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REVIEW & VERIFICATION OF ABORIGINAL HERITAGE LANDSCAPE YEELIRRIE PROJECT, NORTHEASTERN GOLDFIELDS

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Prepared for CAMECO AUSTRALIA

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EXECUTIVE SUMMARY

Cameco-Australia is planning to develop the Yeelirrie Uranium Project in the Northeastern Goldfields region of Western Australia. Numerous Aboriginal heritage surveys and studies have been conducted by previous project owners, and some heritage sites and numerous places with archaeological material were identified and recorded. This report presents a summary and a review of that work and an assessment of all the recorded Aboriginal heritage sites and places, with recommendations for their management, and observations on the heritage landscape of Yeelirrie.

The review is intended to assist Cameco Australia to plan their activities in the project area and ensure better management of Aboriginal heritage, as well as to liaise with the Department of Aboriginal Affairs (DAA) and the Environmental Protection Authority, and in particular to present pertinent heritage information for the environmental impact assessment process and the preparation of the Public Environmental Review document.

The review and reassessment involved the study of previous surveys, investigations, reviews and the Register of Aboriginal Sites for the project area, as well as a fieldtrip to assess firsthand a large sample of the previously recorded heritage places. At the time of writing (May 2015), there were no Registered Aboriginal Sites and no Other Heritage Places on the Register of Aboriginal Sites within the proposed mining and infrastructure areas (the 'Development Envelope'). While not all of the Development Envelope has been surveyed for heritage sites, this review also provides a basis for predicting the likelihood for sites and heritage places in unsurveyed areas.

A number of significant ethnographic and archaeological sites were recorded near breakaways to the north and south of the Development Envelope during surveys conducted in 1976. These include mythological and ceremonial sites, rockshelters with archaeological deposit and/or paintings, stone arrangements, as well as large and small quarries and artefact scatters. These will not be disturbed by the Project. No major habitation sites or important cultural sites were identified during those surveys within the Development Envelope.

A number of places with archaeological material have been recorded within the Development Envelope. The majority of these are small to very small scatters of flaked stone artefacts exposed on the eroding sandy plains. Four larger (but not large) artefact scatters beside claypans have also been recorded. Almost all of the recorded scatters are affected by high levels of erosion while some show signs of occasional inundation. As a result the great majority of scatters have little integrity and little archaeological significance. In fact, some of the scatters probably are not places where artefacts were used and discarded, but have been created by wind and water erosion moving and conflating artefacts into clusters which resemble but which are not *in situ* artefact scatters.

Small scatters of flaked stone artefacts recorded in the Development Envelope will be typical for low-lying areas in the Yeelirrie region and adjacent areas, and these are the most common type of archaeological material in the Northeastern Goldfields. Even the high degree of disturbance from flooding is common in this semi-arid region, where rainfall is erratic but includes occasional deluges from ex-tropical cyclones moving inland as rain-bearing depressions that cause widespread flooding.

Numerous culturally modified trees with scars likely made when wood and bark were removed to make containers or shields were also recorded within the Development Envelope. Only the Kopi Gum (*Eucalyptus gypsophila*) was used in this way. Culturally modified trees are uncommon in this region, so this collection is unusual. But the Kopi Gum Woodland extends well to the west beyond the Project Area and culturally modified trees also occur there, so this is type of archaeological material seems to be locally common. While culturally modified trees may be of cultural interest, individual examples have little potential for scientific research and hence little archaeological significance.

The surveys that recorded the archaeological scatters and the modified trees were conducted between 2009 and 2011 and failed to recognise the geomorphological context of the artefactual material and the

very high levels of disturbance caused by repeated flooding and inundation. They also failed to place the material into a regional perspective.

When those factors and contexts are considered, it is clear that very few of the previously recorded scatters have the ability to contribute to the archaeological knowledge of the region and so have very little scientific significance. They are also commonplace. On this account, most of the artefact scatters are unlikely to meet the definition of a Registered Aboriginal Site under the WA *Aboriginal Heritage Act* 1972.

Similarly, it is considered that the recorded culturally modified trees have very little research potential, and that other similarly modified trees exist nearby. Individually, they too are unlikely to meet the definition of a Registered Aboriginal Site. But further research is warranted of Aboriginal use of the Kopi Gum in the Yeelirrie district.

Only the four larger artefact scatters next to claypans are considered to have a reasonable degree of integrity and some research potential. These artefact scatters probably have the potential to be Registered Aboriginal Sites. They have assemblages with a range of artefacts showing repeated habitation over millennia by people visiting and bringing stone tools from the more significant campsites and quarries recorded to the north of the project area.

These four sites ("Yeelirrie_061", "Yeelirrie_139", "Yeelirrie_179" and "Yeelirrie_198") provide a record of a specific and likely long-lasting settlement pattern and offer opportunities for study, meaning they are likely to be of some importance to the wider community by providing a record of, and information on, Australia's past.

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ACKNOWLEDGEMENTS:
The practical assistance of Colin Tincknell and Tim Duff (Cameco) with fieldwork at Yeelirrie is greatly appreciated, as is the information provided by Simon Williamson and Tim Dunlevie (Cameco).
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SPATIAL INFORMATION:
Coordinates listed in this report are MGA (GDA94) Zone 51.

1.0 INTRODUCTION

1.1 Background

Cameco Australia is planning to develop the Yeelirrie Uranium Project in the Northeastern Goldfields region of Western Australia, approximately 420km north of Kalgoorlie, 60km west of Mount Keith and 70km southwest of Wiluna. The project will involve open-cut pit(s), stockpiles, tailings storage, processing plant, water bores and associated infrastructure, as well as a camp and numerous roads (Figure 1). The Development Envelope comprises the Mining & Processing Area, a small Northern Quarry, a Waste Management Centre, an Accommodation Village and Access Roads & Corridors.

The Yeelirrie Project has a history as a mining prospect dating back to the mid-1970s when it was discovered by Western Mining Corporation (WMC). At that time, WMC commissioned the WA Museum to undertake research into the Aboriginal heritage of the Yeelirrie area. This included a very detailed ethnographic study (Liberman 1977a, 1977b), as well as archaeological work in certain areas (WA Museum 1978). Numerous significant Aboriginal sites were identified and recorded in an area north of the orebody but in close proximity to where WMC proposed to locate a township to house employees. However, none of these sites will be affected by the current proposal and all these sites are located outside of Cameco's proposed Development Envelope (Figure 2).

After a change of ownership to BHP Billiton-Yeelirrie Development Company Pty Ltd (BHPB-YDC), three targeted site surveys were conducted in 2009 and 2010 by Stevens (2009a, 2009b, 2010) ahead of additional drilling programs. In 2010-2011 a comprehensive archaeological site survey over much of the Development Envelope, as well as some adjacent areas, was carried out by Ironbark Heritage & Environment (IHE 2013). There also was an ethnographic and archaeological investigation of adjacent land (Gleason 2011). All of this previous work is discussed in more detail below (section 2).

Many places with archaeological material were recorded in Cameco's Development Envelope (see Figure 3) along with a large number of isolated artefacts. All of the recorded places are archaeological in nature and no ethnographic or culturally significant places occur, although Stevens noted that some importance was attributed to the archaeological remains by some Aboriginal people.

The recorded heritage places are either small to very small artefact scatters, with only a few larger examples situated near claypans, or culturally modified trees (CMT); that is, trees with scars where wood and bark were cut from the trunks to make shields or containers. A discussion and breakdown of these findings is presented below (section 2.2).

The heritage places recorded in the 1970s were reported to the Department of Aboriginal Sites (now the Department of Aboriginal Affairs [DAA]), and most were classified as Registered Aboriginal Sites, with a few found not to qualify and they were accorded a lower status. None of the heritage places recorded during more recent archaeological and ethnographic surveys in 2009, 2010 and 2011 have been reported to the DAA.

Therefore the recently recorded heritage places are neither on the Register of Aboriginal Sites nor have they been assessed to determine their status under the WA *Aboriginal Heritage Act* 1972 (AHA). So it is not known which of those recently recorded archaeological places, if any, might meet the criteria of the AHA and be given the status of Registered Aboriginal Sites.

Opinions on the probable status of the recorded archaeological material were included in IHE's report (2013), but not in the reports by Stevens (2009a, 2009b, 2010). Neither IHE nor Stevens provided a review or discussion of the regional archaeological context or the geomorphological forces acting on the archaeological material. Consequently, any assessments are of limited value.

Since a review in 2012 of the AHA, the criteria defining an Aboriginal Site have become more stringent or rigorous, such that a reported heritage place must be of 'importance and significance to the community as a whole' if it is to become a Registered Aboriginal Site.

Given the great majority of the archaeological material recorded in the Development Envelope is either small to very small scatters of stone tools adversely affected by erosion or culturally modified trees with little research potential, and both these types are commonplace for this area, they are unlikely to meet any test in relation to scientific importance or significance. It is my professional opinion, therefore, that most of the recorded archaeological material or archaeological places will not be considered Registered Aboriginal Sites under the AHA when considered by the Site Assessment Group at the DAA.

1.2 Objectives

Cameco Australia commissioned Waru Consulting to review 'the Aboriginal heritage landscape' for their Yeelirrie Project Area. This was intended to enable Cameco Australia to plan their activities in the Yeelirrie Project Area and take necessary and appropriate steps towards managing any Aboriginal sites in the Development Envelope, as well as liaise with the DAA and the Environmental Protection Authority (EPA), and provide pertinent heritage information in their Public Environmental Review (PER) documents.

Waru's review and reassessment involved the study of previous surveys, investigations, reviews and the Register of Aboriginal Sites for the project area, as well as a short fieldtrip to see firsthand a large sample of the previously recorded archaeological places. There was no need to assess ethnographic sites because none have been recorded in or near the Development Envelope, although the CMT may be of cultural interest to members of the local Aboriginal community.

Fieldwork to visit and assess a sample of the previously recorded archaeological material was conducted with the assistance of Cameco personnel Colin Tincknell and Tim Duff between Monday 16th and Thursday 19th February 2015.

1.3 What is an Aboriginal Site?

There are multiple possible definitions, depending on the viewpoints of the various stakeholders and heritage practitioners, as to what constitutes a 'site'. But in most cases where mining or development are concerned, it is the legal definition as applied by the appropriate authority which is important.

Traditional Aboriginal perceptions of the landscape are very different to Western perceptions, so a topographic or geological feature may be a highly significant site to knowledgeable Aboriginal people, but not be identified as a heritage site by archaeologists or the non-Aboriginal community. Conversely, a scatter of discarded stone tools might be of particular interest to archaeologists but not be significant to Aborigines or non-archaeologists.

Also, heritage professionals may identify different places and things as important, or evaluate them differently because of their professional standpoints. For example, historic remains that post-date WWII will generally be of no interest to archaeologists but may be considered important by historians, and may also be of some importance to Aborigines if they used the site or their families did. Often, Aborigines and non-archaeologists would identify a water source as the place of importance but archaeologists would consider a specialised stone tool or collection of tools nearby to be important.

According to two textbooks on Australian archaeology, 'an archaeological site is any place that still contains physical evidence of past human activity' (Burke & Smith 2004: 63) or 'any place containing

traces of past human activity' (Flood 2010: 19). These definitions quietly stress the need for the material to be *in situ*; that is, a site is the place with artefactual remains, not the material itself.

Ethnographic sites, on the other hand, generally do not involve modification of the land or place and are not readily visible. Typically, they are places with mythological, ceremonial or historical associations, and 'possess special significance because of their role in Indigenous belief systems' (Burke & Smith 2004: 206).

Overriding these different viewpoints is the legislative definition of what constitutes an Aboriginal site. The AHA defines an Aboriginal heritage site as a place that meets the criteria of s.5 and/or s.39 of the Act. Section 5 states that:

> (a) any place of importance and significance where persons of Aboriginal descent have, or appear to have, left any object, natural or artificial, used for, or made or adapted for use for, any purpose connected with the traditional cultural life of the Aboriginal people, past or present;
>
> (b) any sacred, ritual or ceremonial site, which is of importance and special significance to persons of Aboriginal descent;
>
> (c) any place which, in the opinion of the Committee [ACMC], is or was associated with the Aboriginal people and which is of historical, anthropological, archaeological or ethnographical interest and should be preserved because of its importance and significance to the cultural heritage of the State

There is also a provision for the Aboriginal Cultural Material Committee (ACMC) to evaluate and identify sites under Section 39(c), and:

> recommend to the Minister places and objects which, in the opinion of the Committee, are, or have been, of special significance to persons of Aboriginal descent and should be preserved, acquired and managed by the Minister.

Amendments to the AHA have been planned by the State Government, and at the time of writing (May 2015) the *Aboriginal Heritage Amendment Bill* is before Parliament. Prior to but in concert with that legislative proposal, there have been significant administrative and directional changes at the DAA. The ACMC, in collaboration with the Registrar of Aboriginal Sites, consider reported ethnographic or archaeological places to determine whether they have the status of:

a. Registered Aboriginal Site: the reported place meets the criteria of section 5 (s.5) and/or s.39(c) of the AHA, and has full status and protection under the AHA;
b. Stored Data: the reported place does not meet s.5 and/or s.39c criteria, and has no status or protection under the AHA; or
c. Other Heritage Place: lodged but yet to be assessed, with an interim status and protection under the AHA.

Since 2012, the ACMC and the DAA have adopted a more rigorous approach than previously, requiring that a place must have significance to the community as a whole and not just to Aborigines or archaeologists in order to meet the criteria of s.5 of the AHA. Consequently, fewer reported places and site are being accorded the status of Registered Aboriginal Site. These changes have also affected sites on the Register of Aboriginal Sites, with many losing their status as Registered Aboriginal Sites.

