

**THE GEOLOGY AND  
MINERALISATION OF THE  
E31 COPPER - GOLD PROSPECT,  
GOONUMBLA , N.S.W.**

BY

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## ABSTRACT

The E31 copper-gold prospect is one of several porphyry or porphyry related prospects that occur adjacent to the Northparkes Mines site in the Goonumbla district of central N.S.W.

The prospect is hosted by trachyandesitic lavas, volcanoclastic breccias and volcanoclastic sandstones which have been intruded by a biotite monzonite at depth. Intrusive breccias are recognised associated with monzonite dykes intruding the volcanic sequence. A post mineralisation low angle north dipping fault terminates occurs adjacent to the contact of the monzonite with volcanics.

Three major stages of hydrothermal alteration and veining are recognised. Pre-mineralisation biotite alteration was the first phase. Extensive K-feldspar flooding and vein style alteration was associated with bornite and chalcopyrite mineralisation. Sericite-carbonate ( $\pm$  chlorite) alteration with pyrite  $\pm$  chalcopyrite was associated with minor faults and shears. Regional low grade metamorphism, localised albitisation, and late stage carbonate veinlet alteration have also been recognised.

Detailed analysis of geochemical data indicates that Cu/Au mineralisation is associated with Ag, Te, Hg, and Se. An asymmetric Zn and Mn "halo" anomaly occurs in the hanging wall of the mineralisation which could be used as a vector to the mineralisation. Geochemical discrimination of lithological units has identified subtle differences between the monzonite above and below the low angle fault.

Analysis of sulphur isotopes of the E31 prospect indicates that the sulphur associated with the mineralisation was derived from an oxidised magmatic source. The range of the data for bornite and chalcopyrite at the E31 prospect are broadly similar to the values from E26N and E48 but overall the numbers are lower. Isotopic zonation may be present within the prospect but given the small size of the prospect and the limited number of samples collected, zonation has not been determined.

## TABLE OF CONTENTS

### ACKNOWLEDGMENTS

1.	INTRODUCTION	1
1.1	Aims	1
1.2	Exploration and Mining History	1
1.3	Previous Work	3
1.4	Data Collection	5
2.	GEOLOGICAL SETTING	6
2.1	Introduction	6
2.2	Regional Geology and Tectonic Setting	6
2.3	Geology of the Goonumbra district	8
2.3.1	Volcanics	8
2.3.2	Intrusions	8
2.3.3	Structure	9
2.4	Mineralisation	12
3.	GEOLOGY OF THE E31 PROSPECT	14
3.1	Introduction	14
3.2	Sedimentary rocks	14
3.3	Volcanic Rocks	22
3.4	Intrusives	22
3.4.1	Biotite Monzonite (E31 stock)	22
3.4.2	"Intrusive Breccia"	24
3.4.2.1	Interpretation	26
3.4.3	Other Intrusions	27
3.5	Structure	27
3.6	Interpretation of Geological Setting	29
4.	ALTERATION AND MINERALISATION	30
4.1	Introduction	30
4.2	Biotite alteration	30
4.3	K-feldspar alteration	30

4.4	Sericite carbonate alteration	33
4.5	Albitisation	33
4.6	Carbonate veins	33
4.7	Low grade metamorphic assemblages	35
4.8	Summary of Alteration	35
4.9	Magnetic Susceptibility	36
4.10	Mineralisation	38
	4.10.1 Mineralogy and Metal Zoning	38
	4.10.2 Supergene Mineralisation	43
4.11	Discussion	43
5.	GEOCHEMISTRY	44
5.1	Introduction	44
5.2	Methodology	44
5.3	Lithological Variation	45
	5.3.1 Volcanics	45
	5.3.2 Intrusives	45
5.4	Alteration	50
5.5	Copper Gold Mineralisation	51
5.6	Discussion	57
	5.6.1 Volcanics	57
	5.6.2 Intrusives	60
6.	SULPHUR ISOTOPES	61
6.1	Introduction	61
6.2	Analytical Methods	61
6.3	Results	61
6.4	Discussion	63
6.5	E48 Sulphur Isotopes	67
6.6	Conclusions	67
7.	COMPARISON WITH OTHER GOONUMBLA DEPOSITS	70
8.	DISCUSSION ON CONTROLS OF MINERALISATION AT THE E31 PROSPECT	75

