

# Open File Envelope

## No. 10,079

**EL 2971**

**ARTIPENA HILL**

### **FIRST ANNUAL AND FINAL SURRENDER REPORT FOR THE PERIOD 13/6/2002 TO 12/6/2003**

Submitted by  
Ian R. Filsell, Mark A. Filsell and Richard J. Burke  
2003

© 28/11/2003

This report was supplied as part of the requirement to hold a mineral or petroleum exploration tenement in the State of South Australia.  
PIRSA accepts no responsibility for statements made, or conclusions drawn, in the report or for the quality of text or drawings.  
This report is subject to copyright. Apart from fair dealing for the purposes of study, research, criticism or review as permitted under the Copyright Act, no part may be reproduced without written permission of the Chief Executive of Primary Industries and Resources South Australia, GPO Box 1671, Adelaide, SA 5001.

**Enquiries:** Customer Services  
Ground Floor  
101 Grenfell Street, Adelaide 5000

Telephone: (08) 8463 3000  
Facsimile: (08) 8204 1880



**PRIMARY INDUSTRIES  
AND RESOURCES SA**

**EL 2971**

**Willippa and Martins Well  
South Australia**

**FINAL & RELINQUISHMENT  
REPORT**

**For the year ending  
12<sup>th</sup> June, 2003**

**1:250,000 sheet**

**Parachilna SH54-13**

**1:100,000 sheet**

**Reaphook 6735**

**Willippa 6734**

**R.J. Burke B Sc. (Hons)**

**11 Langer Court**

**Fairview Park 5126**

**S.A.**

**August, 2003**

## SUMMARY

This report details the results of exploration undertaken on EL 2971 (Willippa and Martins Well) for the year ending 12<sup>th</sup> June 2003. This area of the eastern Flinders Ranges was selected for exploration on the basis of two conceptual models which were in turn based on the results of previous work at the Paratoo Dome.

The first model involves dolomite/dolomitic sediment hosted copper  $\pm$  gold mineralization with attendant k-feldspar/hematite/sericite alteration epigenetically related to intrusive bodies in structural domes. This model was applied to previously reported copper mineralization in and near the Martins Well and Willippa Domes. The second model involves the weathering, leaching, scavenging and concentration of the high value elements, cobalt and nickel ( $\pm$  copper) in manganese wads. Extraction of these high value elements has been demonstrated to be feasible in studies undertaken on similar cobalt enriched deposits at Calatrava in Spain using solvent extraction/electro-winning technology.

In the field it was found that enhanced copper grades were not accompanied by anomalous gold. The copper mineralization was contained in thin quartz-siderite veins with no economic potential. Often copper grades were enhanced due to the effects of scavenging and concentration in manganese rich and/or iron oxide rich wads. The secondary manganese was sourced from the weathering of the manganese rich, oolitic, Etina Limestone unit. The secondary iron that has acted as a copper scavenger was sourced from either the weathering of iron carbonate (siderite) in copper bearing veins and lodes and elsewhere from the Holowilena Ironstone formation.

Reconnaissance rock chip sampling across the tenement has shown that the concentrations of the high value elements cobalt and nickel are not consistently elevated enough nor are the manganese wads abundant enough to form the basis of a solvent extraction/electro-winning operation. Sampling has also shown that the copper-siderite lodes are low grade or narrow and that gold is absent. For these reasons EL 2971 is being relinquished.

## **TABLE OF CONTENTS**

<b>Summary</b>	<b>i</b>
<b>Table of Contents</b>	<b>ii</b>
<b>List of Figures</b>	<b>ii</b>
<b>List of Appendices</b>	<b>ii</b>
<b>1.0 INTRODUCTION</b>	<b>1</b>
<b>2.0 LOCATION AND ACCESS</b>	<b>1</b>
<b>3.0 TENEMENT DETAILS</b>	<b>1</b>
<b>4.0 PREVIOUS WORK</b>	<b>1</b>
<b>5.0 REGIONAL GEOLOGY</b>	<b>2</b>
<b>6.0 EXPLORATION MODELS</b>	<b>3</b>
<b>7.0 WORK COMPLETED</b>	<b>4</b>
<b>7.1 Geological Reconnaissance</b>	
<b>7.2 Rock Chip Sampling</b>	
<b>8.0 RESULTS</b>	<b>4</b>
<b>8.1 Rock Chip Assays</b>	
<b>9.0 CONCLUSIONS AND RECOMMENDATIONS</b>	<b>5</b>
<b>10.0 EXPENDITURE</b>	<b>5</b>

