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EL 2114

WARRAKIMBO

PROGRESS AND ANNUAL REPORTS FOR THE PERIOD 31/10/95 TO 30/1/99

Submitted by

ORY Pty Ltd
1999

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WARRAKIMBO MIO PROJECT - SYNOPSIS FOR SEPTEMBER 1997

I have compiled some up to date information on the MIO project so far and our perceived expenditure over the next few months.

FINANCIAL ARRANGEMENTS

Ory Pty Ltd has now joined a newly formed Australian company called, MIO Processing Pty. Ltd. This company (MIOP) will be funded from within Australia. An estimated two million dollars, will be drawn down over the next two years during establishment. The ORY-MIOP agreement requires ORY to provide infrastructure on site, construct the processing plant at Port Augusta, supply feedstock and manage operations.

PROCESSING DEVELOPMENT

In August 1995, I Travelled to England and over several Months worked with British Rail (who are the leading experts in the world on MIO) to develop a Grade 1 Quality MIO product. The major part of my research was to develop a processing plant design capable of producing this final product. I then returned to Australia and using the most up to date technology, developed a state of the art MIO processing plant, that is capable of producing 1,500 to 5,000 tonnes per annum.

MIO QUALITY

The Micaceous iron oxide mined at Warrakimbo has now been tested by British Rail under specification No. 70 and the International Standard (ISO 10601 : 1993) and was found to be as good as and in some respects superior to the Austrian " Miox " material, Warrakimbo will be the only other natural MIO to be approved by British Rail.

FUTURE DEVELOPMENT

At present MIOP is purchasing land at Port Augusta, drafting plains for the building to house the processing plant, and placing orders for the processing equipment.

It is estimated that the processing plant should be operational by early February 1998, also with-in this time we hope to develop a drilling schedule and a operation programme, combined with a environmental impact study of the current mining area.

As part of Ory Pty. Ltd. feedstock commitment , we will also be exploring to identify additional resources and secure them with mineral leases.

Richard E Cole
Managing Director

RUSHCO PROPRIETARY LIMITED
(ACN 066 776 485)

PE 30/10/28
& PE 30/10/97

TECHNICAL REPORT 1997

THE WARRAKIMBO SPECULAR HEMATITE PROJECT

EL No. 2114

SOUTH AUSTRALIA

NOVEMBER 1997

COMPILED BY

S. LAMBERT

EDITED BY

J.L. CURTIS

NOVEMBER 1997
PEGASUS GEOLOGICAL SERVICES
JLC EXPLORATION SERVICES

THE WARRAKIMBO SPECULAR HEMATITE PROJECT

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1.0 INTRODUCTION

Specular hematite otherwise known as micaceous iron oxide (MIO) occurs in numerous locations within the Flinders Ranges of South Australia. The mineralisation is predominantly occurs as veining, which tends to have irregular dimensions and is associated with high levels of lime.

Specular hematite with specific characteristics has a particular end use in high quality corrosion resistant paints. Specular hematite from Warrakimbo Mine has been metallurgically investigated and found to be capable of meeting stringent market place criteria.

ORY Pty Ltd whose function is to maintain business arrangements with the registered lease holders of the mine and expedite its development, has recently established a marketing strategy, obtained extra development funding and has initiated prolonged accelerated weathering trials of test paints.

Since assurance of product continuity and quality is important to potential product consumers ORY Pty Ltd has sought the assistance of JLC Exploration Services and Pegasus Geological Services to evaluate the potential for additional resources of specular hematite in the general neighbourhood of the existing deposit.

This report is a comprehensive review of (Curtis, 1992) and entails aspects of previous investigations in the area (circa 1985-6) and provides details regarding recent exploration and documents the re-discovery of insitu massive specular hematite mineralisation 5.5 km N of the existing Warrakimbo mine.

2.0 LOCATION & ACCESS

EL 2114 is located 70 km NNE of Port Augusta on the adjacent 'hundreds' of Warrakimbo (west) and Barndioota (east). (See figure 1) The locality is accessible by a dry weather bush road from Port Augusta to the south and the township of Hawker to the east.

Road travel times are approximately 1 hr & 40 mins Ex – Port Augusta respectively in optimum circumstances. The area is also traversed by the Port Augusta - Leigh Creek Coalfield standard gauge railway with Neuroodla Siding located in the NW portion of the area.

Both the railway and sub-adjacent Moomba - Port Bonython oil/gas pipeline form a corridor across the northwestern and northern portions of the title in areas of relatively poor outcrop and therefore offer little impediment to exploration activity at the present time. Road maintenance in support of these essential services for SA is ensured.

The easterly hills tract of the title is accessible from the road via a bush track that follows the Willochra George in the south, a fence-line track from Hacket tank, and an access to an old abandoned well site in the north.

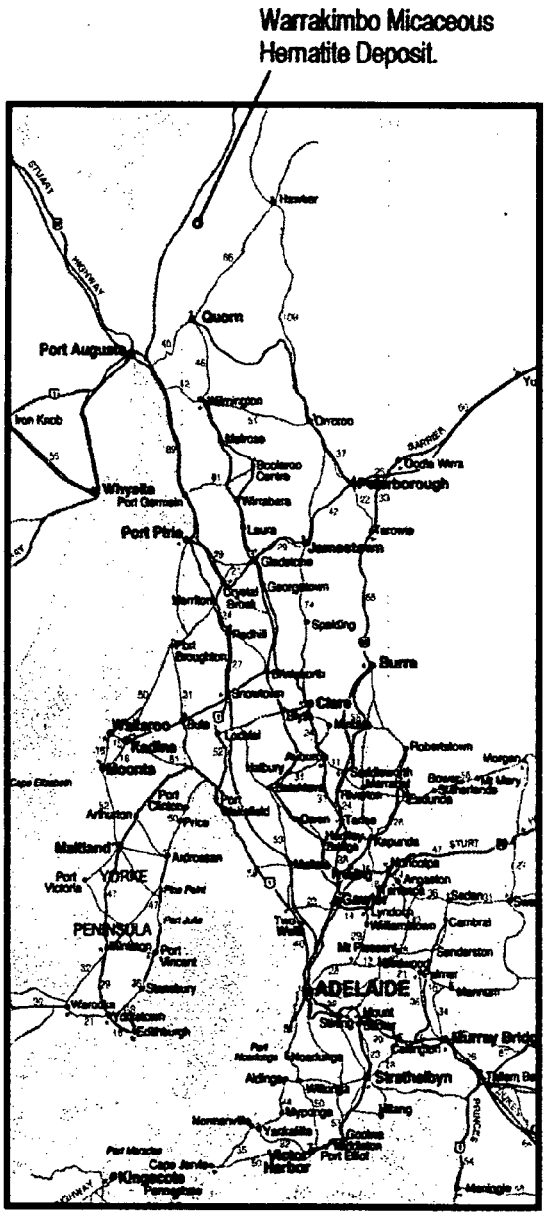


Figure 1.0 : Location Map

3.0 TENURE

EL 2114 was granted to Rushco Pty Ltd during 1996 for an initial term of 6 months and covered an area of 116 km^2. Recently an application for a reduced EL was submitted and granted. (See Figure 2)

The area is under freehold pastoral tenure, which is managed by Mr. L. Dear from 'Partacoona'.

4.0 ABORIGINAL HERITAGE AND NATIVE TITLE

Prior to the advent of Native Title claims, Aboriginal Heritage clearances were conducted between the Kuyani Peoples and the previous leaseholders. The negotiation between the two parties provided for light exploration activities to be undertaken freely until such time as track making, costeaning or drilling are being contemplated, consistent with existing Declared Equipment provisions of the MESA

The current Native Title Claims, which encompass the Warrakimbo area, are summarised in a table below.

Name of Claimant Application	NNTT File No.	General Location and Approximate Size of Application	Representative of Application	Lodged	Acceptance Stage	Public Notify End Date	Member
Kuyani #1	SC95/4	Flinders Ranges, south of Lake Eyre (151834 sq km)	Ron Bower	19/9/95	Accepted 13/3/96	25/11/96	F Chaney M Edmunds R Farley
Barngarla	SC96/4	Eyre Peninsula/Gawler & Flinders Ranges (178029 sq km)	Teitzel	4/4/96	Accepted 21/8/96	19/2/97	F Chaney M Edmunds R Farley
Nukunu	SC96/5	Spencer Gulf Region, South Australia (16275 sq km)	Dittons	10/4/96	Accepted 4/11/96		F Chaney French J R Farley

Agreements will be sought with the above parties regarding exploration activities by contacting the above Native Title Claimants and appropriate Aboriginal clearance bodies.

