lateritic deposits.**”

The host rocks are serpentinised ultramafics, variably altered to carbonate-silica assemblages.

In summary, the Burbank geological setting is very similar to Avebury but the depth of weathering is greater, probably reflecting the presence of a very major fault zone intersecting the altered and mineralised zones. What is observed in core at depth at Burbank is similar to the vuggy limonitic gossan outcrop at Avebury.

Burbank mapping suggests the ultramafic host will plunge south-east. If deeper drilling was to be undertaken it should, therefore, be south-east of the current drilling. Deeper drilling to the north-west may result in intersections too deep in the system.

3.2 Viking West:

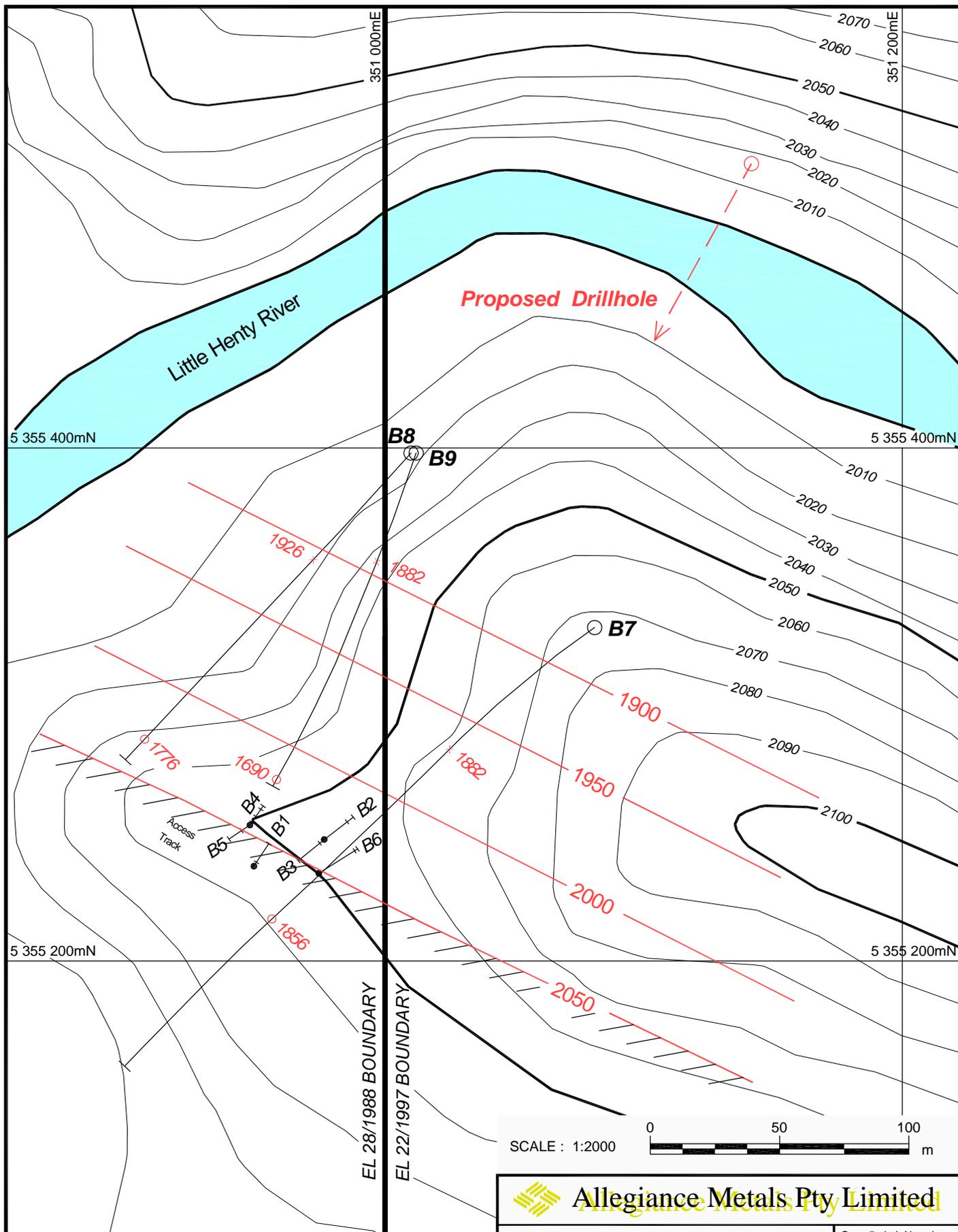
At Avebury the Viking resource has been drilled both from surface and underground from the Viking Decline. The western limit of the resource identified by this drilling is approximately 500 m from the Mining Lease EL 22/1997 boundary.

During the year, underground drill hole A051 was drilled to test for extensions of Viking to the west. It intersected 12 m 1.6% Ni in the Viking approximately

150 m west of the Viking resource.

Surface hole A053 was completed a further 200 m west along strike and intersected 14m 2.5% Ni in the Viking, at a vertical depth of approximately 480 m. This intersection is only 200 m from the boundary with EL 22/1997. The current interpreted strike on the Viking indicates the Viking host rock sequence will pass into EL 22/1997 approximately 200 m west of A053 (Figs 6, 7).

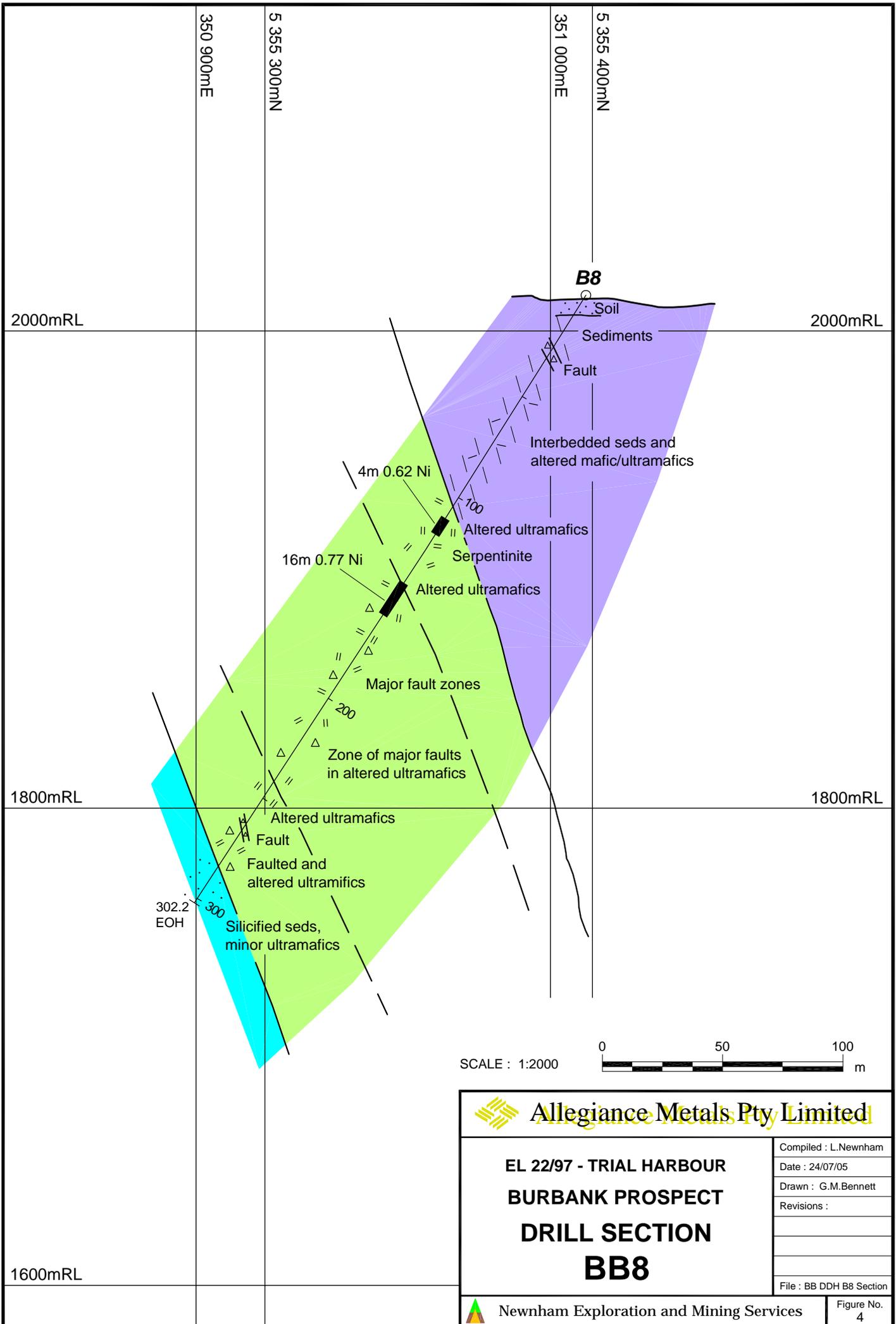
The nickel mineralisation in A053 was present as coarse-grained pentlandite hosted by a skarned serpentinite and accompanied by magnetite.



KEY	
	2000 Contours of Mineralised Zone Hangingwall
	Outcrop of Mineralised Zone

 **Allegiance Metals Pty Limited**

EL 22/97 - TRIAL HARBOUR BURBANK PROSPECT DRILLHOLE LOCATION PLAN AND MINERALISED ZONE	Compiled : L.Newnham
	Date : 24/07/05
	Drawn : G.M.Bennett
	Revisions :
	File : BB Plan 2005
 Newnham Exploration and Mining Services	Figure No. 3



SCALE : 1:2000



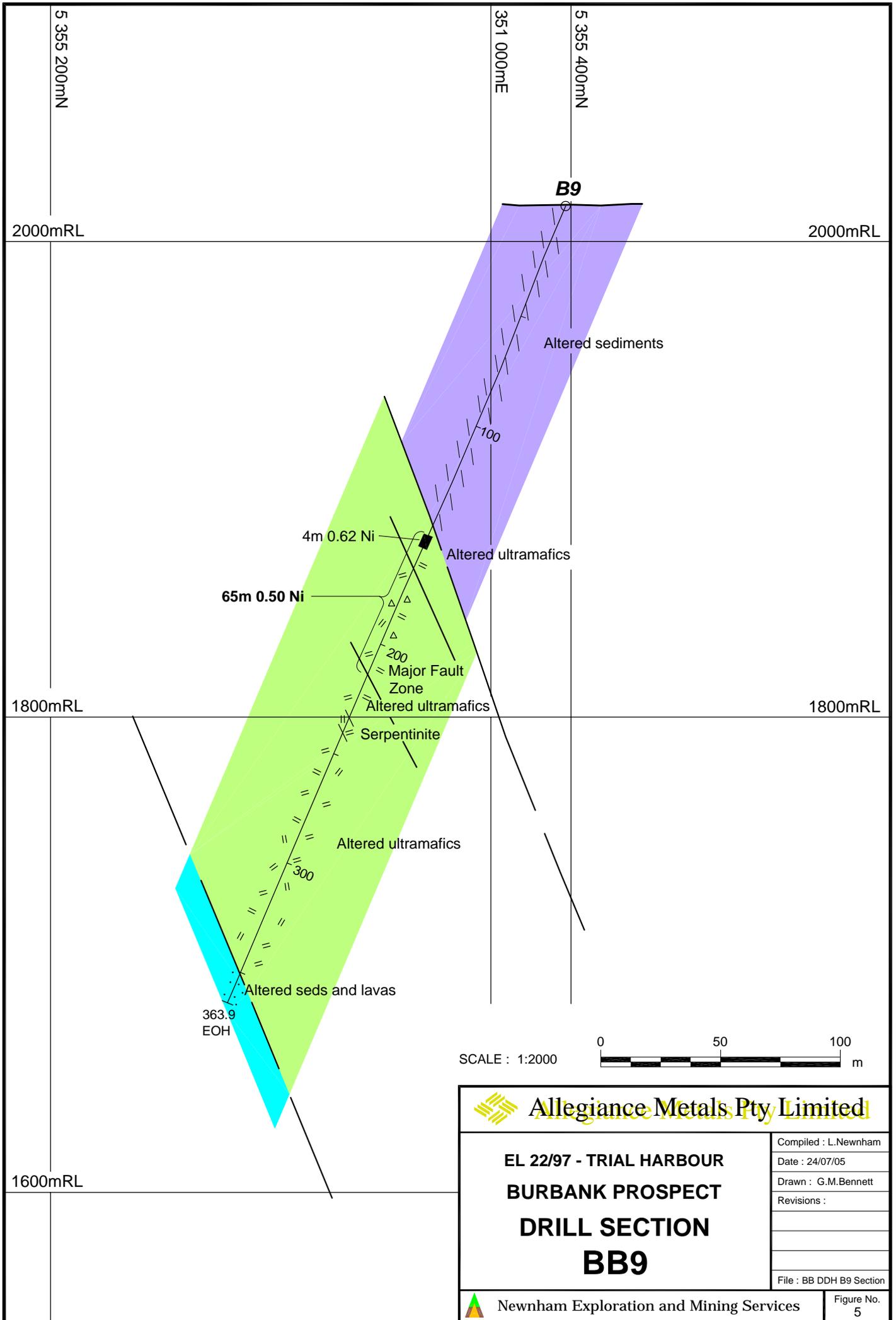
Allegiance Metals Pty Limited

**EL 22/97 - TRIAL HARBOUR
BURBANK PROSPECT
DRILL SECTION
BB8**

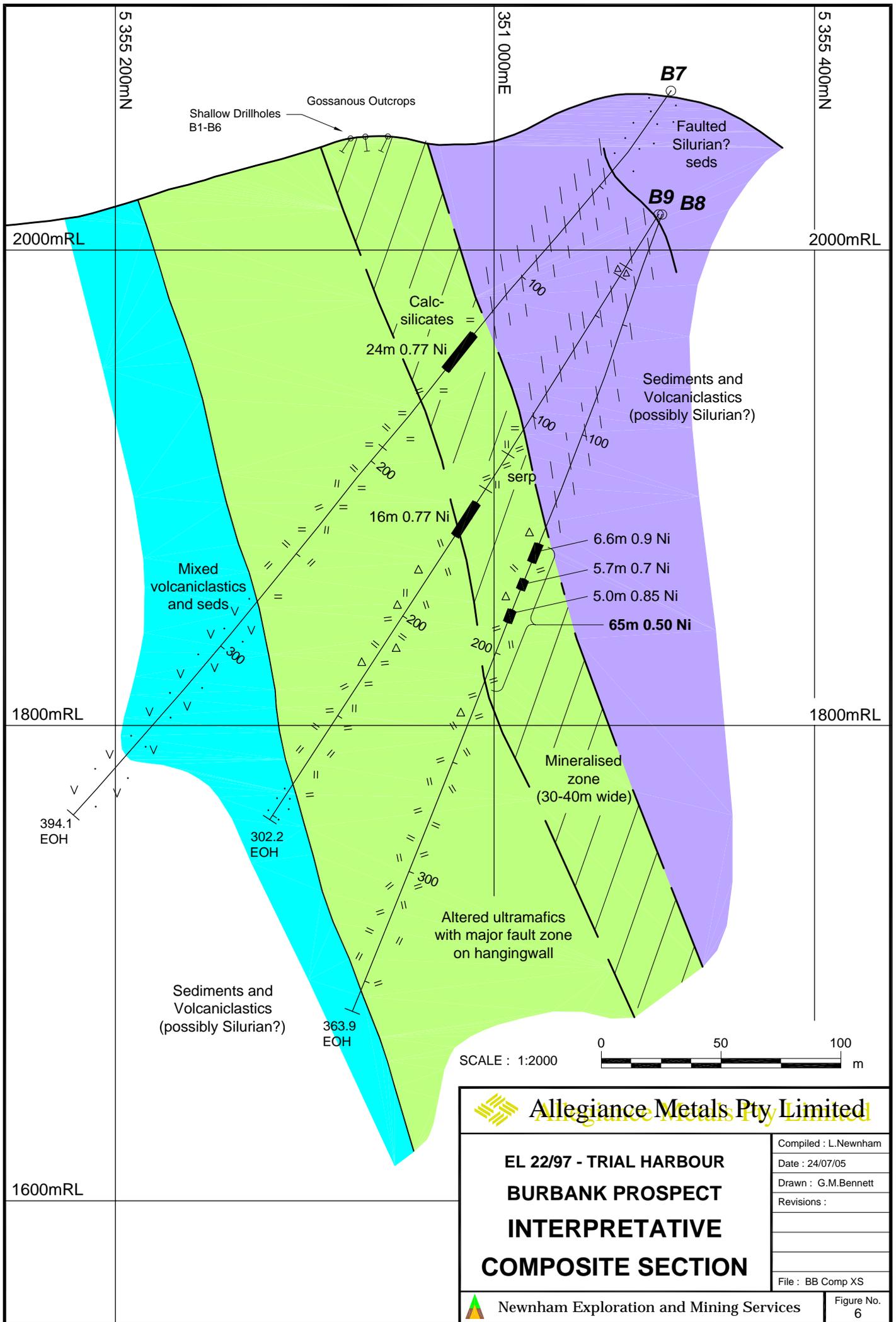
Compiled : L.Newnham
Date : 24/07/05
Drawn : G.M.Bennett
Revisions :
File : BB DDH B8 Section

 Newnham Exploration and Mining Services

Figure No.
4

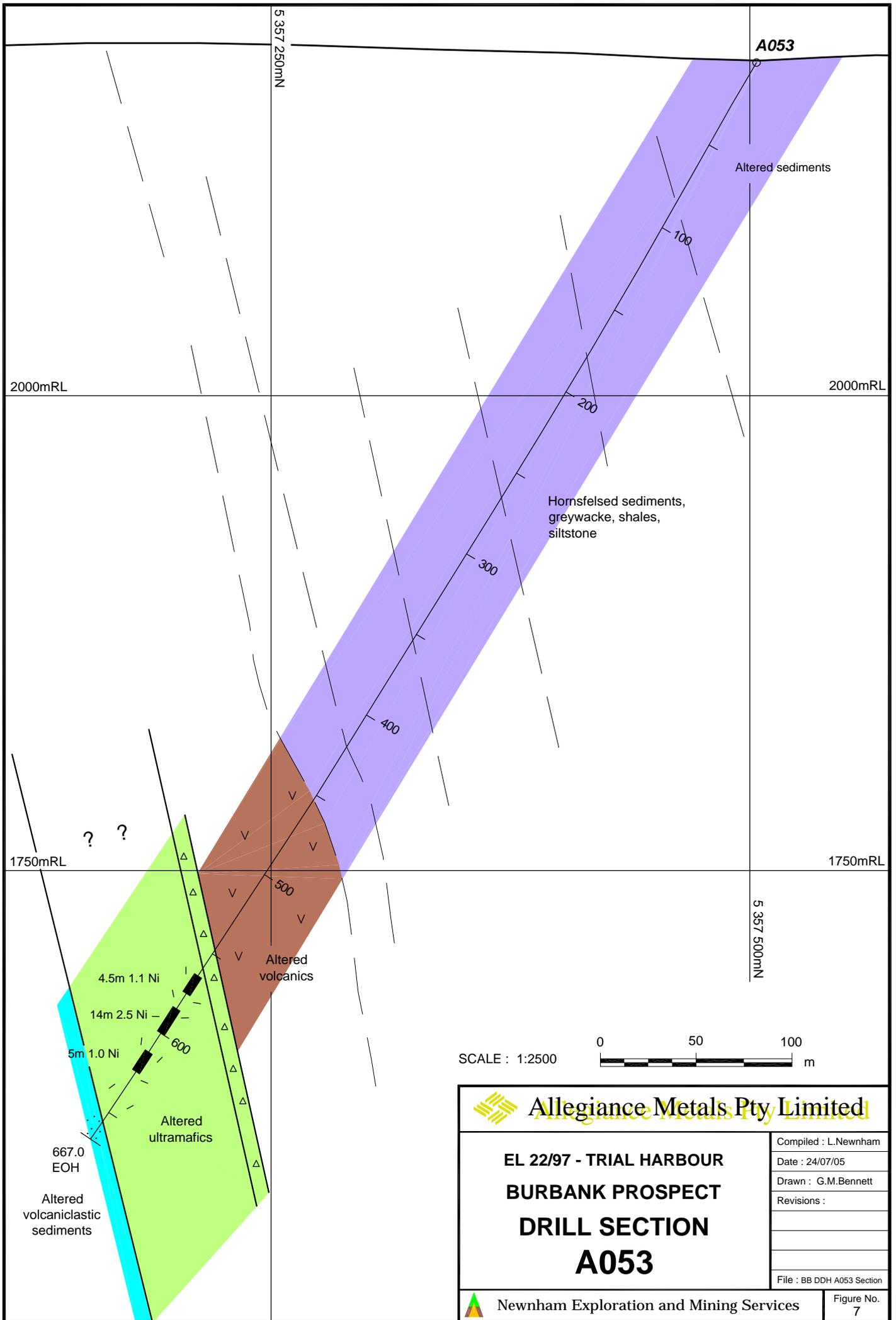


 Allegiance Metals Pty Limited	
EL 22/97 - TRIAL HARBOUR BURBANK PROSPECT DRILL SECTION BB9	
Compiled : L.Newnham	
Date : 24/07/05	
Drawn : G.M.Bennett	
Revisions :	
File : BB DDH B9 Section	
 Newnham Exploration and Mining Services	Figure No. 5



Allegiance Metals Pty Limited

EL 22/97 - TRIAL HARBOUR BURBANK PROSPECT INTERPRETATIVE COMPOSITE SECTION	Compiled : L.Newnham
	Date : 24/07/05
	Drawn : G.M.Bennett
	Revisions :
	File : BB Comp XS
Newnham Exploration and Mining Services	Figure No. 6



A053

Altered sediments

2000mRL

2000mRL

Hornfelsed sediments,
greywacke, shales,
siltstone

1750mRL

1750mRL

5 357 250mN

5 357 500mN

? ?