### **LIST OF FIGURES**

**Figure 1**            **EL 2971 - Location and Boundaries**

### **LIST OF APPENDICES**

**Appendix 1**        **Rock Chip Sample Locations and Descriptions**  
**Appendix 2**        **Rock Chip Sample Assay Results**

## **1.0 INTRODUCTION**

This report details the work undertaken and the results of exploration on EL 2971 during the year ending 12<sup>th</sup> June, 2003. Epigenetic copper-gold mineralization and high value cobalt and nickel rich manganese wad deposits amenable to solvent extraction/electro-winning were both targeted. After a compilation of the available data, field reconnaissance of all mineralized areas was undertaken during several surveys using previously reported rock chip and stream sediment results as a guide.

## **2.0 LOCATION AND ACCESS**

EL 2971 is located on the eastern flank of the Flinders Ranges and is contained within the Willippa and Martins Well pastoral leases. It may be accessed from the east by way of a bitumen road to Yunta and then by traveling part way along the gravel road to Arkaroola. Martins Well station is accessed via a turn off near Curnamona homestead. From the west EL 2971 may be accessed by bitumenized road to Hawker thence by gravel station track to Willippa.

EL 2971 lies within the area covered by the Parachilna 1:250,000 geological map (Sheet 54-13).

## **3.0 TENEMENT DETAILS**

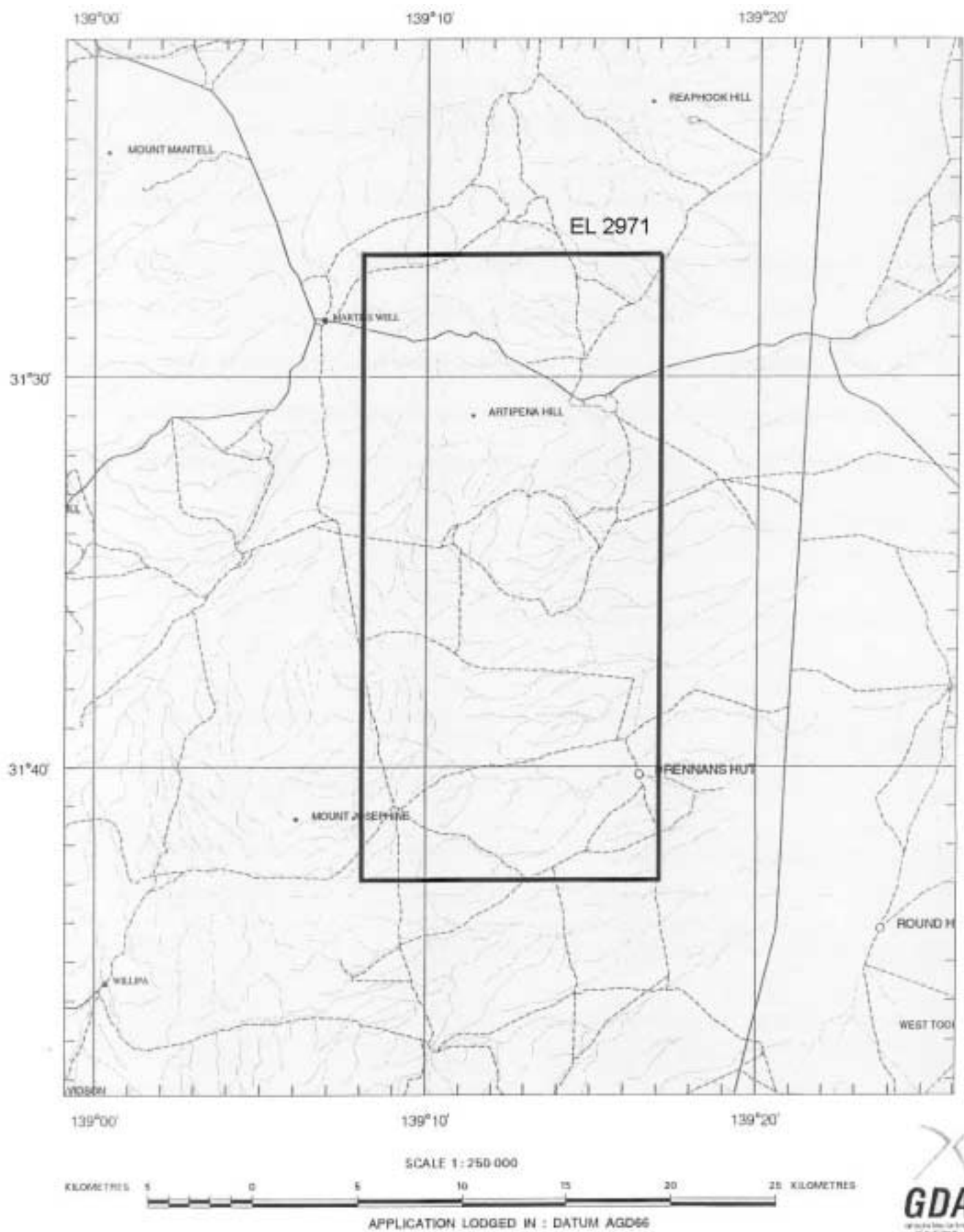
EL 2971 comprising 421 km<sup>2</sup> was granted to I.R. Filsell, M.A. Filsell and R.J Burke on 13<sup>th</sup> June, 2002. It encompasses two structural domes in upper Proterozoic sediments of the Burra, Umberatana and Wilpena Groups. Some minor baryte occurrences have been covered by mineral claims but the small copper showings within the tenement have not.