The Native Title Tribunal has been advised on the interests of ORY Pty Ltd with respect to the licenses and mineral claims of MHE Pty Ltd. It is expected that negotiations will proceed with the Native Title Claimants with respect to project development and exploration activities. Due respect of any Aboriginal sites or features either known or recognised during the course of investigations will be taken at all times.

5.0 HISTORY

Initial prospection of the area was carried out circa 1863 for copper when the Warrakimbo deposit was discovered and subsequently opened up in the early 1900's. The presence of occasional lumps of specular hematite pervaded by green copper carbonate minerals in the dumps suggests that an enrichment carapace may have been present. In any event the specular hematite was then considered gangue and proved to be a disappointing copper resource at depth.

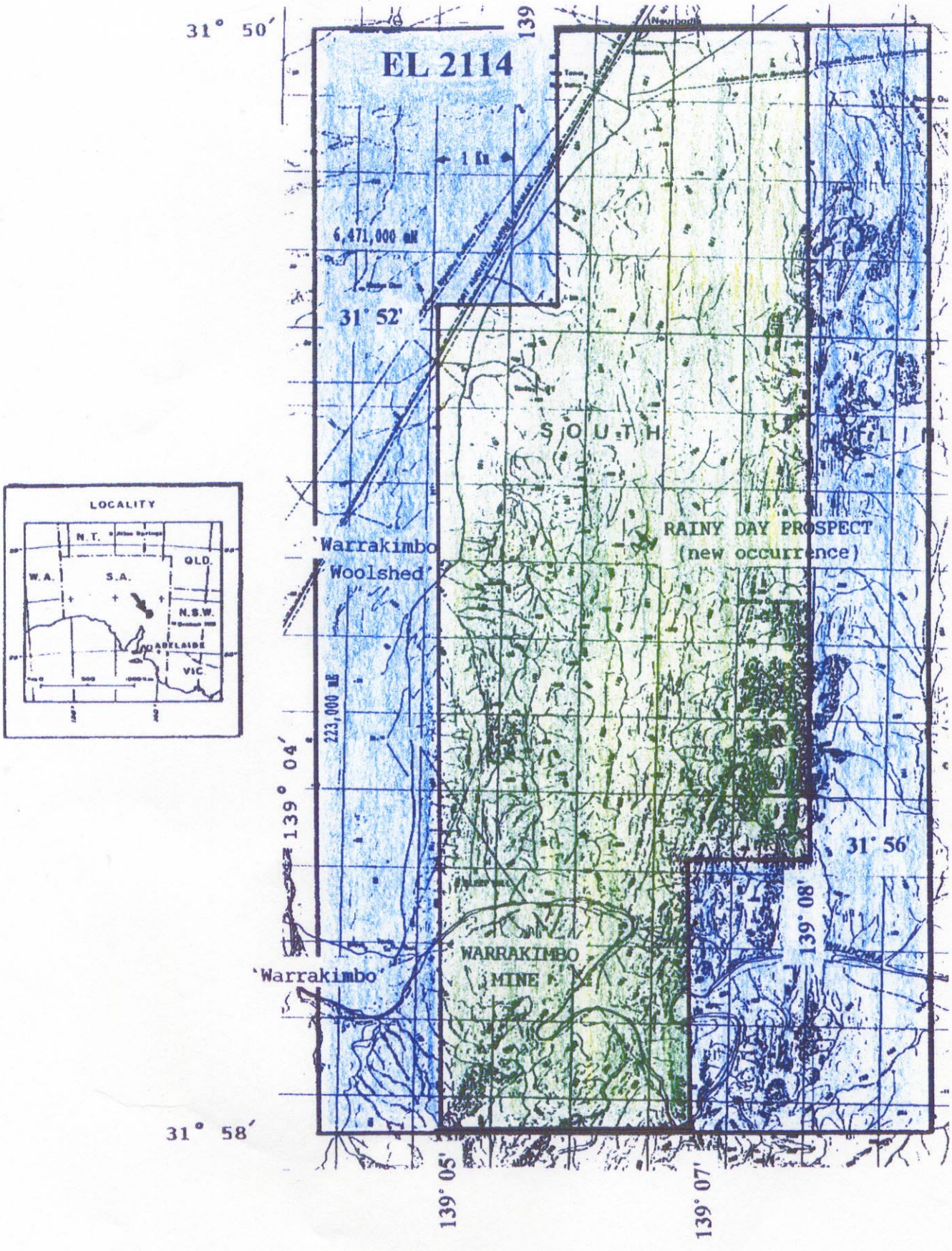


Figure 2.0 : Location of EL 2114

While the specular hematite was recognised in 1908, serious investigation was not undertaken until after regional geological maps were compiled and published as the Parachilna 1:250,000 sheet (previous edition).

Scott (1976) assisted by other Geological Survey officers mapped and reviewed the potential of the Warrakimbo Mine. Periodically Departmental Officers submitted samples to AMDEL laboratories for mineralogical examination and metallurgical test-work.

In 1985 N. M. Rollings finalised a university thesis that specifically examined genetic aspects of the Warrakimbo specular hematite mineralisation (Rollings, 1985).

In 1987 a review of the cumulated metallurgical reports and geological data was prepared by AMDEL for the Department of Mines (AMDEL, 1987).

In the same year the area was briefly explored for specular hematite by N. Rollings on behalf of RIMAC Holdings Pty. Ltd., as EL 1402. Various exploration techniques were employed but the results were not considered encouraging (Rollings, 1987).

In 1990/91 exploration for diamonds by Helix Resources N.L. as EL 2094 centered on the diapir at the abandoned Warrakimbo Woolshed and contributes an overview of an exotic xenolithic assemblage of clasts and mineralogical components in this mass (Slack-Smith, 1991).

In 1992 EL 1759 was granted to NGM PTY LTD, with exploration being undertaken by JLC Exploration Services. An extensive field program followed the examination of the available geological data. This included systematic examination of host stratigraphic packages seeking detection of micaceous hematite and or related dolomitic alteration. Other program's included grid mapping and trial ground magnetic surveys.

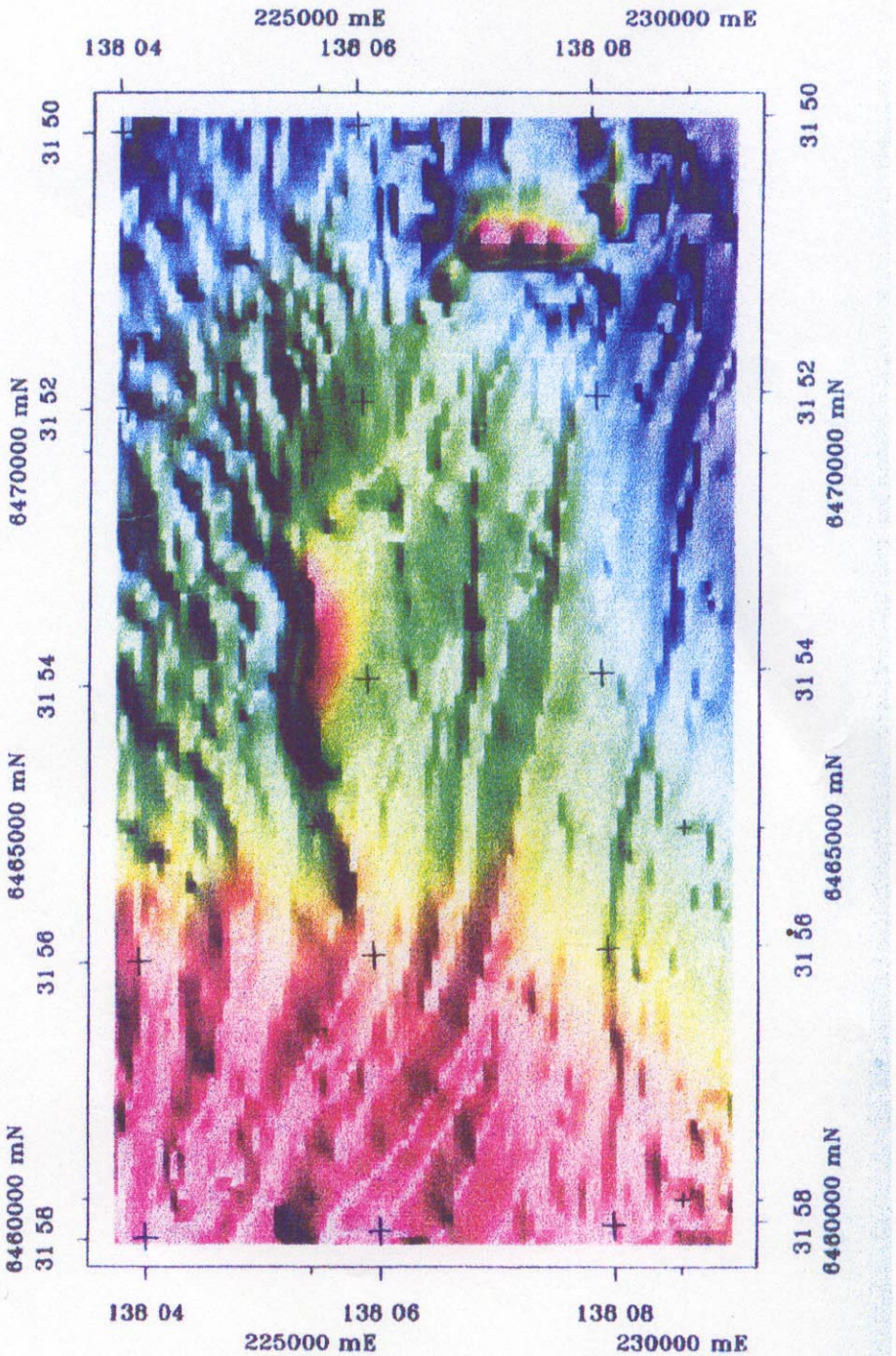
During 1993 field investigations had been completed as well as review of the technical literature. Photo geological overlays were compiled and used as a basis for systematic field examinations, which sought to identify new occurrences of specular hematite. It was during this year that NGM PTY LTD parent company (AMF Holdings Limited) experienced liquidity problems and was unable to fund NGM's planned exploration.