Altered volcanics

4.5m 1.1 Ni

14m 2.5 Ni

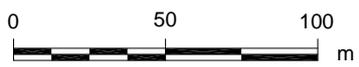
5m 1.0 Ni

Altered ultramafics

667.0 EOH

Altered volcanoclastic sediments

SCALE : 1:2500



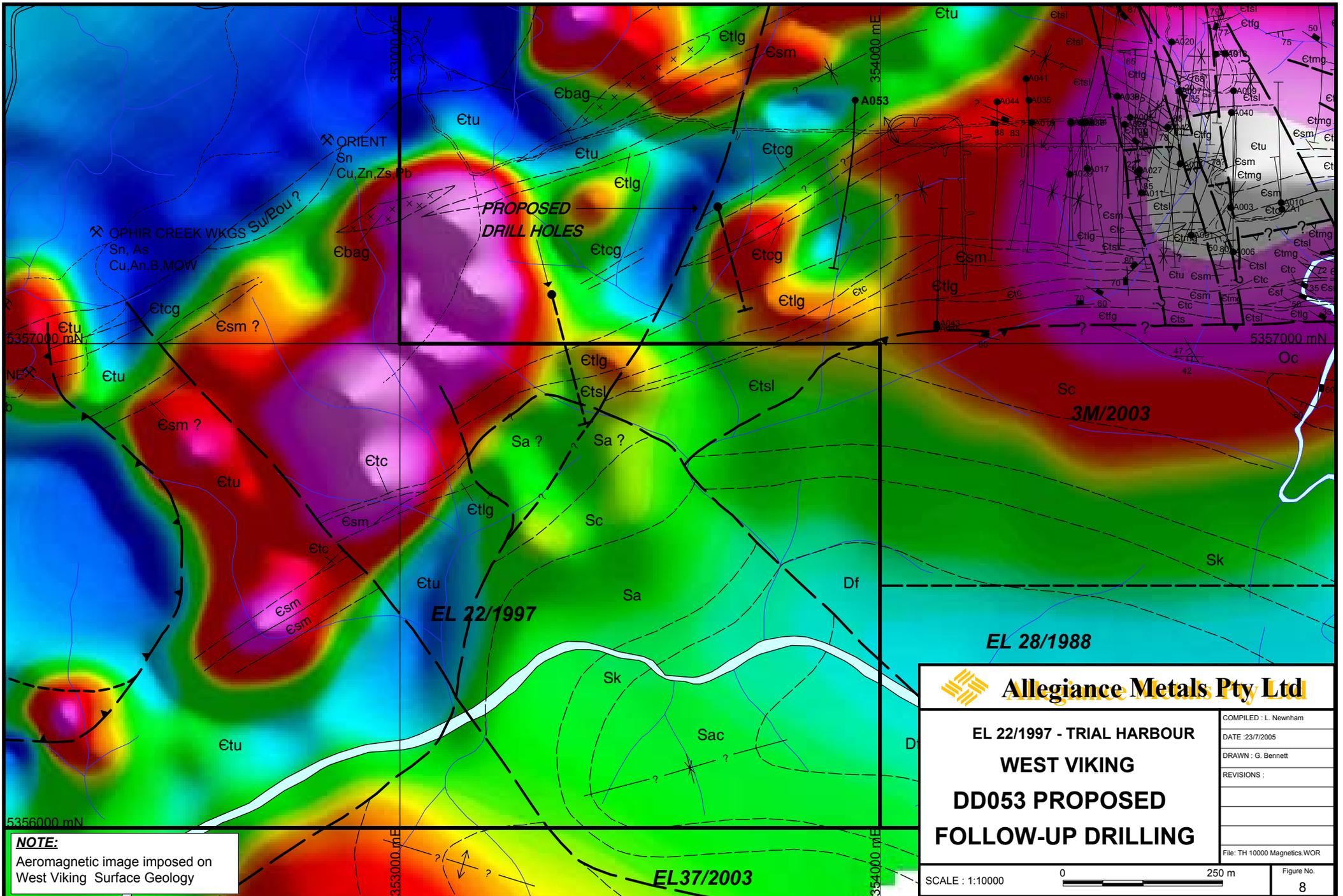
Allegiance Metals Pty Limited

**EL 22/97 - TRIAL HARBOUR
BURBANK PROSPECT
DRILL SECTION
A053**

Compiled : L.Newnham
Date : 24/07/05
Drawn : G.M.Bennett
Revisions :
File : BB DDH A053 Section

Newnham Exploration and Mining Services

Figure No.
7



NOTE:
Aeromagnetic image imposed on
West Viking Surface Geology

 Allegiance Metals Pty Ltd	
EL 22/1997 - TRIAL HARBOUR WEST VIKING DD053 PROPOSED FOLLOW-UP DRILLING	
COMPILED : L. Newnham DATE : 23/7/2005 DRAWN : G. Bennett REVISIONS : File: TH 10000 Magnetics.WOR	Figure No. 8
SCALE : 1:10000 0 250 m	

4. EXPLORATION PLANNED 2005-06

In 2005-06 the following work is planned:

Burbank: 2 cored drill holes, helicopter supported, testing nickeliferous zone at depth and probably to the south-east of B8, B9.

Total metreage: 1,000 m

Budget: \$220,000

Schedule: December-January 2006

**Viking
West:**

2 cored drill holes along strike to the west of A053.

Total metreage: 1,000 m

Budget: \$150,000

Schedule: October-November 2005

.....

APPENDIX 1

DDH B8 drill log

COMPANY: Allegiance Mining NL
PROJECT: Burbank
HOLE NUMBER: B8

Commenced	14 Jan 05
Completed	26 Jan 05
Logged by	L Newnham
Drilled by	Almac

Purpose of Hole

Test leached nickel zone intersected in B7 at greater depth.

Collar details

Grid	AMG
Easting	351,010E
Northing	5,355,398N
Elevation	2,015
Dip	-57
Bearing	222
Length	302.2

Comments on Completion

intersected major fault zone in middle of sequence of serpentinised and hydrothermally altered ultramafics. Significant Ni-Zn mineralisation associated with limonite in upper section of fault zone. Petrological work suggests this is a severely leached epithermal nickel deposit. Nickel rich zone may have been wider than 16 m., but significant core losses below 159.5m

Hole Size

To	Size
116.5	HQ
302.2	NQ

Major core loss zones

From	To	% recov.
26.5	31.8	75
159.5	227.5	see log
280	285	see log

Hole Condition on Completion

all steel removed from hole; strong water flows stopped by placing van ruth and wooden plugs and cement in HQ section of hole.

Summary of Assay Results

Depth		Recovery	Description	Length	Assays		
From (m)	To (m)	%			m.	%Ni	%Zn
110.5	114.5	100	serpentinised ultramafic	4.0	0.62	0.24	<0.10
143.5	159.5	100	HW section of major fault	16.0	0.77	0.37	<0.10

Down Hole Survey Data

Camera	Dip	Mag Brg	Mag Brg	Grid Brg
Depth		Actual	Adjusted	AMG
0	-58	210		222
50	-58	210		222
100	-58	211		223
151	-57	213	211	223
200	-57	215	211	223
248	-57	215	211	223
300	-57	211		223

Notes on Surveys

survey bearings at 151, 200, 248 probably affected by magnetite in ultramafics. Adjusted to relate better to adjacent readings.

General Comments

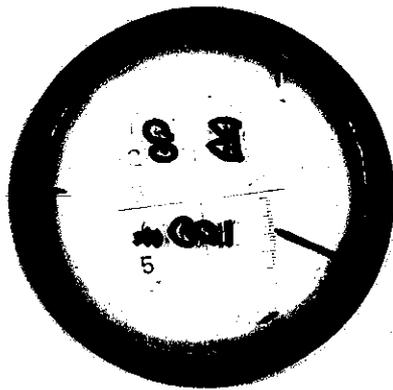
Description		Core Recovery			Assays							
From	To	From	To	%	From	To	% Ni	% Cu	% S	% Zn	% As	% Co
0.0	8.0	0.0	8.0	25								
8.0	26.0	8.0	26.0	100								
26.0	31.0	26.0	26.5	100								
		26.5	27.7	80								
		27.7	28.3	50								
		28.3	30.7	70								
		30.7	31.8	80								
31.0	56.0	31.8	56.0	100								
56.0	105.2	56.0	105.2	100	92.5	93.5	0.01	0.01	0.23	0.01	0.004	
					93.5	94.5	0.01	0.01	0.04	0.01	0.002	
					94.5	95.5	0.01	<0.01	0.10	0.01	0.002	
					95.5	96.5	0.01	0.01	0.40	0.01	0.002	
					96.5	97.5	0.04	0.01	0.20	0.02	0.002	
					97.5	98.5	0.02	0.01	2.03	0.01	0.002	
					98.5	99.5	0.01	0.01	1.97	0.01	0.002	
					99.5	100.5	0.01	<0.01	0.65	0.02	0.002	
					100.5	101.5	0.02	0.01	1.35	0.02	0.002	
					101.5	102.5	0.07	0.01	1.62	0.02	0.003	
					102.5	103.5	0.12	<0.01	0.18	0.04	0.002	
					103.5	104.5	0.24	<0.01	0.08	0.07	0.002	
					104.5	105.5	0.25	<0.01	0.12	0.08	0.005	
105.2	118.0	105.2	116.5	100	105.5	106.5	0.14	<0.01	0.05	0.02	0.006	
		116.5	118.0	86	106.5	107.5	0.16	<0.01	0.08	0.01	0.005	
					107.5	108.5	0.18	<0.01	0.08	0.04	0.004	
					108.5	109.5	0.24	<0.01	0.01	0.05	0.005	
					109.5	110.5	0.33	<0.01	0.01	0.06	0.003	
					110.5	111.5	0.58	<0.01	0.01	0.15	0.005	
					111.5	112.5	0.62	<0.01	0.01	0.24	0.004	
					112.5	113.5	0.58	<0.01	0.01	0.25	0.003	
					113.5	114.5	0.67	<0.01	0.01	0.23	0.006	
					114.5	115.5	0.42	<0.01	0.01	0.07	0.004	
					115.5	116.5	0.20	<0.01	0.06	<0.01	0.010	
					116.5	118.0	0.23	<0.01	0.12	<0.01	0.003	

Description		Core Recovery			Assays							
From	To	From	To	%	From	To	% Ni	% Cu	% S	% Zn	% As	% Co
118.0	137.5	118.0	137.5	100								
		SERPENTINITE: Dark green serpentinitised ultramafic. Gradational with units above and below. Thin white quartz-carbonate veins common. Magnetite common as thin veins and aggregates; possible corroded aggregates of sphalerite?? or magnetite. No pyrrhotite or pentlandite observed; core quite broken but good recoveries										
137.5	145.5	137.5	145.5	100	137.5	138.5	0.22	<0.01	0.09	<0.01	<0.002	
		ALTERED ULTRAMAFICS: similar to 105.2-118.0m; interpreted as serpentinite which has been strongly altered to calc-silicate assemblage; light brown-reddish brown and pale green coloration; quartz-carbonate and magnetite veining common-abundant; aggregates of coarse magnetite common-abundant; rare specs of sulfides; possible corroded aggregates of sphalerite (?or magnetite); ground conditions generally competent; <i>petrological sample 145.3m: veined serpentinite; ultramafic rock which has undergone initial serpentinitisation and later weak hydrothermal alteration;</i>										
					138.5	139.5	0.21	<0.01	0.09	0.01	<0.002	
					139.5	140.5	0.21	<0.01	0.07	0.01	<0.002	
					140.5	141.5	0.23	<0.01	0.07	0.01	<0.002	
					141.5	142.5	0.20	<0.01	0.05	0.01	<0.002	
					142.5	143.5	0.23	<0.01	0.03	0.02	<0.002	
					143.5	144.5	0.51	<0.01	<0.01	0.15	<0.002	
					144.5	145.5	0.69	<0.01	<0.01	0.22	0.002	
145.5	242.6	145.5	159.5	100	145.5	146.5	0.85	<0.01	<0.01	0.42	0.003	
		MAJOR FAULT ZONE: strongly leached major fault zone within the ultramafic body; clasts dominated by altered ultramafics, dominated by calc-silicates (tremolite, epidote? alteration), occasional serpentinite clasts; matrix of iron rich quartz-carbonate; magnetite common throughout as veins and aggregates both in the clasts and matrix (ie) late stage veining; magnetite abundant in some sections towards base of unit; fault is strongly leached and vuggy with open space quartz crystal growths common in vugs; strong water flows reported by drillers in this interval; core is typically strongly iron stained (limonitic) brown color, suggestive of some leached material being sulfides; minor very fine grained sulfides associated with magnetite; even though this is a strongly leached major fault zone, ground conditions are generally very good with only minor core losses; ground becomes more broken and friable towards base of unit; <i>petrological sample 148.5 m: serpentinitised and veined ultramafic;</i> <i>petrological sample 150.5 m: serpentinitised ultramafic, with veins and stringers of magnetite;</i>										
		159.5	162.1	40	146.5	147.5	0.85	<0.01	<0.01	0.41	0.003	
		162.1	175.0	100	147.5	148.5	0.94	<0.01	<0.01	0.45	0.003	
		175.0	177.3	40	148.5	149.5	0.92	<0.01	0.02	0.45	0.003	
		177.3	178.5	66	149.5	150.5	0.79	<0.01	<0.01	0.41	0.004	
		178.5	179.8	15	150.5	151.5	0.87	<0.01	<0.01	0.45	0.003	
		179.8	218.0	100	151.5	152.5	0.87	<0.01	<0.01	0.42	0.005	
		218.0	220.0	60	152.5	153.5	0.58	<0.01	<0.01	0.28	0.004	
		220.0	222.5	75	153.5	154.5	0.76	<0.01	<0.01	0.42	0.003	
		222.5	226.5	100	154.5	155.5	0.72	<0.01	<0.01	0.38	0.002	
		226.5	227.5	12	155.5	156.5	0.77	<0.01	<0.01	0.36	<0.002	
		227.5	242.6	100	156.5	157.5	0.97	<0.01	0.03	0.47	0.004	
					157.5	158.5	0.70	<0.01	<0.01	0.37	0.003	
					158.5	159.5	0.58	<0.01	0.01	0.25	0.004	
					159.5	162.0	0.16	<0.01	<0.01	0.08	<0.002	
					162.0	163.0	0.18	<0.01	0.01	0.12	0.003	
					163.0	164.0	0.30	<0.01	0.01	0.19	0.004	
					164.0	165.0	0.35	<0.01	0.04	0.18	0.005	
					165.0	166.0	0.41	0.01	0.02	0.25	0.002	
					166.0	167.0	0.30	<0.01	0.01	0.25	0.003	
					167.0	168.0	0.26	<0.01	0.02	0.23	<0.002	
					168.0	169.0	0.24	<0.01	0.01	0.19	<0.002	
					169.0	170.0	0.29	<0.01	<0.01	0.13	0.002	
					170.0	171.0	0.33	<0.01	<0.01	0.17	0.002	
242.6	263.3	242.6	263.3	100	171.0	172.0	0.42	<0.01	<0.01	0.16	0.007	
		ALTERED ULTRAMAFICS: typically light gray, speckled altered ultramafics; consists mainly of tremolite and silica with occasional irregular intervals of soft brown talc; fine black speckling due to grains of dark chromite? pervasive green coloration with numerous patches bright green nickel silicate ?? accompanied by purplish axinite and white carbonate matrix; pure silica banding in places; pervasive 1-2% sulfides as coarse irregular grains and aggregates; sulfide is non-magnetic and has appearance of pentlandite; most abundant in zones with common bright green mineral; irregular, almost stylonitic veins of soft brown mineral with reddish brown streak (possibly talc); core very competent with only wide spaced joint sets; no leaching;										
					172.0	173.0	0.35	<0.01	<0.01	0.13	<0.002	
					173.0	174.0	0.24	<0.01	0.01	0.11	0.003	
					174.0	175.0	0.34	<0.01	0.01	0.14	0.005	
					175.0	177.3	0.54	<0.01	0.01	0.27	0.008	
					177.3	179.8	0.40	<0.01	0.01	0.30	0.002	
					179.8	181.0	0.34	<0.01	0.01	0.28	0.004	
					181.0	182.0	0.31	<0.01	0.01	0.25	0.003	
					182.0	183.0	0.22	<0.01	<0.01	0.14	0.004	
					183.0	184.0	0.16	<0.01	0.01	0.15	<0.002	
					184.0	185.0	0.39	<0.01	0.01	0.23	0.005	
					185.0	186.0	0.23	<0.01	<0.01	0.18	<0.002	
					186.0	187.0	0.25	<0.01	0.01	0.22	0.003	
					187.9	189.0	0.44	<0.01	<0.01	0.23	0.002	
					189.0	190.0	0.11	<0.01	<0.01	0.06	<0.002	

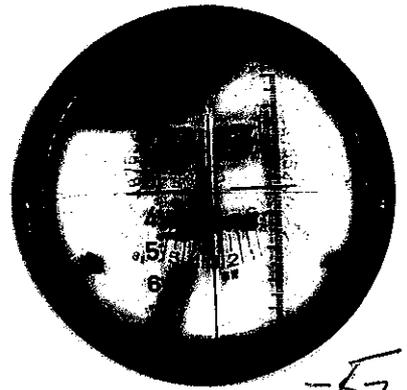
Description		Core Recovery			Assays									
From	To	From	To	%	From	To	% Ni	% Cu	% S	% Zn	% As	% Co		
263.3	264.9	FAULT ZONE: brecciated and broken zone; clasts in top half mainly very soft altered ultramafics with talc-carbonate matrix, and an oolitic texture in places; clasts in lower half strongly silicified light gray sediments ? no sulfides;	263.3	264.9	100	190.0	191.0	0.41	<0.01	0.01	0.25	0.004		
						191.0	192.0	0.26	<0.01	<0.01	0.17	<0.002		
						192.0	193.0	0.25	<0.01	0.01	0.20	<0.002		
						193.0	194.0	0.19	<0.01	0.01	0.18	<0.002		
						194.0	195.0	0.31	<0.01	0.01	0.25	0.003		
						195.0	196.0	0.36	<0.01	0.01	0.30	0.002		
264.9	266.3	SILICIFIED ZONE: pale gray strongly silicified sediments; sharp 30° CA contact with unit above, diffuse contact with unit below; only rare spec of sulfides; ground conditions competent;				196.0	197.0	0.19	<0.01	<0.01	0.13	<0.002		
			264.9	266.3	100	197.0	198.0	0.43	<0.01	0.02	0.14	0.004		
						198.0	199.0	0.32	<0.01	0.01	0.12	<0.002		
						199.0	200.0	0.27	<0.01	<0.01	0.10	<0.002		
						200.0	201.0	0.33	<0.01	<0.01	0.16	0.004		
						201.0	202.0	0.27	<0.01	0.02	0.13	<0.002		
266.3	269.4	ALTERED ULTRAMAFICS: strongly altered ultramafics, dark gray, brecciated appearance; dominated by quartz-actinolite-tremolite alteration with abundant talc-carbonate veining, typically with rusty brown coloration (limonite);	266.3	269.4	100	202.0	203.0	0.27	<0.01	<0.01	0.10	<0.002		
						203.0	204.0	0.28	<0.01	0.01	0.13	<0.002		
						204.0	205.0	0.18	<0.01	0.01	0.11	0.009		
						205.0	206.0	0.37	<0.01	0.01	0.19	0.003		
						206.0	207.0	0.28	<0.01	<0.01	0.16	0.003		
						207.0	208.0	0.26	<0.01	<0.01	0.12	0.005		
269.4	283.8	FAULTED and ALTERED ULTRAMAFICS: altered ultramafics as interval above, but cut by several significant brecciated fault zones which carry abundant coarse grained pale green talc; magnetite is common-abundant in several intervals, (eg) 271.6-274.2 and 281.9-283.4m; from 271.6-274.2m: the magnetite is associated with 2-3% sulfides, possibly including some pentlandite; sulfides occur both as irregular aggregates associated with magnetite and in late stage veinlets up to 1 mm. across; core generally very broken in fault zones, separated by moderately competent altered ultramafics; some core losses;	269.4	280.0	100	208.0	209.0	0.43	<0.01	0.06	0.17	0.006		
			280.0	281.9	70	209.0	210.5	0.51	<0.01	<0.01	0.23	0.006		
			281.9	284.0	90	210.5	211.5	0.32	<0.01	<0.01	0.13	0.004		
						211.5	212.5	0.24	<0.01	0.03	0.11	0.003		
						212.5	213.5	0.33	<0.01	<0.01	0.17	0.005		
						213.5	214.5	0.44	<0.01	0.01	0.17	0.007		
						214.5	215.5	0.28	<0.01	0.01	0.12	0.007		
						215.5	216.5	0.29	<0.01	<0.01	0.11	0.007		
						216.5	217.5	0.31	<0.01	0.01	0.13	0.008		
						217.5	218.5	0.27	<0.01	<0.01	0.09	0.007		
						218.5	220.0	0.41	<0.01	<0.01	0.13	0.008		
			283.8	289.6	SILICIFIED SEDIMENTS: similar to 264.9-266.3m; pale gray, massive, strongly silicified; occasional bands of altered very broken mafic/ultramafic rock; no sulfides observed; upper contact very broken, lower contact approx 30°CA; overall, hard and moderately broken; some core losses;				220.0	221.2	0.64	<0.01	<0.01	0.21
284.0	285.0	80				221.2	222.5	0.72	<0.01	<0.01	0.20	0.010		
285.0	289.6	100				222.5	224.0	0.48	<0.01	<0.01	0.10	0.008		
						224.0	226.0	0.21	<0.01	<0.01	0.02	0.003		
						226.0	227.5	0.25	<0.01	<0.01	0.05	0.002		
						227.5	228.5	0.14	<0.01	<0.01	0.03	0.006		
289.6	292.5	ALTERED ULTRAMAFICS: top metre contains abundant magnetite, including 200 mm massive magnetite; lower section consists of pale green-brown medium-fine grained quartz-talc-tremolite alteration; trace disseminated sulfide; core generally very broken;				228.5	230.0	0.26	<0.01	<0.01	0.13	0.004		
						230.0	231.0	0.33	<0.01	<0.01	0.19	0.003		
						231.0	232.0	0.23	<0.01	<0.01	0.08	0.003		
			289.6	292.5	100	232.0	233.0	0.24	<0.01	<0.01	0.12	0.009		
						233.0	234.0	0.13	<0.01	<0.01	0.01	0.003		
						234.0	235.0	0.07	<0.01	<0.01	0.02	<0.002		
292.5	300.3	ALTERED/BRECCIATED BASALTS or MAFIC SEDIMENTS: generally dark gray, strongly silicified and brecciated mafic rocks, either a basalt or mafic sediment, with soft narrow bands of decomposing ultramafics; sharp 60°CA contact with unit below; unit very broken;				235.0	236.0	0.08	<0.01	<0.01	0.02	<0.002		
						236.0	237.0	0.07	<0.01	<0.01	0.01	<0.002		
						237.0	238.0	0.13	<0.01	<0.01	0.03	<0.002		
						238.0	239.0	0.15	<0.01	<0.01	0.05	0.002		
						239.0	240.0	0.18	<0.01	<0.01	0.05	0.003		
						240.0	241.0	0.18	<0.01	<0.01	0.03	0.005		
300.3	302.2	SILICIFIED SEDIMENTS: dark reddish-brown strongly silicified and altered, fine to medium grained sediments; rare spec of fine sulfide; thin soft talcy seams reduce strength of an otherwise competent rock unit; END OF HOLE	292.5	300.3	100	241.0	242.6	0.22	<0.01	<0.01	0.09	0.002		
						242.6	244.0	0.13	<0.01	0.04	0.03	0.003		
						244.0	245.0	0.10	<0.01	0.04	0.03	<0.002		
						245.0	246.0	0.15	<0.01	0.08	0.03	0.006		
						246.0	247.0	0.14	<0.01	0.09	0.03	0.004		
			300.3	302.2	100	247.0	248.0	0.12	<0.01	0.06	0.01	0.003		
						248.0	249.0	0.10	<0.01	0.03	0.01	<0.002		
						249.0	250.0	0.15	<0.01	0.09	0.02	0.002		
						250.0	251.0	0.20	0.01	0.14	0.03	0.002		
						251.0	252.0	0.16	<0.01	0.11	0.02	<0.002		
			252.0	253.0	0.19	<0.01	0.13	0.09	0.002					
			253.0	254.0	0.18	<0.01	0.12	0.04	0.004					
			254.0	255.0	0.18	<0.01	0.11	0.04	0.008					
			255.0	256.0	0.16	<0.01	0.09	0.07	0.005					