The process of tightening the criteria for heritage sites was already apparent in 2010 when the DAA's predecessor (the Department of Indigenous Affairs) issued 'Guidelines for Recording Aboriginal Sites'. These distinguished between places with heritage material or values, and places that would be granted the status of Registered Aboriginal Sites. It was stressed in the Guidelines that:

> the process of recording places and objects as 'sites' to be registered is not simply a matter of reporting the existence of physical materials or stories that are spiritually laden. It is necessary to show … their importance and significance, special significance or interest … [and] to record and protect particular places and objects that are of special importance and significance rather than every location or area that is or was associated with Aboriginal people. (DIA 2010)

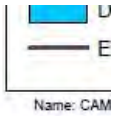

Figure 1: Location and extent of the Yeelirrie Project & the Development Envelope

Figure 2: Archaeological places in the Development Envelope as recorded during the IHE survey 2010-11
(source: BHPB-YDC & IHE 2013)

Figure 3: Significant archaeological places and probable sites meeting the criteria of the AHA in the Development Envelope (source: BHPB-YDC & IHE 2013)

2.0 SITE SURVEYS & HERITAGE PLACES

A number of previous site surveys have been carried out at the Yeelirrie Project and it is evident that most of the Development Envelope has been adequately and sufficiently surveyed for heritage sites. Summaries of these earlier surveys are generally repeated in each subsequent survey report, so the following brief accounts focus on the heritage places and sites identified and recorded. As mentioned above, there are no heritage sites or places listed on the Register of Aboriginal Sites which fall within the Development Envelope, so there is no separate discussion of Registered Aboriginal Sites and Other Heritage Places here.

2.1 Ethnographic Surveys

2.1.1 Liberman & WA Museum

The only comprehensive ethnographic investigation of the Yeelirrie Project Area was commissioned by Western Mining Corporation (WMC) and conducted by the WA Museum. It involved a regional ethnographic study as well as a site survey of the proposed mine site and township for the Yeelirrie project. The principal anthropologist was Liberman, who conducted fieldwork in late 1976 and 1977. He lived temporarily in Leonora and consulted over many months with more than 30 Aboriginal informants, making trips to Yeelirrie and adjacent areas with people who had knowledge of the landscape and sites. Liberman also consulted and visited with an initiated man who had worked on Yeelirrie Station and been given information on significant sites by a more senior lawman who was a custodian for the sites (Liberman 1977a, 1977b; WA Museum 1978). The ethnographic site survey covered a wider area than the designated Project Area, and in fact extended beyond the Yeelirrie Station lease.

In all, eight sites 'which have some mythological significance' were identified and recorded (WA Museum 1978: 123). Five of these were features said to be part of Dreaming stories, and one of these also included engravings of the Panaramittee style (WA Museum 1978: 101-102). The other three were rockshelters containing hand stencils. Some of the ethnographic sites included water sources, such as pools in gorges, soaks in creeklines or gnammas (rockholes) on granite outcrops. Seven other ethnoarchaeological sites were also identified and recorded, including six ceremonial stone arrangements and a site for manufacturing spears (likely used in historic times).

Generally, the recorded ethnographic sites are situated in hills and breakaways to the north or the south of the project area, with several falling in or close to the location proposed by WMC for a townsite approximately 8km north of the Mining & Processing Area. (That townsite proposal was abandoned.) None are within Cameco's Development Envelope. All eight of the recorded ethnographic places were entered on the Register of Aboriginal Sites and have the status of Registered Aboriginal Sites.

2.1.2 Wanmulla Peoples Social History Project

The Wanmulla Social History project was undertaken 'to record the social, cultural and historical affiliations of the Wanmulla people to the land' (de Gand & Wohlan 1998: 3) between the towns of Wiluna and Leonora, including the Yeelirrie Project Area, as described by the Wanmulla Native Title Claim (WC95/82).

Fieldwork was conducted in 1997 to visit various places within the claim area and to record peoples' stories and family connections. Personal histories of senior Wanmulla are included, confirming their

association with the land and the pastoral stations where they grew up and they and their families worked. The report also discusses the various forces that impacted the relationships of Aboriginal people to other tribes and groups as well as to land. These forces included the movement of non-Indigenous people into the Northeastern Goldfields region and the establishment and formalisation of the pastoral industry.

Some of the most important cultural sites for the Wanmulla were also identified and visited during 1997. There are descriptions in the report to the sites recorded by Liberman and the WA Museum which are located in breakaways to the north of the Yeelirrie Project and include mythological and traditional sites as well as water sources. No sites were reported which are located on the low-lying land south of the breakaways or within the Development Envelope.

There was also information on the mythical landscape of Yeelirrie Station reported, but not confirmed. According to the report:

> A woman['s] Dreaming Track goes through Yeelirrie Station according to Lenny Ashwin. Angeline Narrier the most senior woman in the Heritage Team, could not accompany the Team to Yeelirrie because of prior commitments. She did not mention any woman's dreaming track during field work outside of Yeelirrie. (de Gand & Wohlan 1998: 59)

2.1.3 Stevens & CDNTS

Ahead of planned water exploration and geotechnical work, BHPB-YDC commissioned ethnographic and archaeological surveys from the Central Desert Native Title Service (CDNTS), which engaged Stevens for the work. These were 'work area clearance' surveys, meaning that only the proposed impact areas were surveyed and no information about the nature of any reported sites was to be disclosed (Stevens 2009a, 2009b, 2010).

While each ethnographic survey covered a small and specific area; such as drill lines or drilling sumps, these surveys involved driving through the Mining & Processing Area and adjacent land, and at least 20 Aboriginal spokespersons participated. If any significant sites were situated in the Mining & Processing Area and were at risk from future mining it can be presumed the informants would have made that known in the course of these surveys.

No ethnographic sites were identified or reported; that is, no sites of mythological, ceremonial, ritual or historic significance. No issues related to sites of cultural significance were mentioned in Steven's reports. However, a number of places with archaeological material and a number of isolated artefacts were identified (see section 2.2.2). These were either stone artefact scatters or culturally modified trees (CMT).

Stevens (2009a: 3) observes that these archaeological places were considered to be 'significant' by the Aboriginal participants in the survey, although it is not explained what cultural, historical or Aboriginal significance they attributed to these archaeological remains.

2.1.4 Gleason's Assessment

Ahead of proposed exploration drilling in an area 5km northwest of the Mining & Processing Area, BHPB-YDC commissioned an ethnographic and archaeological review and assessment. This work was conducted by anthropologist J. Gleason and archaeologist M. McKenzie in October 2011. From a review of previous surveys in the district, a visit to the area and long experience in the Northeastern Goldfields, it was concluded that 'There are no examples of flat and featureless landscape such as occurs throughout [the study area] being recorded with ethnographic values' (Gleason 2011: 2).

2.2 Archaeological Surveys

2.2.1 WA Museum

An archaeological study and survey was conducted by the WA Museum in conjunction with the ethnographic study and survey by Liberman described above. The methodology applied a predictive model based on the environment and landscape of the project area, with inspections along exiting tracks and in areas considered likely to contain archaeological places. The area of coverage was smaller than for the ethnographic survey, but larger than the Project Area now proposed by Cameco, and previously by BHPB-YDC (see Figure 1).

In all, 26 places with only archaeological material were identified and recorded (WA Museum 1978). This was in addition to 11 ethnoarchaeological places mentioned above (three rockshelters with paintings, one mythological site with engravings, six stone arrangements with ceremonial functions and a stone arrangement used for spear manufacture). A breakdown of the types of recorded material is presented in Table 1.

Table 1: Types of heritage places with archaeology recorded by WA Museum around Yeelirrie

Type	Number	%
artefact scatter	14	*37.8*
quarry	4	*10.8*
culturally modified tree (CMT)	0	*0.0*
rockshelter with artefacts	7	*18.9*
rockshelter with painting	2	*5.4*
engraving	1	*2.7*
stone arrangement	6	*16.2*
grinding patch (with artefacts)	2	*5.4*
spear manufacturing stones	1	*2.7*
Totals	**37**	*100.0*

The most significant of these heritage places were the ethnoarchaeological places; particularly, the engraving site which is of a distinctive and possibly ancient style (Panaramittee tradition), the rockshelters with painted hand stencils, and the numerous stone arrangements (at 16.2%, the third most common type of recorded heritage place).

These stone arrangements range in size, form and complexity, but all are apparently still well defined. There are V-shaped linear arrangements, rings of stones, low cairns and standing stones (i.e. slabs placed upright), with some of the arrangement composed of multiple parts and exhibiting most or all of these types of components.

Artefact scatters were the most common type of archaeological place recorded (14 examples or 37.8%), while artefact scatters were also found in association with some of the rockshelters and the quarries. The assemblage size or the average artefact density of these places was not quantified, but clearly the artefact scatters ranged from very small to very extensive. At one end of the spectrum, a site was described as ‘a small scatter of stone flakes … not distinguishable in any important respect from those at other sites’ (WA Museum 1978: 85) while at the other end of the spectrum, ‘artifact material is scattered in profusion’ at a site next to Yeelirrie Pool, and at a nearby site artefacts occur over ‘several hectares’.

Similarly, the quarries range in size from small, with 'evidence of quarrying and numerous artifacts', up to much larger with 'prolific quantities of primary flakes … associated with the manufacture of stone tools' (WA Museum 1978: 77).

Many of these recorded archaeological places were reported and assessed by the ACMC and accorded the status of Registered Aboriginal Sites, but some were not and were accorded a lower status. No cultural, ritual or ceremonial information was provided in the report for the six ceremonial stone arrangements recorded during the survey, but all of them were considered important and became Registered Aboriginal Sites.

As with the ethnographic sites and places, many of these archaeological places are situated in the hills and breakaways where WMC had proposed a townsite, approximately 8km north of the Project Area. All of these heritage places are outside of Cameco's Development Envelope, and therefore are not part of this review and reassessment of previously recorded heritage places and sites. However, several of these archaeological and ethnoarchaeological sites are relevant because they provide a reference point for consideration of scientific, archaeological and heritage significance, as will be discussed in the conclusion (sections 4.3 and 4.4).

2.2.2 Stevens & CDNTS

Archaeological surveys were carried out in 2009 and 2010 in the Mining & Processing Area, in conjunction with the ethnographic 'work area clearance' surveys ahead of water exploration and geotechnical drilling (Stevens 2009a, 2009b, 2010). The survey methodology is not mentioned in the earlier reports, but is described in the last report as driving through the project area 'accessing existing tracks where possible, and driving cross-country were necessary' (Stevens 2010: 3). A number of Aboriginal people participated in the archaeological inspections or surveys, and in 2009 these people were in addition to the informants employed for the ethnographic survey.

As a result, 35 'areas' with archaeological material were identified. Only the type of material was listed in the reports; i.e. surface artefact scatters or CMT. A further two 'not cleared' points were reported, but no details given for them. In addition, over a hundred isolated artefacts were observed and noted. Stevens observed that the heritage places were 'significant' to the Aboriginal participants in the surveys.

All 35 of the archaeological 'areas' listed by Stevens, and the two 'not cleared' points, were revisited during the later and more comprehensive IHE survey. Most were recorded as archaeological heritage places and more detail was recorded than provided by Stevens. It should also be noted that in several instances, no archaeological material or remains were found at the 'area' reported by Stevens, or a scar on a tree was judged to be natural rather than cultural in origin and so not an archaeological place.

On account of IHE's extra work and more detailed recording, it is the IHE recording of Stevens's 35 reported 'areas' which is considered more reliable and is given precedence for this reassessment.

2.2.3 Gleason's Assessment

The review and assessment conducted ahead of proposed drilling 5km northwest of the Development Envelope included research and four days of fieldwork to walk transects and search a sample of 25% of the designated land (Gleason 2011: 16).

Only a very little archaeological material was identified. This largely consisted of three heritage places; two separate CMTs and four flakes within 2m² thought to be a knapping centre. A small number of isolated artefacts were also recorded.

It was concluded that 'the chances of significant archaeological material occurring on landscape similar to [the study area] were found to be low to very low' (Gleason 2011: 3). The exception was at features that are ephemeral water sources. A few artefacts were noted next to a claypan and a 'cane grass swamp' and the potential for archaeological sites nearby these features was assessed as medium to high (Gleason 2011: 3). It was recommended a survey be carried out if exploration was to occur near these features.

2.2.4 Ironbark Heritage & Environment

The only comprehensive archaeological survey of the Yeelirrie Project Area was begun in December 2010 and completed in April 2011. The survey was commissioned by BHPB-YDC and conducted by Ironbark Heritage & Environment Pty Ltd (IHE).

Cameco's Development Envelope is larger than the areas surveyed by IHE, as is made apparent in Figure 2. Nonetheless, there is generally high level of overlap in regards to the Mining & Processing Area, the Accommodation Village and the Access Roads & Corridors. A considerably larger area for the North Quarry was designated by BHPB-YDC and surveyed by IHE than is being considered by Cameco for the Northern Quarry, but the proposed Waste Management Area next to the Meekatharra-Yeelirrie Road was not surveyed by IHE.

The survey methodology involved archaeologists conducting a comprehensive and systematic search by walking parallel transects spaced 25m apart to cover all of the designated survey areas. A record was made of all archaeological material observed, including isolated artefacts, noting their form, size category and position. It included the re-recording of all heritage 'areas' recorded by Stevens (as mentioned above).

Places with clusters or concentrations of stone artefacts were recorded in the field and a sample of the artefact assemblage recorded. There was also post-survey data processing to identify clustering of artefacts beyond the places observed during fieldwork. (Incidentally, this leads to a little confusion, as in some cases discrete heritage places recorded in the field were amalgamated to create new heritage places but the original places remain in the dataset.)