In 1995 Richard Cole, the managing director of Ory Pty Ltd finalised a refining plant design, established a marketing strategy, found development funding and negotiated a new agreement with the mine lease partners. From these discussions a new and unencumbered business was formed namely Rushco Pty Ltd.

6.0 RECENT ACTIVITIES

During 1995 the newly formed Rushco Pty Lty sought to ensure the resource continuity by taking up the former EL 1759 of NGM Pty Ltd. Subsequently EL 2114 was granted after application. Shortly after the licence was granted Rushco Pty Ltd entered into joint equity participation with MESA in the acquisition of recent airborne survey data, as an initial step in the establishment of its exploration programme. (See Figure 3.0)

AREA B15
Ory Pty Ltd Subset
Total Magnetic Intensity



Scale : 1 : 100 000
Universal Transverse Mercator Projection
Central Meridian 141 East, AMG Zone 54
Grid Cell Size : 25 metres
Graticules : 2 minutes and 5 Kilometres
Figure 3.0

During 1995 subsequent work was carried out by JLC Exploration Services on the compilation and submittal of DEF's for the extraction of an additional parcel of material for marketing purposes, which was approved by M.E.S.A. In addition, part of the existing MIO stockpile was used for trial processing. Mr Cole visited England and transported material to British Rail for quality testing, which successfully passed the International Standards. (ISO 10601: 1993)

Also during 1995 Ore Reserve Estimation Services (O.R.E.S.) commenced 3D terrain modeling using 1: 50000 contour map of the area, with the objective being, successful mine planning and developments approvals. (See Figure 4.0)

Late in 1996 feasibility studies conducted by Ory Pty Ltd, have identified Port Augusta to be the preferred site for a processing mill for the Micaceous Iron Oxide (M.I.O.).

During 1997 Ory Pty Ltd joined a newly formed Australian company called MIO Processing Pty Ltd. (M.I.O.P.) This company is purchasing land at Port Augusta, drafting plans for the building to house the processing plant and is placing orders for processing equipment. The processing plant is estimated to be operational by early February 1998.

Other exploration activities during this year include initiating the search for additional resources using the skills of JLC Exploration Services and Pegasus Geological Services.

7.0 REGIONAL GEOLOGY

The geology surrounding the Warrakimbo Deposit comprises east dipping sedimentary rocks of the rocks of the Umberatana, Wilpena and the Hawker Groups. These groups have been split by a major thrust fault (Mt. Stephen thrust fault), which has a north – south trend sub parallel to strike.

In the west the ABC Range Quartzite is greatly diminished by the tectonism and gives rise to the thin occurrence of the Bunyeroo Formation. The Bunyeroo Formation is conformably overlain by the Wonoka Formation, which eventually passes into the Pound Subgroup, which in turn is truncated at the top by the thrust fault.

In the west, on the eastern side of the Mt Stephen thrust fault, is the upper portion of the Wilmington Formation. The base of the formation is not apparent. Upwards the Wilmington Formation interfingers with the Etina Formation and passes into the disconformably overlying Elatina Formation. The Nuccaleena Formation is only evident in the central region of the area and quickly passes into the Brachina Formation. The Brachina Formation then gives way to the conformably overlying ABC Range Quartzite.

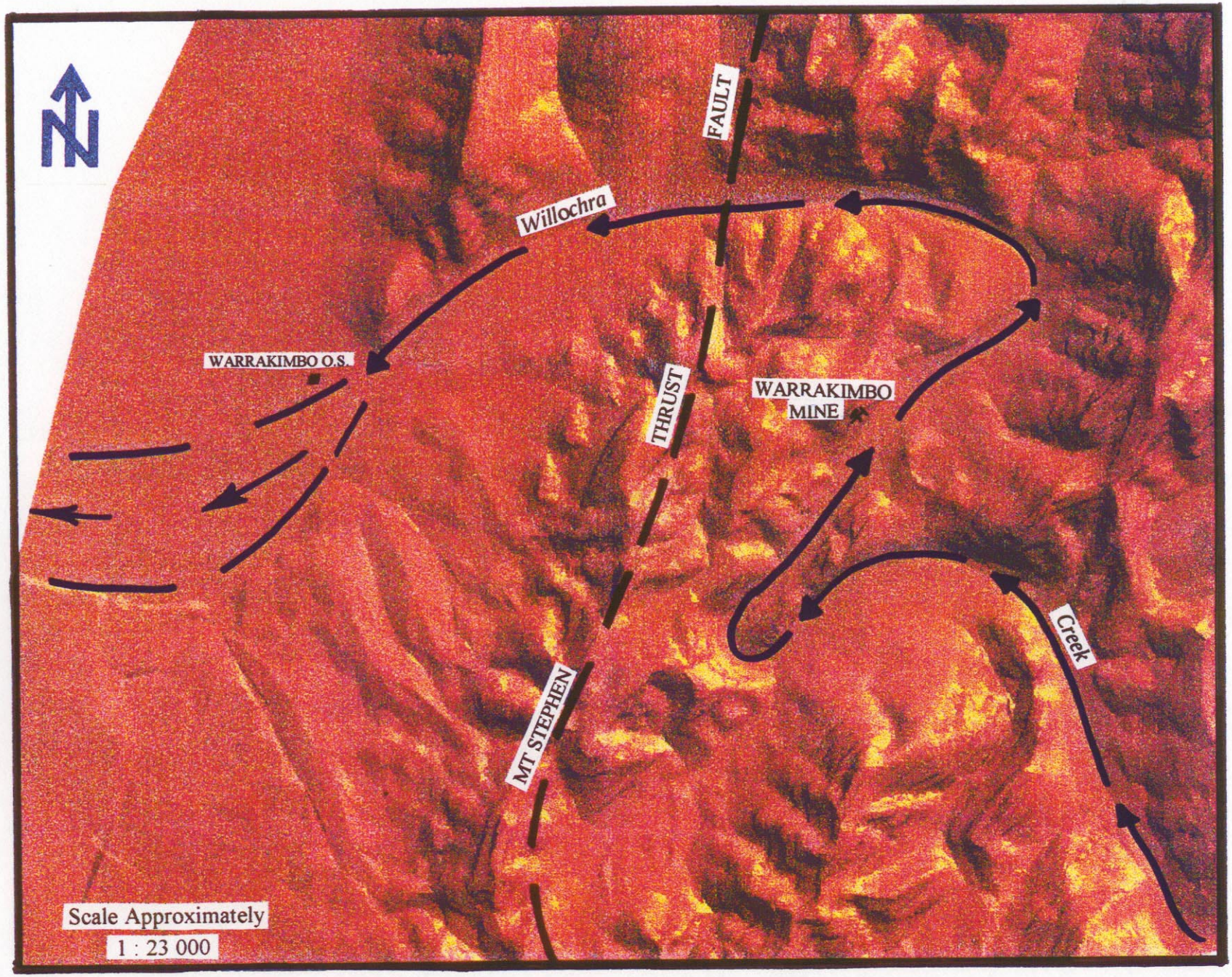


Figure 4.0 : Digital Terrain Model of Mine Area

8.0 WARRAKIMBO MINE AREA

In this area the geology of the east dipping succession between the Mount Stephen thrust and the Nuccaleena Formation was examined by systematic strike walking.