COMPANY: Allegiance Mining NL
PROJECT: Burbank
HOLE NUMBER: B 8

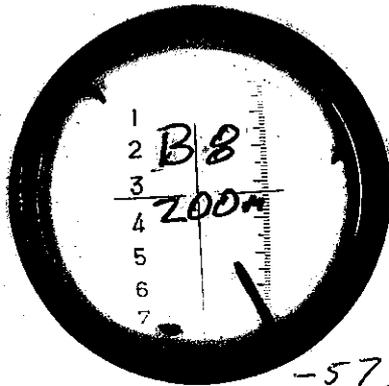
Description			Core Recovery			Assays							
From	To		From	To	%	From	To	% Ni	% Cu	% S	% Zn	% As	% Co
						256.0	257.0	0.19	<0.01	0.10	0.04	0.019	
						257.0	258.0	0.12	<0.01	0.08	0.04	0.005	
						258.0	259.0	0.17	<0.01	0.12	0.04	0.006	
						259.0	260.0	0.10	<0.01	0.04	0.03	0.003	
						260.0	261.0	0.15	<0.01	0.07	0.02	0.005	
						261.0	262.0	0.20	<0.01	0.12	0.05	0.005	
						262.0	263.5	0.22	<0.01	0.12	0.07	0.004	
						263.5	264.8	0.16	<0.01	<0.01	0.03	0.002	
						264.8	266.3	0.04	<0.01	<0.01	<0.01	<0.002	
						266.3	268.0	0.04	<0.01	<0.01	0.01	0.005	
						268.0	269.0	0.15	<0.01	<0.01	0.02	<0.002	
						269.0	270.0	0.18	<0.01	<0.01	0.03	0.003	
						270.0	271.0	0.15	<0.01	<0.01	0.02	<0.002	
						271.0	272.0	0.02	0.02	1.21	0.01	<0.002	
						272.0	273.0	0.13	<0.01	0.55	0.02	<0.002	
						273.0	274.0	0.20	0.03	2.05	0.02	<0.002	
						274.0	275.0	0.13	0.01	0.78	0.01	<0.002	
						275.0	276.0	0.09	<0.01	0.16	0.02	<0.002	
						276.0	277.0	0.11	<0.01	0.12	0.02	<0.002	
						277.0	278.0	0.11	<0.01	0.09	0.01	<0.002	
						278.0	279.0	0.15	<0.01	0.10	0.03	0.002	
						279.0	280.0	0.11	<0.01	0.05	0.03	<0.002	
						280.0	281.9	0.08	<0.01	0.02	0.03	0.007	
						281.9	282.3	0.28	0.01	0.01	0.28	0.007	
						282.3	283.8	0.08	<0.01	<0.01	0.10	0.002	
						289.6	290.6	0.15	0.01	0.19	0.05	0.003	
						290.6	291.6	0.12	<0.01	0.45	0.02	<0.002	
						291.6	292.6	0.09	<0.01	0.32	0.02	0.002	



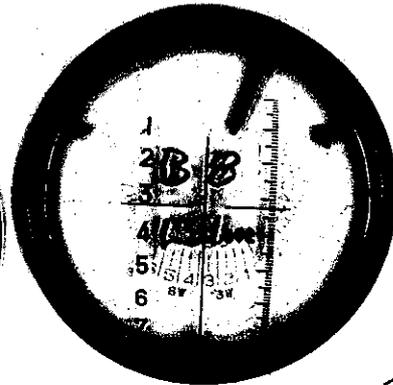
-57
77 long.



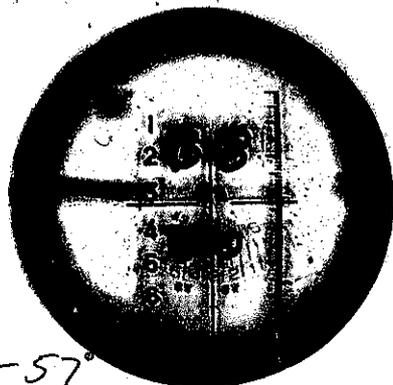
-57.
210 (Mag)



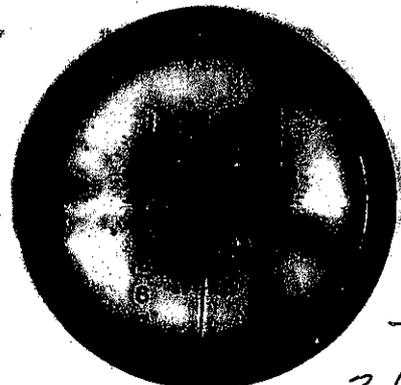
-57.
215 Mag



-58°
213 Mag.



-57°
211 Mag



-57°
214 Mag

APPENDIX 2

DDH B9 drill log

COMPANY: Allegiance Mining NL
PROJECT: Burbank
HOLE NUMBER: B9

Commenced	31 Jan 05
Completed	07 Feb 05
Logged by	L Newnham
Drilled by	Almac

Purpose of Hole

To test leached nickel zone in B8 at greater depth and to the south east

Collar details

Grid	AMG
Easting	351,012E
Northing	5,355,398N
Elevation	2,015
Dip	-67
Bearing	199
Length	363.9

Comments on Completion

.

Hole Size

To	Size
47.8	HQ
363.9	NQ

Major core loss zones

From	To	% recov.
192.3	200.3	see log

Hole Condition on Completion

all steel rods and casing removed; strong water flows stopped with van ruth and wooden plugs and cement in hole just below HQ;

Summary of Assay Results

Depth	Recovery	Description	Length	Assays				
From (m)	To (m)		m.					

Down Hole Survey Data

Camera	Dip	Mag Brg	Mag Brg	Grid Brg
Depth		Actual	Adjusted	AMG
0	-67	187		199
47	-69	187		199
100	-67	189		201
150	-66	190		202
202	-67	190		202
250	-67	205	193	205
300	-67	209	195	207
349	-67	197		209

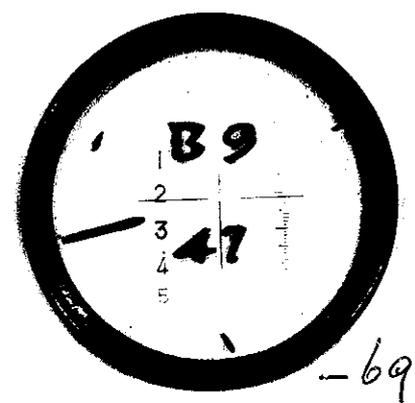
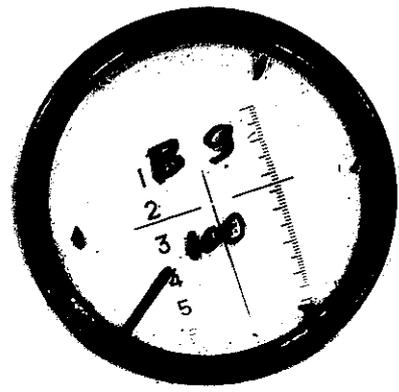
Notes on Surveys

readings at 250 and 300 metres probably affected by magnetite in serpentinite. Thus they have been adjusted to relate better to readings above and below.

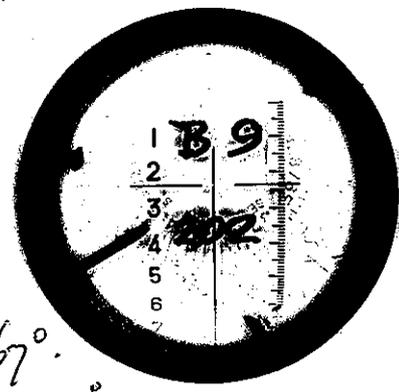
General Comments

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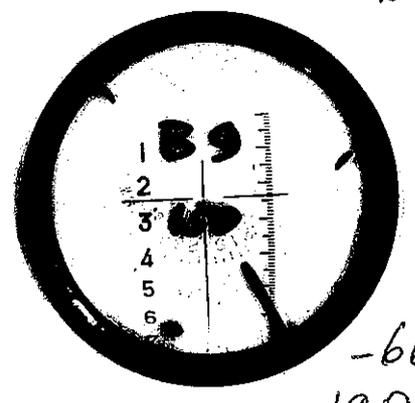
-67°
189°
Mag



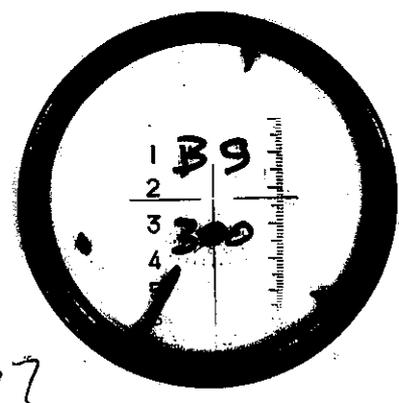
-69°
187°
Mag



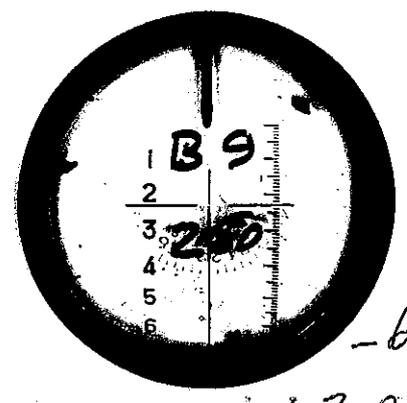
-67°
190°
Mag



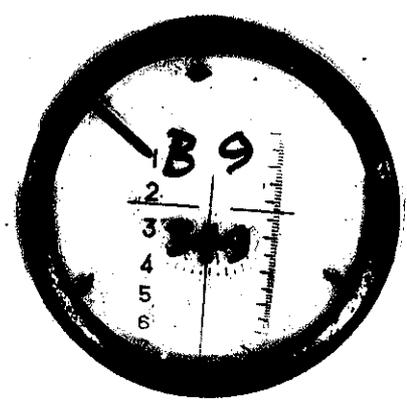
-66°
190°
Mag



-67°
209°
Mag



-67°
205°
Mag



-67°
197°
Mag

Description		Core Recovery			Assays							
From	To	From	To	%	From	To	% Ni	% Cu	% S	% Zn	% As	% Co
0.0	10.0											
		BROKEN SEDIMENTS: snapped off reamer; moved rig and recollared;										
0.0	6.0	0.0	6.0	0								
		NO CORE; triconed, no core;										
6.0	144.5	6.0	24.0	100								
		24.0	25.5	80								
		25.5	142.0	100								
		142.0	145.0	90								
		ALTERED CAMBRIAN SEDIMENTS: well bedded fine grained cherty sediments; upper section: fine grained strongly altered cherty sediments with widespread brecciation; basal section: interbedded sediments and ultramafics, strongly altered and broken; 6.0-80.0 m: dark gray, purplish-brown fine grained sediments; well bedded and strongly altered to hard cherty units, often with interbeds of cream colored fine grained cherty sediments; mafic volcanic component altered to dark green irregular zones dominated by crystalline actinolite; Note: These are Cambrian sediments and very similar in appearance to hangingwall rocks at Avebury; BCA uniform 30'; rare specs of sulfides; core moderately broken by several joint sets but fresh and reasonably competent; grades into: 80.0-88.0 m: fine grained pale gray-pinkish-cream colored altered and cherty sediments; generally well bedded but extensively brecciated with gray-green quartz-tremolite-actinolite matrix infilling around clasts of cherty sediments; BCA higher than unit above, 40-50'; occasional grains of sulfide in breccia matrix; ground conditions improving down hole; competent with several joint sets; 88.0-111.5 m: cherty sediments, strongly brecciated and disrupted; higher component of gray-green felted actinolite-tremolite both as breccia matrix and as narrow isolated masses; note: these rocks are identical to Viking hangingwall rocks; grades into..... 111.5-125.0 m: light gray-light brown-creamy and purplish strongly altered cherty rocks, brecciated in places; ground conditions very good; 125.0-125.4 m: vuggy altered ultramafic, small egg shaped pale green mineral in vugs; lower half limonitic and vuggy; contact 50' CA; 125.4-144.5 m: strongly brecciated and altered cherty sediments, light reddish-brown with some cream clasts; below 142 m., contains altered ultramafic component and is strongly limonitic; bright green talc common in breccia matrix; ground competent to 143m., then becomes moderately broken; low angled irregular clay filled contact with interval below;										
144.5	162.7	145.0	146.0	40								
		146.0	148.0	90								
		148.0	154.0	100								
		154.0	157.7	60	145.0	147.0	0.85	<0.01	0.01	0.50	0.011	
		157.7	162.9	100	147.0	148.0	0.24	<0.01	0.24	0.10	0.003	
					148.0	149.0	0.25	<0.01	0.27	0.12	0.003	
					149.0	150.2	0.24	<0.01	0.18	0.11	<0.002	
		ALTERED ULTRAMAFICS: 144.5-147.0 m: strongly altered and decomposed ultramafic, hematitic-talc, brecciated and broken; possibly a sheared or faulted margin on the ultramafic; 147.0-150.0 m: medium-fine grained, light gray altered ultramafics with flecks and thin seams of white quartz-talc; small pervasive specks and aggregates of magnetite; minor very fine grained sulfides with some coarser aggregates associated with magnetite; ground conditions very good; petrological sample 147.5 m: altered serpentinite, containing calcite and magnetite; very fine grained pentlandite associated with magnetite;										

Description		Core Recovery			Assays							
From	To	From	To	%	From	To	% Ni	% Cu	% S	% Zn	% As	% Co
231.6	238.1				209.0	210.0	0.40	<0.01	<0.01	0.06	0.003	
continued.....					210.0	211.0	0.69	<0.01	<0.01	0.13	0.004	
					211.0	212.0	0.38	<0.01	<0.01	0.03	0.006	
					212.0	213.0	0.29	<0.01	<0.01	0.07	<0.002	
238.1	351.7	238.1	351.7	100	213.0	214.0	0.42	<0.01	<0.01	0.13	0.004	
					214.0	215.0	0.65	<0.01	<0.01	0.15	0.005	
					215.0	216.0	0.38	<0.01	<0.01	0.06	0.003	
					216.0	217.0	0.27	<0.01	<0.01	0.03	0.003	
					217.0	218.0	0.20	<0.01	<0.01	0.01	0.003	
					218.0	219.0	0.17	<0.01	0.12	0.01	<0.002	
					219.0	220.0	0.15	<0.01	0.06	0.01	0.016	
					220.0	221.0	0.12	<0.01	0.05	0.02	0.004	
					221.0	222.0	0.22	<0.01	0.01	0.02	0.004	
					222.0	223.0	0.32	<0.01	0.05	0.03	0.006	
					223.0	224.0	0.11	<0.01	0.01	0.01	<0.002	
					224.0	225.0	0.20	<0.01	<0.01	0.02	0.003	
					225.0	226.0	0.24	<0.01	<0.01	0.02	0.003	
					226.0	227.0	0.12	<0.01	<0.01	0.01	<0.002	
					227.0	228.0	0.24	<0.01	<0.01	0.03	0.006	
					228.0	229.0	0.07	<0.01	<0.01	0.01	0.002	
					229.0	230.0	0.09	<0.01	0.13	<0.01	<0.002	
					230.0	231.0	0.19	<0.01	0.06	0.02	0.002	
					231.0	232.0	0.29	<0.01	<0.01	0.04	0.004	
					232.0	233.0	0.18	<0.01	0.08	0.01	0.020	
					233.0	234.0	0.18	<0.01	0.05	0.02	0.005	
					234.0	235.0	0.15	<0.01	0.01	0.03	0.003	
					235.0	236.0	0.16	<0.01	0.04	0.04	0.003	
					236.0	237.0	0.18	<0.01	0.01	0.05	0.004	
					237.0	238.0	0.22	<0.01	<0.01	0.01	0.002	
					238.0	239.0	0.21	<0.01	0.03	0.04	0.003	
					239.0	240.0	0.17	<0.01	0.12	0.01	0.004	
					240.0	241.0	0.17	<0.01	0.14	0.01	0.006	
					241.0	242.0	0.16	<0.01	0.13	<0.01	0.006	
					242.0	243.0	0.11	<0.01	0.16	<0.01	<0.002	
					243.0	244.0	0.16	<0.01	0.13	0.01	0.002	
					244.0	245.0	0.11	<0.01	0.21	<0.01	0.002	
					245.0	246.0	0.14	<0.01	0.29	0.01	0.002	
					246.0	247.0	0.13	<0.01	0.31	<0.01	0.003	
					247.0	248.0	0.23	<0.01	0.57	<0.01	0.004	
					248.0	249.0	0.15	0.01	0.36	0.01	0.003	
					249.0	250.0	0.15	<0.01	0.35	0.01	0.003	
					250.0	251.0	0.13	<0.01	0.02	0.02	0.004	
					251.0	252.0	0.12	<0.01	0.20	<0.01	0.004	
					252.0	253.0	0.12	<0.01	0.27	<0.01	0.003	
					253.0	254.0	0.10	<0.01	0.23	<0.01	0.002	
					254.0	255.0	0.12	<0.01	0.08	0.02	0.003	
					255.0	256.0	0.14	<0.01	0.04	0.03	0.003	
					256.0	257.0	0.11	<0.01	0.02	0.02	0.004	
					257.0	258.0	0.12	<0.01	0.02	0.02	0.004	
					258.0	259.0	0.16	<0.01	0.03	0.02	0.004	
					259.0	260.0	0.11	<0.01	0.35	<0.01	<0.002	
					260.0	261.0	0.18	<0.01	0.84	<0.01	<0.002	
					261.0	262.0	0.12	<0.01	0.51	<0.01	<0.002	
					262.0	263.0	0.12	<0.01	0.28	<0.01	<0.002	
					263.0	264.0	0.10	<0.01	0.28	<0.01	<0.002	
					264.0	265.0	0.10	<0.01	0.31	<0.01	<0.002	
					265.0	266.0	0.09	<0.01	0.27	<0.01	<0.002	
					266.0	267.0	0.11	<0.01	0.38	<0.01	<0.002	
					267.0	268.0	0.08	<0.01	0.12	<0.01	<0.002	
					268.0	269.0	0.10	<0.01	0.16	0.01	<0.002	
					269.0	270.0	0.10	<0.01	0.16	0.01	<0.002	
					270.0	271.0	0.10	<0.01	0.31	<0.01	<0.002	
					271.0	272.0	0.09	<0.01	0.27	<0.01	<0.002	
					272.0	273.0	0.11	<0.01	0.38	<0.01	<0.002	
					273.0	274.0	0.08	<0.01	0.12	<0.01	<0.002	
					274.0	275.0	0.10	<0.01	0.16	0.01	<0.002	

