

***Report of an archaeological survey  
of the proposed Blue Hills haul road  
and Morawa rail siding***

***Prepared for Mid West Corporation Ltd***

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## **EXECUTIVE SUMMARY**

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In June 2005, Mid West Corporation Ltd commissioned Western Heritage Research Pty Ltd archaeologist Wayne Glendenning to conduct an archaeological survey of the Morawa Rail Siding and Blue Hills haul road (project area) near Morawa, approximately 200 kilometres east of Geraldton. The archaeological survey was undertaken in July 2005.

The areas inspected included the Blue Hills haul from approximately 488694E; 6776370N to approximately 488480E; 6776000N; the Morawa Siding project from approximately 403759E; 6771509N to approximately 420859E; 6771309N; and a 500 metres area surrounding the existing mine at Blue Hills.

Wayne Glendenning was assisted on the survey by Rubysands Pty Ltd tenement consultant Mike Lewis.

As a result of the archaeological survey no new archaeological sites were located. However, three previously recorded sites were inspected: Blue Hills Larger Cave (site ID 20857); Blue Hills Smaller Cave (site ID 20858) and *Granite Pavement with rockhole* (site ID 20860).

The two cave sites are located near to the existing mine at Blue Hills, whereas the site *Granite Pavement with rockhole* is located adjacent to the proposed Blue Hills haul road at 474185E; 6772394N.

If the proponent intends to disturb the archaeological sites, it will need to obtain consent from the Minister for Indigenous Affairs under Section 18 of the *Aboriginal Heritage Act 1972* ("The Act") prior to any such activity occurring.

It is contingent upon the proponent to advise personnel and contractors of the location of all the sites in order to avoid them.

It is therefore recommended that Mid West:

- Avoid all sites within the project area if possible;

- Inform all employees and contractors working on the project of the location of the sites; and
- If Mid West are unable to avoid disturbing a site, they will need to apply for permission to do so from the Minister for Indigenous Affairs under Section 18 of the *Aboriginal Heritage Act 1972*.

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## 1. INTRODUCTION

In June 2005, Mid West Corporation Ltd (the proponent) commissioned Western Heritage Research Pty. Ltd archaeologist Wayne Glendenning to conduct an archaeological survey of the Morawa Rail Siding and Blue Hills haul road (project area – see Figure 1 in the Appendix) near Morawa, approximately 200 kilometres east of Geraldton. Wayne Glendenning was assisted on the survey by Rubysands Pty Ltd Tenement Consultant Mike Lewis.

The Blue Hills haul road will entail the widening of an existing road from which runs from approximately 432079E; 6770268N to approximately 488694E; 6776370N.

The Morawa Siding project will entail redevelopment of a disused rail line corridor extending from approximately 403759E; 6771509N to approximately 420859E; 6771309N.



**Photograph 1: Typical ground surface of the Morawa Rail Siding.**

The archaeological survey progressed in the following manner:

- Archival research;
- Field inspection; and
- Reporting of survey results.



**Photograph 2: Typical surface of the proposed Blue Hills haul road.**

A handheld *Garmin eTrex* Global Positioning System (GPS) unit using the GDA 94 datum was used to record all coordinates on the survey.

## **2. ENVIRONMENTAL CHARACTERISTICS**

### **2.1 CLIMATE**

The climate of the project area is classified, according to the modified Köppen system of climate classification, as Grassland: hot with summer drought (Stern; de Hoedt, and Ernst, 2000). Total average annual rainfall for the area is 339.4 millimetres, which falls predominantly during the months May through to August (Bureau of Meteorology, 2005)<sup>1</sup>. Average temperatures range from a January daily maximum and minimum of 36.6C and 19.4C respectively, to a July daily maximum and minimum of 18.6C and 6.9C respectively. (Bureau of Meteorology, 2005).

### **2.2 GEOLOGY**

Two main geological features are located within the project area: the granite outcrop located on the Blue Hills haul road, and the Blue Hills itself. The remaining area is generally farmland located on alluvial plain.

### **2.3 VEGETATION**

The project area lies within the Austin Botanical District of the Murchison Region. Vegetation within this area is termed 'Mulga low woodland' and is dominated almost solely by the Mulga (*Acacia aneura*), which is found in all environments from saline lacustrine to stony breakaways (Beard 1974a; 1974b). Associated understorey plants in the project area may include *Eremophila margarethae* on loamy soils, *E. granitica* and *E. dielsiana* on hilly country and *E. fraseri* and *E. abietina* on rocky ground (Beard1974a: 40; 1974b).