8.1 Stratigraphy

Farina Subgroup

Exposure of this lowermost stratigraphic unit is restricted to a small area located to the west of the mine and adjacent to the thrust. It is a relatively massive block of grey limestone and limestone conglomerate which is altered (silicification and ferrugenised) and brecciated along its western side where it is topographically prominent. It has been thrust faulted at a steep angle over younger Wonoka Formation to the west.

The lithology would be consistent with the Brighton Limestone although it does not have the massive stromatolitic textures / features observed elsewhere further north, to the east of the abandoned Warrakimbo Woolsheds, where the underlying Tapley Hill Formation is also present. At this latter locality the uppermost Tapley Hill Formation-Brighton Limestone transition has spectacular development of stomatolitic mounds varying from 10s of cm to several meters in height and width. Fragmental material from these limestone's is also incorporated in the sequence and at the contact with the overlying Wilmington Formation but these features are absent to the west of Warrakimbo Mine.

Minor prospect shafts and scrapings for secondary copper associated with thin quartz veining are present but there is no evidence of accompanying specular hematite although some secondary ferrugenisation is associated with the thrust plane.

The actual contact with the overlying Wilmington Formation is unexposed and hence the block could be a wedge shaped fault sliver or a disconformable contact on a former basement high.

Wilmington Formation

The Wilmington Formation is best exposed in the floor and walls of Willochra Gorge. The stratigraphic base of the unit is either poorly exposed or more commonly it has been lost by truncation at the Mount Stephen Thrust.

Locally it is a reasonably robust sequence of red brown weathering siltstones and fine to very fine sand units which form a set of prominent bars that cross the floor of the gorge. It is at least 200 m thick and overlain conformably by the Etina Formation.

Etina Formation

This formation consists of a number of depositional cycles capped by arenite beds. Each cycle, depending on the perspective taken, commences with the deposition of grey coloured fine silt and shale that progresses upward into fine medium brown sandstones, which are commonly resistive to weathering and often, have a dark brown 'varnish'. The fine sandstones gradationally contact and interfinger with conformably overlying massive coarse to medium grained calcarenite beds (sandy granular limestones).

As part of a regional stratigraphic study I. Dyson kindly measured a stratigraphic cross section C..D through the Etina Formation (Plan 2) which has permitted systematic subdivision on the basis of macro deposition cycles C1.. and micro cycles that have given rise to each calcarenite bed M1.. which are designated on Figure 5.

The base of the sequence is commonly marked by an arkosic sandstone (M1) with some larger quartz granules that may superficially resemble calcarenite where physical attrition is the main degradational process as found in Warrakimbo Gorge. Elsewhere when chemical degradation has occurred the outcrop may be subdued to almost non-existent.

The grey silt and shale units have weak outcrop expression and have been viewed by Rollings and other workers to be Wilmington Formation.

The sandstone and calcarenite beds often form robust cuesta ridges commonly with the sandstone forming a minor scarp capped by a partly degraded cap of calcarenite. Both the sandstones and the calcarenite were deposited in an energetic environment and exhibit crossbedding. The depositional environment probably reflects a progressive influx of granular carbonate material rather than a change in overall marine conditions much as might be imagined occurs with migrating offshore bar systems.

The calcarenite samples examined petrologically by Rollings are clearly oolitic, but for the most part the fine structure of these distinctive grains is not in the least evident in the field save for their roundness, which could easily be attributed to simple erosive abrasion. Indeed many of the grains in calcarenite beds appear to consist of sub-rounded grains and chips of pre-existing limestone.

The limestone clasts are generally of very fine grained buff-pinkish muddy looking carbonate. In rare instances thin beds consisting of thin platy fragments of this material a few centimeters in diameter were observed. In one case similar material was observed in-situ as capping a local channel fill of upward-fining calcarenite. It is thus inferred that this type of material is locally sourced and could be consolidated 'dust' from periods of high energy attrition of oolitic material that has settled out only to have been ripped up at the onset of more vigorous marine disturbance.

Each cycle (M1..) is indicative of an upward shallowing environment that probably resulted from sediment accumulation at and across the wave base transition in a near shore setting. Periodic elevations of sea level in the order of 30 m are probably responsible for the accumulation of each cycle.

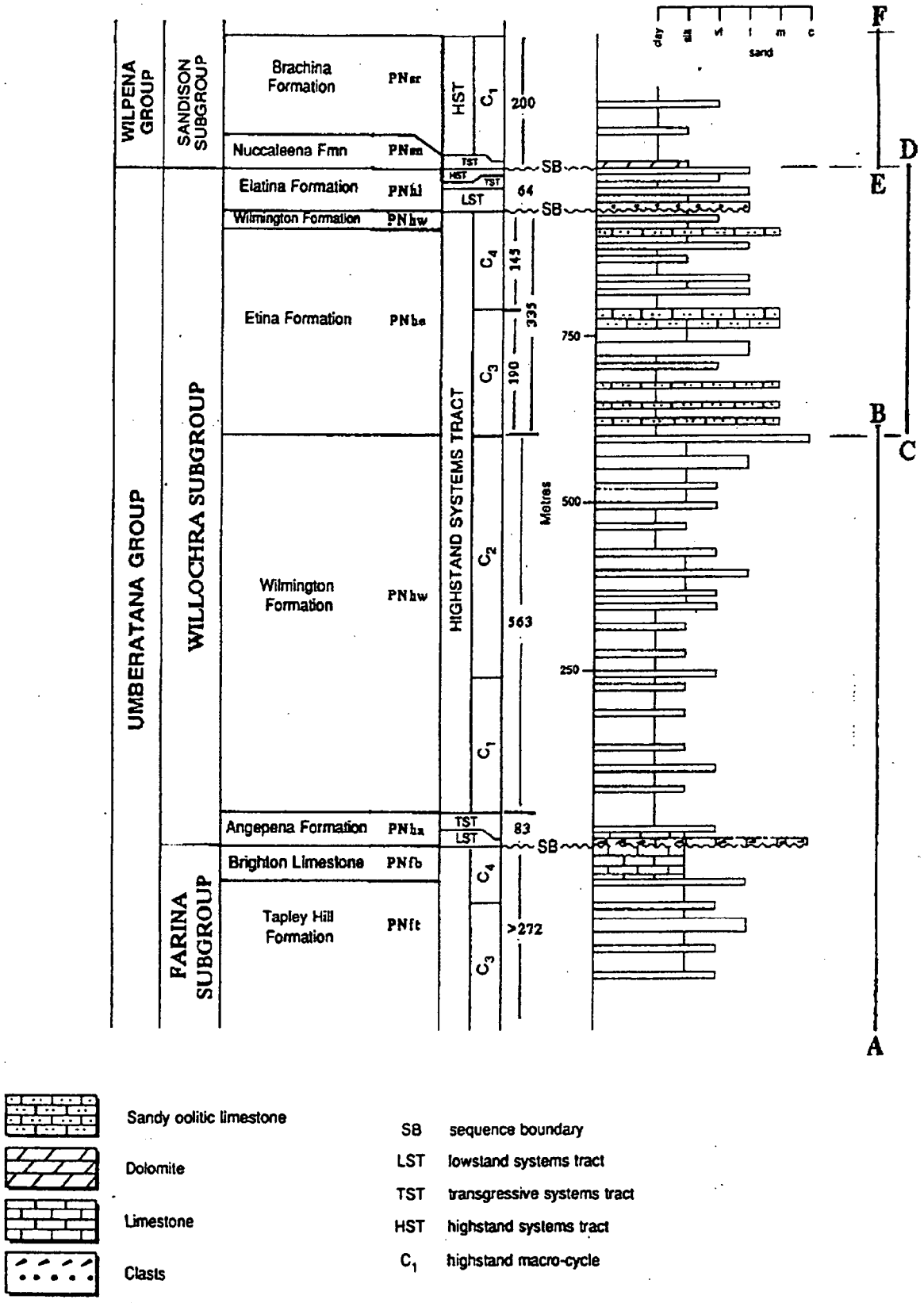


Figure 5.0 : Warrakimbo Composite Stratigraphic Column

In detail, the calcarenite caps (M1..) to each cycle vary from being absent to 10 m thick. Measurements conducted by I. Dyson in the clearly show that there are 10 or more major cycles of which 5 were capped by calcarenite ≥ 5 m thick. Thinner calcarenite beds are present indicating sub-cyclic events but demonstration of their lateral continuity appears to be limited.