END OF HOLE

COMPANY: Allegiance Mining NL
 PROJECT: Burbank
 HOLE NUMBER: B 9

Description		Core Recovery			Assays							
From	To	From	To	%	From	To	% Ni	% Cu	% S	% Zn	% As	% Co
					275.0	276.0	0.07	<0.01	0.20	<0.01	<0.002	
					276.0	277.0	0.10	<0.01	0.39	<0.01	<0.002	
					277.0	278.0	0.23	<0.01	0.27	0.03	0.003	
					278.0	279.0	0.47	<0.01	0.08	0.11	0.004	
					279.0	280.0	0.25	<0.01	0.02	0.05	0.003	
					280.0	281.0	0.40	<0.01	<0.01	0.07	0.005	
					281.0	282.0	0.39	<0.01	0.01	0.08	0.004	
					282.0	283.0	0.13	<0.01	0.36	0.02	0.002	
					283.0	284.0	0.12	<0.01	0.03	0.02	0.002	
					284.0	285.0	0.18	<0.01	0.02	0.05	0.005	
					285.0	286.0	0.14	<0.01	0.05	0.02	0.003	
					286.0	287.0	0.13	<0.01	0.11	0.02	0.002	
					287.0	288.0	0.14	<0.01	0.09	<0.01	0.002	
					288.0	289.0	0.11	<0.01	0.09	<0.01	0.002	
					289.0	290.0	0.09	<0.01	0.09	<0.01	0.002	
					290.0	291.0	0.14	<0.01	0.05	0.01	0.002	
					291.0	292.0	0.13	<0.01	0.05	0.01	<0.002	
					292.0	293.0	0.13	<0.01	0.06	0.03	<0.002	
					293.0	294.0	0.15	<0.01	0.18	0.22	0.003	
					294.0	295.0	0.14	<0.01	0.04	0.03	0.003	
					295.0	296.0	0.12	<0.01	0.07	0.01	<0.002	
					296.0	297.0	0.19	<0.01	0.11	0.01	0.007	
					297.0	298.0	0.13	<0.01	0.07	<0.01	0.006	
					298.0	299.0	0.08	<0.01	0.02	<0.01	0.005	
					299.0	300.0	0.11	<0.01	0.04	0.02	0.005	
					300.0	301.0	0.10	<0.01	0.04	0.02	0.005	
					301.0	302.0	0.11	<0.01	0.04	0.01	0.005	
					302.0	303.0	0.14	<0.01	0.04	0.01	0.005	
					303.0	304.0	0.19	0.02	0.28	0.02	0.013	
					304.0	305.0	0.13	0.01	0.09	0.02	0.007	
					305.0	306.0	0.17	<0.01	0.08	0.05	0.006	
					306.0	307.0	0.22	<0.01	0.06	0.03	0.007	
					307.0	308.0	0.19	<0.01	0.17	0.02	0.009	
					308.0	309.0	0.09	<0.01	0.06	0.01	0.007	
					309.0	310.0	0.11	<0.01	0.05	0.02	0.007	
					310.0	311.0	0.19	<0.01	0.09	0.02	0.009	
					311.0	312.0	0.14	<0.01	0.03	0.01	0.010	
					312.0	313.0	0.33	<0.01	0.79	0.06	0.053	
					313.0	314.0	0.10	<0.01	0.04	0.01	0.026	
					314.0	315.0	0.17	<0.01	0.03	0.01	0.006	
					315.0	316.0	0.21	<0.01	0.03	0.01	0.006	
					316.0	317.0	0.17	<0.01	0.02	0.02	0.006	
					317.0	318.0	0.13	<0.01	0.07	0.01	0.006	
					318.0	319.0	0.13	<0.01	0.08	0.01	0.007	
					319.0	320.0	0.19	<0.01	0.04	0.02	0.007	
					320.0	321.0	0.10	0.02	0.05	0.01	0.005	
					321.0	322.0	0.16	<0.01	0.04	0.02	0.006	
					322.0	323.0	0.13	<0.01	0.03	0.01	0.007	
					323.0	324.0	0.10	<0.01	0.02	0.01	0.007	
					324.0	325.0	0.25	<0.01	0.02	0.03	0.008	
					325.0	326.0	0.09	<0.01	0.36	0.02	0.016	
					326.0	327.0	0.10	<0.01	0.05	0.04	0.010	
					327.0	328.0	0.16	<0.01	0.05	0.15	0.008	
					328.0	329.0	0.20	<0.01	0.01	0.40	0.009	
					329.0	329.8	0.33	0.10	0.39	0.13	0.006	
					329.8	331.0	0.20	<0.01	0.37	0.04	0.007	
					331.0	332.0	0.10	<0.01	0.10	0.02	0.006	
					332.0	333.0	0.18	<0.01	0.22	0.01	0.009	
					333.0	334.0	0.24	<0.01	0.42	0.01	0.006	
					334.0	335.0	0.23	<0.01	0.26	0.01	0.005	
					335.0	336.0	0.18	<0.01	0.22	<0.01	0.008	

APPENDIX 3

DDH A053 drill log

Allegiance Metals Drill Log

Project	BHID	From	To	Stratigraphy	Rock Type	Alteration	Colour	Visual %	L. Cont.	Struct	BCA	Description
Avebury	A053	0	2	2 Q	CLAY	Cy	B3	0.00		Bd	25	Orange deeply weathered clay.
Avebury	A053	2	72.5	Ccc	GWAC	PhBi	B4	0.00		Bd	25	Massive, graded feld-qtz-lithic greywacke. Pervasive phlogopite-biotite alteration. Late act-qtz veins. Silty tops with minor graphitic shale. Facing downhole.
Avebury	A053	72.5	82.8	Ccc	GWAC	PhBi	B4	0.00		Bd	25	Minor ductile deformation of siltstones.
Avebury	A053	82.8	89.1	Ccc	GWAC	PhBi	B4	0.20		Bd	25	Massive, graded feld-qtz-lithic greywacke. Pervasive phlogopite-biotite alteration. Late act-qtz veins. Silty tops with minor graphitic shale. Facing downhole.
Avebury	A053	89.1	121	Ccc	GWAC	PhBi	B4	0.05		Bd	25	Massive, graded feld-qtz-lithic greywacke. Pervasive phlogopite-biotite alteration. Late act-qtz veins. Silty tops with minor graphitic shale. Facing downhole.
Avebury	A053	121	126.6	Ccc	GWAC	PhBi	B4	1.00		Bd	45	Minor ductile deformation of siltstones.
Avebury	A053	126.6	147.4	Ccc	SILT	PhBi	B2	0.10		Bd	30	Laminated siltstone and greywacke with minor shale. Well bedded. Minor qtz-actinopite veins. Trace Po and Py on Jts.
Avebury	A053	147.4	177.4	Ccc	GWAC	PhBi	B4	0.05		Bd	25	Massive, graded feld-qtz-lithic greywacke. Pervasive phlogopite-biotite alteration. Late act-qtz veins. Silty tops with minor graphitic shale. Facing downhole.
Avebury	A053	177.4	179.8	Ccc	GWAC	AcPh	B4	0.50		Bd	45	Minor ductile deformation of siltstones.
Avebury	A053	179.8	204.1	Ccc	GWAC	PhBi	B4	0.05		Bd	25	Massive, graded feld-qtz-lithic greywacke. Pervasive phlogopite-biotite alteration. Numerous late act-qtz-po veins. Silty tops with minor graphitic shale.
Avebury	A053	204.1	217	Ccc	SILT	PhSi	A2	1.00		Bd	45	Minor ductile deformation of siltstones.
Avebury	A053	217	229.1	Ccc	GWAC	PhBi	B4	0.05		Bd	45	Late act-qtz veins. Silty tops with minor graphitic shale.
Avebury	A053	229.1	233.8	Ccc	SHAL	PhAc	A3	1.00		Bd	40	Minor ductile deformation of siltstones.
												Laminated siltstone and shale with minor greywacke. Disrupted beds. Silicified. 1-2% Po veins and disseminations.
												Massive, graded feld-qtz-lithic greywacke. Pervasive phlogopite-biotite alteration. Late act-qtz veins. Silty tops. Minor Po-Py veins.
												Laminated and disrupted shale and siltstone. Sub mylonitic. Po veins.

Allegiance Metals Drill Log

Project	BHID	From	To	Stratigraphy	Rock Type	Alteration	Colour	Visual %	L. Cont.	Struct	CA	Description
Avebury	A053	233.8	272	Ccc	GWAC	PhAc	B3	0.01	Bk	Bd	30	Massive, graded feld-qtz-lithic greywacke. Pervasive phlog-biotite alteration. Late act-qtz veins becoming more common downhole. Silty tops.
Avebury	A053	272	282.6	Ccc	GWAC	PhBi	B4	0.05		Bd	45	Massive, graded feld-qtz-lithic greywacke. Pervasive phlogopite-biotite alteration. Late act-qtz veins. Silty tops. Broken core, possible late brittle faulting?.
Avebury	A053	282.6	342.2	Ccc	GWAC	PhBi	B4	0.05		Bd	45	Massive, graded feld-qtz-lithic greywacke. Pervasive phlogopite-biotite alteration. Numerous late act-qtz veins. Silty tops.
Avebury	A053	342.2	403.4	Ccc	GWAC	PhBi	A4	0.05		Bd	45	Numerous fine, layered late act-qtz veins. Silty tops to beds. Minor Py on Jts.
Avebury	A053	403.4	426.4	Ccc	GWAC	PhBi	A4	0.05		Bd	45	Massive, graded feld-qtz-lithic greywacke. Pervasive phlogopite-biotite alteration. Numerous fine, layered late act-Carb veins. Silty tops to beds. Minor Py on Jts.
Avebury	A053	426.4	431	Ccc	GWAC	PhBi	A4	0.05		Bd	45	Massive, graded feld-qtz-lithic greywacke. Pervasive phlogopite-biotite alteration. Numerous fine, layered late act-Carb veins. Silty tops to beds. Minor Py on Jts. Broken with silkensided chloritic joints.
Avebury	A053	431	432.7	Ccc	GWAC	PhBi	A4	0.05		Bd	45	Massive, graded feld-qtz-lithic greywacke. Pervasive phlogopite-biotite alteration. Numerous fine, layered late act-Carb veins. Silty tops to beds. Minor Py on Jts.
Avebury	A053	432.7	451.6	Ccc	SHAL	PhPo	N	4.00		Bd	80	Laminated black carbonaceous shale. Minor actinolite altered zones. Minor phlogopite altered greywacke. 2-4% Po as veins and aggregates.
Avebury	A053	451.6	453.5	Ccc	GWAC	AcSi	A2	2.00		Bd	80	Pale grey, bleached and silicified feld-lithic greywacke. Actinolite-Po veins 3%. Laminated bedding. Stringer Po Veins.
Avebury	A053	453.5	462.4	Ccc	SHAL	PhPo	N	4.00		Bd	80	Laminated black carbonaceous shale. Minor actinolite altered zones. Minor phlogopite altered greywacke. 2-4% Po as veins and aggregates.
Avebury	A053	462.4	467.8	Cba	PHLG	PhPo	B4	3.00		Bd	60	Massive, intensely phlogopite altered basaltic volcanoclastics?? 2-55 Po as veins and stringers. Domains of intense actinolite alteration.
Avebury	A053	467.8	470	Cba	VBLM	AcSi	A2	2.00		Bd	60	Pale grey, bleached and silicified feld-lithic basaltic volcanoclastic greywacke. Actinolite-Po veins 3%.
Avebury	A053	470	470.2		FALT	AcCh	G3			Bd	60	Broken faulted greywacke.
Avebury	A053	470.2	479	Cba	VBLM	AcSi	A2	2.00		Bd	60	Pale grey, bleached and silicified feld-lithic basaltic volcanoclastic greywacke. Actinolite-Po veins 3%. Well bedded, laminated silty tops intensely silicified.
Avebury	A053	479	487.4	Ccc	SHAL	SiAc	G3	2.00		Bd	60	Pale grey to black graphitic shale and interbedded silicified siltstone. Minor

Alliance Metals Drill Log

Project	BHID	From	To	Stratigraphy	Rock Type	Alteration	Colour	Visual %	L.Cont.	Struct	BCA	Description
Avebury	A053	467.4	501.8	Ccc	GWAC	PhBi	B3	0.50		Bd	45	greywacke. Strongly altered and disrupted. Late Po Veins. Calcite vns. Massive, graded feld-qtz-illitic greywacke. Pervasive phlogopite-biotite alteration. Numerous fine, layered late act-Carb veins. Silty tops to beds. Minor Py on Jts. Po veins. Broken and strongly jointed core.
Avebury	A053	501.8	504.4	Ccc	SHAL	PhTo	N	4.00				Black shale, disrupted and veined. Po veins. Moderately tourmalinised.
Avebury	A053	504.4	515.6	Cba	CONG	AcSi	C3	0.50				Massive, polymict volcanoclastic conglomerate. Clasts of basalt, ssit, chert. Silicified and strongly actinolite altered. Minor Po veins. Tourmaline and axinite zones.
Avebury	A053	515.6	524.4	Cba	LBLB	AcTo	A4	0.05				Intensely homfelsed and metasomatised basaltic volcanics. Pervasive actinolite alteration, disseminated and vein tourmaline.
Avebury	A053	524.4	525.6	Csu	SKSP	TrDi	A1	0.10	Ft	Ft	70	Pale grey, crystalline metasomatised ultramafic. Tremolite-diopside alteration. Minor disseminated Po and vein tourmaline.
Avebury	A053	525.6	529	Ccc	SKRN	SiAc	A4	0.50				Intensely altered greywackes?? Pervasive silica-actinolite with tourmaline clots and veins. Minor Po veins and dissem.
Avebury	A053	529	537.6	Ccc	GWAC	AcTo	B4	0.20		Bd	60	Dark brown to black greywacke and siltstone. Silicified and indurated. on jts. Tourmaline actinolite alteration. 5-10% actinolite veins. Late chlorite. Py
Avebury	A053	537.6	538.7	Ccc	SKRN	SiDi	A2					Pale grey to cream, silicified and indurated greywacke or basalt? Pervasive silica vein tourmaline.
Avebury	A053	538.7	543	Ccc	SHAL	Po	N	1.00		Bd	15	Laminated black shale. Disrupted and foliated. 5% Po veins and stringers.
Avebury	A053	543	549.7	Cba	PHLG	PhAc	B4	0.00				Intensely altered volcanics?? Pervasive crystalline brown phlogopite and actinolite. Calcite veining. Pervasive tourmaline.
Avebury	A053	549.7	550.1		FALT	PhTc	B4	0.00				Broken talcy fault. Serpentinite on joints.
Avebury	A053	550.1	559.9	Cba	PHLG	PhAc	B4	0.00				Intensely altered volcanics?? Pervasive crystalline brown phlogopite and actinolite. Calcite veining. Pervasive tourmaline. Some micro crystalline zones of act-phlog-bio-plag.
Avebury	A053	559.9	561		FALT	PhTc	B4	0.00	Ft			Broken talcy fault. Serpentinite on joints. 0.6m core loss.
Avebury	A053	561	562.2	Cba	PHLG	PhAc	B4	0.00				Intensely altered volcanics?? Pervasive crystalline brown phlogopite and actinolite. Calcite veining. Pervasive tourmaline. Some micro crystalline zones

Allegiance Metals Drill Log

Project	BHID	From	To	Stratigraphy	Rock Type	Alteration	Colour	Visual %	L.Cont.	Struct	BCA	Description
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Assay Sheet

Project	BHID	From m	To m	Ni %	Cu ppm	Pb ppm	Zn ppm	As ppm	Co ppm	S%	MgO	Strat	Rock
Avebury	A053	563	564	0.23	-25	-25	220	92	106	0.16			
Avebury	A053	564	565	0.87	120	-25	240	-50	220	1.22			
Avebury	A053	565	566	1.00	80	-25	120	351	192	0.99			
Avebury	A053	566	567	1.30	100	-25	120	280	260	1.68			
Avebury	A053	567	568	0.71	40	-25	80	192	143	0.89			
Avebury	A053	568	568.5	1.70	120	-25	160	539	360	2.5			
Avebury	A053	568.5	570	0.43				550	20	0.1	19.7		
Avebury	A053	570	571	0.18				50	20	-0.1	19.0		
Avebury	A053	571	572	0.09				50	20	-0.1	17.4		
Avebury	A053	572	573	0.11				50	20	-0.1	16.6		
Avebury	A053	573	574	0.08				50	20	-0.1	14.5		
Avebury	A053	574	575	0.17				650	20	-0.1	15.3		
Avebury	A053	575	576	0.11				100	-20	-0.1	15.0		
Avebury	A053	576	577	0.85				150	160	0.6	15.0		
Avebury	A053	577	578	2.13				500	440	3.4	28.7		
Avebury	A053	578	579	1.76				1700	280	2.1	22.7		
Avebury	A053	579	580	2.85				2600	460	2.8	19.2		
Avebury	A053	580	581	1.87				2650	260	1.7	20.0		
Avebury	A053	581	582	3.44	14-m			1900	640	4.7	24.6		
Avebury	A053	582	583	1.21				450	180	1.2	19.8		
Avebury	A053	583	584	1.77				350	360	2.2	9.1		
Avebury	A053	584	585	1.81				150	320	2.3	11.2		
Avebury	A053	585	586	3.88				450	700	4.9	27.1		
Avebury	A053	586	587	3.97				700	660	4.5	30.0		
Avebury	A053	587	588	4.17				350	660	4.8	23.1		
Avebury	A053	588	589	4.37				200	660	5.3	16.1		
Avebury	A053	589	590	0.95				100	60	1.1	11.5		
Avebury	A053	590	591	0.23				50	-20	-0.1	13.0		
Avebury	A053	591	592	0.16				50	-20	-0.1	12.7		
Avebury	A053	592	593	0.56				50	-20	0.3	15.9		
Avebury	A053	593	594	0.40				50	-20	0.1	16.2		
Avebury	A053	594	595	0.16				50	-20	-0.1	15.1		
Avebury	A053	595	596	0.55				50	-20	0.3	16.5		

Assay Sheet

Project	BHID	From m	To m	Ni %	Cu ppm	Pb ppm	Zn ppm	As ppm	Co ppm	S %	MgO	Strat	Rock
Avebury	A053	596	597	0.17				100	-20	-0.1	10.7		
Avebury	A053	597	598	0.17				250	-20	-0.1	13.6		
Avebury	A053	598	599	0.17				200	-20	-0.1	13.1		
Avebury	A053	599	600	0.56				50	20	0.7	12.2		
Avebury	A053	600	601	0.68				100	40	1.0	11.8		
Avebury	A053	601	602	0.40				150	-20	0.6	11.2		
Avebury	A053	602	603	0.28				150	-20	0.6	9.4		
Avebury	A053	603	604	0.14				50	-20	0.2	7.4		
Avebury	A053	604	605	0.77				200	80	1.2	11.4		
Avebury	A053	605	606	1.80				300	200	2.1	12.9		
Avebury	A053	606	607	0.46				150	20	0.6	12.1		
Avebury	A053	607	608	1.08				100	80	1.0	14.1		
Avebury	A053	608	609	0.95				100	80	0.8	15.6		
Avebury	A053	609	610	0.25				100	-20	0.1	11.9		
Avebury	A053	610	611	0.48				150	20	0.5	12.9		
Avebury	A053	611	612	0.15				100	-20	-0.1	11.4		
Avebury	A053	612	613	0.04				50	-20	-0.1	12.1		
Avebury	A053	613	614	0.04				50	-20	-0.1	10.7		
Avebury	A053	614	615	0.07				50	-20	-0.1	10.1		
Avebury	A053	615	616	0.07				50	-20	-0.1	11.2		
Avebury	A053	616	617	0.16				50	-20	-0.1	11.5		
Avebury	A053	617	618	0.14				50	20	0.1	8.8		
Avebury	A053	618	619	0.07				50	-20	0.1	7.7		
Avebury	A053	619	620	0.06				50	-20	-0.1	8.0		
Avebury	A053	620	621	0.03				50	-20	-0.1	10.9		
Avebury	A053	621	622	0.16				50	-20	0.3	7.5		
Avebury	A053	622	623	0.14				50	-20	0.1	5.8		
Avebury	A053	623	624	0.11				50	-20	-0.1	5.0		
Avebury	A053	624	625	0.22				50	20	0.3	6.3		
Avebury	A053	625	626	0.16				100	20	0.2	8.2		
Avebury	A053	626	627	0.27				100	20	0.5	9.4		
Avebury	A053	627	628	0.28				150	-20	0.5	10.4		
Avebury	A053	628	629	0.11				100	-20	0.1	9.4		

APPENDIX 4

Assays - DDH B8 & B9



SGS Welshpool Minerals

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Lindsay Newnham

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AUSTRALIA

Lab Ref WM084921
Client Ref **236606**
Project
Received 24/03/2005
First Reported 5/04/2005
Re-Reported 13/04/2005

Samples 168
First Sample B8 92.5-93.5
Last Sample *SS B8 290.6-291.6
Pages 12

Fax
eReport
Email
FTP

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Notes

Authorised

on behalf of

Richard Bowen
Laboratory Manager

The results in the following analytical report pertain to the samples provided to this laboratory for preparation and/or analysis as requested by the client.