## **4.0 PREVIOUS WORK**

The following companies have conducted work previously over all or part of EL 2971.

EL 1195	Electrolytic Zinc Co. of Australia	1983 – 1985
EL 1455	Lynch Mining P/L	1987 – 1988
EL 1762	Frontier Exploration Ltd	1992 – 1996
EL 2081	Frontier Exploration Ltd	1995 – 1996
El 2196	Frontier Exploration Ltd	1996 – 1999
EL 2431	Swancove Resources P/L	1997 - 1998

Exploration was primarily for base metals but some stream sediment samples were also assayed for gold as were some of the rock chip samples. The search for a



NOTE: There is no warranty that the boundary of this Exploration Licence is correct in relation to the other features on the map. The boundary is to be ascertained by reference to the Australian Geodetic Datum.

Figure 1

viable ore deposit was unsuccessful in each case because of generally low and inconsistent metal tenors and low tonnages indicated in the relatively small host structures hosting the higher grade mineralization.

## **5.0 REGIONAL GEOLOGY**

EL 2971 is in the Adelaide Geosyncline and covers two structural domes developed in upper Proterozoic sediments of the Burra, Umberatana and Wilpena Groups. The Willippa Dome to the south contains a core of exposed upper Burra Group dolomitic sediments. These outcrop in the shape of an east-west trending oval pinched in the middle. Surrounding the Burra Group concentrically are the basal units of the Umberatana Group including the Holowilena Ironstone and the glacial, dropstone-bearing Wilyerpa Formation. The Holowilena Ironstone is the source of some of the secondary iron oxides in the central part of the Willippa Dome. Stratigraphically above and around this are the siltstones and fine sandstones of the Tapley Hill Formation followed by the calcareous siltstones of the Sunderland Formation. Stratigraphically above these argillaceous units, is a distinctive oolitic and stromatolitic carbonate unit, the Etina Limestone. This unit appears to be the source of the secondary manganese oxides found in the area. The Enorama shale overlying the Etina Limestone is the uppermost unit of the Umberatana Group. Stratigraphically above and concentrically outcropping around the older units are Wilpena Group sediments. The Wilpena Group is the youngest group exposed in the tenement.

The Martins Well Dome in the north of the tenement is within the same stratigraphic succession as the Willippa Dome but at higher stratigraphic levels. The dome is centred on a core of Tapley Hill Formation. Although the Martins Well Dome has a more regular shape than the Willippa Dome it is much more faulted. The northeast trending faults are easily discerned on the TM image and also on the ground as breccia bodies, commonly marking locally discordant breaks in the stratigraphic succession. A series of north-northeast trending faults link the two domes. Most breccia bodies in the Willippa Dome were observed to trend east-west.

In most cases, mineralization in the area is associated with these major structures. Mineralization includes barite as epigenetic veins, copper in siderite  $\pm$  quartz veins and lodes and manganese in fault/fracture zones and in faulted contacts of the Etina Limestone.