The top of the formation is marked by a prominent siltstone unit which I. Dyson believes to be an incursion of Wilmington Formation which has arisen as a result of a substantial increase in water column height.

Elatina Formation

The Elatina Formation is a widespread and generally thick unit that occurs in the Northern Flinders Ranges. At Warrakimbo it is considerably thinner and comprised of massive sandstones. It is recognisable by its disconformable base upon the underlying sequence and the presence of small granules of red-brown chert within the basal few meters.

Locally distinct slump rolls and ballings (≤2 m in diameter) which are clearly a result of soft sediment tectonics related to the undulating disconformity surface, are exposed in the northern wall and visible in the stream bed of Warrakimbo Gorge north of the Mine. A modest palaeoslope associated with an unstable mass of rapidly deposited sediment, from Marinoan Glaciation melt waters, is probable.

Nuccaleena Formation

Fine red brown shales with up to two distinctive pale pink dolomite interbeds beds characterise this unit that conformably overlies the Elatina Formation. Local slump / mudflake type of breccia within the shales is rarely observed, one notable occurrence being just south of the access road ramp down to the floor of the Gorge about 0.5 km north of the mine.

The shales weather readily to a red soil similar to the adjacent overlying Brachina Formation and are much less diagnostic than the dolomite inter-beds when they are present. Elsewhere outside the mine area the Nuccaleena Formation does not have this surface expression. Instead a light coloured clayey soil with 'crab' holes (small solution collapse features) and poor vegetation cover is all that can be seen. This latter expression is however well recognised on colour photographs and is an important field-mapping marker.

Minor oxide copper occurrences have been prospect pitted on the north side of Warrakimbo Gorge adjacent to Willochra Creek at the mouth of a local south flowing tributary drainage and on the east side of Willochra Creek, adjacent to the track opposite the Warrakimbo Mine.

Outcrops of dolomite located on the SE side of the horseshoe bend are the most southerly known field expression.

Brachina Formation

The Brachina Formation seems to be a monotonous chocolate red brown silty/shaley sequence. It was not studied in any detail.

ABC Range Quartzite

The ABC Range Quartzite is a massive thick bedded sandstone that is physically tough and gives rise to robust classic cuesta ridges which dominate the eastern skyline of the study area and the eastern wall of the Gorge opposite the Mine. It was not studied in detail.

8.2 Mineralisation & Alteration

Styolitic banding is quite common and is only rarely mineralised. Rollings work, which examined styolitic mineralisation processes, is not exhaustive because it does not adequately consider the broader context of over all field relationships.

The distribution of styolitic mineralisation and its close field association with crosscutting fault structure and pervasive dolomitic alteration of restricted extent, within the calcarenite beds is probably just as relevant as the microscopic detail.

Field inspection in the vicinity of the Clayton prospect shows that the intensity of brown dolomitic alteration appears to diminish northward along the calcarenite beds away from the Horseshoe Fault system and irregular patchy (non styolitic) specular hematite mineralisation is present in the calcarenite bed (?M3) below the `styolitic' deposit.

Furthermore massive honey yellow, red and dark brown siliceous jasper masses within altered calcarenite both a short distance along strike (M4), south of the mineralisation and in the main fault plane on the north have hitherto been excluded from technical discussion. Similarly also, has the possible relevance of minor secondary copper mineralisation and thin quartz veining in slightly sheared siltstone/shale a few meters away from the main fault plane jasper vein, been unconsidered.

The jaspers appear to be replacement veins and masses within joints/fractures/faults. They could be dismissed as being entirely a secondary feature but this is regarded as being improbable by Curtis, as a guided visit to the Upalinna diapir (courtesy of I. Dyson) , revealed that nearly identical jasperisation is a common replacement alteration of the country rock along the north westerly contact rim of the Upalinna breccia and also locally associated with a nearby radial vein of massive/specular hematite and accessory siderite, in the rim rocks.

The distinctive yellow-brown dolomitic alteration described in detail by Rollings at the Warrakimbo Mine appears to have been preceded by recrystallisation of the calcarenite accompanied by the loss of much sedimentological detail. Recrystallisation of this type could be exclusively diagenetic but might also be attributable to applied stress.

The recrystallised limestone, (in the floor of Willochra George) with abundant styolites has been warped by right lateral drag on the Horseshoe Fault. It is a relatively late event postdating major faulting which opened up permeable pathways in the semi-adjacent rocks. At a slightly later time the fluids deposited specular hematite or replaced a precursor carbonate mineral wherever permeability and adequate porosity permitted.

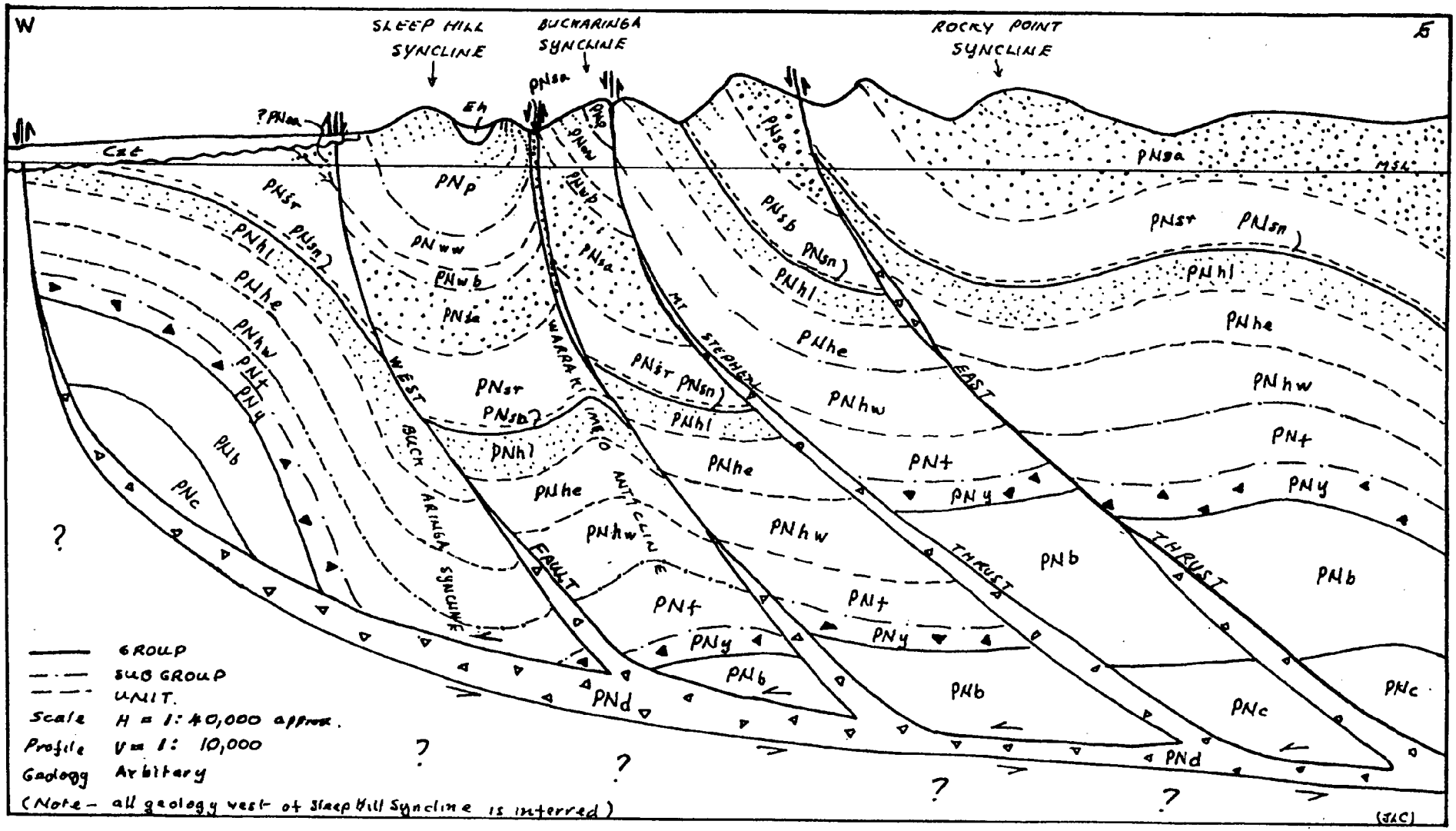
Northward down the Gorge the white calcite veins become less prevalent but sporadic occurrences of brown dolomitic veining continues with subtly increasing abundance and thickness over about 500 meters of strike. In the last 250 metres, south of the upper adit access track, the limestone forms the lower part of the wall of the Gorge where sporadic patches of brown dolomitic alteration penetrates up to 10 cm laterally from some joints. At the mine itself Rollings mapped an irregular 200-m alteration zone. Minor intermittent alteration was also traced northward beyond mapping and obliquely down section to the base of the host calcarenite bed.