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ANALYTICAL REPORT

Sample	Ni	Cu	Pb	Zn	As	S
B8 92.5-93.5	150	170	<50	140	40	2330
B8 93.5-94.5	140	150	<50	120	<20	480
B8 94.5-95.5	170	80	<50	160	<20	1050
B8 95.5-96.5	170	140	<50	150	<20	4070
B8 96.5-97.5	400	90	<50	220	<20	2040
B8 97.5-98.5	250	120	<50	150	20	2.03%
B8 98.5-99.5	190	110	<50	140	<20	1.97%
B8 99.5-100.5	190	60	<50	210	<20	6530
B8 100.5-101.5	200	100	<50	270	20	1.35%
B8 101.5-102.5	710	130	<50	270	30	1.62%
B8 102.5-103.5	1240	50	<50	440	<20	1890
B8 103.5-104.5	2400	50	<50	750	<20	800
B8 104.5-105.5	2550	70	<50	850	50	1210
B8 105.5-106.5	1470	20	<50	290	60	500
B8 106.5-107.5	1600	30	<50	120	50	860
B8 107.5-108.5	1870	<10	70	440	40	840
B8 108.5-109.5	2490	<10	<50	520	50	110
B8 109.5-110.5	3340	<10	<50	670	30	110
B8 110.5-111.5	5820	10	<50	1550	50	130
B8 111.5-112.5	6250	<10	<50	2490	40	120
B8 112.5-113.5	5860	<10	50	2500	30	100
B8 113.5-114.5	6700	<10	<50	2310	60	90
B8 114.5-115.5	4250	<10	<50	780	40	90
B8 115.5-116.5	2070	<10	<50	80	110	680
B8 116.5-118.0	2300	<10	<50	90	30	1220
B8 137.5-138.5	2260	<10	<50	90	<20	980
B8 138.5-139.5	2130	<10	<50	100	<20	900
B8 139.5-140.5	2150	<10	<50	110	<20	700
B8 140.5-141.5	2350	<10	<50	110	<20	730
B8 141.5-142.5	2010	<10	<50	100	<20	550
B8 142.5-143.5	2320	<10	<50	260	<20	320
B8 143.5-144.5	5130	<10	<50	1530	20	60
B8 144.5-145.5	6910	<10	<50	2210	20	60
B8 145.5-146.5	8540	<10	<50	4290	30	70
B8 146.5-147.5	8540	10	<50	4150	30	70
B8 147.5-148.5	9430	<10	<50	4520	30	90
B8 148.5-149.5	9200	80	<50	4580	30	270
B8 149.5-150.5	7950	<10	<50	4190	40	70
B8 150.5-151.5	8700	<10	<50	4560	30	70
B8 151.5-152.5	8740	<10	140	4240	50	80
Scheme	ICP42S	ICP42S	ICP42S	ICP42S	ICP42S	ICP42S
Units	PPM	PPM	PPM	PPM	PPM	PPM
Detection Limit	20	10	50	10	20	20
Upper Scheme						

- not analysed / -- element not determined / I.S. insufficient sample / L.N.R. listed not received

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ANALYTICAL REPORT

Sample	Au	Au(R)	Au(S)			
B8 92.5-93.5	0.02					
B8 93.5-94.5	0.02					
B8 94.5-95.5	0.02					
B8 95.5-96.5	0.02					
B8 96.5-97.5	0.02					
B8 97.5-98.5	<0.01					
B8 98.5-99.5	<0.01					
B8 99.5-100.5	0.02					
B8 100.5-101.5	0.02					
B8 101.5-102.5	<0.01					
B8 102.5-103.5	0.03	0.05				
B8 103.5-104.5	0.02					
B8 104.5-105.5	0.02					
B8 105.5-106.5	<0.01					
B8 106.5-107.5	0.02					
B8 107.5-108.5	0.02					
B8 108.5-109.5	0.02					
B8 109.5-110.5	0.02					
B8 110.5-111.5	<0.01	<0.01				
B8 111.5-112.5	0.02					
B8 112.5-113.5	<0.01					
B8 113.5-114.5	<0.01					
B8 114.5-115.5	<0.01					
B8 115.5-116.5	<0.01					
B8 116.5-118.0	<0.01					
B8 137.5-138.5	0.02					
B8 138.5-139.5	<0.01					
B8 139.5-140.5	<0.01					
B8 140.5-141.5	<0.01	<0.01				
B8 141.5-142.5	<0.01					
B8 142.5-143.5	<0.01					
B8 143.5-144.5	<0.01					
B8 144.5-145.5	<0.01					
B8 145.5-146.5	0.02					
B8 146.5-147.5	0.02					
B8 147.5-148.5	0.02					
B8 148.5-149.5	0.12					
B8 149.5-150.5	<0.01					
B8 150.5-151.5	<0.01					
B8 151.5-152.5	0.02					
Scheme	FAA505	FAA505	FAA505			
Units	PPM	PPM	PPM			
Detection Limit	0.01	0.01	0.01			
Upper Scheme						

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ANALYTICAL REPORT

Sample	Ni	Cu	Pb	Zn	As	S
B8 152.5-153.5	5840	<10	<50	2810	40	70
B8 153.5-154.5	7670	<10	110	4200	30	70
B8 154.5-155.5	7260	<10	<50	3870	20	60
B8 155.5-156.5	7710	<10	<50	3690	<20	50
B8 156.5-157.5	9760	40	100	4790	40	310
B8 157.5-158.5	7040	<10	<50	3730	30	70
B8 158.5-159.5	5800	20	170	2500	40	180
B8 59.5-162.0	1690	20	<50	830	<20	<20
B8 162.0-163.0	1820	10	50	1200	30	110
B8 163.0-164.0	3050	<10	60	1980	40	110
B8 164.0-165.0	3580	<10	50	1830	50	400
B8 165.0-166.0	4100	140	<50	2590	20	280
B8 166.0-167.0	3000	<10	<50	2570	30	180
B8 167.0-168.0	2660	<10	<50	2390	<20	230
B8 168.0-169.0	2490	<10	<50	1900	<20	180
B8 169.0-170.0	2970	<10	<50	1390	20	60
B8 170.0-171.0	3300	<10	<50	1750	20	60
B8 171.0-172.0	4250	10	60	1690	70	70
B8 172.0-173.0	3560	20	60	1320	<20	60
B8 173.0-174.0	2430	<10	<50	1150	30	110
B8 174.0-175.0	3440	20	90	1490	50	100
B8 175.0-177.3	5470	30	200	2780	80	130
B8 177.3-179.8	4030	<10	70	3040	20	180
B8 179.8-181.0	3410	<10	100	2810	40	150
B8 181.0-182.0	3170	<10	110	2500	30	120
B8 182.0-183.0	2210	10	110	1420	40	40
B8 183.0-184.0	1650	<10	110	1510	<20	130
B8 184.0-185.0	3950	<10	120	2330	50	130
B8 185.0-186.0	2390	<10	120	1830	<20	80
B8 186.0-187.0	2570	<10	120	2220	30	110
B8 187.9-189.0	4400	<10	170	2370	20	70
B8 189.0-190.0	1110	<10	<50	670	<20	<20
B8 190.0-191.0	4100	10	150	2540	40	100
B8 191.0-192.0	2610	<10	100	1750	<20	40
B8 192.0-193.0	2550	<10	120	2040	<20	120
B8 193.0-194.0	1960	<10	100	1810	<20	140
B8 194.0-195.0	3140	<10	110	2540	30	130
B8 195.0-196.0	3650	<10	100	3030	20	180
B8 196.0-197.0	1960	<10	90	1370	<20	90
B8 197.0-198.0	4320	20	130	1440	40	230
Scheme	ICP42S	ICP42S	ICP42S	ICP42S	ICP42S	ICP42S
Units	PPM	PPM	PPM	PPM	PPM	PPM
Detection Limit	20	10	50	10	20	20
Upper Scheme						

- not analysed | -- element not determined | I.S. insufficient sample | L.N.R. listed not received

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ANALYTICAL REPORT

Sample	Au	Au(R)	Au(S)			
B8 152.5-153.5	0.04					
B8 153.5-154.5	<0.01					
B8 154.5-155.5	0.02					
B8 155.5-156.5	<0.01					
B8 156.5-157.5	<0.01					
B8 157.5-158.5	0.23					
B8 158.5-159.5	0.04					
B8 59.5-162.0	<0.01					
B8 162.0-163.0	0.02					
B8 163.0-164.0	<0.01					
B8 164.0-165.0	<0.01					
B8 165.0-166.0	<0.01					
B8 166.0-167.0	<0.01	<0.01				
B8 167.0-168.0	<0.01					
B8 168.0-169.0	<0.01					
B8 169.0-170.0	<0.01					
B8 170.0-171.0	<0.01					
B8 171.0-172.0	<0.01					
B8 172.0-173.0	0.04					
B8 173.0-174.0	0.02					
B8 174.0-175.0	<0.01	<0.01				
B8 175.0-177.3	<0.01					
B8 177.3-179.8	<0.01					
B8 179.8-181.0	<0.01					
B8 181.0-182.0	<0.01					
B8 182.0-183.0	0.04					
B8 183.0-184.0	<0.01					
B8 184.0-185.0	<0.01					
B8 185.0-186.0	<0.01					
B8 186.0-187.0	<0.01					
B8 187.9-189.0	<0.01	<0.01				
B8 189.0-190.0	<0.01					
B8 190.0-191.0	<0.01					
B8 191.0-192.0	0.07					
B8 192.0-193.0	0.23					
B8 193.0-194.0	<0.01					
B8 194.0-195.0	<0.01					
B8 195.0-196.0	0.04					
B8 196.0-197.0	0.21					
B8 197.0-198.0	0.08					
Scheme	FAA505	FAA505	FAA505			
Units	PPM	PPM	PPM			
Detection Limit	0.01	0.01	0.01			
Upper Scheme						

- not analysed / -- element not determined / I.S. insufficient sample / L.N.R. listed not received

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ANALYTICAL REPORT

Sample	Ni	Cu	Pb	Zn	As	S
B8 198.0-199.0	3220	<10	<50	1240	<20	120
B8 199.0-200.0	2780	<10	<50	1000	<20	<20
B8 200.0-201.0	3330	10	80	1690	40	<20
B8 201.0-202.0	2780	10	90	1330	<20	250
B8 202.0-203.0	2710	<10	<50	1060	<20	50
B8 203.0-204.0	2880	10	50	1390	<20	120
B8 204.0-205.0	1870	40	100	1170	90	150
B8 205.0-206.0	3780	30	70	1990	30	160
B8 206.0-207.0	2880	20	80	1600	30	60
B8 207.0-208.0	2600	70	80	1250	50	60
B8 208.0-209.0	4380	70	220	1720	60	680
B8 209.0-210.5	5130	70	230	2390	60	<20
B8 210.5-211.5	3210	<10	<50	1380	40	60
B8 211.5-212.5	2480	10	<50	1170	30	350
B8 212.5-213.5	3370	30	<50	1780	50	90
B8 213.5-214.5	4490	50	140	1730	70	160
B8 214.5-215.5	2890	20	140	1280	70	100
B8 215.5-216.5	2900	30	110	1140	70	90
B8 216.5-217.5	3170	40	120	1370	80	110
B8 217.5-218.5	2710	30	130	970	70	50
B8 218.5-220.0	4150	20	100	1320	80	50
B8 220.0-221.2	6470	20	70	2100	160	70
B8 221.2-222.5	7270	60	90	2030	100	80
B8 222.5-224.0	4820	20	60	1080	80	60
B8 224.0-226.0	2130	<10	<50	230	30	70
B8 226.0-227.5	2570	<10	<50	590	20	50
B8 227.5-228.5	1400	10	<50	360	60	90
B8 228.5-230.0	2640	20	<50	1380	40	90
B8 230.0-231.0	3360	10	<50	1910	30	70
B8 231.0-232.0	2380	<10	<50	850	30	90
B8 232.0-233.0	2470	10	50	1270	90	70
B8 233.0-234.0	1370	<10	70	600	30	50
B8 234.0-235.0	740	<10	60	270	<20	70
B8 235.0-236.0	810	<10	<50	220	<20	90
B8 236.0-237.0	710	<10	60	180	<20	40
B8 237.0-238.0	1350	<10	<50	350	<20	40
B8 238.0-239.0	1590	10	<50	550	20	50
B8 239.0-240.0	1840	<10	60	500	30	60
B8 240.0-241.0	1820	60	60	340	50	60
B8 241.0-242.6	2270	70	60	950	20	50
Scheme	ICP42S	ICP42S	ICP42S	ICP42S	ICP42S	ICP42S
Units	PPM	PPM	PPM	PPM	PPM	PPM
Detection Limit	20	10	50	10	20	20
Upper Scheme						

- not analysed / -- element not determined / I.S. insufficient sample / L.N.R. listed not received

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Lab Ref WM084921

Client Ref **236606**

Project

Reported 13/04/2005

Status Final

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ANALYTICAL REPORT

Sample	Au	Au(R)	Au(S)			
B8 198.0-199.0	<0.01					
B8 199.0-200.0	<0.01					
B8 200.0-201.0	0.45					
B8 201.0-202.0	<0.01					
B8 202.0-203.0	<0.01					
B8 203.0-204.0	<0.01					
B8 204.0-205.0	<0.01					
B8 205.0-206.0	<0.01					
B8 206.0-207.0	<0.01					
B8 207.0-208.0	0.02					
B8 208.0-209.0	<0.01					
B8 209.0-210.5	0.22					
B8 210.5-211.5	<0.01					
B8 211.5-212.5	<0.01	<0.01				
B8 212.5-213.5	0.02	<0.01				
B8 213.5-214.5	<0.01					
B8 214.5-215.5	0.02					
B8 215.5-216.5	<0.01					
B8 216.5-217.5	<0.01					
B8 217.5-218.5	<0.01					
B8 218.5-220.0	<0.01					
B8 220.0-221.2	<0.01					
B8 221.2-222.5	0.02					
B8 222.5-224.0	<0.01					
B8 224.0-226.0	<0.01					
B8 226.0-227.5	<0.01					
B8 227.5-228.5	<0.01					
B8 228.5-230.0	0.02					
B8 230.0-231.0	0.02					
B8 231.0-232.0	<0.01					
B8 232.0-233.0	<0.01	<0.01				
B8 233.0-234.0	<0.01					
B8 234.0-235.0	<0.01					
B8 235.0-236.0	<0.01					
B8 236.0-237.0	<0.01					
B8 237.0-238.0	<0.01					
B8 238.0-239.0	<0.01					
B8 239.0-240.0	<0.01					
B8 240.0-241.0	<0.01					
B8 241.0-242.6	<0.01					
Scheme	FAA505	FAA505	FAA505			
Units	PPM	PPM	PPM			
Detection Limit	0.01	0.01	0.01			
Upper Scheme						

- not analysed | -- element not determined | I.S. insufficient sample | L.N.R. listed not received

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Sample	Ni	Cu	Pb	Zn	As	S
B8 242.6-244.0	1320	10	120	320	30	440
B8 244.0-245.0	1020	<10	100	330	<20	450
B8 245.0-246.0	1500	<10	<50	310	60	840
B8 246.0-247.0	1450	<10	200	330	40	910
B8 247.0-248.0	1250	10	60	160	30	670
B8 248.0-249.0	1050	<10	50	140	<20	380
B8 249.0-250.0	1550	60	<50	250	20	950
B8 250.0-251.0	2000	100	<50	320	20	1460
B8 251.0-252.0	1660	60	130	280	<20	1110
B8 252.0-253.0	1900	40	<50	950	20	1390
B8 253.0-254.0	1800	50	<50	420	40	1290
B8 254.0-255.0	1890	10	<50	450	80	1120
B8 255.0-256.0	1640	<10	70	790	50	900
B8 256.0-257.0	1990	<10	70	420	190	1080
B8 257.0-258.0	1260	<10	<50	450	50	870
B8 258.0-259.0	1740	<10	100	450	60	1290
B8 259.0-260.0	1030	<10	<50	320	30	450
B8 260.0-261.0	1530	10	100	280	50	790
B8 261.0-262.0	2070	10	70	580	50	1230
B8 262.0-263.5	2230	<10	80	730	40	1260
B8 263.5-264.8	1680	10	80	360	20	70
B8 264.8-266.3	420	<10	<50	70	<20	70
B8 266.3-268.0	470	20	<50	120	50	70
B8 268.0-269.0	1510	70	<50	280	<20	80
B8 269.0-270.0	1840	20	<50	360	30	30
B8 270.0-271.0	1550	30	<50	230	<20	70
B8 271.0-272.0	2000	210	<50	140	<20	1.21%
B8 272.0-273.0	1330	80	<50	200	<20	5500
B8 273.0-274.0	2040	330	<50	210	<20	2.05%
B8 274.0-275.0	1310	140	<50	160	<20	7850
B8 275.0-276.0	920	10	<50	200	<20	1690
B8 276.0-277.0	1170	20	<50	210	<20	1290
B8 277.0-278.0	1100	20	<50	110	<20	960
B8 278.0-279.0	1580	80	<50	380	20	1080
B8 279.0-280.0	1120	80	<50	350	<20	560
B8 280.0-281.9	870	60	<50	350	70	240
B8 281.9-282.3	2800	100	60	2840	70	120
B8 282.3-283.8	830	20	<50	1020	20	60
B8 289.6-290.6	1520	150	<50	560	30	1900
B8 290.6-291.6	1280	70	<50	250	<20	4520
Scheme	ICP42S	ICP42S	ICP42S	ICP42S	ICP42S	ICP42S
Units	PPM	PPM	PPM	PPM	PPM	PPM
Detection Limit	20	10	50	10	20	20
Upper Scheme						

- not analysed / -- element not determined / I.S. insufficient sample / L.N.R. listed not received

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Sample	Au	Au(R)	Au(S)			
B8 242.6-244.0	<0.01					
B8 244.0-245.0	<0.01					
B8 245.0-246.0	<0.01					
B8 246.0-247.0	<0.01					
B8 247.0-248.0	0.02					
B8 248.0-249.0	<0.01					
B8 249.0-250.0	0.02	0.02				
B8 250.0-251.0	<0.01					
B8 251.0-252.0	<0.01					
B8 252.0-253.0	0.02					
B8 253.0-254.0	<0.01	<0.01				
B8 254.0-255.0	<0.01					
B8 255.0-256.0	<0.01					
B8 256.0-257.0	<0.01					
B8 257.0-258.0	<0.01					
B8 258.0-259.0	<0.01					
B8 259.0-260.0	<0.01					
B8 260.0-261.0	<0.01					
B8 261.0-262.0	<0.01					
B8 262.0-263.5	<0.01					
B8 263.5-264.8	<0.01					
B8 264.8-266.3	<0.01					
B8 266.3-268.0	<0.01					
B8 268.0-269.0	<0.01					
B8 269.0-270.0	<0.01					
B8 270.0-271.0	<0.01					
B8 271.0-272.0	<0.01	<0.01				
B8 272.0-273.0	<0.01					
B8 273.0-274.0	<0.01					
B8 274.0-275.0	<0.01					
B8 275.0-276.0	<0.01	<0.01				
B8 276.0-277.0	<0.01					
B8 277.0-278.0	<0.01					
B8 278.0-279.0	<0.01					
B8 279.0-280.0	<0.01					
B8 280.0-281.9	<0.01					
B8 281.9-282.3	0.10					
B8 282.3-283.8	<0.01					
B8 289.6-290.6	<0.01	<0.01				
B8 290.6-291.6	<0.01					
Scheme	FAA505	FAA505	FAA505			
Units	PPM	PPM	PPM			
Detection Limit	0.01	0.01	0.01			
Upper Scheme						

- not analysed / -- element not determined / I.S. insufficient sample / L.N.R. listed not received

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ANALYTICAL REPORT

<i>Sample</i>	<i>Au</i>	<i>Au(R)</i>	<i>Au(S)</i>			
B8 291.6-292.6	<0.01					
*SS B8 101.5-102.5	<0.01					
*SS B8 146.5-147.5	<0.01					
*SS B8 173.0-174.0	<0.01					
*SS B8 202.0-203.0	<0.01					
*SS B8 231.0-232.0	<0.01					
*SS B8 257.0-258.0	<0.01					
*SS B8 290.6-291.6	<0.01					
<i>Scheme</i>	<i>FAA505</i>	<i>FAA505</i>	<i>FAA505</i>			
<i>Units</i>	<i>PPM</i>	<i>PPM</i>	<i>PPM</i>			
<i>Detection Limit</i>	<i>0.01</i>	<i>0.01</i>	<i>0.01</i>			
<i>Upper Scheme</i>						

- not analysed / -- element not determined / I.S. insufficient sample / L.N.R. listed not received

ANALYSIS DESCRIPTION

For solid samples, reported units are expressed as mass / mass.

ie: % denotes %mass/%mass, ppm denotes mg/kg, ppb denotes µg/kg.

For liquid samples, reported units are expressed as mass / volume.

ie: % denotes %mass/%volume, ppm denotes mg/L, ppb denotes µg/L.

Job number : **WM084921** Order number : **236606**

Scheme code: **ICP42S** ICP-OES after DIG42S

Ni	:	Nickel 20-25000 ppm
Cu	:	Copper 10-25000 ppm
Pb	:	Lead 50-25000 ppm
Zn	:	Zinc 10-25000 ppm
As	:	Arsenic 20-25000 ppm
S	:	Sulphur 20-100000 ppm

Scheme code: **FAA505** Au Pt Pd, FAS, AAS, 50g

Au	:	Gold 0.01-1000 ppm
Au(R)	:	Gold Repeat 0.01-1000 ppm
Au(S)	:	Gold Duplicate 0.01-1000 ppm

SGS

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Lindsay Newnham**Allegiance Metals Pty Limited**PO Box 62
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TASMANIA 7469
AUSTRALIA

Lab Ref WM084999
Client Ref **236606**
Project
Received 24/03/2005
First Reported 5/04/2005
Re-Reported 11/04/2005

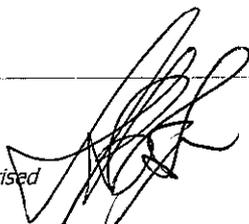
Samples 216
First Sample B9 145.0-147.0
Last Sample *SS 355.0-356.0
Pages 14

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eReport
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FTP

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Notes

Authorised

Richard Bowen
Laboratory Manager

on behalf of

The results in the following analytical report pertain to the samples provided to this laboratory for preparation and/or analysis as requested by the client.

