

# **ZEEHAN NICKEL PROJECT**

**EL 28 / 1988**

## **ANNUAL REPORT**

**For Period Ending  
December 2002**

*Prepared For:*

***Allegiance Mining NL***

**Level 11 Shaw House  
49-51 York Street  
Sydney NSW**

**08 December 2002**



*Prepared by:*

**Lindsay Newnham, Bsc, FAusIMM, CPGeo  
Newnham Exploration and Mining Services  
PO Box 183 Exeter Tasmania 7275  
Ph: (03) 6394 3434 Fax: (03) 6394 3435**

## CONTENTS

1. SUMMARY
2. TENURE
3. EXPLORATION PHILOSOPHY and BACKGROUND
4. BURBANK
5. AVEBURY
6. FUTURE PLANS

### Maps:

- Fig 1: Location Plan**
- Fig 2: Avebury Genesis**
- Fig 3: Aeromagnetics - District Potential**
- Fig 4: Proposed Decline Development**

### Appendices:

- (a) Report titled ***“EL 28/1988 - Trial Harbour. Burbank Prospect. Initial Drilling Program Results”*** by LA Newnham for Allegiance Mining NL, 10 March, 2002
- (b) Report titled ***“Allegiance Mining NL. Avebury Nickel Project. Mineral Resource Report November 2002”*** by Michael V McKeown

## 1. SUMMARY

Exploration during the twelve-month period was focused on the Avebury and Burbank nickel deposits.

At **Burbank** six (6) short cored holes totalling 130 metres were completed with a person-portable rig into a strongly Ni anomalous gossanous ridge of ultramafics south-east of Trial Harbour.

All core assayed was strongly Ni and Zn anomalous. Petrology suggests the Ni and Zn were present in smectite and goethite, possibly derived from an underlying sulfide body.

Deeper drilling is recommended to follow up this initial encouragement.

At **Avebury**, a nine (9) hole core drilling program totalling 3,600 m was completed into the Viking deposit (previously referred to as South Avebury). The three principal outcomes of this program were:

- increase in the Avebury resource
- elevation of knowledge of the Viking deposit resulting in its re-classification into the indicated category
- opportunities for extensions of the Avebury resource

The Avebury resource is now estimated as:

<b>Deposit</b>	<b>Resource Tonnes</b>	<b>Grade (% Ni)</b>	<b>Cut Off (% Ni)</b>	<b>Cont. Ni (t)</b>
<b><u>Indicated Mineral Resource</u></b>				
North Avebury	1,260,000	1.5	0.8	18,900
Viking (*)	1,880,000	1.5	1.0	28,200
Sub-Total	3,140,000	1.5		47,100
<b><u>Inferred Mineral Resource</u></b>				
North Avebury	200,000	1.8	0.8	3,600
Viking (*)	720,000	1.5	1.0	10,800
Sub-Total	920,000	1.6		14,400
<b><u>Total Mineral Resource</u></b>				
North Avebury	1,460,000	(**)1.5	0.8	22,500
Viking (*)	2,600,000	1.5	1.0	39,000
<b>TOTAL</b>	<b>4,060,000</b>	<b>1.5</b>		<b>61,500</b>

**Notes:** (\*) 'Viking' was named 'South Avebury' in earlier estimates  
(\*\*) Grade is rounded down

Geostatistical analysis of the resource data indicates that higher grade zones are present within both the Viking and North Avebury deposits.

These zones are estimated to contain:

	<b>Resource Tonnes</b>	<b>Grade (% Ni)</b>	<b>Cut Off (% Ni)</b>	<b>Cont. Metal(t)</b>
North Avebury	630,000	2.0	1.3	12,600
Viking	630,000	2.0	1.6	12,600
<b>TOTAL</b>	<b>1,260,000</b>	<b>2.0</b>		<b>25,200</b>

Allegiance believes this resource is capable of supporting an underground mining operation producing approximately 6,000-7,000 tonnes per annum nickel contained in high grade concentrates, over a six-year life of mine, with excellent potential to extend the life through further discovery.

An 850 m decline and sill drive development in the upper section of Viking North is in the planning stages.

This development will facilitate detailed resource definition, geotechnical and metallurgical studies, ahead of a decision to advance Avebury to full scale production.

## **2. TENURE (Fig 1)**

EL 28/1988 was granted on 09 December 1988, initially with respect to a 129 sq km area, for a 10-year period.

As exploration became more advanced and focused, the tenement has progressively been reduced in area to 29 sq km.

Special extensions, each of two years, were granted in December 1998 and December 2000 to allow advanced evaluation programs to continue.

Application has recently been submitted to reduce the area further to 16 sq km and extend tenure to December 2004. The reduced area is in two parts - one covering the Burbank discovery, the other covering the Avebury deposit discoveries.

It is anticipated that application for a Mining Lease will be made over the Avebury deposit in the near future.

### **3. EXPLORATION PHILOSOPHY and BACKGROUND**

Exploration of EL 28/1988 was initially directed towards the search for zinc deposits. The area was considered prospective for deposits hosted by Ordovician limestones (Irish style deposits) and Precambrian sediments (Century style deposits).

An aeromagnetic survey in the mid 1990s defined several large anomalies west of Zeehan. These were interpreted as possible zinc skarn deposits. The largest of these anomalies was called Avebury. The area was gridded, mapped and soil sampled ahead of a three (3) hole, helicopter supported, cored drilling program. These three initial holes intersected significant nickel sulfide mineralisation. Subsequent drilling has led to the discovery of the North Avebury-Viking, East Avebury and Burbank deposits.

The area west of Zeehan is now regarded as highly prospective for nickel sulfide deposits of the 'Avebury style', defined as accumulations of sulfides in the anticlinal portions of a folded ultramafic sill (?), which has been intensely altered by the intrusion of the Carboniferous Heemskirk Granite (Fig 2).

Mineralisation is dominated by magnetite and pentlandite with variable amounts of pyrrhotite and minor niccolite in places.

With the benefit of substantial on-going exploration over the past five years, the deposit model and exploration philosophy have steadily evolved.

The prime target zone is now recognised as a tightly folded ultramafic sill which has a linear strike length of approximately 15km and embraces the Avebury, Viking, East Avebury and Burbank discoveries (Fig 3).

#### 4. BURBANK

The Burbank discovery lies immediately south of the Little Henty River to the SSE of Trial Harbour. The area is underlain by a fault bounded slice of altered ultramafics. Large gossanous outcrops are developed on the outcropping ultramafics.

Two campaigns of detailed lithogeochemical sampling defined a large nickel anomalous area (200 m x 50 m) with most values >1% Ni.

Because of the remoteness of the area, it was decided to complete a program of shallow core drilling using a person portable rig, ahead of any more expensive deeper drilling.

This drilling was completed in summer 2002 and the results of the program appear in Appendix (a) in a report titled:

*'EL 28/1988 - Trial Harbour Burbank Prospect. Initial Drilling Program Results'* by LA Newnham, March 2002'

The highlight of the program was the fact that most of the core assayed was highly anomalous in both nickel and zinc (Fig 4).

Petrological studies suggest that the nickel and zinc were present in smectite and goethite, probably derived from underlying sulfide deposits.

## 5. AVEBURY

By the end of 2000, drilling on the Avebury deposit had identified a resource of 3Mt 1.54% Ni, mainly in the inferred category. A Scoping Study was completed in January 2001 on this resource and indicated the deposit could be commercially developed as an underground operation mining 300,000 tpa 1.5% Ni for the recovery of 4,000 tpa nickel into 22% Ni concentrates. The study however highlighted that the project was both very sensitive to nickel price and the resource was largely in the inferred category.

Subsequent financial modelling demonstrated that the commercial robustness and attractiveness of the project would be substantially enhanced if the throughput was increased to 500,000 tpa over a 6-year life of mine.

Ahead of a decision to invest \$5M in an exploratory decline development to acquire detailed technical data necessary for a full feasibility study, Allegiance saw a need to have a higher level of confidence in the resource estimate.

To this end, a nine (9) hole, 3,600 m core drilling program was completed from May-October 2002.

Results of that program are presented as Appendix (b) in a report titled:

*“Allegiance Mining NL. Avebury Nickel Project. Mineral Resource Report November 2002”, by Michael V McKeown*

Important outcomes of the program were:

- (a) Increase in the Avebury resource estimate from 46,900 t contained nickel to 61,500 t contained nickel, a 30% increase.
- (b) Improved understanding of the Viking (formerly South Avebury) deposit, permitting most of it to be reclassified as an indicated resource.
- (c) Recognition of potential for western extensions of the Viking deposit beyond the limits of the current drilling program. Drill hole A 035, the westernmost drill hole, intersected 17.3 m 2.1% Ni, which is one of the best intersections at Avebury to date.
- (d) Discovery of extensions of the Viking deposit east of the previously drilled area. These extensions are now interpreted as truncated to the east by the Main Fault.

Significant intersections in this extension zone included A 007 (25 m 1.60% Ni), A 040 (5 m 1.58% Ni) and A 042 (10.8 m 2.05% Ni).

- (e) Definition of a relatively shallow, relatively high grade zone, in the top of the Viking deposit which may be amenable to early development and production. It is this zone which is envisaged as the area for detailed studies associated with the decline and sill drive development.

## 6. FUTURE PLANS

The Avebury nickel sulfide deposit represents a significant new discovery. Technical and financial modelling suggest it will be capable of supporting a medium sized underground operation. That development opportunity is strengthened by the excellent potential in the district for further discoveries.

East Avebury, Burbank, Bison, Bismark and strike extensions of north Avebury and Viking are rated as having high prospectivity for further substantial discoveries. Discoveries in one or more of these areas will enhance the commercial robustness and viability of Avebury by providing opportunities for both an extension of mine life and an expansion of mine output.

In the short term, Allegiance plans to focus on the development of Avebury. It is envisaged this will be undertaken in three stages.

**Stage 1** will involve development of an 850 m exploratory decline and 200m sill drive into the top section of the Viking deposit at 2060 RL (Fig 4). This development will facilitate the following:

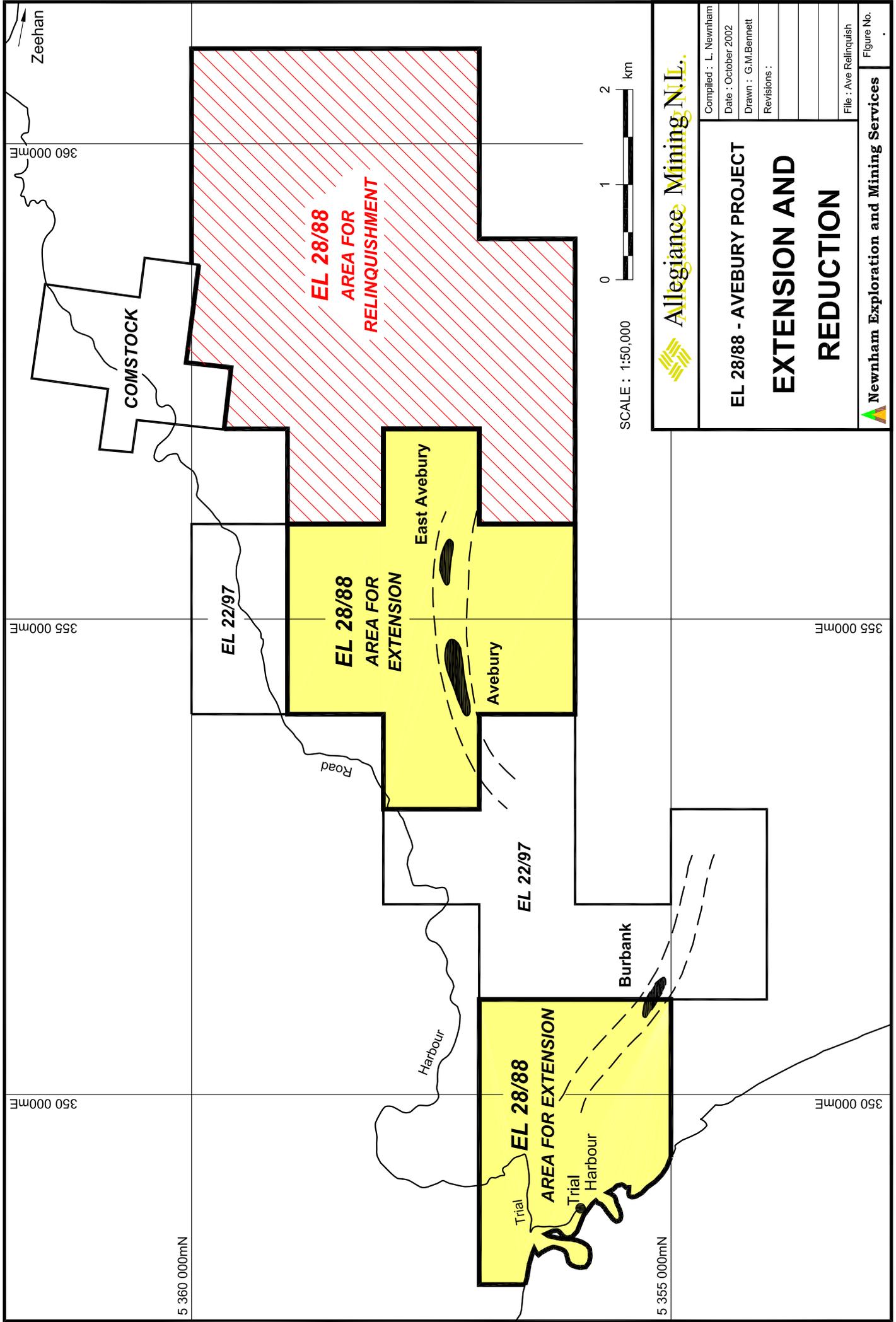
- detailed reserve definition drilling and mineralisation continuity studies
- geotechnical studies necessary for design and costing of a mining operation
- acquisition of a bulk sample for metallurgical test work, mill design and cost estimates

**Stage 2** will involve completion of a final feasibility study on the development of a mining operation at Avebury. Such a study would address short and long-term milling options such as on-site/off-site treatment.

**Stage 3** will involve mine development, given positive outcomes from Stages 1 and 2.

If opportunities for toll milling Avebury ore emerge, it may be possible to compress the above three stages so that as soon as the decline reaches the Viking deposit, mine development and production can commence.

To date several appropriate consultants have been engaged to recommend and cost implementation of Stage 1.



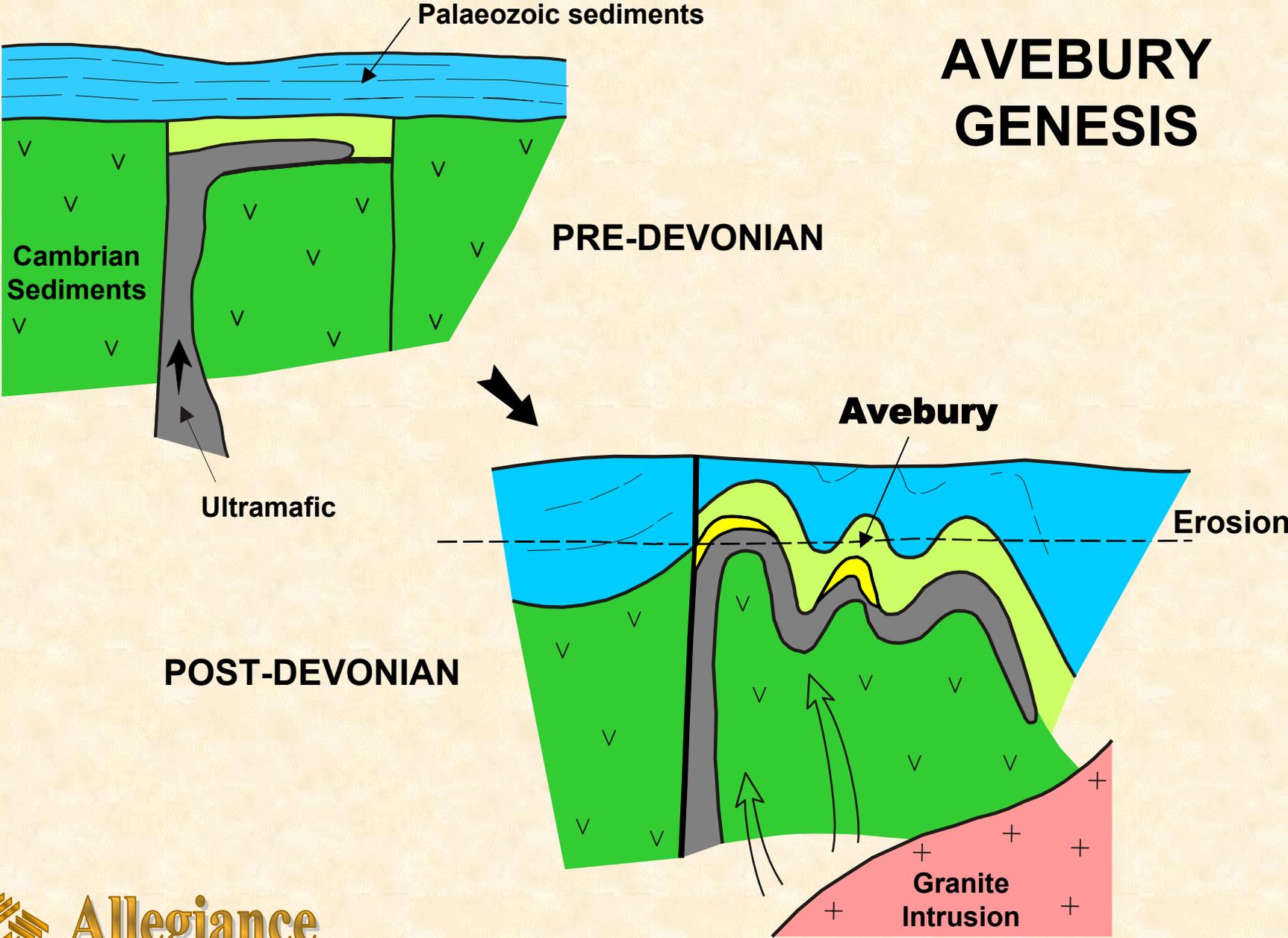
Compiled : L. Newnham
Date : October 2002
Drawn : G.M.Bennett
Revisions :
File : Ave Relinquish

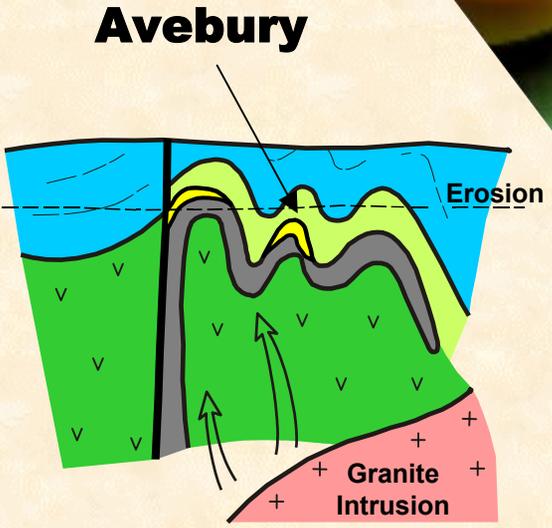
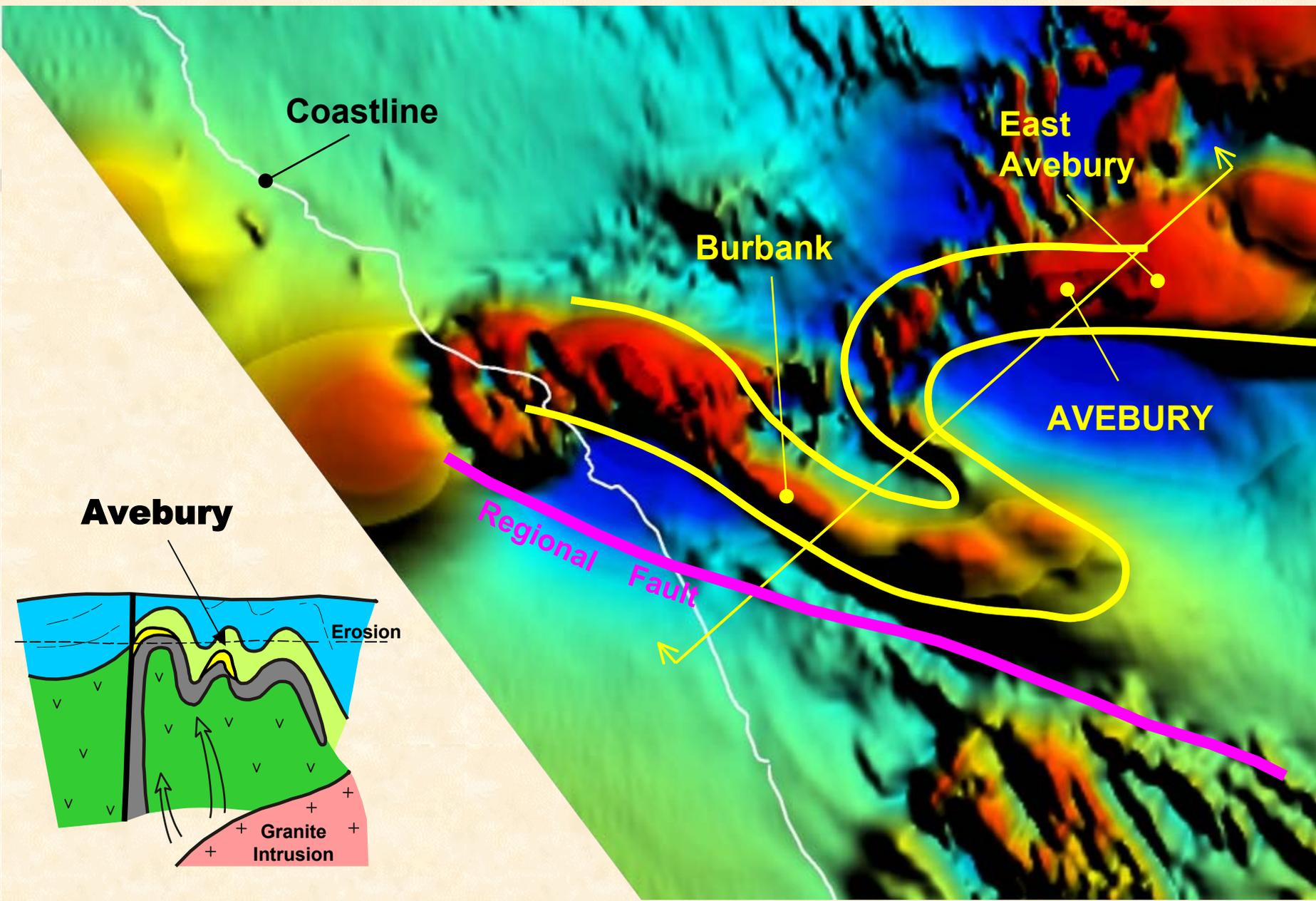
**EL 28/88 - AVEBURY PROJECT**

**EXTENSION AND**

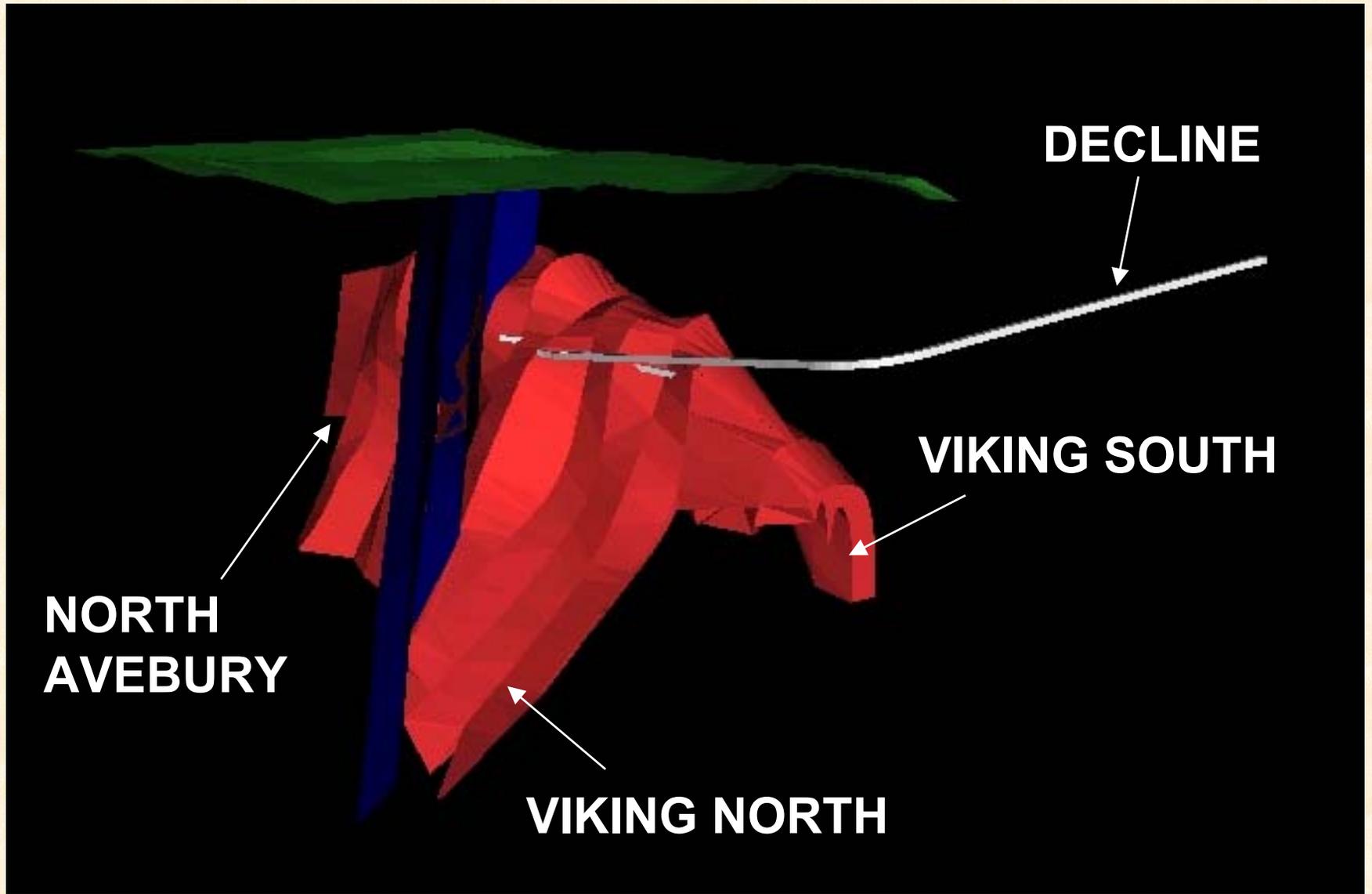
**REDUCTION**

# AVEBURY GENESIS





# AVEBURY - PROPOSED DECLINE DEVELOPMENT



**NORTH  
AVEBURY**

**VIKING NORTH**

**VIKING SOUTH**

**DECLINE**

## **Appendix A**

**Report titled “EL 28/1988 - Trial  
Harbour. Burbank Prospect. Initial  
Drilling Program Results”  
by LA Newnham for  
Allegiance Mining NL,  
10 March, 2002**

***Allegiance Mining NL***

**EL 28/1988 - TRIAL HARBOUR  
BURBANK PROSPECT  
INITIAL DRILLING PROGRAM RESULTS**

**10 March 2002**



***Prepared by:***  
**Lindsay Newnham, Bsc, FAusIMM, CPGeo**  
**Newnham Exploration and Mining Services**  
**PO Box 183 Exeter Tasmania 7275**  
**Ph: (03) 6394 3434 Fax: (03) 6394 3435**

# CONTENTS

## TEXT

1. INTRODUCTION
2. DRILLING PROGRAM
  - 2.1 Details
  - 2.2 Results
  - 2.3 Discussion
3. RECOMMENDATIONS

## APPENDICES

1. Drill logs
2. Petrology report
3. Assay report

## MAPS

- |       |                                 |
|-------|---------------------------------|
| Fig 1 | Location plan                   |
| Fig 2 | District geology                |
| Fig 3 | Drill hole location plan        |
| Fig 4 | Drill hole sections             |
| Fig 5 | Section of proposed drill holes |

## **1. INTRODUCTION**

Detailed aeromagnetic surveys followed by mapping and lithogeochemical sampling programs previously completed by Allegiance, defined a major Ni-Zn anomaly over a fault bounded ridge of altered ultramafics, two kilometres southeast of Trial Harbour.

The ridge lies south of the Little Henty River and trends northwest. It is flanked on the northeast and the southwest sides by major northwest trending structures which fault Silurian-Devonian sedimentary formations against altered ultramafics.

Two lithogeochemical sampling programs defined an anomalous zone of ultramafic approximately 200 metres long x 70 metres wide with values generally in the range 1.0-1.5% Ni and 0.1-0.4% Zn. The limits of the anomaly were determined more by outcrop availability than assay results.

The area is difficult to access and it was decided to further test the prospect with a series of short cored drill holes using a small light weight portable drill rig.

## **2. DRILLING PROGRAM**

### **2.1 Details**

Six cored drill holes totaling 130 metres were completed between 02-16 January 2002 using an EVH 1750 drill rig supplied by Stacpoole Enterprises. The rig and associated equipment was mobilised and demobilised with the assistance of a Jetranger helicopter operated by Tasmanian Helicopters Pty Ltd. Daily access to the site was by 4WD vehicle to the mouth of the Little Henty River, then boat to near Burbank, then by foot along a cut track to the drill sites. Holes were drilled 46 TT size and core is currently stored at the Newnham Exploration and Mining Services facilities in Zeehan.

Hole collars were surveyed by tape and compass and the collar of DDH B1 was determined by GPS. Because of the short lengths of holes, no down-hole surveys were completed.

Core was logged and sampled by LA Newnham. Assaying for Ni, Co, Cu, Pb, Zn, As was by Analabs.

### **2.2 Results**

All six holes were completed entirely within a sequence of intensely altered pale green-pink ultramafics. Magnetite, often weathered to limonite, was common. Two generations of magnetite were recognised - an early primary phase, possibly developed during the serpentinisation of the ultramafic, and a later phase, possibly associated with the intrusion of the underlying Heemskirk Granite.

Petrological examination also identified abundant goethite, probably after sulfides.

Core recoveries at these shallow depths were sometimes poor, and sampling of core for assay purposes was restricted to sampling cohesive sections where reliable samples could be obtained. Thus the core sampling was not always continuous because of highly friable, degraded core. In total, 41 discontinuous core samples totaling 92 metres were assayed.

All samples assayed contained anomalous nickel and zinc, generally in the range 1.1-1.5% Ni and 0.2-0.4% Zn, with highest values of 1.78% Ni, 0.66% Zn and lowest values of 0.52% Ni, 0.12% Zn.

Petrology suggests the Ni and Zn are now present in smectite and goethite, possibly formed by the degradation of sulfides.

Drill logs, assay results and petrological descriptions are appended. Drill hole location plans and sections are attached. The more significant drill intersections are tabulated below:

### **2.3 Discussion**

The results from this initial shallow test of Burbank are considered to be highly encouraging.

Burbank conforms well to the *Avebury nickel sulfide deposit model*:

- ultramafic host rocks, strongly serpentinised by the underlying / nearby, intrusion of the Heemskirk Granite.
- two major fault structures (hydrothermal plumbing) flank the ultramafic
- a later stage (post alteration) magnetite-sulfide phase of mineralisation is present.
- near surface rocks are strongly Ni-Zn anomalous

The geochemical anomalism at Burbank is aurally larger and of far greater amplitude than both Avebury and East Avebury.

Because it is so closely analogous to Avebury and East Avebury, and has an even more intense geochemical signature, Burbank is rated as highly prospective for the discovery of Ni sulfide mineralisation at depth below the weathering profile. The extensive nature of the geochemical anomalism suggests the target is potentially very large.

Hole	Collar details	Drill intersection (metres)	Width (metres)	% Ni
B1	350949E 5355237N 2045 RL 34° AMG brg -45° dip 15 m. length	2.5 - 15.0	12.5	1.06
B2	350976E 5355247N 2055 RL 37° AMG brg -55° dip 25.1 m length	2.0 - 9.6 13.0 - 20.6	7.6 7.6	1.00 0.98
B3	350975E 5355247N 2055 RL 217° AMG brg -55° dip 22.6 m length	3.5 - 10.5 13.2 - 14.0 15.8 - 19.1 21.1 - 22.6	7.0 0.8 3.3 1.5	1.14 1.18 1.04 1.12
B4	350948E 5355252N 2050 RL 35° AMG brg -60° dip 18.4 m length	1.0 - 8.6 9.3 - 16.9 17.3 - 18.4	7.6 7.6 1.1	1.10 0.70 1.00
B5	350948E 5355252N 2050 RL 222° AMG brg -55° dip 17.6 m length	8.6 - 17.6	9.0	0.85
B6	350974E 5355234N 2050 RL 57° AMG brg -55° dip 30.7 m length	3.0 - 20.3 23.0 - 27.7	17.3 4.7	1.06 1.20

Note: core recoveries sometimes <100%

**Principal Intersections**  
**Burbank Initial Drilling Program**

### **3. RECOMMENDATIONS**

Deeper core drilling at Burbank is clearly warranted and should be given a high priority.

The next round of drilling will require a larger drill rig and helicopter support. If results from this drilling continue to be encouraging, ground access may then have to be developed to facilitate more major drilling programs.

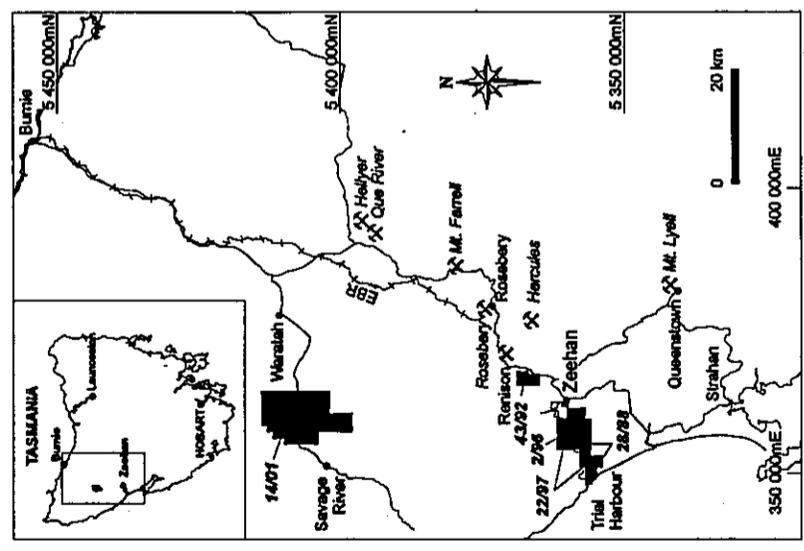
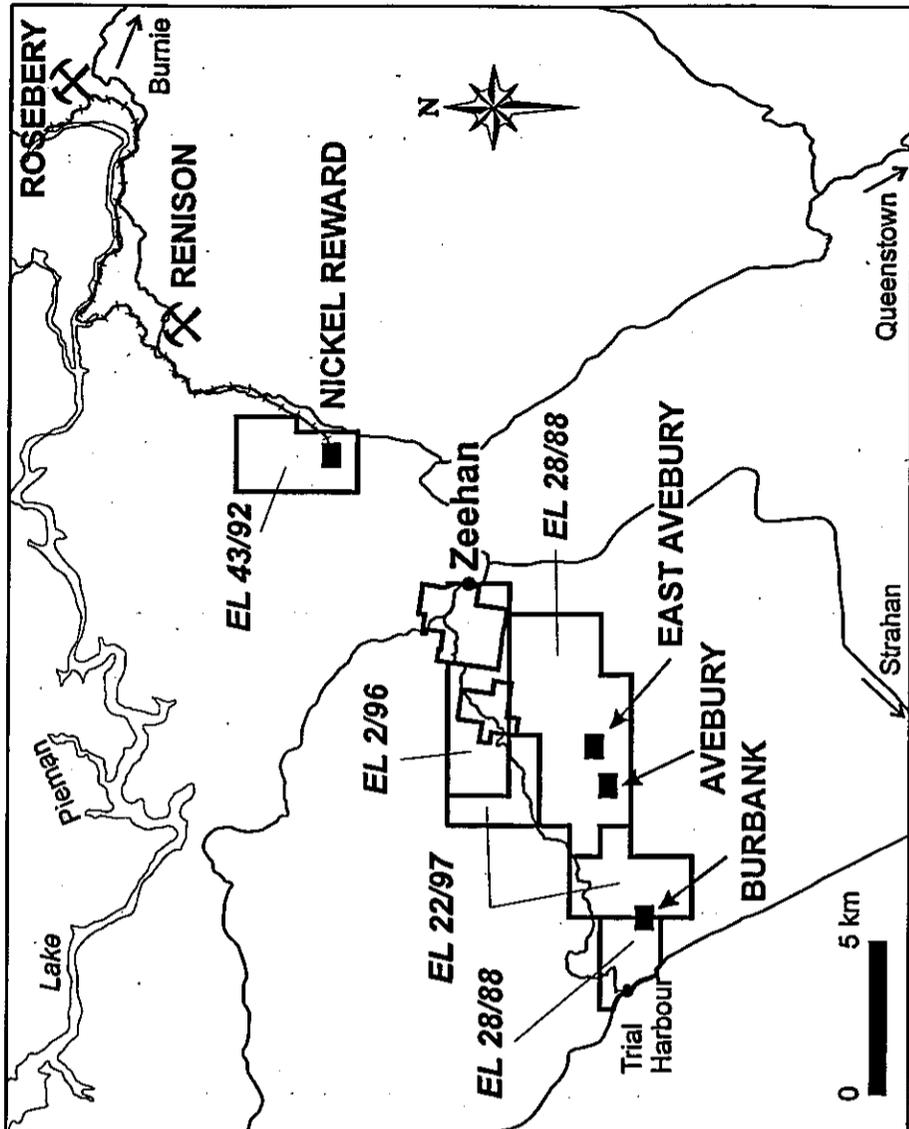
The design of drill holes at this early stage is problematical because there is no certainty of the dip of either the ultramafics or potential sulfide mineralisation. Mapping and aeromagnetic interpretation have not resolved this problem and it is probably most prudent at this early evaluation stage to assume the serpentinite host and contained mineralisation strike north-west and dip vertically.

Drilling of a pair of scissor holes is recommended. These will not only test for ultramafic hosted mineralisation at depth but also provide valuable information on the orientation of the ultramafic host as a guide to on-going drilling.

Two such holes, each 400 metres long, dipping at  $-45^{\circ}$  are recommended as per the attached sketch (Fig 5).

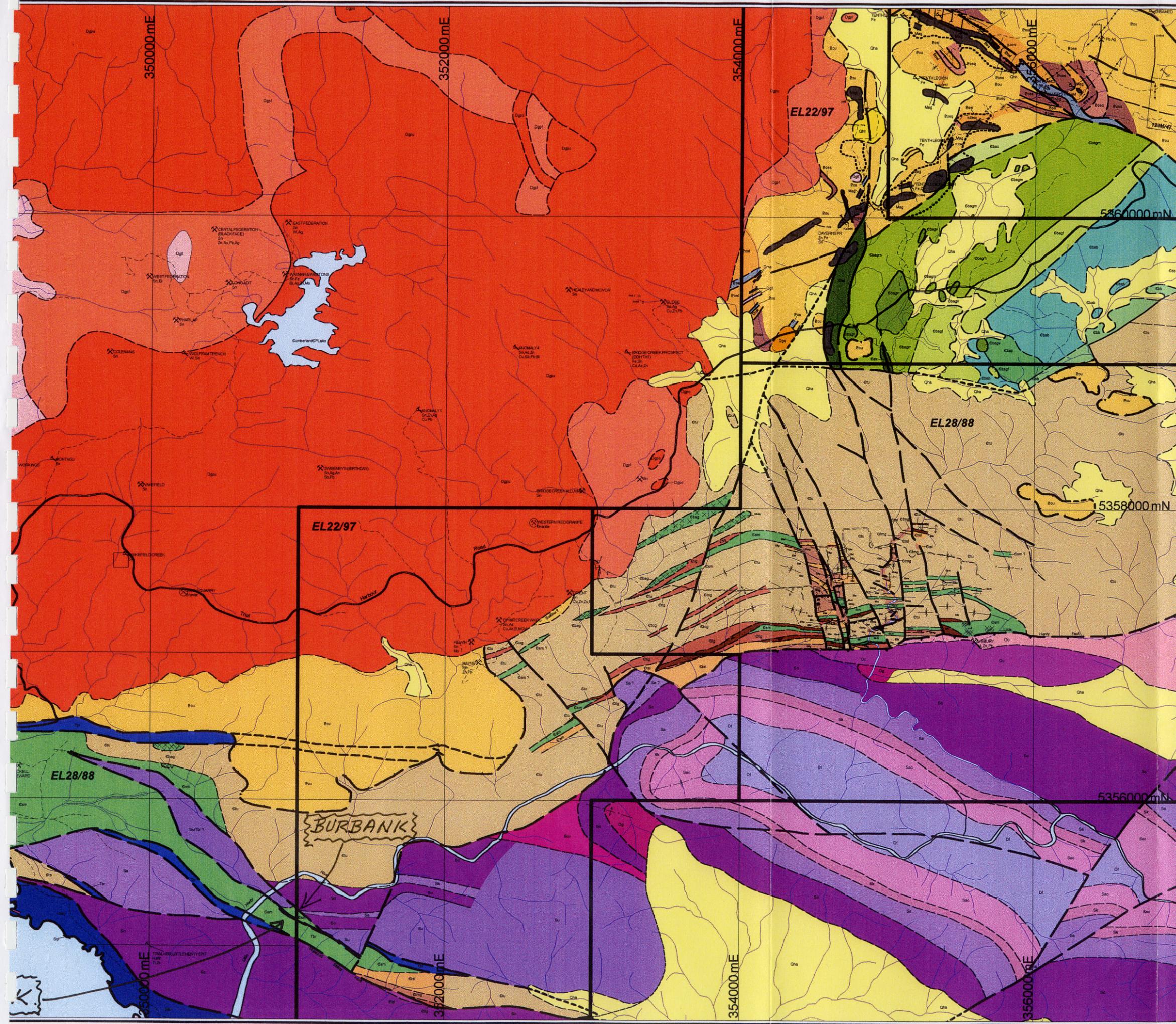
Because of the need for helicopter support, the estimated cost of these two holes is \$120,000 - \$150,000.

---



NEWNHAM EXPLORATION AND MINING SERVICES  
**ALLEGANCE MINING NL**  
**EL28/1988 - TRIAL HARBOUR**  
**BURBANK PROSPECT**  
**LOCATION PLAN**

Drawn: LAN      Date: Mar 02      Scale:  
 Fig: 1



**LEGEND**

**QUATERNARY**

- Qha Alluvial gravels
- Qch Lacustrine clays & sands locally including in-sedimented estuarine (shelly surface-related?)
- Qch Inferred distribution (e.g. faces change or re-sedimented ironstone using aeromag and RGC mapping)
- Qch Raised beach deposits

**DEVONIAN**

- Dgr Generally Pale grey, fine-grained quartz sandstone with subordinate interbedded greenish grey siltstone (Florence Quartzite) - Abundantly fossiliferous
- Dgr Greenish grey and bluish grey laminated siltstone and minor interbedded fine-grained quartz sandstone (Austral Creek Siltstone)
- Dgr Pale grey to white generally fine-grained quartz sandstone (Reel Quartzite)
- Dgr Greenish grey siltstone and siliceous fine-grained sandstone with minor quartz sandstone

**SILURIAN**

- Sa Grey/cream fine to medium grained quartz sandstone, lithic quartz-sandstone & minor conglomerate. Crinoid trace fossils locally
- Sa Pebble-cobble conglomerate with quartz sandstone, grey siliceous and minor quartz vein clasts, commonly moderately to highly silicified
- Sa Quartzite-feldspathic (10 to 20%) sandstone, medium grained, locally vein-bearing (toppled)
- Su Calcareous thin bedded siltstone (Slurton?)
- Su Undifferentiated sediments

**ORBISVAGAN**

- Or Limestone (correlate of Gordon Limestone)
- Or Pebble conglomerate, minor lithic quartz sandstone
- Or Cream to light brown siliceous sandstone and siltstone

**CAMBRIAN**

- Cm Siltstone with minor chert, shale and greywacke interbeds
- Cm Fine grained greywacke/hornfels with minor siltstone
- Cm Medium grained greywacke/hornfels with minor siltstone
- Cm Coarse grained greywacke/hornfels
- Cm Lithic-wackehornfels, bearing granules of greywacke and milliy vein quartz
- Cm Conglomerate, bearing mostly pebble size greywacke clasts, with minor milliy vein-quartz and siliceous clasts
- Cm Undifferentiated Cambrian sediments, mostly greywacke with minor lithic-wacke and conglomerate
- Cm Undifferentiated serpentinites gabbro and/or basalt

**MYCIC ROCKS (McGoverall Complex)**

- Ma Undifferentiated basalt
- Ma Massive to pillowed, aphyric basalt flows with interbedded breccia flows
- Ma Pillowed aphyric basalt flows with interbedded breccia flows
- Ma Undifferentiated gabbro
- Ma Fine grained gabbro
- Ma Medium grained gabbro
- Ma Coarse grained gabbro
- Ma Porphyritic (post-orogenic) clinopyroxene and/or orthopyroxene, chromite basalt, commonly with interbedded gabbro and breccia flows

**ULTRAMAFIC ROCKS (McGoverall Complex?)**

- Um Undifferentiated Ultramafic (+/- mafic) and massive serpentinite
- Um Mafic gabbros, equigranular medium to coarse grained
- Um Mafic gabbros, spinifex textured
- Um Highly feldspathic, medium to coarse grained gabbro
- Um Serpentinized equigranular ultramafic/dunite?
- Um Pseudomylonitic textured ultramafic
- Um Spinifex textured ultramafic dunite?