All places with archaeological material, other than isolated artefacts, were called 'archaeological sites'. After fieldwork, these places were assessed against the criteria of s.5 of the AHA and divided into places possibly meeting the AHA criteria which might be considered to be Registered Aboriginal Sites, and places not meeting the AHA criteria which should be considered Stored Data non-sites.

Definitions used for identifying and recording types of 'archaeological sites' during the survey were explicitly stated in the report, which is useful. But the definitions were not standard and erred on the side of inclusiveness. For example, the definitions of what constituted an artefact scatter or a quarry were largely based on artefact density, with very low thresholds applied.

For artefact scatter sites:

- A density of a minimum of 5 artefacts at 0.05/m² (5 artefacts in 100m²) somewhere in the site; and
- An average overall site density of 0.02/m² (2 artefacts in 100m²). This generally implies a maximum spacing of 10 m between artefacts. (IHE 2013: Box 1, p15)

For quarry sites:

- a minimum density of 0.2/m² (5 artefacts in 25m²) (IHE 2013: Box 1, p15)

Admittedly, there are no uniform or widely accepted density thresholds for these types of sites in Australian archaeological circles; and no guidelines or guidance from the DAA. But most other archaeological companies working in WA use a higher threshold. Density definitions for artefact scatter sites which are sometimes cited in WA consultancy reports include five artefacts in 5mx5m (i.e. a

density of 0.2/m²), or five artefacts in 2mx2m (i.e. a density of 1.25/m²). These definitions are 10 times or 60 times higher than the IHE threshold, respectively.

A very low artefact density threshold for artefact scatter sites is especially problematic in arid and semi-arid landscapes, like Yeelirrie, which are erosional and which are subject to irregular but major flood events which can move artefacts (Holdaway & Fanning 2014; see discussion below). Judgements on site status that do not take geomorphological factors into account are bound to be of limited value.

For culturally modified trees (CMT) with shield or container scars, the IHE definition involved only three criteria:

- be in an accessible location on the tree;
- be symmetrical; and
- have an intact heartwood surface. (IHE 2013: Box 1, p15)

This simple definition is less rigorous than definitions commonly used for identifying scarred trees. For example, Irish (2004: 60) lists 10 criteria to consider, while the DAA (2015) website lists six criteria; namely:

- an indigenous species and a mature individual
- scar base normally begins above ground level
- scar is roughly parallel-sided and fairly symmetrical in its overall shape
- bark regrowth is generally regular
- scar terminations are either squared off or pointed as a result of bark regrowth
- axe marks are present

A total of 166 places with archaeological material (so-called 'archaeological sites') were identified and recorded by IHE during their surveys (Table 2), along with 2933 isolated artefacts. All of the 35 heritage 'areas' recorded by Stevens (see section 2.2.2), and Steven's two 'not cleared' points, were re-recorded by IHE and are included in these totals. One of the archaeological sites (DAA #11526 "Yeelirrie 03") recorded in 1976 by the WA Museum near the Northern Quarry was also re-recorded.

Not all of these 166 so-called 'archaeological sites' were considered significant or important by IHE, and not all of them are within the Development Envelope (see the next section). In particular, the archaeological places that contained rockshelters and quarries were all situated outside the Development Envelope, and were north and/or east of the Northern Quarry, close to the breakaways and granite outcrops where the WA Museum recorded numerous ethnographic, archaeological and ethnoarchaeological sites (Figure 2). Conversely, the CMTs were only found in the Mining & Processing Area. Scatters of artefacts were found principally on low-lying land in the Mining & Processing Area.

It should be noted that the boundaries recorded by IHE for their so-called 'archaeological sites' are unreliable and will overstate the extent of these places. This was because IHE used a very low artefact density, defined some places by analysis of data after fieldwork and did not take into account the taphonomic forces affecting artefacts (a point discussed below).

Table 2: Types and numbers of heritage places recorded in the IHE archaeological survey (source: IHE 2013: Appendix A & Appendix B)

	Sub-totals	%
artefact scatter	129	*77.7*
artefact scatter & quarry/knapping	10	*6.0*
quarry	1	*0.6*
culturally modified tree (CMT)	20	*12.0*
rockshelter	6	*3.6*
other (painting, arrangements, etc.)	0	*0.0*
Total	166	*100.0*

Only 63 of the recorded 166 so-called 'archaeological sites' were judged by IHE to meet or possibly meet the criteria of s.5 of the AHA, as understood in 2011, and were considered possible Aboriginal sites under the AHA (IHE 2013: Appendix A). These were chiefly (but not always) the artefact scatters with more than 70 artefacts (see Table 3). In addition, all 20 CMTs that IHE judged not to be natural scars were considered to meet s.5 criteria and be possible Aboriginal sites under the AHA. That was also the case for the six rockshelters and the single quarry.

The remaining 103 'archaeological sites' were assessed to not meet the AHA criteria and were thought likely to have the status of Stored Data (IHE 2013: Appendix B). All of these likely Stored Data places were artefact scatters with less than 70 artefacts (or artefactual pieces). Although it is not explained or made clear in the report, the negative status assessment was clearly based on their very small size, with most containing less than 20 pieces (Table 3).

Table 3: Size of artefact scatters and quarries recorded by IHE
(source: IHE 2013: Appendix A & Appendix B)

		Assemblage Size (number of artefacts counted or estimated)						
		<20	20-50	51-100	101-250	251-500	501-5000	>5000
Possibly a site under AHA	artefact scatter	-	3	10	11	3	5	2
	artefact scatter & quarry	-	-	-	-	-	2	-
	quarry	-	-	-	-	-	1	-
Likely not a site (Stored Data)	artefact scatter	68	30	3	-	-	-	-
	artefact scatter & quarry	-	-	-	-	-	-	-
	quarry	-	-	-	-	-	-	-

2.3 Heritage Places within the Development Envelope

A total of 43 heritage places were identified within Cameco's Development Envelope which IHE considered likely would meet the criteria of the AHA and which might be accorded the status of Registered Aboriginal Site by the DAA (Table 4). These comprised 21 artefact scatters and 20 CMTs in the Mining & Processing Area, together with two artefact scatters in the Northern Quarry area.

Table 4: Archaeological places recorded by IHE within Cameco's Development Envelope
(source: IHE 2013: Appendix A & Appendix B)

	possibly a site meeting AHA criteria			likely not a site (Stored Data)			
	Mining & Processing Area	**Northern Quarry Area**	**Access Roads & Corridors**	Mining & Processing Area	Northern Quarry Area	Access Roads & Corridors	Totals
artefact scatter	**21**	**2**	**-**	65	8	0	96
artefact scatter & quarry	**-**	**-**	**-**	-	-	-	0
quarry	**-**	**-**	**-**	-	-	-	0
culturally modified tree (CMT)	**20**	**-**	**-**	-	-	-	20
rockshelter	**-**	**-**	**-**	-	-	-	0
sub-totals	**41**	**2**	**0**	65	8	0	**116**
Totals	**43**			73			

Another 73 places with archaeological material were identified within the Development Envelope, but IHE judged that these did not meet the criteria of the AHA, and should not be considered as sites, but instead be considered Stored Data. In most instances, this was because the place was a very small scatter of artefacts at a very sparse density; often with less than 20 pieces and typically less than 50 pieces.

It may be noted that several of the scarred trees recorded by Stevens as heritage 'areas' were judged by IHE archaeologists to be natural scars rather than scars created by Aborigines. This illustrates the inherent difficulties of identifying cultural scars on trees that have a growth habit of dropping branches, which create natural scars.

Heritage places judged by IHE to not meet the criteria of the AHA in 2010 or 2011 will not meet the more rigorous standards now being applied. This is apparent in the trends on site status indicated by recent decisions by the DAA and ACMC (as mentioned above in section 1.3). Therefore, those 73 places already assessed to be Stored Data by IHE will not be reassessed as part of this report. This is also the case for the isolated artefacts recorded by IHE in the project area.

2.4 Archaeological Landscape

2.4.1 Yeelirrie

The results of the WA Museum archaeological survey and IHE's more systematic archaeological survey provide a broad scale view of the patterning of sites at Yeelirrie. They are complimentary, even though they apparently document different archaeological patterns, as this summary will demonstrate.

The WA Museum identified a number of major and significant archaeological (and ethnographic) sites to the north and to the south of the Yeelirrie Project Area and none within it. Principal amongst these are the ethnoarchaeological sites, including an engraving site with mythological associations, a number of rockshelters with paintings and archaeological deposit, and a number of significant ceremonial stone arrangements. All of these are currently Registered Aboriginal Sites, which is understandable given that they have a degree of cultural significance and are uncommon site types for the wider Goldfields region.

A number of large diverse artefact scatters and large silcrete and quartz quarries were also recorded by the WA Museum (as well as by IHE) amid the granite exposures and breakaways north of the Cameco's Development Envelope. These attest to repeated and long-term Aboriginal occupation of the land containing the large granite exposures and breakaways. For example, the artefact scatter (DAA ID) #11525 "Yeelirrie 02" is estimated to contain 50,000 artefacts and could be much larger (personal observation). It is clearly a basecamp that was frequently occupied and where a wide range of activities were carried out.

In contrast, the majority of recorded artefact scatters within the Mining & Processing Area are very small, with between six and 70 pieces (and often less than 20 pieces), and were assessed by IHE to not be sites meeting the criteria of the AHA. Of those artefact scatters which might have qualified as heritage sites under the AHA, most were small low density scatters with between 50 and 500 pieces (IHE 2013: Appendix A; see also Table 3).

Only four larger artefact scatters contained more than 500 pieces, and only two had more than 5000 pieces ("Yeelirrie_139" with an estimated 15,000 pieces and "Yeelirrie_179" with an estimated 6240 pieces). While these are large relative to the other artefact scatters recorded in the Mining & Processing Area, they are only of moderate size when compared with other artefact scatters in the Northeastern Goldfields.

At the Yeelirrie Project, the small or very small and low density artefact scatters in the Mining & Processing Area attest to frequent but brief visits to the ephemeral wetlands and water sources in the Yeelirrie 'valley floor'. There is little evidence of extended occupation or intensive use at these places. Very few specialised implements such as blades, scrapers or adzes were observed in the assemblages. Grindstones which would indicate extended habitation by family groups are very scarce. While souvenir collectors might have removed whole grindstones, the scarcity of grindstone fragments (from even the larger places next to claypans) strongly suggests that extended visits were infrequent. Instead, the assemblages are predominantly or exclusively composed of unmodified flakes and flaked pieces made of quartz and silcrete, both of which are locally available at quarries north of the Northern Quarry area.

This archaeological patterning is consistent with a settlement model of people regularly visiting and staying close to the reliable and long-lasting water sources found in these 'uplands' (e.g. Yeelirrie Pool and associated gnammas and creekline pools), during which time they exploited the numerous sources of siliceous stone suitable for stone tool production which occur nearby. From these major campsites, quarries and cultural sites, people made short journeys onto the southern plains and valley floor to hunt and gather.

In addition to short visits, people stayed beside the claypans and gilgais in the valley floor after heavy rains when these water sources were full. At such times, the ephemeral wetlands would have attracted game and been sources of plant foods and fibres. People likely stayed for extended periods then, keeping the more reliable water sources in the uplands for when the ephemeral waters dried up. This opportunistic use of short-lived water sources and conserving of reliable water sources was described by Gould (1969, 1977) as 'rain chasing' and is considered to be a key subsistence method in arid environments with erratic rainfall and little or no permanent surface water, such as Yeelirrie.

At the same time, people likely cut wood and bark from the Kopi Gums in the *Eucalyptus gypsofilia* woodland to make wooden implements, such as containers or shields. Large Eucalyptus trees have a limited distribution in this region and these trees would have been a useful resource. There is little evidence, however, that wood-working activities were conducted at the small artefact scatters in the Mining & Processing Area. As noted by IHE, and confirmed by personal observation, there are very few wood-working tools in the recorded artefact assemblages, such as scrapers or adzes. However, adzes and a ground-edge axe were noted by the author on site DAA #11525 "Yeelirrie 02", in the breakaways next to Yeelirrie Pool, during a brief visit. Possibly the time-consuming and labour intensive work of fashioning wooden implements from the wooden blanks taken from the Kopi Gums was mostly conducted at the larger campsites near reliable water, north of the Yeelirrie valley floor and outside of the Development Envelope.

2.4.2 Northeastern Goldfields

Scatters of artefacts are the most common type of archaeological material found at Yeelirrie and are the most common type in the wider region. Analysis of the Register of Aboriginal Sites for the Goldfields regions of WA shows that artefact scatters constitute more than two thirds (69.3%) of all reported archaeological sites and places. The only other types which are reasonably common are artefact scatters with quarries (13.7%), quarries (5.7%) and rockshelters (5.6%).

Culturally modified trees are uncommon in the Goldfields regions, with only 31 reported sites or places containing one or more CMTs. This is in marked contrast with the Pilbara region, where CMTs are very common. This difference likely is associated with the properties of the tree species and wood, rather than cultural differences between the Aboriginal inhabitants of these regions. Pilbara CMTs are predominantly Snappy Gum, with far fewer examples on River Gums or Mulga. Similarly, in the Yeelirrie district, all of the reported CMTs are restricted to one tree species (Kopi Gum) and none have been recorded on the Mulga or other Eucalyptus species.

While there is no data on the size and occurrence of archaeological artefact scatters in the Goldfields regions, it is possible to extract some information from a small sample of surveys carried out between Wiluna and Leonora. These show that very small artefact scatters are typical for the region, and most are affected to some degree of disturbance and erosion because of their general proximity to watercourses. These very small and ubiquitous scatters are in marked contrast to the far less common and very much larger artefact scatters that represent major campsites.