## 6.0 EXPLORATION MODEL

The Martins Well and Willippa Domes were selected as exploration targets because previous work at the Paratoo Dome has shown potential for epigenetic copper  $\pm$  gold mineralization associated with doming and structural dislocation caused by late to post orogenic (Delamerian) igneous intrusions. The dolerite intrusions at Paratoo, in addition to being discordant to the local fold stratigraphy, are associated with thermal metamorphic effects such as recrystallization of proximal carbonate rock to marble and also proximal hydrothermal alteration including intense potassium feldspathization, iron metasomatism and late stage sericitic/phyllitic alteration.

The Willippa Dome features a coincident magnetic and gravity low and this is the signature for Delamerian granites (c/f Anabama Granite). Against this interpreted concealed granite is a magnetic high along a sector of its southern contact. Since the Holowilena Ironstone is not magnetic where tested in outcrop it was considered possible that the magnetic high could represent a magnetite skarn on the contact of the granite. Core from Willippa No. 1 was examined and the dolomitic sediments showed signs of intense fracturing similar to fracturing around the discordant dolerites at Paratoo. Also the core contained k-feldspar rich arkose with some specularite and sericite similar to the alteration found around intrusions at Paratoo. For these reasons it was thought that there was the possibility for Blue Rose type copper-gold mineralization in the Willippa Dome.

The Paratoo work has also shown potential for supergene upgrading of high value divalent elements like cobalt, nickel, copper and silver and to a lesser extent zinc to levels approaching ore grades. In manganese wad at Paratoo (and also at Oodla Wirra) some cobalt assays were in the range 1000 – 5000 ppm (0.1% to 0.5% Co), nickel sometimes reported in excess of 1000 ppm and silver reported up to 16 ppm. Where some secondary iron was also present with the manganese oxides copper sometimes exceeded 0.5% Cu up to a maximum of 0.7% Cu. The divalent cations of Co-Ni-Zn-Cu and Ag are believed to have been released into percolating groundwaters gradually during weathering of the dolerite and related epigenetic/contact mineralization. Low concentrations of these divalent cations were subsequently scavenged over time by divalent sedimentary manganese released by weathering from the Skillogalee Dolomite Formation.

Manganese sols are unusual among oxide sols in that their particles carry a negative charge and therefore preferentially adsorb cations out of solution, especially divalent cations. Research has revealed that the Calatrava cobalt mining project in Spain is based on solvent extraction/electrowinning of high value cobalt at an average grade of only 0.14% Co from low grade manganese ores with Co recovery rates between 85% - 90%. It was thought that with higher cobalt grades



and with supplementary Ni, Cu, Ag and Zn credits, a viable mining project might result.

## **7.0 WORK COMPLETED**

### **7.1 Geological Reconnaissance**

All of the larger structures visible on the TM imagery were visited together with all known areas of copper, baryte and manganese mineralization. All stream sediment cobalt, nickel, copper and manganese anomalies were followed up to their source. Streams with weak gold anomalies were also traversed.

### **7.2 Rock Chip Sampling**

A total of 55 rock chip samples were collected. This was deemed sufficient to test the validity of the exploration models employed. Most were assayed for Cu, Co, Ni, Fe and Mn and in addition, where appropriate, some were also assayed for Au, Ag, As, Bi, Te and Ba.

## **8.0 RESULTS**

### **8.1 Rock Chip Assays**

Assays of small quartz-siderite veins returned assays up to 9.8% Cu, and up to 1.01% As but with no anomalous gold or silver. In the manganese wads divalent element concentrations were observed to increase with increased manganese content. The highest assays recorded for the divalent elements in combination with high manganese in wad were 0.57% Co (with 11 samples > 0.2% Co), 0.32% Ni (with 7 samples > 0.1% Ni), 1.41% Cu (with 11 samples > 0.1% Cu).