**PRECAMBRIAN (Doraith Formation)**

- Pb Siltstone and laminated siltstone
- Pb Sandstone
- Pb Quartz sandstone
- Pb Undifferentiated sediments

**DEVONIAN GRANITES**

- Dgr White granofeucogranite
- Dgr Red granite
- Dgr Red granite - porphyritic
- Dgr Quartz-rich granoblast (greenish?)
- Dgr Alkali (feucogranite)

**LITHOLOGY/FEATURES**

- Geological boundary - accurate
- Geological boundary - approximate
- Geological boundary - inferred

**STRUCTURE**

- Major Fault Zone - High faulted & deformed rocks with zones of cataclastic breccia and tectonic melange, comprising highly altered rocks and large clasts of variable lithologies (including Pb, Ch, Cm and Su, major lithologies noted)
- Fault, accurate
- Fault, approximate
- Fault, inferred
- Fault, concealed
- Thrust fault
- Reverse fault
- Fault showing dip & plunge of resection on fault plane
- Vein
- Fold, anticline

**MINE WORKINGS**

- Mine
- Open cut or quarry
- Adit
- Trench
- Dump

SCALE: 1:25000

0 250 500 1000 m

**Allegiance Mining N.L.**

COMPILED: Rob Reid  
 DATE: 03/08/2001  
 DRAWN: G.M. Bennett  
 REVISIONS:

**DISTRICT GEOLOGY**

FILE: DistrictGeology 25000.v

Newnham Exploration and Mining Services

Figure No. 2

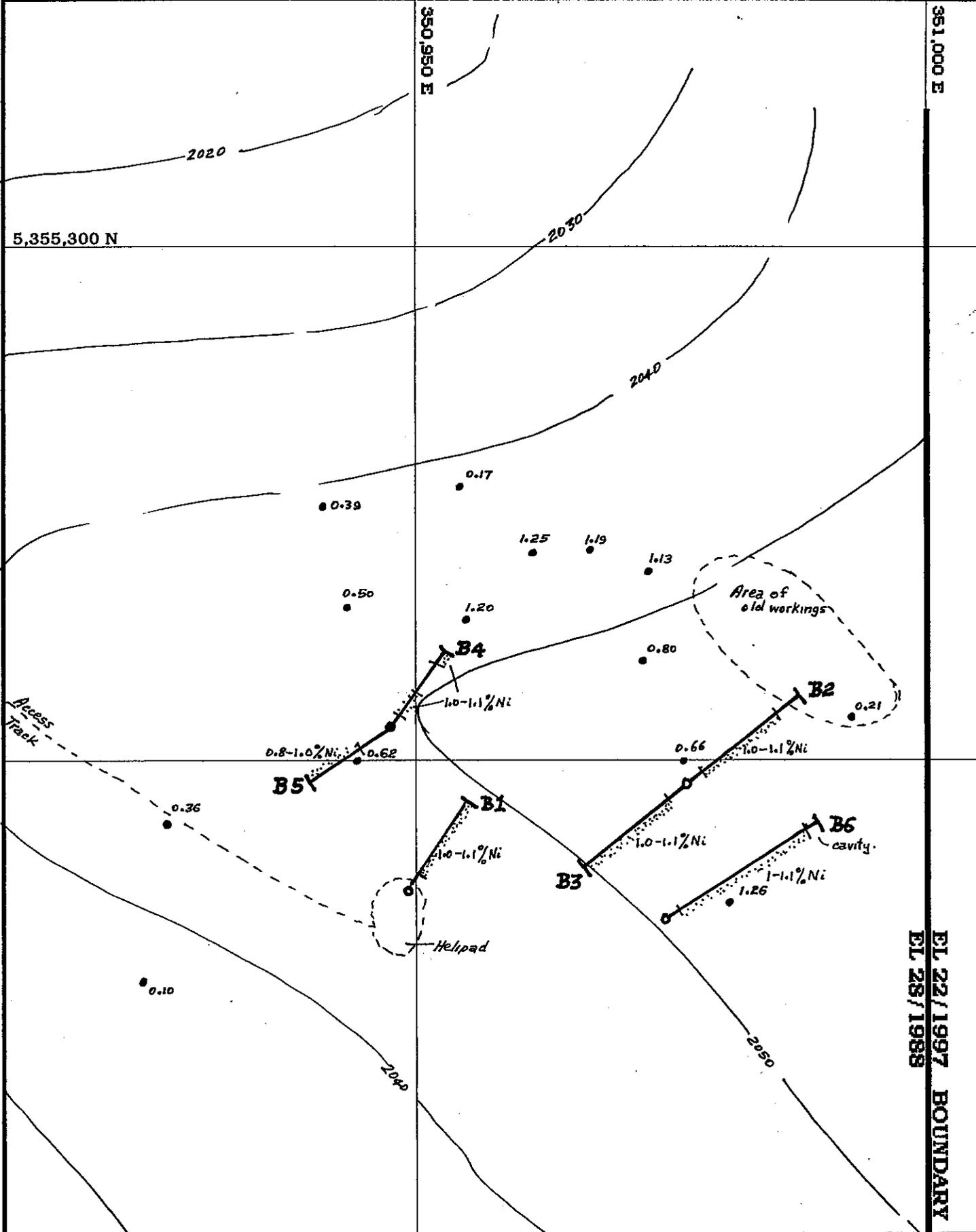
350,950 E

361,000 E

5,355,300 N

5,355,200 N

EL 22/1997 BOUNDARY  
EL 28/1988



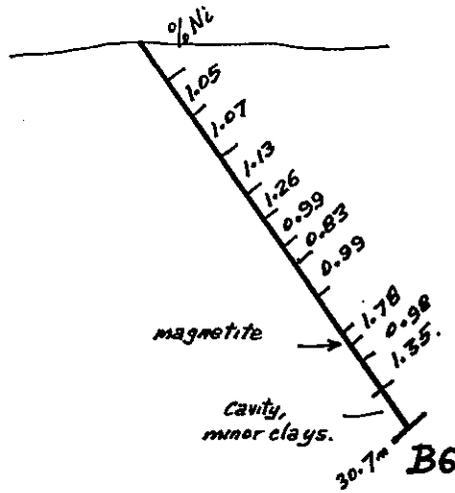
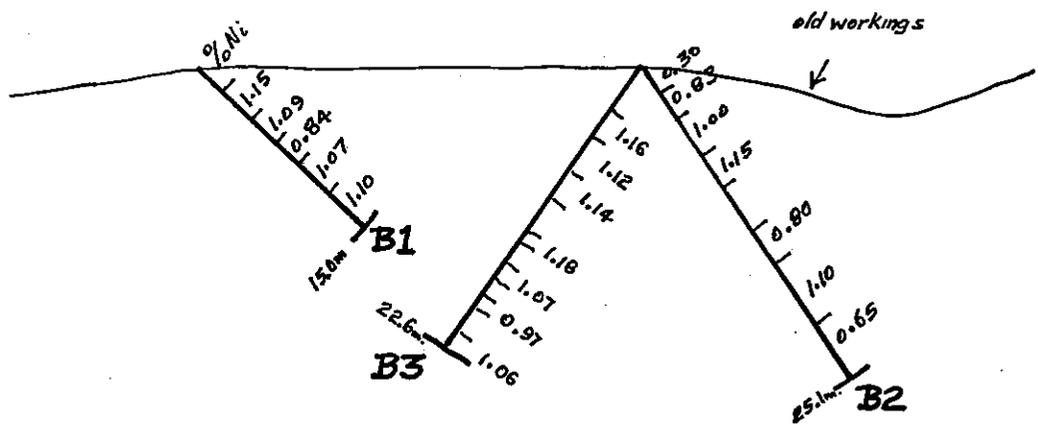
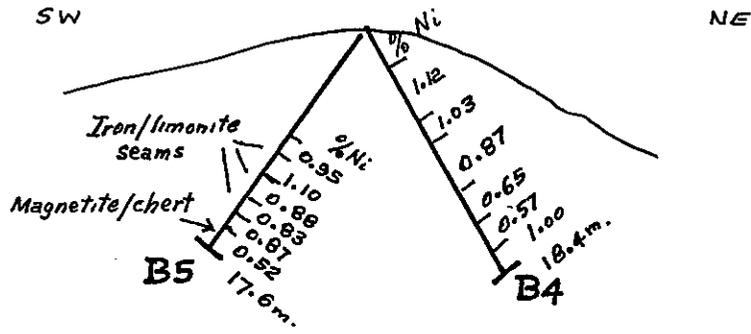
**Notes:**

- surface rock sample % Ni
- RL = MSL+2000 m.
- survey by tape and compass

NEWNHAM EXPLORATION AND MINING SERVICES

**ALLEGIANCE MINING NL  
EL 28/1998 and EL 22/1997  
BURBANK PROSPECT  
DDH LOCATION PLAN**

0m	120	Scale: 1: 500
Drawn: LAN	Date: Feb 02	Fig: 3.



NEWHAM EXPLORATION AND MINING SERVICES

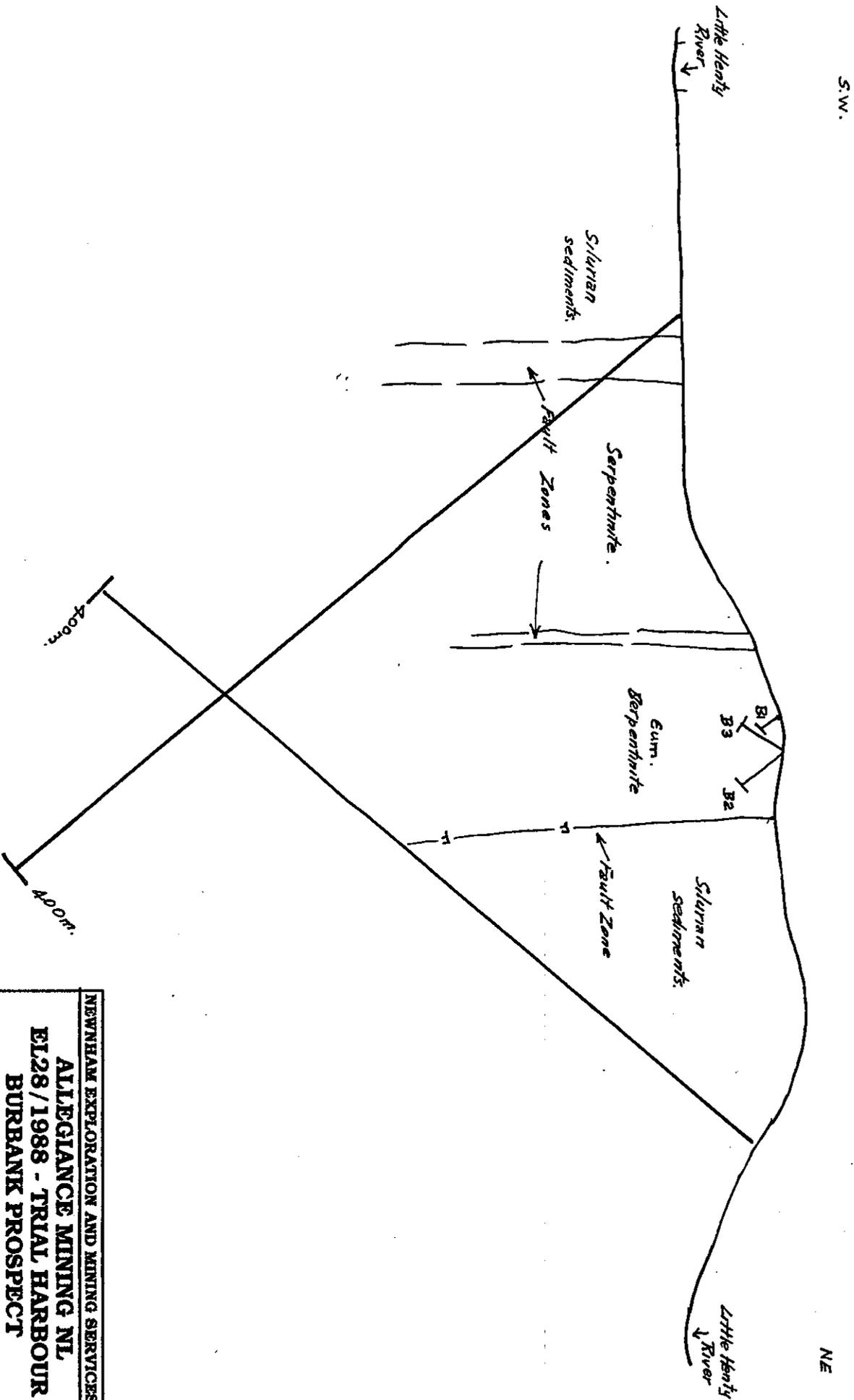
ALLEGIANCE MINING NL

EL 28/1988- BURBANK PROSPECT

CORED DRILL HOLE SECTIONS

(looking north-west)

Drawn: LAN	Date: Feb 02	Scale: 1: 500
		Fig: 4.



NEWNHAM EXPLORATION AND MINING SERVICES		
ALLEGANCE MINING NL		
E128 / 1988 - TRIAL HARBOUR		
BURBANK PROSPECT		
PROPOSED DRILL HOLES		
Drawn: IAN	Date: Mar 02	Scale: 1:2,500
		Fig: 5

**APPENDIX 1**

**DRILL LOGS**

**COMPANY: Allegiance Mining  
PROJECT: Burbank  
HOLE NUMBER: B1**

<b>Commenced:</b>	04 Jan 02
<b>Completed:</b>	07 Jan 02
<b>Logged By:</b>	L.A.Newnham
<b>Drilled By:</b>	Stacpoole

<b>Purpose of Hole</b>
To obtain a shallow drill test of the major Burbank Ni-Zn lithogeochemical anomaly

<b>Comments on Completion</b>
significant Ni and zinc mineralisation was intersected throughout the hole in altered ultramafics. Hole was terminated because of drilling problems caused by belled bit.

**Collar Details**

Grid	Northing	Easting	Elevation	Dip	Bearing
AMG	5355237	350949	2045	-45	34

Length (m)
15

Hole Size	
To (m)	Size
15	46TT

Significant Core Loss Zones		
From	To	%Rec.
minor losses throughout	see log	

<b>Hole Condition on Completion</b>
all down hole equipment removed from hole

**Summary of Results:**

Depth		Recovery	Assays			
From	To	%	Length	% Ni	% Cu	% S
2.5	15.0	some losses	12.5	1.06		
		altered serpentine				



**COMPANY: Allegiance Mining**  
**PROJECT: Burbank**  
**HOLE NUMBER: B 2**

<b>Commenced:</b>	07 Mar 02
<b>Completed:</b>	09 Mar 02
<b>Logged By:</b>	L.A.Newnham
<b>Drilled By:</b>	Stacpoole

<b>Purpose of Hole</b>
to test a major lithogeochemical Ni-Zn anomaly at shallow depth east of B1

<b>Comments on Completion</b>
significant Ni and Zn values were intersected in altered ultramafics for the full length of the hole;

**Collar Details**

Grid	Northing	Easting	Elevation	Dip	Bearing
AMG	5355247	350976	2055	-55	37

Length (m)
25.1

Hole Size	
To (m)	Size
25.1	46TT

Significant Core Loss Zones		
From	To	%Rec.
14.5	22.1	<40

<b>Hole Condition on Completion</b>
all down hole equipment removed from hole;

**Summary of Results:**

Depth		Recovery		Assays			
From	To	%	%	Length	% Ni	% Cu	% S
2.0	9.6	90		7.6	1.00		
13.0	20.6	<40		7.6	0.98		

COMPANY: Allegiance Mining NL  
 PROJECT: Burbank  
 HOLE NUMBER: B 2

Page No: 1

		Description		Core Recovery			RQD			Assays							
From	To			From	To	%	From	To	%	From	To	NI %	S %	Cu ppm	Co %	Zn %	As
0.0	3.9	<p><b>CHERT- MAGNETITE, minor sulfides (?)</b>            altered ultramafics, light brown-green, strongly silicified, brecciated in places and cut by late stage veins of magnetite extensively weathered to goethite; magnetite also as segregations (spots), discontinuous and thin wispy veins in brecciated matrix; magnetite seams are at low angle to CA, suggesting easterly dip; possible minor very fine grained iron sulfides associated with magnetite; extensive limonite/goethite development with magnetite may be after weathering of these sulfides; core generally hard; core loss in cavity near surface;</p>		0.0	3.6	60				0.0	2.0	0		25		0.11	<50
3.9	12.2	<p><b>ALTERED ULTRAMAFICS, magnetite common:</b>            soft pale green-pink, weathered, strongly altered and brecciated ultramafics; magnetite is common as late stage seams, veinlets, infilling breccia interstices, and isolated spots and disseminations; possible trace fine grained iron sulfides associated with magnetite; pale green (nickel) alteration pervasive; core very soft with some core losses; grades into unit below;</p>		3.6	4.5	90				2.0	4.0	0.83		<25		0.26	<50
				4.5	5.5	80				4.0	7.0	1.00		<25		0.66	65
				5.5	7.6	100				7.0	9.6	1.15		34		0.66	95
				7.6	8.4	90											
				8.4	9.6	65											
				9.6	10.5	100											
				10.5	11.8	50											
				11.8	13.0	60											
12.2	23.0	<p><b>ALTERED ULTRAMAFIC, cherty, abundant magnetite:</b>            pale pink and green altered and silicified ultramafics cut by abundant late stage magnetite, extensively altered to hematite/goethite as seams/veins, spots and coarse segregations; possible trace very fine grained iron sulfides in magnetite, reflected by extensive limonite/goethite; core is very broken, with some intervals of very high core loss (cf. bottom B6);</p>		13.0	14.5	90				13.0	15.9	0.80		50		0.40	80
				14.5	15.9	30				15.9	20.6	1.10		46		0.47	<50
				15.9	17.6	30				22.1	25.1	0.65		<25		0.31	<50
				17.6	19.1	12											
				19.1	20.6	40											
				20.6	22.1	10											
				22.1	23.4	60											



**COMPANY: Allegiance Mining**  
**PROJECT: Burbank**  
**HOLE NUMBER: B 3**

<b>Commenced:</b>	09 Jan 02
<b>Completed:</b>	10 Jan 02
<b>Logged By:</b>	L.A.Newnham
<b>Drilled By:</b>	Stacpoole

<b>Purpose of Hole</b>
to test the Burbank lithochemical Ni-Zn anomaly at shallow depth between B1 and B2

<b>Comments on Completion</b>
significant Ni and Zn values were intersected throughout the hole in altered serpentinites;

**Collar Details**

<b>Grid</b>	<b>Northing</b>	<b>Easting</b>	<b>Elevation</b>	<b>Dip</b>	<b>Bearing</b>
AMG	5355247	350975	2055	-55	217

<b>Length (m)</b>
22.6

<b>Hole Size</b>	
<b>To (m)</b>	<b>Size</b>
22.6	46TT

<b>Significant Core Loss Zones</b>		
<b>From</b>	<b>To</b>	<b>%Rec.</b>
0.0	4.1	40-50

<b>Hole Condition on Completion</b>
all down hole equipment removed from hole;

**Summary of Results:**

Depth		Recovery		Assays				
From	To	%	Description	Length	% Ni	% Cu	% S	
3.5	10.5	80	altered serpentinite	7.0	1.14			
13.2	14.0	100	altered serpentinite	0.8	1.18			
15.8	19.1	95	altered serpentinite	3.3	1.04			
21.1	22.6	90	altered serpentinite	1.5	1.12			



**COMPANY: Allegiance Mining**  
**PROJECT: Burbank**  
**HOLE NUMBER: B 4**

<b>Commenced:</b>	11 Jan 02
<b>Completed:</b>	12 Jan 02
<b>Logged By:</b>	L.A.Newnham
<b>Drilled By:</b>	Stacpoole

<b>Purpose of Hole</b>
To test at shallow depth the Burbank Ni-Zn lithochemical anomaly To the north of B1..B3.

<b>Comments on Completion</b>
significant levels of Ni and Zn were intersected throughout the hole in altered serpentinites;

**Collar Details**

<b>Grid</b>	<b>Northing</b>	<b>Easting</b>	<b>Elevation</b>	<b>Dip</b>	<b>Bearing</b>
AMG	5355252	350948	2050	-60	35

<b>Length (m)</b>
18.4

<b>Hole Size</b>	
<b>To (m)</b>	<b>Size</b>
18.4	46TT

<b>Significant Core Loss Zones</b>		
<b>From</b>	<b>To</b>	<b>%Rec.</b>
0.0	6.1	30-40

<b>Hole Condition on Completion</b>
all down hole equipment removed from hole;

**Summary of Results:**

Depth		Recovery		Assays				
From	To	%		Length	% Ni	% Cu	% S	
1.0	8.6	50		7.6	1.10			
9.3	16.9	90	altered serpentinites	7.6	0.70			
17.3	18.4	100	altered serpentinite	1.1	1.00			
			altered serpentinite					



**COMPANY: Allegiance Mining**  
**PROJECT: Burbank**  
**HOLE NUMBER: B5**

<b>Commenced:</b>	13 Jan 02
<b>Completed:</b>	14 Jan 02
<b>Logged By:</b>	L.A.Newnham
<b>Drilled By:</b>	Stacpoole

<b>Purpose of Hole</b>
To test the Burbank lithochemical anomaly at shallow depth south of DDH B4;

<b>Comments on Completion</b>
significant Ni and Zn values were intersected in the upper part of the hole; hole stopped in very hard hematitic chert which the drill could not penetrate;

**Collar Details**

Grid	Northing	Easting	Elevation	Dip	Bearing
AMG	5355252	350948	2050	-55	222

Length (m)
17.6

Hole Size	
To (m)	Size
17.6	46TT

Significant Core Loss Zones		
From	To	%Rec.
0.0	8.6	50

<b>Hole Condition on Completion</b>
all down hole equipment removed from hole;

**Summary of Results:**

Depth		Recovery	Description				Assays			
From	To	%	Length	% Ni	% Cu	% S				
8.6	17.6	85	9.0	0.85						



**COMPANY: Allegiance Mining**  
**PROJECT: Burbank**  
**HOLE NUMBER: B 6**

<b>Commenced:</b>	15 Jan 02
<b>Completed:</b>	16 Jan 02
<b>Logged By:</b>	L.A.Newnham
<b>Drilled By:</b>	Stacpoole

<b>Purpose of Hole</b>
To test the Burbank Ni-Zn lithogeochemical anomaly at shallow depth south-east of B1-B2-B3.

<b>Comments on Completion</b>
significant Ni and Zn mineralisation intersected throughout hole; core recoveries in bottom 5 m. was very poor with virtually no resistance on the drill string; last 3 m was essentially a cavity and the hole was stopped in this for fear of sticking the rod string;

**Collar Details**

<b>Grid</b>	<b>Northing</b>	<b>Easting</b>	<b>Elevation</b>	<b>Dip</b>	<b>Bearing</b>
AMG	5355234	350974	2050	-55	57

<b>Length (m)</b>
30.7

<b>Hole Size</b>	
<b>To (m)</b>	<b>Size</b>
30.7	46TT

<b>Significant Core Loss Zones</b>		
<b>From</b>	<b>To</b>	<b>%Rec.</b>
25.2	30.7	<25

<b>Hole Condition on Completion</b>
all down hole equipment removed from hole;

**Summary of Results:**

Depth		Recovery		Description				Assays			
From	To	%	%	Length	% Ni	% Cu	% S				
3.0	20.3	95	altered serpentinite	17.3	1.06						
23.0	27.7	4.7	altered serpentinite	4.7	1.20						





**APPENDIX 2**  
**PETROLOGY REPORT**

# Central Mineralogical Services

---

8 Bradshaw Avenue, Crafers, S.A. 5152  
Telephone (08) 8370 9779 Fax (08) 8370 9788  
International Telephone +618 8370 9779 Fax +618 8370 9788



19 February 2002

Mr L.A. Newnham  
Newnham Exploration and Mining Services  
PO Box 183  
EXETER TAS 7275

## REPORT NO. CMS 02/2/8

YOUR REFERENCE: Fax 14 February 2002  
DATE RECEIVED: 15 February 2002  
SAMPLE NOS: As per report (Burbank)  
SUBMITTED BY: L.A. Newnham  
WORK REQUESTED: Petrology

*H.W. Fander.*

H.W. Fander, M. Sc.

REPORT CMS 02/2/8

BURBANK PROSPECT DRILL CORE

Ten samples of drill core were received for petrographic study; thin sections were prepared and examined.

Summary

All the rocks are medium-to coarsely-crystalline serpentinites (as indicated by relict textures) of a broadly similar composition, suggesting that the original ultramafics were also petrogenetically similar.

Apart from being serpentinitised, several rocks were further altered in some way; several are silicified, and several were incipiently or partly tremolitised; there is evidence of a later deposition of (generally fibrous) magnetite, and of sulphides - now completely oxidised to goethite.

Many of the rocks are characterised by the presence of chromite mantled with magnetite.

At this stage, no Ni or Zn minerals were specifically identified; it is very likely that both elements occur as silicates, probably as smectite-group Ni and Zn "clays" - these are difficult to identify, even by XRD (because they are often amorphous or poorly-crystalline).

These rocks are similar in a number of significant features to those at Avebury.

A summary of the characteristics of the individual <sup>rocks</sup> follows.

B1/11.9-12.0m

Incipiently tremolitised serpentinite, probably originally coarsely-crystalline, with magnetite, later fibrous magnetite and associated goethite (oxidised sulphides).

B2/8.6-8.8m

Silicified serpentinite, with chrysotile veinlets and interstitial opaline silica (i.e. in addition to the replacive quartz). Scattered euhedral magnetite. Patches of yellow, cryptocrystalline ?Ni-smectite.

B3/13.5-13.7m

Medium-grained, incipiently tremolitised serpentinite with fine-grained magnetite and goethite (oxidised sulphides).

**B3/22.1-22.3m**

Extensively tremolitised serpentinite.

**B4/7.4-7.6m**

Similar to *B3/22.1m*, with primary chromite mantled with magnetite; cut by chrysotile veinlets.

**B4/17.3-17.5m**

Silicified serpentinite with primary chromite mantled with magnetite. Goethite films and patches. Small aggregates of ?Ni-chlorite.

**B5/11.2-11.4m**

Patchily tremolitised serpentinite, with numerous small patches of opaline silica.

**B5/16.5-16.6m**

Silicified serpentinite, partly tremolitised, with euhedral and (younger) fibrous magnetite; abundant goethite - some represents oxidised pyrite.

**B6/13.6-13.8m**

Serpentinite with veinlets of amorphous and finely-fibrous yellow ?Ni-smectite.

**B6/23.5-23.6m**

Serpentinite with conspicuous chromite and abundant fine-grained magnetite. Fine networks of opaline silica and veinlets of yellow amorphous ?Ni smectite.

**APPENDIX 3**

**ASSAY REPORT**



Our reference : BU018866  
 Your reference : 132885  
 Project code : Drill Core  
 Date received : 25/01/02  
 Date reported : 08/02/02

**Analabs Pty. Ltd.**  
 ACN 004 591 664  
 14 Thirkell St, Burnie  
 Tasmania 7320  
 Telephone : (03) 6431 6837  
 Facsimile : (03) 6431 8890

Lindsay Newnham  
 Managing Geologist  
  
 Allegiance Mining NL  
 C/Newnham Exploration & Mining Service  
 PO Box 183  
 EXETER  
 TAS 7275

Number of pages of results : 1  
 Number of Samples : 42  
 First Sample : B1 2.5-5.1  
 Last Sample : B6 25.6-27.7

Invoice to:  
 Lindsay Newnham  
 Managing Geologist  
  
 Allegiance Mining NL  
 C/Newnham Exploration & Mining Service  
 PO Box 183  
 EXETER  
 TAS 7275

Electronic Data Transmission :  
 Modem Y 08/02/02  
 Facsimile / /  
 Disk Report Y / /

Results to:

Results to:

Remarks:

Authorised by ..... *R. Gelston* .....  
 On behalf of:

Ricky Gelston  
 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.



Reference : BU018866  
 Reference : 132885  
 Project code : Drill Core  
 Report date : 08/02/02  
 Report status : Final  
 Page : 1 of 1

**Analabs Pty. Ltd.**  
 ACN 004 591 664  
 14 Thirkell St, Burnie  
 Tasmania 7320  
 Telephone : (03) 6431 6837  
 Facsimile : (03) 6431 8890

## ANALYTICAL DATA

Sample	Ni	Cu	Pb	Zn	As
B1 2.5-5.1	1.15%	<25	195	3060	<50
B1 5.1-7.3	1.09%	<25	190	3330	<50
B1 7.3-9.4	8390	<25	240	3470	<50
B1 9.4-12.3	1.07%	<25	130	4280	90
B1 12.3-15.0	1.10%	46	56	4710	65
B2 0.0-2.0	3230	<25	78	1090	<50
B2 2.0-4.0	8320	<25	110	2640	<50
B2 4.0-7.0	9990	<25	50	6590	65
B2 7.0-9.6	1.15%	34	130	6570	95
B2 13.0-15.9	8000	50	210	3980	80
B2 15.9-20.6	1.10%	46	96	4750	<50
B2 22.1-25.1	6560	<25	66	3070	<50
B3 3.5-5.4	1.16%	30	185	1890	65
B3 5.4-8.5	1.12%	<25	88	2190	<50
B3 8.5-10.5	1.14%	<25	60	2780	55
B3 13.2-14.0	1.18%	<25	46	4680	<50
B3 15.8-18.1	1.07%	<25	56	4730	60
B3 18.1-19.1	9690	<25	48	4460	60
B3 21.1-22.6	1.08%	<25	48	4740	55
B4 1.0-3.0	1.12%	<25	78	4450	90
B4 3.0-7.1	1.12%	<25	42	4360	75
B4 7.1-8.6	1.03%	28	78	4430	100
B4 9.3-12.1	8730	<25	140	4530	60
B4 12.1-14.6	6540	<25	84	2130	<50
B4 14.6-16.9	5710	<25	105	1170	<50
B4 17.3-18.4	1.00%	90	40	3370	75
B5 8.6-9.9	9510	82	180	3800	90
B5 9.9-11.4	1.11%	28	54	3590	85
B5 11.4-13.3	8870	36	335	3520	155
B5 13.3-14.6	8310	82	205	3870	95
B5 14.6-16.0	8780	34	100	3630	75
B5 16.0-17.6	5270	36	210	1930	90
B6 3.0-5.7	1.05%	<25	38	1690	50
B6 5.7-8.7	1.07%	<25	40	2280	55
B6 8.7-12.0	1.13%	<25	82	3600	75
B6 12.0-13.9	1.26%	26	215	3830	120
B6 13.9-16.2	9900	<25	92	2400	90
B6 16.2-17.6	8350	<25	34	1780	70
B6 17.6-20.3	9950	<25	46	3390	100
B6 23.0-23.8	1.78%	36	150	5710	70
B6 23.8-25.2	9810	<25	30	3650	50
B6 25.6-27.7	1.35%	26	190	4170	150
*SS B2 13.0-15.9	7910	48	190	3950	75
*SS B6 8.7-12.0	1.19%	<25	82	3790	70
*Rep B2 2.0-4.0	8080	32	115	2710	<50
*Rep B4 3.0-7.1	1.16%	30	32	4560	85
*Blk BLANK	<10	<25	<25	<25	<50
*Std SU 1A	1.17%	9380	88	215	<50
*Std MHO	5670	385	<25	76	<50
Method	1104	1104	1104	1104	1104
Units	ppm	ppm	ppm	ppm	ppm
Detection Limit	10	25	25	25	50
Upper Method	A105				

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

## **Appendix B**

**Report titled “Allegiance Mining  
NL. Avebury Nickel Project.  
Mineral Resource Report November  
2002” by Michael V McKeown**

**ALLEGIANCE MINING NL**  
**AVEBURY NICKEL PROJECT**  
**MINERAL RESOURCE REPORT**

**NOVEMBER 2002**

**Prepared by**

**MICHAEL V. McKEOWN**

**MEngSc (Ballarat), Grad Dip Mining (Ballarat),  
BSc (Melbourne), FAusIMM**

**for**

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

**on behalf of**

**ALLEGIANCE MINING NL**

## **IMPORTANT NOTES**

This report has been prepared using information and data available to the author at the time of writing.

This report is not intended for use as a public document nor, in whole or in part, in a public document.

This report should only be reproduced in whole, not in part.

Neither Michael V. McKeown nor McKeown Mining Pty Ltd nor their Associates hold shares or options in Allegiance Mining NL

## **MAP CONVENTIONS**

Co-ordinates in this report are in AMG.

RLs in this report are MSL plus 2000m.

Cross sections are drawn looking west, that is, north to the right.

Longitudinal projections are drawn looking north, that is, east to the right.

## EXECUTIVE SUMMARY

Allegiance Mining NL (Allegiance) holds Exploration Licence 28/88, a licence in two parts, south-west of Zeehan and at Trial Harbour. In accordance with a Joint Venture Agreement, Rio Tinto Exploration Pty Ltd holds a 2% Net Smelter Royalty on production from any future operations on the licence.

At Avebury, Allegiance has drilled 42 diamond drill holes and five wedged holes for a total length drilled of 17,659m, including 3,628 metres drilled this year. The former licence holder CRA Exploration Pty Ltd drilled three holes, ZA1 to ZA3, for a total drilled length of 796m.

The Avebury nickel sulphide mineralisation occurs within a moderately to steeply dipping Cambrian ultramafic body lying within a sequence of Cambrian metamorphic rocks dominated by hornfels and chert.

The whole sequence was metamorphosed and metasomatised during the intrusion of the Heemskirk granite at the time of the Devonian Tabberabberan Orogeny when the ultramafic was partly converted to diopside-tremolite rock along its margins. During the metamorphic and metasomatic events, nickel sulphide mineralisation appears to have been mobilised from within the ultramafic and concentrated immediately adjacent to the margins of the ultramafic, principally in the diopside-tremolite rock.

Most of the nickel mineralisation is located within the ultramafic immediately adjacent to its margins. The outer boundary of the mineralisation is sharp and coincides with the ultramafic contact; the inner boundary of the mineralisation is defined by a split between high grade and lower grade nickel and the zone of mineralisation is referred to as the high grade rim.

Resource estimates have been made for two zones of high grade rim mineralisation: North Avebury and Viking (formerly South Avebury). The tonnage and grade of these resources are such that there are reasonable prospects for eventual economic extraction. The grade of the nickel mineralisation, the relatively coarse grained nickel sulphides observed in the drill core, petrological studies, and metallurgical test work all suggest that the nickel sulphides present at Avebury will be recoverable and that there are reasonable prospects for eventual economic extraction.

Cut-off grades for North Avebury and Viking were estimated by calculating an equivalent nickel grade to the Renison Bell tin mine cut-off grade, making allowance for differences in metal prices, smelter charges and mill recoveries.

The North Avebury high grade rim mineralisation strikes east west and dips north at about 70° to 80°. The mineralisation is known along strike length from 354,450m E to 354,850m E and down-dip from about 70 metres below the surface at 2100m RL to about 1800m RL. The mineralisation thickness, from the outer ultramafic contact to the inner 0.7% Ni grade split, ranges up to about 30 metres measured perpendicular to the ultramafic boundary.

The Viking high grade rim mineralisation is a saddle shaped zone at the top of the southern ultramafic. The zone strikes east west and dips more less vertically to the south and from vertical to 45° to the north. The mineralisation is known over a strike length from 354,300m E to 354,700m E and down-dip from about 200 metres below the surface at 2000m RL to about 1700m RL. The mineralisation thickness, from the outer ultramafic contact to the inner 0.7% Ni grade split, ranges up to nearly 50 metres measured perpendicular to the ultramafic boundary.

Mineral Resources were estimated by interpolating nickel grades into block models using the nearest neighbour method. Blocks within 25 metres of a cross-section showing at least one drill hole were classified as Indicated Mineral Resources and the balance was classified as Inferred Mineral Resource, a classification considered consistent with the definitions in the JORC code:

**AVEBURY NICKEL PROJECT  
MINERAL RESOURCES - NOVEMBER 2002**

<b>INDICATED MINERAL RESOURCE</b>				
	<b>cutoff</b>	<b>resource</b>	<b>grade</b>	<b>grade</b>
	<b>%Ni</b>	<b>tonnes</b>	<b>% Ni</b>	<b>% Co</b>
North Avebury	0.8	1,260,000	1.5	0.04
Viking	1.0	1,880,000	1.5	0.03
<b>Total</b>		<b>3,140,000</b>	<b>1.5</b>	<b>0.03</b>

<b>INFERRED MINERAL RESOURCE</b>				
	<b>cutoff</b>	<b>resource</b>	<b>grade</b>	<b>grade</b>
	<b>%Ni</b>	<b>tonnes</b>	<b>% Ni</b>	<b>% Co</b>
North Avebury	0.8	200,000	1.8	0.05
Viking	1.0	720,000	1.5	0.03
<b>Total</b>		<b>920,000</b>	<b>1.6</b>	<b>0.03</b>

<b>TOTAL MINERAL RESOURCE</b>				
	<b>cutoff</b>	<b>resource</b>	<b>grade</b>	<b>grade</b>
	<b>%Ni</b>	<b>tonnes</b>	<b>% Ni</b>	<b>% Co</b>
North Avebury	0.8	1,460,000	1.5	0.04
Viking	1.0	2,600,000	1.5	0.03
<b>Total</b>		<b>4,060,000</b>	<b>1.5</b>	<b>0.03</b>

<b>CONTAINED WITHIN THE INDICATED MINERAL RESOURCE</b>				
	<b>cutoff</b>	<b>resource</b>	<b>grade</b>	<b>grade</b>
	<b>%Ni</b>	<b>tonnes</b>	<b>% Ni</b>	<b>% Co</b>
North Avebury	1.3	630,000	2.0	0.05
Viking	1.6	630,000	2.0	0.05
<b>Total</b>		<b>1,260,000</b>	<b>2.0</b>	<b>0.05</b>

No estimates were made of the resources at Central Avebury where A001 intersected 10.7m (down-hole length) at 1.64% Ni, including 0.4m (down-hole length) at 24.8% Ni.

There are occurrences of nickel sulphides outside the ultramafics: particularly immediately outside the upper boundary of the southern ultramafic, and, notably, in a concordant zone, known as the Pink Eye Marker Unit, within the Crimson Creek Formation about 30 metres into the hangingwall of the southern ultramafic where A038 intersected 0.2m (down-hole length) at 8.85% Ni and 0.2m (down-hole length) at 2.80% Ni, and A039 intersected 1.3m (down-hole length) at 8.15% Ni.

## CONTENTS

- 1 INTRODUCTION
- 2 LOCAL GEOLOGY
- 3 MINERALOGY
- 4 DRILLING PROGRAMS
  - 4.1 DRILLING PROGRAMMES
  - 4.2 DRILLING TECHNIQUES
  - 4.3 CORE LOGGING
  - 4.4 CORE RECOVERY
  - 4.5 DRILL HOLE SURVEYS
- 5 SAMPLING
  - 5.1 SAMPLE PREPARATION
  - 5.2 ASSAY METHOD AND ASSAY LABORATORIES
  - 5.3 VERIFICATION OF SAMPLING AND ASSAY DATA
  - 5.4 ASSAY DATABASE
- 6 RESOURCE ESTIMATES
  - 6.1 INTRODUCTION
  - 6.2 GEOLOGICAL INTERPRETATION
  - 6.3 MINERALISATION BOUNDARIES
  - 6.4 ASSAY DATA SETS
  - 6.5 TONNAGE FACTORS
  - 6.6 CUT-OFF GRADES
  - 6.7 MINERAL RESOURCE ESTIMATES
    - 6.7.1 INTRODUCTION
    - 6.7.2 NORTH AVEBURY MINERAL RESOURCE
    - 6.7.3 VIKING MINERAL RESOURCE
    - 6.7.4 POTENTIAL CONTAMINANTS IN CONCENTRATES
  - 6.8 OTHER RESOURCES
    - 6.8.1 CENTRAL AVEBURY
    - 6.8.2 PINK EYE
    - 6.8.3 OTHER INTERSECTIONS
- 7 MINERAL RESOURCE SUMMARY

## References

- Appendix 1 Drill logs for holes completed during 2002 drilling programme
- Appendix 2 Downhole surveys
- Appendix 3 Assays checked during 2002 drilling programme
- Appendix 4 Nickel assay data used for the resource estimates
- Appendix 5 Specific gravities of drill core
- Appendix 6 Cut-off grade estimate for Renison Bell operations
- Appendix 7 Method for Mineral Resource estimates using cross-sectional method
- Appendix 8 Index to resource assessment criteria

## TABLES

- 1 Avebury Nickel Project - rock types
- 2 Avebury Nickel Project - sulphide and arsenide minerals
- 3 Holes drilled
- 4 Avebury Nickel Project - Mineral Resources November 2002

## FIGURES

- 1 Avebury Nickel Project location plan
- 2 Cross-section 354,300m E
- 3 Cross-section 354,400m E
- 4 Cross-section 354,450m E
- 5 Cross-section 354,500m E
- 6 Cross-section 354,550m E
- 7 Cross-section 354,600m E
- 8 Cross-section 354,650m E
- 9 Cross-section 354,700m E
- 10 Cross-section 354,750m E
- 11 Cross-section 354,850m E
- 12 Longitudinal projection - North Avebury
- 13 Longitudinal projection - Viking - northern limb
- 14 Longitudinal projection - Viking - southern limb
- 15 Log probability plot - one metre nickel composited nickel assays - Avebury ultramafic
- 16 Log probability plot of nickel assays - one metre composites - North Avebury
- 17 Histogram of nickel assays - one metre composites - North Avebury
- 18 Log probability plot of nickel assays - one metre composites - Viking
- 19 Histogram of logs of nickel assays - one metre composites - Viking
- 20 Down-hole relative variogram - North Avebury
- 21 Down-hole relative variogram - Viking
- 22 Grade distribution in North Avebury block models
- 23 Grade-tonnage curve North Avebury Mineral Resource
- 24 Grade distribution in Viking block models
- 25 Grade-tonnage curve Viking Mineral Resource

## 1 INTRODUCTION

Allegiance Mining NL (Allegiance) holds Exploration Licence 28/88, a licence in two parts, south-west of Zeehan and at Trial Harbour. In accordance with a Joint Venture Agreement, Rio Tinto Exploration Pty Ltd holds a 2% Net Smelter Royalty on production from any future operations on the licence.

The Avebury Project lies within EL28/88 about 8 kilometres south-west of Zeehan (Figure 1). Allegiance has undertaken four drilling campaigns at Avebury: the summer of early 1998, the summer of early 1999, from November 1999 to October 2000, and the latest from May to September 2002.

In 1998, A001, the first hole drilled by Allegiance, intersected high grade nickel sulphide mineralisation at the Avebury Project and since then a total of 42 holes have been drilled by Allegiance into the mineralised zones at Avebury. Five zones of sulphide mineralisation have been identified: North Avebury, Viking (formerly known as South Avebury), Central Avebury, East Avebury and Pink Eye. The two largest zones are North Avebury and Viking.

There have been two previous estimates of the Mineral Resource at North Avebury and Viking (McKeown, 1999 and Newnham, 2001). This resource report has been compiled following the completion of a diamond drilling programme conducted from May to September 2002.

This report was completed in accordance with the *Australasian Code for Reporting of Mineral Resources and Ore Reserves, September 1999 (The JORC Code)* by Michael V. McKeown of McKeown Mining Pty Ltd, who is a Fellow of the Australasian Institute of Mining and Metallurgy and who has more than five years relevant experience in the estimation, assessment and evaluation of Mineral Resources of this style of mineralisation and type of deposit.

## 2 LOCAL GEOLOGY

The Avebury nickel sulphide mineralisation occurs within a moderately to steeply dipping Cambrian ultramafic body lying within a sequence of Cambrian metamorphic rocks dominated by hornfels and chert. The ultramafic is probably associated with the McIvor Hill ultramafic complex; the other rocks were originally siltstones and conglomerates of the Success Creek Group? and siltstones and volcanoclastics of the

Crimson Creek Formation (Table 1). The Avebury ultramafic appears to be concordant to sub-concordant with the enclosing rocks but is dislocated by a major north-west striking fault known as the Main Fault (Figures 2 to 11).

The Main Fault has disrupted the ultramafic producing sinistral strike slip movement of about 250 metres and vertical movement, south block down, of about 100 metres. The ultramafic to the north of the fault (the northern ultramafic) has been identified in drill holes over a strike length of about 400 metres and a vertical extent of over 300 metres; the ultramafic is open to the east and down dip. The ultramafic to the south of the fault (the southern ultramafic) has been identified in drill holes over a strike length of about 400 metres and a vertical extent of over 300 metres; the ultramafic is open to the east, the west and down dip. (Figures 2 to 11)

The northern ultramafic just reaches outcrop at 354,850m E and the top of the ultramafic plunges gently to the west. The top of the southern ultramafic is about 200 metres below the surface at 354,700m E and plunges very gently to the west to 354,400m E, and then at about 30 degrees to 354,300m E although this apparent increase in dip may be due to a cross-cutting fault.

The whole sequence was metamorphosed and metasomatised during the intrusion of the Heemskirk granite at the time of the Devonian Tabberabberan Orogeny when rocks of the Success Creek Group? and Crimson Creek Formation were partly silicified, actinolitised and phlogopitised and partly converted to skarns, and the ultramafic was serpentinised and partly converted to diopside-tremolite rock along its margins.

During the metamorphic and metasomatic events, nickel sulphide mineralisation appears to have been mobilised from within the ultramafic and concentrated immediately adjacent to the margins of the ultramafic, principally in the diopside-tremolite rock.

Most of the nickel mineralisation is located within the ultramafic immediately adjacent to its margins. The outer boundary of the mineralisation is sharp and coincides with the ultramafic contact; the inner boundary of the mineralisation is defined by a split between high grade and lower grade nickel mineralisation (6.2 GEOLOGICAL INTERPRETATION and 6.3 MINERALISATION BOUNDARIES).

The North Avebury mineralisation is located within the northern ultramafic immediately adjacent to its northern margin. The intersections of nickel mineralisation at Central Avebury mineralisation are located within the northern ultramafic adjacent to the contact with the Main Fault. The Viking mineralisation lies along the boundaries of the southern ultramafic. The North Avebury mineralisation is open to the east and down-dip and the Viking mineralisation is open to the east, west and down-dip.

There are occurrences of nickel sulphides outside the ultramafics: particularly immediately outside the upper boundary of the southern ultramafic, and in a concordant zone, known as the Pink Eye Marker Unit, within the Crimson Creek Formation about 30 metres into the hangingwall of the southern ultramafic, see for example, cross-section 354,500m E (Figure 5). Some of the extra-ultramafic nickel sulphides are very high grade (6.8.3 OTHER INTERSECTIONS).

The East Avebury mineralisation is not dealt with in this report.

---

TABLE 1

ALLEGIANCE MINING NL  
 AVEBURY NICKEL PROJECT - ROCK TYPES

Recent	weathering products clay claystone ironstone
Devonian	metamorphic and metasomatic rocks resulting from Heemskirk granite intrusion: massive pyrrhotite zones replacing Cambrian limestone or dolomite skarns containing axinite and/or schorl actinolitised and phlogopitised hornfels and chert diopside-tremolite rock (after ultramafic) containing nickel mineralisation serpentinised ultramafic?
Cambrian	ultramafic (McIvor Hill Ultramafic Complex?) pre-alteration ultramafic rock (dunite?)
Cambrian	chert/hornfels association (Crimson Creek Formation) hornfels after volcanoclastic rocks chert after mudstone shale and siltstone
Cambrian	conglomerate/limestone association (Success Creek Group?) conglomerate limestone very altered sedimentary rocks

---

### 3 MINERALOGY

All parts of the ultramafic at Avebury contain some nickel. There is a concentration of nickel within, and marginal to, ultramafic contacts. There are parts of the ultramafic which are relatively depleted in nickel. The zones of concentrated nickel mineralisation which have been identified carry nickel sulphides and lesser arsenides and sulph-arsenides. The dominant nickel bearing sulphide is pentlandite but nickel bearing pyrrhotite is also present.

The nickel sulphides occur as coarse grained disseminated and stringer mineralisation and, even at low nickel grades, nickel sulphides can be seen in the core with the naked eye. Petrological examination of many specimens by Wally Fander (included in McKeown, 1999) and metallurgical test work suggest that recovery of the nickel bearing sulphides by flotation will be feasible.

The sulphides and sulpharsenides which have been identified in the zones of nickel mineralisation are listed in Table 2.

-----T

TABLE 2

ALLEGIANCE MINING NL  
 AVEBURY NICKEL PROJECT -  
 SULPHIDE AND ARSENIDE MINERALS

pyrite	FeS <sub>2</sub>
pyrrhotite	FeS
valleriite	CuFeS <sub>2</sub> (Mg,Al,Fe)(OH) <sub>2</sub>
mackinauwite	(Fe,Ni) <sub>9</sub> S <sub>8</sub>
pentlandite	(Fe,Ni)S
millerite	NiS
niccolite	NiAs
gersdorffite	NiAsS
maucherite	Ni <sub>3</sub> As <sub>2</sub> or Ni <sub>4</sub> As <sub>2</sub>

-----

Based on core logging, petrological descriptions and assay data, five sulphide assemblages have been identified within the ultramafic bodies: three enriched nickel assemblages, a background assemblage throughout the main ultramafic mass, and a depleted assemblage in parts of the ultramafic.

**Enriched pentlandite assemblage:** apart from traces of pyrite and chalcopyrite, pentlandite is the dominant sulphide mineral present, for example, North Avebury mineralisation in A004 131.1m 152.1m. Sulphur and nickel grades in this style of mineralisation are about equal, implying the presence of pentlandite, and the arsenic content is low.

**Enriched pyrrhotite-pentlandite assemblage:** pentlandite and pyrrhotite are the dominant sulphides present, for example, North Avebury mineralisation in A004 173.1m to 184.2m. Sulphur grades exceed nickel grades, implying the presence of pyrrhotite as well as pentlandite, and arsenic content is low.

**Enriched pyrrhotite-pentlandite-arsenide assemblage:** pentlandite and pyrrhotite are accompanied by various nickel arsenides and sulpharsenides such as niccolite, gersdorffite and maucherite, for example, North Avebury mineralisation in A004 164.9m to 173.1m. Arsenic grades can exceed 1% and, where this occurs, nickel grades can exceed sulphur grades, implying the presence of nickel arsenides and sulph-arsenides.

**Background pentlandite assemblage:** pentlandite disseminations occur throughout the main ultramafic and nickel grades average about 0.2% Ni, for example, southern ultramafic in A035 349.7m to 372.0m.

**Depleted pentlandite assemblage:** nickel grades are less than 0.1%, suggesting nickel depletion, for example, southern ultramafic in A037 407.5m to 416.0m and nearby A025 549.4m to 559.4m

## 4 DRILLING

### 4.1 DRILLING PROGRAMMES

At Avebury, Allegiance has drilled 42 diamond drill holes, numbered A001 to A042 and five wedged holes, for a total length drilled of 17,659m; the former licence holder

CRA Exploration Pty Ltd drilled three holes, ZA1 to ZA3, for a total drilled length of 796m (Table 3). The drilling programme completed in 2002 totalled 3,628 metres.

Holes ZA1 to ZA3 and A001 to A006 were drilled by Diamond Drilling Tasmania Pty Ltd and holes A007 to A042 by Almac Drilling Pty Ltd.