A survey of a powerline south of Wiluna (Prince et al. 1994) identified seven artefact scatters. Most were very small and situated beside drainage lines. Most ranged in size from four to 50 pieces, but one was estimated to contain 5,100 artefacts. Another was described 'as a series of six artefact concentrations' beside The Jones Creek which contained between 2 and 16 pieces (Prince et al. 1994: 6). These 'concentrations' were all subject to flooding and the artefacts very probably were not *in situ*.

A survey of a section of the Goldfield Highway north of Leinster (Mattner & Quartermaine 1992) identified four archaeological places, and re-recorded seven previously known places. Most were artefact scatters with a quarry component, and ranged in size between 10 and 10,000 pieces. In a subsequent survey of a northern section of the same highway (Martinick & Assoc 1994), six artefact scatters were recorded. Of these, five scatters ranged in size from 10 to 70 artefacts, while the other site contained an estimated 5,000 artefacts.

A survey of tenements in the Kathleen Valley, north of Leinster (Mattner & Quartermaine 1994) identified two artefact scatters and a quarry. Both scatters contained less than 100 artefacts, were diffuse and partly disturbed by sheetwash. A previously recorded scatter was re-recorded. It contained between 250-400 artefacts very sparsely distributed over a large area and had 'questionable' integrity (Mattner & Quartermaine 1994: 14).

A survey of a large parcel of land near Agnew, west of Leinster, recorded 22 archaeological sites or places (McGann 1999). These were evenly divided between artefact scatters and quarries (10 of each), with a site that comprised an artefact scatter, quarry and grindstone. Three of the 10 artefact scatters contained less than 20 pieces, while another three had less than 100 pieces. Similarly, most of the quarries were very small with half of them containing less than 100 pieces. Only one of the recorded places (a quarry) contained more than several thousand pieces.

An assessment and verification of reported archaeological sites north of Leonora (O'Reilly & Mattner 2007) resulted in the re-recording of 10 archaeological places and sites. Most were extensive artefact scatters situated beside creeklines or drainage lines, and contained between 100 and 5,000 artefacts. Several of the previously recorded sites, which were situated next to creeklines, could not be found and it was noted that they may have been destroyed by flooding since the time of their initial recording. The adverse effects of erosion and sheetwash on the recorded artefact scatters was noted.

2.5 Archaeological Context at Yeelirrie

2.5.1 Geoarchaeology

In order to understand and assess the recorded archaeological places at Yeelirrie, it is important to understand their environmental and geomorphological context. As emphasised in a recent Australian archaeological textbook:

> It is clear that geoarchaeological approaches are needed to understand the archaeological record of Aboriginal presence and what it can tell us about their use of the landscape in the past. Many natural processes disperse or concentrate artefacts, or leave them visible only in patches, making the identification of sites – and therefore settlement patterns that solely reflect human activity – problematic … Most concentrations of artefacts are now understood to form a complex interplay of repeated human activity at one location influenced by a variety of post-depositional processes.
>
> (Holdaway & Fanning 2014: 5)

As these authors note, the archaeological record of semi-arid and arid zones is likely more affected than elsewhere because the paucity of vegetation and the regular desiccation of meagre soils leads to persistent erosion. This can result in highly disturbed archaeological material and remains. At Yeelirrie, as is common in the Northeastern Goldfields, this has been exacerbated by over a century of sheep grazing which severely depleted the stocks of grasses and groundcover increasing the effects of wind and water erosion.

During the frequent dry periods, artefacts from different levels and different chronological periods which are dispersed in the sandy soils are exposed by deflating winds and accumulate on erosional surfaces. They give the appearance of an artefact scatter, but are not *in situ* and are not in spatial or temporal context. Subsequently, these erosional residues may be (partially) covered by migrating sands or deposits, again giving a false impression of *in situ* material.

Furthermore, erosional surfaces at the base of dunes, amid eroding plains or near claypans and saltpans often concentrate water and sheetwash from rapid rainfall, leading to water erosion. This can result in the further movement of artefacts and their dispersal or accumulation. While in some instances water movement may be detectable by size sorting of the artefacts, it is not always obvious. On the other hand, there is generally little sign of wind deflation which removes the sediment and sand from beneath artefacts and leaves them conflated on a windswept surface. Photographs at the end of this report illustrate the effects of these processes.

In such circumstances, any scatters of artefacts need to be critically assessed with close attention to geomorphological factors and the probability that they have been subject to taphonomic forces. Only after taking those factors into consideration can any opinion be offered about the provenance and integrity of the artefact scatter. Even more care needs to be taken regarding the possibility for archaeological deposit if artefacts are found on or next to eroding sandy soils.

> Following conventional site survey techniques … it is tempting to interpret artefact concentrations directly in behavioural terms, as though their content reflects the operation of a single … settlement system … [but] such an interpretation cannot be correct …
>
> The visible archaeological record is not only the result of long-term geomorphological processes, but also a function of contemporary local-scale environmental processes …
>
> (Holdaway & Fanning 2014: 17)

2.5.2 Environment & Geomorphology

Yeelirrie Station is located in the Northeastern Goldfields for the most parts on extensive and largely flat or slightly undulating red sand plains. There is little expression of the underlying granitoid geology apart from a few low and highly weathered breakaways, such as occur north of the Northern Quarry area.

The Northeastern Goldfields is characterised by poorly developed internal drainage, but there are major palaeodrainage systems marked by chains of saline playa lakes (Western Botanical 2011: 14). The Yeelirrie Project Area is located within the Lake Miranda catchment and runoff following very heavy rainfall can fill Lake Miranda, including runoff from Yeelirrie (URS 2015: 6).

The Yeelirrie uranium deposit is developed in calcrete formed in a palaeodrainage line. The Mining & Processing Area is focussed on part of that calcrete. A number of small saltpans, claypans and smectitic clay depressions (gilgai) occur along the palaeodrainage line (see Figure 2). These fill irregularly from sheetwash after sufficient rain, and are flanked by very low sand dunes, low calcrete rises and platforms or low-lying eroded and deflating sand plain (Western Botanical 2011: 20). When full, the claypans and gilgai would have been a focus for Aboriginal activities such as hunting, foraging and camping. This is confirmed by the presence of abundant but typically sparsely distributed artefacts directly beside these ephemeral wetlands.

Rainfall in this semi-arid area is irregular and highly variable, with an average annual rainfall of 238mm. Summer storms can bring heavy downpours and localised flooding, which fill the claypans, gilgai and saltpans that are a feature of the Mining & Processing Area, as well as the gnammas and creekline pools that occur in the breakaways beyond the Northern Quarry.

Rain-bearing depressions from ex-cyclones can produce widespread flooding that re-activates palaeodrainage lines. For example, in 1995 ex-Cyclone Bobbi dumped between 100mm and 400mm of rain on the Goldfields in 48 hours (BOM 2014), causing the normally dry Lake Raeside south of Yeelirrie to overflow its banks, cut roads and railway lines and flow out into the Nullarbor Plain for months (Johnson et al. 1999: 4). In all, 13 ex-cyclones passed within 200km of Yeelirrie Homestead between 1970 and 2000 (URS 2015: 3) and likely brought heavy rains.

But heavy rainfall and flooding is not limited to cyclonic depressions. In April 1973, 125mm of rain fell at Yeelirrie over several days and there was flooding of the Homestead and the road to the highway (URS 2015: 7). The station's rainfall records show that on 36 occasions since 1928 rainfall has exceeded 48mm, or 20% of the annual rainfall, in a 24 hour period. The highest daily rainfall was 99.1mm on 30/3/1931, followed by 90.2mm on 23/1/1952 and 89.6mm on 31/3/1983. In a 48 hour period, rainfall has exceeded 96mm, or 40% of the annual total, on four occasions; namely 107.2mm on 30-31/3/1931; 115.4mm on 16-17/4/1992; 99.0mm on 19-20/12/1994 and 108.6mm on 16-17/2/2011.

The low-lying ground associated with the Yeelirrie palaeodrainage and valley floor would have been flooded or partly flooded at these time, and on many other occasions over the last few centuries and in past millennia. In the Yeelirrie Catchment 'surface water flow … occurs as sheet flow … [and] runoff reaching the valley floor flows to the southeast along the axis of the valley floor towards Yeelirrie Playa, Albion Downs Playa and ultimately Lake Miranda' (URS 2015: 20). Surface runoff 'is typically characterised as short-lived, overland sheet flow and channel flow' (URS 2015: 15). The calcrete in the Yeelirrie palaeodrainage 'receives enhanced groundwater discharge via direct rainfall infiltration, and more particularly *inundation from surface runoff* … during intense rainfall events' (Johnson et al. 1999: 19 [my emphasis]).

In models of water movement for the proposed Yeelirrie mine, hydrologists have predicted that the floodwater in watercourses through the Mining & Processing Area would reach a height of between 0.75m and 1m in a 1 in 100 year rainfall event, and between 0.25m and 0.5m in a 1 in 20 year rainfall event (URS 2015: 30; & Figure 5-10).

The adverse effects of surface runoff, sheetwash and inundation on small artefact scatters will be significant, and especially for the mostly small artefacts and unconsolidated sands at such scatters which are very prone to water movement.

In the Mining & Processing Area, which is most affected by the storms and flood events, there are serious questions about the integrity of the many small scatters of artefacts. It is very probable that many of them are entirely or mostly a product of erosion, with artefacts concentrated and exposed by water movement (Photographs 1 - 6). The same processes will have contributed to shaping and possibly forming some of the clusters and concentrations observed at larger artefact scatters (as discussed below).

The vegetation of the Yeelirrie Project Area is well documented and is generally typical for similar landforms in this region (Western Botanical 2011). Of particular note for archaeological reasons is the occurrence of Kopi Gum Woodland on calcrete in parts of the Yeelirrie valley floor. The rough barked Kopi Gum (*Eucalyptus gypsophila*) was the sole tree species exhibiting scars believed to derive from Aboriginal extraction of wood and bark for bowls, containers and/or shields (Photographs 7-10). This woodland extends 'northwest-southeast for almost 15 km, but only 4.5 km of … [it] is in the main project survey area [i.e. Mining & Processing Area]' (IHE 2013: 26).

It is reasonable to expect that numerous Kopi Gums with cultural scars (i.e. other CMTs) will occur in those portions of the woodland beyond the Development Envelope. This was in fact established during the fieldwork for this site re-assessment, when three CMTs were identified and photographed several

hundred metres beyond the western boundary of the project area. Two other CMTs were identified in an area 5km to the northwest during an inspection by Gleason and McKenzie of another exploration area (Gleason 2011; see section 2.2.3 above).

The exclusive use of Kopi Gum for wooden tool manufacture is notable for several reasons. This species drops branches and natural scars are common on the tree trunks, some of which resemble cultural scars. The species also suffers rapid deterioration and death from termite attack. Many of the trees identified by Stevens and by IHE as CMTs were dead, and many of those had fallen over. This is unusual and confirms the rapidity which with Kopi Gums die from termite attack.

Kopi Gum Woodland has a limited distribution on Yeelirrie Station. That is also the case wherever it grows, as it is restricted to calcrete and gypsiferous soils. Nonetheless, it occurs in small patches throughout semi-arid WA, including in the Murchison and Gascoyne regions, the Northeastern Goldfields and the Eastern Goldfields (Florabase 2015).

Interestingly, no cultural scars were identified on mulga trees, although mulgas occur in the project area. Similarly, no cultural scars were recorded by IHE on any trees or on any sites in the Northern Quarry survey area where there are mulga and other Eucalyptus species. Nor were any CMTs recorded by the WA Museum during the 1976 survey, not even on any of the large, multi-component sites recorded at that time. The reason for this apparent absence of CMTs from other landforms and tree species on Yeelirrie Station is not readily apparent. It may indicate a strong preference by the past Aboriginal population to exploit only Kopi Gums on account of some property of the wood or tree.

2.5.3 Personal Observations

A three day visit was made to the Yeelirrie Project Area by the author. During this time I visited the Mining & Processing Area, the Northern Quarry and some areas outside of the Development Envelope. This fieldwork included inspecting, photographing and making brief observations on more than a dozen of the CMTs and over 20 of the recorded artefact scatters. I also visited two of the significant heritage sites recorded by the WA Museum in 1976 outside the Yeelirrie Project Area.

My principal observation concerned erosion. The effects of erosion were evident on all of the artefact scatters inspected, but particularly those in the Mining & Processing Area. Most obvious was water erosion, with the effects of sheetwash clearly apparent in the local environment and soils (Photographs 1-6), and also apparent in many cases in the distribution of artefacts at the recorded archaeological places. Typical patterns of distribution included:

- artefacts clustered on lower ground levels as a result of sheetwash flowing into those low areas and transporting artefacts;
- artefacts clustered in narrow bands where sheetwash was directed to flow between vegetation;
- artefacts distributed down the slope of low sand dunes and extending around the base of the dunes as a result of surface runoff;
- size sorting of artefacts in some of these instances, with smaller artefacts downslope or preferentially distributed alongside erosion rills; and
- artefacts exposed on bare surfaces ('scalds') which are constantly being deflated by wind erosion and occasionally are inundated and experience flowing water.

But also evident was the effects of wind and water erosion on the general landscape in the Mining & Processing Area. Much of the land surface has been deflated, with the most obvious effects on the low-lying sandy plains and flats in the vicinity of water features (i.e. claypans, gilgai, saltpans, washlines). Bare patches of land or 'scalds' that are constantly deflating are interspersed amongst very low wanderrie sand deposits which are unconsolidated and prone to erosion. Throughout, low shrubs

were observed which retain a pediment around their bases between 5cm to 15cm high, attesting to the erosion of between 5cm and 15cm of soil from the adjacent land which is unprotected by roots and rootlets.