### **8.2 Geology and Mineralization**

Both epigenetic and supergene mineralization were in all cases observed to be structurally controlled. Economically insignificant, thin, discontinuous, epigenetic quartz-siderite veins hosted in Burra Group sediments in the Willippa Dome contained highly anomalous copper and arsenic but no gold or silver as did the siderite veins at the Copper Crest workings in the Martins Well Dome. Larger siderite lodes at the Mammoth Black Ridge Mine contained only sub economic copper and no gold. The Black Puzzle Mine was only weakly anomalous in the divalent metals and not at all in the precious metals. Siliceous ironstone breccias in the Willippa Dome, possibly resulting from the weathering of dolomite and nearby iron rich sediment contained only very weak and sporadic copper and arsenic values and these are considered to be the result of supergene processes. No gold

was reported in any of the samples taken. Where faults intersected the Etina Limestone unit in the Martins Well Dome and also between the Martins Well Dome and the Willippa Dome there were always manganese wad occurrences along the faults and these contained highly anomalous concentrations of the divalent elements. Baryte veins contained none of the sought after metals. The east–west trending Starlight Bore Fault along the lower contact of the Etina Limestone contained sporadic concentrations of manganese and divalent elements. The Kunoth road ironstones and wads contained only weakly anomalous cobalt and nickel.

## **9.0 CONCLUSIONS AND RECOMMENDATIONS**

Gold is absent from the small siderite±quartz veins that host the better copper grades. Copper grades in the larger siliceous ironstone lodes are low and gold is absent. There is no potential for viable epigenetic Cu-Au mineralization on the exploration lease though the concealed magnetite skarn potential remains untested.

The tenor of cobalt-nickel-copper grades is very much dependent on the manganese content of the host wad. Metal grades are unpredictable and spotty. There are insufficient amounts of wad to support a mining operation.

EL 2971 should be relinquished.

## **10.0 EXPENDITURE**

Salaries	\$19,950-00
Travel, Accommodation and Meals	\$4,290-00
Consumables and Assays	\$4,750-00
<b>TOTAL</b>	<b>\$28,990-00</b>