### **2.4 LAND INTEGRITY**

The project areas are highly disturbed having been used as a rail line in the case of the Morawa rail siding, a roadway in the case of the Blue Hills access road. The area around the mine has been subject to mining motor vehicles and drill

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<sup>1</sup> Recordings taken from the Mullewa Meteorological Station

sampling. There is almost no section of the survey area that does not indicate previous disturbance of some type

### **3. ARCHAEOLOGICAL SURVEY**

#### **3.1 ARCHAEOLOGICAL BACKGROUND.**

The project area is situated in the semi arid/arid zone of Australia. Most archaeological research in this zone has focused on the timing of Pleistocene occupation and abandonment during the time of the Last Glacial Maximum (LGM)<sup>2</sup>, and the subsequent Holocene re-occupation by Aboriginal people. (Smith 1987; Lampert and Hughes 1988; Veth 1989a; Ross, Donnelly and Wasson 1992; Bowdler, 1990).

It remains difficult to ascertain the exact nature of arid zone occupation prior to the LGM. According to Ross *et al* (1992), the arid zone has never been well watered and hyper-arid conditions during the LGM would have made the arid zone unsuitable (Hiscock n.d.). Early occupation was therefore either opportunistic (Veth 1989a; Hiscock n.d.) or required behaviour modifications in order to live in arid conditions (Ross *et al* 1992).

Such modifications may have resulted in population adjustments and human groups retreating to areas of greater resources and water (Lampert and Hughes 1980, 1987; O'Connor 1990; Smith 1988; Veth 1989a), which Veth (1989b:256) terms 'refuges'; that is "...piedmont/montane uplands and riverine/gorge systems, both providing networks of permanent water sources capable of withstanding climatic extremes".

Gould (1980) has suggested that two types of adaptation to the environment operated in the arid zone: 'adaptive process' and 'adaptive behaviour'. 'Adaptive process' is an adaptation involving large-scale responses to the continuing climatic patterns that produce aridity and is characterised by a risk minimisation strategy. In contrast, 'adaptive behaviour' describes responses to short-term changes in climatic conditions, for example, periods of extreme drought or high rainfall.

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<sup>2</sup> Between 15,000 Before Present (BP) and 25,000 BP

With climate amelioration during the late Pleistocene and early Holocene, around 12,000 BP, human populations again moved into the marginal areas of the corridors and to a lesser extent, barrier deserts. According to Smith (1988), there seems to be neither a sudden increase in population nor new sites within the arid zone. Most sites located have been found within the 'corridors' possibly reflecting a post LGM recolonisation (O'Connor 1990; Veth 1989a)

In contrast to the occupation patterns of the late Pleistocene and early Holocene, the late Holocene saw both a substantial increase in sites within the arid zone and an increased utilisation of those sites, as evidenced at *Mandu Mandu* Creek in North-west Australia (Morse 1988), Colless Creek in Queensland (Hiscock 1988), and *Puritjarra* in Central Australia (Smith 1987, 1988). Data captured from these sites supports Veth's (1989a: 239) assertion that sites numbers and occupation intensity is a function of the emergence of reciprocity networks and the development of seed grinding technology and not of environmental conditions.

The evidence for the antiquity of human occupation of the arid zone is scant and, until relatively recently, few radio-carbon dates were available. A date of 2160 +/- 105 BP has been obtained from charcoal in deposits at Agnew rockshelter, whilst at two hearth sites at Wiluna, dates of 1040 +/- 80 BP and 4090 +/- 100 BP were obtained from charcoal (O'Connor and Veth, 1996).

Excavations undertaken at *Katampul* rockshelter in the northeastern Goldfields near Leonora have yielded evidence of human occupation dating from the Pleistocene to the present (O'Connor and Veth, 1996). At the site, located mid-way between Wiluna and Leonora, the archaeologists obtained five radiocarbon dates from charcoal samples within a stratified deposit, ranging from 21,170 +/- 190 BP to 350 +/- 350 BP. According to O'Connor and Veth (1996: 49) these dates represent "a Last Glacial Maximum incursion into the arid zone, followed by permanent occupation by the mid-Holocene".

### **3.2 PREVIOUS ARCHAEOLOGICAL RESEARCH**

Previous research in a given area may reveal certain archaeological characteristics, which may help in establishing predictive models for further research undertaken within that area. With this in mind, the archaeologist reviewed reports of previous research held at the DIA library and conducted a search of site files held at the DIA Sites Section for information pertaining to sites located within a nominal 10 kilometre radius of the project area.