Erosion effects are less obvious on the sandy plain in the Northern Quarry area. Nonetheless, it is clear the plain is alluvial in origin, composed of coarse sand grains weathering from the extensive granite outcrops a few hundred metres to the east and northeast. A very short drainage line arising in those outcrops flows through the largest of the recorded artefact scatters and floods out onto the plain. This was only one of two artefact scatters in Cameco's Northern Quarry considered by IHE to possibly meet the criteria of the AHA. However, it has low integrity and is (at least partly) a 'creekline scatter'. There is even less integrity in the much smaller scatters on the outwash plain, which IHE considered to be Stored Data on account of their small size, and some of these clusters may have been produced by sheetwash.

A further important observation concerned the density of artefacts on the artefact scatters recorded by IHE. As noted above (section 2.2.4), IHE applied a very low artefact density threshold to define an artefact scatter. They also identified some of the artefact scatters in post-fieldwork processing of data based on density, rather than on-the-ground observations.

Many of the recorded heritage places have very low artefact density and I would not have recorded them as heritage places, in the first instance. Instead, I regard them as part of a sparse 'background scatter' of isolated artefacts that occurs throughout the Mining & Processing Area and the Northern Quarry. That 'background scatter' was noted by Stevens and IHE, and is made obvious by the 2933 isolated artefacts recorded by IHE outside of their defined artefact scatters (IHE 2013: viii). This 'background scatter' derives from a combination of past Aboriginal activity with artefact discard in these areas and the wide dispersal of artefacts by erosion, inundation and extensive sheetwash.

Applying a very low threshold means that clusters in the 'background scatter', which often will have resulted from erosion, have been erroneously identified as artefact scatters and 'archaeological sites'. This accounts for many of the very small artefact scatters with between six and 20 pieces recorded by IHE (and assessed by them to be Stored Data).

It also means that IHE have mapped very large boundaries around the larger artefact scatters. The most extensive artefact scatter ("Yeelirrie_139") is nearly 1km long by 0.5km wide and covers over 35ha. In practice, these large boundaries typically extend well beyond any artefact concentrations to include artefacts in a wide surrounding area that are unrelated (spatially or chronologically) to the majority of the artefactual material.

For example, in two instances the boundaries of larger artefact scatter surround entire claypans ("Yeelirrie_139" and "Yeelirrie_179"). In both cases there is strong clustering of artefacts on the eastern margin of the claypan (which might more usefully be considered the site), while around other margins there is only an extensive background scatter within which there are separate small clusters.

It needs also to be noted that these claypans fill as sheetwash is directed into them along low-lying land, so some of their margins are subject to flooding and water movement. Artefacts in that position should be excluded from any 'archaeological site'. At a claypan in the northwest of the Mining & Processing Area, this situation was taken into account and IHE recorded three separate artefact scatters ("Yeelirrie_061", "Yeelirrie_175" and "Yeelirrie_198") flanking the claypan rather than one encompassing it.

Another observation is that there is typically very little potential for archaeological deposit to exist in this geomorphological situation, and any comments made by IHE regarding potential archaeological deposit at some artefact scatters are not valid. It is problematic that such comments ignore the geomorphological context and rely on observations of artefacts apparently eroding from sand dunes.

As is the case elsewhere in the Goldfields and other semi-arid regions, many artefact scatters have been recorded on the low sand dunes which form around claypans (Mattner 2000). This reflects both

an Aboriginal preference for camping on slightly elevated sandy ground and the high exposure rate and conspicuousness of artefacts on easily eroded sands.

Unfortunately, these same dunes are unconsolidated and regularly disturbed (bioturbated) by burrowing animals, treadage by large animals including introduced stock moving to and from the water source, and roots from shrubs and trees. The dunes, which formed by deposition of clay and sands from the claypans, are also subject to regular erosion and occasional partial or complete inundation.

Artefacts are often exposed in eroded portions of the dune, and it is typically the case they have collected onto an eroding surface as sand is removed rather than being 'uncovered' by erosion.

Archaeological excavations conducted at artefact scatter sites on sand dunes beside claypans near Lake Carey, Northeastern Goldfields, found an almost complete lack of stratigraphy in all of the dunes tested. There was also evidence for the movement of artefacts up and down through the dunes, possibly caused by burrowing animals over centuries (Mattner 2000). Similarly, excavations on sand dunes on the Swan Coastal Plain in Perth also typically find unstratified deposits (Mattner *et al.* 2014).

It is nonetheless important to note that if any stratified deposits or intact hearth features were to be discovered, then they would be archaeologically significant, especially because of their rarity. Only at the four larger artefact scatters next to the claypans might there be any potential for archaeological deposit; namely "Yeelirrie_061", "Yeelirrie_139", "Yeelirrie_179"and "Yeelirrie_198".

Finally, the occurrence of numerous CMTs in the Mining & Processing Area is uncommon in my experience and is interesting on that account. However, I would recommend caution in ascribing all of the identified CMTs to people taking wood for implements.

As has been noted above, natural scarring on the Kopi Gums is common and indicates a growth habit of readily dropping branches. A few natural scars exhibited some of the same characteristics (particularly shape and size) as scars identified by Stevens and/or IHE as cultural scars. Many of the scars are on dead trees where there is no bark or regrowth to obscure the scar, and in no instance did I see axe marks on the exposed 'heartwood' (see Photographs 7, 9 & 10). Finally, in two instances of recorded CMTs, the scar is in a position in a fork of the tree that would make it very difficult (but not impossible) to wield an axe or handaxe. So in my opinion, it is not certain that all of the 20 CMTs recorded in the Development Envelope are in fact Aboriginal in origin. A study by an arborist may be necessary to answer this point.

2.5.4 Unsurveyed Land

Most but not all of the land described by Cameco as the Development Envelope was surveyed for archaeological sites by IHE in 2010-11. The unsurveyed land comprises a strip around the edges of the Mining & Processing Area, the northeast corner of the Mining & Processing Area, the proposed Waste Management Centre, a little land at the proposed Village and minor realignments of roads and corridors (as illustrated in Figure 2).

The great majority of this unsurveyed land is flat sand plain to the north or south of the valley floor and some distance from the palaeodrainage line that runs through the Mining & Processing Area. As Figure 2 makes apparent, the distribution of archaeological material, places and possible sites is concentrated along the palaeodrainage line and the string of claypans and gilgais which occur there. This is made even more apparent in the figures in Appendix 3.This patterning of material was also confirmed by my personal observations.

Very little archaeological material was found on the largely featureless sand plains directly adjacent to the unsurveyed land by the IHE team in their comprehensive survey. This strongly suggests that there is a very low likelihood for archaeological sites or places to occur in the adjacent unsurveyed land, especially when there are no topographic features (such as claypans or drainage lines).

The one obvious exception is where the unsurveyed land contains Kopi Gums growing on gypsiferous or calcareous soils. This is the case for a small portion of unsurveyed land in the northwest of the Mining & Processing Area, where the Yeelirrie palaeodrainage line enters the Development Envelope. CMTs are likely to be found there.

Notwithstanding the low potential for archaeological material, places or sites, archaeological surveys should be conducted over any land to be disturbed which was not previously surveyed.

3.0 ASSESSMENT OF RECORDED HERITAGE PLACES

It is now possible to meet the objective of this review, which is to assess those recorded heritage places in the Yeelirrie Project Area to determine which, if any, would meet the criteria of the AHA as currently interpreted and should be considered a Registered Aboriginal Site.

3.1 Recorded Heritage Places

IHE recorded 43 heritage places within Cameco's proposed Development Envelope which they considered met the criteria of s.5 of the AHA, or were considered likely to in 2010 and 2011. That assessment was based on the often erroneous assumption that those places had a degree of scientific significance. These were all places with archaeological material and none were ethnographic in nature. These included 17 of the heritage 'areas' recorded by Stevens (2009a, 2009b, 2010) and the Aboriginal participants in his ethnographic and archaeological surveys.

As noted above, the IHE judgements did not relate to an assessment of the significance and importance to the community 'as a whole' of the heritage places, nor did they consider the highly disturbed nature of most of the artefactual material, and so are neither a useful or reliable guide to the status of these 43 heritage places.

3.2 Artefact Scatters

3.2.1 Minor Scatters

A total of 23 scatters of artefacts were identified as possibly meeting the criteria of the AHA by IHE. Of these, four artefact scatters are situated on low sand dunes next to claypans in the Mining & Processing Area. They contain more than 500 artefacts and include a range of material and types. They are different from the small to very small and generally diffuse scatters that are common, and are discussed separately below.

The other 19 scatters are all small or very small and have little if any research potential. They are predominantly composed of unmodified, mundane flaked artefacts made of locally available stone types. Typically, these assemblages are disturbed to a considerable degree. Two of these are in the Northern Quarry Area, with 17 in the Mining & Processing Area.

While the artefacts in these scatters were undoubtedly made, used and discarded by Aboriginal people visiting the areas, it is clear that post-deposition factors have shaped the scatters. Taphonomic forces affecting the artefacts include deflation and erosion of the sandy sediments in arid times, together with the erosion of the sandy ground by runoff, sheetwash and floodwaters during storm events and floods, with the consequent movement and deposition of smaller artefacts by flowing water. As discussed above, some scatters may be a product of taphonomic forces, such as water and wind erosion, rather than the sole result of Aboriginal activities such as camping or processing food and plant resources.

These erosional forces will result in the concentration of artefacts on bare eroded sands and 'scalds'. Such concentrations may resemble *in situ* artefact scatters exposed by erosion rather than collections of unassociated artefacts created by erosion (which is why it is necessary for archaeologists to understand and evaluate the geomorphological context of the material). Eroded artefacts may also be reincorporated into sediments by the subsequent deposition of sands, further compounding the identification of *in situ* archaeological material. The effects of taphonomic forces on scatters will be

greater in the low-lying Mining & Processing Area, but also have adversely affected those scatters in the Northern Quarry Area.

The partial or complete loss of integrity and archaeological context in the many small scatters means that they have very little, if any, potential to address research questions concerned with intra-site spatial pattering or chronology. The mixing of artefacts from different occupation episodes and potentially very different periods of time means there is little potential for technological analysis of the assemblages, while erosion and inundation reduces the usefulness of microscopic residue and edgewear analysis.

In considering the significance of these 19 artefact scatters, it must also be noted that similar scatters are very likely to occur in other portions of the Yeelirrie valley floor outside of the Development Envelope. Also, small and highly disturbed surface artefact scatters are a common archaeological feature of many parts of the Northeastern Goldfields, as noted above.

For these reasons, the 19 small or very small scatters recorded as potential sites by IHE are assessed to most probably not meet the criteria of s.5 of the AHA, and not be Registered Aboriginal Sites. They should be considered to be Stored Data.

The same status of Stored Data applies to the abundant artefactual material scattered across the low-lying valley floor which may be characterised as a background scatter of isolated finds disturbed by erosion and sheetwash and probably dispersed by flooding.

3.2.2 Significant Sites

Four of the 43 heritage places were considered by IHE to be 'potentially the most archaeologically significant sites' in the project area (IHE 2013: 26). These four places are all situated in the Mining & Processing Area, next to claypans that are both ephemeral water sources and sources of food (attracting game and supporting edible plant resources). These four artefact scatters (from the IHE descriptions) are:

1. **Yeelirrie_061**: an artefact scatter containing an estimated 664 pieces at an average density of approximately 0.03/m², including multiple stone types, which is part of a suite of larger, more complex sites.
2. **Yeelirrie_139**: an artefact scatter with an estimated 15,000 pieces at an average density of approximately 0.4/m², including multiple stone types, numerous implements and grindstones, and higher density clusters in parts.
3. **Yeelirrie_179**: an artefact scatter with an estimated 6,240 pieces at an average density of approximately 0.03/m², including multiple stone types, numerous implements and grindstones, and concentrations on eroded soils that were interpreted as indicating potential for archaeological deposit.
4. **Yeelirrie_198**: an artefact scatter with an estimated 3,460 pieces at an average density of approximately 0.4/m², including multiple stone types, numerous implements, and potential for archaeological deposit in uneroded sands on higher ground.

From my observations and as explained above, these artefact scatters are not as significant as suggested. These sites are not particularly large or complex when considered in a regional perspective. A number of the artefact scatters recorded by the WA Museum to the north are larger and more complex, with greater diversity of stone tool types, with degrees of spatial patterning and sometimes with other archaeological components. Site DAA #11525 "Yeelirrie 02" is a case in point, as it contains at least 50,000 artefacts, including wood-working and seed grinding implements, and is next to several quarries where the movement of stone resources and tool-making processes can be studied.

Furthermore, part of the purported significance of these four sites lies in the identification of 'potential for archaeological deposit'. These four artefact scatters occur on low sand dunes flanking claypans, with artefacts exposed on deflating and eroding surfaces of the dunes. Without taking into account the geomorphological context of the dunes, and the erosional nature of the flood-prone and overgrazed Yeelirrie valley floor, it appears that IHE archaeologists unfamiliar with the Northeastern Goldfields assumed the visible artefacts were evidence of *in situ* artefacts in the uneroded sand dunes, and those dunes had potential archaeological deposit. However, it is well established that stratified archaeological deposits are uncommon in the loose sands of aeolian dunes (Holdaway & Fanning 2014; Mattner 2000; Wandsnider & Camilli 1992; but cf. Mattner et al. 2014).

Despite all these problems with understanding and interpreting the archaeological material at these four larger artefact scatters, it must be noted that these sites occupied favourable position next to water and food resources, and have been used for thousands of years. In contrast to most of the small and very small artefact scatters, which have very uncertain provenance, these larger scatters have accumulated from very many repeated visits to these specific places during which a range of subsistence activities were repeatedly conducted.

Furthermore, in all four cases, estimates of their assemblage size may be too low because there is potential for artefacts to be buried in the sands, even though probably not in any stratigraphic context.