TABLE 3

bhid	east m	north m	rl m	length m	collar brg AMG	collar dip
ZA1	354,837.3	5,357,277.8	2,171.4	284.5	352	-65
ZA2	355,619.6	5,357,342.2	2,177.2	255.5	352	-48.5
ZA3	355,782.3	5,357,134.2	2,162.8	256.0	352	-55
A001	354,648.1	5,357,224.9	2,152.1	532.6	5	-47
A002	355,225.2	5,357,585.6	2,175.0	307.0	182	-52
A003	354,730.2	5,357,281.6	2,163.4	339.0	5	-48
A004	354,625.3	5,357,371.9	2,146.0	226.3	353	-49.5
A005	354,520.9	5,357,467.4	2,171.3	202.5	354	-47.5
A006	354,735.8	5,357,189.7	2,150.0	481.5	0	-43.5
A007	354,622.7	5,357,521.4	2,157.0	465.2	175	-45
A008	354,629.3	5,357,744.1	2,178.8	575.0	178	-46
A009	354,736.1	5,357,522.6	2,164.2	525.0	177	-45
A010	354,835.6	5,357,291.0	2,169.3	373.0	0	-46
A011	354,545.1	5,357,311.7	2,158.8	452.0	351	-50.5
A012	354,559.6	5,357,742.7	2,178.5	544.0	177	-59.5
A013	354,674.0	5,357,744.5	2,176.7	545.6	173	-58.5
A014	354,427.7	5,357,459.0	2,180.0	379.5	172	-45
A014A	354,453.4	5,357,286.9	2,016.0	40.9	wedged off A014 at 239.2m	
A015	354,907.5	5,357,752.5	2,168.0	467.0	174	-51.5
A016	354,316.4	5,357,457.4	2,181.2	355.5	175	-45
A017	354,431.5	5,357,362.2	2,179.4	187.0	174	-45
A018	354,718.7	5,357,599.0	2,166.4	396.9	193	-47
A018A	354,686.7	5,357,474.0	2,032.3	54.8	wedged off A018 at 186.2m	
A019	354,699.1	5,357,598.1	2,165.2	281.7	175	-60.5
A019A	354,703.1	5,357,496.7	1,985.0	72.3	wedged off A019 at 206.9m	
A020	354,607.7	5,357,623.3	2,167.0	465.9	189	-52
A021	354,657.2	5,357,750.6	2,177.5	507.6	179	-54
A022	354,629.0	5,357,743.0	2,179.0	172.9	178	-52
A023	354,569.4	5,357,742.6	2,179.5	524.6	174	-52
A024	354,465.7	5,357,753.7	2,174.5	613.0	180	-63
A024A	354,452.0	5,357,586.2	1,869.5	232.2	wedged off A024 at 348.5m	
A025	354,494.6	5,357,735.7	2,177.1	559.4	179	-50
A026	354,509.6	5,357,453.0	2,171.0	351.9	181	-45
A026A	354,505.6	5,357,306.2	2,022.6	124.9	wedged off A026 at 208.8m	
A027	354,541.0	5,357,359.0	2,164.0	288.0	179	-45
A028	354,397.6	5,357,455.7	2,181.8	343.0	178	-45
A029	354,395.3	5,357,350.0	2,180.0	254.0	178	-45
A030	355,446.3	5,357,673.9	2,180.4	393.1	181	-45
A031	355,501.6	5,357,595.8	2,178.4	451.3	179	-45.5
A032	355,616.2	5,357,553.5	2,183.2	396.5	179	-47
A033	355,667.6	5,357,516.1	2,186.5	316.5	188	-44
A034	354,397.6	5,357,457.9	2,181.8	446.0	182	-57
A035	354,310.5	5,357,503.0	2,180.3	465.3	179	-50
A036	354,420.6	5,357,456.7	2,180.4	384.0	178	-50
A037	354,420.6	5,357,457.5	2,180.4	416.0	180	-70
A038	354,493.8	5,357,510.7	2,179.5	433.5	175	-48
A039	354,494.1	5,357,511.4	2,179.5	382.7	171	-60.5
A040	354,732.3	5,357,477.4	2,167.0	451.1	198	-45
A041	354,304.6	5,357,547.3	2,177.7	465.3	175	-55
A042	354,599.5	5,357,447.1	2,168.9	415.5	178	-47
<b>total</b>				<b>18,454.5</b>		

## 4.2 DRILLING TECHNIQUES

All intersections considered for this resource report were made by diamond drilling. Core was NQ size, drilled using a standard inner tube on wireline, that is, not triple tube. All drill core is stored at the Allegiance Mining NL core shed, Zeehan.

## 4.3 CORE LOGGING

All core was lithologically logged in sufficient detail to support this Mineral Resource estimate (for example, see Appendix 1). Drill logs describe the rocks and mineralisation intersected and are accompanied by core recoveries, assays and some petrological descriptions by Wally Fander of Central Metallurgical Services. All core was logged by Lindsay Newnham of Newnham Exploration and Mining Services or by the author. Hard copies of drill logs are kept at the offices of Allegiance Mining NL at Zeehan and Newnham Exploration and Mining Services at Exeter; computer based copies are kept at the office of McKeown Mining Pty Ltd at Ridgley. Hard copies of assay data as received from analytical laboratories are kept at the offices of Allegiance Mining NL at Zeehan and Newnham Exploration and Mining Services at Exeter; computer based copies are kept at the office of McKeown Mining Pty Ltd at Ridgley.

Logs for the holes drilled in the latest programme are attached (Appendix 1).

## 4.4 CORE RECOVERY

Core recoveries were recorded for each drilling run and were generally 100%, with small losses in some broken (fault?) zones. There was no systematic core loss in the nickel mineralisation which tends to occur associated with hard silicate rocks and, consequently, there was no apparent relationship between sample recovery and nickel grade.

## 4.5 DRILL HOLE SURVEYS

The co-ordinates of the collars and the collar bearings of all drill holes drilled by Allegiance have been determined by theodolite traverse, most of the collar dips were

also determined by theodolite traverse, a few by clinometer; this survey work was undertaken by Ian Green, Licensed Surveyor.

All co-ordinates in this report are in AMG and RLs are actual heights above MSL plus 2000m.

Magnetite in the Awebury ultramafics significantly deforms the local magnetic field. The deformations can be large, for example, near the collars of A005 and A026 there is a magnetic bearing error of 15°. Drilling crews made downhole surveys of all holes using cameras but these surveys were subject to errors caused by the presence of magnetite and, to a lesser extent, pyrrhotite and pentlandite. Twelve holes have been surveyed downhole using a Maxibor, a downhole survey instrument which is not affected by surrounding magnetic materials. Not all the Maxibor surveys were successful and Maxibor surveys were not available for all holes and, so, for many holes, a method of correcting the downhole bearings by treating them as relative bearings has been used (Appendix 2).

The accuracy of the surveys is adequate for the classes of Mineral Resource estimates made for this report.

## **5 SAMPLING**

### **5.1 SAMPLE PREPARATION**

Core was sawn in half longitudinally, and half the core was crushed, and all or half the crushed material was pulverised for assay. All crushed and pulverised samples not consumed by the assay process were retrieved and are stored in Allegiance's Zeehan core shed. Some nickel assays were checked by re-assay during the recent drilling program (Appendix 3). The results of all check nickel assays were highly correlated with the original assays suggesting that the sample preparation method is satisfactory.

Some whole core of the nickel mineralisation in two wedged holes, A014 and A018, was used for metallurgical test work and was consumed by the test work process.

## 5.2 ASSAY METHOD AND ASSAY LABORATORIES

All nickel assays used for this resource estimate were total nickel assays determined by ICP following an acid leach. All assays were performed by NATA registered laboratories: Analabs Pty Ltd and Amdel Pty Ltd.

## 5.3 VERIFICATION OF SAMPLING AND ASSAY DATA

Verification of sampling and assaying were described in McKeown (1999) and some nickel assays were checked by re-assay during the recent drilling program (Appendix 3). The results of the check nickel assays were highly correlated with the original assays suggesting that the assay method is satisfactory.

Twinned holes, in the form of wedged holes have been drilled, the wedged intersections generally being within about 5 metres of the original intersections. Of the five wedged holes, whole core from parts of three holes, A014A, A018A and A019A, was used for metallurgical test work and yielded the following comparative results:

Viking	A014	254.7m to 267.3m	1.56% Ni	2.66% S
	A014A	254.7m to 264.8m	1.96% Ni	3.34% S
North Avebury	A018	214.4m to 217.4m	1.69% Ni	1.96% S
	A018A	213.9m to 217.0m	1.43% Ni	1.36% S
	A018	217.4m to 221.2m	1.23% Ni	1.12% S
	A018A	217.0m to 221.5m	1.29% Ni	0.97% S
	A019	241.8m to 245.0m	1.87% Ni	2.59% S
	A019A	240.5m to 244.4m	3.10% Ni	4.34% S
	A019	245.0m to 248.0m	3.52% Ni	4.00% S
	A019A	244.4m to 247.4m	3.50% Ni	4.24% S
	A019	248.0m to 251.0m	1.93% Ni	2.39% S
	A019A	247.4m to 250.4m	3.53% Ni	4.06% S

Core from a South Avebury intersection in one parent hole and its daughter, A024 and A024A, was split and assayed, the two South Avebury intersections being about 10 metres apart, with the following comparative results:

South Avebury A024	548.1m to 549.1m	0.75% Ni	0.66% S
A024A	548.2m to 549.4m	3.20% Ni	4.85% S
A024	549.1m to 550.4m	1.21% Ni	1.50% S
A024A	549.4m to 550.0m	1.68% Ni	2.10% S

The assays confirm the along strike and down dip continuity of the mineralisation but suggest a relatively high short range variation in grade. The short range variations in grade were confirmed by variography (6.7 MINERAL RESOURCE ESTIMATES - 6.7.1 INTRODUCTION).

## 5.4 ASSAY DATABASE

All assay data used for estimates of grade in this report have been checked against the original laboratory assay sheets. The nickel assay data used for these resource estimates are attached (Appendix 4).

## 6 RESOURCE ESTIMATES

### 6.1 INTRODUCTION

The tonnage and grade of resources described in this report are such that there are reasonable prospects for eventual economic extraction (6.6 CUT OFF GRADES and 6.7 MINERAL RESOURCE ESTIMATES) but, except for this assumption, the resources described in this report are Mineral Resources and, for this report, no account has been taken of mining factors. The size, shape and attitude of the mineralised zones and the probable need for a selective mining method suggest that the likely stopping methods will be room and pillar, benching and open stoping. There is grade banding apparent near the top of the Viking mineralisation, for example, on cross-sections 354,400m E and 354,600m E (Figures 3 and 7), which implies that successful selective mining will be possible.

The grade of the nickel mineralisation, the relatively coarse grained nickel sulphides observed in the drill core, petrological studies which have been undertaken, and metallurgical test work which has been completed all suggest that the nickel sulphides present at Avebury will be recoverable and that there are reasonable prospects for eventual economic extraction.

An index to the resource assessment criteria listed in the JORC code is attached (Appendix 8).

## **6.2 GEOLOGICAL INTERPRETATION**

The geological interpretation for this resource estimate can be seen in Figures 2 to 14. The interpretation was devised using ten north-south cross-sections at 354,300m E, at fifty metre intervals from 354,400m E to 354,750m E inclusive, and at 354,850m E (Figures 2 to 11), and a detailed structure contour plan, all at 1:1000 scale. When examining the cross-sections, note the oblique angles between the drill holes and the cross-sections, the oblique angles between geological structures and the cross-sections, and the distances of drill holes from the cross-sections.

## **6.3 MINERALISATION BOUNDARIES**

As has been described (2 LOCAL GEOLOGY), nickel mineralisation occurs mainly near and within the contacts of the ultramafic. The occurrence of nickel mineralisation outside the ultramafic is sporadic and is possibly related to small fractures in the enclosing mass of country rock or to narrow lenses of ultramafic beyond the main ultramafic. Whatever the origin of the extra-ultramafic nickel mineralisation, its continuity cannot be established at the present time and, so, the outer boundary of nickel mineralisation was taken in all cases to be at the contact of ultramafic with country rock. In some cases, this meant the inclusion of relatively low grade material within the nickel mineralisation close to the ultramafic boundary, for example, at North Avebury in A004 (Figure 7). This outer boundary of the mineralisation is in a consistent and definite geological position and is a hard boundary.

The definition of a useful inner boundary is less obvious and the identification of the inner boundary is described here.

In the master assay file named XASSAYS, assays of drill core samples within the ultramafic boundaries were flagged using codes (the UMFLAG codes) to indicate the origins of the samples:

UMFLAG code	ultramafic body
-----	
Umn	northern ultramafic
Ums	southern ultramafic

Nearly all samples were of one metre length (Appendix 4) and the samples in the master assay file were composited to one metre lengths, the new file being named CASSAYS.

A log probability plot of the one metre composited nickel assays of samples from within both ultramafics was created (Figure 15). Four straight lines could be fitted to the points on the probability plot, each line corresponding to a distinct family of assays: <0.1% Ni, 0.1% to 0.2% Ni, 0.2% to 0.7% Ni, and > 0.7% Ni. The occurrence of the two lower grade families could have been expected from the qualitative description of the mineralogy (3 MINERALOGY).

The split at 0.7% Ni was applied, with judgement, to the assay data to define an inner boundary to the mineralisation. As a general rule, the last assay greater than or equal to 0.7% Ni was taken as the inner boundary but the practical application of the grade split can best be demonstrated by reference to a few examples:

- A008 on cross-section 354,600m E, North Avebury
- A014 on cross-section 354,450m E, Viking
- A036 on cross-section 354,400m E, Viking
- A038 on cross-section 354,500m E, Viking

The zone of nickel mineralisation inside the ultramafic boundary was named the high grade rim. The internal boundary to the high grade rim nickel mineralisation, defined by the 0.7% Ni grade split, is a soft boundary.

In the master assay file, XASSAYS, assays of samples within the high grade rim were flagged using codes (the MINFLAG codes) to indicate which samples came from the high grade rim:

UMFLAG code	ultramafic body	MINFLAG code	mineralised zone
Umn	northern ultramafic	hgr	North Avebury
Ums	southern ultramafic	hgr	Viking

In the master assay file, XASSAYS, assays of samples were flagged using codes (the LIMBFLAG codes) to indicate from which limb of the ultramafic the samples came:

LIMBFLAG code	ultramafic limb
nth	northern limb
sth	southern limb

#### 6.4 ASSAY DATA SETS

The basic nickel statistics of the data in the high grade rim of North Avebury mineralisation were:

composite length	no of samples	length range	mean length	mean Ni grade	Ni grade variance
uncomposited	252	0.4m to 1.8m	1.03m	0.91%	0.93% <sup>2</sup>
1.0m	259	0.5m to 1.0m	0.99m	0.91%	0.84% <sup>2</sup>

The basic nickel statistics of the data in the high grade rim of Viking mineralisation were:

composite length	no of samples	length range	mean length	mean Ni grade	Ni grade variance
uncomposited	409	0.2 m to 2.8m	1.04m	1.26%	4.00% <sup>2</sup>
1.0m	424	0.5m to 1.0m	0.99m	1.12%	1.00% <sup>2</sup>

Log probability plots of the one metre composited nickel assays of samples from within the Viking and North Avebury high grade rim mineralisation were created (Figures 16 & 18).

The log probability plot for North Avebury indicated the presence of a high grade outlier which appeared to belong to a separate population from the other assays and this suggestion was confirmed by a histogram of nickel assays (Figure 17 ). The outlying assay indicated on the two plots was from A011 283.93m to 285.10m at 9.30% Ni. The effect of this single assay in A011 was to significantly increase the mean grade and the variance of the one metre composited nickel assay data:

including the outlier: 259 samples    mean grade = 0.91% Ni    variance =  
0.84%<sup>2</sup>

excluding the outlier: 258 samples    mean grade = 0.87% Ni    variance =  
0.55%<sup>2</sup>

It may be that the apparent occurrence of this outlier is due to the low number of samples in the sample population, however, for this estimate, this assay was omitted from the assay data set which was used for the grade estimates of North Avebury high grade rim mineralisation.

The log probability plot for Viking indicated that there may be high grade outliers present in the sample data (Figure 18) but the histogram of the logs of nickel assays (Figure 19) suggested that the outliers probably belong to the same sample population as the rest of the assays and that the outlier effect on the log probability plot was due to the relatively low number of samples in the sample population. No assays were omitted from the assay data set used for the grade estimates of Viking mineralisation.

## 6.5 TONNAGE FACTORS

The specific gravity of specimens of drill core was determined by two methods. In the first method, the volume of the core was measured by displacement of water in a graduated cylinder and the air dried core was weighed; this method was used for whole and split core. In the second method, the diameter and length of whole pieces of core were measured and the volume of the core was then calculated, and the air dried core was weighed. For both methods, the mass of the specimens was measured using an electronic balance.

The specific gravities of 68 samples of ultramafic and 13 samples of waste rock were determined (Appendix 5).

The average specific gravity of the samples of high grade rim mineralisation was 3.08 gm/cubic cm. For the estimates in this report, the density of nickel mineralisation was estimated by discounting the average specific gravity to allow for joints and voids in the mineralisation and a density of 3.0 tonnes per cubic metre was used.

## 6.6 CUT-OFF GRADES

Global Mineral Resources in the zones of high grade rim mineralisation were estimated within geological boundaries and will contain parts which are profitably mineable, and parts which are not. Cut-off grades could not be calculated from cost data because cost data will not be available until mining has commenced. However, an estimate of cut-off grade was required to make a realistic inventory of the mineralisation which may be economically extractable.

Current operations at the nearby Renison Bell tin mine are similar in several significant ways to operations which will probably be used at Avebury:

	<b>Avebury</b>	<b>Renison Bell</b>
<b>location</b>	10km west of Zeehan	15km north of Zeehan
<b>ore production</b>	250,000 to 500,000 tpa	750,000 tpa
<b>access to mine</b>	decline	decline
<b>stopping methods</b>	room and pillar, benching, open stopping	room and pillar, benching, open stopping
<b>production drills</b>	electric	electric
<b>loaders</b>	diesel	diesel
<b>haulage</b>	diesel trucks	diesel trucks, shaft
<b>mill method</b>	flotation	flotation, gravity concentration

At the Renison Bell mine, the cut-off grade, equivalent to the minimum grade at which cash costs are recovered, was estimated to be 1.7% Sn (Appendix 6). As a result of the similarities listed above, a cut-off grade for the Avebury mineralisation was estimated by calculating an equivalent nickel grade to the Renison Bell cut-off grade, making allowance for differences in metal prices, smelter charges and mill recoveries (in the listing assumptions are denoted by : and calculations by =):

tin price:	4,195 \$US per tonne
nickel price:	7,250 \$US per tonne
exchange rate:	0.56 \$US per \$A
tin price =	7,491 \$A per tonne
nickel price =	12,946 \$A per tonne
tin smelter charges:	10%
nickel smelter charges:	25%
tin price from smelter =	6,742 \$A per tonne
nickel price from smelter =	9,710 \$A per tonne
tin mill recovery:	67%
nickel mill recovery:	95%
tin cut-off grade:	1.7 % Sn
<b>equivalent nickel cut-off grade =</b>	<b>0.8 % Ni</b>

For these resource estimates, the cut-off grade for North Avebury was set at 0.8% Ni and for Viking, where mining can be expected to be more costly due to the shape of the mineralised zone, the cut-off grade was set at 1.0% Ni.

## 6.7 MINERAL RESOURCE ESTIMATES

### 6.7.1 INTRODUCTION

The Mineral Resources in the North Avebury and Viking mineralisation were estimated in block models created using DATAMINE software. The stoping methods likely to be used at Avebury are room and pillar, benching and open-stoping, so block models were created with dimensions consistent with the dimensions of selective mining units compatible with these likely stoping methods. The block size used for all block models was 5 metres (east-west) by 5 metres (north-south) by 5 metres (vertical).

Down-hole experimental variograms were calculated for drill hole intersections in the North Avebury high grade rim mineralisation based on one metre sample composites, and Viking high grade rim mineralisation based on two metre sample composites (Figures 20 & 21). Both variograms had zero nugget effect with a very short range structure and a longer range structure and spherical variograms fitted to the experimental data were:

North Avebury	$\gamma = 0.0 + 0.21\text{Sph}_3 + 0.24\text{Sph}_{18}$
Viking	$\gamma = 0.0 + 0.22\text{Sph}_3 + 0.08\text{Sph}_{18}$

The range of both variograms was 18 metres.

The spacing of data meant that it was not possible to calculate useful experimental variograms other than the down-hole variograms. Consequently, it was not possible to interpolate grades into the block models by kriging.

As the size of blocks of ore increases, the variance of the grades of the blocks decreases. It is possible to estimate the variance of the grades of blocks of ore of particular sizes from the known variance of the grades of samples and the range of the variogram of the samples. For example, the variance of the grades of 5\*5\*5 metre blocks of ore can be estimated from the variance of one metre composited drill core samples.

The expected variance of the nickel grades of 5\*5\*5 metre blocks of ore was estimated using Krige's Relationship. For both mineralised zones, samples composited to 5 metre lengths used to interpolate grades into 5\*5\*5 metre blocks resulted in estimates which had grade variances consistent with the expected variances (6.7.2 NORTH AVEBURY MINERAL RESOURCE and 6.7.3 VIKING MINERAL RESOURCE).

## 6.7.2 NORTH AVEBURY MINERAL RESOURCE

There have been two previous estimates of the North Avebury Mineral Resource (McKeown, 1999 and Newnham, 2001). During the 2002 diamond drilling programme, only hole A040 passed through the northern ultramafic which hosts the North Avebury mineralisation. A040 passed through the contact just above the North Avebury mineralisation on section 354,700m E.

The geological interpretation of the North Avebury high grade rim mineralisation is shown on sections 354,450m E to 354,850m E (Figures 4 to 11). The distribution of intersections within the North Avebury mineralisation is shown on a longitudinal projection (Figure 12).

The North Avebury high grade rim mineralisation strikes east west and dips north at about 70° to 80°. The mineralisation is known along strike length from 354,450m E to 354,850m E and down-dip from about 70 metres below the surface at 2100m RL to about 1800m RL. The mineralisation thickness, from the outer ultramafic contact to the inner 0.7% Ni grade split (6.3 MINERALISATION BOUNDARIES) ranges up to about 30 metres measured perpendicular to the ultramafic boundary.

The perimeters of the North Avebury high grade rim mineralisation from sections 354,450 m E to 354,850m E were wireframed using DATAMINE software.

A block model of the North Avebury high grade rim mineralisation was made by filling the wireframe of the mineralisation with 5\*5\*5 metre blocks using DATAMINE software. No block splitting was permitted during the block filling, so all blocks are the same size. The volumes of the wireframe and block model were:

North Avebury wireframe volume	1,240,000 cubic metres
North Avebury block model volume	1,237,000 cubic metres

The block model volume was within one quarter of one percent of the wireframe volume and was considered acceptable.

Nickel grades were interpolated into the blocks using the nearest neighbour method, a single interpolation point per block, and a 120 metre X 120 metre X 120 metre rectangular search. The search ranges ensured that most blocks in the model were informed although there were uninformed blocks with a combined tonnage of about a quarter of a million tonnes. These uninformed blocks were located along the down-dip extremity of the mineralisation and no further attempt was made to include them in the resource estimates.

Several interpolations were made using different composite lengths for the drill hole samples and the grade ranges, mean grades and variances of the resulting block models were:

<b>composite length</b>	<b>grade range</b>	<b>mean Ni grade</b>	<b>Ni grade variance</b>
1.0m	0.02% to 4.25%	1.11%	0.74% <sup>2</sup>
2.0m	0.03% to 3.71%	1.11%	0.65% <sup>2</sup>
3.0m	0.05% to 3.44%	1.06%	0.61% <sup>2</sup>
4.0m	0.09% to 2.86%	0.98%	0.52% <sup>2</sup>
5.0m	0.16% to 2.57%	0.98%	0.40% <sup>2</sup>

The block model created using the 5 metre composited nickel assays resulted in a model with a nickel grade variance of 0.40%<sup>2</sup> which compared well with the variance of 0.41%<sup>2</sup> estimated from Krige's Relationship (6.1 INTRODUCTION) (Figure 22). This was the block model used as the estimate of the North Avebury high grade rim mineralisation in this report and the global Mineral Resource was estimated to be 3.47 million tonnes at 1.0% Ni.

A check estimate of the global Mineral Resource was made using a manual cross-sectional method (Appendix 7). The global Mineral Resource in North Avebury estimated by the manual sectional method was 3.6 million tonnes at 0.9% Ni which was considered to be in reasonable agreement with the block model estimate.

The length weighted average nickel grade for the North Avebury high grade rim mineralisation was 0.9% Ni. This was the same as the average nickel grade estimated by the cross-sectional method and somewhat lower than the average nickel grade estimate based on the block model. Considering the spatial distribution of intersections throughout North Avebury, the three average nickel grade estimates were considered to be in reasonable agreement.

Cobalt grades were interpolated using the same parameters as were used for the interpolation of nickel grades.

When a 0.8% Ni cut-off (6.6 CUT-OFF GRADES) was applied to the grade-tonnage information the North Avebury Mineral Resource was estimated to be 1.46 million tonnes at 1.5% Ni. The grade-tonnage information for block model of the high grade rim mineralisation was presented as a grade-tonnage curve (Figure 23). Blocks within 25 metres of a cross-section showing at least one drill hole were classified as Indicated Mineral Resources and the balance was classified as Inferred Mineral

Resource, a classification considered consistent with the definitions in the JORC code:

**North Avebury Mineral Resource  
at 0.8% Ni cut-off**

<b>Indicated</b>	<b>1,260,000 tonnes</b>	<b>1.5% Ni</b>	<b>0.04% Co</b>
<b>Inferred</b>	<b>200,000 tonnes</b>	<b>1.8% Ni</b>	<b>0.05% Co</b>
<b>Total</b>	<b>1,460,000 tonnes</b>	<b>1.5% Ni</b>	<b>0.04% Co</b>

Note that much of the Inferred Mineral Resource is located west of 354,525m E and the grade of this part of the resource is strongly influenced by the high grade intersection in hole A011 on section 354,550m E.

Included in the Indicated Mineral Resource, there was a significant tonnage of mineralisation at a higher grade:

**North Avebury Mineral Resource  
at 1.3% Ni cut-off**

<b>Indicated</b>	<b>630,000 tonnes</b>	<b>2.0% Ni</b>	<b>0.05% Co</b>
------------------	-----------------------	----------------	-----------------

**6.7.3 VIKING MINERAL RESOURCE**

There have been two previous estimates of the Viking Mineral Resource at Viking (McKeown, 1999 and Newnham, 2001). During the 2002 diamond drilling programme, all holes passed through or into the southern ultramafic which hosts the Viking mineralisation.

The geological interpretation of the Viking high grade rim mineralisation is shown on sections 354,300 m E to 354,700m E (Figures 2 to 9). The distribution of intersections within the Viking mineralisation is shown on two longitudinal projections (Figures 13 & 14).

The Viking high grade rim mineralisation occupies a saddle shaped zone at the top of the southern ultramafic. The zone strikes east west and dips more or less vertically to

the south and from vertical to 45<sup>0</sup> to the north. The mineralisation is known over a strike length from 354,300m E to 354,700m E and down-dip from about 200 metres below the surface at 2000m RL to about 1700m RL. The mineralisation thickness, from the outer ultramafic contact to the inner 0.7% Ni grade split (6.3 MINERALISATION BOUNDARIES) ranges up to nearly 50 metres measured perpendicular to the ultramafic boundary.

The perimeters of the Viking high grade rim mineralisation from sections 354,300m E to 354,700m E were wireframed using DATAMINE software.

A block model of the Viking high grade rim mineralisation was made by filling the wireframe of the mineralisation with 5\*5\*5 metre blocks using DATAMINE software. No block splitting was permitted during the block filling, so all blocks are the same size. The volumes of the wireframe and block model were:

Viking wireframe volume	1,800,000 cubic metres
Viking block model volume	1,795,000 cubic metres check this

The block model volume was within about one quarter of one percent of the wireframe volume and was considered acceptable.

Nickel grades were interpolated into the blocks using the nearest neighbour method, a single interpolation point per block, and a 100 metre X 100 metre X 100 metre rectangular search. The search ranges ensured that all blocks in the model were informed.

Several interpolations were made using different composite lengths for the drill hole samples and the grade ranges, mean grades and variances of the resulting block models were:

<b>composite length</b>	<b>grade range % Ni</b>	<b>mean Ni grade</b>	<b>Ni grade variance</b>
1.0m	0.10% to 13.48%	1.21%	0.81% <sup>2</sup>
2.0m	0.15% to 7.25%	1.16%	0.51% <sup>2</sup>
3.0m	0.21% to 4.92%	1.08%	0.37% <sup>2</sup>
4.0m	0.26% to 3.85%	1.17%	0.34% <sup>2</sup>
5.0m	0.26% - 3.76 %	1.09%	0.28% <sup>2</sup>

The block model created using the 5 metre composited nickel assays resulted in a model with a nickel grade variance of 0.28%<sup>2</sup> which is less than the variance of 0.47%<sup>2</sup> estimated from Krige's Relationship (6.1 INTRODUCTION) (Figure 24) and suggests that the grades in the block model have been somewhat smoothed compared to the grades in the sample population. This was the block model used for the estimate of the Viking high grade rim mineralisation in this report and the global Mineral Resource was estimated to be 5.39 million tonnes at 1.1% Ni.

A check estimate of the global Mineral Resource was made using a manual cross-sectional method (Appendix 7). The global Mineral Resource in Viking estimated by the manual sectional method was 5.3 million tonnes at 1.2% Ni which was in reasonable agreement with the block model estimate.

The length weighted average nickel grade for the Viking high grade rim mineralisation was 1.1% Ni. This was the same as the average nickel grade estimate based on the block model. The three average nickel grade estimates were considered to be in reasonable agreement.

Cobalt grades were interpolated using the same parameters as were used for the interpolation of nickel grades.

When a 1.0% Ni cut-off (6.5 CUT-OFF GRADES) was applied to the grade-tonnage information the Mineral Resource in the Viking mineralisation was estimated to be 2.60 million tonnes at 1.5% Ni. The grade-tonnage information for the block model was presented as a grade-tonnage curve for the block model (Figure 25). Blocks within 25 metres of a cross-section showing at least one drill hole were classified as Indicated Mineral Resources and the balance was classified as Inferred Mineral Resource, a classification considered consistent with the definitions in the JORC code:

**Viking Mineral Resource  
at 1.0% Ni cut-off**

<b>Indicated</b>	<b>1,880,000 tonnes</b>	<b>1.5% Ni</b>	<b>0.03% Co</b>
<b>Inferred</b>	<b>720,000 tonnes</b>	<b>1.8% Ni</b>	<b>0.03% Co</b>
-----			
<b>Total</b>	<b>2,600,000 tonnes</b>	<b>1.5% Ni</b>	<b>0.03% Co</b>

Included in the Indicated Mineral Resource, there was a significant tonnage of mineralisation at a higher grade:

**Viking Mineral Resource  
at 1.6% Ni cut-off**

<b>Indicated</b>	<b>630,000 tonnes</b>	<b>2.0% Ni</b>	<b>0.05% Co</b>
------------------	-----------------------	----------------	-----------------

**6.7.4 POTENTIAL CONTAMINANTS IN CONCENTRATES**

Two elements are present in the mineralisation which could be deleterious in nickel sulphide concentrates: arsenic and sulphur. Arsenic occurs in several nickel arsenide and nickel sulph-arsenide minerals. Sulphur occurs mainly in nickel sulphides, nickel sulph-arsenides and pyrrhotite. (3 MINERALOGY)

Arsenic is a contaminant in nickel sulphide concentrates. At the present time, the distribution of arsenic in the mineralisation is not well understood but arsenic is not ubiquitous in high grade rim mineralisation. Some high As assays appear to be isolated occurrences, for example, A003 223.7m to 280.0m: all assays are less than 260ppm As but for one assay from 278.1m to 279.1m: 500ppm As, and one from 279.1m to 280.0m: 1.36% As, these two being at the outer contact.

There were insufficient As assay data to perform modelling of As grades.

Sulphur from sulphide minerals other than pentlandite which reports to nickel concentrates dilutes the nickel grade of the concentrates. The distribution of these other sulphide minerals is not well understood at the present time and S grades were not modelled.

## 6.8 OTHER RESOURCES

### 6.8.1 CENTRAL AVEBURY

The Central Avebury nickel mineralisation occurs along the southern, faulted contact of the northern ultramafic near 354,650m E (Figure 8). At the present time, continuity of the mineralisation cannot be assumed and no resource estimate was made.

Two holes have intersected significant nickel mineralisation at Central Avebury:

A001	243.9m to 273.6m	27.9m down-hole length	0.93% Ni, 0.02% Co
	including		
	243.9m to 255,6m	10.7m down-hole length	1.64% Ni, 0.02% Co
	including		
	243.9m to 244.3m	0.4m down-hole length	<b>24.8% Ni</b> , 0.34% Co
A018	298.0m to 311.2m	13.2m down-hole length	1.41% Ni, 0.02% Co

### 6.8.2 PINK EYE

A zone of nickel mineralisation, referred to as the Pink Eye marker unit, has been sporadically recognised about 30 to 40 metres into the hangingwall of Viking North Limb (Figures 2 to 8). The zone appears to be hosted within an altered calcareous unit of the Crimson Creek Formation but the geology of the zone is not well understood. The continuity of mineralisation in the zone is not established and no resource estimate was made. To date, significant nickel sulphide intersections have been made in two holes near 354,500m E (Figure 5):

A038	253.7m to 253.9m	0.2m down-hole length	<b>8.85% Ni</b> , 14.8% S, 0.36% Co
	and		
A038	254.6m to 254.8m	0.2m down-hole length	<b>2.80% Ni</b> , 5.5% S, 0.11% Co
A039	316.0m to 317.3m	1.3m down-hole length	<b>8.15% Ni</b> , 6.9 % S, 0.12% Co

The zone also includes a high grade cobalt intersection near 354,400m E (Figure 3):

A025 480.8m to 490.8m 10.0m down-hole length 0.03% Ni, 0.26% S, **0.30%**

**Co**

including

1.0m down-hole length 0.06% Ni, 0.81% S, **1.13% Co**

### 6.8.3 OTHER INTERSECTIONS

In the Crimson Creek Formation in the hangingwall of the Viking high grade rim mineralisation, there are several significant nickel intersections near 354,400E and 354,450 E (Figures 3 and 4). At the present time, continuity of the mineralisation cannot be assumed and no resource estimate was made.

The intersections include, for example:

A014 243.7m to 246.7m 3.0m down-hole length 1.50% Ni

A024 497.0m to 501.4m 4.4m down-hole length 0.53% Ni

A028 252.0m to 256.0m 4.0m down-hole length 1.27% Ni

## 7 MINERAL RESOURCE SUMMARY

A summary of the Mineral Resources at the Avebury Project is presented in Table 4.

**TABLE 4**  
**AVEBURY NICKEL PROJECT**  
**MINERAL RESOURCES - NOVEMBER 2002**

<b>INDICATED MINERAL RESOURCE</b>				
	<b>cutoff</b>	<b>resource</b>	<b>grade</b>	<b>grade</b>
	<b>%Ni</b>	<b>tonnes</b>	<b>% Ni</b>	<b>% Co</b>
North Avebury	0.8	1,260,000	1.5	0.04
Viking	1.0	1,880,000	1.5	0.03
<b>Total</b>		<b>3,140,000</b>	<b>1.5</b>	<b>0.03</b>

<b>INFERRED MINERAL RESOURCE</b>				
	<b>cutoff</b>	<b>resource</b>	<b>grade</b>	<b>grade</b>
	<b>%Ni</b>	<b>tonnes</b>	<b>% Ni</b>	<b>% Co</b>
North Avebury	0.8	200,000	1.8	0.05
Viking	1.0	720,000	1.5	0.03
<b>Total</b>		<b>920,000</b>	<b>1.6</b>	<b>0.03</b>

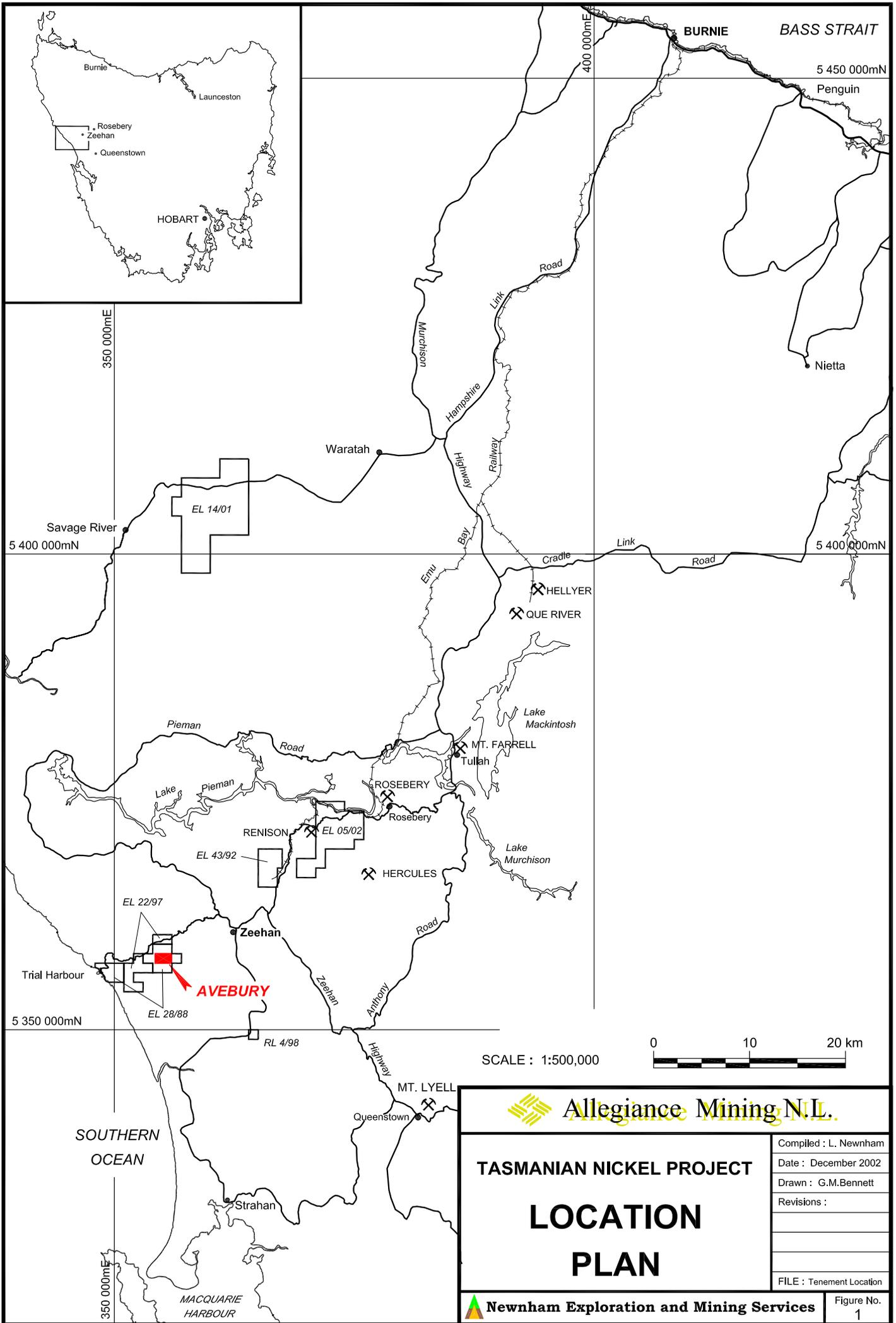
<b>TOTAL MINERAL RESOURCE</b>				
	<b>cutoff</b>	<b>resource</b>	<b>grade</b>	<b>grade</b>
	<b>%Ni</b>	<b>tonnes</b>	<b>% Ni</b>	<b>% Co</b>
North Avebury	0.8	1,460,000	1.5	0.04
Viking	1.0	2,600,000	1.5	0.03
<b>Total</b>		<b>4,060,000</b>	<b>1.5</b>	<b>0.03</b>

<b>CONTAINED WITHIN THE INDICATED MINERAL RESOURCE</b>				
	<b>cutoff</b>	<b>resource</b>	<b>grade</b>	<b>grade</b>
	<b>%Ni</b>	<b>tonnes</b>	<b>% Ni</b>	<b>% Co</b>
North Avebury	1.3	630,000	2.0	0.05
Viking	1.6	630,000	2.0	0.05
<b>Total</b>		<b>1,260,000</b>	<b>2.0</b>	<b>0.05</b>

## **REFERENCES**

**McKeown, M.V., 1999.** Allegiance Mining NL, Avebury Nickel Project, Mineral Resource Report, November 2000. McKeown Mining Pty Ltd.

**Newnham, L.A, 2001.** Avebury EL 28/1988 Resource and Project Development Recommendations Report, June 2001. Newnham Exploration and Mining Services.



 Allegiance Mining N.L.

TASMANIAN NICKEL PROJECT

# LOCATION PLAN

Compiled : L. Newnham

Date : December 2002

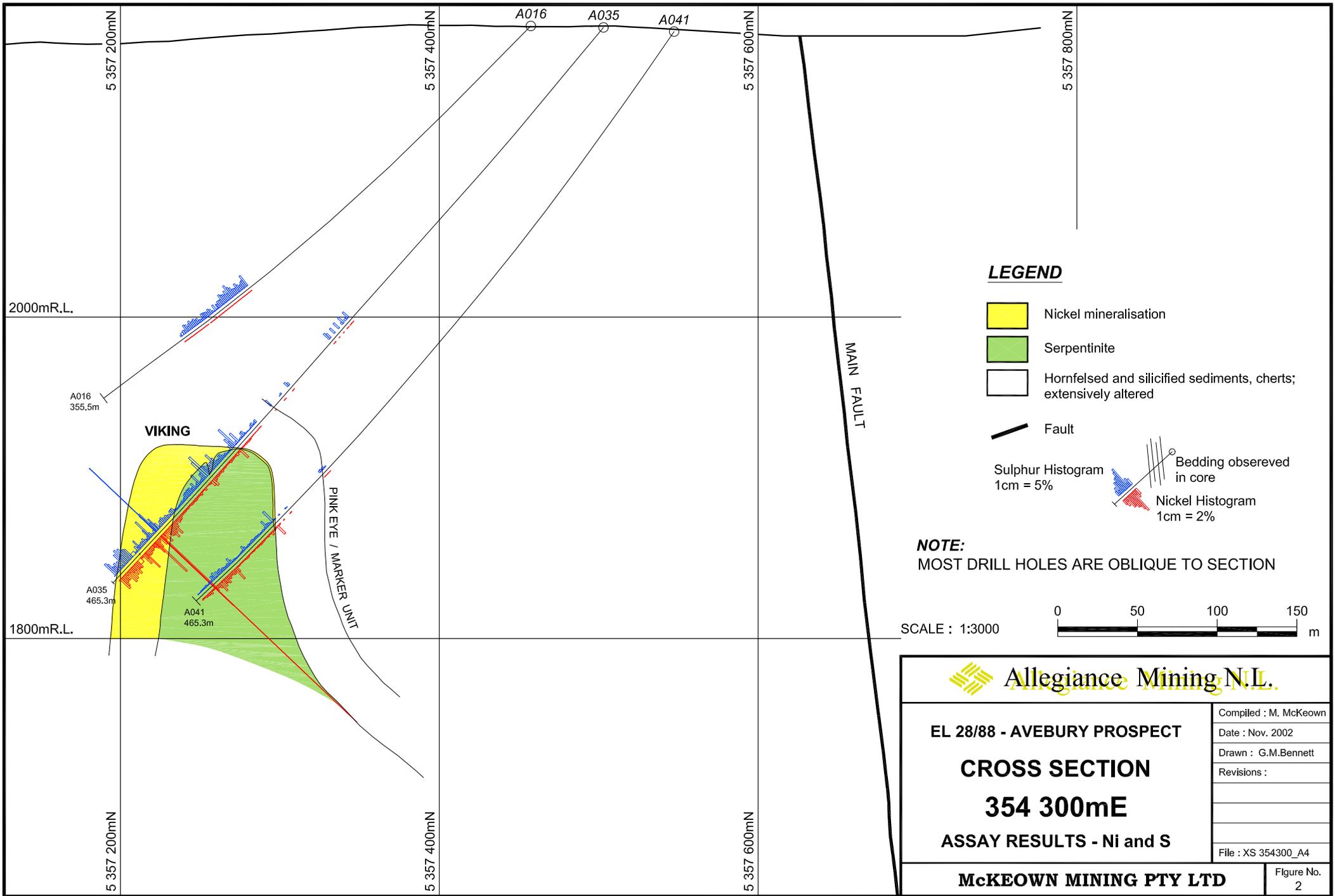
Drawn : G.M.Bennett

Revisions :

FILE : Tenement Location

 Newnham Exploration and Mining Services

Figure No. 1



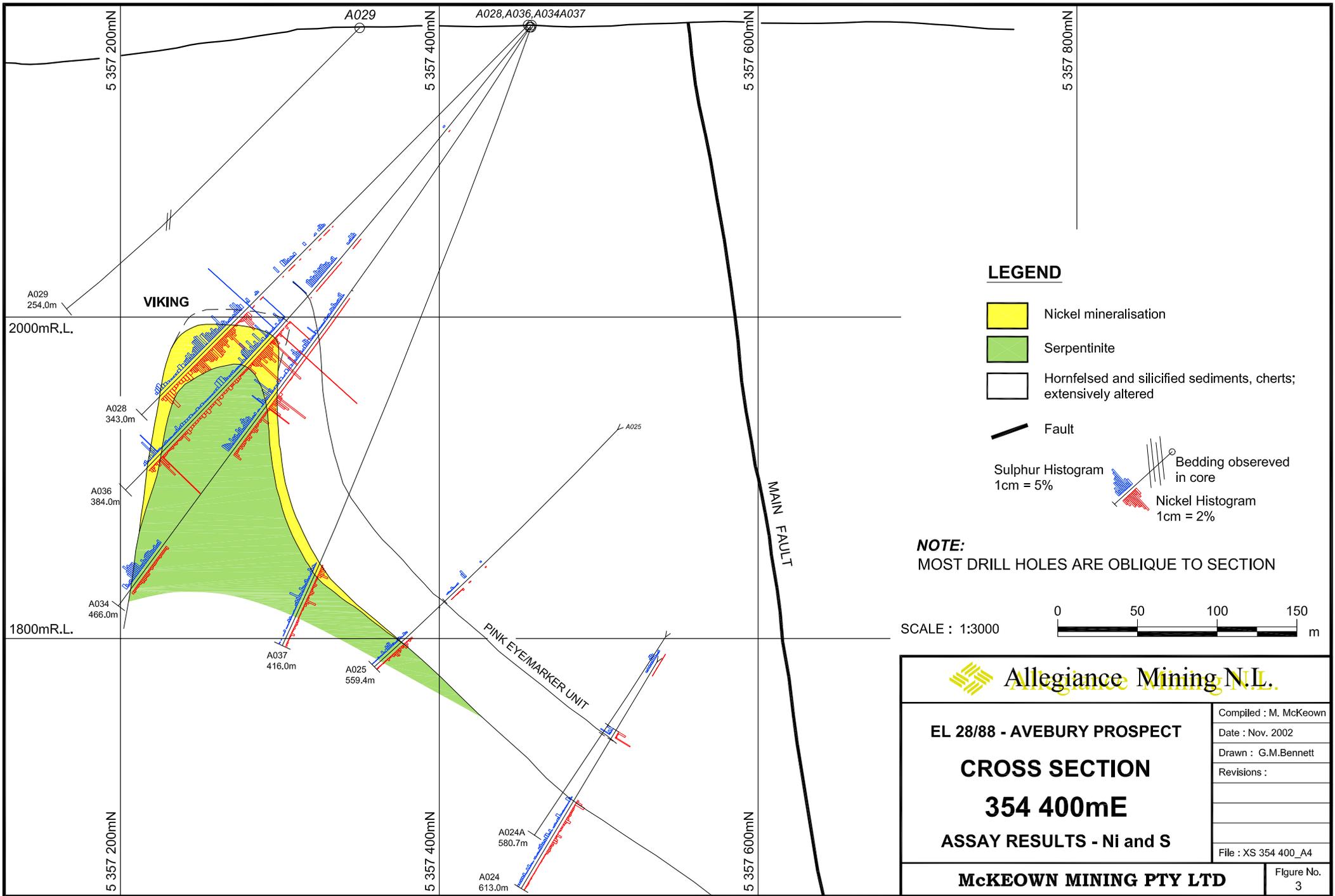
**LEGEND**

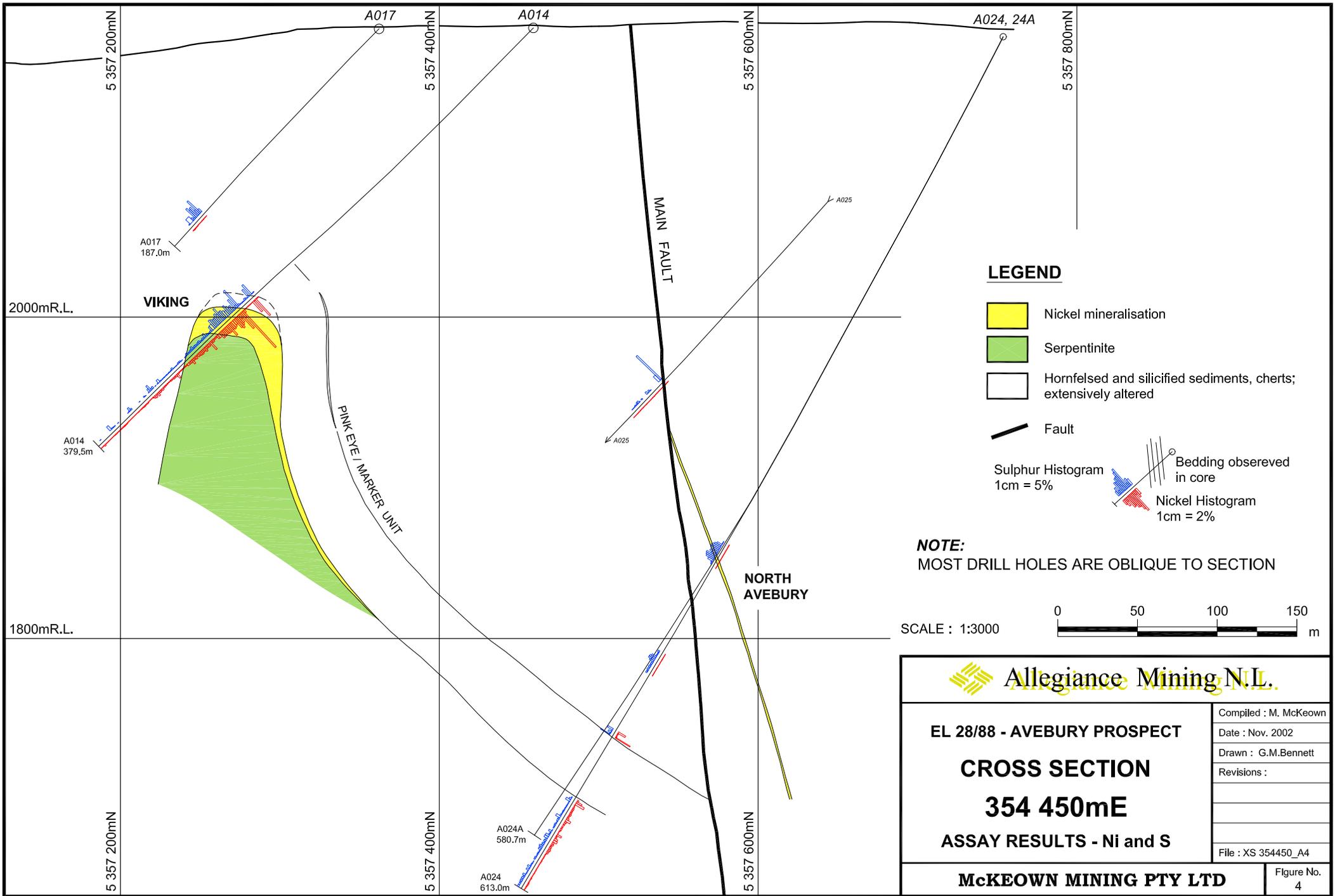
- Nickel mineralisation
- Serpentinite
- Hornfelsed and silicified sediments, cherts; extensively altered
- Fault
- Sulphur Histogram  
1cm = 5%
- Nickel Histogram  
1cm = 2%
- Bedding observed in core