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ANALYTICAL REPORT

Sample	Au	Au(R)	Au(S)			
B9 145.0-147.0	0.06					
B9 147.0-148.0	0.02					
B9 148.0-149.0	0.02	<0.01				
B9 149.0-150.2	0.02					
B9 150.2-151.3	0.02					
B9 151.3-152.3	0.02					
B9 152.3-153.3	0.04					
B9 153.3-154.0	0.04					
B9 154.0-154.7	0.04					
B9 154.7-156.8	0.04					
B9 156.8-157.8	<0.01					
B9 157.8-158.8	<0.01					
B9 158.8-159.8	0.02					
B9 159.8-160.8	<0.01					
B9 160.8-161.8	<0.01					
B9 161.8-162.8	0.02					
B9 162.8-164.0	0.08					
B9 164.0-165.0	0.02	0.02				
B9 165.0-166.0	NVL					
B9 166.0-167.5	0.02					
B9 167.5-168.5	<0.01					
B9 168.5-169.5	<0.01					
B9 169.5-170.5	0.02					
B9 170.5-171.5	0.15					
B9 171.5-172.5	<0.01					
B9 172.5-173.5	<0.01					
B9 173.5-174.5	0.02					
B9 174.5-175.5	0.02					
B9 175.5-176.5	<0.01					
B9 176.5-177.5	0.06					
B9 177.5-178.5	<0.01	0.02				
B9 178.5-179.5	<0.01					
B9 179.5-180.5	<0.01					
B9 180.5-181.5	<0.01					
B9 181.5-182.5	<0.01					
B9 182.5-183.5	<0.01					
B9 183.5-184.5	<0.01					
B9 184.5-185.5	0.02					
B9 185.5-186.5	0.02					
B9 186.5-187.5	<0.01					
Scheme	FAA505	FAA505	FAA505			
Units	PPM	PPM	PPM			
Detection Limit	0.01	0.01	0.01			
Upper Scheme						

- not analysed | -- element not determined | I.S. insufficient sample | L.N.R. listed not received

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Sample	Ni	Cu	Pb	Zn	As	S
B9 187.5-188.5	5390	120	100	1520	60	50
B9 188.5-189.5	3880	90	110	1530	60	20
B9 189.5-190.5	2710	70	<50	870	40	150
B9 190.5-191.5	3030	70	50	900	30	80
B9 191.5-192.5	3700	70	<50	990	30	140
B9 192.5-193.5	4100	110	70	1420	30	40
B9 193.5-194.9	5840	110	120	2200	40	80
B9 194.9-196.0	5350	60	<50	1470	30	50
B9 196.0-197.0	5710	50	290	1610	40	90
B9 197.0-198.0	3350	50	150	820	40	<20
B9 198.0-199.0	3540	30	190	1460	50	60
B9 199.0-200.4	5630	20	<50	1460	30	30
B9 200.5-202.0	1480	<10	<50	430	30	380
B9 202.0-203.0	4540	30	110	1190	40	80
B9 203.0-204.0	3500	20	<50	870	30	60
B9 204.0-205.0	1240	<10	<50	200	<20	300
B9 205.0-206.0	2030	20	<50	250	20	470
B9 206.0-207.0	4620	50	<50	160	120	3860
B9 207.0-208.0	4350	60	<50	680	40	120
B9 208.0-209.0	4740	80	<50	790	40	40
B9 209.0-210.0	4010	30	<50	680	30	40
B9 210.0-211.0	6960	<10	<50	1300	40	50
B9 211.0-212.0	3800	<10	<50	850	60	60
B9 212.0-213.0	2940	10	<50	710	<20	20
B9 213.0-214.0	4250	20	<50	1340	40	40
B9 214.0-215.0	6510	<10	<50	1540	50	50
B9 215.0-216.0	3850	<10	<50	630	30	50
B9 216.0-217.0	2720	<10	<50	350	30	70
B9 217.0-218.0	2010	<10	<50	170	30	80
B9 218.0-219.0	1780	<10	<50	160	<20	1260
B9 219.0-220.0	1510	10	<50	150	160	660
B9 220.0-221.0	1200	<10	<50	200	40	530
B9 221.0-222.0	2240	10	<50	210	40	120
B9 222.0-223.0	3260	10	<50	360	60	550
B9 223.0-224.0	1100	<10	<50	160	<20	190
B9 224.0-225.0	2010	<10	<50	280	30	50
B9 225.0-226.0	2410	20	<50	280	30	70
B9 226.0-227.0	1210	<10	<50	130	<20	80
B9 227.0-228.0	2410	40	<50	390	60	80
B9 228.0-229.0	740	<10	<50	170	20	90
Scheme	ICP42S	ICP42S	ICP42S	ICP42S	ICP42S	ICP42S
Units	PPM	PPM	PPM	PPM	PPM	PPM
Detection Limit	20	10	50	10	20	20
Upper Scheme						

- not analysed | -- element not determined | I.S. insufficient sample | L.N.R. listed not received

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Lab Ref WM084999
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ANALYTICAL REPORT

Sample	Au	Au(R)	Au(S)			
B9 187.5-188.5	0.02					
B9 188.5-189.5	<0.01					
B9 189.5-190.5	0.02					
B9 190.5-191.5	0.02	<0.01				
B9 191.5-192.5	<0.01					
B9 192.5-193.5	<0.01					
B9 193.5-194.9	<0.01					
B9 194.9-196.0	<0.01					
B9 196.0-197.0	0.12					
B9 197.0-198.0	<0.01					
B9 198.0-199.0	<0.01					
B9 199-.0-200.4	0.02					
B9 200.5-202.0	0.02					
B9 202.0-203.0	0.06	0.05				
B9 203.0-204.0	0.16					
B9 204.0-205.0	<0.01					
B9 205.0-206.0	<0.01					
B9 206.0-207.0	0.02					
B9 207.0-208.0	<0.01					
B9 208.0-209.0	<0.01					
B9 209.0-210.0	<0.01					
B9 210.0-211.0	<0.01					
B9 211.0-212.0	<0.01					
B9 212.0-213.0	<0.01					
B9 213.0-214.0	<0.01	<0.01				
B9 214.0-215.0	0.02					
B9 215.0-216.0	0.02					
B9 216.0-217.0	<0.01					
B9 217.0-218.0	<0.01					
B9 218.0-219.0	0.02					
B9 219.0-220.0	<0.01					
B9 220.0-221.0	<0.01					
B9 221.0-222.0	<0.01					
B9 222.0-223.0	<0.01					
B9 223.0-224.0	0.02					
B9 224.0-225.0	<0.01					
B9 225.0-226.0	0.06					
B9 226.0-227.0	0.04					
B9 227.0-228.0	<0.01					
B9 228.0-229.0	<0.01	<0.01				
Scheme	FAA505	FAA505	FAA505			
Units	PPM	PPM	PPM			
Detection Limit	0.01	0.01	0.01			
Upper Scheme						

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ANALYTICAL REPORT

Sample	Ni	Cu	Pb	Zn	As	S
B9 229.0-230.0	920	20	<50	90	<20	1350
B9 230.0-231.0	1980	20	<50	270	20	600
B9 231.0-232.0	2960	<10	<50	490	40	60
B9 238.0-239.0	1830	<10	<50	150	200	870
B9 239.0-240.0	1890	<10	<50	210	50	570
B9 240.0-241.0	1550	10	<50	390	30	100
B9 241.0-242.0	1620	40	<50	410	30	420
B9 242.0-243.0	1860	50	<50	550	40	490
B9 243.0-244.0	2210	<10	<50	440	20	80
B9 244.0-245.0	2190	10	<50	470	30	350
B9 245.0-246.0	1710	<10	<50	150	40	1210
B9 246.0-247.0	1750	<10	<50	100	60	1420
B9 247.0-248.0	1670	10	<50	70	60	1380
B9 248.0-249.0	1120	20	<50	50	<20	1660
B9 249.0-250.0	1660	10	<50	130	20	1800
B9 250.0-251.0	1100	20	<50	70	20	2140
B9 251.0-252.0	1400	20	<50	130	20	2930
B9 252.0-253.0	1350	20	<50	70	30	3160
B9 253.0-254.0	2350	60	<50	60	40	5740
B9 254.0-255.0	1550	100	<50	130	30	3640
B9 255.0-256.0	1540	90	<50	130	30	3580
B9 256.0-257.0	1310	20	<50	220	40	220
B9 257.0-258.0	1210	40	<50	90	40	2050
B9 258.0-259.0	1230	10	<50	60	30	2780
B9 259.0-260.0	1070	10	<50	80	20	2340
B9 260.0-261.0	1240	40	<50	210	30	870
B9 261.0-262.0	1440	30	<50	300	30	440
B9 262.0-263.0	1130	20	<50	280	40	220
B9 263.0-264.0	1290	60	<50	250	40	250
B9 264.0-265.0	1400	50	<50	290	40	200
B9 265.0-266.0	1620	50	<50	260	40	330
B9 266.0-267.0	1150	30	<50	60	<20	3560
B9 267.0-268.0	1830	90	<50	80	<20	8430
B9 268.0-269.0	1280	50	<50	60	<20	5170
B9 269.0-270.0	1220	20	<50	60	<20	2820
B9 270.0-271.0	1050	30	<50	70	<20	3180
B9 271.0-272.0	950	20	<50	60	<20	2700
B9 272.0-273.0	1120	30	<50	80	<20	3880
B9 273.0-274.0	850	20	<50	80	<20	1210
B9 274.0-275.0	1080	<10	<50	100	<20	1670
Scheme	ICP42S	ICP42S	ICP42S	ICP42S	ICP42S	ICP42S
Units	PPM	PPM	PPM	PPM	PPM	PPM
Detection Limit	20	10	50	10	20	20
Upper Scheme						

- not analysed / -- element not determined / I.S. insufficient sample / L.N.R. listed not received

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Lab Ref WM084999

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ANALYTICAL REPORT

Sample	Au	Au(R)	Au(S)			
B9 229.0-230.0	0.04					
B9 230.0-231.0	0.02					
B9 231.0-232.0	0.02					
B9 238.0-239.0	0.02					
B9 239.0-240.0	<0.01	0.02				
B9 240.0-241.0	<0.01					
B9 241.0-242.0	<0.01					
B9 242.0-243.0	<0.01					
B9 243.0-244.0	<0.01					
B9 244.0-245.0	<0.01					
B9 245.0-246.0	<0.01					
B9 246.0-247.0	<0.01					
B9 247.0-248.0	0.01					
B9 248.0-249.0	0.02					
B9 249.0-250.0	<0.01					
B9 250.0-251.0	<0.01					
B9 251.0-252.0	0.01					
B9 252.0-253.0	0.02					
B9 253.0-254.0	0.02					
B9 254.0-255.0	<0.01					
B9 255.0-256.0	0.02					
B9 256.0-257.0	<0.01					
B9 257.0-258.0	<0.01					
B9 258.0-259.0	<0.01	<0.01				
B9 259.0-260.0	0.02					
B9 260.0-261.0	0.02	<0.01				
B9 261.0-262.0	0.02					
B9 262.0-263.0	<0.01					
B9 263.0-264.0	<0.01					
B9 264.0-265.0	<0.01					
B9 265.0-266.0	<0.01					
B9 266.0-267.0	<0.01					
B9 267.0-268.0	0.02					
B9 268.0-269.0	0.02					
B9 269.0-270.0	0.02					
B9 270.0-271.0	<0.01					
B9 271.0-272.0	<0.01					
B9 272.0-273.0	0.02					
B9 273.0-274.0	<0.01	<0.01				
B9 274.0-275.0	<0.01					
Scheme	FAA505	FAA505	FAA505			
Units	PPM	PPM	PPM			
Detection Limit	0.01	0.01	0.01			
Upper Scheme						

- not analysed / -- element not determined / I.S. insufficient sample / L.N.R. listed not received

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ANALYTICAL REPORT

Sample	Ni	Cu	Pb	Zn	As	S
B9 275.0-276.0	760	10	<50	70	<20	2080
B9 276.0-277.0	1040	50	<50	80	<20	3980
B9 277.0-278.0	2310	40	<50	380	30	2760
B9 278.0-279.0	4780	30	<50	1130	40	820
B9 279.0-280.0	2590	30	<50	520	30	210
B9 280.0-281.0	4090	80	<50	720	50	80
B9 281.0-282.0	3940	50	<50	860	40	160
B9 282.0-283.0	1380	40	<50	280	20	3640
B9 283.0-284.0	1240	30	<50	280	20	380
B9 284.0-285.0	1820	20	<50	530	50	210
B9 285.0-286.0	1490	10	<50	230	30	510
B9 286.0-287.0	1360	50	<50	270	20	1130
B9 287.0-288.0	1480	50	<50	90	20	920
B9 288.0-289.0	1110	30	<50	70	20	950
B9 289.0-290.0	990	30	<50	70	20	930
B9 290.0-291.0	1430	20	<50	140	20	580
B9 291.0-292.0	1300	50	<50	110	<20	570
B9 292.0-293.0	1330	<10	<50	330	<20	650
B9 293.0-294.0	1570	20	<50	2220	30	1890
B9 294.0-295.0	1450	<10	<50	300	30	460
B9 295.0-296.0	1240	<10	<50	110	<20	740
B9 296.0-297.0	1950	20	<50	180	70	1170
B9 297.0-298.0	1370	50	<50	80	60	720
B9 298.0-299.0	800	20	<50	70	50	270
B9 299.0-300.0	1130	10	<50	230	50	480
B9 300.0-301.0	1050	10	<50	260	50	430
B9 301.0-302.0	1150	10	<50	150	50	470
B9 302.0-303.0	1420	10	<50	180	50	460
B9 303.0-304.0	1930	230	<50	220	130	2820
B9 304.0-305.0	1300	160	<50	220	70	970
B9 305.0-306.0	1730	30	<50	530	60	850
B9 306.0-307.0	2230	10	<50	300	70	660
B9 307.0-308.0	1980	10	<50	260	90	1710
B9 308.0-309.0	970	<10	<50	170	70	620
B9 309.0-310.0	1160	<10	<50	200	70	580
B9 310.0-311.0	1950	10	<50	240	90	900
B9 311.0-312.0	1410	10	<50	170	100	350
B9 312.0-313.0	3320	30	70	640	530	7970
B9 313.0-314.0	1010	10	<50	110	260	410
B9 314.0-315.0	1740	<10	<50	170	60	320
Scheme	ICP42S	ICP42S	ICP42S	ICP42S	ICP42S	ICP42S
Units	PPM	PPM	PPM	PPM	PPM	PPM
Detection Limit	20	10	50	10	20	20
Upper Scheme						

- not analysed / -- element not determined / I.S. insufficient sample / L.N.R. listed not received

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Sample	Au	Au(R)	Au(S)			
B9 275.0-276.0	<0.01					
B9 276.0-277.0	0.02					
B9 277.0-278.0	<0.01					
B9 278.0-279.0	<0.01					
B9 279.0-280.0	0.02					
B9 280.0-281.0	0.02					
B9 281.0-282.0	<0.01					
B9 282.0-283.0	0.02					
B9 283.0-284.0	0.06	0.05				
B9 284.0-285.0	0.02					
B9 285.0-286.0	<0.01					
B9 286.0-287.0	<0.01					
B9 287.0-288.0	<0.01					
B9 288.0-289.0	0.02					
B9 289.0-290.0	0.02					
B9 290.0-291.0	<0.01					
B9 291.0-292.0	<0.01					
B9 292.0-293.0	0.02					
B9 293.0-294.0	0.02					
B9 294.0-295.0	<0.01					
B9 295.0-296.0	<0.01					
B9 296.0-297.0	0.02					
B9 297.0-298.0	<0.01					
B9 298.0-299.0	0.02	0.02				
B9 299.0-300.0	0.02					
B9 300.0-301.0	<0.01					
B9 301.0-302.0	<0.01					
B9 302.0-303.0	0.02					
B9 303.0-304.0	0.02					
B9 304.0-305.0	<0.01					
B9 305.0-306.0	<0.01					
B9 306.0-307.0	<0.01					
B9 307.0-308.0	0.02					
B9 308.0-309.0	<0.01					
B9 309.0-310.0	0.02					
B9 310.0-311.0	<0.01					
B9 311.0-312.0	<0.01					
B9 312.0-313.0	<0.01					
B9 313.0-314.0	<0.01	<0.01				
B9 314.0-315.0	<0.01					
Scheme	FAA505	FAA505	FAA505			
Units	PPM	PPM	PPM			
Detection Limit	0.01	0.01	0.01			
Upper Scheme						

- not analysed / -- element not determined / I.S. insufficient sample / L.N.R. listed not received

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Sample	Ni	Cu	Pb	Zn	As	S
B9 315.0-316.0	2100	10	<50	150	60	390
B9 316.0-317.0	1740	20	50	290	60	290
B9 317.0-318.0	1340	<10	<50	150	60	700
B9 318.0-319.0	1350	<10	<50	170	70	840
B9 319.0-320.0	1960	<10	<50	230	70	420
B9 320.0-321.0	1090	280	<50	160	50	540
B9 321.0-322.0	1630	<10	<50	200	60	450
B9 322.0-323.0	1300	<10	<50	160	70	330
B9 323.0-324.0	1020	<10	<50	170	70	280
B9 324.0-325.0	2530	<10	<50	370	80	260
B9 325.0-326.0	980	<10	<50	260	160	3600
B9 326.0-327.0	1090	<10	<50	410	100	570
B9 327.0-328.0	1690	30	<50	1590	80	520
B9 328.0-329.0	2070	70	50	4030	90	150
B9 329.0-329.8	3330	1060	<50	1330	60	3930
B9 329.8-331.0	2010	90	<50	460	70	3740
B9 331.0-332.0	1070	20	<50	250	60	1090
B9 332.0-333.0	1810	30	50	160	90	2290
B9 333.0-334.0	2410	60	60	130	60	4210
B9 334.0-335.0	2370	30	50	100	50	2650
B9 335.0-336.0	1840	10	<50	80	80	2210
B9 336.0-337.0	2090	30	<50	120	60	2970
B9 337.0-338.0	2470	220	<50	140	40	1.68%
B9 338.0-339.0	1560	90	<50	100	40	5820
B9 339.0-340.0	1440	60	110	280	110	1.08%
B9 340.0-341.0	1570	20	60	260	40	650
B9 341.0-342.0	1230	20	<50	140	40	1220
B9 342.0-343.0	1410	10	<50	150	40	1380
B9 343.0-344.0	1580	<10	<50	210	40	2040
B9 344.0-345.0	2710	10	50	200	50	3160
B9 345.0-346.0	2550	260	130	290	20	1.45%
B9 346.0-347.0	1490	80	60	120	<20	5720
B9 347.0-348.0	1380	70	<50	100	20	4110
B9 348.0-349.0	920	20	<50	180	<20	1030
B9 349.0-350.0	780	20	<50	130	50	620
B9 350.0-351.7	700	50	<50	170	90	3250
B9 351.7-353.0	410	100	<50	90	30	9060
B9 353.0-354.0	260	10	<50	80	40	700
B9 354.0-355.0	230	30	<50	80	<20	1410
B9 355.0-356.0	170	10	<50	70	<20	340
Scheme	ICP42S	ICP42S	ICP42S	ICP42S	ICP42S	ICP42S
Units	PPM	PPM	PPM	PPM	PPM	PPM
Detection Limit	20	10	50	10	20	20
Upper Scheme						

- not analysed / -- element not determined / I.S. insufficient sample / L.N.R. listed not received

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ANALYTICAL REPORT

Sample	Au	Au(R)	Au(S)			
B9 315.0-316.0	<0.01					
B9 316.0-317.0	<0.01					
B9 317.0-318.0	<0.01					
B9 318.0-319.0	<0.01					
B9 319.0-320.0	<0.01					
B9 320.0-321.0	0.02					
B9 321.0-322.0	<0.01					
B9 322.0-323.0	<0.01					
B9 323.0-324.0	0.04					
B9 324.0-325.0	<0.01					
B9 325.0-326.0	<0.01					
B9 326.0-327.0	0.04					
B9 327.0-328.0	0.10					
B9 328.0-329.0	<0.01	<0.01				
B9 329.0-329.8	<0.01					
B9 329.8-331.0	0.06					
B9 331.0-332.0	<0.01					
B9 332.0-333.0	<0.01					
B9 333.0-334.0	<0.01					
B9 334.0-335.0	<0.01	<0.01				
B9 335.0-336.0	<0.01					
B9 336.0-337.0	<0.01					
B9 337.0-338.0	0.02					
B9 338.0-339.0	<0.01					
B9 339.0-340.0	<0.01					
B9 340.0-341.0	<0.01					
B9 341.0-342.0	0.02					
B9 342.0-343.0	0.02					
B9 343.0-344.0	<0.01					
B9 344.0-345.0	0.02					
B9 345.0-346.0	<0.01	<0.01				
B9 346.0-347.0	<0.01					
B9 347.0-348.0	<0.01					
B9 348.0-349.0	<0.01					
B9 349.0-350.0	<0.01					
B9 350.0-351.7	<0.01					
B9 351.7-353.0	0.02	0.02				
B9 353.0-354.0	<0.01					
B9 354.0-355.0	<0.01					
B9 355.0-356.0	<0.01					
Scheme	FAA505	FAA505	FAA505			
Units	PPM	PPM	PPM			
Detection Limit	0.01	0.01	0.01			
Upper Scheme						

- not analysed / -- element not determined / I.S. insufficient sample / L.N.R. listed not received

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ANALYTICAL REPORT

Sample	Ni	Cu	Pb	Zn	As	S
B9 356.0-357.0	200	30	<50	60	<20	4190
B9 357.0-358.0	180	20	<50	70	<20	2090
B9 358.0-359.0	150	20	<50	60	<20	990
B9 359.0-360.0	180	50	<50	60	<20	5870
B9 360.0-361.0	160	20	<50	70	<20	760
B9 361.0-362.0	210	30	<50	70	<20	1810
B9 362.0-363.0	250	30	<50	60	<20	1250
B9 363.0-363.9	310	70	<50	70	<20	4750
*SS 171.5-172.5	3160	20	90	1890	90	130
*SS 197.0-198.0	2620	40	130	740	30	40
*SS 223.0-224.0	930	10	<50	140	50	240
*SS 254.0-255.0	1370	120	<50	140	30	3330
*SS 279.0-280.0	2260	40	<50	550	30	200
*SS 304.0-305.0	1170	170	<50	270	50	900
*SS 329.0-329.8	2750	1100	<50	1540	40	3560
*SS 355.0-356.0	170	30	<50	70	<20	360
<i>Scheme</i>	<i>ICP42S</i>	<i>ICP42S</i>	<i>ICP42S</i>	<i>ICP42S</i>	<i>ICP42S</i>	<i>ICP42S</i>
<i>Units</i>	<i>PPM</i>	<i>PPM</i>	<i>PPM</i>	<i>PPM</i>	<i>PPM</i>	<i>PPM</i>
<i>Detection Limit</i>	<i>20</i>	<i>10</i>	<i>50</i>	<i>10</i>	<i>20</i>	<i>20</i>
<i>Upper Scheme</i>						

- not analysed / -- element not determined / I.S. insufficient sample / L.N.R. listed not received

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ANALYTICAL REPORT

Sample	Au	Au(R)	Au(S)			
B9 356.0-357.0	<0.01					
B9 357.0-358.0	0.02					
B9 358.0-359.0	0.02	<0.01				
B9 359.0-360.0	<0.01					
B9 360.0-361.0	<0.01					
B9 361.0-362.0	<0.01					
B9 362.0-363.0	<0.01					
B9 363.0-363.9	<0.01					
*SS 171.5-172.5	<0.01					
*SS 197.0-198.0	<0.01					
*SS 223.0-224.0	<0.01					
*SS 254.0-255.0	0.02					
*SS 279.0-280.0	<0.01					
*SS 304.0-305.0	<0.01					
*SS 329.0-329.8	<0.01					
*SS 355.0-356.0	<0.01					
<i>Scheme</i>	<i>FAA505</i>	<i>FAA505</i>	<i>FAA505</i>			
<i>Units</i>	<i>PPM</i>	<i>PPM</i>	<i>PPM</i>			
<i>Detection Limit</i>	<i>0.01</i>	<i>0.01</i>	<i>0.01</i>			
<i>Upper Scheme</i>						

- not analysed / -- element not determined / I.S. insufficient sample / L.N.R. listed not received

ANALYSIS DESCRIPTION

For solid samples, reported units are expressed as mass / mass.

ie: % denotes %mass/%mass, ppm denotes mg/kg, ppb denotes µg/kg.