The search revealed sixteen archaeological sites are recorded as being in the vicinity of the project area. Details of these sites are presented in Table 1.

<b>Site ID</b>	<b>Name</b>	<b>Easting</b>	<b>Northing</b>	<b>Type</b>
<b>5357</b>	Pindarrie Soak	461639	6774651	Artefact Scatter
<b>5394</b>	Kadji Kadji	436639	6779651	Artefact Scatter
<b>5395</b>	Wgi Soak	436639	6777651	Artefact Scatter
<b>5396</b>	Kadji Kadji Creek	436639	6779651	Artefact Scatter
<b>5399</b>	Claypan	445140	6775151	Artefact Scatter
<b>5400</b>	Quoandong Claypan	441639	6778651	Artefact Scatter
<b>5401</b>	Jack's Bore Claypan	442639	6776651	Artefact Scatter
<b>5405</b>	Causeway Quartz Quarry	447639	6771651	Quarry
<b>5406</b>	Causeway 1	447639	6771651	Artefact Scatter
<b>5408</b>	Causeway Claypan	455140	6775151	Artefact Scatter
<b>5410</b>	Boiada Soak	452639	6770651	Artefact Scatter
<b>5934</b>	Karara Ochre Quarry	485298	6775246	Quarry
<b>20857</b>	Blue Hills Larger Cave	488861	6776319	Artefact Scatter
<b>20858</b>	Blue Hills Smaller Cave	488808	6775792	Artefact Scatter
<b>21374</b>	KAR/02 Mt Karar	479300	6773189	Artefact Scatter

**Table 1: Sites recorded within the vicinity of the project areas.**

In addition, five reports detailing consultancy research undertaken in the course of archaeological surveys in the vicinity of the survey area (Quartermaine 1996; Australian Interaction Consultants 2004; 2005a; 2005b; 2005c).

### **3.3 SURVEY METHODOLOGY**

Archaeologist Wayne Glendenning, assisted by Mike Lewis, conducted the archaeological survey between the 5<sup>th</sup> and 7<sup>th</sup> of July, 2005.

The survey area comprised two separate areas:

- The Blue Hills haul road project - from approximately 432079E; 6770268N to approximately 488694E; 6776370N.
- The Morawa Siding project - from approximately 403759E; 6771509N to approximately 420859E; 6771309N.

Considering the archaeological signature noted in previous research in the area and given the characteristics of the survey area, a survey methodology was established determined by ground conditions, and focusing on areas of high archaeological visibility, as well as the area of the proposed haul road, rail line and mine area. The methodology involved two strategies:

- Opportunistic pedestrian and vehicular inspection of the proposed Blue Hills haul road and Morawa rail line;
- Purposive pedestrian inspection of areas with a high possibility of artefactual material being present, such as granite outcrops; and
- Opportunistic pedestrian inspection of the hill surrounding the mine within 500 metres of the existing mine.

It is estimated that, by using this methodology, approximately 90% of the proposed Blue Hills haul road area and Morawa rail line area was surveyed, and approximately 10% of the hill surrounding the existing mine was surveyed.

### ***3.3 RESULTS OF THE ARCHAEOLOGICAL SURVEY***

As a result of the archaeological survey no new archaeological sites were identified.

#### **4. DISCUSSION AND RECOMMENDATIONS**

In July 2005, an archaeological survey of the Morawa Rail Siding and Blue Hills haul road near Morawa, was conducted.

The Blue Hills haul road project was inspected from approximately 488694E; 6776370N to approximately 488480E; 6776000N.

The Morawa Siding project was inspected from approximately 403759E; 6771509N to approximately 420859E; 6771309N.

As a result of the archaeological survey no new archaeological sites were located. However, three previously recorded sites were inspected: Blue Hills Larger Cave (site ID 20857); Blue Hills Smaller Cave (site ID 20858) and *Granite Pavement with rockhole* (site ID 20860).

Both of the cave sites are located near to the existing mine at Blue Hills, and the site *Granite Pavement with rockhole* is located adjacent to the proposed Blue Hills haul road at 474185E; 6772394N.

If the proponent intends to disturb the archaeological sites, it will need to obtain consent from the Minister for Indigenous Affairs under Section 18 of the *Aboriginal Heritage Act 1972* (“The Act”) prior to any such activity occurring.

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