**NOTE:**  
MOST DRILL HOLES ARE OBLIQUE TO SECTION



<b>Allegiance Mining N.L.</b>	
<b>EL 28/88 - AVEBURY PROSPECT</b>  <b>CROSS SECTION</b>  <b>354 300mE</b>  <b>ASSAY RESULTS - Ni and S</b>	Compiled : M. McKeown Date : Nov. 2002 Drawn : G.M.Bennett Revisions :  File : XS 354300_A4
<b>McKEOWN MINING PTY LTD</b>	Figure No. <b>2</b>





**LEGEND**

- Nickel mineralisation
- Serpentinite
- Hornfelsed and silicified sediments, cherts; extensively altered
- Fault
- Sulphur Histogram  
1cm = 5%
- Nickel Histogram  
1cm = 2%
- Bedding observed in core

**NOTE:**  
MOST DRILL HOLES ARE OBLIQUE TO SECTION



**Allegiance Mining N.L.**

**EL 28/88 - AVEBURY PROSPECT**

**CROSS SECTION**

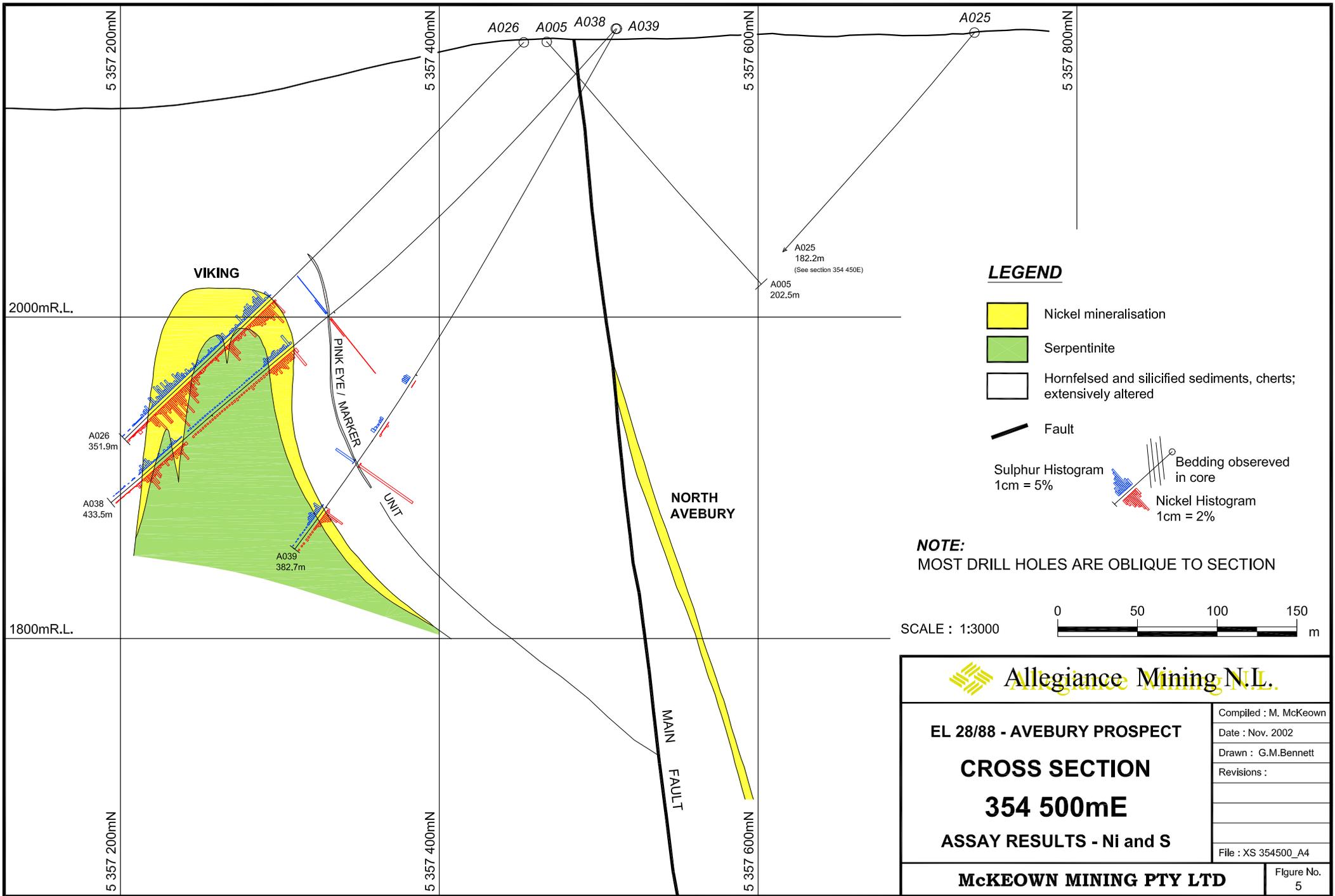
**354 450mE**

**ASSAY RESULTS - Ni and S**

**McKEOWN MINING PTY LTD**

Compiled : M. McKeown
Date : Nov. 2002
Drawn : G.M.Bennett
Revisions :
File : XS 354450_A4

Figure No.  
4



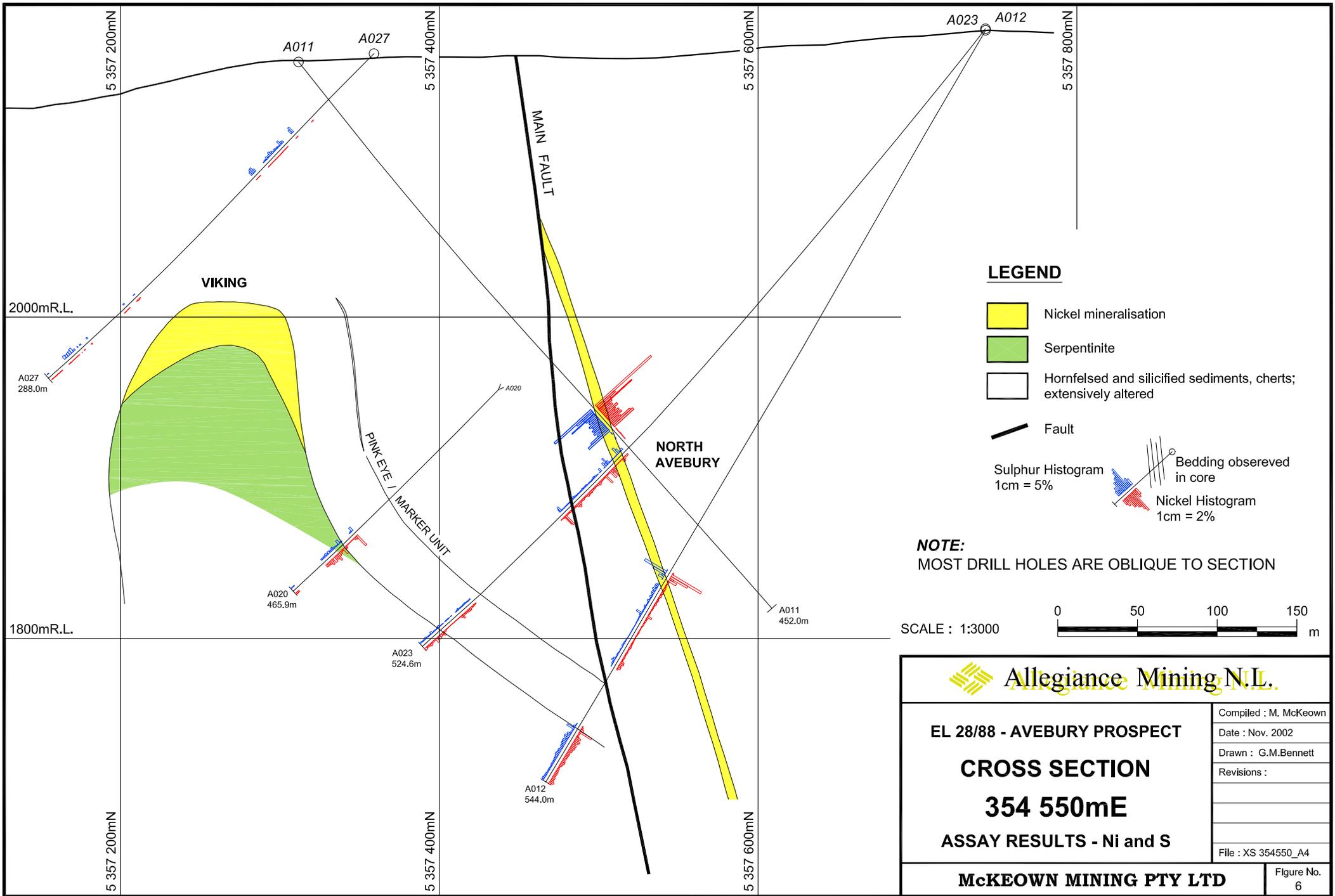
**LEGEND**

- Nickel mineralisation
- Serpentinite
- Hornfelsed and silicified sediments, cherts; extensively altered
- Fault
- Sulphur Histogram  
1cm = 5%
- Nickel Histogram  
1cm = 2%
- Bedding observed in core

**NOTE:**  
MOST DRILL HOLES ARE OBLIQUE TO SECTION

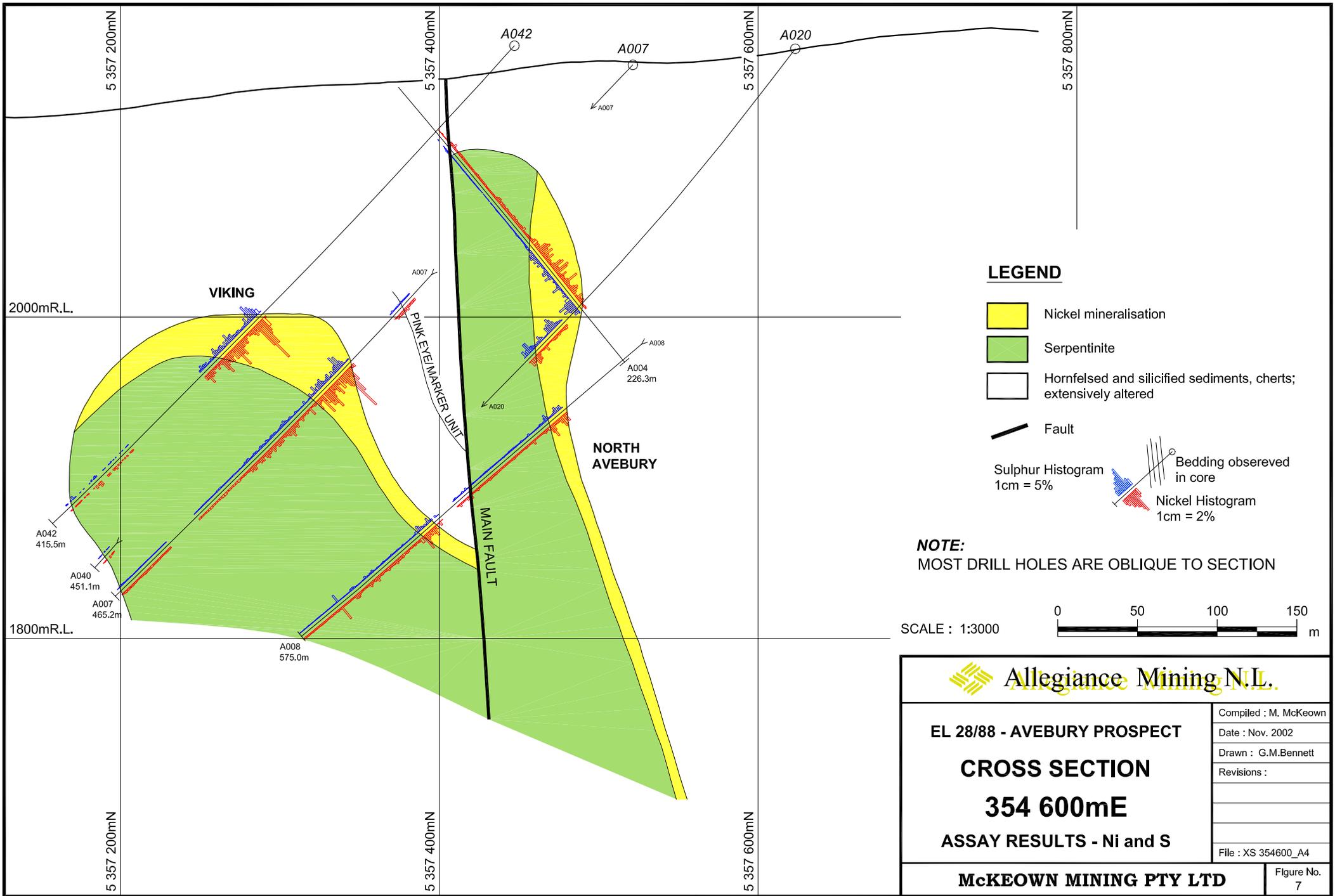


<b>Allegiance Mining N.L.</b>	
<b>EL 28/88 - AVEBURY PROSPECT</b>  <b>CROSS SECTION</b>  <b>354 500mE</b>  <b>ASSAY RESULTS - Ni and S</b>	Compiled : M. McKeown Date : Nov. 2002 Drawn : G.M.Bennett Revisions :  File : XS 354500_A4
<b>McKEOWN MINING PTY LTD</b>	Figure No. <b>5</b>



**Allegiance Mining N.L.**

<p><b>EL 28/88 - AVEBURY PROSPECT</b></p> <p><b>CROSS SECTION</b></p> <p><b>354 550mE</b></p> <p><b>ASSAY RESULTS - Ni and S</b></p>	<p>Compiled : M. McKeown</p> <p>Date : Nov. 2002</p> <p>Drawn : G.M.Bennett</p> <p>Revisions :</p> <p>File : XS 354550_A4</p>
<p><b>McKEOWN MINING PTY LTD</b></p>	<p>Figure No. 6</p>



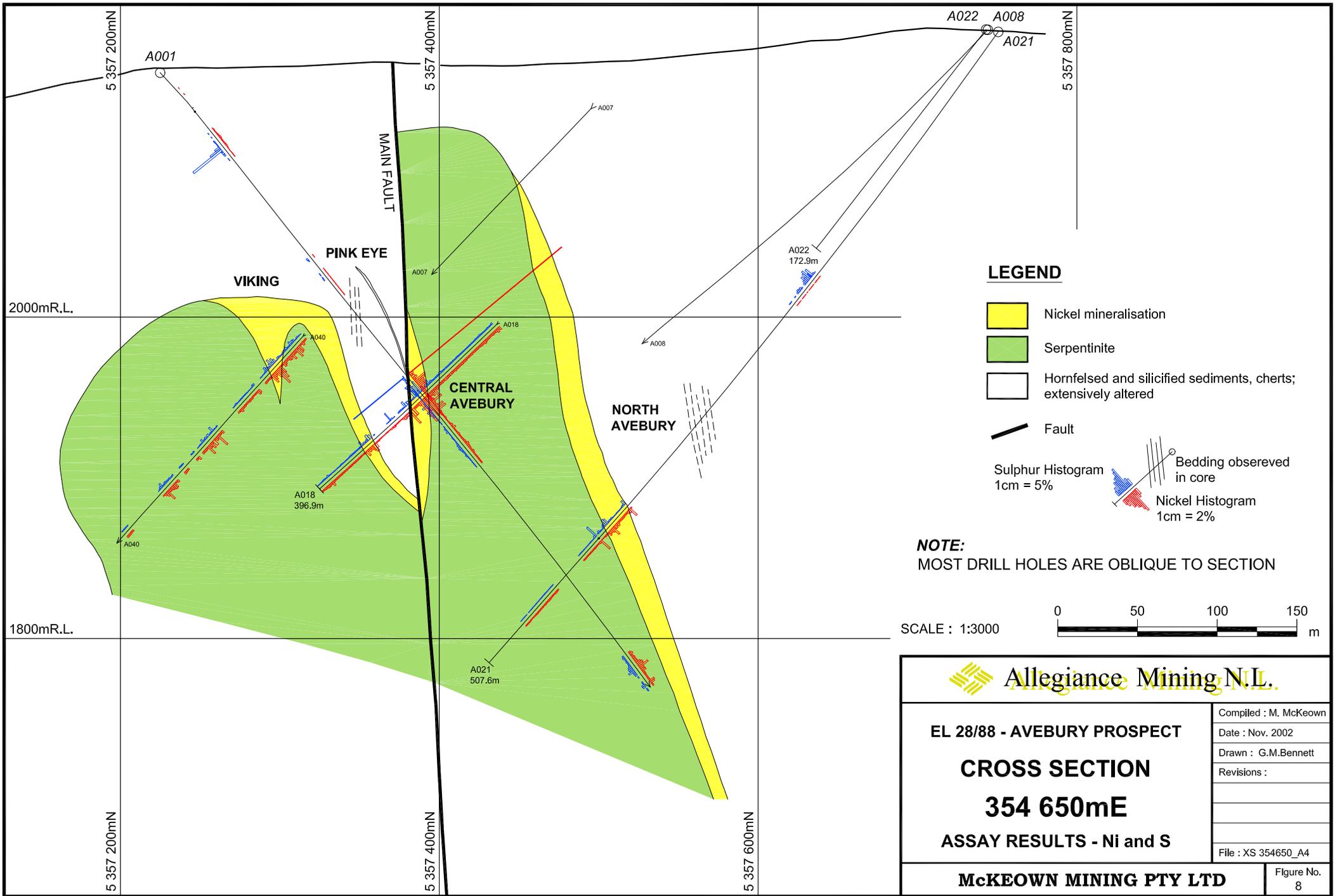
**LEGEND**

- Nickel mineralisation
- Serpentinite
- Hornfelsed and silicified sediments, cherts; extensively altered
- Fault
- Sulphur Histogram  
1cm = 5%
- Nickel Histogram  
1cm = 2%
- Bedding observed in core

**NOTE:**  
MOST DRILL HOLES ARE OBLIQUE TO SECTION



<b>Allegiance Mining N.L.</b>	
<b>EL 28/88 - AVEBURY PROSPECT</b>  <b>CROSS SECTION</b>  <b>354 600mE</b>  <b>ASSAY RESULTS - Ni and S</b>	Compiled : M. McKeown Date : Nov. 2002 Drawn : G.M.Bennett Revisions :  File : XS 354600_A4
<b>McKEOWN MINING PTY LTD</b>	Figure No. <b>7</b>



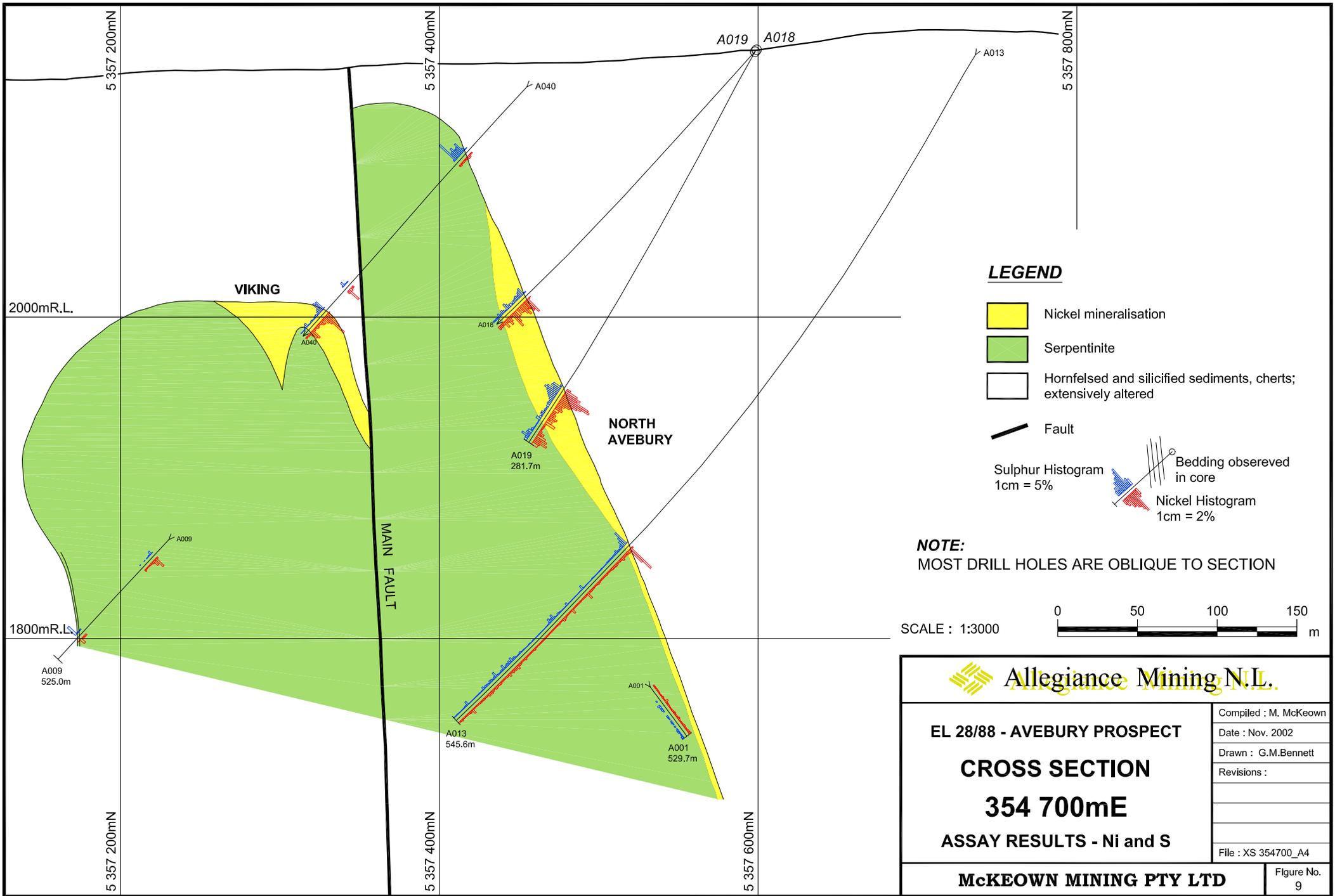
**LEGEND**

- Nickel mineralisation
- Serpentinite
- Hornfelsed and silicified sediments, cherts; extensively altered
- Fault
- Sulphur Histogram  
1cm = 5%
- Nickel Histogram  
1cm = 2%
- Bedding observed in core

**NOTE:**  
MOST DRILL HOLES ARE OBLIQUE TO SECTION



<b>Allegiance Mining N.L.</b>	
<b>EL 28/88 - AVEBURY PROSPECT</b>  <b>CROSS SECTION</b>  <b>354 650mE</b>  <b>ASSAY RESULTS - Ni and S</b>	Compiled : M. McKeown Date : Nov. 2002 Drawn : G.M.Bennett Revisions : _____ _____ File : XS 354650_A4
<b>McKEOWN MINING PTY LTD</b>	Figure No. <b>8</b>



**LEGEND**

- Nickel mineralisation
- Serpentinite
- Hornfelsed and silicified sediments, cherts; extensively altered
- Fault
- Sulphur Histogram  
1cm = 5%
- Nickel Histogram  
1cm = 2%
- Bedding observed in core

**NOTE:**  
MOST DRILL HOLES ARE OBLIQUE TO SECTION



**Allegiance Mining N.L.**

**EL 28/88 - AVEBURY PROSPECT**

**CROSS SECTION**

**354 700mE**

**ASSAY RESULTS - Ni and S**

**McKEOWN MINING PTY LTD**

Compiled : M. McKeown

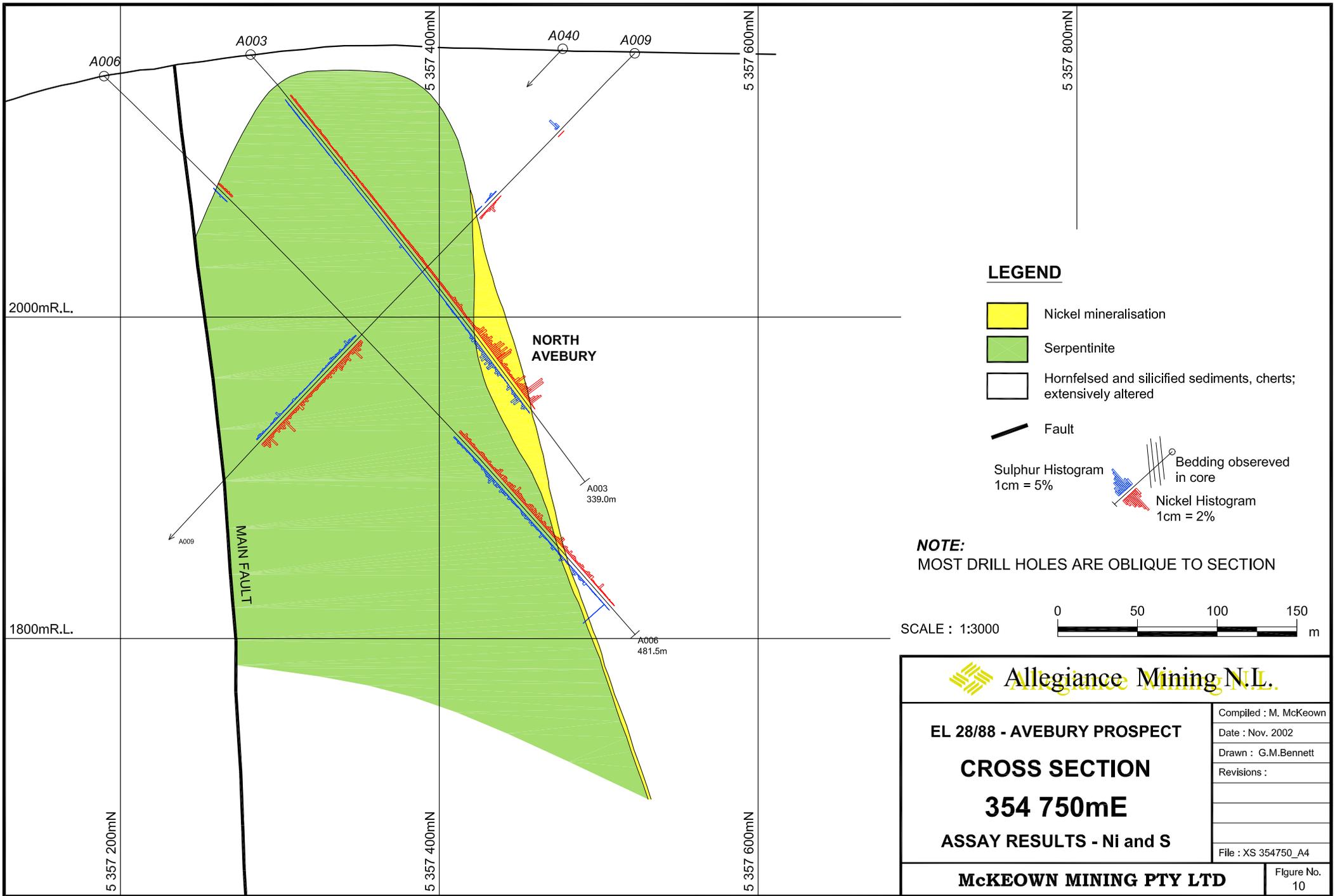
Date : Nov. 2002

Drawn : G.M.Bennett

Revisions :

File : XS 354700\_A4

Figure No.  
9



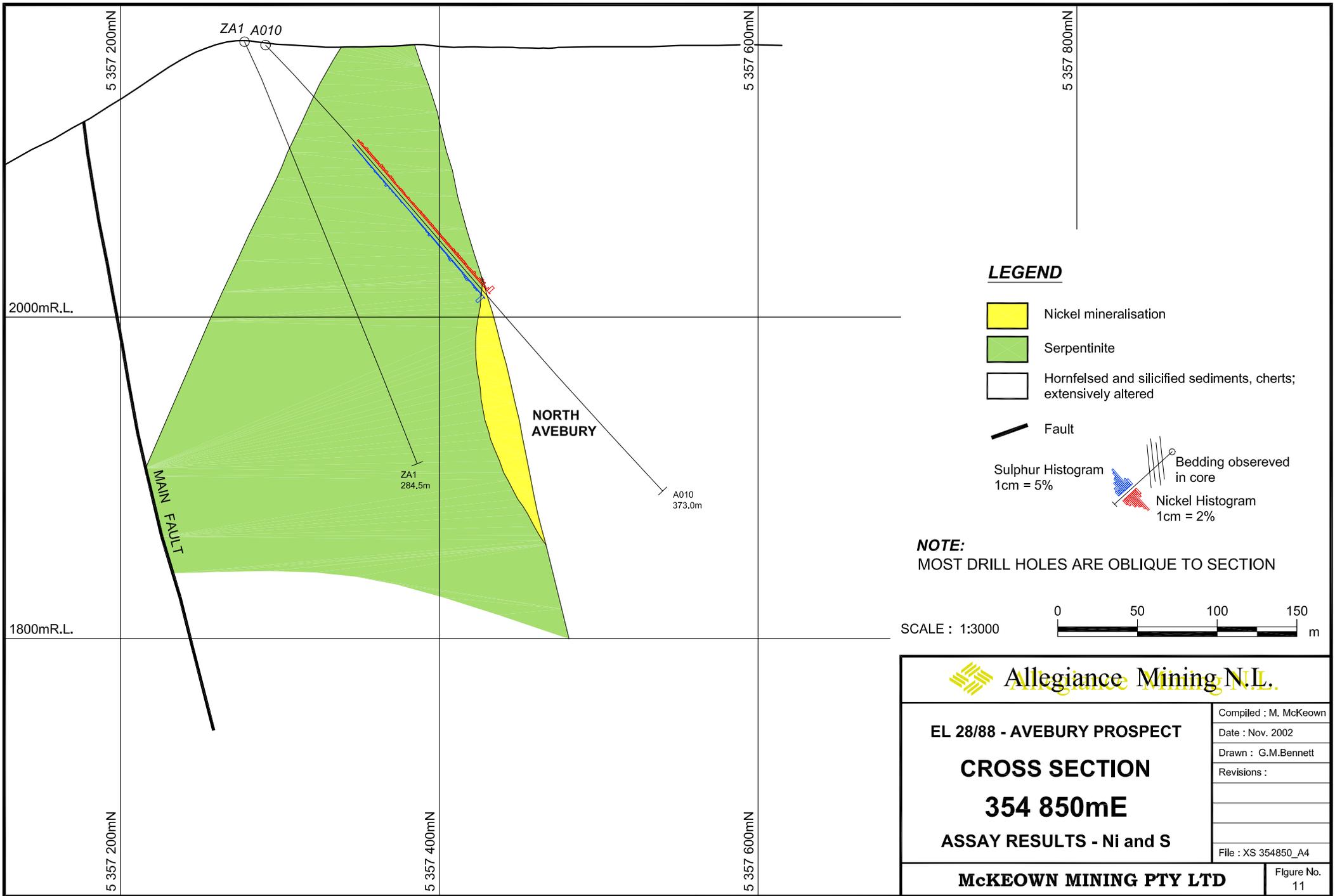
**LEGEND**

- Nickel mineralisation
- Serpentinite
- Hornfelsed and silicified sediments, cherts; extensively altered
- Fault
- Sulphur Histogram  
1cm = 5%
- Nickel Histogram  
1cm = 2%
- Bedding observed in core

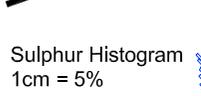
**NOTE:**  
MOST DRILL HOLES ARE OBLIQUE TO SECTION



<b>Allegiance Mining N.L.</b>	
<b>EL 28/88 - AVEBURY PROSPECT</b>  <b>CROSS SECTION</b>  <b>354 750mE</b>  <b>ASSAY RESULTS - Ni and S</b>	Compiled : M. McKeown Date : Nov. 2002 Drawn : G.M.Bennett Revisions :  File : XS 354750_A4
<b>McKEOWN MINING PTY LTD</b>	Figure No. 10



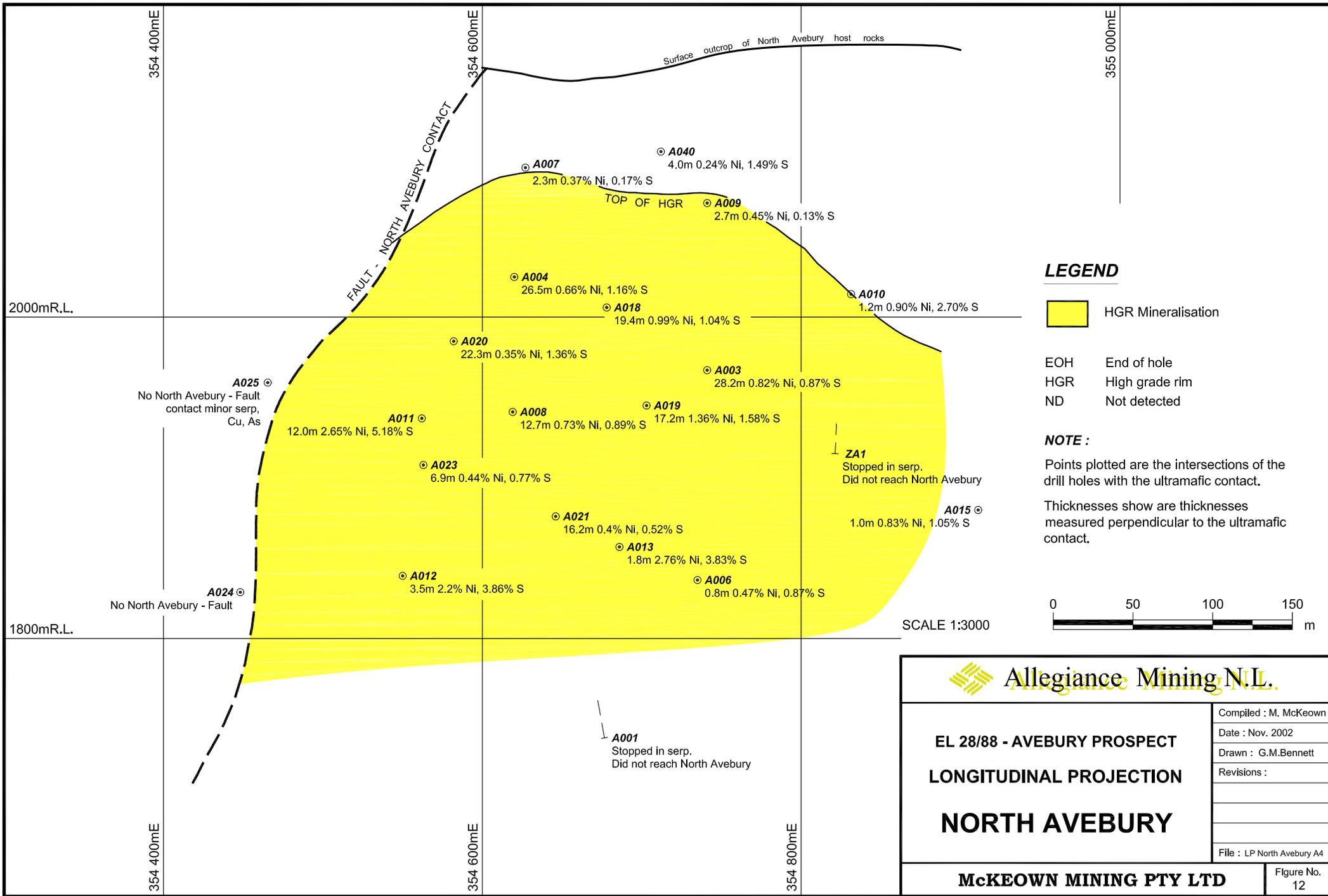
**LEGEND**

-  Nickel mineralisation
-  Serpentinite
-  Hornfelsed and silicified sediments, cherts; extensively altered
-  Fault
-  Sulphur Histogram  
1cm = 5%
-  Bedding observed in core
-  Nickel Histogram  
1cm = 2%

**NOTE:**  
MOST DRILL HOLES ARE OBLIQUE TO SECTION

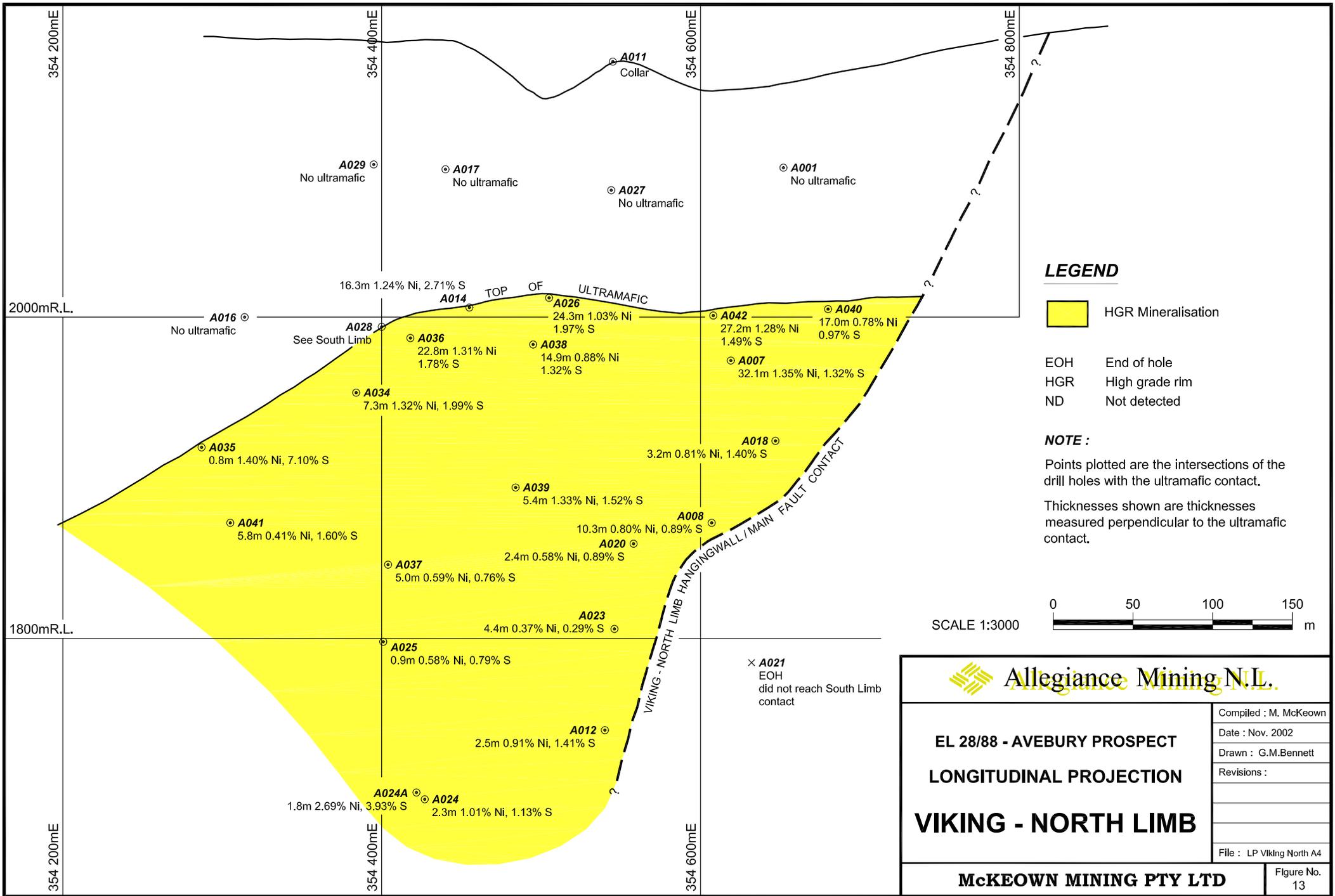
SCALE : 1:3000 

 <b>Allegiance Mining N.L.</b>	
<p><b>EL 28/88 - AVEBURY PROSPECT</b></p> <p><b>CROSS SECTION</b></p> <p><b>354 850mE</b></p> <p><b>ASSAY RESULTS - Ni and S</b></p>	<p>Compiled : M. McKeown</p> <p>Date : Nov. 2002</p> <p>Drawn : G.M.Bennett</p> <p>Revisions :</p> <p>File : XS 354850_A4</p>
<b>McKEOWN MINING PTY LTD</b>	Figure No. 11



**Allegiance Mining N.L.**

<p><b>EL 28/88 - AVEBURY PROSPECT</b></p> <p><b>LONGITUDINAL PROJECTION</b></p> <p><b>NORTH AVEBURY</b></p>	Compiled : M. McKeown
	Date : Nov. 2002
	Drawn : G.M.Bennett
	Revisions :
	File : LP North Avebury A4
<b>McKEOWN MINING PTY LTD</b>	
Figure No. 12	



354 200mE 354 400mE 354 600mE 354 800mE

2000mR.L. 1800mR.L.

354 200mE 354 400mE 354 600mE

**A011** Collar

**A029** No ultramafic

**A017** No ultramafic

**A027** No ultramafic

**A001** No ultramafic

16.3m 1.24% Ni, 2.71% S

**A014** TOP OF ULTRAMAFIC

**A026** 24.3m 1.03% Ni 1.97% S

**A042** 27.2m 1.28% Ni 1.49% S

**A040** 17.0m 0.78% Ni 0.97% S

**A016** No ultramafic

**A028** See South Limb

**A036** 22.8m 1.31% Ni 1.78% S

**A038** 14.9m 0.88% Ni 1.32% S

**A007** 32.1m 1.35% Ni, 1.32% S

**A034** 7.3m 1.32% Ni, 1.99% S

**A035** 0.8m 1.40% Ni, 7.10% S

**A041** 5.8m 0.41% Ni, 1.60% S

**A018** 3.2m 0.81% Ni, 1.40% S

**A039** 5.4m 1.33% Ni, 1.52% S

**A008** 10.3m 0.80% Ni, 0.89% S

**A020** 2.4m 0.58% Ni, 0.89% S

**A037** 5.0m 0.59% Ni, 0.76% S

**A023** 4.4m 0.37% Ni, 0.29% S

**A025** 0.9m 0.58% Ni, 0.79% S

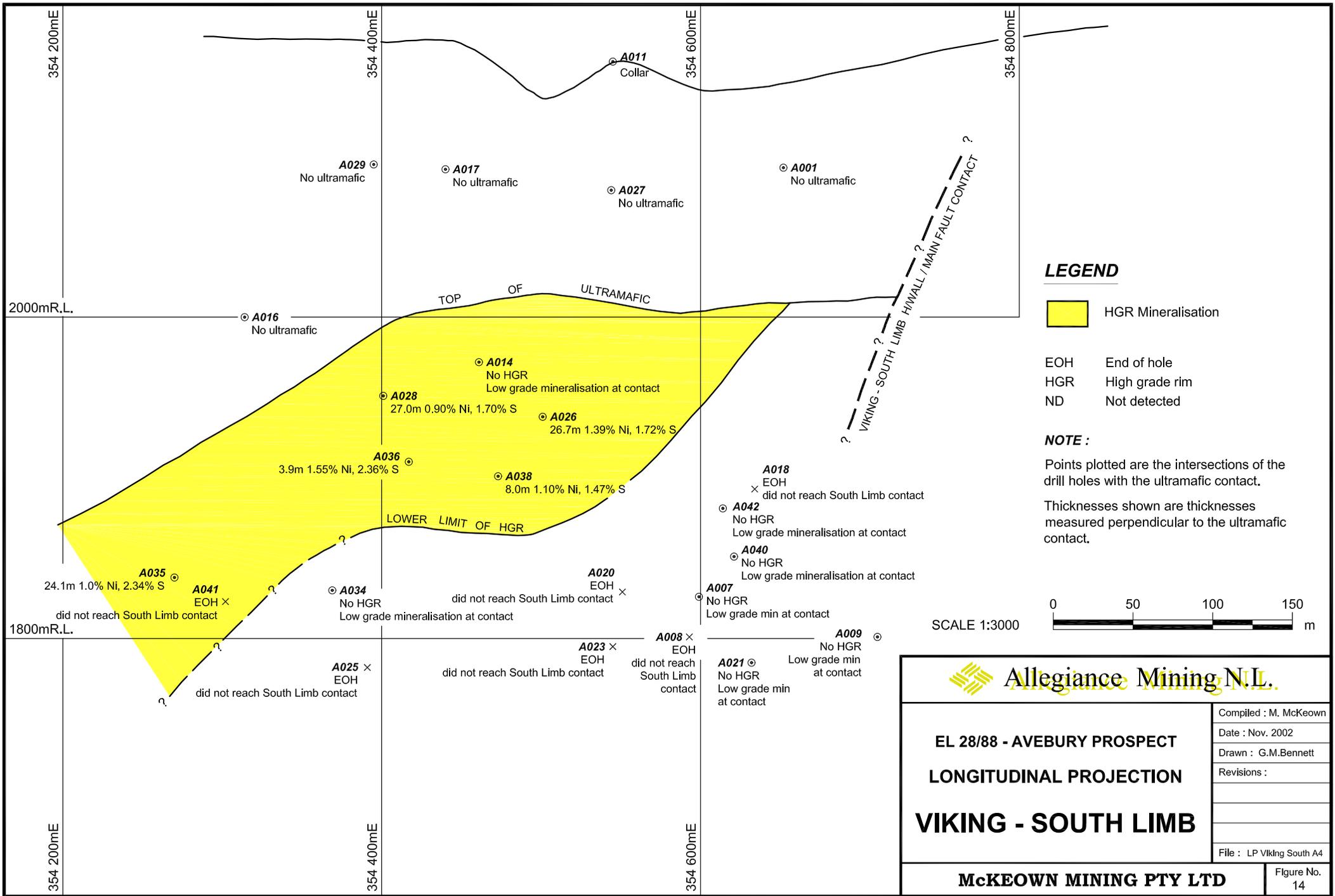
**A012** 2.5m 0.91% Ni, 1.41% S

**A024A** 1.8m 2.69% Ni, 3.93% S

**A024** 2.3m 1.01% Ni, 1.13% S

VIKING - NORTH LIMB HANGINGWALL / MAIN FAULT CONTACT

**A021** EOH did not reach South Limb contact

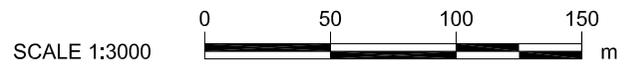


**LEGEND**

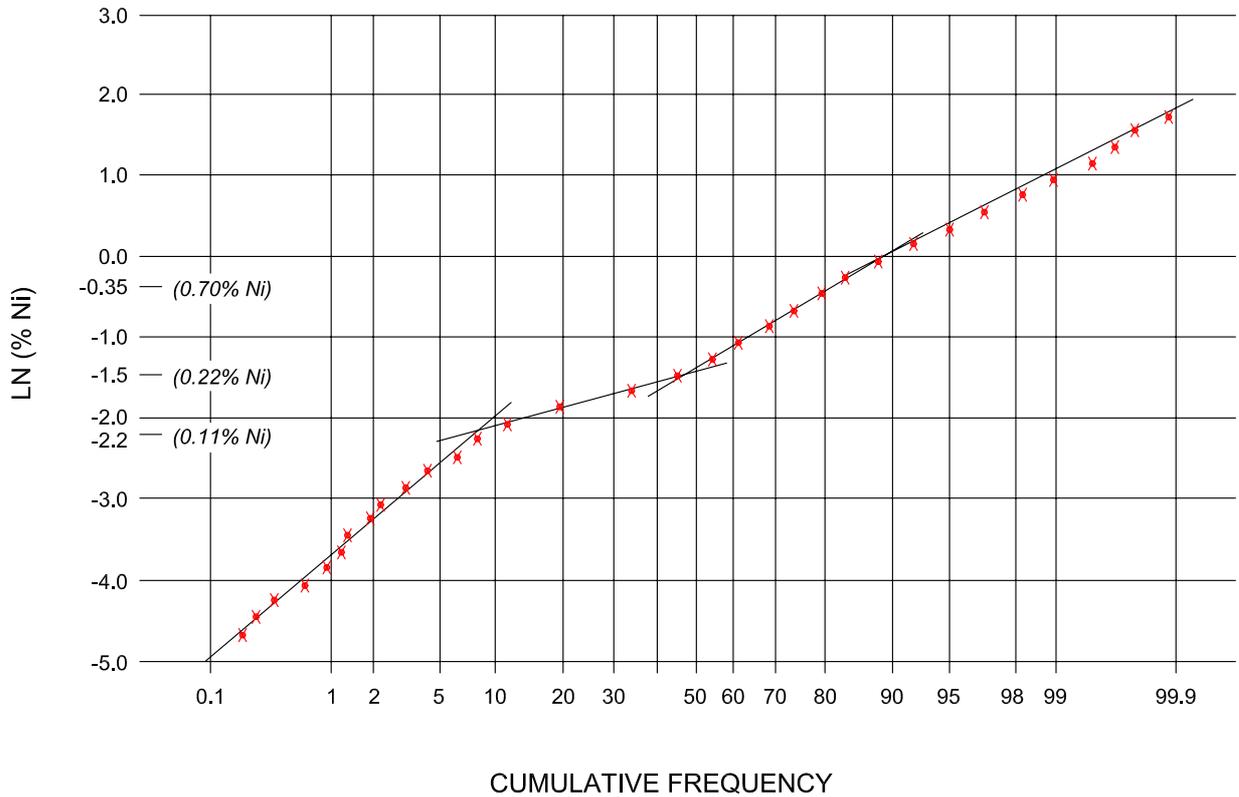
- HGR Mineralisation
- EOH End of hole
- HGR High grade rim
- ND Not detected

**NOTE :**

Points plotted are the intersections of the drill holes with the ultramafic contact.  
 Thicknesses shown are thicknesses measured perpendicular to the ultramafic contact.