Please Note: Rollings detailed 1:1,000 scale map of this area shows a southern termination of the alteration zone within the host limestone but this is potentially misleading because all outcrop virtually disappears at this point due to soil cover which extends from about the 130 m topographic contour beyond the explosives magazine site southward to the other side of the minor east flowing creek. The drawing is clearly interpretive.

Without detailed re-mapping there is a hint that the dolomitic alteration has a preferential bias to bedding oblique fractures oriented approximately SSE. In the mine adit (A) there is clear evidence of bedding parallel strain that was initially observed by Rollings who inferred that it had influenced the distribution of mineralisation. Two of the shears were mapped at surface by Rollings but there are at least four that can be recognised underground. The two additional shears occur in the portal shales and another one is present on the portal side of the vehicle turn-around bay. This latter shear seems to be slightly steeper than the bedding and might indicate that this could be a pattern exhibited by the other shears.

The main specular hematite mass exposed in the adit is irregularly shaped with minor late stage veins of white carbonate. At least two generations of white carbonate are present, the older being structurally dislocated and the pale brown footwall dolomite shows evidence of brecciation prior to specular hematite deposition. Samples taken from the mulloch dump show that chalcopyrite was probably introduced with the carbonate.

The free clasts of specular hematite in the diapiric breccias suggest that veining took place but subsequent tectonic mobilisation has resulted in fragmentation. The field relationships of similar veining at Upalinna strongly suggest that the fluids at Warrakimbo were sourced from a diapiric breccia which is concealed at depth along the Mount Stephen thrust fault in the mine area. (See Figure 6)



Eh — NAWHER GROUP

WILPENA GROUP

PNp- POUND SUBGROUP

PNw- — SUBGROUP

PNs- SANDISON SUBGROUP

UMBERATANA GROUP

PNh- WILLOCHRA SUBGROUP

PNt- FARINA SUBGROUP

PNY- YUDNAMUTANA SUBGROUP

PNb BURRA GROUP

PNc CALLANA GROUP

WARRAKIMBO HYBRID CROSS SECTION — STRUCTURAL MODEL

Figure 6.0

9.0 RAINY DAY PROSPECT

An old shallow prospect pit sunk on a specular hematite vein with a trace of copper oxides probably dates from the time of the initial discovery of the Warrakimbo Mine. Large blocks of undisturbed black specular hematite adjacent to the pit are unmarked indicating that the target was visible green copper mineralisation.

The pit which occurs on the northern end of a small outcrop of M4 horizon, was first observed by L. Dear in 1978 and is restricted to the downslope to the adjacent creek channel in an otherwise relatively flat terrain.

The specular hematite dips shallowly to the east and appears to be roughly parallel to the dip of the host limestone. The vein appears to pinch down dip and extends only a few meters to the south of the pit.

Following a field visit, further traces of mineralisation were noted by C. Adsett and a decision was taken to carry out detailed mapping in the immediate vicinity of the mineralisation.

9.1 Photo-geology

Prior to undertaking field work additional photo-enlargements were obtained for the area of interest and a more thorough examination of this data was carried out. Faulting in the proximity of the mineralisation was confirmed and demonstrated to be the distal extremities of minor arcuate feather faulting to the Mount Stephen Thrust.

The fault traces are difficult to pinpoint precisely due to the fairly uniform bedding in the Wilmington Formation and soil/scree cover over the Etina Formation with the exception of the M5 horizon. The fault(s) are oriented roughly north at the Thrust and swing to the NE across the Wilmington Formation and then seem to swing northward again sub-parallel to strike and die out against the Elatina Formation in the east (a sigmoidal signature) (see Plan. 2).

The fault traces are focussed in the region with indications of mineralisation --- selected for detailed mapping with the addition of Jasper Hill which lies less than 100-m further north. The M5 horizon dipslope has a distinctive dark brown colour tone on the photo over this interval. Jasper debris is not the cause since the scree slope on the west of Jasper Hill has no significant contrast and the abundance of jasper on the dipslopes is much too low. A weak alteration signature that is not immediately evident in the field is therefore a possibility. This colouration is not evident on the lower carbonate horizons, which are fairly difficult to distinguish in the first place.

9.2 Mapping

A grid comprising a baseline at 352° Mag (1.5° west of TN) was run parallel to strike about 100 m west of the M5 horizon. Cross lines were laid in at 50 m intervals and flagged at 10 m intervals. The main zone of mineralisation was covered by cross lines at 25 m intervals. The resulting grid is 1.4 km x 0.45 km in area.

Field mapping sought to identify all features directly relevant to the occurrence of the mineralisation and establish the existence and relevance of dispersed specular hematite float clasts and traces. Attention was therefore directed to the distribution of Etina Formation carbonate units.

The results of the mapping programme are presented in plan 3. This drawing is designed to present both factual ground truth/superficial geology and underlying Proterozoic solid geology (interpretation with superficial units deleted) and can be coloured to present these features at will. The colour scheme of drawing (A) in the back pocket emphasises solid geology and the stratigraphy of the Etina Formation limestone horizons, and drawing (B) emphasises outcrop lithology and cover units.

9.3 Stratigraphy

Etina Formation

The lithologies are little different from the Warrakimbo Mine area and have been summarised in the table below.

SUMMARY OF THE ETINA FORMATION			
UNIT	**LITHOLOGY**	**ALTERATION**	**MINERALOGY**
M1	Off white, coarse grained, granular sandstone.	None	None
M2	Coarse grained arkose	None	None
M3 – M4	Predominantly grey brown limestone with minor siltstone lenses	Traces of dolomitic alteration.	Massive specular hematite & copper oxide traces.
M5	Grey fissile laminated siltstone	None	None
M6	Fine grained sandstone with limestone lenses.	None	None

9.4 Mineralisation

Two outcrops of mineralisation are located to the north of the prospect pit and on the west side of the creek. The two exposures are more or less in-situ but the presumed limestone host rock, evident close by, is not in direct contact with either of the masses. The bedrock in the region between the two specular hematite masses (90 m) is concealed by a small talus fan possibly a meter or more thick. Continuity of limestone beds across the fan is not demonstrable and cross faulting is inferred.

Neither outcrop contains any sign of secondary copper minerals and until this programme no sampling of significance has ever occurred. Free clasts are present in the vicinity of the main outcrop and may have been taken previously in lieu of outcrop sampling.

The small south-westerly outcrop was found first. It consists of several small black masses, clustered in an area of about a square meter that barely break through the scree deposit. The largest mass is about 30 cm across and 25 cm. high. The distribution is suggestive of a partly dismembered mass almost totally buried by talus.

The second mass lies 90 m to the NE and is far more impressive being dominated by nearly vertical rounded mini-spire about 1.25 m high and 1.5 m long, oriented parallel to the strike of the nearby limestone. A 10-m trail of large and small clasts of specular hematite mark the northerly extent of the vein. Free clasts are dispersed to the east down slope to the adjacent creek.

The thickness of the vein is difficult to estimate but probably exceeds 30 cm and the plane of symmetry is nearly upright suggesting a dip that is oblique to the local stratigraphy. The prominent mass contains visible silica, which has given it resistance to weathering processes. The remainder of the vein has poor exposure because it is either thin or degraded by weathering through lack of resistive silica.