Therefore the four larger artefact scatters "Yeelirrie_061", "Yeelirrie_139", "Yeelirrie_179" and "Yeelirrie_198" offer some possibility for archaeological analysis; for example, a study of the movement of stone raw materials between quarry sites and these campsites, or comparisons of assemblages on artefact scatters in the uplands north of the Project Area and in the Yeelirrie valley floor. Also, although it is considered unlikely, there may also be hearth features or some stratified deposit in the remnant dunes which could provide research opportunities. If so, their archaeological significance would be enhanced.

Finally, these four places are examples of a long history of Aboriginal use of the Yeelirrie valley floor, and provide an opportunity to capture and record some aspects of the past interaction of people with this environment, which may be of interest to the archaeological and non-archaeological community, as well as the Aboriginal community. But it should be noted that similar artefact scatter sites very likely occur beside claypans and gilgais in other portions of the Yeelirrie valley floor outside of the Development Envelope.

According to these considerations, the four places "Yeelirrie_061", "Yeelirrie_139", "Yeelirrie_179" and "Yeelirrie_198" probably will meet the criteria of s.5 of the AHA and should be considered as Registered Aboriginal Sites. That decision rests finally with the ACMC, in consultation with the DAA.

Nonetheless, it may be noted that much larger artefact scatter sites have been recorded further north by the WA Museum, and they offer considerably more potential for chronological, technological, residue and/or spatial analysis than any artefact scatters in the Development Envelope.

Finally, it must be pointed out that the boundaries recorded by IHE for all artefact scatters including these four sites are unreliable and overstate their size and extent. This is particularly the case for sites "Yeelirrie_139" and "Yeelirrie_179", where areas of land subject to flooding and the claypans central to the artefact scatters are included within the IHE site boundary. The boundaries of all four sites should be determined more accurately as part of detailed site recording.

3.3 Culturally Modified Trees

The occurrence of numerous scarred trees recorded as CMTs in the Mining & Processing Area is noteworthy, as is the exclusive use of Kopi Gum (*Eucalyptus gypsophila*). It likely means there was some property of this tree species that made it preferable as a source of wood for containers or shields.

The strong preference for a particular tree species is also apparent in the Pilbara, where CMTs are commonplace and mostly found in Snappy Gum trees (*Eucalyptus leucophloia*).

Very few CMTs have been recorded in the Northeastern Goldfields and these examples at Yeelirrie are certainly the largest collection on record. In this sense, these CMTs as a group are an archaeological resource. However, there is little to be gleaned from the mostly dead individual trees other than measurements and a photographic record of the scar. So the individual CMTs have little archaeological significance.

Their significance is also limited given that many CMTs will occur in the Kopi Gum Woodland that extends widely over parts of the Yeelirrie valley floor beyond the proposed mining and infrastructure areas (Gleason 2011; personal observation). Similarly, the significance apparently attributed to these heritage places by Aboriginal participants in Stevens' surveys (Stevens 2009a: 3) will apply to any other examples, including those beyond the Mining & Processing Area.

In a discussion of the CMTs, it was suggested that 'it may be possible to salvage some of the [dead] CMTs for a small pilot study' into dating them by dendrochronology (IHE 2013: 26). That is not, however, a practical avenue for investigation. These scars will only be relatively recent (i.e. within the last few hundred years) because of the rapid date of decomposition of this species of tree. So dating will only confirm their recent age, without providing any indication of when this practice may have started or if there were changes in the use of these trees over time.

It is considered likely that the 20 recorded CMTs will not meet a rigorous assessment under the criteria of the AHA and will not be considered to be Registered Aboriginal Sites. Instead, they likely will be assessed as Stored Data (not a site) by the DAA and ACMC. Nonetheless, work should be conducted to record more examples in parts of the Yeelirrie valley floor outside the project area, and Aboriginal groups could be engaged for this work. Kopi Gum woodlands occur in other parts of WA's semi-arid interior and it would be interesting to find out if CMTs are present in those woodlands.

3.4 Historical Features

Some Aboriginal families worked on Yeelirrie Station and consultations with these people may provide some relevant and interesting oral histories for the recent past.

There are also a number of remains from Yeelirrie's pastoral history still extant, including sheep yards and pens and shearing sheds. There may be merit in recording and preserving these, as some Aboriginal people may have direct connection to these features, either building them or working there.

3.5 Summary

Several rockshelter sites with archaeological deposit and some with hand stencils, as well as large artefact scatters and quarries are outside (to the north) of the Development Envelope designated by Cameco, while there are rockshelters and significant stone arrangements elsewhere on Yeelirrie Station. They offer considerably more potential for scientific study than any of the sites in the Development Envelope, including chronological and technological analysis. These large and complex archaeological sites are of 'significance and importance to the community as a whole'.

The heritage places recorded in Cameco's project area are less significant, and many have very little if any significance. They are typically small or very small with little inherent research potential and little integrity. Numerous other culturally modified trees and small artefact scatters will occur in other parts of the Yeelirrie valley floor, and larger artefact scatters can be expected surrounding other claypans in

the area. In other words, many further examples of the recorded heritage places are likely to exist outside of the Development Envelope and the recorded places are not unique.

Only four of the larger artefact scatters might be potentially of interest to the community as a whole and therefore be considered Registered Aboriginal Sites; namely, “Yeelirrie_061”, “Yeelirrie_139”, “Yeelirrie_179” and “Yeelirrie_198”. But even these sites have limited research potential, and in part their significance arises from the fact they they have been identified and recorded (i.e. are known) whereas other similar places outside of the Development Envelope have not (i.e. are unknown).

Management of the Aboriginal heritage places within the Development Envelope will need to be considered, with the aim of avoiding unnecessary damage or disturbance, irrespective of their status under the WA *Aboriginal Heritage Act* 1972. The involvement of local Aboriginal groups and the Native Title Claimant group is recommended in developing a Cultural Heritage Management Plan for these heritage places and archaeological remains.

4.0 RECOMMENDATIONS

This assessment confirmed that comprehensive ethnographic and archaeological studies and surveys have been carried out at the Yeelirrie Project. These provide a great deal of information on its Aboriginal 'heritage landscape', if placed in the correct context. This information and analysis, and decades of experience, provide a reliable basis for the following recommendations.

1. When the 'footprint' of the project is finalised (i.e. areas for mining, infrastructure and associated roads, corridors, borefields, etc. are settled), it is recommended that Cameco Australia commission archaeological investigations of any land which will be disturbed but which has not been previously surveyed for archaeological sites. This includes some land on the edges of the Development Envelope, as well as the Waste Management Centre and any subsidiary infrastructure and realignments of planned roads and corridors.

2. Where practicable, it is recommended that Cameco Australia avoid unnecessary disturbance or destruction of the recorded scatters of artefacts and culturally modified trees. Although most of this material likely would not be considered to meet the criteria of a Registered Aboriginal Site, these are the tangible remains of a long history of Aboriginal land use.

3. Where it is not possible to avoid disturbance of the recorded scatters of artefacts or culturally modified trees, it is recommended that Cameco Australia make an application under Section 18 of the WA *Aboriginal Heritage Act* 1972 'to use the land' containing those places. Such an application should also be made if there is a risk of inadvertent disturbance from working nearby.

   In particular, Section 18 applications need to be made before any disturbance of the four significant archaeological sites "Yeelirrie_061", "Yeelirrie_139", "Yeelirrie_179" and "Yeelirrie_198". In the event of Section 18 applications for any of these four artefact scatters, it is recommended that an archaeological salvage program be conducted to record them in detail prior to their destruction.

4. It is recommended that Cameco Australia develop a Cultural Heritage Management Plan (CHMP) in conjunction with the local Aboriginal communities and in accordance with the template provided by the Department of Aboriginal Affairs. A CHMP should extend to the wider area and include those significant ethnographic, archaeological and ethnoarchaeological sites north and south of the Development Envelope.

   The CHMP should involve further ethnographic and archaeological recording of significant sites on Yeelirrie Station, and neighbouring stations if possible, in order to build as comprehensive a picture as possible of the heritage landscape of this district.

   Also, the CHMP should include a particular focus on recording culturally modified trees in other portions of the Kopi Gum Woodland on the Yeelirrie valley floor and investigating the extent of past use of this tree species.

5. It is recommended that Cameco Australia engage with a wide section of the Aboriginal community in the Northeastern Goldfields regarding the project, its effects on Aboriginal heritage and the management of heritage matters through the CHMP.

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Photograph 1: “Yeelirrie_179”: showing bare & eroded sands with sparse artefacts

Photograph 2: “Yeelirrie_163”: showing eroding sands and very few artefacts

Photograph 3: “Yeelirrie_161”: showing eroding sands and very few artefacts

Photograph 4: “Yeelirrie_121”: showing bare eroding and deflating sands

Photograph 5: “Yeelirrie_175”: very sparse artefacts on mobile deflating sands

Photograph 6: “Yeelirrie_178”: showing numerous white quartz artefacts on eroding sands

Photograph 7: “Yeelirrie_56”: CMT showing scar on dead and fallen Kopi Gum

Photograph 8: “Yeelirrie_77”: CMT showing scar on live Kopi Gum & Kopi Gum Woodland behind

Photograph 9: “Yeelirrie_82”: CMT showing scar on dead Kopi Gum

Photograph 10: “Yeelirrie_60”: purported CMT showing scar on fallen dead Kopi Gum

APPENDICES

APPENDIX 1: Obligations relating to sites under the WA *Aboriginal Heritage Act* 1972

APPENDIX 2: Copy of search of Register of Aboriginal Sites (via AHIS)

APPENDIX 3: Assessment of the archaeological places recorded by IHE in 2010-11

APPENDIX 4: Maps showing the assessment of archaeological places recorded by IHE

APPENDIX 1

OBLIGATIONS RELATING TO SITES UNDER THE WA *ABORIGINAL HERITAGE ACT* 1972

5. Application to places

This Act applies to -

(a) any place of importance and significance where persons of Aboriginal descent have, or appear to have, left any object, natural or artificial, used for, or made or adapted for use for, any purpose connected with the traditional cultural life of the Aboriginal people, past or present;

(b) any sacred, ritual or ceremonial site, which is of importance and special significance to persons of Aboriginal descent;

(c) any place which, in the opinion of the Committee, is or was associated with the Aboriginal people and which is of historical, anthropological, archaeological or ethnographical interest and should be preserved because of its importance and significance to the cultural heritage of the State;

(d) any place where objects to which this Act applies are traditionally stored, or to which, under the provisions of this Act, such objects have been taken or removed.

15. Report of findings

Any person who has knowledge of the existence of any thing in the nature of Aboriginal burial grounds, symbols or objects of sacred, ritual or ceremonial significance, cave or rock paintings or engravings, stone structures or arranged stones, carved trees, or of any other place or thing to which this Act applies or to which this Act might reasonably be suspected to apply shall report its existence to the Registrar, or to a police officer, unless he has reasonable cause to believe the existence of the thing or place in question to be already known to the Registrar.

16. Excavation of Aboriginal sites

(1) Subject to Section 18, the right to excavate or to remove any thing from an Aboriginal site is reserved to the Registrar.

(2) The Registrar, on the advice of the Committee, may authorise the entry upon and excavation of an Aboriginal site and the examination or removal of any thing on or under the site in such manner and subject to such conditions as the Committee may advise.

17. Offences relating to Aboriginal sites

A person who -

(a) excavates, destroys, damages, conceals or in any way alters any Aboriginal site; or

(b) in any way alters, damages, removes, destroys, conceals, or who deals with in a manner not sanctioned by relevant custom, or assumes the possession, custody or control of, any object on or under an Aboriginal site,

commits an offence unless he is acting with the authorisation of the Registrar under section 16 or the consent of the Minister under Section 18.

18. Consent to certain uses

(1) For the purposes of this section, the owner of any land includes a lessee from the Crown, and the holder of any mining tenement or mining privilege, or of any right or privilege under the *Petroleum Act 1967*, in relation to the land.

(1a) A person is also included as an owner of land for the purposes of this section if -

(a) the person -

(i) is the holder of rights conferred under section 34 of the *Dampier to Bunbury Pipeline Act 1997* in respect of the land or is the holder's nominee approved under section 34(3) of that Act*;* or

(ii) has authority under section 7 of the *Petroleum Pipelines Act 1969* to enter upon the land;

or

(b) the person is the holder of a distribution license under Part 2A of the *Energy Coordination Act 1994* as a result of which the person has rights or powers in respect of the land.

(2) Where the owner of any land gives to the Committee notice in writing that he requires to use the land for a purpose which, unless the Minister gives his consent under this section, would be likely to result in a breach of section 17 in respect of any Aboriginal site that might be on the land, the Committee shall, as soon as it is reasonably able, form an opinion as to whether there is any Aboriginal site on the land, evaluate the importance and significance of any such site, and submit the notice to the Minister together with its recommendation in writing as to whether or not the Minister should consent to the use of the land for that purpose, and, where applicable, the extent to which and the conditions upon which his consent should be given.

(3) Where the Committee submits a notice to the Minister under subsection (2) he shall consider its recommendation and having regard to the general interest of the community shall either -

(a) consent to the use of the land the subject of the notice, or a specified part of the land, for the purpose required, subject to such conditions, if any, as he may specify*;* or

(b) wholly decline to consent to the use of the land the subject of the notice for the purpose required,

and shall forthwith inform the owner in writing of his decision.

(4) Where the owner of any land has given to the Committee notice pursuant to subsection (2) and the Committee has not submitted it with its recommendation to the Minister in accordance with that subsection the Minister may require the Committee to do so within a specified time, or may require the Committee to take such other action as the Minister considers necessary in order to expedite the matter, and the Committee shall comply with any such requirement.

(5) Where the owner of any land is aggrieved by a decision of the Minister made under subsection (3) he may apply to the State Administrative Tribunal for a review of the decision.