9. CONCLUSIONS

77

10. REFERENCES

79

## LIST OF FIGURES

Figure 1.1	Locality Map of the Goonumbla District	2
Figure 1.2	Prospect Location Plan - Goonumbla District	2
Figure 2.1	Ordovician volcanic belts and interpreted intrusive centres.	7
Figure 2.2	Tectonic subdivisions of New South Wales	9
Figure 2.3	Regional geology of the Goonumbla area	10
Figure 2.4	Geology of the Northparkes Mines area	11
Figure 3.1	Interpreted geology of the E31 prospect & drillhole location plan	15
Figure 3.2	E31 prospect - Section 10400E	16
Figure 3.3	E31 prospect - Section 10500E	17
Figure 3.4	E31 prospect - Section 10525E	18
Figure 3.5	E31 prospect - Section 10600E	19
Figure 3.6	E31 prospect - Section 10850E	20
Figure 3.7	Volcaniclastic Sandstone (E31D4 176.8m)	21
Figure 3.8	Volcanic Breccia (E31D6 176m)	21
Figure 3.9	Porphyritic trachyandesite (NSW6436 - E31D11 155.3m)	21
Figure 3.10	Biotite Monzonite (E31D3 210m)	23
Figure 3.11	Quartz Monzonite (E31D3 116.4m)	23
Figure 3.12	Biotite Adamellite (E31D10 100.8m)	23
Figure 3.13	Intrusive Breccia (E31D3 - 101m)	25
Figure 3.14	Intrusive Breccia (E31D11 132.8m)	25
Figure 3.15	Intrusive Breccia (GD1 179m)	25
Figure 3.16	Interpretation of ground magnetics	28
Figure 4.1	Biotite alteration (NSW6442 - E31D3 109.2m)	31
Figure 4.2	Pervasive K-feldspar alteration (E31D11 150m)	31
Figure 4.3	Vein style K-feldspar alteration (NSW6442 - E31D3 109.2m)	31
Figure 4.4	Sericite-carbonate alteration (NSW6440 - E31D7 62.1m)	34
Figure 4.5	Albite alteration (GPR2079 - E31D6 139.35m)	34
Figure 4.6	Carbonate veining (NSW6442 - E31D3 109.2m)	34
Figure 4.7	Section 10500E - Magnetic susceptibility data	39
Figure 4.8	Disseminated mineralisation replacing ferro-magnesian minerals (E31D11 150m)	40
Figure 4.9	Quartz-calcite veinlets (NSW6436 - E31D11 155.3m)	40
Figure 4.10	Segregations . (E31D3 109m)	40
Figure 4.11	Coarse sulphide blebs (NSW6446 - E31D3 123m)	41



Figure 4.12	Chalcopyrite in sericite alteration zone (E31D3 108.4m)	41
Figure 4.13	Visible gold (NSW6445 - E31D3 120.7m)	41
Figure 5.1	E31D3. Elements indicating stratigraphic variation	46
Figure 5.2	E31D7. Elements indicating stratigraphic variation	47
Figure 5.3	E31D3. Variation in monzonite composition	48
Figure 5.4	E31D7. Variation in monzonite composition	49
Figure 5.5	Elements associated with Au mineralisation	52
Figure 5.6	Elements associated with Cu mineralisation and Sulphur	53
Figure 5.7	E31D3. Elements associated with Cu and Au mineralisation	54
Figure 5.8	E31D7. Elements associated with Cu and Au mineralisation	55
Figure 5.9	Discrimination diagrams for fractionation trends of magmas	58
Figure 5.10	K <sub>2</sub> O v SiO <sub>2</sub> plot for Goonumbla and Wombin Volcanics and Intrusions	60
Figure 6.1	Sulphur isotope values - E31 prospect	63
Figure 6.2	Section 10500E - Sulphur isotope values - Bornite	64
Figure 6.3	Section 10500E - Sulphur isotope values - Chalcopyrite	65
Figure 6.4	E26 deposit - Sulphur isotope values - Bornite	66

## LIST OF TABLES

Table 1.1	Northparkes Mines - Mineral Resources and Ore Reserves - June 1997	4
Table 4.1	Summary of Alteration events at the E31 prospect	37
Table 5.1	Summary of elemental correlations with Cu and Au	56
Table 6.1	Sulphur Isotope Analyses - E31 prospect	62
Table 6.2	Sulphur Isotope Analyses - E48 Deposit	68
Table 7.1	Comparison of E31 prospect with E22, E26, E27 & E48 deposits	71

## LIST OF APPENDICES

Appendix 1	Data Location, Drilling Techniques and Orientation, Sample Preparation and Assaying Techniques, Magnetic Susceptibility Data and Data Storage
Appendix 2	Thin section descriptions
Appendix 3	Diamond drillhole logs
Appendix 4	Magnetic susceptibility logs
Appendix 5	Drillhole Assay results
Appendix 6	Sulphur Isotope results