The specular hematite is coarse bladed and easily flaked, being similar to that obtained at Warrakimbo Mine. No mineralogical investigations have been initiated at this time.

The re-discovery of this mineralisation at 26,800 mE, 67,300 mN AMG underlines the potential difficulty of recognising indications of specular hematite mineralisation in the field and suggests that even the smallest trace of specular hematite justifies follow-up. Recognition of both natural processes and human intervention in the re-distribution of the material is self-evidently important.

10.0 CONCLUSIONS

- The Mount Stephen Thrust is host to a `diapiric' type fault breccia at the foot of Mount Stephen.

- Epigenetic specular hematite mineralisation is associated with a style of silicic alteration (japerisation) known from the Upallina Diapir rim rocks contact zone.

- Epigenetic specular hematite mineralisation is associated with secondary/tertiary level structures of the Mount Stephen Thrust Fault system.

- Epigenetic specular hematite mineralisation is therefore closely associated with late Delamarian deformation and diapiric breccia injection along major faults.

- The Etina Formation carbonate members remain the most prospective host lithology.

11.0 RECCOMENDATIONS

Rainy Day Prospect

- Continue Aboriginal consultation concerning Rainy Day.

- Plan & execute costeaning, mapping and a sampling programme.

- Review results, plan and implement drilling where warranted.

- Seek to obtain formal mineral tenure over the prospect.

Warrakimbo Area

- Carry out detailed mapping of the Etina Formation along the Horseshoe Bend Fault.

- Consider carrying out a limited petrological study comparing recrystallisation and alteration signatures from the Warrakimbo and Rainy Day regions.

- Plan and implement drilling at the mine area to examine the extent of mineralisation.

- Continue Aboriginal consultation

12.0 REFERENCES

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CENOZOIC

QUATERNARY – RECENT

Qa — Gravel & sand in active drainage

UNDIFFERENTIATED

Cze — Eluvial soil & screes of local derivation

Cza — Alluvial soils

Czg — Alluvial gravels

PALAEOZOIC

DELAMARIAN
(Diapiric Fault Breccias)

PNd2 — MT. STEPHENS BRECCIA
Rafts of basic volcanics & dolerite, & brown dolomite in matrix of pink & grey siltstone chips minor masses of specular hematite.

PNd1 — WARRAKIMBO BRECCIA
Rafts of vesicular basalt & brown dolomite in a grey siltstone chip matrix, accessory clasts of quartz & specular hematite, minor Cu oxides

CAMBRIAN

HAWKER GROUP

MERN MERNA FORMATION
(PARARA LIMESTONE)

Ehr — Grey silty laminated limestone

PHANEROZOIC

NEOPROTEROZOIC — WILPENA GROUP

UNDIFFERENTIATED

PN — Pink-orange brown sandstones & grey siltstones, interbedded

POUND SUBGROUP

PNpr — RAWNSLEY QUARTZITE
Pale pink, white, orange & brown sandstone & shaley interbeds, "Ediacaran Fauna Zone"

PNpb — BONNEY SANDSTONE
Orange brown soft sandstone

PNww — WONOKA FORMATION
Grey-pink limey shales with interbeds of grey laminated dolomite, (dk-brown varnish)

PNwb — BUNYEROO FORMATION
Pink-Red brown shale/siltstone

SANDISON SUBGROUP

PNsa — ABC RANGE QUARTZITE
Massive bedded, white-pink sandstone with small scale cross bedding, minor silty interbeds.

PNsr — BRACHINA FORMATION
Massive laminated siltstone/shale.

PNsn — NUCCALEENA FORMATION
Pale pink dolomite beds in bright pink shales, minor 'ripup' clasts, exposures in drainage, elsewhere yellowish clays with solution craters.

NEOPROTEROZOIC — UMBERATANA GROUP

WILLOCHRA SUBGROUP

PNhl — ELATINA FORMATION
Massive, bedded siliceous sandstones with jasper granules at base, silty interbeds

PNhe — ETINA FORMATION
Grey - pink weathering siltstone/shale with interbeds of fine sand grading upward into clastic/oolitic calc-arenite
M2 – M5 are calcarenite beds at the top of shallow marine depositional cycles. M1 is an arkosic bed.

PNhw — WILMINGTON FORMATION
Fine to very fine calcareous sandy beds in shale with minor siltstones.

PNha — ANGEPENA FORMATION
Transitional unit with basal clastic limestone progressing upward into limey sand and shale/siltstone.

FARINA SUBGROUP

PNfb — BRIGHTON LIMESTONE
Thin & thick (1-2m) beds of domal stromatolites with shale interbeds

PNft — TADLEY HILL FORMATION
Grey laminated siltstones & minor shales.

ROCK BOUNDARIES

- Outcrop boundary
- Stratigraphic Boundary
- Stratigraphic subunit Boundary
- Strike direction, subunit interpolation
- Dip/Strike indicator

STRUCTURE

- Major Fault
- Indicated Major Fault
- Inferred Major Fault
- "Lesser" Fault
- Indicated Fault
- Inferred Fault
- Fold - Syncline
- Fold - Anticline
- Hybrid Cross section, Fig 4 Geology

MT STEPHENS

EL Boundary Markers

DRAINAGE

- MAJOR STREAM
- minor stream.

OTHER

- WARRAKIMBO MINE
- RAINY DAY PROSPECT
- Photo-centre 005
- A..B Measured Stratigraphic section

CULTURE

- Road
- Track
- Railway
- Fence (II-Electric)
- Oil/Gas pipline
- Power Line
- Building

AGRICULTURE

- Water Catch
- Turkeys Nest
- Water Tank
- Water Pipeline
- Windmill Pump

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EL 1759 SA
WARRAKIMBO
REGIONAL GEOLOGY
PHOTO-COMPILATION

Prep. JLC Ex. Sv.	Date 28.2.93	Figure No. 2

9328-1

CENOZOIC
QUATERNARY – RECENT

Qa	Sands and gravels in active drainage

UNDIFFERENTIATED

Cze	Eluvial soil & minor ocrae
Cza	Alluvial soil
Czg_2	Younger alluvial gravels
Czg_1	Older cemented alluvial gravels
Czc	Calcreted soil/gravel.
Czt	Talus breccias

PHANEROZOIC

PALAEOZOIC
DELAMARIAN

PNd	– Fault 'breccia/alteration zones)

CAMBRIAN
HAWKER GROUP – MERN MERNA FORMATION (PARARA LIMESTONE)

Ehr	– Light grey bedded Limestone

GROUP

POUND SUBGROUP

PNpr	RAWNSLEY QUARTZITE Pale pink – white – orangy brown sandstone shaley interbeds
PNpb	BONNEY SANDSTONE Orange-brown 'soft' sandstone.
PNww	WONOKA FORMATION. Grey-pink, minor green shales, dolomite interbeds with dk-brown 'varnish'
PNwb	BUNYEROO FORMATION. Pink-red brown shale & siltstone.

NEOPROTEROZOIC — WILPENA GROUP

SANDISON SUBGROUP

PNsa	ABC RANGE QUARTZITE Massive bedded yellow brown sandstone with basal white member, small scale xbeds, ripples
PNsr	BRACHINA FORMATION Massive red-brown laminated siltstone/shale
PNsn	NUCCALEENA FORMATION Pale pink dolomite beds in bright pink shale Frequently unexposed

WILLOCHRA SUBGROUP

PNhl	ELATINA FORMATION Massive yellow-brown sandstones, jasper granules present in basal portion.
PNhe (M6, M5, M4, M3, M2, M1)	ETINA FORMATION Grey/pink-weathering siltstones & shales with interbeds of fine sandstone grading upward into calc-arenite, cyclically. M_2–M_6, calc-arenite beds, oolitic and clastic, light to dark brown. M_1 arkosic basal sandstone, easily mistaken for calc-arenite

UMBERATANA GROUP

WILLOCHRA SUBGROUP (Cont'd)

PNhw	WILMINGTON FORMATION. Fine to medium grained calcareous sands & shales, interbedded, red weathering

FARINA SUBGROUP

?PNfk	?TAPLEY HILL FORMATION medium grey bedded limestone and limestone conglomerate – uncertain stratigraphic position – possible Brighton Limestone

ROCK BOUNDARIES

- Outcrop boundary/contact.
- Stratigraphic boundary
- Inferred stratigraphic boundary
- Lithological contact/ stratigraphic sunit
- Lithological "strike" trend
- Dip/strike indicator

(Measurements – N. Rollings '86, loc. approx.)