<b>Allegiance Mining N.L.</b>	
<b>EL 28/88 - AVEBURY PROSPECT</b> <b>LONGITUDINAL PROJECTION</b> <b>VIKING - SOUTH LIMB</b>	Compiled : M. McKeown Date : Nov. 2002 Drawn : G.M.Bennett Revisions : File : LP Viking South A4
<b>McKEOWN MINING PTY LTD</b>	Figure No. <b>14</b>



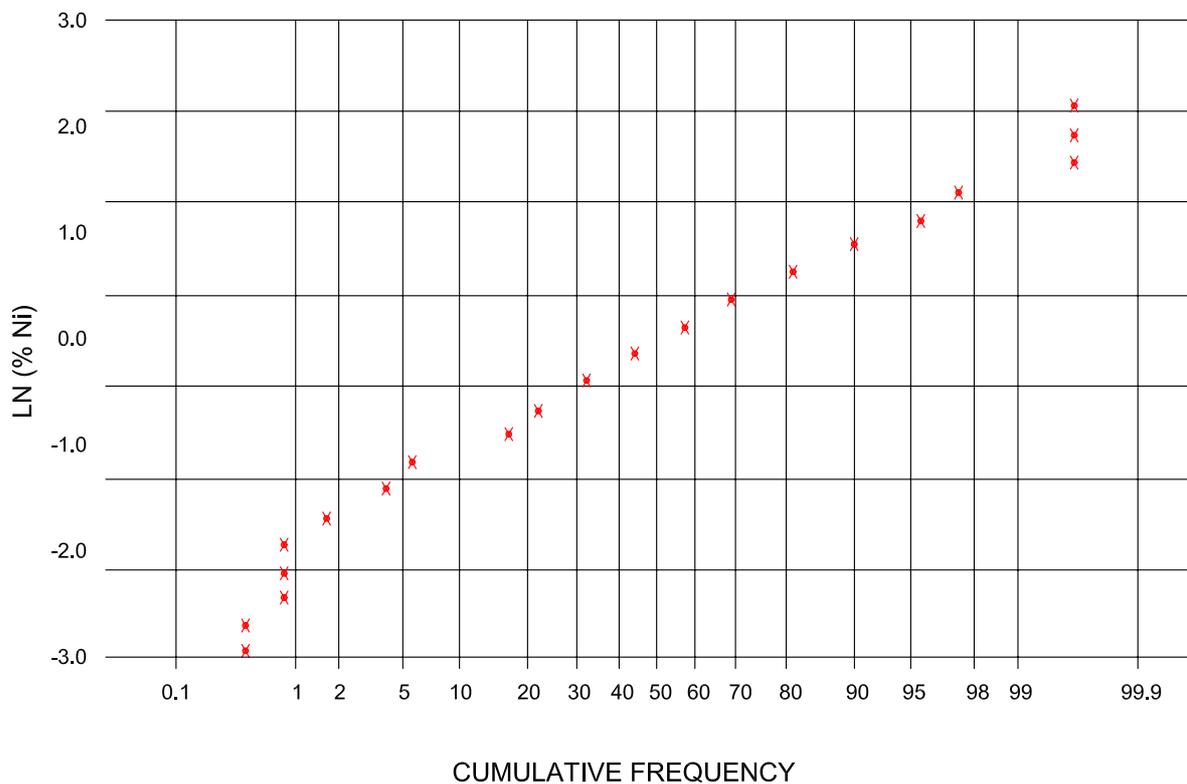
 Allegiance Mining N.L.

**EL 28/88 - AVEBURY PROSPECT**  
**AVEBURY MINERALISATION**  
**LOG PROBABILITY PLOT**  
**1m COMPOSITES % Ni**

Compiled : M.McKeown  
 Date : November 2002  
 Drawn : G.M.Bennett  
 Revisions :  
 \_\_\_\_\_  
 \_\_\_\_\_  
 File : AM PLog Ni

**McKEOWN MINING PTY LTD**

Figure No.  
15



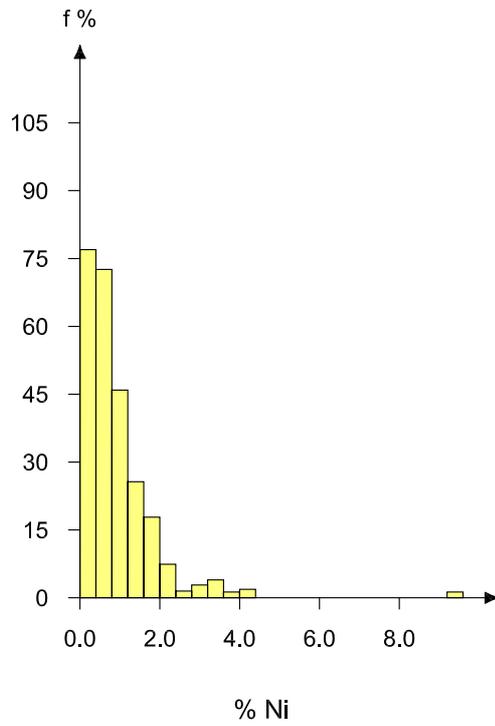
 Allegiance Mining N.L.

**EL 28/88 - AVEBURY PROSPECT**  
**NORTH AVEBURY MINERALISATION**  
**LOG PROBABILITY PLOT**  
**1m COMPOSITES % Ni**

Compiled : M.McKeown  
 Date : November 2002  
 Drawn : G.M.Bennett  
 Revisions :  
 \_\_\_\_\_  
 \_\_\_\_\_  
 File : NAM PLog Ni

**McKEOWN MINING PTY LTD**

Figure No.  
16



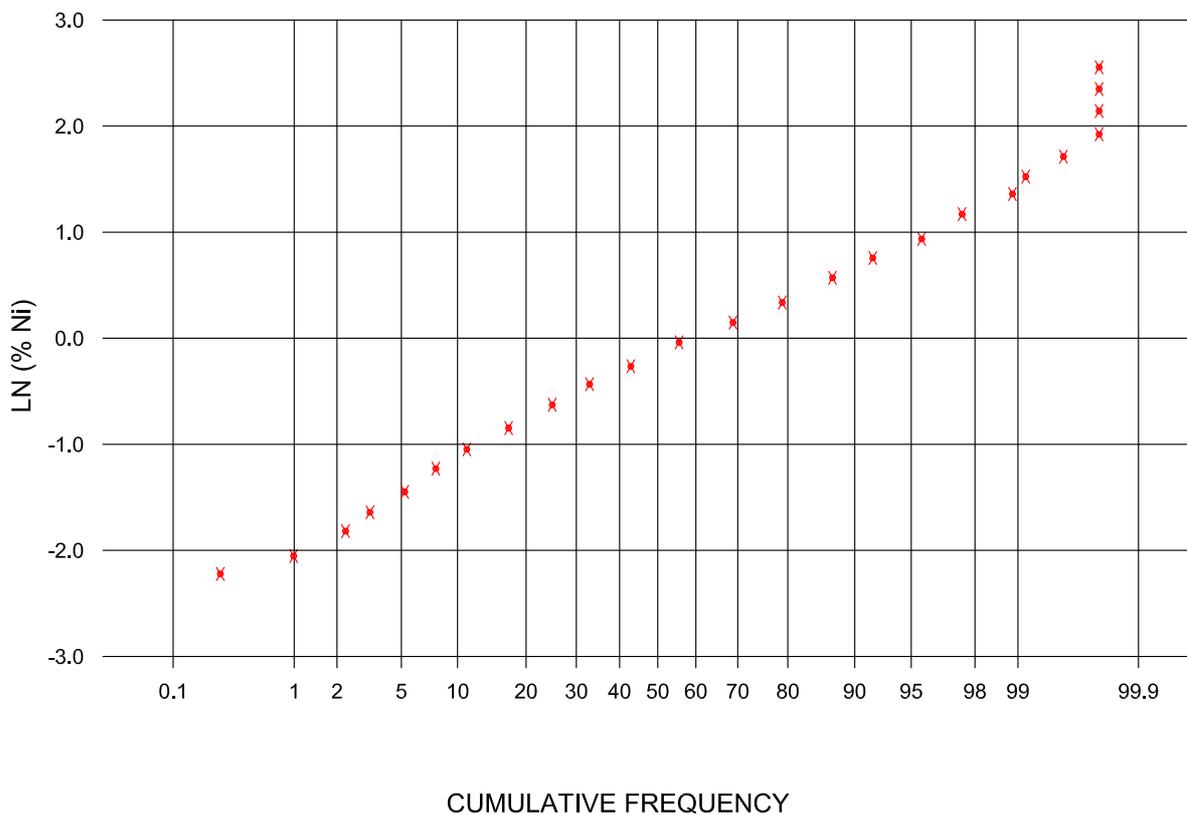
 Allegiance Mining N.L.

**EL 28/88 - AVEBURY PROSPECT**  
**NORTH AVEBURY MINERALISATION**  
**HISTOGRAM OF**  
**1m COMPOSITES (% Ni)**

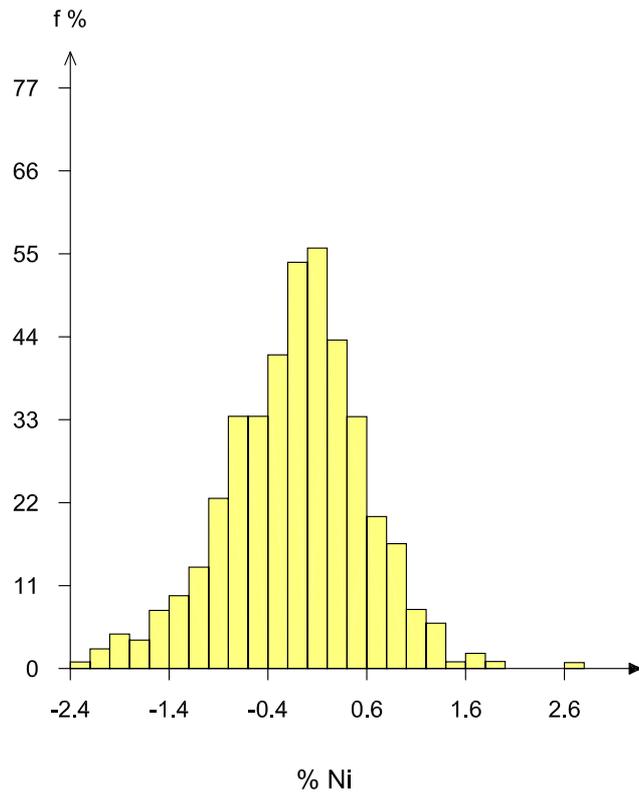
Compiled : M.McKeown  
 Date : November 2002  
 Drawn : G.M.Bennett  
 Revisions :  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 File : NA Hist Ni

**McKEOWN MINING PTY LTD**

Figure No.  
17



 <b>Allegiance Mining N.L.</b>	
<b>EL 28/88 - AVEBURY PROSPECT</b> <b>VIKING MINERALISATION</b> <b>LOG PROBABILITY PLOT</b> <b>1m COMPOSITES % Ni</b>	Compiled : M.McKeown Date : November 2002 Drawn : G.M.Bennett Revisions :  File : VM PLog Ni
<b>McKEOWN MINING PTY LTD</b>	Figure No. 18



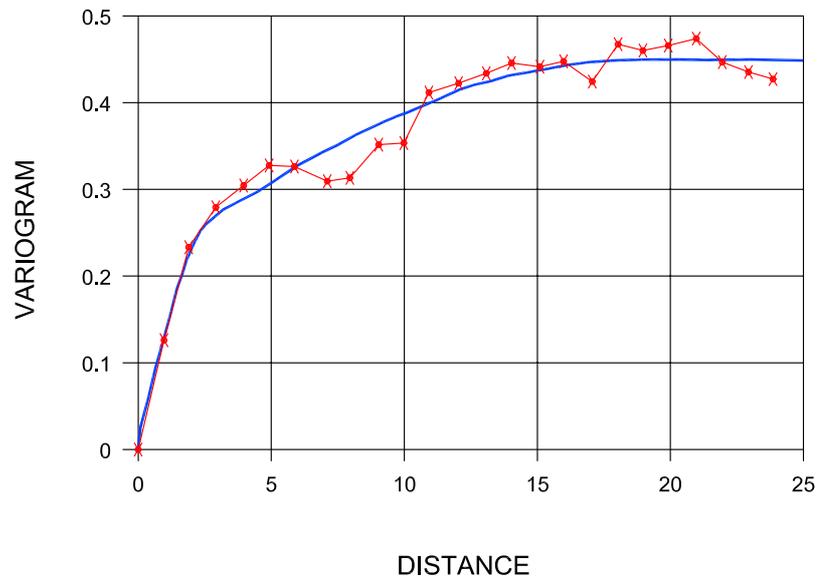
 Allegiance Mining N.L.

**EL 28/88 - AVEBURY PROSPECT**  
**VIKING MINERALISATION**  
**HISTOGRAM OF**  
**1m COMPOSITES In (% Ni)**

Compiled : M.McKeown  
 Date : November 2002  
 Drawn : G.M.Bennett  
 Revisions :  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 File : VM Hist In Ni

**McKEOWN MINING PTY LTD**

Figure No.  
19



—x— Experimental Variogram      — Fitted Model

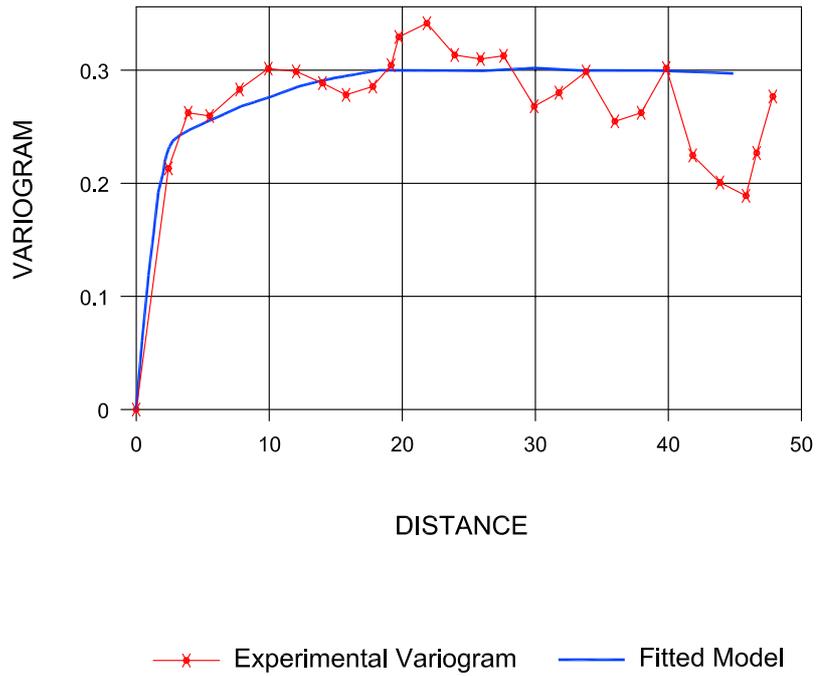
 Allegiance Mining N.L.

**EL 28/88 - AVEBURY PROSPECT**  
**NORTH AVEBURY MINERALISATION**  
**DOWNHOLE**  
**VARIOGRAM**

Compiled : M.McKeown  
 Date : November 2002  
 Drawn : G.M.Bennett  
 Revisions :  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 File : NAM DVariogram

**McKEOWN MINING PTY LTD**

Figure No.  
20



 Allegiance Mining N.L.

**EL 28/88 - AVEBURY PROSPECT**  
**VIKING MINERALISATION**  
**DOWNHOLE**  
**VARIOGRAM**

Compiled : M.McKeown

Date : November 2002

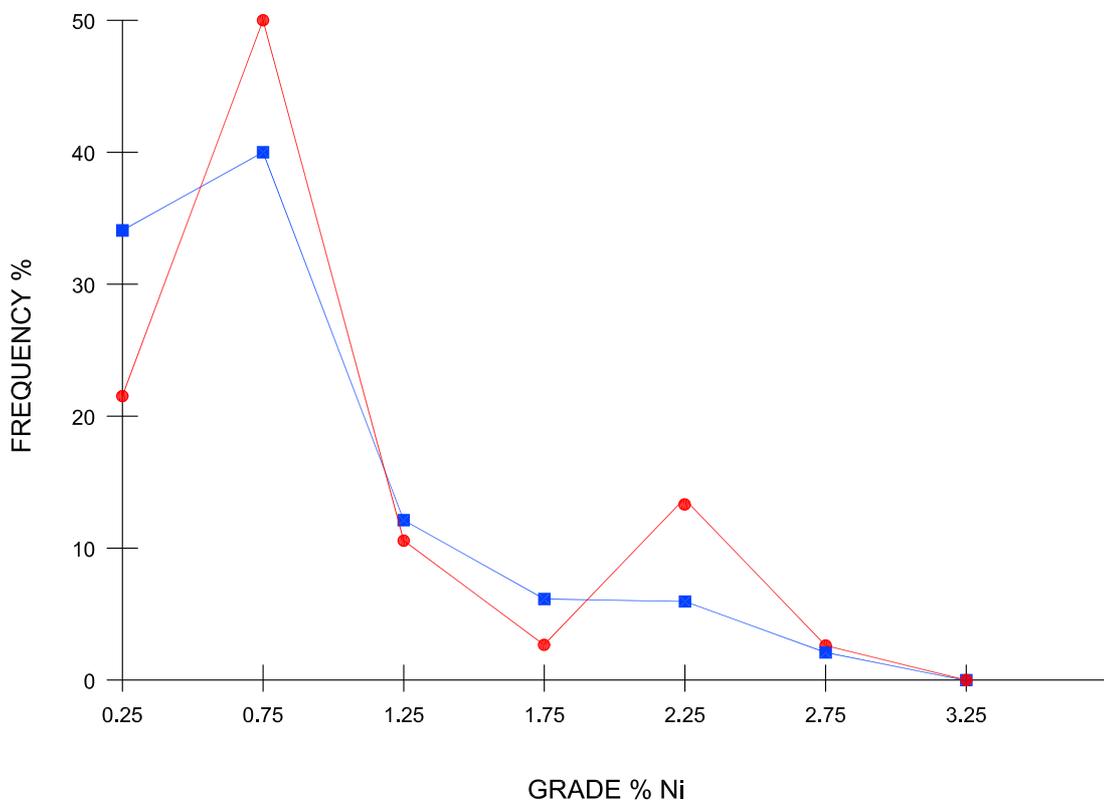
Drawn : G.M.Bennett

Revisions :

File : NAM DVariogram

**McKEOWN MINING PTY LTD**

Figure No.  
21



—●— 5m x 5m x 5m blocks      —■— 1m samples

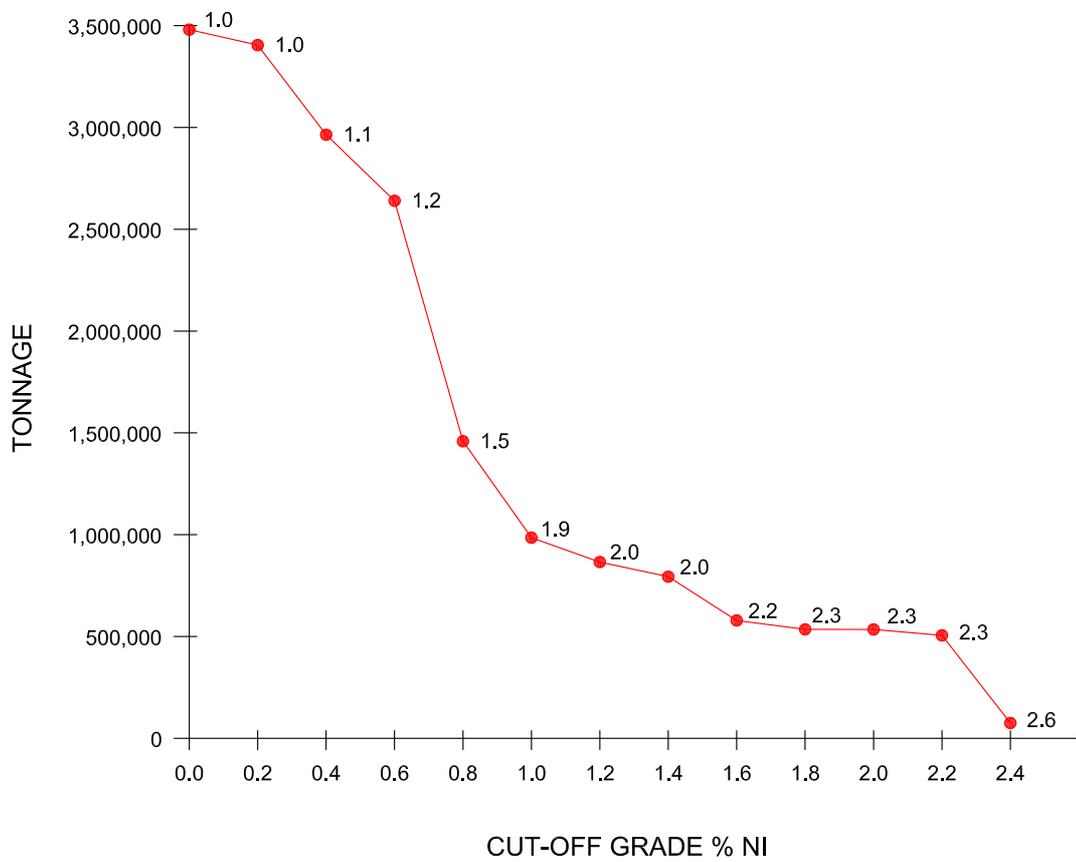
 Allegiance Mining N.L.

**EL 28/88 - AVEBURY PROSPECT**  
**NORTH AVEBURY MINERALISATION**  
**GRADE**  
**DISTRIBUTION**

Compiled : M.McKeown  
 Date : November 2002  
 Drawn : G.M.Bennett  
 Revisions :  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 File : NAM Grade Dist

**McKEOWN MINING PTY LTD**

Figure No.  
22



**Allegiance Mining N.L.**

**EL 28/88 - AVEBURY PROSPECT  
NORTH AVEBURY MINERALISATION  
GRADE - TONNAGE  
CURVE**

Compiled : M.McKeown

Date : November 2002

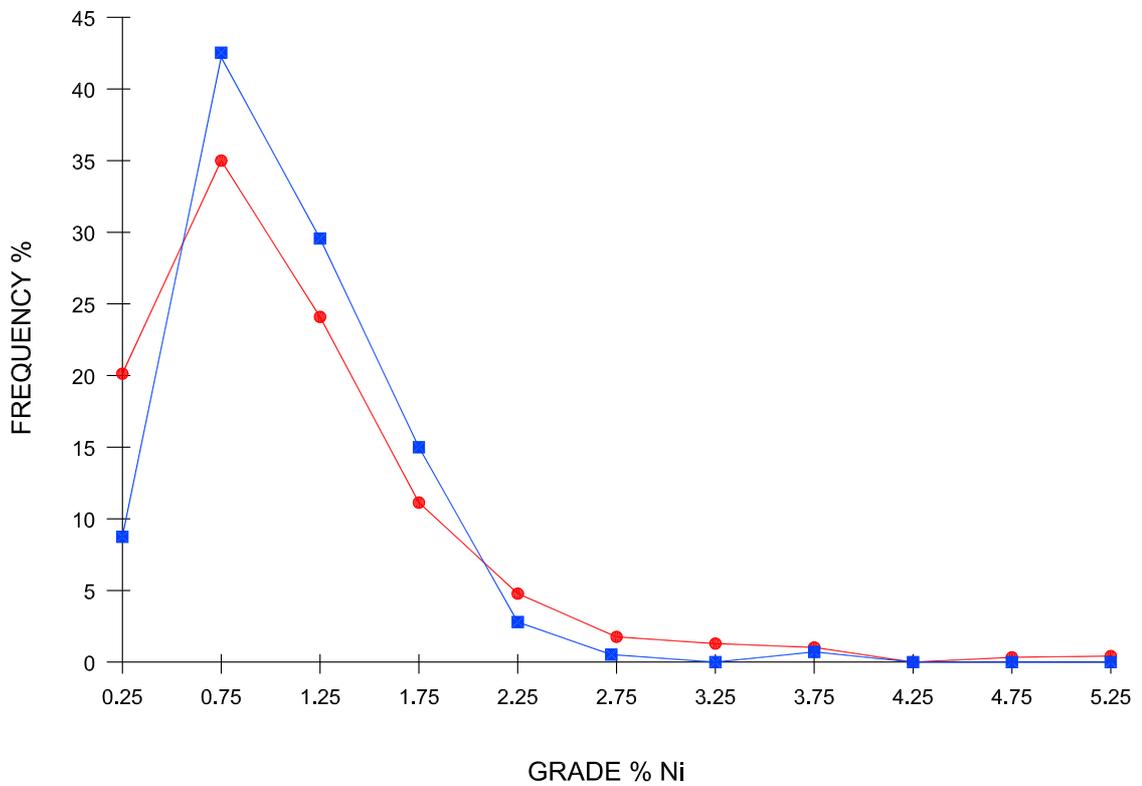
Drawn : G.M.Bennett

Revisions :

File : NAM Grade Ton

**McKEOWN MINING PTY LTD**

Figure No.  
23



—●— 5m x 5m x 5m blocks      —■— 1m samples

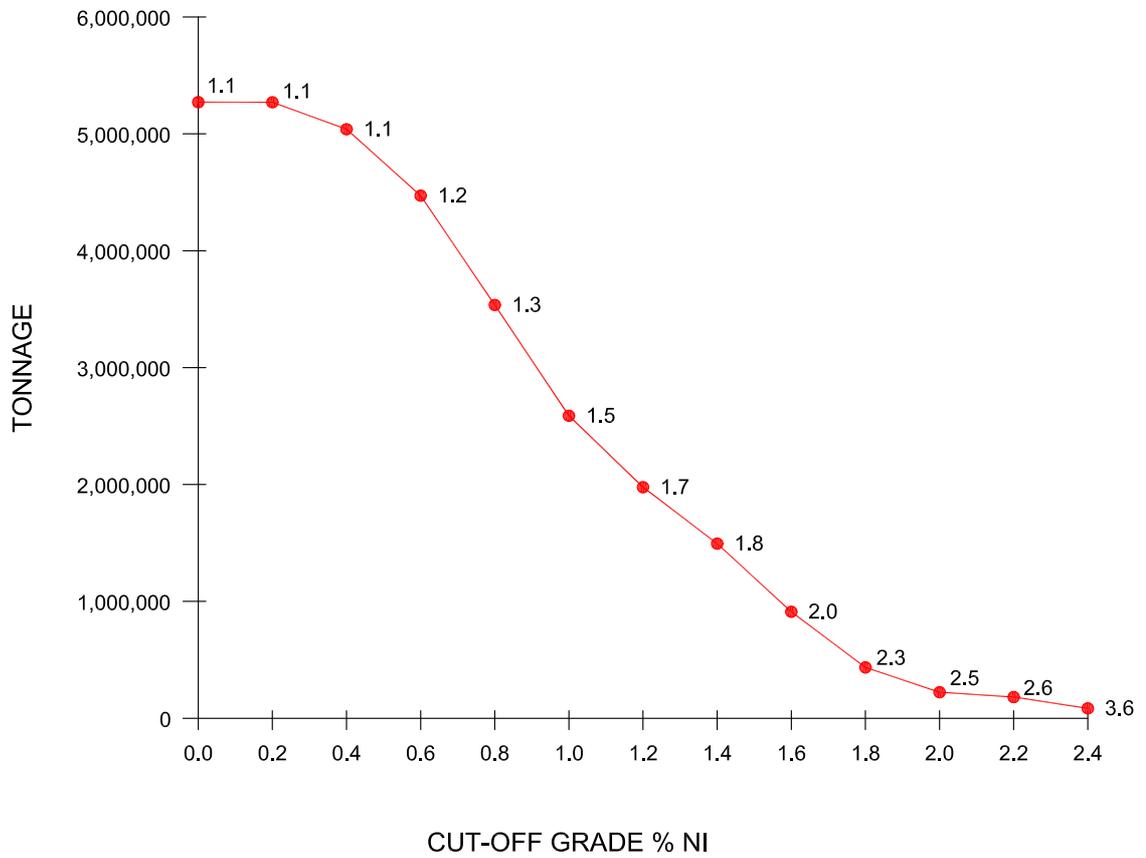


**EL 28/88 - AVEBURY PROSPECT**  
**VIKING MINERALISATION**  
**GRADE**  
**DISTRIBUTION**

Compiled : M.McKeown  
 Date : November 2002  
 Drawn : G.M.Bennett  
 Revisions :  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 File : VM Grade Dist

**McKEOWN MINING PTY LTD**

Figure No.  
24



**Allegiance Mining N.L.**

**EL 28/88 - AVEBURY PROSPECT  
VIKING MINERALISATION  
GRADE - TONNAGE  
CURVE**

Compiled : M.McKeown

Date : November 2002

Drawn : G.M.Bennett

Revisions :

File : VM Grade Ton

**McKEOWN MINING PTY LTD**

Figure No.  
25

## **APPENDIX 1**

**Drill logs for holes completed during 2002 drilling programme**



		Description	Core Recovery			Assays										
From	To		From	To	%	From	To	% Ni	% Cu	% S	% Zn	% As	% Co			
250.5	256.1	<b>This hole is an extension of the previously drilled A 007 which was drilled HQ to 250.5 m; coring was recommenced at that depth NQ;</b>														
		<b>ALTERED and HORNFELSED SEDIMENTS:</b> pale gray, weakly silicified massive sediment; irregular patches of schorl, minor axinite;	250.5	256.1	100											
256.1	311.8	<b>ULTRAMAFICS:</b> irregular contact approx 40° CA; first metre or two may be altered mafic sediments with patches of schorl and minor splashes of schorl; <b>256.1-267.0 m:</b> mottled light gray-green-dark green serpentinite carrying minor-common pentlandite and pyrrhotite; lighter gray-green material surrounding dark green serpentinitemasses consists largely of felted amphibole (actinolite) and minor talc; sulfides occur mainly in lighter material as large splashes, late stage veinlets and disseminations, generally associated with magnetite; ground conditions generally good but some serpentinite zones soft and talcose and occasionally broken along greasy slickensided surfaces; at 265.0 m., 300 mm light brown sedimentary inclusion; <b>267.0-270.6 m:</b> dark green-dark brown-black serpentinite, very soft, talcy and broken to 268.4 m., carrying lesser sulfides than previous unit, but still abundant in places; <b>270.6-279.5 m:</b> mottled light gray-light green-black altered ultramafic as for 256.1 m.... large patches of pentlandite and minor pyrrhotite associated with magnetite and infilling late stage veinlets; sulfides mainly in the lighter gray-green material and becoming abundant towards base of unit; ground conditions good; <b>279.5-283.7 m:</b> dark green-dark brown-black serpentinite with abundant magnetite and 3-5% sulfides associated with fine irregular late stage veining and irregular aggregates and disseminations; <b>283.7-311.5 m:</b> mottled altered ultramafics as for 256.1 m...., but with higher component of dark green soft serpentinite; abundant magnetite throughout; pentlandite and pyrrhotite common-abundant throughout but generally decreasing down hole; occurs as large patches, fine late stage vein infillings and aggregates in close association with magnetite; ground conditions generally good but some softer broken talcy sections;	256.0	257.0	0.40	<0.01	0.24	<0.01	0.034	0.014						
			256.1	311.8	100	257.0	258.0	0.33	<0.01	0.24	<0.01	0.066	0.010			
						258.0	259.0	0.15	<0.01	0.05	0.01	0.012	0.007			
						259.0	260.0	0.41	<0.01	0.20	0.01	0.022	0.012			
						260.0	261.0	1.86	<0.01	1.09	<0.01	1.580	0.047			
						261.0	262.0	1.20	<0.01	1.90	<0.01	0.037	0.023			
						262.0	263.0	3.35	0.14	4.10	0.01	0.164	0.068			
						263.0	264.0	0.78	<0.01	1.34	0.01	0.046	0.014			
						264.0	265.0	5.60	0.02	4.80	0.01	0.015	0.088			
						265.0	266.0	2.05	<0.01	2.05	0.02	0.013	0.035			
						266.0	267.0	1.78	<0.01	1.79	<0.01	0.006	0.034			
						267.0	268.0	1.07	<0.01	1.32	0.01	0.007	0.024			
						268.0	269.3	0.71	<0.01	0.72	0.01	0.008	0.015			
						269.3	270.6	1.40	<0.01	1.40	0.01	0.007	0.028			
						270.6	271.6	0.58	<0.01	0.51	<0.01	0.007	0.010			
						271.6	272.6	0.41	<0.01	0.35	<0.01	0.006	0.009			
						272.6	273.6	1.77	<0.01	1.75	0.01	0.008	0.029			
						273.6	274.6	1.22	<0.01	1.25	<0.01	0.010	0.021			
						274.6	275.6	0.73	<0.01	0.74	0.01	<0.005	0.014			
						275.6	276.6	0.57	<0.01	0.48	0.01	<0.005	0.012			
						276.6	277.6	0.86	<0.01	0.77	0.01	0.005	0.017			
						277.6	278.4	1.38	<0.01	1.29	0.01	0.009	0.024			
						278.4	279.4	2.80	<0.01	2.45	0.01	0.014	0.047			
						279.4	280.4	2.05	<0.01	1.93	0.01	0.010	0.036			
						280.4	281.4	1.54	<0.01	1.53	0.01	0.010	0.029			
						281.4	282.4	2.00	<0.01	1.97	0.01	0.012	0.038			
						282.4	283.8	1.34	<0.01	1.29	0.01	0.010	0.026			
						283.8	284.8	0.83	<0.01	0.79	<0.01	0.016	0.015			
						284.8	285.8	2.50	<0.01	2.35	0.01	0.020	0.041			
						285.8	286.8	0.44	<0.01	0.46	<0.01	0.007	0.009			
						286.8	287.8	0.50	<0.01	0.50	0.01	0.008	0.011			
						287.8	288.8	0.61	<0.01	0.63	0.01	0.008	0.013			
						288.8	289.8	1.30	<0.01	1.32	0.01	0.009	0.026			
						289.8	290.8	0.23	<0.01	0.24	0.01	0.007	0.007			
						290.8	291.8	0.33	<0.01	0.32	0.01	0.006	0.009			
						291.8	292.8	0.18	<0.01	0.14	0.01	0.006	0.006			
						292.8	293.8	0.13	<0.01	0.11	0.01	0.008	0.004			
						293.8	294.8	0.09	<0.01	0.07	0.01	0.007	0.003			
311.8	418.5	<b>MASSIVE SERPENTINITE:</b> massive dark brown-dark green-black serpentinite with asbestiform material developed on joint surfaces, especially 319-339 m; trace pentlandite throughout, more common in some sections, closely associated with magnetite in aggregates and small irregular splashes; joint surfaces often coated with greasy talc and asbestiform material; asbestiform seams are narrow (<10 mm) and widely spaced; core soft but overall competent with some significant broken zone: 366.0-369.0 m: very broken; 389.0-391.8 m: very broken with several pug seams; 392.6 m: 200 mm pug seam; 395.2-396.5 m: very broken; 400.6-404.0 m: very broken with some asbestiform veining;	311.8	356.1	100	294.8	295.8	1.01	<0.01	1.00	0.02	0.010	0.017			
						356.1	357.5	90	295.8	296.8	0.16	<0.01	0.10	0.01	0.007	0.005
						357.5	389.4	100	296.8	297.8	0.18	<0.01	0.11	0.01	0.007	0.005
						389.4	390.6	80	297.8	298.8	0.32	<0.01	0.25	0.02	0.006	0.009
						390.6	418.5	100	298.8	299.8	0.14	<0.01	0.11	0.01	0.005	0.005
									299.8	300.8	0.24	<0.01	0.21	0.01	0.005	0.008
									300.8	301.8	0.16	<0.01	0.14	0.01	0.006	0.006
									301.8	302.8	0.29	<0.01	0.29	0.02	<0.005	0.009
									302.8	303.8	0.55	<0.01	0.59	0.02	0.006	0.017
									303.8	304.8	0.21	<0.01	0.20	0.01	<0.005	0.007
									304.8	305.8	0.14	<0.01	0.11	0.01	0.006	0.005
									305.8	306.8	0.12	<0.01	0.11	0.01	0.007	0.004
						418.5	434.4	100	306.8	307.8	0.34	<0.01	0.34	0.02	<0.005	0.009
						434.4	436.5	75	307.8	308.8	0.68	<0.01	0.65	0.01	0.006	0.011
						436.5	455.6	100	308.8	309.8	0.45	<0.01	0.41	0.01	0.007	0.008
418.5	456.5	<b>ALTERED ULTRAMAFIC:</b> dark brown-black serpentinite with mottled .....	455.6	455.9	50	309.8	310.8	0.38	<0.01	0.36	0.01	0.006	0.007			
			455.9	456.5	100	310.8	311.8	0.59	<0.01	0.59	0.01	0.006	0.012			

Description		Core Recovery			Assays								
		From	To	%	From	To	% Ni	% Cu	% S	% Zn	% As	% Co	
418.5	456.5	<p>patches of pale green altered ultramafics;  pale gray-green patches have corroded margins and appear fractured and partially replaced by dark green-black serpentinite; occasionally have felted or coarsely crystalline fabric;  magnetite abundant in serpentinite;  minor patches of pentlandite, both within the pale green ultramafics and the serpentinite, typically associated with magnetite;  minor asbestiform material on some joint surfaces to 432 m;  narrow clay/pug zones at:  448.0 m: 100 mm  449.2 m: 100 mm  453.1 m: 100 mm  455.5 m: 100 mm  minor core losses;  core moderately broken along greasy, talcose hackly joint surfaces, particularly below 448 m;  core loss between 434.4-436.5 m due to redrilled core when lifters failed to hold core (ie) not due to bad ground;</p>				311.8	312.8	0.78	<0.01	0.83	0.03	<0.005	0.017
continued.....						312.8	313.8	1.21	<0.01	1.30	0.01	0.006	0.027
						313.8	314.8	0.37	<0.01	0.44	0.01	0.006	0.012
						314.8	315.8	0.76	<0.01	0.86	0.01	0.007	0.018
						315.8	316.8	0.58		0.65			
						316.8	317.8	0.37		0.44			
						317.8	318.8	0.40		0.41			
						318.8	319.8	0.25		0.24			
						319.8	320.8	0.19		0.18			
						320.8	321.8	0.57	<0.01	0.51	<0.01	0.006	0.010
						321.8	322.8	0.61		0.60			
						322.8	323.8	0.46		0.45			
						323.8	324.8	0.68		0.72			
						324.8	325.8	0.65	<0.01	0.66	0.01	0.005	0.018
						325.8	326.8	0.32		0.34			
					326.8	327.8	0.33		0.34				
					327.8	328.8	0.53		0.59				
					328.8	329.8	0.76	<0.01	0.83	0.03	0.008	0.019	
456.5	460.5	<p><b>ALTERED ULTRAMAFICS:</b>  <b>456.5-459.0 m:</b> dark gray altered ultramafics with felted appearance in places; minor dark green-black serpentinite patches and streaks;  irregular aggregates of magnetite and pyrrhotite common in places but overall 2-3% sulfides;  core competent;  <b>459.0-460.3 m:</b> pale gray-green fine grained altered ultramafics with trace magnetite and small spots and aggregates of sulfides;  core competent;  irregular but fairly sharp contact with unit below;</p>				329.8	330.8	0.21		0.23			
			456.5	460.5	100	330.8	331.8	0.43	<0.01	0.45	0.01	0.006	0.013
						331.8	332.8	0.53		0.59			
						332.8	333.8	0.46		0.49			
						333.8	334.8	0.82	<0.01	0.79	0.02	0.005	0.019
						334.8	335.8	0.59		0.55			
						335.8	336.8	0.22		0.18			
						336.8	337.8	0.22		0.17			
						337.8	338.8	0.61	<0.01	0.52	0.01	<0.005	0.013
						338.8	339.8	0.48		0.47			
460.5	461.0	<p><b>FAULT ?:</b>  vuggy coarsely crystalline quartz with irregular patches green-dark gray ultramafic material;  no sulfides observed;  core crumbly and very broken;  bottom 100 mm. dark gray-green soft ultramafic;  irregular contact with sediments below;</p>				339.8	340.8	0.58	<0.01	0.61	0.04	0.006	0.014
			460.5	461.0	100	340.8	341.8	0.30		0.31			
						341.8	342.8	0.29		0.30			
						342.8	343.8	0.24	<0.01	0.24	<0.01	0.006	0.008
						343.8	344.8	0.26		0.27			
					344.8	345.8	0.64		0.71				
461.0	465.2	<p><b>SEDIMENTS:</b>  well bedded fine grained dark reddish brown and gray sediments;  BCA variable 60-80°;  <b>463.3-464.7 m:</b> silicified and cherty sediments;  minor sulfides in thin discontinuous streaks along bedding planes;  non-magnetic;  core moderately competent; several joint sets at high angles to bedding;</p>				345.8	346.8	0.66	<0.01	0.70	0.02	0.007	0.013
			461.0	465.2		346.8	347.8	0.41		0.45			
						347.8	348.8	0.57		0.63			
						348.8	349.8	0.25		0.24			
						349.8	350.8	0.25		0.24			
						350.8	351.8	0.18		0.16			
						351.8	352.8	0.16		0.13			
						352.8	353.8	0.22		0.23			
						353.8	354.8	0.17		0.17			
						354.8	355.8	0.19		0.17			
						355.8	356.8	0.16		0.16			
						356.8	357.8	0.15		0.14			
						357.8	359.8	0.27		0.29			
						359.8	361.8	0.18		0.22			
						361.8	363.8	0.19		0.23			
					363.8	365.8	0.16		0.20				
					365.8	367.8	0.18		0.23				
					367.8	369.8	0.16		0.22				
					369.8	371.8	0.28		0.37				
					371.8	373.8	0.25		0.33				
					373.8	375.8	0.17		0.18				
					375.8	377.8	0.14		0.15				
					377.8	379.8	0.15		0.17				
					379.8	381.8	0.16		0.20				
					381.8	383.8	0.21		0.27				
					383.8	385.8	0.19		0.25				
					385.8	387.8	0.17		0.21				

**END OF HOLE**

Description			Core Recovery			Assays							
From	To		From	To	%	From	To	% Ni	% Cu	% S	% Zn	% As	% Co
						387.8	389.8	0.13		0.16			
						389.8	391.8	0.13		0.16			
						391.8	393.8	0.15		0.15			
						418.5	419.5	0.15		0.12			
						419.5	420.5	0.17		0.13			
						420.5	421.5	0.16		0.12			
						421.5	422.5	0.18		0.13			
						422.5	423.5	0.18		0.13			
						423.5	424.5	0.14		0.11			
						424.5	425.5	0.14		0.14			
						425.5	426.5	0.14		0.13			
						426.5	427.5	0.13	<0.01	0.11	0.01	0.009	0.008
						427.5	428.5	0.16	<0.01	0.14	0.01	0.008	0.009
						428.5	429.5	0.19	<0.01	0.16	0.01	0.009	0.009
						429.5	430.5	0.17	<0.01	0.14	0.01	0.010	0.008
						430.5	431.5	0.18	<0.01	0.14	<0.01	0.009	0.009
						431.5	432.5	0.18	<0.01	0.14	0.01	0.010	0.009
						432.5	433.5	0.17	<0.01	0.14	0.01	0.008	0.009
						433.5	434.5	0.19	<0.01	0.15	0.02	0.007	0.010
						434.5	436.5	0.22	<0.01	0.18	0.01	0.008	0.011
						436.5	437.5	0.21	<0.01	0.19	0.01	0.008	0.008
						437.5	438.5	0.20	<0.01	0.17	<0.01	0.009	0.008
						438.5	439.5	0.21	<0.01	0.18	<0.01	0.008	0.009
						439.5	440.5	0.21	<0.01	0.18	0.01	0.008	0.008
						440.5	441.5	0.26	<0.01	0.21	0.01	0.008	0.010
						441.5	442.5	0.23	<0.01	0.21	0.01	0.009	0.009
						442.5	443.5	0.18	<0.01	0.17	0.01	0.010	0.008
						443.5	444.5	0.18	<0.01	0.16	0.01	0.008	0.009
						444.5	445.5	0.18	<0.01	0.18	0.01	0.009	0.008
						445.5	446.5	0.14	<0.01	0.12	0.01	0.009	0.007
						446.5	447.5	0.13	<0.01	0.13	<0.01	0.008	0.007
						447.5	448.5	0.11	<0.01	0.10	0.01	0.008	0.006
						448.5	449.5	0.17	<0.01	0.16	<0.01	0.007	0.008
						449.5	450.5	0.19	<0.01	0.20	0.01	0.009	0.009
						450.5	451.5	0.17	<0.01	0.15	<0.01	0.008	0.008
						451.5	452.5	0.22	<0.01	0.22	<0.01	0.010	0.010
						452.5	453.5	0.22	<0.01	0.25	0.01	0.007	0.011
						453.5	454.5	0.20	<0.01	0.22	<0.01	0.008	0.011
						454.5	455.5	0.20	<0.01	0.22	0.01	0.007	0.011
						455.5	456.5	0.25	<0.01	0.31	<0.01	0.007	0.012
						456.5	457.5	0.18	<0.01	0.33	<0.01	0.008	0.008
						457.5	458.5	0.26	<0.01	0.42	<0.01	0.050	0.008
						458.5	459.5	0.23	<0.01	0.16	0.01	0.058	0.005
						459.5	460.5	0.17	<0.01	0.06	0.02	0.061	0.005
						460.5	461.5	0.08	<0.01	0.03	0.03	0.024	0.004

**COMPANY:** Allegiance Mining NL  
**PROJECT:** Avebury  
**HOLE NUMBER:** A 035

<b>Commenced</b>	23 May2002
<b>Completed</b>	30 June 2002
<b>Logged by</b>	L A Newnham
<b>Drilled by</b>	Almac

**Purpose of Hole**

to test western extension of South Avebury;

**Collar details**

<b>Grid</b>	AMG
<b>Easting</b>	354310.5
<b>Northing</b>	5357502.8
<b>Elevation</b>	2,180.3
<b>Dip</b>	-50
<b>Bearing</b>	179
<b>Length</b>	465.3

**Comments on Completion**

hole intersected a 120 m. wide zone of altered ultramafics carrying approx 6% sulfides; the northern section was mainly pyrrhotite and the southern half a mixture of pyrrhotite and pentlandite;

**Hole Size**

<b>To</b>	<b>Size</b>
41.4	HQ
465.3	NQ

**Major core loss zones**

<b>From</b>	<b>To</b>	<b>% recov.</b>
0	18.4	<50
270.2	279.6	50
438.3	442.1	88
442.1	445.4	70

**Hole Condition on Completion**

all steel pipe removed from hole;  
PVC collar pipe inserted;

**Summary of Assay Results**

<b>Depth</b>		<b>Recovery</b>	<b>Description</b>	<b>Length</b>	<b>Assays</b>				
<b>From (m)</b>	<b>To (m)</b>	<b>%</b>		<b>m.</b>	<b>Ni</b>	<b>Cu</b>	<b>S</b>	<b>As</b>	<b>Co</b>
<b>411.6</b>	<b>460.8</b>	<b>99</b>	<b>altered and mineralised ultramafics</b>	<b>49.2</b>	<b>1.26</b>	<b>&lt;0.01</b>	<b>2.30</b>	<b>0.030</b>	
<b>incl</b>									
<b>411.6</b>	<b>428.9</b>	<b>100</b>		<b>17.3</b>	<b>2.10</b>	<b>&lt;0.01</b>	<b>2.58</b>	<b>0.010</b>	<b>0.024</b>
<b>incl</b>									
<b>422.3</b>	<b>423.4</b>	<b>100</b>		<b>1.1</b>	<b>14.70</b>	<b>0.02</b>	<b>11.40</b>	<b>0.040</b>	<b>0.147</b>

**Down Hole Survey Data**

<b>Camera</b>	<b>Depth</b>	<b>Dip</b>	<b>Mag Brg Actual</b>	<b>Mag Brg Adjusted</b>	<b>Grid Brg</b>
	0	-50	171	171	179
	12	-50	171	171	179
	41	-50	173	173	181
	72	-50	173	173	180
	102	-49	174	174	182
	132	-48	176	176	184
	160	-48	178	178	185
	190	-48	179	179	187
	220	-48	174	179	187
	250	-48	187	184	191
	298	-48	184	184	191
	328	-47	185	185	193
	358	-47	184	185	193
	387	-47	182	185	193
	418	-46	197	185	193
	448	-46	158	185	193
	465.3	-46		185	193