## **APPENDICES**

Sample_ID	AMG_East	AMG_North	Sample_Type	Company	EL	Prospect	Date	Notes	Amdel_Job_No
WIL001	330090	6498004	Rock Chip	Filsell/Burke	EL 2971	Willippa Dome	Feb-02	Grab from ironstone o/c ~50m wide. Possible dolomite replacement textures	2AD0545
WIL002	329951	6498008	Rock Chip	Filsell/Burke	EL 2971	Willippa Dome	Feb-02	Cellular b/w in ironstone with some Q fragments	2AD0545
WIL003	327976	6498036	Rock Chip	Filsell/Burke	EL 2971	Willippa Dome	Feb-02	Q + siderite with chalcocite, Cu wad and malachite in siltstone	2AD0545
WIL004	327910	6498710	Rock Chip	Filsell/Burke	EL 2971	Willippa Dome	Feb-02	Qv with siderite and some malachite and possible cuprite	2AD0545
WIL005	327802	6497467	Rock Chip	Filsell/Burke	EL 2971	Willippa Dome	Feb-02	Qv + FeO and MnO in tillite unit	2AD0545
WIL006	324795	6501335	BLEG -2mm	Filsell/Burke	EL 2971	Willippa Dome	Feb-02	Check previous BLEG assay	2AD0545
WIL007	332004	6497615	Rock Chip	Filsell/Burke	EL 2971	Willippa Dome	Feb-02	Grab from ironstone near Boynes Dam	2AD0545
WIL008	330747	6497468	Rock Chip	Filsell/Burke	EL 2971	Willippa Dome	Feb-02	Grab of ironstone in silicified breccia above dolomitic ironstone unit	2AD0545
WIL009	327147	6490966	Rock Chip	Filsell/Burke	EL 2971	White Well	Feb-02	MnO and Fe carbonate	2AD0545
WIL010	326923	6490829	Rock Chip	Filsell/Burke	EL 2971	White Well	Feb-02	MnO rich sample from mine dump	2AD0545
WIL011	326923	6490829	Rock Chip	Filsell/Burke	EL 2971	White Well	Feb-02	Fresh RC from dump, no MnO/FeO staining, possible Mn carbonate	2AD0545
WIL012	326923	6490829	Rock Chip	Filsell/Burke	EL 2971	White Well	Feb-02	Carbonate in stockwork from mine dump	2AD0545
WIL013	326923	6490829	Rock Chip	Filsell/Burke	EL 2971	White Well	Feb-02	Wallrock to carbonate veining, sample from mine dump	2AD0545
WIL014	330434	6498282	Rock Chip	Filsell/Burke	EL 2971	Willippa Dome	Mar-02	Sugary silica, goethite, hematite replacing carbonate bed	2AD0831
WIL015	330865	6498606	Rock Chip	Filsell/Burke	EL 2971	Willippa Dome	Mar-02	MnO rich sample of carbonate replacement ironstone	2AD0831
WIL016	330255	6498924	Rock Chip	Filsell/Burke	EL 2971	Willippa Dome	Mar-02	Fractured Qv with ironstone sub parallel to quartzite bedding	2AD0831
WIL017	329938	6498936	Rock Chip	Filsell/Burke	EL 2971	Willippa Dome	Mar-02	Sheeted Qv with ironstone normal to quartzite bedding	2AD0831
WIL018	316421	6489807	Rock Chip	Filsell/Burke	EL 2971	Stardrift fault	Mar-02	Crusty lateritic MnO on faulted Etina limestone	2AD0831
WIL019	316676	6489830	Rock Chip	Filsell/Burke	EL 2971	Stardrift fault	Mar-02	Crusty lateritic MnO on faulted Etina limestone	2AD0831
WIL020	316804	6489609	Rock Chip	Filsell/Burke	EL 2971	Stardrift fault	Mar-02	Fractured Qv with MnO cement	2AD0831
WIL021	316930	6489814	Rock Chip	Filsell/Burke	EL 2971	Stardrift fault	Mar-02	Crusty lateritic MnO on faulted Etina limestone	2AD0831
WIL022	317560	6489585	Rock Chip	Filsell/Burke	EL 2971	Stardrift fault	Mar-02	Goethite and lesser MnO subcrop west of gate. This sample MnO rich	2AD0831
WIL023	317759	6489581	Rock Chip	Filsell/Burke	EL 2971	Stardrift fault	Mar-02	Grab from bold goethite>MnO o/c east of gate	2AD0831
WIL024	320672	6489600	Rock Chip	Filsell/Burke	EL 2971	Stardrift fault	Mar-02	Crusty lateritic MnO on faulted Etina limestone	2AD0831
WIL025	322240	6489419	Rock Chip	Filsell/Burke	EL 2971	Breakaway	Mar-02	Qv + MnO in FeO/MnO rich E-W fault zone	2AD0831
WIL026	321970	6489540	Rock Chip	Filsell/Burke	EL 2971	Breakaway	Mar-02	Qv with goethite cement in ferruginous E-W fault zone	2AD0831
WIL027	326909	6490826	Rock Chip	Filsell/Burke	EL 2971	White Well	Mar-02	Grab from shaft dump	2AD0831
WIL028	326860	6490766	Rock Chip	Filsell/Burke	EL 2971	White Well	Mar-02	Pitchy goethite from small mine dump west of shaft	2AD0831
WIL029	320588	6489649	Rock Chip	Filsell/Burke	EL 2971	Stardrift fault	Mar-02	Grab from large MnO boulders in creek	2AD0831
WIL030	320585	6489645	Rock Chip	Filsell/Burke	EL 2971	Stardrift fault	Mar-02	Grab from large MnO boulders in creek	2AD0831
WIL031	317083	6489801	Rock Chip	Filsell/Burke	EL 2971	Stardrift fault	Mar-02	Lateritic MnO rubble west of gate hill	2AD0831
WIL032	317124	6489904	Rock Chip	Filsell/Burke	EL 2971	Stardrift fault	Mar-02	MnO lateritic rubble	2AD0831
WIL033	314460	6489772	Rock Chip	Filsell/Burke	EL 2971	Stardrift fault	Mar-02	MnO laterite rubble west of Stardrift bore	2AD0831
WIL034	328786	6517320	Rock Chip	Filsell/Burke	EL 2971	Copper Crest	Mar-02	20cm thick Q-siderite vein in 10m wide zone of conformable stockwork zone	2AD0831
WIL035	330108	6516840	Rock Chip	Filsell/Burke	EL 2971	Black Puzzle	Mar-02	MnO + Q in fractured Etina limestone	2AD0831