For liquid samples, reported units are expressed as mass / volume.

ie: % denotes %mass/%volume, ppm denotes mg/L, ppb denotes µg/L.

Job number : **WM084999** Order number : **236606**

Scheme code: **ICP42S** ICP-OES after DIG42S

Ni	:	Nickel 20-25000 ppm
Cu	:	Copper 10-25000 ppm
Pb	:	Lead 50-25000 ppm
Zn	:	Zinc 10-25000 ppm
As	:	Arsenic 20-25000 ppm
S	:	Sulphur 20-100000 ppm

Scheme code: **FAA505** Au Pt Pd, FAS, AAS, 50g

Au	:	Gold 0.01-1000 ppm
Au(R)	:	Gold Repeat 0.01-1000 ppm
Au(S)	:	Gold Duplicate 0.01-1000 ppm

APPENDIX 5

Petrological Report - DDH B8 & B9

The Petrology of 8 Samples from the Burbank Prospect, Tasmania

- For Allegiance Metals NL
- M1159
- 7 June 2005



The Petrology of 8 Samples from the Burbank Prospect, Tasmania

- M1159
- 7 June 2005

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Summary

A suite of eight rock samples from Burbank, Tasmania was examined in polished thin section.

The original lithologies comprise serpentinised ultramafics.

The rocks have been serpentinised then variably altered to carbonate-silica assemblages and most have then been oxidised by groundwaters.

Veining and brecciation is limited and veins consists mainly of magnesite and quartz, with minor magnetite and chalcedony.

Chromite occurs as a primary mineral and some magnetite was produced during serpentinisation. Hydrothermal magnetite is also present and in the least oxidised sample it is accompanied by pentlandite. In the oxidised samples the magnetite and pentlandite have been altered to goethite and limonite with possibly some limonite and goethite introduced into some of the rock from groundwaters.

Elevated zinc concentrations may reflect a franklinite component in the hydrothermal magnetite with some zinc also possibly present in the limonite in more oxidised samples.

It is concluded that an epithermal nickel deposit formed along a major structure that also served as later conduit for oxidised groundwaters such that sulphides are only preserved peripherally to the structure or possibly at greater depths within it. Limonite and goethite produced by the oxidation are considered to host the nickel in the oxidised samples, but at much higher concentrations than the limonite of laterite nickel deposits.

1. Introduction

A suite of eight samples from Burbank, Tasmania was submitted in May 2005 with an e-mailed request for petrological analysis (see appendix A).

Of these samples, all were prepared as polished thin sections, and examined in transmitted and reflected light as appropriate.

The principal aim of the study was to establish where exploitable nickel sulphides may be found.

2. Lithologies

Lithologies, alteration and vein mineralogy of the samples are summarised in Table 2-1. Full petrographic descriptions are given in Section 7.

■ **Table 2-1 Summary of Lithologies and Alteration**

Sample Numbers		Lithology (and primary minerals)	Alteration and Veining	
SKM	Allegiance			
13228	B8 145.3 m	Serpentinite (Chr)	Total:	Chs, Mag, Lm, Mt, Hm, Tlc
			Vein:	Lm, Mag, Q, Ccd, Mt
13229	B8 148.5 m	Serpentinite (Chr)	Total:	Chs, Mag, Mt, Lm, Tlc
			Vein:	Mag, Lm
13230	B8 150.5 m	Serpentinite (Chr)	Total:	Chs, Lm, Lx
			Vein:	Mag, Q
13231	B9 147.5 m	Serpentinite (Chr)	Total:	Cal, Mt, Chs, Pen, Rt
13232	B9 150.4 m	Serpentinite (Chr)	Total:	Mag, Mt, Lm, Cal
13233	B9 164.8 m	Serpentinite (Chr)	Total:	Mag, Cal, Q, Lm, Mt
13234	B9 183.5	Serpentinite (Chr)	Total:	Mag, Q, Lm, Goe, Mt, Ccd
13235	B9 185.4 m	Serpentinite	Total:	Q, Mag, Lm, Goe, Mt
			Vein:	Lm

Mineral Abbreviations

Cal	Calcite	Lx	Leucoxene
Ccd	Chalcedony	Mag	Magnesite
Chr	Chromite	Mt	Magnetite
Chs	Chrysotile	Pen	Pentlandite
Gth	Goethite	Rt	Rutile
Hm	Hematite	Q	Quartz
Lm	Limonite	Tlc	Talc

The rocks have all been designated as serpentinite. The basis for doing this is either the presence of serpentine minerals, remnant chromite with a shattered texture or the ghost of chromite with a shattered texture. Chromite is resistant to alteration so is usually a good marker mineral for ultramafic precursors to altered rocks. During serpentinisation of ultramafics there is a volume increase and one of the features that mark it is the pulling apart of chromite grains, to give a shattered texture. So when this texture is observed not only can altered rocks be identified as ultramafics they can be interpreted to have been serpentinised, as is the case in this instance. In one sample there is a ghost of elongate olivine grains and in another there are ghosts of pyroxene grains. The occurrence of remnant primary textures is too limited to apply ultramafic rock names, although in least in the case of that with the pyroxene ghosts, the rock is likely to have been originally a peridotite.

3. Alteration and Vein Mineralogy

In this group of rocks three alteration events can be recognised. The first is serpentinisation, the second is hydrothermal alteration and the third is oxidation by ground waters. Serpentinisation involves a hydration of ultramafic rocks with olivine and pyroxenes going to serpentinite minerals. Since serpentine minerals do not incorporate much iron or titanium in their structure the iron from the primary minerals forms magnetite and titanium forms rutile or leucosene, as are observed in these rocks. There is a fibrous habit to at least some of the serpentinite in these rocks and on this basis it has been identified as chrysotile. An XRD would be required to exactly identify it, but the point is not germane to the goal of this study. The serpentinisation process usually takes place below the seafloor following the formation of the ultramafics at spreading ridges. Since these rocks are regarded as being Cambrian in age the serpentinisation is very likely a Cambrian event, significantly predating the intrusion of Carboniferous granite into the area and the hydrothermal alteration associated with it.

Where ultramafics are hydrothermally altered, rather than serpentines there are strong brecciation textures due to the volume of the rock increasing, and indications of supersaturation of the altering fluids with silica in non-equilibrium phases. In this case volume-increase textures are lacking and there are only minor occurrences of non-equilibrium forms of silica, which means that the rocks were serpentinised prior to hydrothermal alteration and the volume increase had already taken place.

Altered serpentinites have a very distinctive suite of alteration minerals. There is a characteristic succession of minerals with increasing intensity of alteration that reflects the degree of water/rock interaction indicative of either increasing proximity to a fluid bearing structure and/or the amount of fluid that has passed through the structure that was responsible for the alteration. Talc is usually the first mineral to form, which is then replaced by carbonates and then by silica minerals, with the most intensely altered rocks consisting only of silica. All these minerals are found in the sample suite and their distribution can be used to determine hydrothermal fluid flow pathways.

On this basis B9 is closer to a major structure that hydrothermal fluids have moved along than B8 because there is only minor alteration of the serpentinite in B8 and there are only minor remnants of serpentinite in B9. Going from 147.5 m to 185.4 m in B9 the hole is getting closer to such a major structure, because the remnants of serpentinite are in the sample from 147.5 m and the abundance of hydrothermal silica minerals (mainly quartz with minor chalcedony) steadily increases with depth over this interval.

Veining is found mainly in B8 and most of the hydrothermal minerals in these rocks are in veins, with only very limited alteration around them, suggestive of considerable prior reaction between serpentinite and the fluid such that the fluid is close to being in equilibrium with the serpentinite. This is consistent with these samples being some distance from a major structure. Hydrothermal minerals in the veins include mainly magnesite, but quartz and chalcedony are also found along with opaques.

The conditions of the hydrothermal alteration can be interpreted from the textures and minerals present. The presence of open space textures, mainly vugs, is suggestive that pressures were hydrostatic, and the presence of both quartz and chalcedony is

suggestive of temperatures in the vicinity of 200°C, possibly with the chalcedony reflecting cooling. The presence of carbonates is indicative of the hydrothermal waters containing CO₂.

Limonite and goethite are present in all except the sample from B9 147.5 m. They can be seen to be oxidation products of magnetite and possibly any sulphides that were originally present. Limonite and goethite also occur in veins, and limonite lines cracks and stains parts of the rock.

As the rocks are found at depth below the normal weathering surface this oxidation must have been produced by ground waters where a limited set of conditions applied. This is because generally ground waters become reduced below the water table by rock reaction. The special conditions are that the ground waters must be cold, the area have high relief and precipitation rates and that the waters are channelled. This is because oxygen has inverse solubility in water and is more abundant in cold waters. There also needs to be a strong hydraulic gradient with possible rock reaction focussed into the area where the samples are derived. It is understood that a major thrust fault is present in the area that fulfils the last requirement and the other requirements should also be met in western Tasmania. The fact that holes were collared at sea level would suggest that either they are bordering on an area of high relief or that the oxidation is not current.

4. Brecciation and Veining

With the exception of some limonite veining in B9 185.4 m veining is limited to samples from B8. In the sample from 145.3 m the veins have formed a stockwork, but the veining is much weaker in the other samples. The style of veining is indicative of multiple brittle fracturing events. The lack of shearing is suggestive that the process may be one of hydrothermal brecciation under tensile conditions rather than a purely tectonic process.

5. Mineragraphy

Four sets of opaque or semi-opaque minerals can be recognised: primary minerals, minerals produced by serpentinisation, minerals produced by hydrothermal alteration and minerals produced by oxidation by ground waters. Chromite is the primary mineral present, it has the shattered appearance typical of that in serpentinites and while most of it is dark brown and transparent some is opaque suggestive of it being iron rich.

Magnetite has been produced during serpentinisation as a host for the iron from mafic minerals that can not be incorporated into serpentine minerals. It occurs as dusty material disseminated through the rock.

Hydrothermal opaques are most apparent in the sample from B9 147.5 m that has not been oxidised. Magnetite is found replacing talc and as very fine grains with pentlandite. The pentlandite also occurs as individual grains. The assay of the rock (See Appendix A) gives 0.1 wt% Zn, but no zinc minerals are apparent, possibly the magnetite has a significant franklinite ($ZnFe_2O_4$) component to it. In other samples magnetite can be seen replacing chromite as well as talc and as a vein mineral.

The oxidation minerals are goethite and limonite that occur as replacement of magnetite and by themselves in veins.

6. Discussion

The main aim of the study was to establish if there is an exploitable nickel sulphide body present. Secondary aims included establishing the residence of the nickel and to a lesser extent the zinc. Nickel sulphide (pentlandite) has been directly identified in B9 147.5 m associated with carbonate hydrothermal alteration. Where hydrothermal textures have been preserved, such as in B9 185.4 m, there is evidence in the form of goethite similar in size and shape to the pentlandite in B9 147.5 m that nickel sulphides were originally present. Therefore, since chalcedony and vuggy textures are present the deposit originally formed as an epithermal-nickel deposit. A similar deposit is found at Jaro on the island of Leyte in the Philippines. The deposit at Burbank has then been modified by oxidising ground waters. Of the minerals present after oxidation limonite and goethite are capable of containing nickel, and these can be major ore minerals in lateritic nickel deposits. There is a very rough relationship between the abundance of limonite and goethite, and nickel in the oxidised samples. However, the grades found at Burbank are similar to those found in limonitic ore of lateritic deposits which are essentially all limonite and this requires that the limonite and goethite at Burbank to be very nickel-rich.

Table 6-1 Potential Nickel bearing Minerals in Relation to Assays

Sample No.	Ni (%)	S (ppm)	Pentlandite (vol %)	Limonite + goethite (vol %)
B8 145.3 m	0.69	60		4
B8 148.5 m	0.92	270		5
B8 150.5 m	0.79	70		2
B9 117.5 m	0.24	2700	<1	
B9 150.4 m	2.09	120		7
B9 164.8 m	1.07	80		4
B9 183.5 m	1.53	100		9
B9 185.4 m	0.60	40		8

In B8 the hydrothermal alteration is suggestive of the samples being away from the main structure controlling hydrothermal alteration. This may possibly also reflect the intensity of the hydrothermal mineralisation, with there thus being limited hydrothermal nickel mineralisation, but there is still oxidation suggestive that nickel is being transferred from elsewhere, during the oxidation process and that the ground waters are channelled by something other than the main structure.

In B9 the oxidised samples have better nickel grades than the unoxidised sample, but it is not known what the original distribution of hydrothermal nickel was in the oxidised samples. Since the alteration sequence in B9 is indicative of the sulphide-bearing sample being furthest from the main structure there would also be an expectation that it would have a lower hydrothermal nickel content in comparison to samples closer to the structure. As oxidation is present in B9 closer to where the main structure is interpreted to be, it is likely that in B9 the major structure is both the main control over the distribution of hydrothermal nickel and the oxidising groundwater. Thus it is likely that only the lower grade, peripheral sulphide mineralisation will be preserved where the oxidised waters have flowed through the main structure. Therefore to find nickel sulphides requires finding where the oxidised waters have not been. This is either laterally peripheral to the main structure or at depths sufficiently

great that oxygen in the groundwater has been removed by the rock oxidation processes.

No primary zinc minerals are apparent in the unoxidised sample (B9 117.5 m) and it is suggested that the zinc may be present in secondary magnetite as a franklinite component. As hydrothermal magnetite is preserved in most of the samples the zinc can remain in the magnetite and for the oxidised samples there is scope for zinc to be absorbed onto limonite.

It is concluded that an epithermal nickel deposit is present, but much of its currently known extent has been oxidised. Some transport of nickel has occurred during the oxidation where ground waters have been channelled outside of the structure that originally controlled the location of the mineralisation. Where ground waters have travelled along the same structure as the mineralisation only peripheral sulphide mineralisation has been preserved, but there is scope for sulphide mineralisation to be present associated with the main structure at greater depths. This is of course providing that the hydrothermal mineralisation is of greater vertical extent than the oxidation and is of adequate grade.

It is possible that there may be a zone of supergene enrichment of nickel at the interface between the oxidised waters and any preserved hypogene sulphides at depth that may require drilling directly down the major structure to test, providing that this is technically feasible. Otherwise, new holes should be stepped out from known zones of mineralisation in order to intercept the mineralisation deeper, if topography allows.

7. Petrographic Descriptions

Sample Numbers:	Allegiance	:	B8 145.3 m
	Sinclair Knight Merz	:	13228
Rock Name:	Veined Serpentinite		

Petrographic Description

Lithology: In hand specimen, the sample is a pale brown rock cut by a network of veins. It is weakly magnetic and does not react with HCl.

The rock has been serpentinised, which implies an ultramafic precursor, the only remnants of which lie in the presence of fine grained chromite with a shattered texture.

Alteration: The rock has undergone two phases of alteration. The first is serpentinisation and the second is weak hydrothermal alteration. In thin section, the rock consists mainly of fine to medium grained chrysotile. In places it has a radiating fibrous texture to identify it as chrysotile. Overall there is a mesh texture defined by clear curved elongate grains surrounding opaques and grains of chrysotile that have a light brown stain to them.

There is patchy replacement of the chrysotile in the vicinity of veins by magnesite and less commonly talc. Very fine grained limonite is patchily disseminated through the rock.

Veining: There is a network of very thin veins (< 0.1 mm) cut by later veins up to 3 mm wide. The early, thin veins consist of limonite and magnesite. The thicker veins consist of magnesite, limonite and opaques with the thicker veins have vugs with rhombohedral magnesite and fine grained prismatic quartz lining them. Some vugs are infilled by chalcedony.

Mineragraphy: Fine grained subhedral grains of chromite show a shattered texture, typical of that found in serpentinites. The grains are nearly completely opaque, indicating an iron rich chromite. They have slight alteration on the margins and fractures to magnetite. Very fine grained opaque disseminated through the rock is magnetite, the repository of the iron from the original mafic minerals. Magnetite also occurs in the veins, where it shows slight alteration

on its margins to hematite and lies within much more common limonite.

Brecciation: The multiple veining events have produced a stockwork.

Proportions (%): Primary: Chromite (1)
Secondary: Chrysotile (85), magnesite (5), limonite (4),
magnetite (3), talc (2), quartz (<1), chalcedony (<1),
hematite (<1)

Sample Numbers:	Allegiance	:	B8 148.5 m
	Sinclair Knight Merz	:	13229
Rock Name:	Veined Serpentinite		

Petrographic Description

Lithology: In hand specimen, the rock is a pale brown colour with white veins. It is magnetic and does not react with HCl.

In thin section, there is a vague ghost of an original granular texture, including some ghosts of elongate olivine grains. Some fine grained primary chromite is the remnant of an ultramafic precursor.

Alteration: The rock has been serpentinised to chrysotile that has a mesh texture defined by rounded grains surrounding patches of very fine grained opaques. Some of the serpentine has a fibrous habit to identify it as chrysotile.

There is patchy alteration around veins to magnesite and talc. Limonite surrounds patches of the larger opaque grains.

Veining: Veins consist of fine grained magnesite and have some vugs. There are area of cloudy magnesite that surround rounded patches of jarosite.

Mineragraphy: Fine grained opaques have cores of primary chromite that is replaced by magnetite or are entirely replaced by magnetite. Very fine grained opaques in the chrysotile are magnetite.

Brecciation: The rock has been fractured to form the veins.

Proportions (%): Primary: Chromite (<1)
Secondary: Chrysotile (86), magnesite (6), magnetite (5),
limonite (2), jarosite (1), talc (<1)

Sample Numbers:	Allegiance	:	B8 150.4 m
	Sinclair Knight Merz	:	13230
Rock Name:	Serpentinite		

Petrographic Description

Lithology: In hand specimen, this is a pink-brown rock with a layered appearance that contains patches of bleached material and grains of magnetite. The sample is magnetic and doesn't react with HCl.

In thin section, there are the ghosts of medium grained pyroxene grains and primary chromite to indicate that the rock was originally an ultramafic, presumably a peridotite.

Alteration: The rock has been serpentinised and has a fine grained mesh texture defined by grains of chrysotile around very fine grained dusty opaques. The bleached areas are after pyroxene grains and contain very fine grained opaques that do not take a polish that is leucoxene.

Limonite is found surrounding opaques and as patches through the rock.

Veining: There are thin veins of anhedral fine grained quartz and thicker veins of fine grained magnesite. Along the margins of the magnesite veins are ghosts of a radiating mineral, possibly talc.

Mineragraphy: Primary chromite occurs as fine anhedral to subhedral grains, it is slightly replaced around its margins by magnetite. Magnetite also occurs as fine stringers of fine grains and as very fine grains in the chrysotile.

Brecciation: The rock has been fractured to provide the veining.

Proportions (%): Primary: Chromite (1)
Secondary: Chrysolite (84), magnesite (5), limonite (5), magnetite (3), leucoxene (2), quartz (<1)

Sample Numbers:	Allegiance	:	B9 147.5 m
	Sinclair Knight Merz	:	13231
Rock Name:	Altered Serpentinite		

Petrographic Description

Lithology: In hand specimen, the sample is a dark rock with white patches and a band of fine grained magnetite. It is magnetic and reacts with HCl.

In thin section, nothing remains of the original rock except for fine grained primary chromite that has a shattered texture suggestive of a serpentinised ultramafic.

Alteration: There are minor remnants of chrysotile, other wise the rock is totally replaced by calcite and opaques. There are ghosts of a platey radiating mineral throughout the rock. Possibly this was talc. It is now replaced by opaques and by calcite. It occurs in layers with more granular calcite that contains fine grained, equant, disseminated opaques.

Mineragraphy: Primary chromite is found as fine, shattered grains. The opaque replacing the platey mineral is magnetite. Magnetite also as anhedral to subhedral fine to very fine grains in patches, some of which is intergrown with very fine anhedral pentlandite. The pentlandite also occurs as individual grains or intergrown with rutile.

Proportions (%): Primary: Chromite (1)
Secondary: Calcite (95), magnetite (4), chrysotile (<1),
pentlandite (<1), rutile (<1)

Sample Numbers:	Allegiance	:	B9 150.4 m
	Sinclair Knight Merz	:	13232
Rock Name:	Altered Serpentinite		

Petrographic Description

Lithology: In hand specimen, the sample is a dark rock that has been strongly oxidised. It is magnetic where it is dark and weakly reacts with HCl.

In thin section, nothing remains of the original rock except for some primary chromite with a shattered texture suggestive of a serpentinised ultramafic.

Alteration: The rock consists of carbonates, opaques and limonite. Since the rock is only weakly reactive to HCl the majority of the carbonate is likely to be magnesite, with some calcite. Most of the carbonate is granular, but some has dusty ghosts of a radiating platy mineral, most likely talc. Some of the opaque also replaces the platy mineral, but is otherwise disseminated through the rock. Limonite occurs in large patches.

Mineragraphy: There are shattered fine grains of chromite and some similar looking grains of magnetite, possibly after chromite. Magnetite is found replacing a platy mineral and as very fine disseminated grains.

Proportions (%): Primary: Chromite (1)
Secondary: Magnesite (80), magnetite (7), limonite (7), calcite (5)

Sample Numbers:	Allegiance	:	B9 164.8 m
	Sinclair Knight Merz	:	13233
Rock Name:	Altered Serpentinite		

Petrographic Description

Lithology: In hand specimen, the sample has a chaotically layered appearance with pale bands between dark and iron stained bands. It is magnetic and patchily reactive to HCl.

In thin section, primary chromite that occurs as fine shattered grains is all that remains of the original rock. This suggests an ultramafic precursor, with the texture of the chromite indicative of serpentinisation..