[(6) repealed]

(7) Where the owner of any land gives notice to the Committee under subsection (2), the Committee may, if it is satisfied that it is practicable to do so, direct the removal of any object to which this Act applies from the land to a place of safe custody.

(8) Where consent has been given under this section to a person to use any land for a particular purpose nothing done by or on behalf of that person pursuant to, and in accordance with any conditions attached to, the consent constitutes an offence against this Act.

* * *

APPENDIX 2

COPY OF SEARCH OF REGISTER OF ABORIGINAL SITES

(via the online Aboriginal Heritage Inquiry System, March 2015)

Registered Aboriginal Sites


10746
YEELIRRIE 2
Kutjara
10747
YEELIRRIE 2
KUTJARA Ca

11524	YEELIRRIE 0
11525	YEELIRRIE 0

11529	YEELIRRIE 1
11530	YEELIRRIE 1

Other Heritage Places


10752 YEELIRRIE 27.


11527 YEELIRRIE 10.

* * *

APPENDIX 3

ASSESSMENT OF THE ARCHAEOLOGICAL PLACES RECORDED IN THE DEVELOPMENT ENVELOPE
BY IRONBARK HERITAGE & ENVIRONMENT (IHE)

IHE Name	Type	Area	IHE Assessment in 2011	Waru Assessment in 2015
Yeelirrie_032	AS	Northern Quarry	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_034	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_036	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_048	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_049	CMT	Mining & Processing	Culturally Modified Tree - probably s5 site	CMT - probably not s5 site; probably Stored Data
Yeelirrie_050	CMT	Mining & Processing	Culturally Modified Tree - probably s5 site	CMT - probably not s5 site; probably Stored Data
Yeelirrie_051	AS	Mining & Processing	not a CMT	not archaeological material
Yeelirrie_052	CMT	Mining & Processing	Culturally Modified Tree - probably s5 site	CMT - probably not s5 site; probably Stored Data
Yeelirrie_053	CMT	Mining & Processing	Culturally Modified Tree - probably s5 site	CMT - probably not s5 site; probably Stored Data
Yeelirrie_054	CMT	Mining & Processing	Culturally Modified Tree - probably s5 site	CMT - probably not s5 site; probably Stored Data
Yeelirrie_055	CMT	Mining & Processing	Culturally Modified Tree - probably s5 site	CMT - probably not s5 site; probably Stored Data
Yeelirrie_056	CMT	Mining & Processing	Culturally Modified Tree - probably s5 site	CMT - probably not s5 site; probably Stored Data
Yeelirrie_057	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_058	CMT	Mining & Processing	Culturally Modified Tree - probably s5 site	CMT - probably not s5 site; probably Stored Data
Yeelirrie_059	AS	Mining & Processing	not a CMT	not archaeological material
Yeelirrie_060	CMT	Mining & Processing	Culturally Modified Tree - probably s5 site	CMT - probably not s5 site; probably Stored Data
Yeelirrie_061	AS	Mining & Processing	Artefact Scatter - s5 site	Artefact Scatter - probably s5 site
Yeelirrie_062	AS	Mining & Processing	Scatter of artefacts - probably s5 site	Scatter of artefacts - probably Stored Data
Yeelirrie_063	AS	Mining & Processing	not a CMT	not archaeological material
Yeelirrie_064	AS	Mining & Processing	not a CMT	not archaeological material
Yeelirrie_065	AS	Mining & Processing	not a CMT	not archaeological material
Yeelirrie_066	AS	Mining & Processing	not a CMT	not archaeological material
Yeelirrie_067	CMT	Mining & Processing	Culturally Modified Tree - probably s5 site	CMT - probably not s5 site; probably Stored Data
Yeelirrie_068	AS	Mining & Processing	not a CMT	not archaeological material
Yeelirrie_069	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_070	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_071	AS	Mining & Processing	not a CMT	not archaeological material
Yeelirrie_072	AS	Mining & Processing	not a CMT	not archaeological material
Yeelirrie_073	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds

Yeelirrie_074	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_075	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_076	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_077	CMT	Mining & Processing	Culturally Modified Tree - probably s5 site	CMT - probably not s5 site; probably Stored Data
Yeelirrie_078	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_079	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_080	AS	Mining & Processing	Scatter of artefacts - probably s5 site	Scatter of artefacts - probably Stored Data
Yeelirrie_081	CMT	Mining & Processing	Culturally Modified Tree - probably s5 site	CMT - probably not s5 site; probably Stored Data
Yeelirrie_082	CMT	Mining & Processing	Culturally Modified Tree - probably s5 site	CMT - probably not s5 site; probably Stored Data
Yeelirrie_083	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_084	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_085	CMT	Mining & Processing	Culturally Modified Tree - probably s5 site	CMT - probably not s5 site; probably Stored Data
Yeelirrie_087	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_088	AS	Mining & Processing	Scatter of artefacts - probably s5 site	Scatter of artefacts - probably Stored Data
Yeelirrie_089	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_092	AS	Mining & Processing	Scatter of artefacts - probably s5 site	Scatter of artefacts - probably Stored Data
Yeelirrie_093	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_094	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_095	AS	Mining & Processing	not a CMT	not archaeological material
Yeelirrie_096	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_097	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_098	CMT	Mining & Processing	Culturally Modified Tree - probably s5 site	CMT - probably not s5 site; probably Stored Data
Yeelirrie_099	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_100	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_101	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_102	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_103	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_104	AS	Mining & Processing	Scatter of artefacts - probably s5 site	Scatter of artefacts - probably Stored Data
Yeelirrie_105	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_106	AS	Mining & Processing	Scatter of artefacts - probably s5 site	Scatter of artefacts - probably Stored Data
Yeelirrie_107	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_108	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_109	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_121	AS	Mining & Processing	Scatter of artefacts - probably s5 site	Scatter of artefacts - probably Stored Data
Yeelirrie_122	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_123	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds

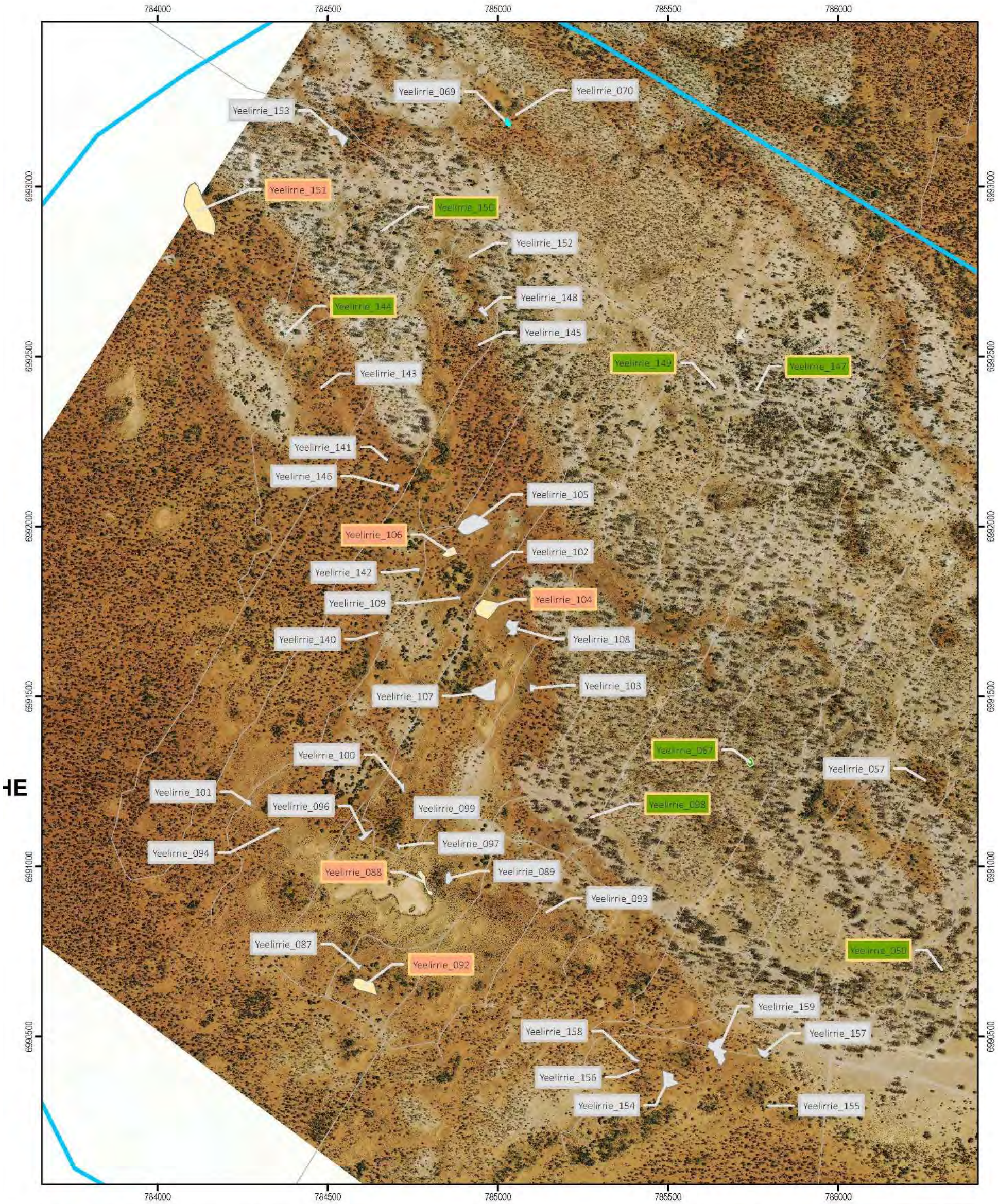
Yeelirrie_124	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_125	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_126	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_127	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_128	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_129	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_130	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_131	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_132	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_133	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_136	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_138	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_139	AS	Mining & Processing	Artefact Scatter - s5 site	Artefact Scatter - probably s5 site
Yeelirrie_140	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_141	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_142	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_143	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_144	CMT	Mining & Processing	Culturally Modified Tree - probably s5 site	CMT - probably not s5 site; probably Stored Data
Yeelirrie_145	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_146	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_147	CMT	Mining & Processing	Culturally Modified Tree - probably s5 site	CMT - probably not s5 site; probably Stored Data
Yeelirrie_148	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_149	CMT	Mining & Processing	Culturally Modified Tree - probably s5 site	CMT - probably not s5 site; probably Stored Data
Yeelirrie_150	CMT	Mining & Processing	Culturally Modified Tree - probably s5 site	CMT - probably not s5 site; probably Stored Data
Yeelirrie_151	AS	Mining & Processing	Scatter of artefacts - probably s5 site	Scatter of artefacts - probably Stored Data
Yeelirrie_152	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_153	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_154	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_155	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_156	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_157	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_158	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_159	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_160	AS	Mining & Processing	Scatter of artefacts - probably s5 site	Scatter of artefacts - probably Stored Data
Yeelirrie_161	AS	Mining & Processing	Scatter of artefacts - probably s5 site	Scatter of artefacts - probably Stored Data
Yeelirrie_162	AS	Mining & Processing	Scatter of artefacts - probably s5 site	Scatter of artefacts - probably Stored Data

Yeelirrie_163	AS	Mining & Processing	Scatter of artefacts - probably s5 site	Scatter of artefacts - probably Stored Data
Yeelirrie_164	AS	Mining & Processing	Scatter of artefacts - probably s5 site	Scatter of artefacts - probably Stored Data
Yeelirrie_165	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_166	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_167	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_168	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_169	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_170	AS	Mining & Processing	Scatter of artefacts - probably s5 site	Scatter of artefacts - probably Stored Data
Yeelirrie_171	CMT	Mining & Processing	Culturally Modified Tree - probably s5 site	CMT - probably not s5 site; probably Stored Data
Yeelirrie_172	AS	Mining & Processing	Scatter of artefacts - probably s5 site	Scatter of artefacts - probably Stored Data
Yeelirrie_173	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_174	AS	Mining & Processing	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_175	AS	Mining & Processing	Scatter of artefacts - probably s5 site	Scatter of artefacts - probably Stored Data
Yeelirrie_177	AS	Mining & Processing	Scatter of artefacts - probably s5 site	Scatter of artefacts - probably Stored Data
Yeelirrie_179	AS	Mining & Processing	Artefact Scatter - s5 site	Artefact Scatter - probably s5 site
Yeelirrie_181	AS	Northern Quarry	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_184	AS	Northern Quarry	Scatter of artefacts - probably s5 site	Scatter of artefacts - probably Stored Data
Yeelirrie_185	AS	Northern Quarry	Scatter of artefacts - probably s5 site	Scatter of artefacts - probably Stored Data
Yeelirrie_186	AS	Northern Quarry	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_187	AS	Northern Quarry	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_188	AS	Northern Quarry	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_195	AS	Northern Quarry	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_196	AS	Northern Quarry	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_197	AS	Northern Quarry	Scatter - Stored Data (non-site)	isolated finds
Yeelirrie_198	AS	Mining & Processing	Artefact Scatter - s5 site	Artefact Scatter - probably s5 site

Key: AS = scatter of artefacts or artefact scatter; CMT = culturally modified tree
s5 = Section 5 of the WA *Aboriginal Heritage Act* 1972

APPENDIX 4

MAPS SHOWING THE ASSESSMENT OF ARCHAEOLOGICAL PLACES RECORDED IN THE DEVELOPMENT ENVELOPE BY IRONBARK HERITAGE & ENVIRONMENT IN 2010-11 (boundaries are as recorded by IHE and need to be verified