**Notes on Surveys**

hole collar is measured by compass and adjusted against measurement by surveyor; down hole surveys are adjusted accordingly; bearings below 200 m are affected by ultramafic;

**General Comments**



Description			Core Recovery			Assays							
From	To		From	To	%	From	To	% Ni	% Cu	% S	% Zn	% As	% Co
0.0	2.0	<b>TRICONE:</b> no core;	0.0	2.0	0								
2.0	11.8	<b>RUBBLE-HORNFELSE SEDIMENTS:</b> dark gray hornfelse sediments, extremely broken, essentially present as rubble; iron staining common on fracture surfaces;	2.0	4.0	50								
			4.0	6.0	40								
			6.0	8.9	50								
11.8	237.4	<b>HORNFELSE MAFIC SEDIMENTS or VOLCANICLASTICS:</b> dark gray-purplish-green fine grained hornfelse mafic sediments; veins and irregular masses dark-light green amphibole, often with felted or bladed appearance (actinolite/tremolite ?), common throughout; no distinct bedding, but alteration banding after bedding 40° CA; minor sulfides associated with these amphibole patches- mainly pyrrhotite but occasionally significant chalcopryite (eg) 32 m.; minor thin quartz-phlogopite-schorl veining throughout, occasionally containing minor pyrrhotite and chalcopryite; ground fresh but strongly fractured along several close spaced joint sets; brittle fracturing associated with alteration zones; ground conditions improving down hole, becoming moderately good below 20m; <b>below 80 m:</b> very monotonous sequence of dark gray-dark green strongly altered fine-medium grained mafic sediments possibly with a volcanic component; strong pervasive overprint of iron metasomatism in the form of felted light-dark green amphibole (actinolite/tremolite ?) and fine brown phlogopite; late stage actinolite veins often contain significant disseminated sulfides, probably pyrrhotite; BCA's generally 60-70°; <b>below 140 m:</b> rocks are generally finer grained with some cherty patches; <b>below 170 m:</b> minor quartz and quartz-carbonate veining, sometimes accompanied by minor fine grained schorl (?); core remains strongly fractured along several close spaced joint sets and along actinolite veins, often sub-parallel to CA; overall core is hard and competent but with significant cherty/brittle fracturing in places; BCA at 196: 45°; <b>below 200 m:</b> increase in thin seams and irregular patches of felted amphibole, often accompanied by pyrrhotite and chalcopryite; overall monotonous sequence of dark gray-dark brown medium grained sediments; strongly fractured in places along several joint sets; BCA at 205 m., 45°; quite broken to 237.4 m;	8.9	10.2	40								
			10.2	11.6	50								
			11.6	17.5	100								
			17.5	18.4	30								
			18.4	41.4	100								
			41.4	43.2	90								
			43.2	237.4	100								
237.4	270.7	<b>HORNFELSE MAFIC ROCKS-mottled and sulfidic:</b> gradational with unit above; mottled light gray hornfelse sediments interbedded/intermixed with fine grained dark gray-black hard hornfelse mafic rocks; mottled sections are mixture of dark green-gray felted amphibole clasts or irregular patches set in light gray fine grained siliceous groundmass; fine grained brownish mineral (phlogopite ?) common; dark gray-black fine grained and altered mafic units contain phlogopite (brown banding)in places; banding/bedding 60°CA; 3-5% sulfides (mainly pyrrhotite) as irregular veins, discontinuous seams, rounded clots; give the appearance of infilling tension fractures in hornfelse sediments; ground hard but competent; overall ground conditions much better than previous interval;	237.4	270.2	100	241.0	242.0	0.01	0.03	2.35	<0.01	0.002	0.007
						242.0	243.0	<0.01	<0.01	0.66	<0.01	0.002	0.003
						243.0	244.5	<0.01	<0.01	0.65	<0.01	0.002	0.003
						245.4	246.5	0.01	0.05	2.40	<0.01	<0.002	0.008
						246.5	247.5	<0.01	0.01	0.76	<0.01	<0.002	0.004
						250.0	251.0	<0.01	0.02	2.30	<0.01	0.002	0.005
						254.0	255.0	0.01	0.03	2.05	0.02	0.008	0.007
						258.0	259.0	<0.01	0.01	1.79	<0.01	0.004	0.005
						259.0	260.0	0.01	0.02	2.45	<0.01	0.002	0.006

Description		Core Recovery			Assays									
From	To	From	To	%	From	To	% Ni	% Cu	% S	% Zn	% As	% Co		
237.4 continued.....	270.7	<b>below 265 m:</b> medium-light gray silicified medium grained hornfelsed sediments, strongly fractured and healed with thin quartz veins; minor pyrrhotite as late stage veins and associated with quartz veins; core broken;												
270.7	278.9	<b>FAULT ZONE:</b> brecciated light and dark gray hornfelsed sediments with significant quartz component in main brecciated zones; minor coarse pyrite and chalcopyrite associated with quartz in brecciated sections; core very broken and rubbly with some core loss;		270.2	271.6	50								
				271.6	272.5	40								
				272.5	272.9	50								
				272.9	273.8	60								
				273.8	274.4	60								
				274.4	277.1	30								
278.9	305.4	<b>HORNFELSESED SEDIMENTS:</b> dark gray-dark brown fine-medium grained hornfelsed sediments; several sections carrying substantial quartz as random veins and irregular masses; below 293.0 m., sulfides (pyrrhotite ?) common as infillings in several sets of thin joints and as discontinuous seams; core moderately competent but some broken zones;		277.1	278.9	90	297.5	298.6	<0.01	<0.01	0.87	<0.01	<0.002	0.003
				278.9	279.6	30	298.6	299.6	<0.01	0.01	1.61	<0.01	<0.002	0.004
				279.6	281.0	90								
				281.0	282.4	90								
				282.4	305.4	100								
305.4	307.5	<b>BRECCIATED CHERTY SEDIMENTS:</b> light gray mottled cherty and brecciated sediments; silicification accompanied by fine felted amphibole (actinolite ?) and minor axinite; pyrrhotite and trace pentlandite (?) common as seams, irregular masses, discordant veins and disseminated grains;		305.4	307.5	100	305.3	306.3	0.01	0.02	0.38	0.01	0.003	0.004
							306.3	307.5	<0.01	<0.01	0.04	<0.01	0.002	0.002
307.5	323.0	<b>HORNFELSESED SEDIMENTS and MOTTLED CHERTY ZONES:</b> dark brown fine-medium grained hornfelsed sediments with several sections of light gray mottled and cherty sediments; hornfelsed sediments often have greenish appearance because of presence of fine grained felted actinolite; sulfides (pyrrhotite, pentlandite ?) common in some hornfelsed units as late stage veinlets and irregular masses (eg) 315.0-315.9 m; ground moderately competent;					314.9	315.9	0.01	0.03	2.30	<0.01	<0.002	0.006
323.0	338.2	<b>MOTTLED CHERTY AND ALTERED MAFIC ROCKS:</b> interval of strongly altered mottled cherty rocks and light gray-light green altered mafic rocks; bedding variable but typically 60° CA; strong pale greenish coloration in places accompanied by schorl and abundant axinite as veins and irregular masses, particularly near base of interval; minor sulfides near top of interval, becoming more abundant towards base; interesting 20 mm ovoid of sulfide at 329.2 m.; ground conditions excellent; indistinct contact with ultramafics below;					329.0	330.0	0.01	0.02	0.93	<0.01	0.002	0.006
				307.5	338.2	100	330.0	331.0	0.01	0.01	0.58	0.01	0.002	0.005
							331.0	332.0	<0.01	<0.01	0.25	0.01	0.002	0.004
							332.0	333.0	0.02	0.02	1.05	0.01	0.004	0.012
							333.0	334.0	0.02	0.01	0.78	0.01	0.005	0.013
							334.0	335.0	0.02	<0.01	0.20	0.05	0.005	0.004
							335.0	336.0	0.01	<0.01	0.04	0.02	0.011	0.004
							336.0	337.0	0.01	<0.01	0.01	<0.01	0.006	0.003
							337.0	338.2	0.03	<0.01	0.15	0.05	0.010	0.004
338.2	460.9	<b>ALTERED ULTRAMAFICS with common-abundant sulfides:</b> <b>338.2-346.5 m:</b> mixed mottled and pale green finely felted ultramafics; sulfides (pyrrhotite, pentlandite ?) common-abundant as disseminations, large masses and occasional aggregates of acicular material; ground conditions good but soft; <b>346.5-348.5 m:</b> light gray sedimentary rock, carrying only trace disseminated sulfides; BCA 40°; either a large xenolith or a bed near the margin of the folded ultramafic sill; <b>348.5-351.7 m:</b> black serpentinite with minor zones of gray altered ultramafic; magnetite .....		338.2	438.3	100	338.2	339.1	0.04	<0.01	0.12	0.02	0.005	0.005
							339.1	339.9	0.13	<0.01	0.52	0.01	0.007	0.009
							339.9	340.9	0.15	0.01	1.60	0.04	0.010	0.011
							340.9	341.9	0.16	0.01	1.47	<0.01	0.015	0.012
							341.9	342.9	0.1	<0.01	0.42	0.01	0.008	0.008
							342.9	344.2	0.14	0.01	0.46	0.01	0.012	0.008
							344.2	345.5	0.09	<0.01	0.21	0.02	0.004	0.005
							345.5	346.7	0.12	0.04	3.70	0.01	0.003	0.019
							346.7	347.7	0.07	<0.01	0.86	0.06	0.002	0.006
							347.7	348.6	0.08	<0.01	0.12	0.04	0.008	0.006
							348.6	349.7	1.4	0.03	7.10	0.01	0.003	0.104
							349.7	350.7	0.21	0.01	2.30	0.01	<0.002	0.017
							350.7	351.7	0.13	0.01	3.75	0.01	0.002	0.012

Description		Core Recovery			Assays							
From	To	From	To	%	From	To	% Ni	% Cu	% S	% Zn	% As	% Co
338.2	460.9				351.7	353.0	0.34	0.02	1.48	0.21	0.026	0.012
continued.....					353.0	354.0	0.20	<0.01	0.39	0.02	0.015	0.007
					354.0	355.0	0.18	<0.01	0.33	0.01	0.023	0.007
					355.0	356.0	0.17	<0.01	0.27	0.01	0.009	0.006
					356.0	357.0	0.23	<0.01	0.36	0.02	0.017	0.007
					357.0	358.0	0.21	0.01	0.81	0.04	0.009	0.008
					358.0	359.0	0.28	0.01	0.49	0.04	0.010	0.008
					359.0	360.0	0.14	0.01	1.05	0.02	<0.002	0.009
					360.0	361.0	0.13	0.03	1.74	0.21	<0.002	0.013
					361.0	362.0	0.10	0.03	1.80	0.27	<0.002	0.013
					362.0	363.0	0.10	0.02	1.05	0.08	0.002	0.009
					363.0	364.0	0.19	<0.01	1.21	<0.01	0.013	0.011
					364.0	365.0	0.14	0.01	1.22	<0.01	0.004	0.008
					365.0	366.0	0.17	0.04	2.75	0.07	0.002	0.016
					366.0	367.0	0.32	0.08	4.85	0.23	0.002	0.030
					367.0	368.0	0.16	0.03	2.40	0.15	<0.002	0.012
					368.0	369.0	0.22	0.02	2.40	0.02	0.002	0.014
					369.0	370.0	0.21	0.02	1.73	0.01	<0.002	0.011
					370.0	371.0	0.28	0.01	2.45	<0.01	<0.002	0.013
					371.0	372.0	0.17	0.01	1.39	0.02	<0.002	0.008
					372.0	373.0	0.37	0.03	2.85	0.02	<0.002	0.018
					373.0	374.0	0.45	0.03	3.35	0.01	0.002	0.020
					374.0	375.3	0.97	0.07	8.15	0.01	0.006	0.074
					375.3	376.6	0.72	0.05	6.45	<0.01	0.004	0.060
					376.6	377.6	0.18	0.03	2.35	0.01	0.005	0.019
					377.6	378.6	0.15	0.04	2.35	0.25	0.002	0.014
					378.6	379.6	0.07	0.01	0.91	0.04	<0.002	0.006
					379.6	380.6	0.05	0.01	0.68	0.11	<0.002	0.005
					380.6	381.6	0.04	0.01	0.50	0.10	<0.002	0.005
					381.6	382.6	0.30	0.08	3.95	0.14	0.002	0.021
					382.6	383.6	0.07	0.05	1.25	0.49	0.002	0.009
					383.6	384.6	0.09	0.02	0.82	0.15	0.002	0.008
					384.6	385.6	0.11	<0.01	0.47	0.04	0.002	0.007
					385.6	386.6	0.32	0.06	2.25	0.07	0.003	0.014
					386.6	387.6	0.19	0.01	1.23	0.01	<0.002	0.009
					387.6	388.6	0.14	0.01	1.07	0.05	<0.002	0.008
					388.6	389.7	0.18	0.03	1.85	0.15	<0.002	0.012
					389.7	390.6	0.20	0.01	1.79	0.02	<0.002	0.011
					390.6	391.6	0.28	0.01	1.91	0.03	<0.002	0.012
					391.6	392.6	0.21	0.01	1.58	0.04	<0.002	0.011
					392.6	393.6	0.19	0.04	1.80	0.40	<0.002	0.010
					393.6	394.6	0.22	0.04	1.55	0.18	<0.002	0.011
					394.6	395.6	0.21	0.01	1.02	0.05	<0.002	0.008
					395.6	396.6	0.15	0.01	0.76	0.08	0.002	0.006
					396.6	397.6	0.11	<0.01	0.37	0.06	<0.002	0.005
					397.6	398.6	0.20	<0.01	0.73	0.03	0.002	0.006
					398.6	399.6	0.15	<0.01	0.51	0.01	<0.002	0.005
					399.6	400.6	0.15	<0.01	0.44	0.01	<0.002	0.004
					400.6	401.6	0.22	<0.01	0.37	0.03	0.006	0.007
					401.6	402.6	0.12	<0.01	0.17	0.01	0.002	0.004
					402.6	403.6	0.21	<0.01	0.26	0.02	0.003	0.006
					403.6	404.6	0.13	<0.01	0.28	0.01	0.003	0.004
					404.6	405.6	0.30	<0.01	0.68	0.04	0.003	0.008
					405.6	406.6	0.47	<0.01	1.59	0.12	<0.002	0.011
					406.6	407.6	0.49	0.01	1.53	0.24	<0.002	0.011
					407.6	408.6	0.59	<0.01	1.42	0.16	0.002	0.012
		438.3	440.0	85	408.6	409.6	0.17	<0.01	0.45	0.10	0.002	0.005
		440.0	442.1	90	409.6	410.6	0.48	<0.01	0.90	0.02	0.003	0.008
		442.1	443.3	40	410.6	411.6	0.82	<0.01	1.07	0.02	0.010	0.010
		443.3	445.4	70	411.6	412.6	1.71	<0.01	1.53	<0.01	0.012	0.020
					412.6	413.6	0.82	<0.01	0.97	0.05	0.005	0.009



**COMPANY:** Allegiance Mining NL  
**PROJECT:** Avebury  
**HOLE NUMBER:** A 036

<b>Commenced</b>	23 May 2002
<b>Completed</b>	17 June 2002
<b>Logged by</b>	L A Newnham
<b>Drilled by</b>	Almac

**Purpose of Hole**

to test the two South Avebury mineralised zones

**Collar details**

<b>Grid</b>	AMG
<b>Easting</b>	354,420.6
<b>Northing</b>	5357456.7
<b>Elevation</b>	2,180.4
<b>Dip</b>	-50
<b>Bearing</b>	178
<b>Length</b>	384.0

**Comments on Completion**

intersected South Avebury north lens close to A 028 - approx. 25% of the nickel in this lens was present as nicolite; in some assayed intervals, nearly all the nickel was present as nicolite;  
  
in the South Avebury south lens, most of the nickel was present as pentlandite with only minor nicolite;

**Hole Size**

To	Size
41.2	HQ
384	NQ

**Major core loss zones**

From	To	% recov.

**Hole Condition on Completion**

all materials removed from hole; PVC collar pipe inserted

**Summary of Assay Results**

Depth	Recovery	Description	Length	Assays					
From (m)	To (m)		m.	% Ni	%Cu	%S	%As	% Co	
258.0	270.0	100	South Avebury - North Lens mineralised serpentinite	12.0	1.75	0.01	2.05	0.404	0.025
352.8	356.0	100	South Avebury - South Lens mineralised serpentinite	3.2	2.39	0.02	3.60	0.180	0.055

**Down Hole Survey Data**

Camera	Depth	Dip	Mag Brg Actual	Mag Brg Adjusted	Grid Brg
	0	-50	173	173	178
	15	-50	173	173	178
	50	-51	174	174	179
	80	-51	174	174	179
	110	-51	176	176	180
	140	-50	178	178	182
	170	-50	178	178	182
	200	-49	224	179	183
	232	-48	182	179	183
	262	-47	199	179	183
	292	-46	176	176	180
	325	-46	246	176	180
	357	-46	216	175	180
	384	-45	174	175	180

**Notes on Surveys**

collar was surveyed by registered surveyor, and down hole camera bearings adjusted accordingly; bearings near middle of hole affected by serpentinite;

**General Comments**

.









		Description	Core Recovery			Assays							
From	To		From	To	%	From	To	% Ni	% Cu	% S	% Zn	% As	% Co
257.0	364.2	<p><b>ALTERED and MINERALISED ULTRAMAFICS:</b> alternating units of black serpentinite and mottled light green-gray-black altered ultramafics, both containing abundant pyrrhotite and pentlandite); magnetite common in black serpentinite;</p> <p><b>257.0-260.0 m:</b> ultramafic dominated by dark gray-black serpentinite, siliceous in parts with common-abundant pyrrhotite/pentlandite (?), including several semi-massive bands; unit moderately fractured in places but overall competent; grades into.....</p> <p><b>260.0-270.0 m:</b> mottled light gray-pale green severely altered ultramafic with common-abundant pyrrhotite/pentlandite (?); gray-green sections are dominantly felted actinolite and tremolite, mildly silicified and cut by thin veins of black talcose serpentinite; sulfides common-abundant throughout, including several seams and large patches of semi-massive sulfide; disseminated and clots of sulfide associated with amphiboles and serpentinisation alteration;</p> <p><b>270.0-272.5 m:</b> black massive serpentinite with common-abundant pyrrhotite/Pentlandite (?) as irregular patches and aggregates associated with actinolite and magnetite; minor green talc on joint surfaces; core strongly fractured and broken;</p> <p><b>272.5-273.8 m:</b> light gray-green mottled and altered ultramafic as for 260.0....., but sulfides not as abundant;</p> <p><b>273.8-278.6 m:</b> black serpentinite with common pyrrhotite associated with magnetite as for 270.0 m.....; grades into.....</p> <p><b>278.6-286.0 m:</b> alternating zones black serpentinite and light gray mottled and altered ultramafics; minor tremolite as fibrous veinlets; &lt;1% sulfides as isolated aggregates, thin discontinuous veinlets, commonly associated with magnetite in black serpentinite;</p> <p><b>286.0-331.1 m:</b> massive dark green-black serpentinite; generally contains &lt;1% sulfides, but occasionally up to 2% as small clusters and aggregates closely intergrown with magnetite; small clots of acicular actinolite common in places, with or without sulfide and magnetite and sulfide; in the section from 289-297 m., the serpentinite is strongly sheared and graphitic with common black greasy slickensided joint surfaces, often sub-parallel to CA; results in very weak and broken core; below 297.0 m., ground is soft but competent with many breaks being driller breaks;</p> <p><b>331.1-332.3 m:</b> very soft decomposed serpentinite, clayey and graphitic;</p> <p><b>332.3-333.8 m:</b> black serpentinite graphitic and broken;</p> <p><b>333.8-344.0 m:</b> mottled gray-light green altered and silicified ultramafics; spotty appearance due to patches of pale green fine grained material set in light gray serpentinite; dark green serpentinite patches with associated sulfides common throughout; minor magnetite; coarse aggregates of sulfide, pyrrhotite/ pentlandite associated with light green spots, generally 0.5-1%;</p> <p><b>333.8 m:</b> 200 mm. band of semi massive sulfide; proportion of dark green serpentinite increasing towards 344 m., including some massive bands; ground conditions generally good;</p>	257.0	364.2	100	257.0	258.0	0.83	<0.01	0.43	0.01	0.186	0.009
						258.0	259.0	5.80	0.01	3.95	<0.01	1.140	0.071
						259.0	260.0	1.11	<0.01	0.18	<0.01	0.770	0.008
						260.0	261.0	1.29	<0.01	0.90	<0.01	0.344	0.019
						261.0	262.0	2.10	0.01	2.10	<0.01	0.335	0.037
						262.0	263.0	1.48	<0.01	1.10	<0.01	0.585	0.019
						263.0	264.0	0.82	<0.01	1.19	<0.01	0.297	0.013
						264.0	265.0	0.72	0.02	3.90	<0.01	0.049	0.019
						265.0	266.0	1.38	<0.01	1.89	<0.01	0.887	0.017
						266.0	267.0	0.51	<0.01	0.57	<0.01	0.161	0.006
						267.0	268.0	0.61	<0.01	1.25	<0.01	0.009	0.010
						268.0	269.0	4.10	0.01	4.95	<0.01	0.150	0.060
						269.0	270.0	1.17	<0.01	2.65	<0.01	0.046	0.019
						270.0	271.0	0.86	0.01	3.05	<0.01	0.021	0.019
						271.0	272.0	0.69	0.01	2.75	0.01	0.079	0.019
						272.0	272.5	0.45	<0.01	2.10	<0.01	0.016	0.012
						272.5	273.8	0.18	<0.01	0.33	<0.01	0.019	0.004
						273.8	275.0	0.26	<0.01	0.71	<0.01	0.021	0.011
						275.0	276.0	1.26	0.01	2.10	<0.01	0.498	0.035
						276.0	277.0	0.20	<0.01	0.47	<0.01	0.057	0.009
						277.0	278.0	0.17	<0.01	0.17	<0.01	0.148	0.013
						278.0	279.4	0.17	<0.01	0.25	<0.01	0.142	0.011
						279.4	280.4	0.18	<0.01	0.37	<0.01	0.101	0.005
						280.4	281.4	0.20	<0.01	0.34	<0.01	0.092	0.006
						281.4	282.5	0.14	<0.01	0.31	<0.01	0.027	0.007
						282.5	283.5	0.12	<0.01	0.11	0.01	0.040	0.006
						283.5	284.7	0.34	<0.01	0.74	<0.01	0.124	0.012
						284.7	286.2	0.34	<0.01	0.52	<0.01	0.127	0.008
						286.2	287.7	0.40	<0.01	0.36	<0.01	0.354	0.024
						287.7	289.5	0.26	<0.01	0.43	<0.01	0.205	0.012
						289.5	290.5	0.25	<0.01	0.60	0.01	0.143	0.009
						290.5	291.5	0.27	<0.01	1.07	<0.01	0.165	0.011
						291.5	293.5	0.46	<0.01	2.20	0.01	0.387	0.032
						293.5	295.5	0.20	<0.01	2.25	0.01	0.086	0.012
						295.5	297.5	0.25	<0.01	2.10	0.01	0.137	0.018
						297.5	299.5	0.17	<0.01	0.58	0.01	0.073	0.008
						299.5	301.5	0.37	<0.01	0.44	<0.01	0.198	0.009
						301.5	303.5	0.23	<0.01	0.27	<0.01	0.079	0.007
						303.5	305.5	0.77	<0.01	0.24	<0.01	0.592	0.024
						305.5	307.5	0.21	<0.01	0.27	<0.01	0.052	0.008
					307.5	309.5	0.20	<0.01	0.26	<0.01	0.042	0.008	
					309.5	311.5	0.23	<0.01	0.30	<0.01	0.077	0.009	
					311.5	313.5	0.56	<0.01	0.61	0.01	0.296	0.015	
					313.5	315.5	0.25	<0.01	0.38	<0.01	0.086	0.010	
					315.5	317.5	0.47	<0.01	0.68	0.05	0.307	0.030	
					317.5	319.5	0.20	<0.01	0.25	0.01	0.069	0.009	
					319.5	321.5	0.19	<0.01	0.28	<0.01	0.034	0.008	
					321.5	323.5	0.25	<0.01	0.68	0.01	0.030	0.012	
					323.5	325.5	0.24	<0.01	0.56	0.01	0.040	0.011	
					325.5	327.5	0.26	<0.01	0.61	0.01	0.028	0.009	
					327.5	329.5	0.36	<0.01	0.66	<0.01	0.076	0.010	
					329.5	331.1	0.56	<0.01	0.90	0.01	0.097	0.013	
					331.1	332.4	0.26	<0.01	0.58	<0.01	0.059	0.011	
					332.4	333.5	0.19	<0.01	0.28	0.01	0.078	0.018	
					333.5	334.5	1.07	<0.01	1.63	0.02	0.587	0.028	
					334.5	335.5	0.18	<0.01	0.70	<0.01	0.015	0.007	
					335.5	336.5	0.24	<0.01	0.19	<0.01	0.016	0.005	
					336.5	337.5	0.26	<0.01	0.36	<0.01	0.024	0.007	
					337.5	338.5	0.20	<0.01	0.26	<0.01	0.006	0.006	
					338.5	339.5	0.08	<0.01	0.08	<0.01	<0.002	0.004	
					339.5	340.5	0.14	<0.01	0.16	<0.01	0.002	0.006	



**COMPANY:** Allegiance Mining NL  
**PROJECT:** Avebury  
**HOLE NUMBER:** A 037

<b>Commenced</b>	19 June 2002
<b>Completed</b>	14 July 2002
<b>Logged by</b>	LANewnham
<b>Drilled by</b>	Almac

**Purpose of Hole**

To test the South Avebury north lens down dip of A 036

**Collar details**

<b>Grid</b>	AMG
<b>Easting</b>	354420.6
<b>Northing</b>	5357457.5
<b>Elevation</b>	2,180.4
<b>Dip</b>	-70
<b>Bearing</b>	179.5
<b>Length</b>	416.0

**Comments on Completion**

the outh Avebury North Lens was only weakly mineralised; the interval 362.4-389.7 m (27.3 m) contained approximately 3% sulfides as pyrrhotite and pentlandite, but Ni was < 0.5%; best intersection using 0.5% Ni cut off was on the HW from 362.4-366.4 m (4 m) 0.69% Ni, 0.92 % S;

**Hole Size**

<b>To</b>	<b>Size</b>
23.5	HQ
416	NQ

**Major core loss zones**

<b>From</b>	<b>To</b>	<b>% recov.</b>
0	11	70

**Hole Condition on Completion**

all steel removed from hole; PVC collar pipe inserted;

**Summary of Assay Results**

Depth	Recovery	Description	Length	Assays				
From (m)	To (m)	%	m.	% Ni	% S			
362.4	366.4	100	4.0	0.69	0.92			

**Down Hole Survey Data**

Camera	Dip	Mag Brg	Mag Brg	Grid Brg
Depth		Actual	Adjusted	
0	-70	174	174	179.5
18	-70	174	174	179.5
46	-70	175	175	180
76	-69	177	177	182
107	-69	180	180	185
140	-68	181	181	186
170	-68	185	183	189
200	-68	184	184	189
230	-68	201	185	190
260	-67	187	186	191
290	-67	186	187	192
320	-67	169	186	191
350	-66	198	185	190
380	-65	184	184	189
416	-65		184	189

**Notes on Surveys**

collar was surveyed by licenced surveyor and down hole bearings adjusted accordingly; bearings obviously affected by magnetite were rejected;

**General Comments**

.



Description		Core Recovery			Assays								
From	To		From	To	%	From	To	% Ni	% Cu	% S	% Zn	% As	% Co
0.0	3.0	<b>TRICONE:</b> no core;	0.0	3.0	0								
3.0	13.0	<b>HORNFELS - rubble:</b> light gray and brown hornfelsed sediments, very broken, rubble in places, core losses;	3.0	5.0	50								
			5.0	5.8	80								
13.0	179.0	<b>HORNFELSED SEDIMENTS:</b> fresh, less broken dark brown-dark gray hornfelsed sediments; irregular patches and veins felted actinolite and quartz, commonly carrying minor disseminated sulfides (pyrrhotite); BCA @ 30 m: 40'; <b>below 40 m:</b> minor light gray brecciated cherty patches; BCA @ 47 m 60'; <b>below 50 m:</b> massive dark gray and dark brown hornfelsed sediments with patches green felted actinolite; light gray-pink-cream cherty patches near 70 m and 96 m; ground conditions moderately good but several close spaced joint sets; between 92.5-99.0 m., core is quite broken along several joint sets; BCA @ 68 m: 50'; <b>below 97m:</b> dark brown-dark gray hornfelsed sediments with patches dark green felted actinolite and minor cherty patches; BCA at 107.5 m: 45'; trace pyrrhotite usually with actinolite sections; <b>111.0-121.0 m:</b> core very broken along bedding planes and at least two joint sets; BCA at 128.0 m: 50'; <b>143.0-144.5 m:</b> band of actinolite rich cherty rocks with felted texture and minor veins of quartz-schorl- chalcopyrite;  generally ground throughout this interval is moderately broken, hard and cherty in places, with several close spaced joint sets;	6.9	6.9	100								
			6.9	7.4	70								
			7.4	9.3	90								
			9.3	11.0	60								
			11.0	179.0	100								
179.0	193.0	<b>ALTERED MAFIC ROCK -quartz-actinolite-schorl-axinite alteration:</b> intensely altered streaky light-dark gray cherty rock strongly silicified and containing irregular patches of actinolite-schorl-axinite alteration; some sections contain 1-2% sulfides (pyrrhotite) and a lighter colored silvery sulfide;	179.0	193.0	100								
193.0	214.0	<b>ALTERED HORNFELSED SEDIMENTS:</b> dark brown fine grained altered and hornfelsed sediments with brecciated textures in places; irregular patches of dark green felted actinolite; BCA at 211 m: 35' minor sulfides in thin veinlets, increasing towards base of unit; ground conditions generally good, with a few narrow broken zones;	193.0	214.0	100								
214.0	232.8	<b>HORNFELSED SEDIMENTS- pyrrhotitic:</b> dark brown, dark gray fine grained hornfelsed sediments similar to unit above but containing characteristic thin irregular veinlets of sulfides, mainly pyrrhotite; ( this appears to be a predictable unit seen in other holes, approximately 100 m in HW of South Avebury); sulfide veins generally 1-2 mm wide but some thicker bands up to 50 mm. of felted actinolite and abundant pyrrhotite; ground conditions excellent;	214.0	232.8	100	218	219	0.01	0.03	1.90	<0.01	<0.005	0.007
						221.3	222.8	0.01	0.02	1.29	0.01	<0.005	0.010
						226.0	227.5	0.01	0.03	1.65	0.01	<0.005	0.012
						247.0	248.0	0.02	0.05	1.68	0.02	0.063	0.024
						251.5	252.5	0.41	0.02	2.10	0.09	<0.005	0.028
232.8	274.5	<b>MIXED CHERTY SEDIMENTS and ALTERED ACTINOLITE RICH SEDIMENTS-pyrrhotitic:</b> unit of mixed lighter colored cherty sediments, often brecciated, and darker gray-green fine-medium grained mafic rocks, with felted actinolite..	232.8	274.5	100	260.4	261.4	0.01	0.01	1.45	0.01	<0.005	0.006
						265.4	266.4	0.01	0.02	1.28	0.01	<0.005	0.007





**COMPANY:** Allegiance Mining NL  
**PROJECT:** Avebury  
**HOLE NUMBER:** A 038

<b>Commenced</b>	03 July 2002
<b>Completed</b>	01 Aug 2002
<b>Logged by</b>	LA Newnham
<b>Drilled by</b>	Almac

**Purpose of Hole**

To test South Avebury North and South Lenses beneath A 026

**Collar details**

<b>Grid</b>	AMG
<b>Easting</b>	354493.8
<b>Northing</b>	5357510.7
<b>Elevation</b>	2,179.5
<b>Dip</b>	-48
<b>Bearing</b>	175
<b>Length</b>	433.5

**Comments on Completion**

South Avebury mineralisation in A 038 was not as well developed as in A 026; a significant proportion of the Ni in the North Lens is present as nicolite ( approx 25% of the nickel);

**Hole Size**

To	Size
44.2	HQ
433.5	NQ

**Major core loss zones**

From	To	% recov.
0	22.4	
367.5	372.2	70
421.5	423.4	85

**Hole Condition on Completion**

hanging wedge placed at 264 m., to steepen hole; wedge remains in hole; all drill rods and casing removed; PVC collar pipe placed in hole;

**Summary of Assay Results**

Depth	Recovery	Description	Length	Assays					
From (m)	To (m)	%	m.	% Ni	% Cu	% S	% As	% Co	
382.7	304.0	100	mottled and black ultramafics	21.3	0.87	<0.01	1.32	0.110	0.021
294.0	303.0	100	black serpentinite (S Av- North Lens)	9.0	0.94	<0.01	1.64	0.226	0.026
398.2	408.1	100	altered ultramafics (S Av-South Lens)	9.9	1.05	<0.01	1.36	0.045	0.022
398.2	406.0	100		7.8	1.16	<0.01	1.54	0.027	0.024

**Down Hole Survey Data**

Camera	Depth	Dip	Mag Brg Actual	Mag Brg Adjusted	Grid Brg
	0	-48			175
	14	-48	171	171	175
	42	-48	172	172	176
	70	-47	174	174	178
	103	-46	176	176	180
	132	-45	178	178	181
	161	-44	179	179	181
	190	-43	345	179	181
	220	-41	179	179	181
	250	-39	176	179	181
	276	-41	182	180	181
	285	-40	180	180	181
	300	-40	173	173	179
	316	-40	171	171	179
	335	-40	174	174	178
	365	-41	171	171	178
	394	-41	177	177	178
	424	-40	170	170	176
	433.5	-40	170	170	176

**Notes on Surveys**

collar was surveyed by licenced surveyor; down hole surveys were adjusted accordingly; below 250 m., surveys were affected firstly by the wedge at 250 m and then the ultramafics from 282-407 m; hole below 250 m is believed to be straight because a 6 m barrel was used under controlled drilling conditions designed to keep the hole straight;

**General Comments**

--



Description			Core Recovery			Assays							
From	To		From	To	%	From	To	% Ni	% Cu	% S	% Zn	% As	% Co
0.0	9.0	<b>TRICONE:</b> no core	0.0	9.0	0								
9.0	18.0	<b>RUBBLE:</b> mixture of rubbly hornfelsed sediments and clays; significant core losses;	9.0	12.0	5								
			12.0	15.0	20								
18.0	282.6	<b>HORNFELSED SEDIMENTS:</b> dark gray fine grained hornfelsed sediments; some mottled intervals with clasts of white-cream colored sediments set in dark gray-green groundmass; patches of felted mafic minerals common (?actinolite), occasionally carrying minoe chalcopyrite; <b>below 18.0 m:</b> core fresh but quite broken along several joint sets, often with limonite coating on joints; several narrow very broken/rubble zones; BCA at 24.5 m: 45°; 40 m: 55°; <b>below 44 m:</b> dark brown hornfels (phlogopite rich?) <b>below 60 m:</b> increase in lighter gray, silicified hornfelsed sediments, with overall brecciated and disrupted fabric; groundmass in brecciated units typically dark gray, fine grained felted mafics (actinolite, chlorite?); ground still moderately broken; BCA 50-55°; <b>89.2-90.8 m:</b> schorl veining common, accompanied by large aggregates of light brown sphalerite and minor coarse splashes of chalcopyrite; <b>90.8-94.7 m:</b> mixed brown and light gray altered sediments, crackled by irregular fine dark veins (?chlorite); grades into... <b>below 94.7 m:</b> alternating dark brown-dark gray altered sediments, strongly fractured /brecciated with clasts of light green-cream sediments set in a felted fine grained matrix of mafic material accompanied by abundant schorl and minor sulfides; ground conditions generally good but some broken zones associated with strong jointing; <b>103.0-115.0 m:</b> lighter colored cherty fine grained sediments, strongly fractured and healed by dark gray siliceous material; <b>115.0-124.8 m:</b> dark gray-dark brown fine grained hornfelsed sediments quite broken by several close spaced joint sets; <b>124.8-151.5 m:</b> lighter gray-brown hornfelsed sediments, strongly fractured/ brecciated and healed by dark gray siliceous and felted mafic material; minor patches of schorl; BCA @ 146 m., 70°; trace fine grained sulfides in late stage quartz- actinolite matrix; ground conditions reasonably good; grades into..... <b>151.5-163.5 m:</b> dark brown-dark gray fine grained hornfelsed sediments; faint brecciated texture in places; BCA @ 157 m., 70°; ground moderately good but broken in places by close spaced joint sets; <b>163.5-194.0 m: pyrrhotitic marker unit ?</b> dark gray-purplish fine grained hornfelsed sediments, similar to previous unit , but carrying 3- 5% pyrrhotite as narrow seams and veinlets, sometimes parallel to bedding, chaotic elsewhere; also as small clots and large masses up to 20 mm; significant felted mafic component often associated with sulfides but also as large late stage masses and infillings around clasts in cherty sections; unit suggestive of a siltstone which has been hornfelsed, weakly brecciated and subjected to late stage iron and sulfur metasomatism; pyrrhotite abundance decreases below 179 m; ground conditions generally good;	15.0	17.0	40								
			17.0	19.7	80								
			19.7	22.4	95								
			22.4	282.6	100								

Description		Core Recovery			Assays							
From	To	From	To	%	From	To	% Ni	% Cu	% S	% Zn	% As	% Co
18.0 continued.....	282.6	<p><b>194.0-231.0 m:</b> mixed light gray-cream cherts interbedded with dark gray-purplish hornfelsed sediments, similar to unit above; thin pyrrhotite veinlets common in darker sediments, as for 163.5 m...; BCA in cherty units generally 60°; BCA at 222 m: 70°; at 198.5 m., 400 mm zone of quartz-schorl-axinite alteration; ground conditions reasonable but several close spaced joint sets result in several fractured intervals;</p> <p><b>231.0-245 m:</b> mottled brecciated cherty unit with fractured cream-white cherty material set in interstitial dark green felted actinolite (?); BCA generally 70°; minor thin late stage sulfide veinlets; several weakly magnetic sections due to either minor magnetite or pyrrhotite veinlets; probably a well bedded siliceous sediment subjected to iron metasomatism accompanied by minor sulfide; ground conditions good; grades into.....</p> <p><b>below 245 m:</b> darker gray brown well bedded mafic unit, probably containing abundant phlogopite and actinolite; minor chert component; some patches of schorl; BCA uniform 65-70°; ground conditions excellent;</p> <p><b>255.9 m:</b> 150 mm. band of massive pyrrhotite;</p> <p><b>below 255 m:</b> alternating units of strongly altered well bedded sediments with stripey appearance, and dark gray-dark green fine grained mafic rocks; stripey sediments contain abundant phlogopite and possibly fine grained brown dravite; mafic units contain minor-common pyrrhotite as late stage veinlets; several patches of semi-massive sulfide eg 268 m; minor carbonate veining; BCA at 256 m: 60°; 270 m: 40°; some of the mafic units have an altered ultramafic appearance;</p> <p><b>wedge placed at 264 m. to steepen hole;</b></p> <p><b>below 275 m:</b> sediments become lighter gray and more siliceous; ground conditions excellent; contact with ultramafics below somewhat diffuse and not obvious;</p>										
282.6	407.1	<p><b>ALTERED ULTRAMAFICS:</b> diffuse contact with mottled light gray and pale green altered mafic-ultramafic units;</p> <p><b>282.6-285.6 m:</b> dark and light gray -pale green altered mafic and ultramafic rocks with abundant pyrrhotite and pentlandite;</p> <p><b>285.6-287.0 m:</b> dark gray altered mafic (possibly sedimentary) rocks; minor disseminated sulfides, occasional larger splashes; core moderately competent;</p> <p><b>287.0-294.0 m:</b> mottled gray-dark green and black altered ultramafics; pentlandite-pyrrhotite common-abundant in places; strongly magnetic due to magnetite and pyrrhotite; core moderately competent;</p> <p><b>294.0-374.7 m:</b> dark gray-dark green-black massive serpentinite; significant pentlandite and pyrrhotite to 304 m., then rapidly diminishes to only minor spots; sulfides typically associated with magnetite in aggregates; magnetite common throughout as irregular granular aggregates and occasional late stage seams or veins; core generally competent but overall soft due to talcose component and graphite development in ....</p>										
					282.7	284.1	0.54	<0.01	0.59	<0.01	0.013	0.013
		282.6	309.6	100	284.1	285.4	2.45	<0.01	3.85	<0.01	0.024	0.045
		309.6	312.7	90	285.4	287.0	0.41	<0.01	0.32	<0.01	0.011	0.009
		312.7	367.5	100	287.0	288.0	0.83	<0.01	1.30	<0.01	0.012	0.015
					288.0	289.0	0.83	<0.01	1.11	<0.01	0.012	0.015
					289.0	290.0	0.75	<0.01	0.89	<0.01	0.008	0.012
					290.0	291.0	0.81	<0.01	1.08	<0.01	0.017	0.014
					291.0	292.0	0.47	<0.01	0.70	<0.01	0.028	0.010
					292.0	293.0	0.81	<0.01	1.28	<0.01	0.026	0.017
					293.0	294.0	0.36	<0.01	0.54	0.01	0.016	0.009
					294.0	295.0	1.38	0.01	1.88	<0.01	0.250	0.029
					295.0	296.0	1.16	0.01	1.90	0.01	0.124	0.030
					296.0	297.0	0.95	<0.01	1.64	0.02	0.157	0.027
					297.0	298.0	0.71	<0.01	1.25	0.01	0.127	0.020
		367.5	369.8	60	298.0	299.0	0.64	<0.01	1.08	0.01	0.215	0.016
		369.8	372.2	80	299.0	300.0	1.29	<0.01	1.37	0.01	0.947	0.045
		372.2	407.1	100	300.0	301.0	0.57	<0.01	1.01	0.01	0.119	0.017
					301.0	302.0	0.73	<0.01	1.48	0.02	0.040	0.022
					302.0	303.0	1.04	<0.01	2.00	0.03	0.058	0.029
					303.0	304.0	0.68	<0.01	1.20	0.01	0.111	0.020
					304.0	305.0	0.36	<0.01	0.48	0.01	0.158	0.014
					305.0	306.0	0.26	<0.01	0.31	0.01	0.106	0.011

Description		Core Recovery			Assays							
From	To	From	To	%	From	To	% Ni	% Cu	% S	% Zn	% As	% Co
282.6	407.1				307.0	308.0	0.27	<0.01	0.19	0.01	0.206	0.015
continued.....					309.0	310.0	0.31	<0.01	0.18	0.01	0.227	0.012
					311.0	312.0	0.25	<0.01	0.38	<0.01	0.033	0.011
					313.0	314.0	0.26	<0.01	0.34	0.01	0.030	0.011
					315.0	316.0	0.23	<0.01	0.24	<0.01	0.012	0.010
					317.0	318.0	0.31	<0.01	0.34	0.03	0.017	0.012
					319.0	320.0	0.56	<0.01	0.38	0.04	0.223	0.015
					321.0	322.0	0.18	<0.01	0.18	<0.01	0.009	0.007
					323.0	324.0	0.16	<0.01	0.15	<0.01	0.007	0.007
					325.0	326.0	0.17	<0.01	0.16	<0.01	0.007	0.007
					327.0	328.0	0.16	<0.01	0.14	<0.01	0.007	0.007
					329.0	330.0	0.18	<0.01	0.15	<0.01	0.007	0.007
					331.0	332.0	0.03	<0.01	0.35	0.02	0.009	0.010
					333.0	334.0	0.26	<0.01	0.31	0.01	0.007	0.008
					335.0	336.0	0.26	<0.01	0.30	<0.01	0.009	0.008
					337.0	338.0	0.16	<0.01	0.15	<0.01	0.008	0.006
					339.0	340.0	0.18	<0.01	0.19	<0.01	0.008	0.007
					341.0	342.0	0.21	<0.01	0.30	0.02	0.008	0.008
					343.0	344.0	0.15	<0.01	0.20	<0.01	0.007	0.007
					345.0	346.0	0.20	<0.01	0.35	0.04	0.006	0.007
					347.0	348.0	0.20	<0.01	0.25	0.01	0.008	0.008
					349.0	350.0	0.22	<0.01	0.38	0.01	0.008	0.009
					351.0	352.0	0.20	<0.01	0.33	<0.01	0.007	0.007
					353.0	354.0	0.22	<0.01	0.38	0.01	0.006	0.008
					355.0	356.0	0.18	<0.01	0.37	0.02	0.007	0.008
					357.0	358.0	0.20	<0.01	0.37	0.01	0.008	0.009
					359.0	360.0	0.20	<0.01	0.37	0.01	0.007	0.011
407.1	433.5	407.1	421.5	100								
		421.5	423.4	85	361.0	362.0	0.23	<0.01	0.31	0.01	0.057	0.012
		423.4	433.5	100								
					363.0	364.0	0.19	<0.01	0.26	<0.01	0.023	0.010
					365.0	366.0	0.18	<0.01	0.46	<0.01	0.037	0.008
					367.0	368.0	0.23	<0.01	0.24	0.01	0.118	0.018



**COMPANY:** Allegiance Mining NL  
**PROJECT:** Avebury  
**HOLE NUMBER:** A 039

<b>Commenced</b>	04 Aug 2002
<b>Completed</b>	23 Aug 2002
<b>Logged by</b>	L Newnham
<b>Drilled by</b>	Almac

**Purpose of Hole**

A 039 was designed to test the South Avebury North Lens down dip of A 038;

**Collar details**

<b>Grid</b>	AMG
<b>Easting</b>	354494.1
<b>Northing</b>	5357511.4
<b>Elevation</b>	2,179.5
<b>Dip</b>	-60.5
<b>Bearing</b>	171
<b>Length</b>	382.7

**Comments on Completion**

South Avebury North Lens consisted of an 11 m wide sulfidic zone of which the upper half contained mainly pentlandite and the lower half mainly pyrrhotite; there were minor core losses in the upper half; approx 35 m. in the HW of South Avebury, there was a 1.3 m. wide band of semi-massive pentlandite in a siliceous tourmalinised rock which assayed 8.15% Ni;

**Hole Size**

To	Size
56.3	HQ
382.7	NQ

**Major core loss zones**

From	To	% recov.
353.3	356.0	90

**Hole Condition on Completion**

9 m of HQ rods remain in hole 47-56 m; all other casing and rods removed; PVC collar pipe inserted;

**Summary of Assay Results**

Depth	Recovery	Description	Length	Assays					
From (m)	To (m)	%	m.	% Ni	% Cu	% S	% As	% Co	
352.0	356.0	95	serpentinite (1.0% Ni cut-off)	4.0	1.61	<0.01	1.82	0.007	0.030
352.0	358.0		(0.5% Ni cut-off)	6.0	1.33				
316.0	317.3	100	white siliceous tourmalinised rock	1.3	8.15	0.01	6.85	0.030	0.124

**Down Hole Survey Data**

Camera	Depth	Dip	Mag Brg Actual	Mag Brg Adjusted	Grid Brg
Collar		-60.5			171
	24	-60	167	168	172
	73	-60	169	169	173
	103	-60	170	170	174
	133	-60	172	172	176
	164	-59.5	169	170	174
	194	-59	173	172	176
	223	-58	169	170	173
	254	-57	165	170	173
	284	-56	170	170	174
	314	-55	171	171	175
	344	-54	167	171	175
	374	-53	167	171	175
	382.7	-53			175

**Notes on Surveys**

collar was surveyed by licenced surveyor and down hole bearings adjusted in accordance with protocol developed previously; surveys below 314 m are influenced by magnetite in adjacent rock;

**General Comments**

Description		Core Recovery			Assays								
From	To		From	To	%	From	To	% Ni	% Cu	% S	% Zn	% As	% Co
0.0	9.0	<b>TRICONE:</b> no core;	0.0	9.0	0								
			9.0	12.5	10								
9.0	15.0	<b>SEDIMENT RUBBLE:</b> very broken limonitic sedimentary rubble;	12.5	15.0	35								
15.0	349.8	<b>SEDIMENTS and MAFIC VOLCANICS(?):</b> <b>15.0-45.2 m:</b> dark gray and reddish brown fine-medium grained sediments, cherty in places; minor green felted mafic component (actinolite alteration); BCA 24 m: 50°; 30 m: 40°; 32.5 m: 45°; core fresh but very broken; hole initially cased of to NQ at 35.3 m., and advanced to 43 m NQ; however ground became extremely broken and rubbly so HQ extended to 56.3 m; <b>below 45.2 m:</b> dark gray fine grained sedimentary rock; BCA 53 m: 30°; core fresh but quite broken along several joint sets; <b>below 54.5 m:</b> similar to unit above but bands of quartz-actinolite alteration; cherty in places, typically with a crackled appearance; BCA 64 m: 30°; <b>below 73 m:</b> mixture of brown, fine-medium grained sediments and dark gray mafic rocks consisting mainly of dark green amphibole with felted texture (actinolite-tremolite); irregular patches of quartz-schorl; cream colored chert zones common in green mafic sections below 77 m; trace sulfides as small aggregates in mafic units; ground moderately broken; <b>below 86 m:</b> similar to unit above but dominated by brown-dark gray fine-medium grained altered sediments with lesser mafic and cherty component; BCA 105 m: 40°; trace chalcopyrite associated with schorl-actinolite alteration; ground moderately broken; <b>below 109.5 m:</b> unit dominated by dark gray-brown siliceous sediments, crackle fractured and healed with soft brown material (phlogopite?) ground conditions improving; <b>below 115 m:</b> dark brown-dark gray fine grained hornfelsed sediments with numerous patches green felted actinolite; ground conditions below 117 m. very good; <b>below 125 m:</b> light gray and brown siliceous medium grained sediments; schorl and actinolite seams and patches becoming common below 132 m; <b>below 135 m:</b> light gray-cream cherts, chaotically mixed with green altered mafic material; <b>below 139 m:</b> pale gray cherty rocks mixed with pale green felted mafic material similar to unit above but characterised by abundant coarse black tourmaline often associated with axinite and actinolite as thick bands and irregular masses ; BCA 158 m: 50°; occasional splashes of sulfide- chalcopyrite and pyrrhotite; ground conditions excellent; <b>below 161 m:</b> grades into dark gray-dark brown purplish <b>pyrrhotitic marker unit</b> ; fine grained hornfelsed sediment, possibly rich in phlogopite; occasional green felted actinolite patches; 3-5% pyrrhotite as thin seams and irregular clots; amount of pyrrhotite diminishes towards base of unit; ground conditions good; <b>below 177 m:</b> dark brown-dark gray hornfelsed sediments similar to unit above but less pyrrhotite; bands of cream-gray chert chaotically set in groundmass of green felted actinolite accompanied by axinite; <b>188-197 m:</b> dark brown fine grained hornfelsed sediments with 3-5% pyrrhotite as thin seams and	15.0	35.3	100								
			35.3	37.0	90								
			37.0	41.6	80								
			41.6	42.6	40								
			42.6	44.3	80								
			44.3	45.2	80								
			45.2	265.0	100								