Alteration: With the exception of the chromite the rock is altered to carbonates, quartz and opaques with patches of limonite. Most of the carbonate is granular, but some has a ghost of a texture of a platy mineral, possibly talc. Some of the opaque minerals are also replacing this platy mineral. Fine grain granular quartz is patchily intergrown with the carbonate. There are no clear optical differences in the carbonate, but the samples behaviour when reacted with HCl suggests that there is a mixture of calcite and magnesite. There are patches of limonite throughout the rock, but some are concentrated around opaques.

Mineragraphy: Fine, shattered grains of chromite are present. There are also similar grains of magnetite that may be after magnetite. Magnetite is also found as a replacement of a platy mineral and as very fine grained disseminated material throughout the sample.

Proportions (%): Primary: Chromite (1)
Secondary: Magnesite (55), calcite (30), quartz (6), limonite (4), magnetite (4)

Sample Numbers:	Allegiance	:	B9 183.5 m
	Sinclair Knight Merz	:	13234
Rock Name:	Altered Serpentine		

Petrographic Description

Lithology: In hand specimen, the sample is strongly iron-stained. It is not reactive to HCl and is patchily magnetic.

In thin section, fine to medium grained anhedral, shattered grains of chromite are concentrated in one part of the sample. These are all that remains of the original rock to suggest that it was an ultramafic, with the shattered texture consistent with it being serpentinised.

Alteration: The rock is altered to fine grained, granular magnesite that occurs as oblate patches amongst fine grained granular quartz, with both mineral stained by and intergrown with limonite. There are minor small areas of fine grained chalcedony

Mineragraphy: In addition to the chromite there are fine to very fine grained patches of magnetite, which sit in patches of goethite and limonite. Other patches of goethite and limonite are possibly after magnetite.

Proportions (%): Primary: Chromite (2)
Secondary: Magnesite (44), quartz (43), limonite (6), goethite (3), magnetite (2), chalcedony (<1)

Sample Numbers:	Allegiance	:	B9 185.4
	Sinclair Knight Merz	:	13235
Rock Name:	Altered Serpentinite		

Petrographic Description

Lithology: In hand specimen, this is a dark brown rock with a granular texture with elongate whit areas. It is patchily magnetic and does not react with HCl.

In thin section, there is a ghost of shattered chromite grains sufficiently similar to other samples in the suite to suggest that the rock was a serpentinised ultramafic.

Alteration: The rock is totally altered to fine grained granular quartz, with some variation in grain size, that contains oblate patches of fine grained granular magnesite. There are scattered opaques and limonite throughout the rock.

Veining: There are elongate areas of limonite.

Mineragraphy: Where there are ghosts of shattered primary chromite there are minor remnants of magnetite after the chromite and there are a few isolated very fine grains of magnetite throughout the rock. However, most of the iron minerals have been oxidised to goethite and limonite with limonite predominating. There are also patches of limonite without goethite. In areas of carbonate there are grains of goethite very similar in shape and size to the magnetite and pentlandite found in B9 147.5 m.

Proportions (%): Secondary: Quartz (80), magnesite (12), limonite (5), goethite (3), magnetite (<1)

Appendix A Client Instructions

From: LINDSAY ARTHUR NEWNHAM [mailto:lnewnham@vision.net.au]
Sent: Fri 29/04/2005 6:49 p.m.
To: White, Philip J (SKM)
Cc: Allegiance
Subject: samples for inspection.

Phil,

On behalf of Allegiance Mining NL., I am forwarding to you today 8 slabs of drill core for petrological and mineralogical examination.

The samples come from two recently completed drill holes, B8 and B9, on a project known as Burbank in western Tasmania.

The drill tested area is underlain by a body of Cambrian ultramafic rocks which have been intruded at depth by a Carboniferous granite. The ultramafic is very strongly altered and, in the case of these two drill holes, cut by a major (regional) fault structure.

Our primary search target in this area is nickel sulfides. These two holes intersected significant nickel but it was not present as sulfide. Assays also suggest the nickel is accompanied by zinc, again not present as sulfide.

A casual review of the assay data from both holes suggest there is an inverse relationship between nickel and sulfur. I will fax to you full assay data on the these holes but request you keep this information confidential.

The core has been extensively leached and the drillers reported strong water flows from these intervals. Both holes collared at sea level and the principal intersections are well beneath the very thin surface zone of weathering in this part of Tasmania.

The overall appearance of this core is strongly limonitic, with pervasive coarse grained magnetite.

Our principal interest is whether this nickeliferous material has been derived from a sulfidic deposit, and if that is a possibility, would the sulfidic body be deeper, or along strike closer or further from the granite.

The sample numbers and assay data(for the 1 metre sample intervals) are:

B8- 145.3 m: 0.69% Ni, 0.22% Zn, 60 ppm S

B8- 148.5 m: 0.92% Ni, 0.45% Zn, 270 ppm S

B8- 150.5 m: 0.79% Ni, 0.41% Zn, 70 ppm S

B9- 147.5 m: 0.24% Ni, 0.10% Zn, 0.27% S
B9- 150.4 m: 2.09% Ni, 0.78% Zn, 120 ppm S
B9- 164.8 m: 1.07% Ni, 0.27% Zn, 80 ppm S
B9- 183.5 m: 1.53% Ni, 0.33% Zn, 100 ppm S
B9- 185.4 m: 0.60% Ni, 0.21% Zn, 40 ppm S

Please phone me at any time should you wish to discuss progress.
61 3 63943434

Your invoice should be forwarded to:
Allegiance Metals NL
PO Box 62,
Zeehan,
TASMANIA, 7275
AUSTRALIA

Thanks very much,

Regards,

Lindsay Newnham

Appendix B Glossary and Definitions

ALTERATION ASSEMBLAGES

- Argillic:** Clay-rich assemblages dominated by low-temperature clays such as kaolinite, smectite, and interlayered illite-smectite. These are formed by low temperature (<230°C), acid to neutral, low salinity hydrothermal fluids.
- Phyllic:** Dominated by illite or sericite and quartz, together with pyrite and possibly anhydrite. May also contain minor chlorite, calcite, titanite and rutile. Formed in the presence of moderate to high temperature (approx. 230-400°C), acid to neutral fluids at a range of salinities, commonly in permeable zones and adjacent to veins.
- Propylitic:** Characterised by chlorite, with some of illite/sericite, epidote, quartz, albite, calcite, and anhydrite. Formed at moderate temperatures (mostly 200-300°C), in the presence of near-neutral pH fluids with a range of salinities, commonly in low permeability areas.
- High-temperature propylitic:** Contains secondary actinolite and/or garnet in addition to the above assemblage. Forms under similar conditions, but higher temperatures (>290°C) than propylitic assemblages.
- Potassic:** Major secondary minerals are biotite, orthoclase, quartz, and magnetite. Anhydrite is a common accessory, and minor albite and titanite or rutile can also develop. Potassic alteration is caused by near-intrusive, hot fluids (>300°C) with a strong magmatic character and high salinity.
- Advanced argillic:** Contains alunite, diaspore, and/or pyrophyllite, together with one or more of quartz, chalcedony, kaolinite, and dickite. These assemblages occur as tabular near-vertical zones formed from condensed acid magmatic vapours in the porphyry environment, and as near-horizontal blankets at shallow epithermal levels, where acid-sulphate fluids form from oxidised steam condensates.
- Skarn:** May contain garnet, clinopyroxene, vesuvianite, scapolite, wollastonite, epidote, amphibole, magnetite and calcite as major components. Minor amounts of biotite, K-feldspar, quartz and chlorite may also be present. Minerals present are similar to those found in potassic, high temperature propylitic and propylitic assemblages of porphyry systems. Developed in the presence of calcium-rich, high salinity fluids over a wide temperature range with early anhydrous minerals forming in the range 300 - 700°C. Occurs near the contact between calcareous lithologies and intrusives.

MINERALISATION

Carlin-type:	Precious metal mineralisation, usually with the gold occurring submicroscopically, associated with the silicification of calcareous rocks in continental settings. Also broadly applied to any carbonate replacement deposit; evidence is mounting that this may be erroneous.
Epithermal:	Mineralisation produced by near-surface hydrothermal fluids related to igneous activity; originally defined as having formed in the range 50-200°C, though 150-300°C is perhaps more commonly accepted now.
Epigenetic:	Mineralisation which was later introduced into older rocks
Gold fineness:	A measure of the gold content of native gold or silver grains, determined by the equation $1000 \times \text{Au}/(\text{Au} + \text{Ag})$, where Au and Ag are determined by weight.
High-sulphidation:	Originally referred to opaque minerals which contain sulphur in a high oxidation state, but now used in a broader sense for deposits which contain them; for example “enargite-gold” (or quartz-alunite, or acid-sulphate) systems, in which the mineralising hydrothermal fluids have a major magmatic component, and produce acid alteration, with base metal mineralisation at shallow levels.
Hypogene:	Formed by processes occurring within the earth, especially mineralisation associated with ascending hot fluids.
Hypothermal:	Mineralisation associated with high temperature hydrothermal fluids; originally defined as forming at 300-500°C, today it commonly applies to temperatures over about 500°C.
Low-sulphidation:	Originally referred to opaque minerals containing sulphur in a low oxidation state, but now used in a broader sense for the deposits which contain them; for example “adularia-sericite” type systems in which meteoric-dominated fluids produce phyllic, propylitic, and argillic alteration zones.
Mesothermal:	Mineralisation produced at deep levels in the crust, from high temperature hydrothermal fluids (250-400°C+), at near lithostatic pressures. The fluids can be meteoric and/or magmatic and/or metamorphic in origin; where the latter is significant, this mineralisation is normally termed metamorphogenic.
Porphyry:	Hypothermal deposits occurring as stockworks or disseminations intimately associated with porphyritic intrusives, with mineralisation associated with potassic alteration, although this is frequently overprinted.
Skarn:	Mineralisation associated with moderate to high temperature, hydrothermally altered/metasomatised rocks near the contact between intrusive bodies and carbonate rocks.

Supergene:	Formed by surficial processes, particularly oxidation, hydration, solution, and deposition.
Syngenetic:	Mineralisation which formed at the same time as the enclosing rocks.
Volcanic-Hosted Massive Sulphide (VHMS)	Mineralisation associated with hydrothermal systems developed in volcanic and volcano-sedimentary rocks in a submarine setting.

GENERAL DESCRIPTIVE TERMS

Sinter:	Surficial chemically deposited precipitate, that is in the strictest sense of the term, siliceous. May be diagnosed on the basis of recognisable plant fragments (leaves, stems), near-horizontal planar lamination, and/or low-temperature mineralogy (<i>eg.</i> opal and chalcedony).
Travertine:	Calcareous (usually CaCO ₃) sinter deposit.
Vein:	Material which was chemically deposited by fluids within a rock fracture. Veins exhibit a range of textures and minerals, depending primarily on the temperature, depth, and composition of both the fluid and the host rock. Veins may contain a small amount (<10%) of entrained host rock and/or vein clasts.
Breccia:	Coarse (usually >2 mm) fragmental rock, consisting of generally angular clasts of one or more lithologies. A complexly veined rock can have a brecciated appearance (if veins are multi-generational and/or branching), but it is important to differentiate between the two. Veins are generally linear or sinuous, whereas a breccia matrix is highly irregular.

TEXTURAL TERMS FOR VEINS AND BRECCIAS

Matrix:	<p>The interstitial material between clasts in a breccia, of which there are two main types. Some breccias may contain a proportion of both types:</p> <p style="padding-left: 40px;"><i>Clastic matrix</i>: composed of finely ground clast material; and</p> <p style="padding-left: 40px;"><i>Chemically deposited matrix (cement)</i>: composed of chemically deposited material (usually similar to veins).</p> <p>If the matrix encloses and separates clasts, the breccia is <i>matrix-supported</i>; if clasts are in contact and support each other, it is described as <i>clast-supported</i>.</p>
Vug (druse):	Open cavity within a rock, usually in a vein or breccia cement, which is lined by euhedral prismatic crystals that project into the cavity.
Pseudomorph:	A mineral or minerals occurring in the crystal form of another, usually due to alteration or replacement of the original mineral (<i>eg.</i> limonite after pyrite, alunite + pyrophyllite after feldspar, quartz after calcite).

Prismatic:	Crystals which exhibit elongate euhedral shapes and have prismatic terminations are common in veins and cements, where they are considered to form by slow crystallisation. Prismatic crystals may be zoned by bands of different composition (<i>e.g.</i> amethyst bands in quartz) or with abundant fluid inclusions.
Colloform:	A botryoidal type of texture commonly observed in vein chalcedony, where radiating aggregates of chalcedony have a grape-like outer surface. Banding within this material produces agate.
Comb:	Masses of parallel long, thin crystals growing inwards from the vein margins produce a texture like that of a comb.
Saccharoidal:	Granular aggregates of equant crystals having the appearance of sugar in hand specimen.
Crustiform:	Banding texture produced by differences of mineralogy, texture, and/or colour away from the vein margins. Crustiform banding is commonly produced by alternating chalcedony and saccharoidal quartz layers.
Cockade:	Concentric crustiform banding in the cement surrounding matrix-supported breccia clasts.
Imbrication:	A fabric found within some breccias where there is a subparallel alignment of clasts, similar to that observed within some fluvial gravels.
Vein breccia:	Rock consisting predominantly of vein fragments (<10% host rock clasts) in a chemically-deposited matrix. Clasts are generally subangular, and matrix-supported in a matrix of generally similar vein minerals (<i>eg.</i> quartz, chalcedony), which may be banded and enclose open cavities.
Polymict vein breccia:	Rock consisting of altered host rock \pm vein clasts in a chemically deposited matrix, where the matrix, rock, and vein clasts each comprise at least 10% of the rock volume. Clasts are generally subangular, and enclosed by a matrix of vein minerals (<i>eg.</i> quartz, chalcedony).
Polymict breccia:	Rock consisting of various altered host rock \pm lesser (<10%) vein clasts. These may occur in a chemically-deposited matrix, or in a clastic matrix. Clasts range from subangular to subrounded, and may be either clast or matrix-supported.
Monomict breccia:	Similar to a polymict breccia, but containing only a single clast type. Jigsaw breccias and crackle breccias are special types of monomict breccia.
Brecciated rock:	A rock which consists largely (>90%) of fragments of a single lithology. Clasts are commonly angular, and are usually surrounded by matrix material.
Brecciated vein:	Similar to a brecciated rock, but consisting largely (>90%) of vein clasts.

- Matrix breccia: A breccia which consists largely (>80%) of clastic matrix material.
- Crackle breccia: A type of brecciated rock that has been fractured, but with little or no matrix material. Clasts are still essentially in place. These have been called hydrofractured breccias, but “crackle breccia” is preferred.
- Jigsaw breccia: A type of brecciated rock that has been fractured, and has minor matrix material separating clasts. There has been minimal transport and rotation of the clasts, which can be visually fitted together by removal of the matrix.

GENETIC TERMS FOR BRECCIAS

- Hydrothermal breccia: A general term for breccias that formed primarily as a result of hydrothermal activity, including phreatic and magmatic-phreatic breccias. These range from brecciated rocks to vein breccias and polymict breccias, and include both erupted (*Hydrothermal eruption breccias*) and subsurface rocks. Diagnostic features include the presence of altered host rock clasts, hydrothermal vein clasts, and hydrothermal minerals within the matrix cement, though not all will exhibit all of these features. Plant fragments may occur in hydrothermal eruption breccias.
- Phreatic breccia: A more specific term for breccias which form due to the expansion of steam and gas in a water-dominated hydrothermal fluid where there is no direct association of brecciation with magmatic activity.
- Magmatic-phreatic breccia: A specific term for breccias formed due to flashing of hydrothermal fluids following intrusion of magma, but which do not contain juvenile magmatic material.
- Phreatomagmatic (diatreme) breccia: A breccia formed by the explosive interaction of magma and groundwater. Diatremes are near-vertical pipe-like bodies up to 1 km across. The breccias are generally polymict, with rounded, matrix-supported clasts. The matrix contains finely ground wallrock clasts and juvenile magmatic material, but lacks chemically deposited minerals (unless deposited later).
- Tectonic breccia: Breccia formed by the mechanical disruption of rocks in response to tectonic stress. These generally occur in identifiable fault planes, which are commonly steeply dipping. They typically exhibit a planar fabric, imbrication, slickensides, and strain textures such as undulose extinction in quartz crystals.
- Sedimentary breccia: Breccia emplaced at the Earth’s surface by predominantly sedimentary processes. These breccias are generally polymict and exhibit sedimentary textures (*eg.* planar fabric, graded bedding). They include talus breccias, debris flows, turbidites, landslide deposits, solution breccias, reef breccias, and glacial deposits (tillites).

Intrusive breccia:	A breccia which forms at the margins of an intrusive body during emplacement. Clasts include early-crystallised intrusive material and wallrock fragments.
Volcaniclastic breccia:	Breccia formed at or near the surface due to fragmentation on release of magmatic volatiles to produce deposits which include vent breccias, crumble breccias, flow breccias, tuffs, lapilli tuffs, ignimbrites, and lahar deposits. Clasts are mostly unaltered volcanic material in a matrix of fine volcanic detritus.

HYDROTHERMAL SYSTEMS

Boiling zone:	Zone of two-phase (<i>ie.</i> boiling) fluid, generally within a hydrothermal upflow.
Conductive:	Transmitted through a rock or liquid.
Convective:	Transmitted by movement of a fluid.
Hydrofracturing:	Fracturing of rocks when fluid pressure exceeds the minimum compressive stress plus the effective tensile strength of the rock.
Hydrostatic:	Where pressures are determined by the amount of overlying liquid.
Hydrothermal breccia:	A general term for a rock which was brecciated by fluid processes within a hydrothermal system, without being specific as to whether energy transfer was convective or conductive, or directly magmatic.
Hydrothermal eruption:	An eruption which reaches the surface and is caused by hydrothermal processes.
Lithostatic:	Where fluid pressures are determined by the confining rock pressure
Magmatic:	Water of magmatic origin, that is derived from the loss of volatiles from magma.
Meteoric:	Water of surficial origin, including near-surface groundwaters.
Outflow:	Area where water is flowing laterally away from an upflow zone.
Paleowatertable:	The level within the rock mass below which groundwaters were formerly present.
Permeability:	The ability of fluid to flow through the rock, which depends on the porosity and the degree of interconnection of pores.
Piezometric surface:	A surface of equal fluid pressure within the rock mass.
Porosity:	Degree of pore space within a rock.

Single phase zone:	A zone in which the pressure gradient corresponds to a single-phase liquid.
Two-phase fluid:	Fluid consisting of two separate phases (<i>ie.</i> liquid (water) and gas (steam)).
Upflow:	Area where hot water is flowing more or less vertically upwards within a geothermal system.

FLUID INCLUSIONS

Daughter crystal:	Solid crystal which has been precipitated within a fluid inclusion after trapping.
Equivalent salinity:	An estimate of salinity, expressed as wt% NaCl, calculated from melting temperature determinations.
Necking:	Post-entrapment reshaping of an inclusion to a more equant shape, during which an inclusion may be divided into two or more separate inclusions, which can have different vapour/liquid ratios.
Primary:	Trapped during primary crystal growth from a fluid.
Pseudosecondary:	Trapped on a microfracture during growth of the crystal.
Secondary:	Trapped after growth of the crystal, generally on a healed microfracture.

PETROGRAPHIC TEXTURAL TERMS

Aphanitic:	Fine-grained igneous rocks in which individual crystals are not visible to the naked eye.
Amygdaloidal:	Containing vesicles which have been infilled by a secondary mineral.
Equigranular:	Composed of crystals of approximately equal grain size.
Holocrystalline:	Composed entirely of crystals (<i>ie.</i> , no glass).
Hyaline:	Containing volcanic glass.
Ophitic:	Coarse pyroxene crystals partly or wholly enclosing plagioclase laths.
Pilotaxitic:	Felted mass of acicular or lath-like crystals.
Porphyritic:	Igneous rock containing coarse crystals (phenocrysts) in a fine groundmass.
Porphyry:	Medium-grained subvolcanic rock containing phenocrysts.

Trachytic:	Parallel, flow-aligned feldspars, with sparse phenocrysts.
Vesicular:	Containing spherical/ellipsoidal cavities of gas bubbles trapped in a cooling lava.
Vitric:	Glassy; dominated by volcanic glass.

ALTERATION INTENSITY

Unaltered:	No secondary minerals.
Weak:	Minor (<25 vol.%) secondary minerals.
Moderate:	25-75 vol.% secondary minerals.
Strong:	>75 vol.% secondary minerals.
Intense:	Completely altered (except for primary quartz, zircon, and apatite), but primary textures remain visible.
Total:	Completely altered (except for primary quartz, zircon, and apatite), and primary textures lost.

GRAIN SIZE (AS USED IN IGNEOUS/HYDROTHERMAL PETROLOGY)

Very fine	<0.05 mm
Fine	0.05-1 mm
Medium	1-5 mm
Coarse	5-30 mm
Very coarse	>30 mm

MINERAL PROPORTIONS

Rare	<1%
Minor	1-5%
Moderate	5-10%
Major	10-50%
Predominant	>50%

MINERAL AND ROCK TERMS

Rock classification follows that given in the Australasian Institute of Mining and Metallurgy, Field Geologists' Manual. Mineral nomenclature is that of the IMA.

Some terms that have been found to be used elsewhere in different senses are defined below:

Illite:	Colourless, birefringent clay which is characterised by having the largest XRD peak at about 10.0Å (8.8°). This peak should not shift on glycolation, but is not sufficiently sharp to be termed sericite.
Illite-smectite:	Pale green or brownish fine-grained clay, which has a major XRD peak between 15.4 and 10.0Å (5.7 - 8.8°) that shifts on glycolation.
Sericite:	Colourless birefringent clay which commonly forms coarse flakes. It is characterised by very sharp XRD peaks at 10.0Å (8.8°), 4.98 (17.8) and 3.33Å (26.6°).
Obsidian:	Volcanic rock composed of >80% glass with well developed conchoidal fracturing and vitreous lustre.
Pitchstone:	Volcanic rock composed of >80% glass with poorly developed conchoidal fracturing and a resinous lustre. Contains >4% water and more crystallites than obsidian.
Perlite:	Weakly anisotropic, hydrous volcanic glass usually with spherical fractures.