Sample_ID	AMG_East	AMG_North	Sample_Type	Company	EL	Prospect	Date	Notes	Amdel_Job_No
WIL036	330232	6516847	Rock Chip	Filsell/Burke	EL 2971	Black Puzzle	Mar-02	Brecciated Etina limestone replaced by FeO >> MnO	2AD0831
WIL037	330239	6516850	Rock Chip	Filsell/Burke	EL 2971	Black Puzzle	Mar-02	Pitchy botryoidal goethite	2AD0831
WIL038	319007	6489647	Rock Chip	Filsell/Burke	EL 2971	Stardrift fault	Mar-02	o/c MnO from sheared contact b/w Etina limestone and underlying shale	2AD0831
WIL039	327561	6504530	Rock Chip	Filsell/Burke	EL 2971	Coad's shed	Apr-02	S/c and litter MnO cobbles	2AD0831
WIL040	327453	6504470	Rock Chip	Filsell/Burke	EL 2971	Coad's shed	Apr-02	Laterite with MnO	2AD0831
WIL041	327504	6503962	Rock Chip	Filsell/Burke	EL 2971	Coad's shed	Apr-02	O/c MnO rich limestone	2AD0831
WIL042	329613	6504265	Rock Chip	Filsell/Burke	EL 2971	Tra. 401	Apr-02	MnO in Etina lmst	2AD0831
WIL043	330151	6504432	Rock Chip	Filsell/Burke	EL 2971	Tra. 401	Apr-02	Fault bx with MnO	2AD0831
WIL044	330000	6504715	Rock Chip	Filsell/Burke	EL 2971	Tra. 401	Apr-02	Sed bx with MnO matrix	2AD0831
WIL045	329941	6504555	Rock Chip	Filsell/Burke	EL 2971	Tra. 401	Apr-02	Etina lmst bx with MnO cement	2AD0831
WIL046	329821	6504360	Rock Chip	Filsell/Burke	EL 2971	Tra. 401	Apr-02	Etina lmst bx with MnO cement	2AD0831
WIL047	329800	6504340	Rock Chip	Filsell/Burke	EL 2971	Tra. 401	Apr-02	Etina lmst bx with MnO cement	2AD0831
WIL048	329506	6503170	Rock Chip	Filsell/Burke	EL 2971	Mammoth	Apr-02	MnO and goeth ex siderite	2AD0831
WIL049	329589	6502800	Rock Chip	Filsell/Burke	EL 2971	Mammoth	Apr-02	Goeth and minor MnO main outcrop	2AD0831
WIL050	329490	6502661	Rock Chip	Filsell/Burke	EL 2971	Mammoth	Apr-02	Goeth and minor MnO main outcrop	2AD0831
WIL051	330100	6518980	Rock Chip	Filsell/Burke	EL 2971	Nth Irvine	Apr-02	Nodular MnO in stream	2AD0831
WIL052	330000	6518980	Rock Chip	Filsell/Burke	EL 2971	Nth Irvine	Apr-02	Shale bx with MnO cement	2AD0831
WIL053	326659	6510477	Rock Chip	Filsell/Burke	EL 2971	Wilp. Ck	Apr-02	Fl. Mno rich sed	2AD0831
WIL054	326750	6510569	Rock Chip	Filsell/Burke	EL 2971	Wilp. Ck	Apr-02	Fl. Mno rich sed	2AD0831
WIL055	326530	6510466	Rock Chip	Filsell/Burke	EL 2971	Wilp. Ck	Apr-02	MnO rich Etina lmst bx	2AD0831

## 2AD0545

IDENT	Au	Au Rpt	Ag	As	Cu	Co	Ni	Ce	Fe	Mn	Bi	Te	Ba	Au	Cu	Ag
UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppb	ppb	ppb
SCHEME	FA1	FA1	IC3E	IC3E	IC3E	IC3E	IC3E	IC3E	IC3E	IC3E	IC3E	XRF1	XRF1	BLEG1A	BLEG1A	BLEG1A
DETECTION LIMIT	0.01	0.01	1	3	2	2	2	10	100	5	5	10	10	0.5	100	20
WIL001	<0.01	--	2	1250	84	2	3	20	427000	340	10	<10	135	N.A.	N.A.	N.A.
WIL002	<0.01	--	2	300	195	82	94	130	437000	14000	10	<10	1100	N.A.	N.A.	N.A.
WIL003	0.01	--	<1	10100	71200	21	27	<10	74900	2450	10	<10	<10	N.A.	N.A.	N.A.
WIL004	0.02	0.03	<1	200	98000	5	14	15	186000	3900	15	<10	30	N.A.	N.A.	N.A.
WIL005	<0.01	--	<1	470	550	130	51	30	492000	34600	5	<10	1050	N.A.	N.A.	N.A.
WIL006	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	<0.5	1900	<20
WIL007	<0.01	--	1	165	700	3	<2	20	473000	20600	10	<10	<10	N.A.	N.A.	N.A.
WIL008	<0.01	--	1	34	37	11	79	30	511000	4600	5	<10	380	N.A.	N.A.	N.A.
WIL009	<0.01	--	<1	89	130	950	550	50	306000	85600	<5	<10	2950	N.A.	N.A.	N.A.
WIL010	<0.01	--	<1	16	32	350	380	70	120000	132000	<5	<10	150	N.A.	N.A.	N.A.
WIL011	<0.01	--	<1	4	19	4	2	<10	1750	400	<5	<10	<10	N.A.	N.A.	N.A.
WIL012	<0.01	--	<1	<3	6	9	10	15	3800	3050	<5	<10	<10	N.A.	N.A.	N.A.
WIL013	<0.01	--	<1	<3	21	<2	<2	10	1050	220	<5	<10	<10	N.A.	N.A.	N.A.