STRUCTURE

- MAJOR FAULT
- fault

OTHER

- Prospect pits/occurrence
- Mine shaft
- Mine Portal
- Dump
- C…D Measured Stratigraphic section
- Lease marker.
- Cu Copper
- Sp Specular Hematite.

CULTURAL FEATURES

- Fence
- Gate
- Track
- Water Pipline
- Water Tank
- Tunkey's Nest

NATURAL FEATURES

- Major Stream
- Water hole
- Minor stream
- Spring

Notes

Scale: Nominally 1:5000 without photogrametric correction
Photo: 4244/044

Grid: AMG, approximately located using Topographic base 6534-3. Accuracy estimated @ ±10m

Data: Compiled from field inspection steregraphic examination & previous mapping

Specular Hematite occurrences

- SP1 Stylolite
- SP2 Clayton
- SP3 Windy Ridge

TN AMG N MN 1.31° 5°

(Scale 1:5000)

100 50 0 100 200 300 400 500 m

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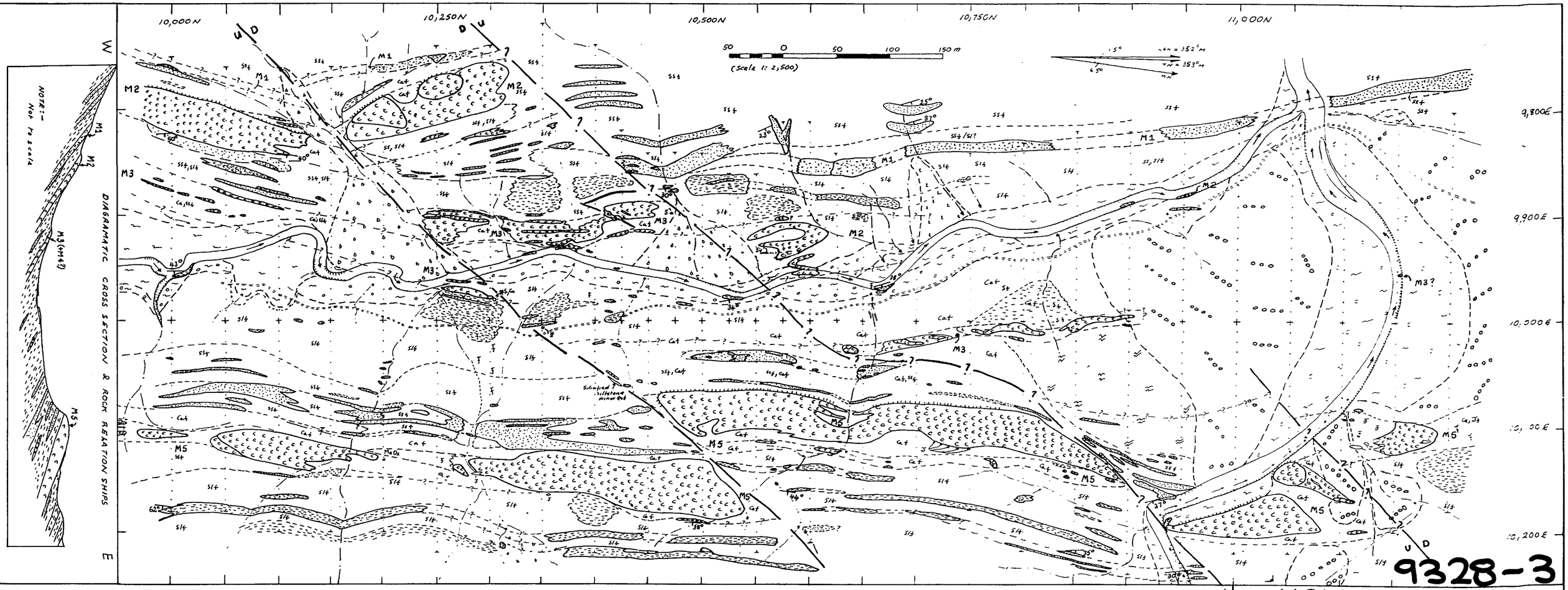
WILLOCHRA GORGE GEOLOGY MAP

Prep. JLC Ex.Sv.	Date 1.3.93	Figure No. 5

9328–2



Stratigraphy

UMBERATANA GROUP	WILLOCHRA SUBGROUP	Etina Formation	C_4
			C_3
		Wilmington Formation	C_2

Metres: 750, 500

Refer to Figure No: 3

QUATERNARY

?HOLOCENE

- Alluvial Soil
- Older alluvium with Quartzite gravel - ABC Range Quartzite

?PLEISTOCENE

- "Fanglomerate" Alluvium overlying gravels - gilgai surface
- "Scree Fans" Small talus of angular sandstone clasts

NEOPROTEROZOIC

Lithofacies

- Fine to very fine grained sandstones, calcareous, brown varnish (sst = float)
- Siltstones, minor shales, Pale pink to brown weathering (slt = float)
- Calcarenite, coarse to medium grained, grey-brown, oolitic (Cat = float)
- Arkose, very coarse to medium grained, brown weathering, friable (bold outcrop infrequent, looks like ccc)

Mineralization — *

- S Specular hematite
- J Yellow-brown Jasper
- Cu Copper-oxides
- Sd Siderite
- F Jasper float
- Sf Specular hematite float.

Boundaries

- Outcrop
- Subcrop
- Indicated
- Inferred
- Fault
- ?— " Indicated
- ?—?— " Inferred
- 50° Dip & Strike

Natural & Cultural Features

- Water course
- Main water course
- Steep Slope
- Lease corner peg
- Fence & Track
- Pit & spoil pile
- Excavation
- Grid: boundary, stations & Base line markers

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EL 1759 SA WARRAKIMBO

RAINY DAY PROSPECT GEOLOGY MAP

Prep. JLC Ex.Sv.	Date 25.2.93	Figure No. 6

PRIMARY INDUSTRIES AND RESOURCES SOUTH AUSTRALIA

SUMMARY REPORT ON MINERAL EXPLORATION

Exploration Licence No : EL 2114

For Three Years Ending : 31/12/98 Operator / Manager : Ory Pty Ltd

Minerals Sought : Specular Hematite Excluding Opals

Prepared By : S. P. Lambert Consultant Geologist.
Contact : 08 83966 558

Date: 30 / 1 / 99

SUMMARY OF OPERATIONS:
(Eg No, type of sample; Line Km & type of survey; Man days mapping;
No of holes, metres of each type of drilling; Environmental / Rehabilitation activities; etc)

Exploration during the reporting period has been minimal, as the focus of the project has been to establish a viable processing plant with a guaranteed feedstock (already identified and tested) and a receptive market to the product.

Aside from the marketing and design focus an extended period of legal difficulties forced capital expenditure to be temporarily suspended. The impact of this period lasted for approximately eight months. The closure of legal undertakings resulted in the extended construction of the processing plant in Port Augusta.

The construction of the processing plant has paved the way for extensive testing of the feedstock ore. Minor testing has been undertaken on samples recovered from mineral occurrences within EL 2114, with the results outlining the necessity for further exploration and or a drilling programme.

It has been forseen that exploration should be undertaken within the calendar year to define the extent of new mineral occurrences located within EL 2114.

EXPENDITURE

Approximate Annual Expenditure : $ 39,074.00
Total Expenditure for Licence : $ 117,223.00

PROJECT : EL 2114 WARRAKIMBO AREA EXPENDITURES FOR THE THREE YEAR PERIOD ENDING 31/12/98	
COST CATEGORY	**EXPENDITURE**
Communications	$840.00
Earth Moving and Site Services	$5,726.00
Geological Services	$5,482.00
Legal & Professional Services	$177.00
Management and Administration Services	$18,000.00
Metallurgical Services	$14,544.00
Mine Equipment	$7,564.00
Processing Plant & Infrastructure	$29,981.00
Transport	$22,200.00
Vehicle Expenses	$12,709.00
TOTAL EXPENDITURE (3 YEARS)	**$117,223.00**
Approximate Annual Expenditure	**$39,074.33**

[1] Expenditure prepared by Pegasus Geological Services from financial data provided by Richard Cole Project Manager for Ory Pty Ltd