Yeelirrie Heritage Verification

Map 1 - Showing Results of Verification Work

Plan No: CAM01_18
Author: Tristan Bergin
Date: 9/06/2015

Yeelirrie_000 Scatter of artefacts - probably Stored Data

Yeelirrie_000 Culturally Modified Tree - probably not s5 site

Yeelirrie_000 Isolated finds

Development Envelope

Yeelirrie Tracks

WARU

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Meters

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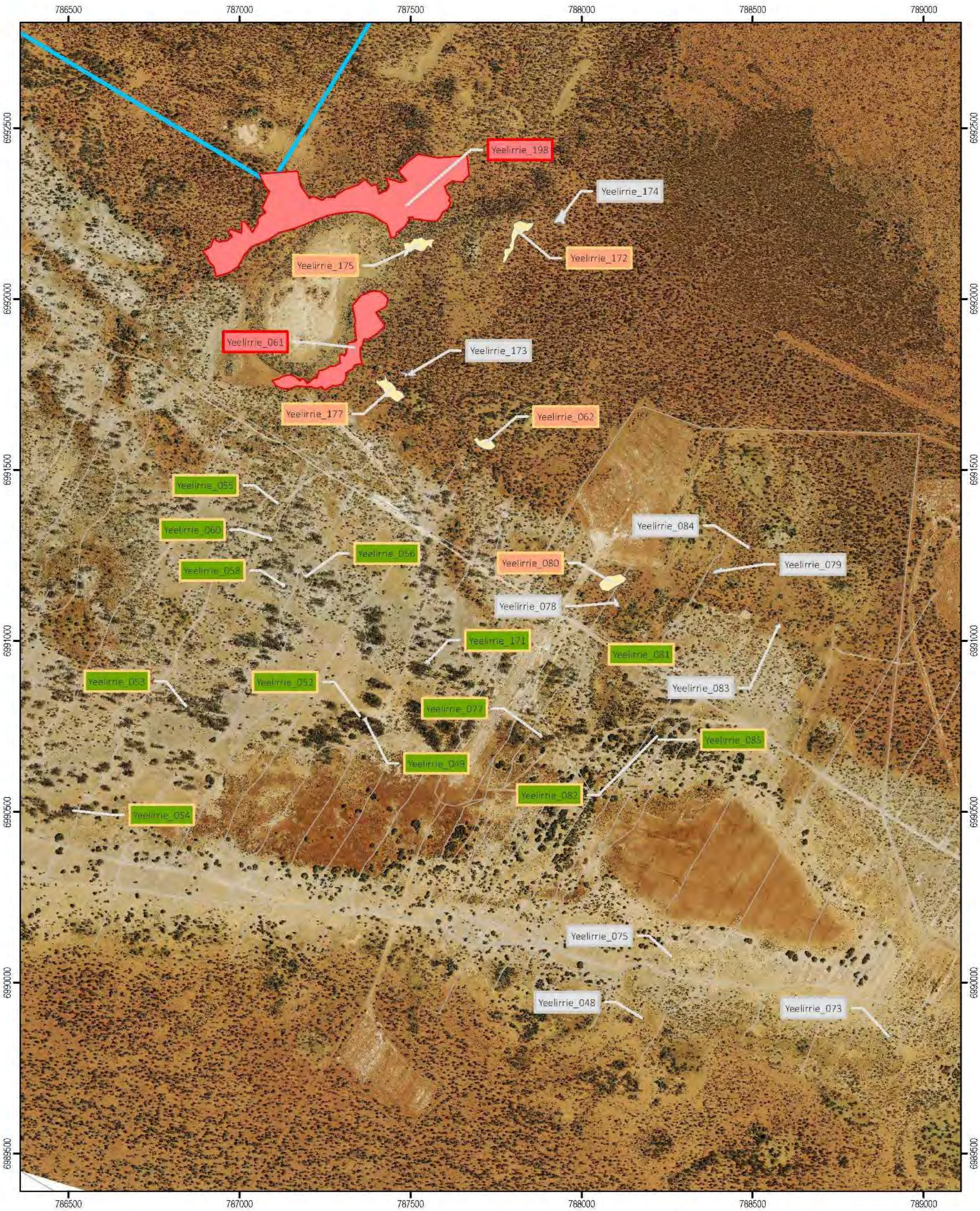
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Yeelirrie_171
Yeelirrie_081
Yeelirrie_053
Yeelirrie_052
Yeelirrie_083
Yeelirrie_077
Yeelirrie_085
Yeelirrie_049
Yeelirrie_082
Yeelirrie_054
Yeelirrie_075
Yeelirrie_048
Yeelirrie_073
Yeelirrie Heritage Verification
Map 2 - Showing Results of Verification Work
Plan No: CAM01_19
Author: Tristan Bergin
Date: 9/06/2015
Yeelirrie_000 Artefact Scatter - probably s5 site
Yeelirrie_000 Scatter of artefacts - probably Stored Data
Yeelirrie_000 Culturally Modified Tree - probably not s5 site
Yeelirrie_000 Isolated finds
Yeelirrie Tracks
Development Envelope
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Yeelirrie_076
Yeelirrie_074
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Yeelirrie_132
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Yeelirrie_130
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Yeelirrie_131
Yeelirrie_127
Yeelirrie_168
Yeelirrie_170
Yeelirrie_136
Yeelirrie_166
Yeelirrie_169
Yeelirrie_162
Yeelirrie_139
Yeelirrie Heritage Verification
Map 3 - Showing Results of Verification Work
Plan No: CAM01_20
Author: Tristan Bergin
Date: 9/06/2015
Yeelirrie_000 Artefact Scatter - probably s5 site
Yeelirrie_000 Scatter of artefacts - probably Stored Data
Yeelirrie_000 Isolated finds
Yeelirrie Tracks
Development Envelope
WARU
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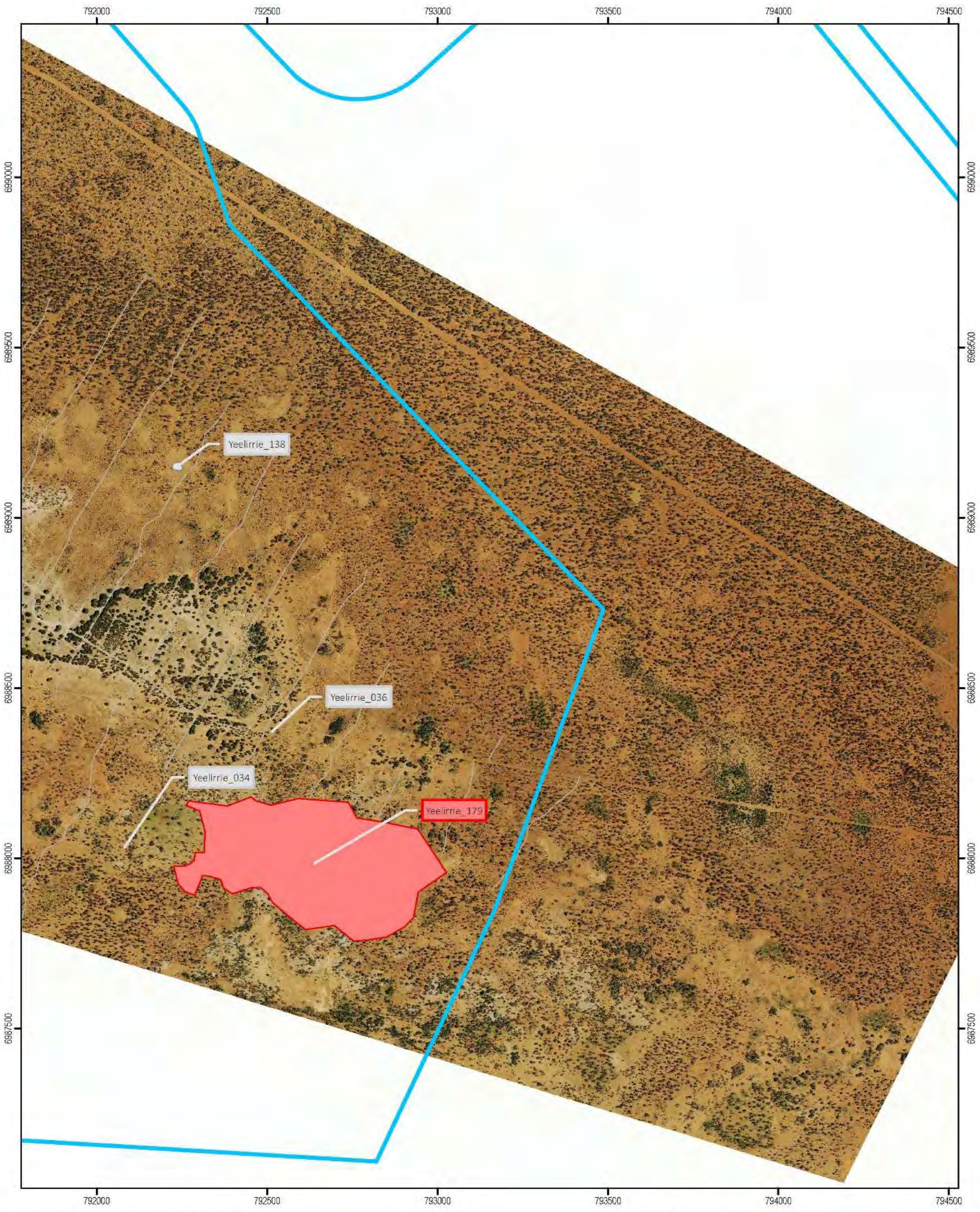

Yeelirrie Heritage Verification

Map 4 - Showing Results of Verification Work

Plan No: CAM01_21
Author: Tristan Bergin
Date: 9/06/2015

Yeelirrie_000 Artefact Scatter - probably s5 site

Yeelirrie_000 Isolated finds

Yeelirrie Tracks

Development Envelope

WARU

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Meters

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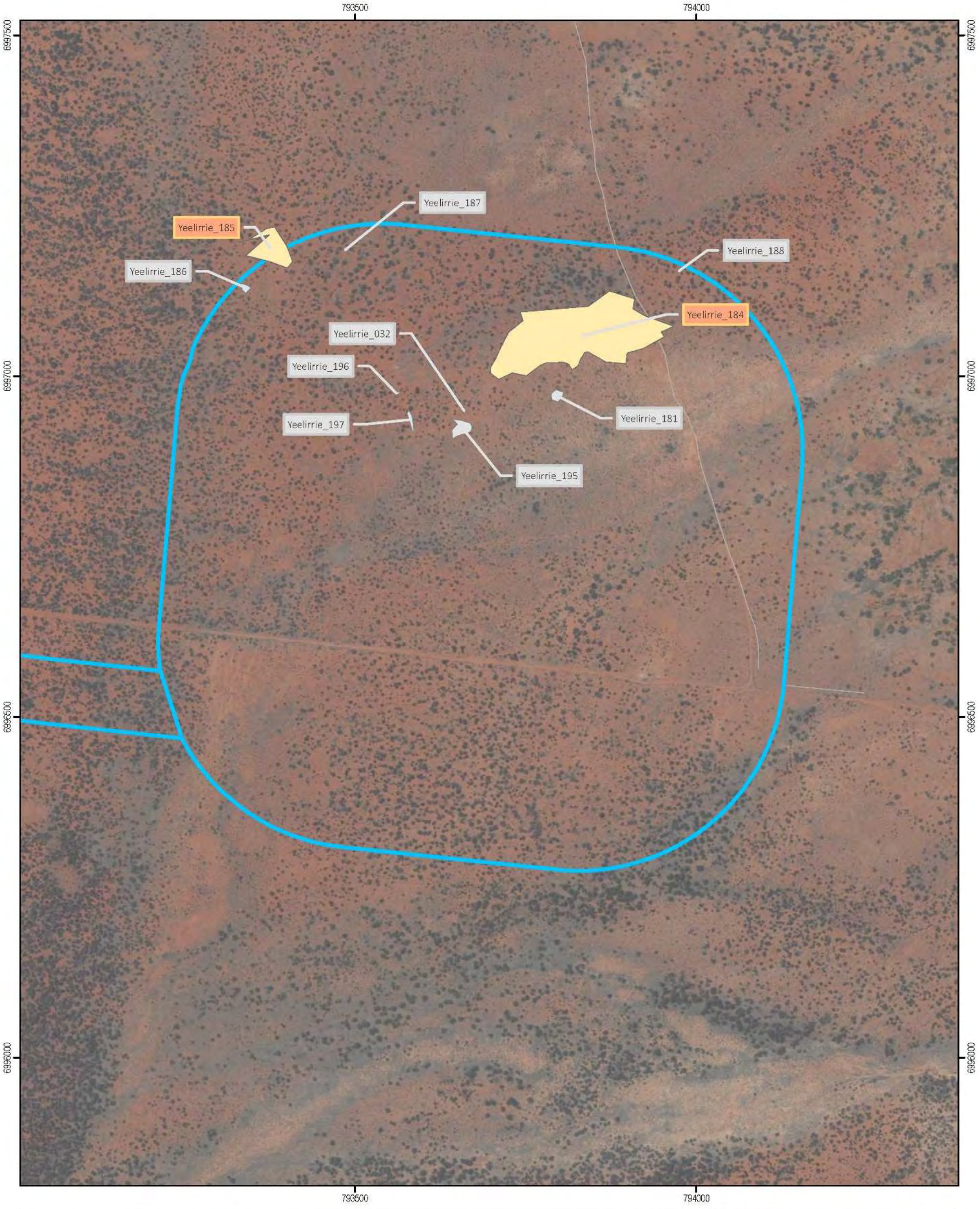

Yeelirrie Heritage Verification

Map5 - Showing Results of Verification Work

Plan No: CAM01_22
Author: Tristan Bergin
Date: 9/06/2015

Yeelirrie_000 Scatter of artefacts - probably Stored Data

Yeelirrie_000 Isolated finds

Yeelirrie Tracks

Development Envelope

WARU

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Meters

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