**2AD0831**

IDENT	Cu	Co	Ni	Fe	Mn
UNITS	%	ppm	ppm	%	%
SCHEME	MET1	MET1	MET1	MET1	MET1
DETECTION LIMIT	0.005	20	50	0.005	0.005
WILL 14	0.01	70	<50	25.1	2.04
WILL 15	0.12	1000	700	36.8	11.6
WILL 16	0.01	30	100	48	0.12
WILL 17	0.015	60	150	36	0.32
WILL 18	0.01	600	350	1.33	11.9
WILL 19	0.005	750	200	0.89	13.8
WILL 20	0.045	2050	650	0.59	18.9
WILL 21	<0.005	600	400	0.37	21.7
WILL 22	0.06	5700	3200	0.37	43.3
WILL 23	<0.005	360	350	49.7	0.665
WILL 24	0.025	950	400	3.51	16.4
WILL 25	0.01	250	200	31.4	2.37
WILL 26	<0.005	40	<50	21	0.4
WILL 27	<0.005	460	500	19.8	12.7
WILL 28	0.02	160	650	58.2	0.15
WILL 29	0.01	3150	1250	0.81	34.1
WILL 30	0.01	1100	800	0.435	52.6
WILL 31	<0.005	850	550	0.53	46.2
WILL 32	<0.005	1900	550	0.955	35.1
WILL 33	0.01	650	500	0.66	14.4
WILL 34	<0.005	<20	<50	41.7	3.18
WILL 35	0.105	2900	2300	2.66	28
WILL 36	0.015	260	150	45.6	7.99
WILL 37	0.01	<20	<50	58.7	0.835
WILL 38	0.01	2050	1700	1	38.5
WILL 39	0.155	2300	1650	1.18	36.6
WILL 40	0.14	4200	750	3.05	23.7
WILL 41	0.23	2850	2300	1.04	29
WILL 42	0.045	750	300	2.15	26.5
WILL 43	0.06	380	250	1.12	25
WILL 44	0.615	4000	1500	2.78	31.9
WILL 45	1.41	2850	700	2.34	23.2
WILL 46	0.59	4500	700	4.21	24.9
WILL 47	0.02	30	<50	7.98	0.955
WILL 48	0.18	160	200	47.6	8.44

**2AD0831**

IDENT	Cu	Co	Ni	Fe	Mn
UNITS	%	ppm	ppm	%	%
SCHEME	MET1	MET1	MET1	MET1	MET1
DETECTION LIMIT	0.005	20	50	0.005	0.005
WILL 49	0.19	<20	<50	47.9	1.3
WILL 50	0.115	210	300	50.6	3.53
WILL 51	0.025	850	950	2.55	37
WILL 52	0.01	340	350	4.38	25.1
WILL 53	<0.005	1500	500	4.47	30.3
WILL 54	0.065	400	350	32.9	8.62
WILL 55	<0.005	500	300	18.4	15



**File Verification Listing of Digital Files Supplied on CD with Hard Copy Report**

Verification Listing	VL1		
<b>Exploration Work Type</b>	<b>File_Name</b>	<b>Format</b>	<b>Description</b>
Office Studies			
Report	EL2971_200306_01_FinalReport.pdf	pdf	Final technical report
Report	EL2971_200306_05_FileVerificationList.txt	txt	List of files supplied
Geochemical Surveying			
Rock chip	EL2971_200306_02_Sample locations.txt	txt	Sample locations
Rock chip	EL2971_200306_03_AssayFile2AD0545.txt	txt	Assay file
Rock chip	EL2971_200306_04_AssayFile2AD0831.txt	txt	Assay file