**COMPANY:** Allegiance Mining NL  
**PROJECT:** Avebury  
**HOLE NUMBER:** A 040

<b>Commenced</b>	13 Aug 2002
<b>Completed</b>	31 Aug 2002
<b>Logged by</b>	LA Newnham
<b>Drilled by</b>	Almac

**Purpose of Hole**

A 040 was designed to test the upper extent of North Avebury, Central Avebury, the Viking North Lens close to Main Fault and Viking South Lens at depth;

**Collar details**

<b>Grid</b>	AMG
<b>Easting</b>	354732.3
<b>Northing</b>	5357477.4
<b>Elevation</b>	2,167.0
<b>Dip</b>	-45
<b>Bearing</b>	198
<b>Length</b>	451.1

**Comments on Completion**

North Avebury was intersected at 65 vert.m., and contained low levels of Ni in a pyrrhotitic host; Cent Avebury was thin but av 1.64% Ni; South Avebury North Lens av 1.58% Ni, of which about 7% is present as nicolite; South Avebury south lens was poorly mineralised or may have been faulted off; there were several >1% Ni zones in the ultramafic between North and South lenses;

**Hole Size**

To	Size
44.4	HQ
451.1	NQ

**Major core loss zones**

From	To	% recov.
319.2	321.1	60

**Hole Condition on Completion**

all steel removed from hole; PVC collar pipe inserted;

**Summary of Assay Results**

Depth	Recovery	Description	Length	Assays					
From (m)	To (m)	%	m.	Ni	S	Zn	As	Co	
90.3	99.3	100	9.0	0.24	2.98				
206.3	207.4	100	1.1	1.64	1.33	0.01	0.043	0.027	
226.5	231.5	100	5.0	1.58	2.32	0.01	0.127	0.034	
272.5	277.5	100	5.0	1.37	1.47				

**Down Hole Survey Data**

Camera	Dip	Mag Brg	Mag Brg	Grid Brg
Depth		Actual	Adjusted	
0	-45			198
17	-45			198
42	-45.5			198
74	-46			199
104	-46			199
139	-47			200
164	-46.5			201
181	-46.5			200
205	-46			200
226	-46			200
256	-45.5			201
298	-45			203
328	-46			203
357	-45			204
388	-45			204
423	-45			204
451.1	-45			204

**Notes on Surveys**

collar was surveyed by licenced surveyor; down hole was surveyed by single shot camera and maxibore; camera and maxibore dips were in close agreement; camera bearings were adjusted in accordance with established down hole survey protocol and agreed closely with maxibore; bearings used were from maxibore;

**General Comments**

Description			Core Recovery			Assays							
From	To		From	To	%	From	To	% Ni	% Cu	% S	% Zn	% As	% Co
0.0	5.4	<b>TRICONE</b> - no core;	0.0	5.4	0								
5.4	11.5	<b>SKARN:</b> intensely weathered interval consisting of remnant sections of green (actinolite) crystalline material and strongly leached zones; 8.8-10.0 m: limonitic gossan material; minor sulfide present in some leached vuggy sections; overall, interval is strongly limonitic and broken; (drill site was developed in this material also);	5.4	6.6	95								
			6.6	9.0	95								
			9.0	11.5	100								
11.5	45.5	<b>SEDIMENTS:</b> light-dark gray fine-medium grained sediments, weakly hornfelsed; core relatively fresh, but with minor limonite on some fracture surfaces; moderately broken to 31 m., but improving below that; BCA's: 12 m: 60°; 20 m: 45°; 36 m: 60°;	11.5	45.5	100								
45.5	59.2	<b>CHERTS:</b> brecciated and mottled cherts consisting of irregular clasts or disrupted beds of pale creamy colored chert set in dark gray-dark green fine grained material; no definite bedding observed but there is a strong joint set, possibly parallel to bedding at 45° CA; ground moderately broken; grades into.....	45.5	56.1	100								
			56.1	57.3	70								
			57.3	59.2	100								
59.2	88.1	<b>ALTERED MAFIC ROCK:</b> dark greenish-gray fine grained mafic rock; quite soft due to pervasive talc alteration; cut by narrow veins of talc and carbonate, the latter carrying minor pyrrhotite and pentlandite (?); soft brown mineral, possibly phlogopite, associated with talc-carbonate alteration eg 65.8 m; <b>below 71 m:</b> patches and streaks of green crystalline mineral (epidote ?) becoming common; rock weakly magnetic, possibly due to minor disseminated pyrrhotite; ground conditions moderately good but some softer broken zones where talc component is high; broken below 85 m;	59.2	61.2	100								
			61.2	64.4	70								
			64.4	88.1	100								
88.1	100.1	<b>ALTERED and MINERALISED ULTRAMAFICS: (interpreted as North Avebury)</b> pale green (epidote ?) altered ultramafics and light green felted actinolite mixed with irregular dark green-dark gray serpentinite giving overall mottled appearance; sulfides (mainly pyrrhotite) common-abundant as large massive patches, small aggregates and disrupted seams and infilling late stage fractures; magnetite common-abundant, particularly in upper half of unit; ground conditions very good; abrupt change to unit below;	88.1	100.1	100	88.2	89.3	0.13	<0.01	0.04	0.07	0.024	0.004
						89.3	90.3	0.12	<0.01	0.24	0.01	0.089	0.002
						90.3	91.3	0.30	<0.01	1.03	0.02	0.030	0.002
						91.3	92.3	0.35	0.0	3.55	0.02	0.009	0.002
						92.3	93.3	0.32	<0.01	2.60	0.01	<0.005	0.002
						93.3	94.3	0.16	<0.01	2.25	0.06	0.010	0.003
						94.3	95.3	0.18	<0.01	2.35	0.05	0.011	0.002
						95.3	96.3	0.19	0.01	3.55	0.13	0.013	0.003
						96.3	97.3	0.20	<0.01	2.60	0.01	0.012	0.002
						97.3	98.3	0.15	<0.01	2.20	0.02	0.011	0.002
						98.3	99.3	0.28	0.03	6.75	0.03	0.013	0.002
						99.3	100.1	0.19	<0.01	0.46	0.01	0.102	0.002
100.1	126.0	<b>SERPENTINITE:</b> dark brown-dark green-black massive serpentinite with thin talc and /or asbestiform veins; magnetite common as irregular masses and coarse aggregates; trace-minor sulfides associated with magnetite; ground talcose and broken to 103 m., then soft but competent to 126 m; most breaks along talcy/asbestiform fracture fillings; grades into unit below....	100.1	106.5	100								
			106.5	109.5	85								
			109.5	126.0	100								
126.0	208.3	<b>SERPENTINITE with ACTINOLITIC PATCHES:</b> similar to unit above but abundant seggregations of light gray-green crystalline (felted) actinolite-tremolite set in the dark massive serpentinite, resulting in mottled appearance;	126.0	208.3	100								



Description		Core Recovery			Assays							
From	To	From	To	%	From	To	% Ni	% Cu	% S	% Zn	% As	% Co
225.5	443.5				249.5	250.5	0.14	<0.01	0.13	<0.01	0.007	0.005
continued.....					250.5	251.5	0.22	<0.01	0.20	<0.01	0.008	0.007
					251.5	252.5	0.44	<0.01	0.41	0.01	0.008	0.012
					252.5	253.5	0.17	<0.01	0.14	<0.01	0.009	0.006
					253.5	254.5	0.14	<0.01	0.08	0.01	0.012	0.004
					254.5	255.5	0.81	<0.01	0.71	<0.01	0.024	0.015
					255.5	256.5	0.94	<0.01	0.86	0.02	0.063	0.021
					256.5	257.5	0.21	<0.01	0.20	0.01	0.010	0.006
					257.5	258.5	1.23	<0.01	1.17	<0.01	0.012	0.023
					258.5	259.5	0.34	<0.01	0.27	<0.01	0.010	0.007
					259.5	260.5	0.37	<0.01	0.32	0.01	0.007	0.008
					260.5	261.5	0.34	<0.01	0.31	0.01	0.006	0.008
					261.5	262.5	0.86	<0.01	0.83	0.01	0.007	0.019
					262.5	263.5	0.32	<0.01	0.30	<0.01	0.007	0.009
					263.5	264.5	0.55	<0.01	0.56	0.01	0.009	0.012
					264.5	265.5	0.49	<0.01	0.48	<0.01	0.006	0.010
					265.5	266.5	0.28	<0.01	0.26	0.01	0.008	0.007
					266.5	267.5	0.23	<0.01	0.18	<0.01	0.006	0.005
					267.5	268.5	0.29	<0.01	0.25	<0.01	0.006	0.007
					268.5	269.5	0.45	<0.01	0.48	<0.01	0.008	0.012
					269.5	270.5	0.56	<0.01	0.59	<0.01	0.005	0.015
					270.5	271.5	0.18	<0.01	0.12	0.01	0.005	0.005
					271.5	272.5	0.18	<0.01	0.11	<0.01	0.007	0.005
					272.5	273.5	1.05	<0.01	1.09	0.01	0.005	0.027
					273.5	274.5	1.67	<0.01	1.87	0.02	0.011	0.044
					274.5	275.5	0.80	<0.01	0.88	<0.01	0.010	0.021
					275.5	276.5	2.25	<0.01	2.40	0.01	0.012	0.047
					276.5	277.5	1.07	<0.01	1.14	0.01	0.011	0.024
					277.5	278.5	0.41	<0.01	0.43	0.01	0.008	0.011
					278.5	279.5	0.58	<0.01	0.59	0.01	0.007	0.014
					279.5	280.5	0.86	<0.01	0.94	0.01	0.009	0.020
					280.5	281.5	1.18	<0.01	1.47	0.01	0.009	0.026
					281.5	282.5	0.25	<0.01	0.42	0.02	0.008	0.008
					282.5	283.5	0.19	<0.01	0.18	0.01	0.006	0.007
					283.5	284.5	0.17	<0.01	0.14	0.01	0.007	0.007
					284.5	285.5	0.15	<0.01	0.10	0.02	0.005	0.006
					285.5	286.5	0.19	<0.01	0.08	<0.01	<0.002	0.009
		319.2	321.1	60	286.5	287.5	0.21	<0.01	0.13	<0.01	<0.002	0.009
		321.1	443.5	100								
					293.0	294.0	0.44	<0.01	0.51	0.01	0.006	0.013
					294.0	295.0	0.55	<0.01	0.53	0.01	0.010	0.013
					295.0	296.0	0.15	<0.01	0.13	<0.01	<0.005	0.005
					296.0	297.0	0.16	<0.01	0.12	<0.01	<0.005	0.005
					297.0	298.0	0.12	<0.01	0.10	0.01	<0.005	0.003
					298.0	299.0	0.12	<0.01	0.11	0.01	<0.005	0.003
					299.0	300.0	0.12	<0.01	0.09	0.01	0.007	0.004
					300.0	301.0	0.23	<0.01	0.19	0.01	0.010	0.007
					301.0	302.0	0.20	<0.01	0.18	<0.01	<0.005	0.006
					302.0	303.0	0.23	<0.01	0.22	0.01	<0.005	0.007
					303.0	304.0	0.23	<0.01	0.26	0.01	<0.005	0.006
					304.0	305.0	0.12	<0.01	0.21	<0.01	<0.005	0.003
					305.0	306.0	0.15	<0.01	0.21	0.01	<0.005	0.004
					306.0	307.0	0.18	<0.01	0.20	<0.01	<0.005	0.005
					307.0	308.0	0.21	<0.01	0.18	<0.01	<0.005	0.005
					308.0	309.0	0.21	<0.01	0.16	<0.01	<0.005	0.005
					309.0	310.0	0.23	<0.01	0.17	0.01	<0.005	0.005
					310.0	311.0	0.42	<0.01	0.41	0.01	<0.005	0.009
					311.0	312.0	0.21	<0.01	0.13	<0.01	<0.005	0.006
					312.0	313.5	0.17	<0.01	0.16	<0.01	<0.005	0.006



**COMPANY:** Allegiance Mining NL  
**PROJECT:** Avebury  
**HOLE NUMBER:** A 041

<b>Commenced</b>	28 August 02
<b>Completed</b>	19 Sept 02
<b>Logged by</b>	LA Newnham
<b>Drilled by</b>	Almac

**Purpose of Hole**

To test the western extension of Viking North below A 035

**Collar details**

<b>Grid</b>	AMG
<b>Easting</b>	354304.6
<b>Northing</b>	5357547.3
<b>Elevation</b>	2,177.7
<b>Dip</b>	-55
<b>Bearing</b>	175
<b>Length</b>	465.3

**Comments on Completion**

ultramafic was intensely altered but only weakly mineralised; the Viking North zone contained only three narrow units >1% Ni, two of these being in a 16 m wide zone averaging 0.67% Ni; significant sphalerite and very low As were present in the Viking North zone, which, when considered with A 035, suggests some mineralogical zoning on this western edge of Viking North;

**Hole Size**

To	Size
50.3	HQ
465.3	NQ

**Major core loss zones**

From	To	% recov.

**Hole Condition on Completion**

all steel casing removed from hole; PVC collar pipe inserted and capped; HQ casing was extremely tight and difficult to pull;

**Summary of Assay Results**

Depth From (m)	To (m)	Recovery %	Description	Length m.	Assays				
					Ni	Cu	S	As	Co
395.6	396.8	100	altered serpentinite	1.2	1.36	0.06	4.25	<0.005	0.040
432.0	448.0	100	altered serpentinite	16.0	0.67	<0.01	1.04	<0.005	0.010
			incl						
433.0	434.0			1.0	1.72	0.02	2.05	0.009	0.019
446.0	447.0			1.0	1.33	0.01	1.99	<0.005	0.019

**Down Hole Survey Data**

Camera	Depth	Dip	Mag Brg Actual	Mag Brg Adjusted	Grid Brg
	0	-55			175
	18	-55			175
	48	-54.5			175
	62	-54			176
	92	-54			178
	122	-53			178
	152	-52			179
	185	-51			180
	215	-50			181
	244	-49.5			181
	275	-49			182
	304	-48.5			182
	335	-47			183
	365	-46			183
	395	-45.5			183
	424	-45			184
	465.3	-43			184

**Notes on Surveys**

hole collar was surveyed by licenced surveyor; down hole was surveyed by both single shot camera and maxibore; problems were experienced with maxibore dips so camera dips used; maxibore bearings used;

**General Comments**

Description		Core Recovery			Assays									
From	To		From	To	%	From	To	% Ni	% Cu	% S	% Zn	% As	% Co	
0.0	5.5	<b>TRICONE:</b> no core;	0.0	5.5	100									
5.5	393.7	<b>HORNFELSE SEDIMENTS:</b> <b>5.5-130 m:</b> dark gray-purplish, massive fine grained hornfelse sediments; minor limonite staining on joint surfaces to 10 m; relatively fresh below 10 m; common patches of fine grained actinolite alteration, and sections of crackle-fractured chert; definite BCA's not apparent in top section of interval; gradual increase in mafic component below 50 m-mafic volcanic ? crackle fracturing occasionally infilled with carbonate-actinolite-sulfides (pyrrhotite ?); narrow brecciated chert zone 95.0-96.0 m; interval non-magnetic; ground fresh but moderately broken; several joint sets, dominant at 45° and 30° CA; <b>below 130 m:</b> dark gray, fine-medium grained hornfelse sediments with brown coloration in some intervals (dravite?); crystalline actinolite (felted texture) infilling and healing fractures; BCA 180 m: 45°; 221-225 m: 60°; BCA generally 40° CA; there is a strong joint set 30° CA which in places looks like bedding; trace disseminated sulfides, normally associated with quartz-actinolite in late stage veining; unit generally non-magnetic except for several narrow sections of fine grained mafic material which may be carrying fine grained magnetite (eg) 202-204 m; ground conditions improving but still moderately broken; <b>237.2-238.5 m:</b> dark gray medium grained mafic unit with vague relict breccia texture; interval broken; slickensides on joint surfaces; <b>below 238.5 m:</b> reverts to dark gray-purplish fine-medium grained hornfelse sediments; BCA 245 m: 50°; unit non-magnetic; ground still moderately broken with several strong joint sets, dominant one 45° CA; <b>264.0-272.0 m:</b> <i>strongly magnetic</i> dark gray hornfelse fine-medium grained sediments; vague BCA 60°; no pyrrhotite or coarse magnetite observed, so magnetic influence assumed to be disseminated very fine grained magnetite; core moderately competent but bedding plane fractures and a joint set 30° CA; <b>272.0-283.7 m: part of pyrrhotite marker:</b> light gray mafic unit, altered to finely crystalline tremolite, interbedded with dark brown-dark gray hornfelse sediments containing abundant phlogopite; BCA at 284.7 m: 70°; mafic units contain blebs and streaks of pyrrhotite accompanied by trace chalcopyrite; hornfelse sediments also contain discontinuous veins and patches of pyrrhotite; unit variably magnetic, reflecting the abundance of pyrrhotite; ground moderately broken by several joint sets, including one at low angle to CA; <b>299.0-318.5 m:</b> dark gray, fine-medium grained hornfelse sediments; differs from unit above in that there is little or no pyrrhotite; minor thin discontinuous quartz veining common; ground moderately broken by several joint sets; <b>318.5-328.3 m:</b> light green-gray fine-medium grained mafic unit with common thin quartz veins, usually carrying minor sulfides, interbedded with brownish medium grained hornfelse sediments ....	5.5	7.6	20									
			7.6	9.0	100									
			9.0	10.1	60									
			10.1	50.3	100									
			50.3	52.4	90									
			52.4	393.7	100									





**COMPANY:** Allegiance Mining NL  
**PROJECT:** Avebury  
**HOLE NUMBER:** A 042

<b>Commenced</b>	03 Sep 2002
<b>Completed</b>	23 Sep 2002
<b>Logged by</b>	LANewnham
<b>Drilled by</b>	Almac

**Purpose of Hole**

to test the eastern extension of Viking below A 007;

**Collar details**

<b>Grid</b>	AMG
<b>Easting</b>	354599.5
<b>Northing</b>	5357447.1
<b>Elevation</b>	2,168.9
<b>Dip</b>	-47
<b>Bearing</b>	178
<b>Length</b>	415.5 m

**Comments on Completion**

hole intersected a broad zone of Viking North mineralisation: 38.8 m 1.28% Ni, including a zone on the HW which assayed 10.8 m 2.05% Ni- this correlates with a similar high grade zone in A 007; the Viking South zone was either poorly mineralised or faulted off;

**Hole Size**

To	Size
68.9	HQ
415.5	NQ

**Major core loss zones**

From	To	% recov.
397	398.1	85
398.1	399.7	20

**Hole Condition on Completion**

all steel casing and rods removed from hole; PVC collar pipe inserted;

**Summary of Assay Results**

Depth	Recovery	Description	Length	Assays					
From (m)	To (m)	%	m.	% Ni	% Cu	% S	% As	% Co	
230.7	269.5	100	altered & serpentinised ultramafics	38.5	1.28	<0.01	1.48	0.040	0.030
incl									
230.7	241.5	100		10.8	2.05	<0.01	2.39	<0.01	0.040
253.5	264.5	100		16.0	1.31	<0.01	1.48	0.100	0.030

**Down Hole Survey Data**

Camera	Dip	Mag Brg Actual	Mag Brg Adjusted	Grid Brg
0	-47			178
15	-48			177
45	-47			177
77	-47			177
110	-47			177
135	-46.5			177
163	-46			177
196	-45.5			177
225	-45			177
256	-45			177
286	-45			177
320	-45			177
350	-45			177
388	-44			177
415.5	-43			177

**Notes on Surveys**

hole surveyed by maxibore to 286 m., and down hole camera for whole length; dips compared well between methods; camera surveys adjusted as per protocol and maxibore surveys compared well; rods could be turned with stilson which suggests hole very straight;

**General Comments**

.

Description		Core Recovery			Assays								
From	To		From	To	%	From	To	% Ni	% Cu	% S	% Zn	% As	% Co
0.0	6.0	<b>TRICONE</b> no core;	0.0	6.0	0								
6.0	8.0	<b>RUBBLE:</b> mixture of mafic material and weathered sediments;	6.0	9.0	20								
8.0	37.0	<b>WEATHERED SEDIMENTS:</b> poor recoveries; mixture of light orange, reddish brown and fawn fine grained sediments; extremely weathered and very broken with very high core losses-overall approximately 30% recovery;	9.0	12.0	50								
			12.0	13.0	75								
			13.0	16.5	25								
			16.5	19.5	15								
			19.5	21.0	15								
			21.0	24.0	0								
			24.0	25.3	90								
			25.3	27.0	40								
37.0	42.0	<b>WEATHERED SEDIMENTS/OR WEATHERED ALTERED ULTRAMAFICS:</b> rubby cream, pale green, orange-brown weathered rocks; could be either weathered and brecciated sediments or weathered mottled altered ultramafics;	27.0	31.5	35								
			31.5	35.5	90								
			35.5	38.0	20								
			38.0	40.5	30								
			40.5	42.0	10								
42.0	43.5	<b>CLAY-WEATHERED ULTRAMAFICS(?)</b> pale yellow-orange gritty clay; poor recovery;	42.0	43.5	30								
43.5	45.0	<b>NO RECOVERY:</b> possibly same as unit above;	43.5	45.0	0								
45.0	46.2	<b>WEATHERED ROCK:</b> similar to 37m....; possibly weathered ultramafic; poor recovery;	45.0	46.0	50								
			46.0	47.0	90								
46.2	50.2	<b>WEATHERED ALTERED ULTRAMAFIC:</b> dark gray-black medium grained altered mafic-ultramafic rock; severely weathered-reduced to clay in places with significant core losses; <b>46.5-47.0 m:</b> abundant magnetite and sulfides; sulfides mainly euhedral pyrite on weathered fracture surfaces; also infilling fine veins (pyrite /pentlandite?); <b>49.0-50.0m:</b> brecciated texture with groundmass of felted/crystalline amphibole (actinolite?);	47.0	47.7	80								
			47.7	49.0	90								
			49.0	50.2	60								
50.2	62.0	<b>HORNFELSED SEDIMENTS:</b> dark-light gray fine-medium grained hornfelsed sediments with brecciated texture in places where large light colored cherty clasts set in fine grained light gray-green groundmass; overall pinkish coloration of fine grained siliceous units suggests minor but pervasive axinite; no sulfides observed; core fresh but quite broken;	50.2	55.4	100								
			55.4	56.9	35								
			56.9	58.3	50								
			58.3	59.9	65								
			59.9	61.5	50								
			61.5	62.0	100								
62.0	64.0	<b>FAULT (?)</b> zone of brecciated hornfelsed sediments, reduced to rubble for most part; <i>possible</i> fault zone;	62.0	64.0	100								
64.0	230.7	<b>HORNFELSED SEDIMENTS:</b> <b>64.0-76.0m:</b> dark gray (deep purplish color in part) fine-medium grained massive hornfelsed sediments; fractures infilled with actinolite, occasionally accompanied by minor sulfides; core generally very broken but fresh and with full recoveries; grades into..... <b>76.0-79.6 m:</b> silicified fine grained cherty sediments, brecciated in places; cut by thin quartz-actinolite-sulfide veins; core very broken; <b>79.6-108.0 m:</b> dark gray, fine grained hornfelsed sediments, cut by network of random 1-5 mm white quartz veins, common in places; quartz veins occasionally contain minor sulfides; core generally very broken; <b>108-118.5 m:</b> light gray fine grained silicified sediments, crackeled and brecciated in part with ....	64.0	68.9	100								
			68.9	69.3	50								
			69.3	126.3	100								



Description		Core Recovery			Assays							
From	To	From	To	%	From	To	% Ni	% Cu	% S	% Zn	% As	% Co
230.7	283.5	230.7	283.5	100	229.5	230.7	0.21	<0.01	0.06	0.01	0.006	0.011
					230.7	232.5	1.29	0.01	1.58	0.01	<0.005	0.033
					232.5	233.5	1.80	0.02	2.50	0.01	<0.005	0.045
					233.5	234.5	2.15	0.02	3.15	0.01	<0.005	0.052
					234.5	235.5	3.55	0.02	4.15	0.02	0.006	0.073
					235.5	236.5	0.69	<0.01	0.81	0.01	<0.005	0.014
					236.5	237.5	5.70	0.03	5.35	0.01	0.012	0.096
					237.5	238.5	3.40	0.02	3.10	0.01	0.045	0.058
					238.5	239.5	0.90	<0.01	1.07	0.02	<0.005	0.017
					239.5	240.5	0.50	<0.01	0.55	0.01	<0.005	0.009
					240.5	241.5	1.12	<0.01	2.25	0.01	0.007	0.020
					241.5	242.5	0.77	<0.01	0.99	<0.01	<0.005	0.014
					242.5	243.5	0.50	<0.01	0.68	<0.01	<0.005	0.010
					243.5	244.5	0.42	<0.01	0.53	0.01	<0.005	0.008
					244.5	245.5	0.42	<0.01	0.62	0.01	<0.005	0.009
					245.5	246.5	0.12	<0.01	0.39	<0.01	0.007	0.004
					246.5	247.5	0.18	<0.01	0.38	0.01	0.007	0.005
					247.5	248.5	0.41	<0.01	0.80	0.01	0.072	0.015
					248.5	249.5	0.88	<0.01	0.91	0.01	<0.005	0.016
					249.5	250.5	0.79	<0.01	0.78	0.01	0.011	0.017
					250.5	251.5	0.34	<0.01	0.32	0.01	0.006	0.009
					251.5	252.5	0.85	<0.01	0.84	0.01	0.016	0.019
					252.5	253.5	0.84	<0.01	0.89	0.01	0.013	0.019
					253.5	254.5	1.80	<0.01	1.92	0.01	0.022	0.037
					254.5	255.5	1.41	<0.01	1.68	0.01	0.005	0.029
					255.5	256.5	1.45	<0.01	1.55	0.02	0.080	0.029
					256.5	257.5	2.95	0.01	3.05	0.03	0.097	0.053
					257.5	258.5	1.38	<0.01	1.48	0.01	0.039	0.027
					258.5	259.5	0.48	<0.01	0.52	0.02	0.006	0.012
					259.5	260.5	1.40	<0.01	1.52	0.01	0.183	0.038
					260.5	261.5	0.22	<0.01	0.23	0.01	0.005	0.007
					261.5	262.5	0.75	<0.01	0.87	0.01	0.115	0.023
					262.5	263.5	1.32	<0.01	1.56	0.01	0.018	0.026
					263.5	264.5	1.20	<0.01	1.50	0.01	0.012	0.027
					264.5	265.5	1.00	<0.01	1.23	0.01	0.157	0.026
					265.5	266.5	0.79	<0.01	0.96	0.01	0.187	0.020
					266.5	267.5	1.19	<0.01	1.42	0.02	0.203	0.027
					267.5	268.5	2.10	0.01	2.55	0.03	0.221	0.029
					268.5	269.5	1.52	<0.01	1.65	0.02	0.220	0.028
					269.5	270.5	0.49	<0.01	0.51	0.01	0.030	0.008
					270.5	271.5	0.21	<0.01	0.19	0.01	0.022	0.005
					271.5	272.5	0.34	<0.01	0.25	0.01	0.060	0.005
					272.5	273.5	0.67	<0.01	0.72	0.01	0.059	0.012
					273.5	274.5	0.18	<0.01	0.18	<0.01	0.018	0.005
					274.5	275.5	0.28	<0.01	0.33	0.01	<0.005	0.006
					275.5	276.5	0.14	<0.01	0.11	0.01	<0.005	0.005
283.5	340.0	283.5	340.0	100	276.5	277.5	0.66	<0.01	0.91	<0.01	<0.005	0.016
					277.5	278.5	0.50	<0.01	0.70	0.01	<0.005	0.012
					278.5	279.5	0.78	<0.01	1.05	0.01	0.016	0.016
					279.5	280.5	0.59	<0.01	0.68	0.02	0.076	0.012
					280.5	281.5	1.38	<0.01	1.50	0.01	0.158	0.025
					281.5	282.5	0.59	<0.01	0.56	0.01	0.068	0.010
					282.5	283.5	0.57	<0.01	0.50	0.01	0.069	0.012

		Description	Core Recovery			Assays									
From	To		From	To	%	From	To	% Ni	% Cu	% S	% Zn	% As	% Co		
283.5 continued.....	340.0	<p><b>299.2-306.0m:</b> massive black serpentinite; magnetite common-abundant; sulfides (pentlandite) 1% as small aggregates and patches, typically associated with magnetite; talc-asbestiform material in thin (1-2mm) veinlets- this core not assayed; ground conditions moderately good, but core soft and talcy fractures make core weak;</p> <p><b>306.0-325.5m:</b> black serpentinite similar to unit above but only trace sulfides; magnetite abundant; core moderately broken and very broken between 321.0-323.6m; abundance of asbestiform veins decreasing down unit; grades into.....</p> <p><b>325.5-329.7m:</b> black serpentinite as for previous unit, but containing large patches and intervals of mottled material composed of crystalline tremolite rock intermixed with small dark green patches of serpentinite; magnetite abundant; only trace sulfides; ground conditions moderately good, with a few narrow broken zones;</p> <p><b>329.7-340.0m:</b> black serpentinite carrying abundant magnetite; minor thin (1-2 mm) asbestiform-talc veins developed mainly on joint surfaces; trace sulfides; core broken with talc common on fracture surfaces;</p>													
340.0	401.8		<b>ALTERED ULTRAMAFICS:</b> gray-green altered ultramafics containing abundant magnetite, minor serpentinite and trace sulfides;	340.0	397.0	100									
			<b>340.0-343.8m:</b> gray crystalline tremolite rock mixed with black serpentinite and patches of fine grained pale green material (epidote?); magnetite abundant; trace sulfides; ground conditions good;	397.0	398.1	85									
			<b>343.8-350.1m:</b> light gray-green fine-medium grained crystalline tremolite rock with patches of coarse grained green material (diopside?); unit cut by both 100-200 mm wide bands of black serpentinite and semi-massive magnetite, and thin 1-2mm veins dark green serpentinite; both thick and thin veins 70-80° CA; small spots/aggregates of magnetite in light gray ultramafic give rock a speckled appearance; trace disseminated sulfides; ground conditions moderately good;	398.1	399.7	20									
			<b>350.1-359.0m:</b> similar light gray-green altered ultramafics to unit above but patches of dark green-black serpentinite and magnetite more abundant;	399.7	401.8	100									
			bands 100-300mm wide of black serpentinite containing semi-massive to massive magnetite; trace-minor pentlandite in both lighter colored ultramafics and associated with magnetite in serpentinite;				347.0	348.0	0.13	<0.01	0.11	<0.01	<0.005	0.002	
			serpentinisation postdates tremolite alteration of ultramafics with numerous thin veins and patches of dark serpentinite cutting ultramafics; ground weak and moderately broken;				348.0	349.0	0.17	<0.01	0.08	0.01	<0.005	0.003	
			<b>359.0-382.0m:</b> pale green-white altered ultramafics, possibly composed of mainly fine grained crystalline tremolite with minor actinolite and epidote (?); small irregular patches of serpentinite common throughout;				349.0	350.0	0.12	<0.01	0.03	0.01	<0.005	0.002	
			pervasive carbonate alteration with carbonate forming as large clots and patches throughout the altered ultramafics; spots and patches of magnetite common, typically associated with serpentinised areas;												
							352.0	353.0	0.16	<0.01	0.09	0.01	0.012	0.009	
						354.0	355.0	0.15	<0.01	0.08	<0.01	0.009	0.007		
						356.0	357.0	0.08	<0.01	<0.02	0.01	0.010	0.005		
						358.0	359.0	0.16	<0.01	0.04	0.01	0.016	0.009		
						360.0	361.0	0.18	<0.01	0.07	0.01	<0.005	0.003		
						362.0	363.0	0.37	<0.01	0.26	0.02	0.036	0.008		
						363.0	364.0	0.18	<0.01	0.04	0.01	<0.005	0.005		
						364.0	365.0	0.21	<0.01	0.11	0.01	<0.005	0.003		
						367.5	368.5	0.21	<0.01	0.10	0.01	<0.005	0.003		
						369.0	370.0	0.22	<0.01	0.16	0.01	0.032	0.004		



## **APPENDIX 2**

### **Avebury Nickel Project - downhole surveys**

This appendix contains the text of a memorandum included in full in McKeown, M.V., 1999. Allegiance Mining NL, Avebury Nickel Project, Mineral Resource Report, November 2000. McKeown Mining Pty Ltd.

**TO** File  
**FROM** Mick McKeown  
**DATE** 12 October 2000

**SUBJECT** AVEBURY NICKEL PROJECT - DOWNHOLE SURVEYS

### **Error in magnetic bearings at Avebury**

Magnetite in the Avebury serpentinites significantly deforms the local magnetic field. The largest variation detected, so far, occurs near the collars of A005 and A026 where there is a bearing error of 15<sup>0</sup>. Magnetic errors have been determined by comparing theodolite bearings of drill hole collars with magnetic bearings from downhole camera surveys made close to collars, and theodolite bearings between known points with magnetic bearings read by Suunto compass.

The error in magnetic variation resulted in some early drill holes, which were aligned assuming the accuracy of the magnetic compass, being drilled slightly skew to the planned bearing, for example, A014 which was planned on a collar bearing of 180<sup>0</sup> AMG was set up at 172<sup>0</sup> AMG . Other holes were set up by determining true north by the location of the sun at true noon, for example, A008, planned at 180<sup>0</sup> AMG actually drilled at 178<sup>0</sup> AMG, or by alignment along a line established by theodolite traverse, for example, A025, planned at 180<sup>0</sup> AMG, actually drilled at 179<sup>0</sup> AMG.

In the future, it is recommended that all holes be aligned along lines established by theodolite traverse.

### **Downhole surveys**

Drilling crews made downhole surveys of all holes using downhole cameras owned by the drilling contractors. These camera surveys are subject to bearing errors caused by the presence of magnetite and pyrrhotite and, probably but to a lesser extent, pentlandite in the rocks at Avebury. During the most recent drilling program, ten holes were surveyed downhole using a Maxibor, a downhole survey instrument which is not affected by surrounding magnetic materials (Table 1). The Maxibor was supplied by, and operated by staff from, Diamond Drilling Tasmania Pty Ltd.

TABLE 1

**Down-hole survey methods**

A001	camera	
A002	camera	
A003	camera	
A004	camera	
A005	camera	
A006	camera	
A007	camera	
A008	camera	Maxibor
A009	camera	
A010	camera	Maxibor
A011	camera	
A012	camera	Maxibor
A013	camera	Maxibor
A014	camera	Maxibor
A014A	camera	
A015	camera	
A016	camera	
A017	camera	
A018	camera	Maxibor
A019	camera	
A019	camera	Maxibor
A019A	camera	
A020	camera	Maxibor
A021	camera	Maxibor
A022	camera	
A023	camera	Maxibor
A024	camera	
A024A	camera	
A025	camera	
A026	camera	
A026A	camera	

Downhole dips from the camera surveys and the Maxibor surveys were compared (Figures 1 to 10); there were seven holes where the dips from both survey methods were in at least reasonable agreement, that is within about 3° of each other (Table 2).

TABLE 2

hole no	dip agreement	maximum dip disagreement	operator
A008	good	1.7°	S
A010	good	0.1°	S
A012	poor	3.3°	P
A013	poor	14.0°	P
A014	good	1.0°	S
A018	good	1.2°	W
A019A/A019A	reasonable	2.1°	W
A020	reasonable	3.1°	W
A021	good	1.7°	W
A023	poor	9.2°	M

The reliability of the Maxibor surveys seems to rely on the Maxibor operator, all of the apparently good and reasonable surveys were carried out by two particular operators.

Also, a comparison of the downhole camera bearings and the Maxibor bearings was made. For all camera surveys, downhole bearings as read were converted to relative bearings. For each hole, the collar bearing as determined by theodolite survey was compared to the downhole camera bearing closest to the collar, the difference between the two bearings being applied to all the downhole bearings, for example, for A008 the difference applied to all bearings was -4°:

AVEBURY NICKEL PROJECT

bhid	at	bearing as read	bearing as read	bearing relative
	m	magnetic	AMG	AMG
A008	0	-	178	178
A008	50	169	182	178
A008	100	173	186	182
A008	150	174	187	183
A008	200	179	192	188
A008	250	178	191	187
A008	300	184	197	193
A008	350	188	201	197
A008	400	119	132	128
A008	454	177	190	186
A008	498	186	199	195
A008	560	163	176	172

After this correction was applied, obviously erratic bearings, such as that at 400m, were interpolated or extrapolated to fit the general trend of the bearing change for the hole; the general trend of the bearing change is best determined from a plot of bearing against downhole depth (see bearing plot for A008):

bhid	at	bearing as read	bearing as read	bearing relative	bearing corrected		
	m	magnetic	AMG	AMG	AMG		
A008	0	-	178	178	178		
A008	50	169	182	178	178		
A008	100	173	186	182	182		
A008	150	174	187	183	183		
A008	200	179	192	188	188	pyrrhotite	
A008	250	178	191	187	187		
A008	300	184	197	193	193		
A008	350	188	201	197	197		
A008	400	119	132	128	196	magnetite	interpolated
A008	454	177	190	186	196	magnetite	interpolated
A008	498	186	199	195	195		
A008	560	163	176	172	195	magnetite	extrapolated

After the correction was made, there was reasonable agreement between the corrected downhole relative camera bearings and the Maxibor bearings:

AVEBURY NICKEL PROJECT

bhid	at	bearing as read	bearing as read	bearing relative	bearing corrected	bearing Maxibor
	m	magnetic	AMG	AMG	AMG	AMG
A008	0	-	178	178	178	178
A008	50	169	182	178	178	178
A008	100	173	186	182	182	179
A008	150	174	187	183	183	181
A008	200	179	192	188	188	183
A008	250	178	191	187	187	184
A008	300	184	197	193	193	186
A008	350	188	201	197	197	187
A008	400	119	132	128	196	188
A008	454	177	190	186	196	190
A008	498	186	199	195	195	190
A008	560	163	176	172	195	190

The downhole survey data and information for all holes is attached.

**Recommended protocol for dealing with downhole surveys**

As a result of the investigations so far, the following protocol is now recommended for dealing with the existing downhole surveys.

*always use the collar bearing and dip determined by the surveyor*

These data are the most reliable survey data we have.

*always use the down-hole dips from the camera surveys*

It is difficult to see how the dip apparatus in the downhole camera can be drastically inaccurate, whereas, the dips from the Maxibor are apparently subject to operator error, probably when the operator incorrectly assembles the Maxibor instrument.

*if a Maxibor survey is available and if the dips from the Maxibor survey are in good agreement with dips from the camera, use the Maxibor survey bearings*

If the Maxibor is working properly, the method that the Maxibor determines bearings will be unaffected by magnetic effects in the surrounding rocks and, so, the Maxibor bearings should be used. If the maximum dip difference between the two methods at each survey depth is less than 3<sup>0</sup>, use the Maxibor bearing results.

*if a Maxibor survey is available but if the dips from the Maxibor survey are not in good agreement with dips from the downhole camera, or if a Maxibor survey is unavailable, use corrected relative camera bearings*

The procedure to be followed has been outlined in the example, based on hole A008, given above.

1. Compare the first reliable camera bearing with the collar bearing as supplied by the surveyor; that is, the first reliable camera bearing is the first bearing which is not obviously affected by magnetic effects caused by mineralisation, casing or equipment on the surface. Determine the bearing correction constant.
- 2 Apply the correction constant to all the as-read camera bearings.
3. Plot a graph of relative camera bearings and corrected camera bearings.
4. For bearings which are extreme to the trend of bearing change, determine and note the cause; this will usually be the presence of magnetic mineralisation or casing.
5. If there are sufficient good corrected bearings, then, for the bearings which do not fit the trend of bearing change, interpolate or extrapolate a bearing and note that this has been done.

*if there is no reliable Maxibor survey and if there are insufficient good corrected relative camera bearings, then the bearings for the hole should be determined by analogy to the bearings in nearby holes of similar orientation*

Note which nearby hole has been used as the analogous model.

## **Conclusion**

The downhole bearings which have been used for each hole are listed on the cover page of the drill log. A plot of the plan traces of all drill holes reveals a reasonably consistent variation in deviation which is dependent on whether the holes are drilled to the north or to the south (plan attached). Holes drilled to the north appear to tend to maintain collar bearing; holes drilled to the south tend to maintain collar bearing, and dip, to about 200 to 250 metres downhole depth and then deviate to the west, that is in the direction of bit rotation.

## **APPENDIX 3**

### **Assays checked during 2002 drilling programme**

Check assays from AMDEL are included here; the original assays from Analabs are included in the drill logs (Appendix 1)

Order No	
IDENT	Ni
UNITS	ppm
SCHEME	MET1
DETECTION LIMIT	50
A035 359.0-360.0	1400
A035 360.0-361.0	1350
A035 361.0-362.0	1150
A035 362.0-363.0	1100
A035 363.0-364.0	1950
A035 364.0-365.0	1500
A035 365.0-366.0	1900
A035 366.0-367.0	3250
A035 367.0-368.0	1750
A035 368.0-369.0	2350
A035 369.0-370.0	2300
A035 370.0-371.0	2650
A035 371.0-372.0	1750
A035 372.0-373.0	3700
A035 373.0-374.0	4650
A035 374.0-375.3	9300
A035 375.3-376.6	6700
A035 376.6-377.6	1750
A035 377.6-378.6	1500
A035 410.6-411.6	8500
A035 411.6-412.6	16600
A035 412.6-413.6	8050
A035 413.6-414.6	11500
A035 414.6-415.6	16400
A035 415.6-416.6	11700
A035 416.6-417.6	10800
A035 417.6-418.6	6800
A035 418.6-419.6	2450
A035 419.6-420.6	14100
A035 420.6-421.3	3500
A035 421.3-422.3	7650
A035 422.3-423.0	94500
A035 423.0-423.2	337000
A035 423.2-423.4	121000
A035 423.4-424.4	11600
A035 424.4-425.4	2350
A035 425.4-426.4	4600
A035 426.4-427.3	10600
A035 427.3-428.2	54500
A035 428.2-428.9	16000
A035 428.9-429.7	7750
A035 429.7-430.5	5350
A035 430.5-431.2	3550
A035 431.2-432.2	4050
A035 432.2-433.2	5350
A035 433.2-434.2	4550

A035 434.2-435.2	6700
A035 435.2-436.2	6850
A035 436.2-437.2	5550
A035 437.2-437.9	24600
A035 437.9-438.9	7350
A035 438.9-439.9	14200
A035 439.9-440.9	2150
A035 440.9-441.9	1950
A035 441.9-444.7	5950
A035 444.7-445.7	9550
A035 445.7-446.7	8500
A035 446.7-447.7	9150
A035 447.7-448.7	13200
A035 448.7-449.7	6500
A035 449.7-450.7	11700
A035 450.7-451.7	6050
A035 451.7-452.7	15000
A035 452.7-453.7	3350
A035 453.7-454.7	15600
A035 454.7-455.7	3450
A035 455.7-456.7	9250
A035 456.7-457.7	7900
A035 457.7-458.7	9100
A035 458.7-459.7	13100
A035 459.7-460.8	16000
A007 260.0-261.0	19600
A007 261.0-262.0	12500
A007 262.0-263.0	35500
A007 263.0-264.0	8000
A007 264.0-265.0	58500
A007 265.0-266.0	21500
A007 266.0-267.0	18700
A007 267.0-268.0	11200
A007 268.0-269.3	7300
A007 269.3-270.6	14500
A007 270.6-271.6	5900
A007 271.6-272.6	4050
A007 272.6-273.6	18100
A007 273.6-274.6	12800
A007 274.6-275.6	7600
A007 275.6-276.6	6250
A007 276.6-277.6	8700
A007 277.6-278.4	14000
A007 278.4-279.4	27900
A007 279.4-280.4	21200
A007 280.4-281.4	15300
A007 281.4-282.4	19800
A007 282.4-283.8	13300
A007 283.8-284.8	8050
A007 284.8-285.8	24700
A007 285.8-286.8	4400

A007 286.8-287.8	4950
A007 287.8-288.8	6200
A007 288.8-289.8	13000
A040 90.3- 91.3	3050
A040 91.3- 92.3	3600
A040 92.3- 93.3	3200
A040 93.3- 94.3	1600
A040 94.3- 95.3	1850
A040 95.3- 96.3	1900
A040 96.3- 97.3	1950
A040 97.3- 98.3	1550
A040 98.3- 99.3	2850

## **APPENDIX 4**

**Nickel assay data used for the resource estimates**

BHID	from m	to m	% Ni	UMFLAG	MINFLAG	LIMBFLAG
A003	223.7	224.7	1.02	Umn	nav	nth
A003	224.7	225.7	0.56	Umn	nav	nth
A003	225.7	227	1.04	Umn	nav	nth
A003	227	228.2	0.5	Umn	nav	nth
A003	228.2	229.2	0.82	Umn	nav	nth
A003	229.2	230.2	0.62	Umn	nav	nth
A003	230.2	231.2	0.72	Umn	nav	nth
A003	231.2	232.2	1.12	Umn	nav	nth
A003	232.2	233.2	0.61	Umn	nav	nth
A003	233.2	234.2	0.82	Umn	nav	nth
A003	234.2	235.2	0.59	Umn	nav	nth
A003	235.2	236.2	0.53	Umn	nav	nth
A003	236.2	237.2	0.93	Umn	nav	nth
A003	237.2	238.2	1.64	Umn	nav	nth
A003	238.2	239.2	0.82	Umn	nav	nth
A003	239.2	240.2	1.8	Umn	nav	nth
A003	240.2	241.2	0.99	Umn	nav	nth
A003	241.2	242.2	0.87	Umn	nav	nth
A003	242.2	243.2	1.84	Umn	nav	nth
A003	243.2	244.2	0.72	Umn	nav	nth
A003	244.2	244.9	1.22	Umn	nav	nth
A003	244.9	245.9	2.08	Umn	nav	nth
A003	245.9	246.9	1.83	Umn	nav	nth
A003	246.9	247.9	0.36	Umn	nav	nth
A003	247.9	248.7	0.19	Umn	nav	nth
A003	248.7	249.7	0.18	Umn	nav	nth
A003	249.7	250.7	0.42	Umn	nav	nth
A003	250.7	251.7	0.58	Umn	nav	nth
A003	251.7	252.7	0.25	Umn	nav	nth
A003	252.7	253.7	0.38	Umn	nav	nth
A003	253.7	254.7	0.32	Umn	nav	nth
A003	254.7	255.7	0.4	Umn	nav	nth
A003	255.7	256.7	0.17	Umn	nav	nth
A003	256.7	257.7	0.12	Umn	nav	nth
A003	257.7	258.7	0.24	Umn	nav	nth
A003	258.7	259.7	0.15	Umn	nav	nth
A003	259.7	260.7	0.2	Umn	nav	nth
A003	260.7	262	0.2	Umn	nav	nth
A003	262	263.3	0.74	Umn	nav	nth
A003	263.3	264.3	1.47	Umn	nav	nth
A003	264.3	265.3	0.19	Umn	nav	nth
A003	265.3	266.3	0.42	Umn	nav	nth
A003	266.3	267.3	0.61	Umn	nav	nth
A003	267.3	268.3	1.02	Umn	nav	nth
A003	268.3	269.3	0.67	Umn	nav	nth
A003	269.3	270.1	0.92	Umn	nav	nth
A003	270.1	271.1	0.89	Umn	nav	nth
A003	271.1	272.1	2.98	Umn	nav	nth
A003	272.1	273.1	1.06	Umn	nav	nth
A003	273.1	274.1	2.83	Umn	nav	nth
A003	274.1	275.1	0.34	Umn	nav	nth
A003	275.1	276.1	0.26	Umn	nav	nth
A003	276.1	277.1	0.35	Umn	nav	nth
A003	277.1	278.1	0.9	Umn	nav	nth
A003	278.1	279.1	1.31	Umn	nav	nth
A003	279.1	280	1.63	Umn	nav	nth
A004	131.1	132.1	0.55	Umn	nav	nth

<b>BHID</b>	<b>from m</b>	<b>to m</b>	<b>% Ni</b>	<b>UMFLAG</b>	<b>MINFLAG</b>	<b>LIMBFLAG</b>
A004	132.1	133.9	0.62	Umn	nav	nth
A004	133.9	134.9	0.5	Umn	nav	nth
A004	134.9	136.1	0.52	Umn	nav	nth
A004	136.1	137.3	0.35	Umn	nav	nth
A004	137.3	138.3	1.19	Umn	nav	nth
A004	138.3	139.3	1.34	Umn	nav	nth
A004	139.3	140.3	1.57	Umn	nav	nth
A004	140.3	141.3	1.04	Umn	nav	nth
A004	141.3	142.3	0.36	Umn	nav	nth
A004	142.3	143.3	1.44	Umn	nav	nth
A004	143.3	144.3	0.71	Umn	nav	nth
A004	144.3	145.3	0.39	Umn	nav	nth
A004	145.3	146.3	1.11	Umn	nav	nth
A004	146.3	147.3	0.28	Umn	nav	nth
A004	147.3	148.3	0.43	Umn	nav	nth
A004	148.3	149.3	0.28	Umn	nav	nth
A004	149.3	150.1	0.19	Umn	nav	nth
A004	150.1	151.1	0.53	Umn	nav	nth
A004	151.1	152.1	1.38	Umn	nav	nth
A004	152.1	153.1	1.62	Umn	nav	nth
A004	153.1	154.1	0.61	Umn	nav	nth
A004	154.1	155.1	0.62	Umn	nav	nth
A004	155.1	156.1	1.92	Umn	nav	nth
A004	156.1	157.1	1.6	Umn	nav	nth
A004	157.1	158.1	0.19	Umn	nav	nth
A004	158.1	159.1	0.35	Umn	nav	nth
A004	159.1	159.9	1	Umn	nav	nth
A004	159.9	160.9	0.48	Umn	nav	nth
A004	160.9	161.9	0.42	Umn	nav	nth
A004	161.9	162.9	0.36	Umn	nav	nth
A004	162.9	163.9	0.63	Umn	nav	nth
A004	163.9	164.9	1.88	Umn	nav	nth
A004	164.9	165.9	0.55	Umn	nav	nth
A004	165.9	166.9	0.4	Umn	nav	nth
A004	166.9	167.9	0.25	Umn	nav	nth
A004	167.9	168.9	0.41	Umn	nav	nth
A004	168.9	169.9	0.71	Umn	nav	nth
A004	169.9	170.9	1.06	Umn	nav	nth
A004	170.9	172	0.84	Umn	nav	nth
A004	172	173.1	0.49	Umn	nav	nth
A004	173.1	174.9	0.22	Umn	nav	nth
A004	174.9	175.9	0.23	Umn	nav	nth
A004	175.9	176.9	0.81	Umn	nav	nth
A004	176.9	177.9	0.41	Umn	nav	nth
A004	177.9	178.9	0.38	Umn	nav	nth
A004	178.9	179.9	0.61	Umn	nav	nth
A004	179.9	180.9	0.24	Umn	nav	nth
A004	180.9	182.2	0.15	Umn	nav	nth
A004	182.2	183.2	0.15	Umn	nav	nth
A004	183.2	184.2	0.22	Umn	nav	nth
A006	435	436	0.37	Umn	nav	nth
A006	436	437.5	0.47	Umn	nav	nth
A007	88.4	89.4	0.19	Umn	nav	nth
A007	89.4	90.7	0.51	Umn	nav	nth
A008	356.3	357.3	0.21	Umn	nav	nth
A008	357.3	358.3	1.04	Umn	nav	nth
A008	358.3	359.3	0.67	Umn	nav	nth

BHID	from m	to m	% Ni	UMFLAG	MINFLAG	LIMBFLAG
A008	359.3	360.6	1.15	Umn	nav	nth
A008	360.6	361.6	1.32	Umn	nav	nth
A008	361.6	362.6	0.72	Umn	nav	nth
A008	362.6	363.6	0.34	Umn	nav	nth
A008	363.6	364.6	0.36	Umn	nav	nth
A008	364.6	365.6	0.35	Umn	nav	nth
A008	365.6	366.6	0.32	Umn	nav	nth
A008	366.6	367.6	0.32	Umn	nav	nth
A008	367.6	368.6	0.85	Umn	nav	nth
A008	368.6	369.6	1.64	Umn	nav	nth
A008	369.6	370.4	0.97	Umn	nav	nth
A009	129.3	130.3	0.19	Umn	nav	nth
A009	130.3	131.3	0.38	Umn	nav	nth
A009	131.3	132.3	0.8	Umn	nav	nth
A011	283.93	285.1	9.3	Umn	nav	nth
A011	285.1	286.1	3	Umn	nav	nth
A011	286.1	287.2	2.1	Umn	nav	nth
A011	287.2	287.6	5.5	Umn	nav	nth
A011	287.6	288.6	1.98	Umn	nav	nth
A011	288.6	289.6	1.49	Umn	nav	nth
A011	289.6	290.65	1.73	Umn	nav	nth
A011	290.65	291.65	1.04	Umn	nav	nth
A011	291.65	292.65	2.2	Umn	nav	nth
A011	292.65	293.65	1.67	Umn	nav	nth
A011	293.65	294.65	1.4	Umn	nav	nth
A011	294.65	295.65	1.9	Umn	nav	nth
A011	295.65	296.65	1.5	Umn	nav	nth
A011	296.65	297.65	1.97	Umn	nav	nth
A011	297.65	298.65	1.26	Umn	nav	nth
A011	298.65	299.65	1.55	Umn	nav	nth
A011	299.65	300.7	2.95	Umn	nav	nth
A011	300.7	301.9	3.25	Umn	nav	nth
A012	391.9	393.3	4.25	Umn	nav	nth
A012	393.3	394.6	2.45	Umn	nav	nth
A012	394.6	395.6	0.5	Umn	nav	nth
A012	395.6	396.9	1.07	Umn	nav	nth
A013	391.9	392.9	3.35	Umn	nav	nth
A013	392.9	393.9	2.18	Umn	nav	nth
A018	214.4	215.4	2.05	Umn	nav	nth
A018	215.4	216.4	1.47	Umn	nav	nth
A018	216.4	217.4	1.56	Umn	nav	nth
A018	217.4	218.2	1.11	Umn	nav	nth
A018	218.2	219.2	0.92	Umn	nav	nth
A018	219.2	220.2	1.61	Umn	nav	nth
A018	220.2	221.2	1.27	Umn	nav	nth
A018	221.2	222.2	0.84	Umn	nav	nth
A018	222.2	223.4	0.8	Umn	nav	nth
A018	223.4	224.4	0.33	Umn	nav	nth
A018	224.4	225.9	0.84	Umn	nav	nth
A018	225.9	227	0.87	Umn	nav	nth
A018	227	228	1.42	Umn	nav	nth
A018	228	229	1.97	Umn	nav	nth
A018	229	230	0.22	Umn	nav	nth
A018	230	231	0.31	Umn	nav	nth
A018	231	232	0.67	Umn	nav	nth
A018	232	233	1.01	Umn	nav	nth
A018	233	234	0.49	Umn	nav	nth

BHID	from m	to m	% Ni	UMFLAG	MINFLAG	LIMBFLAG
A018	234	235	0.35	Umn	nav	nth
A018	235	236	0.94	Umn	nav	nth
A019	241.8	243	1.62	Umn	nav	nth
A019	243	244	2.2	Umn	nav	nth
A019	244	245	1.85	Umn	nav	nth
A019	245	246	3.7	Umn	nav	nth
A019	246	247	3.95	Umn	nav	nth
A019	247	248	2.9	Umn	nav	nth
A019	248	249	2.4	Umn	nav	nth
A019	249	250	1.82	Umn	nav	nth
A019	250	251	1.57	Umn	nav	nth
A019	251	252	0.98	Umn	nav	nth
A019	252	253	0.61	Umn	nav	nth
A019	253	254	0.76	Umn	nav	nth
A019	254	255	0.99	Umn	nav	nth
A019	255	256.6	0.66	Umn	nav	nth
A019	256.6	257.7	0.38	Umn	nav	nth
A019	257.7	258.7	0.4	Umn	nav	nth
A019	258.7	259.7	0.64	Umn	nav	nth
A019	259.7	260.7	0.46	Umn	nav	nth
A019	260.7	261.7	1.07	Umn	nav	nth
A019	261.7	262.6	0.89	Umn	nav	nth
A019	262.6	263.6	0.31	Umn	nav	nth
A019	263.6	265	0.72	Umn	nav	nth
A019	265	266.4	1.32	Umn	nav	nth
A020	225.8	227	0.4	Umn	nav	nth
A020	227	228	0.34	Umn	nav	nth
A020	228	229	0.26	Umn	nav	nth
A020	229	230	0.19	Umn	nav	nth
A020	230	231	0.2	Umn	nav	nth
A020	231	232	0.21	Umn	nav	nth
A020	232	233	0.31	Umn	nav	nth
A020	233	234	0.15	Umn	nav	nth
A020	234	235	0.28	Umn	nav	nth
A020	235	236	0.33	Umn	nav	nth
A020	236	237	0.31	Umn	nav	nth
A020	237	238	0.2	Umn	nav	nth
A020	238	239	0.08	Umn	nav	nth
A020	239	240	0.1	Umn	nav	nth
A020	240	241.3	0.06	Umn	nav	nth
A020	241.3	242.3	0.12	Umn	nav	nth
A020	242.3	243.3	0.15	Umn	nav	nth
A020	243.3	244.3	0.67	Umn	nav	nth
A020	244.3	245.3	0.15	Umn	nav	nth
A020	245.3	246.3	0.23	Umn	nav	nth
A020	246.3	247.3	0.13	Umn	nav	nth
A020	247.3	248.3	0.11	Umn	nav	nth
A020	248.3	249.3	0.12	Umn	nav	nth
A020	249.3	250.2	0.31	Umn	nav	nth
A020	250.2	251	0.84	Umn	nav	nth
A020	251	251.9	0.84	Umn	nav	nth
A020	251.9	253	0.99	Umn	nav	nth
A020	253	254	1.09	Umn	nav	nth
A020	254	255.3	0.55	Umn	nav	nth
A020	255.3	256.5	0.52	Umn	nav	nth
A020	256.5	257.7	0.8	Umn	nav	nth
A021	376	377	1.18	Umn	nav	nth

BHID	from m	to m	% Ni	UMFLAG	MINFLAG	LIMBFLAG
A021	377	378	0.47	Umn	nav	nth
A021	378	379	0.36	Umn	nav	nth
A021	379	380	0.21	Umn	nav	nth
A021	380	381	0.17	Umn	nav	nth
A021	381	382	0.2	Umn	nav	nth
A021	382	383	0.2	Umn	nav	nth
A021	383	384	0.24	Umn	nav	nth
A021	384	385	0.25	Umn	nav	nth
A021	385	386	0.2	Umn	nav	nth
A021	386	387	0.2	Umn	nav	nth
A021	387	388	0.22	Umn	nav	nth
A021	388	389	0.46	Umn	nav	nth
A021	389	390	0.31	Umn	nav	nth
A021	390	391.1	0.48	Umn	nav	nth
A021	391.1	392	0.41	Umn	nav	nth
A021	392	393	1.15	Umn	nav	nth
A021	393	394	0.56	Umn	nav	nth
A023	355.9	356.7	0.02	Umn	nav	nth
A023	356.7	357.7	0.02	Umn	nav	nth
A023	357.7	358.7	0.07	Umn	nav	nth
A023	358.7	359.7	0.23	Umn	nav	nth
A023	359.7	360.7	0.57	Umn	nav	nth
A023	360.7	361.4	1.26	Umn	nav	nth
A023	361.4	362.5	0.43	Umn	nav	nth
A023	362.5	363.6	1.08	Umn	nav	nth
<b>length weighted average</b>			<b>0.90</b>			

BHID	from m	to m	% Ni	UMFLAG	MINFLAG	LIMBFLAG
A007	256	257	0.41	Ums	hgr	nth
A007	257	258	0.34	Ums	hgr	nth
A007	258	259	0.15	Ums	hgr	nth
A007	259	260	0.42	Ums	hgr	nth
A007	260	261	1.86	Ums	hgr	nth
A007	261	262	1.2	Ums	hgr	nth
A007	262	263	3.35	Ums	hgr	nth
A007	263	264	0.78	Ums	hgr	nth
A007	264	265	5.6	Ums	hgr	nth
A007	265	266	2.05	Ums	hgr	nth
A007	266	267	1.78	Ums	hgr	nth
A007	267	268	1.07	Ums	hgr	nth
A007	268	269.3	0.71	Ums	hgr	nth
A007	269.3	270.6	1.4	Ums	hgr	nth
A007	270.6	271.6	0.58	Ums	hgr	nth
A007	271.6	272.6	0.41	Ums	hgr	nth
A007	272.6	273.6	1.77	Ums	hgr	nth
A007	273.6	274.6	1.22	Ums	hgr	nth
A007	274.6	275.6	0.73	Ums	hgr	nth
A007	275.6	276.6	0.58	Ums	hgr	nth
A007	276.6	277.6	0.86	Ums	hgr	nth
A007	277.6	278.4	1.38	Ums	hgr	nth
A007	278.4	279.4	2.8	Ums	hgr	nth
A007	279.4	280.4	2.05	Ums	hgr	nth
A007	280.4	281.4	1.54	Ums	hgr	nth
A007	281.4	282.4	2	Ums	hgr	nth
A007	282.4	283.8	1.34	Ums	hgr	nth
A007	283.8	284.8	0.83	Ums	hgr	nth
A007	284.8	285.8	2.5	Ums	hgr	nth
A007	285.8	286.8	0.45	Ums	hgr	nth
A007	286.8	287.8	0.51	Ums	hgr	nth
A007	287.8	288.8	0.62	Ums	hgr	nth
A007	288.8	289.8	1.3	Ums	hgr	nth
A008	464.4	465.8	0.52	Ums	hgr	nth
A008	465.8	466.8	0.28	Ums	hgr	nth
A008	466.8	467.8	1.19	Ums	hgr	nth
A008	467.8	468.8	0.76	Ums	hgr	nth
A008	468.8	469.8	0.24	Ums	hgr	nth
A008	469.8	470.8	0.68	Ums	hgr	nth
A008	470.8	471.8	0.44	Ums	hgr	nth
A008	471.8	472.8	0.66	Ums	hgr	nth
A008	472.8	473.8	0.84	Ums	hgr	nth
A008	473.8	474.8	1.4	Ums	hgr	nth
A008	474.8	475.8	1.93	Ums	hgr	nth
A012	504.3	505.8	0.38	Ums	hgr	nth
A012	505.8	506.8	1.72	Ums	hgr	nth
A014	254.7	255.7	6.1	Ums	hgr	nth
A014	255.7	256.7	0.88	Ums	hgr	nth
A014	256.7	257.7	2.5	Ums	hgr	nth
A014	257.7	258.7	0.63	Ums	hgr	nth
A014	258.7	259.7	1.14	Ums	hgr	nth
A014	259.7	260.7	1.37	Ums	hgr	nth
A014	260.7	261.7	1.66	Ums	hgr	nth
A014	261.7	262.7	1.44	Ums	hgr	nth
A014	262.7	264	0.71	Ums	hgr	nth
A014	264	265.3	0.9	Ums	hgr	nth
A014	265.3	266.3	1.01	Ums	hgr	nth

BHID	from m	to m	% Ni	UMFLAG	MINFLAG	LIMBFLAG
A014	266.3	267.3	0.88	Ums	hgr	nth
A014	267.3	268.3	1.71	Ums	hgr	nth
A014	268.3	269.3	0.94	Ums	hgr	nth
A014	269.3	270.3	0.95	Ums	hgr	nth
A014	270.3	271.3	0.85	Ums	hgr	nth
A014	271.3	272.3	0.8	Ums	hgr	nth
A014	272.3	273.3	0.88	Ums	hgr	nth
A014	273.3	274.3	0.85	Ums	hgr	nth
A014	274.3	275.3	0.89	Ums	hgr	nth
A014	275.3	277	0.53	Ums	hgr	nth
A014	277	278	0.51	Ums	hgr	nth
A018	349.5	350.8	0.65	Ums	hgr	nth
A018	350.8	352.2	1	Ums	hgr	nth
A018	352.2	353	0.74	Ums	hgr	nth
A020	422.3	423.4	0.29	Ums	hgr	nth
A020	423.4	424.7	0.82	Ums	hgr	nth
A023	508.3	509.3	0.49	Ums	hgr	nth
A023	509.3	510.4	0.28	Ums	hgr	nth
A023	510.4	511.8	0.31	Ums	hgr	nth
A023	511.8	513.2	0.42	Ums	hgr	nth
A024	548.1	549.1	0.75	Ums	hgr	nth
A024	549.1	550.4	1.21	Ums	hgr	nth
A024A	548.2	549.4	3.2	Ums	hgr	nth
A024A	549.4	550	1.68	Ums	hgr	nth
A025	533	534	0.58	Ums	hgr	nth
A025	534	535	0.58	Ums	hgr	nth
A026	224.5	225.5	1.98	Ums	hgr	nth
A026	225.5	226.6	0.14	Ums	hgr	nth
A026	226.6	228	0.65	Ums	hgr	nth
A026	228	229	0.1	Ums	hgr	nth
A026	229	230	2.75	Ums	hgr	nth
A026	230	231	1.19	Ums	hgr	nth
A026	231	232	1.31	Ums	hgr	nth
A026	232	233	1.78	Ums	hgr	nth
A026	233	234	1.33	Ums	hgr	nth
A026	234	235	1.07	Ums	hgr	nth
A026	235	236	1.17	Ums	hgr	nth
A026	236	237	1.07	Ums	hgr	nth
A026	237	238	1.08	Ums	hgr	nth
A026	238	239	1.39	Ums	hgr	nth
A026	239	240	0.91	Ums	hgr	nth
A026	240	241	1.25	Ums	hgr	nth
A026	241	242	0.89	Ums	hgr	nth
A026	242	243	0.76	Ums	hgr	nth
A026	243	244.2	0.57	Ums	hgr	nth
A026	244.2	245.4	0.48	Ums	hgr	nth
A026	245.4	246.4	0.23	Ums	hgr	nth
A026	246.4	247.6	0.34	Ums	hgr	nth
A026	247.6	248.8	1.65	Ums	hgr	nth
A026	262	263	1.79	Ums	hgr	nth2
A026	263	264	1	Ums	hgr	nth2
A026	264	265	1.79	Ums	hgr	nth2
A026	265	266	2.4	Ums	hgr	nth2
A026	293.8	295	1.1	Ums	hgr	sth
A026	295	296	0.38	Ums	hgr	sth
A026	296	297.4	0.67	Ums	hgr	sth
A026	297.4	298.2	1.34	Ums	hgr	sth

BHID	from m	to m	% Ni	UMFLAG	MINFLAG	LIMBFLAG
A026	298.2	299	0.85	Ums	hgr	sth
A026	299	300	1.96	Ums	hgr	sth
A026	300	301	1.94	Ums	hgr	sth
A026	301	302	1.86	Ums	hgr	sth
A026	302	303	2.7	Ums	hgr	sth
A026	303	304	0.59	Ums	hgr	sth
A026	304	305	0.89	Ums	hgr	sth
A026	305	306	0.35	Ums	hgr	sth
A026	306	307	0.94	Ums	hgr	sth
A026	307	308	1.49	Ums	hgr	sth
A026	308	309	3.2	Ums	hgr	sth
A026	309	310	1.88	Ums	hgr	sth
A026	310	311	1.45	Ums	hgr	sth
A026	311	312	2.65	Ums	hgr	sth
A026	312	313	0.68	Ums	hgr	sth
A026	313	314	1.09	Ums	hgr	sth
A026	314	315	2.8	Ums	hgr	sth
A026	315	316	2.35	Ums	hgr	sth
A026	316	316.9	4.05	Ums	hgr	sth
A026	316.9	318	0.91	Ums	hgr	sth
A026	318	319	0.95	Ums	hgr	sth
A026	319	320	1.25	Ums	hgr	sth
A026	320	321	0.17	Ums	hgr	sth
A026	321	322	0.88	Ums	hgr	sth
A026	322	323	2.25	Ums	hgr	sth
A026	323	324	2.25	Ums	hgr	sth
A026	324	325	0.48	Ums	hgr	sth
A026	325	326.2	0.28	Ums	hgr	sth
A026	326.2	327.2	0.2	Ums	hgr	sth
A026	327.2	328	0.19	Ums	hgr	sth
A026	328	329	2.35	Ums	hgr	sth
A026	329	330	1.08	Ums	hgr	sth
A026	330	331	1.55	Ums	hgr	sth
A026	331	331.9	1.24	Ums	hgr	sth
A028	266	267	1.01	Ums	hgr	sth
A028	267	268	0.6	Ums	hgr	sth
A028	268	269	2.9	Ums	hgr	sth
A028	269	270	1.03	Ums	hgr	sth
A028	270	271	0.36	Ums	hgr	sth
A028	271	272	0.28	Ums	hgr	sth
A028	272	273	0.76	Ums	hgr	sth
A028	273	274	0.84	Ums	hgr	sth
A028	274	275	1.37	Ums	hgr	sth
A028	275	276	0.88	Ums	hgr	sth
A028	276	277	0.64	Ums	hgr	sth
A028	277	278	0.84	Ums	hgr	sth
A028	278	279	1.5	Ums	hgr	sth
A028	279	280	1.16	Ums	hgr	sth
A028	280	281	1.59	Ums	hgr	sth
A028	281	282.5	1.61	Ums	hgr	sth
A028	282.5	283.8	0.21	Ums	hgr	sth
A028	283.8	285	1.35	Ums	hgr	sth
A028	285	286	1.44	Ums	hgr	sth
A028	286	287	1.17	Ums	hgr	sth
A028	287	288	1.25	Ums	hgr	sth
A028	288	289	1.12	Ums	hgr	sth
A028	289	290	0.68	Ums	hgr	sth

BHID	from m	to m	% Ni	UMFLAG	MINFLAG	LIMBFLAG
A028	290	291	0.61	Ums	hgr	sth
A028	291	292	0.48	Ums	hgr	sth
A028	292	293	1.73	Ums	hgr	sth
A028	293	294	1.55	Ums	hgr	sth
A028	294	295	0.98	Ums	hgr	sth
A028	295	296	1.46	Ums	hgr	sth
A028	296	297	0.25	Ums	hgr	sth
A028	297	298	1.45	Ums	hgr	sth
A028	298	299	0.71	Ums	hgr	sth
A028	299	300	0.74	Ums	hgr	sth
A028	300	301	0.58	Ums	hgr	sth
A028	301	302	0.13	Ums	hgr	sth
A028	302	304	0.49	Ums	hgr	sth
A028	304	306	0.99	Ums	hgr	sth
A028	306	308	0.69	Ums	hgr	sth
A028	308	310	0.48	Ums	hgr	sth
A028	310	312	0.43	Ums	hgr	sth
A028	312	314	0.21	Ums	hgr	sth
A028	314	316	0.32	Ums	hgr	sth
A028	316	318	0.41	Ums	hgr	sth
A028	318	320	0.74	Ums	hgr	sth
A028	320	321.8	1.01	Ums	hgr	sth
A028	321.8	323.5	2.25	Ums	hgr	sth
A028	323.5	324.8	1.39	Ums	hgr	sth
A028	324.8	326.3	0.56	Ums	hgr	sth
A034	280.1	280.9	0.61	Ums	hgr	nth
A034	280.9	281.7	4.4	Ums	hgr	nth
A034	281.7	283	0.65	Ums	hgr	nth
A034	283	284	2.1	Ums	hgr	nth
A034	284	285	1.65	Ums	hgr	nth
A034	285	286	0.38	Ums	hgr	nth
A034	286	286.8	0.56	Ums	hgr	nth
A034	286.8	288	0.16	Ums	hgr	nth
A034	288	289	0.82	Ums	hgr	nth
A034	289	290	1.69	Ums	hgr	nth
A034	290	290.5	3.2	Ums	hgr	nth
A035	348.6	349.7	1.4	Ums	hgr	nth
A035	374	375.3	0.98	Ums	hgr	nth1
A035	375.3	376.6	0.73	Ums	hgr	nth1
A035	410.6	411.6	0.83	Ums	hgr	sth1
A035	411.6	412.6	1.71	Ums	hgr	sth1
A035	412.6	413.6	0.83	Ums	hgr	sth1
A035	413.6	414.6	1.17	Ums	hgr	sth1
A035	414.6	415.6	1.73	Ums	hgr	sth1
A035	415.6	416.6	1.2	Ums	hgr	sth1
A035	416.6	417.6	1.1	Ums	hgr	sth1
A035	417.6	418.6	0.7	Ums	hgr	sth1
A035	418.6	419.6	0.26	Ums	hgr	sth1
A035	419.6	420.6	1.46	Ums	hgr	sth1
A035	420.6	421.3	0.36	Ums	hgr	sth1
A035	421.3	422.3	0.8	Ums	hgr	sth1
A035	422.3	423	9.95	Ums	hgr	sth1
A035	423	423.2	33.8	Ums	hgr	sth1
A035	423.2	423.4	12.5	Ums	hgr	sth1
A035	423.4	424.4	1.21	Ums	hgr	sth1
A035	424.4	425.4	0.23	Ums	hgr	sth1
A035	425.4	426.4	0.48	Ums	hgr	sth1

BHID	from m	to m	% Ni	UMFLAG	MINFLAG	LIMBFLAG
A035	426.4	427.3	1.12	Ums	hgr	sth
A035	427.3	428.2	5.35	Ums	hgr	sth
A035	428.2	428.9	1.72	Ums	hgr	sth
A035	428.9	429.7	0.82	Ums	hgr	sth
A035	429.7	430.5	0.56	Ums	hgr	sth
A035	430.5	431.2	0.39	Ums	hgr	sth
A035	431.2	432.2	0.43	Ums	hgr	sth
A035	432.2	433.2	0.57	Ums	hgr	sth
A035	433.2	434.2	0.49	Ums	hgr	sth
A035	434.2	435.2	0.71	Ums	hgr	sth
A035	435.2	436.2	0.72	Ums	hgr	sth
A035	436.2	437.2	0.58	Ums	hgr	sth
A035	437.2	437.9	2.55	Ums	hgr	sth
A035	437.9	438.9	0.78	Ums	hgr	sth
A035	438.9	439.9	1.49	Ums	hgr	sth
A035	439.9	440.9	0.21	Ums	hgr	sth
A035	440.9	441.9	0.19	Ums	hgr	sth
A035	441.9	444.7	0.62	Ums	hgr	sth
A035	444.7	445.7	0.99	Ums	hgr	sth
A035	445.7	446.7	0.88	Ums	hgr	sth
A035	446.7	447.7	0.9	Ums	hgr	sth
A035	447.7	448.7	1.41	Ums	hgr	sth
A035	448.7	449.7	0.68	Ums	hgr	sth
A035	449.7	450.7	1.22	Ums	hgr	sth
A035	450.7	451.7	0.66	Ums	hgr	sth
A035	451.7	452.7	1.52	Ums	hgr	sth
A035	452.7	453.7	0.34	Ums	hgr	sth
A035	453.7	454.7	1.67	Ums	hgr	sth
A035	454.7	455.7	0.36	Ums	hgr	sth
A035	455.7	456.7	0.93	Ums	hgr	sth
A035	456.7	457.7	0.83	Ums	hgr	sth
A035	457.7	458.7	0.96	Ums	hgr	sth
A035	458.7	459.7	1.37	Ums	hgr	sth
A035	459.7	460.8	1.63	Ums	hgr	sth
A036	253.2	253.9	4.35	Ums	hgr	nth
A036	253.9	254.3	0.47	Ums	hgr	nth
A036	254.3	255.6	0.11	Ums	hgr	nth
A036	255.6	257	0.63	Ums	hgr	nth
A036	257	258	0.84	Ums	hgr	nth
A036	258	259	5.8	Ums	hgr	nth
A036	259	260	1.11	Ums	hgr	nth
A036	260	261	1.29	Ums	hgr	nth
A036	261	262	2.1	Ums	hgr	nth
A036	262	263	1.48	Ums	hgr	nth
A036	263	264	0.83	Ums	hgr	nth
A036	264	265	0.72	Ums	hgr	nth
A036	265	266	1.38	Ums	hgr	nth
A036	266	267	0.52	Ums	hgr	nth
A036	267	268	0.62	Ums	hgr	nth
A036	268	269	4.1	Ums	hgr	nth
A036	269	270	1.17	Ums	hgr	nth
A036	270	271	0.86	Ums	hgr	nth
A036	271	272	0.69	Ums	hgr	nth
A036	272	272.5	0.45	Ums	hgr	nth
A036	272.5	273.8	0.18	Ums	hgr	nth
A036	273.8	275	0.27	Ums	hgr	nth
A036	275	276	1.26	Ums	hgr	nth

BHID	from m	to m	% Ni	UMFLAG	MINFLAG	LIMBFLAG
A036	352.8	353.2	6.6	Ums	hgr	sth
A036	353.2	354.2	1.26	Ums	hgr	sth
A036	354.2	355.2	1.56	Ums	hgr	sth
A036	355.2	356	2.75	Ums	hgr	sth
A036	356	357.1	0.21	Ums	hgr	sth
A036	357.1	358.4	0.63	Ums	hgr	sth
A037	360.9	361.4	0.19	Ums	hgr	nth
A037	361.4	362.4	0.37	Ums	hgr	nth
A037	362.4	363.4	0.67	Ums	hgr	nth
A037	363.4	364.4	0.18	Ums	hgr	nth
A037	364.4	365.4	0.65	Ums	hgr	nth
A037	365.4	366.4	1.27	Ums	hgr	nth
A038	282.7	284.1	0.54	Ums	hgr	nth
A038	284.1	285.4	2.45	Ums	hgr	nth
A038	285.4	287	0.42	Ums	hgr	nth
A038	287	288	0.84	Ums	hgr	nth
A038	288	289	0.84	Ums	hgr	nth
A038	289	290	0.75	Ums	hgr	nth
A038	290	291	0.81	Ums	hgr	nth
A038	291	292	0.47	Ums	hgr	nth
A038	292	293	0.82	Ums	hgr	nth
A038	293	294	0.37	Ums	hgr	nth
A038	294	295	1.38	Ums	hgr	nth
A038	295	296	1.16	Ums	hgr	nth
A038	296	297	0.95	Ums	hgr	nth
A038	297	298	0.71	Ums	hgr	nth
A038	298	299	0.64	Ums	hgr	nth
A038	299	300	1.29	Ums	hgr	nth
A038	300	301	0.58	Ums	hgr	nth
A038	301	302	0.74	Ums	hgr	nth
A038	302	303	1.04	Ums	hgr	nth
A038	303	304	0.69	Ums	hgr	nth
A038	377.5	378.5	0.52	Ums	hgr	sth2
A038	378.5	379.5	1.83	Ums	hgr	sth2
A038	379.5	380.4	0.83	Ums	hgr	sth2
A038	380.4	381.4	0.56	Ums	hgr	sth2
A038	381.4	382.4	0.69	Ums	hgr	sth2
A038	382.4	383.4	0.31	Ums	hgr	sth2
A038	383.4	384.4	0.84	Ums	hgr	sth2
A038	398.2	399.2	1.12	Ums	hgr	sth
A038	399.2	400.2	1.26	Ums	hgr	sth
A038	400.2	401.2	0.59	Ums	hgr	sth
A038	401.2	402.2	0.67	Ums	hgr	sth
A038	402.2	403.2	1.67	Ums	hgr	sth
A038	403.2	404.2	0.71	Ums	hgr	sth
A038	404.2	405.2	2.25	Ums	hgr	sth
A038	405.2	406	1.01	Ums	hgr	sth
A038	406	407.1	0.69	Ums	hgr	sth
A039	352	353	2.5	Ums	hgr	nth
A039	353	354	1.81	Ums	hgr	nth
A039	354	355	1.02	Ums	hgr	nth
A039	355	356	1.13	Ums	hgr	nth
A039	356	357	0.9	Ums	hgr	nth
A039	357	358	0.63	Ums	hgr	nth
A040	226.5	227.5	0.82	Ums	hgr	nth
A040	227.5	228.5	1.97	Ums	hgr	nth
A040	228.5	229.5	3.05	Ums	hgr	nth

BHID	from m	to m	% Ni	UMFLAG	MINFLAG	LIMBFLAG
A040	229.5	230.5	1.21	Ums	hgr	nth
A040	230.5	231.5	0.87	Ums	hgr	nth
A040	231.5	232.5	0.18	Ums	hgr	nth
A040	232.5	233.5	0.62	Ums	hgr	nth
A040	233.5	234.5	0.56	Ums	hgr	nth
A040	234.5	235.5	0.32	Ums	hgr	nth
A040	235.5	236.5	0.1	Ums	hgr	nth
A040	236.5	237.5	0.26	Ums	hgr	nth
A040	237.5	238.5	0.36	Ums	hgr	nth
A040	238.5	239.5	0.22	Ums	hgr	nth
A040	239.5	240.5	0.17	Ums	hgr	nth
A040	240.5	241.5	0.28	Ums	hgr	nth
A040	241.5	242.5	1.25	Ums	hgr	nth
A040	242.5	243.5	1.03	Ums	hgr	nth
A040	272.5	273.5	1.05	Ums	hgr	nth2
A040	273.5	274.5	1.67	Ums	hgr	nth2
A040	274.5	275.5	0.8	Ums	hgr	nth2
A040	275.5	276.5	2.25	Ums	hgr	nth2
A040	276.5	277.5	1.07	Ums	hgr	nth2
A040	277.5	278.5	0.42	Ums	hgr	nth2
A040	278.5	279.5	0.59	Ums	hgr	nth2
A040	279.5	280.5	0.87	Ums	hgr	nth2
A040	280.5	281.5	1.18	Ums	hgr	nth2
A041	395.6	396.8	1.36	Ums	hgr	nth
A041	396.8	398	0.08	Ums	hgr	nth
A041	398	399	0.17	Ums	hgr	nth
A041	399	400	0.15	Ums	hgr	nth
A041	400	401	0.16	Ums	hgr	nth
A041	401	402	0.43	Ums	hgr	nth
A042	230.7	232.5	1.29	Ums	hgr	nth
A042	232.5	233.5	1.8	Ums	hgr	nth
A042	233.5	234.5	2.15	Ums	hgr	nth
A042	234.5	235.5	3.55	Ums	hgr	nth
A042	235.5	236.5	0.7	Ums	hgr	nth
A042	236.5	237.5	5.7	Ums	hgr	nth
A042	237.5	238.5	3.4	Ums	hgr	nth
A042	238.5	239.5	0.9	Ums	hgr	nth
A042	239.5	240.5	0.51	Ums	hgr	nth
A042	240.5	241.5	1.12	Ums	hgr	nth
A042	241.5	242.5	0.77	Ums	hgr	nth
A042	242.5	243.5	0.5	Ums	hgr	nth
A042	243.5	244.5	0.43	Ums	hgr	nth
A042	244.5	245.5	0.43	Ums	hgr	nth
A042	245.5	246.5	0.12	Ums	hgr	nth
A042	246.5	247.5	0.19	Ums	hgr	nth
A042	247.5	248.5	0.42	Ums	hgr	nth
A042	248.5	249.5	0.88	Ums	hgr	nth
A042	249.5	250.5	0.79	Ums	hgr	nth
A042	250.5	251.5	0.35	Ums	hgr	nth
A042	251.5	252.5	0.86	Ums	hgr	nth
A042	252.5	253.5	0.84	Ums	hgr	nth
A042	253.5	254.5	1.8	Ums	hgr	nth
A042	254.5	255.5	1.41	Ums	hgr	nth
A042	255.5	256.5	1.45	Ums	hgr	nth
A042	256.5	257.5	2.95	Ums	hgr	nth
A042	257.5	258.5	1.38	Ums	hgr	nth
A042	258.5	259.5	0.48	Ums	hgr	nth

<b>BHID</b>	<b>from m</b>	<b>to m</b>	<b>% Ni</b>	<b>UMFLAG</b>	<b>MINFLAG</b>	<b>LIMBFLAG</b>
A042	259.5	260.5	1.4	Ums	hgr	nth
A042	260.5	261.5	0.22	Ums	hgr	nth
A042	261.5	262.5	0.76	Ums	hgr	nth
A042	262.5	263.5	1.32	Ums	hgr	nth
A042	263.5	264.5	1.2	Ums	hgr	nth
A042	264.5	265.5	1	Ums	hgr	nth
A042	265.5	266.5	0.79	Ums	hgr	nth
A042	266.5	267.5	1.19	Ums	hgr	nth
A042	267.5	268.5	2.1	Ums	hgr	nth
A042	268.5	269.5	1.52	Ums	hgr	nth
<b>length weighted average</b>			<b>1.13</b>			

## **APPENDIX 5**

### **Specific gravities of drill core**

bhid	at	description	core size	core state	diam mm	length 1 mm	length 2 mm	length 3 mm	length 4 mm	water vo 1 cc	water vol 2 cc	volume cc	mass gm	specific gravity gm/cc
<b>HIGH GRADE RIM SAMPLES</b>														
A007	275.4	mottled cream and grey silicate rock with sparse pentlandite	NQ	half						642	794	152	496	3.26
A007	280.3	black serpentinite with common pentlandite	NQ	half						644	769	125	380	3.04
A011	288.7	serpentinite and minor pentlandite	NQ	half						697	825	128	365	2.85
A011	294.0	white diopside rock	NQ	half						695	825	130	379	2.92
A011	301.0	serpentinite with common pentlandite	NQ	half						694	788	94	288	3.06
A012	393.8	black serpentinite	NQ	half						711	845	134	397	2.96
A013	392.5	semi-massive pentlandite and black serpentinite	NQ	whole						711	945	234	787	3.36
A018A	214.6	black serpentinite and white diopside rock	NQ	whole	47	117.5	120	121	119.5			207	658	3.17
A018A	217.4	black serpentinite and white diopside rock	NQ	whole	47	121	122	121	121			210	656	3.12
A018A	221.7	black serpentinite	NQ	whole	47	190	190	190	190.5			330	933	2.83
A018A	224.6	semi-massive magnetite and black serpentinite	NQ	whole	47	202	201	202	201			350	1152	3.29
A018A	228.4	semi-massive magnetite and black serpentinite	NQ	whole	47	224.5	224	224	224			389	1182	3.04
A018A	233.3	semi-massive magnetite and black serpentinite	NQ	whole	47	199	199	199	199			345	1116	3.23
A026	226.8	black serpentinite and light green silicate rock	NQ	half	47					810	880	70	219	3.13
A026	241.9	black serpentinite	NQ	half	47					809	891	82	229	2.79
A026	250.0	mottled green, cream, grey and grey green silicate rock	NQ	half	47					809	900	91	300	3.30
A026	278.0	mottled light green and black silicate-magnetite rock	NQ	half	47					801	851	50	152	3.04
A026	320.0	mottled grey, cream and green-grey silicate rock	NQ	half	47					801	861	60	179	2.98
A028	266.7	green silicate rock and black serpentinite with common pe	NQ	half						634	748	114	334	2.93
A028	278.6	mottled grey and green silicate rock with sparse pentlandite	NQ	half						636	770	134	401	2.99
A028	292.9	black serpentinite with common pentlandite	NQ	half						640	754	114	331	2.90
A028	320.0	black serpentinite and sparse pentlandite	NQ	half						630	718	88	243	2.76
A034	285.4	black serpentinite and lesser white silicate rock with sparse pe	NQ	half						630	882	252	724	2.87
A034	419.1	black serpentinite with common pentlandite	NQ	half						625	818	193	544	2.82
A035	349.3	white silicate rock with abundant pentlandite	NQ	half						680	765	85	305	3.59
A035	375.4	green-black serpentinite with common pentlandite	NQ	half						677	770	93	291	3.13
A035	385.7	mottled light green silicate rock	NQ	half						672	770	98	269	2.74
A035	414.2	mottled grey silicate rock with common pentlandite	NQ	half						668	830	162	543	3.35
A035	422.9	mottled green silicate rock with common pentlandite	NQ	half						665	785	120	434	3.62
A035	432.9	mottled grey and cream silicate rock with sparse pentlandite	NQ	half						661	808	147	487	3.31
A035	440.4	black serpentinite with sparse pentlandite	NQ	half						660	758	98	280	2.86
A036	262.7	green silicate rock with trace pentlandite	NQ	half						637	774	137	420	3.07
A036	269.2	grey and black silicate rock with common pentlandite	NQ	half						640	865	225	679	3.02

bhid	at m	description	core size	core state	diam mm	length 1 mm	length 2 mm	length 3 mm	length 4 mm	water vo 1 cc	water vol 2 cc	volume cc	mass gm	specific gravity gm/cc
A036	275.4	black serpentinite with common pentlandite	NQ	half						642	840	198	630	3.18
A036	353.5	cream silicate rock and black serpentinite with sparse pentlandite?	NQ	half						652	774	122	391	3.20
A036	355.7	mottled grey and white silicate rock with common pentlandite	NQ	half						654	882	228	758	3.32
A037	365.4	black serpentinite with sparse pentlandite	NQ	half						622	754	132	367	2.78
A038	293.9	green and cream silicate rock and black serpentinite with sparse pentlandite	NQ	half						651	825	174	512	2.94
A038	399.4	grey silicate rock with common pentlandite	NQ	half						659	874	215	703	3.27
A038	404.5	mottled green silicate rock with sparse pentlandite	NQ	half						662	862	200	621	3.11
A039	353.9	black serpentinite with common pentlandite	NQ	half						650	790	140	378	2.70
A040	228.9	mottled green-cream silicate rock with magnetite and common pentlandite	NQ	half						646	760	114	384	3.37
A040	276.3	black serpentinite with common pentlandite	NQ	half						648	776	128	393	3.07
<b>average</b>														<b>3.08</b>

#### OTHER SAMPLES WITHIN ULTRAMAFIC

A011	284.5	massive pentlandite	NQ	half						697	774	77	357	4.64
A012	402.0	black serpentinite	NQ	half						712	820	108	289	2.68
A012	411.3	black serpentinite and white diopside rock	NQ	half						715	832	117	325	2.78
A012	417.9	black serpentinite	NQ	half						717	897	180	498	2.77
A012	430.4	white diopside rock	NQ	half						720	874	154	504	3.27
A012	436.4	black serpentinite and white diopside rock	NQ	half						722	988	266	774	2.91
A012	453.8	black serpentinite	NQ	half						723	840	117	331	2.83
A012	445.0	white diopside rock	NQ	half						726	836	110	370	3.36
A013	401.2	semi-massive magnetite and black serpentinite	NQ	whole						708	987	279	851	3.05
A013	409.4	semi-massive magnetite and black serpentinite	NQ	whole						540	940	400	1171	2.93
A013	418.3	semi-massive magnetite and black serpentinite	NQ	whole						538	831	293	813	2.77
A013	428.5	black serpentinite	NQ	whole						531	1000	469	1240	2.64
A013	436.8	black serpentinite	NQ	whole						529	717	188	500	2.66
A013	448.4	black serpentinite	NQ	whole						526	709	183	530	2.90
A020	422.9	light green serpentinite	NQ		47					710	891	181	603	3.33
A020	428.7	black serpentinite, sparse pentlandite	NQ		47					712	822	110	306	2.78
A020	437.8	black serpentinite	NQ	whole	47	130	130	131	130			226.067	624	2.76
A020	465.4	black serpentinite	NQ		47	184.5	184.5	185	184			320.226	890	2.78
A025	295.0	serpentinite	NQ		47					799	929	130	399	3.07
A026	345.0	mottled light green silicate rock	NQ	half	47					800	899	99	305	3.08

bhid	at m	description	core size	core state	diam mm	length 1 mm	length 2 mm	length 3 mm	length 4 mm	water vo 1 cc	water vol 2 cc	volume cc	mass gm	specific gravity gm/cc
A028	254.7	green silicate rock with trace pentlandite	NQ	half						632	790	158	493	3.12
A035	354.9	mottled light coloured silicate rock	NQ	half						678	778	100	287	2.87
A035	363.2	mottled light green silicate rock	NQ	half						678	775	97	322	3.32
A036	366.7	black serpentinite	NQ	half						649	846	197	548	2.78
A037	373.0	green-cream silicate rock with common pentlandite?	NQ	half						620	766	146	473	3.24
<b>HOST ROCKS</b>														
A018A	195.3	hornfels	NQ	whole	47	192.5	193	193	193			335	969	2.89
A018A	200.1	hornfels	NQ	whole	47	143	144	143	143			249	729	2.93
A020	338.8	hornfels/chert	NQ	whole	47	97	97	96.5	96.5			168	520	3.10
A020	399.8	chert	NQ	whole	47	118	118	119	120			206	579	2.81
A020	418.0	chert	NQ	whole	47	128	128	128	129			223	651	2.92
A025	300.0	green and brown actinolite-phlogopite rock	NQ	whole	47					798	861	63	216	3.43
A025	321.2	brown phlogopite rock	NQ	whole	47					792	860	68	196	2.88
A025	363.0	green actinolite rock	NQ	whole	47	69	69	69	70			120	379	3.15
A025	400.1	hornfels	NQ	whole	47	90	90	90	90			156	456	2.92
A026	215.1	chert	NQ	whole	47	119	119	119	119			207	602	2.91
A026	220.0	chert	NQ	whole	47	89	90	89	89			155	439	2.83
A036	366.2	chert	NQ	whole						658	896	238	658	2.76
A037	356.8	chert	NQ	whole						625	890	265	750	2.83
<b>average</b>														<b>2.95</b>

## **APPENDIX 6**

### **Cut-off grade estimate for Renison Bell operations**

**inputs**

ore mined	163,724 tonnes	Murchison Ltd Quarterly Report, 30 Jun 2002
ore milled	147,983 tonnes	Murchison Ltd Quarterly Report, 30 Jun 2002
tin produced	1,757 tonnes	Murchison Ltd Quarterly Report, 30 Jun 2002
cash cost	7,641 \$A per tonne	Murchison Ltd Quarterly Report, 30 Jun 2002
cash cost	4,212 \$US per tonne	Murchison Ltd Quarterly Report, 30 Jun 2002
tin price	4,195 \$US per tonne	LME spot price 31 Oct 2002
exchange rate	0.55 \$US per \$A	
tin price	7,627 \$A per tonne	
mill recovery	67.7 %	Murchison Ltd Quarterly Report, 30 Jun 2002

**calculations**

ore treated	155,854 tonnes	(ore mined + ore milled)/2
total production cost	13,425,237 \$A	tin produced*production cost
unit production cost	86 \$A per tonne treated	total production cost/ore treated
tin content for cost recovery	1.13 %Sn	(unit production cost/tin price)*100
<b>calculated cut-off grade</b>	<b>1.67 %Sn</b>	tin content for cost recovery*100/mill recovery

## **APPENDIX 7**

### **Method for Mineral Resource estimates using cross-sectional method**

Manual estimates of the global Mineral Resource in North Avebury and Viking mineralisation was made using a sectional method:

- an area of influence for each drill hole was marked on cross-section, the influence from a particular drill hole extending half way to the next nearest drill hole
- the area of influence of each drill hole was measured by planimeter
- the along-strike influence of each cross-section was calculated as the east-west distance between points mid-way to each adjacent cross-section
- the volume of mineralisation attributed to each drill hole was estimated by multiplying the

area of influence of each drill hole on cross-section

X

the along strike influence of each cross-section

- the tonnage of mineralisation attributed to each drill hole was estimated by multiplying the

volume of mineralisation for each drill hole

X

mineralisation density

- the length-weighted nickel grade for each drill hole intersection was calculated
- the tonnage of nickel metal attributed to each drill hole was estimated by multiplying the

tonnage of mineralisation for each drill hole

X

length weighted nickel grade / 100

- the volume of mineralisation, the tonnage of mineralisation and the tonnage of metal for each drill hole were summed to give estimates of the global volume, mineralisation tonnage and nickel metal tonnage

- the global mean grade was estimated by dividing

global nickel metal tonnage

by

global mineralisation tonnage

## **APPENDIX 8**

### **Index to resource assessment criteria**

Drilling techniques: 4.2 DRILLING TECHNIQUES

Logging: 4.3 CORE LOGGING

Drill sample recovery: 4.4 CORE RECOVERY

Sub-sampling techniques and sample preparation: 5.1 SAMPLE PREPARATION

Quality of assay data and laboratory tests: 5.2 ASSAY METHOD AND ASSAY  
LABORATORIES

Verification of sampling and assaying: 5.3 VERIFICATION OF SAMPLING AND ASSAY  
DATA

Location of data points: 4.5 DRILL HOLE SURVEYS

Data density and distribution: 6.7 MINERAL RESOURCE ESTIMATES

Audits and reviews of sampling techniques and data: 5.1 SAMPLE PREPARATION and 5.3  
VERIFICATION OF SAMPLING AND ASSAY DATA

Database integrity: 5.4 ASSAY DATABASE

Geological interpretation: 6.2 GEOLOGICAL INTERPRETATION

Estimation and modelling techniques: 6.7 RESOURCE ESTIMATES

Cut-off grades or parameters: 6.6 CUT OFF GRADE.

Mining factors or assumptions: 6.1 INTRODUCTION in 6 GLOBAL RESOURCE  
ESTIMATES

Metallurgical factors or assumptions: 6.1 INTRODUCTION in 6 GLOBAL RESOURCE  
ESTIMATES

Tonnage factors: 6.5 TONNAGE FACTORS

Classification: 6.7.1 NORTH AVEBURY RESOURCE ESTIMATES and 6.7.2 VIKING  
RESOURCE ESTIMATES